

Report of the Working Group on Disease Burden for 12th Five Year Plan

*WG-3 (2): Non
Communicable
Diseases*

No. 2(6)2010-H&FW
Government of India
Planning Commission

Yojana Bhavan, Sansad Marg
New Delhi – 110001

Dated 9th May 2011

OFFICE MEMORANDUM

Subject: Constitution of working group on Disease Burden (Communicable and non-communicable diseases) for the formulation of the Twelfth Five Year Plan (2012-2017)

With a view to formulate the Twelfth Five Year Plan (2012-2017) for the Health Sector, it has been decided to constitute a Working Group on Disease Burden with sub groups on Communicable Diseases and Non-communicable Diseases for the formulation of the Twelfth Five Year Plan (2012-2017) under the Chairmanship of **Dr. R. K. Srivastava, DGHS, Ministry of Health and Family welfare, Government of India.**

The composition and the terms of reference of the Working group would be as follows:

Subgroup I: Communicable Diseases

1.	Dr. R. K. Srivastava, DGHS, MoHFW	Chairperson
2.	Dr. Yogesh Jain, Jan Swasthya Sahyoj	Co- Chairperson
3.	Dr. Shiv Lal, Adviser, DGHS, MoHFW	Member
4.	Joint Secretary (Public Health), MoHFW	Member
5.	Dr. Lalit Kant, Scientist 'G' and Head (Epidemiology and Communicable Diseases Division), ICMR, New Delhi	Member
6.	Director, Patel Chest Institute, Delhi	Member
7.	Director, All India Institute of Hygiene and Public Health (AIIH & PH), Kolkata	Member

8.	Director, National Vector Borne Disease Control Programme (NVBDCP), New Delhi	Member
9.	Director, National Institute of Epidemiology, Chennai	Member
10.	Director, Voluntary Health Association of India, New Delhi	Member
11.	Dr. J.C. Suri, Head Dept. of Pulmonary Medicine, Vardhman Mahavir Medical College & Safdarjung Hospital Hospital (VMCC & SJ), New Delhi	Member
12.	Dr. C.S. Pandav, Dept. of Community Medicine, AIIMS, New Delhi	Member
13.	Prof. Jay Prakash Muliyl, Head of Dept. of Community Medicine, Christian Medical College, Vellore	Member
14.	Dr. John C Oommen, Krushi Hospital, Cuttack, Orissa	Member
15.	Dr. Biswaroop Chatterjee, Microbiologist, West Bengal	Member
16.	Dr. S Sridhar, BASIX (Bhartiya Samruddhi Investments and Consulting Services), Gujarat	Member
17.	Dr. M. Bhattacharya, Head Community Health Administration, NIHFV (National Institute of Health & Family Welfare), New Delhi	Member
18.	Dr. Shreelakha Roy, Voluntary Health Association of Tripura	Member
19.	Principal Secretary (H&FW), Government of Chhattisgarh	Member
20.	Principal Secretary (H&FW), Government of Orissa	Member
21.	Mr. S M Mahajan, Adviser (Health) Planning Commission	Member
22.	Director, National Centre for Disease Control (NCDC), New Delhi	Member Secretary

Terms of Reference

- I. To document the burden and trend of communicable diseases including emerging and re-emerging infectious diseases in India

- II. To review the achievement of ongoing major communicable disease control programmes their target and suggests corrective measures to improve their implementation in the 12th Plan.
- III. To suggest introduction of new programmes/ continuation of existing programmes for control of communicable diseases and modifications required, if any, in the 12th Five Year Plan on the basis of 1& 2 above along with detailed budget for each programme.
- IV. To review the current system of monitoring and evaluation of the existing communicable disease control programmes and suggest measures to make the system more effective
- V. To suggest mechanisms of partnership with mother NGOs/private sector/community/local self government in implementation and monitoring of the health programmes proposed in the 12th Plan.
- VI. To review the current status of HMIS in terms of its quality and utilization and propose to develop it into an effective system during the 12th Plan for providing reliable and updated data base for communicable diseases.
- VII. To review the functioning Integrated Disease Surveillance Programme in terms of its effectiveness in strengthening surveillance for picking up early warning signals of outbreaks and institution of appropriate control measures in a timely manner, identify gaps and suggest measures to strengthen the surveillance system for prevention and control of communicable diseases during the 12th Plan.
- VIII. To review the status of implementation of International Health Regulations 2005 in the country with special reference to public health response to various types of public health emergencies of international concern and suggest measures to comply with requirements under IHR.
- IX. To deliberate and give recommendations on any other matter relevant to prevention and control of communicable diseases.

Subgroup 2: Non-Communicable Diseases

1.	Dr. R. K. Srivastava, DGHS, MoHFW	Chairperson
2.	Dr. H.C. Goyal, Adviser, DGHS, MoHFW	Member
3.	Sh. B. K. Prasad , Joint Secretary MoHFW New Delhi	Member
4.	Dr. Bela Shah, Scientist 'G' and Head (NCD Division), ICMR, New Delhi	Member
5.	Dr. Rajender A Badwe, Director, Tata Memorial Hospital, Mumbai	Member
6.	Prof. Ashok Seth, Chairman, Max Heart Hospital, Saket, New Delhi	Member
7.	Dr. B.K. Rao, Chairman, Sir Ganga Ram Hospital, New Delhi	Member
8.	Dr. Sanjay Aggarwal, HOD, Dept. of Nephrology, AIIMS	Member
9.	Dr. Sanjay Wadhwa, Addl. Professor, PMR, AIIMS	Member
10.	Dr. G. N. Rao, L. V. Prasad Eye Institute, Hyderabad	Member
11.	Mr. Tulsiraj, Arvind Eye Care, Tamil Nadu	Member
12.	Ms. Shobha John, Leading Anti Tobacco Activist	Member
13.	Dr. R. Krishna Kumar, NIMHANS, Bangalore	Member
14.	Dr. Suresh Kumar, Director, Institute of Palliative Medicine, Calicut	Member
15.	Dr. Raman Kataria, Pediatric Surgeon, Jan Swasthya Sahyog, Chhattisgarh	Member
16.	Dr. Krishna Kumar, Amrita Institute of Medical Sciences, Kochi	Member
17.	Dr. Sara Bhattacharji, MD Professor CMC, Vellore	Member
18.	Principal Secretary (H&FW), Jammu and Kashmir	Member
19.	Principal Secretary (H&FW), Goa	Member
20.	Mr. Ambrish Kumar, Adviser (Health) Planning Commission	Member
21.	Dr. D. Bachani, DDG (NCD), Dte. General of Health Services, MoHFW (O) 23062649	Member Secretary

Joint Member Secretary for Subgroup I & II

Dr. Jagdish Kaur, Chief Medical Officer, Ministry of Health & Family Welfare (O)23063120

Terms of Reference

- I. To document burden and trend of non-communicable diseases in India.
- II. To review status of ongoing Central Sector/Centrally Sponsored Disease Control Programme for non-communicable diseases.
- III. To suggest introduction of new programmes/ continuation of existing programmes for control of non-communicable diseases and modifications required, if any, in the 12th Five Year Plan on the basis of 1& 2 above along with detailed budget for each programme. This shall include initiating a Programme for any non-communicable disease of public health importance not yet covered under any Programme.
- IV. To assess the need for developing a National Institute for Health Promotion and Control of Chronic Diseases to play leadership role in prevention and control of NCDs and suggest its broad set up and fund requirement.
- V. To study and work out comparative effectiveness of interventions at different levels of health care such as health promotion, prevention, community based services, screening/ early diagnosis, treatment and rehabilitative care taking into account short term and long term needs for prevention and management of non-communicable diseases.
- VI. Based on the assessment made as at 5 above, suggest proportionate expenditure on preventive, promotive, curative and rehabilitative health care for non-communicable diseases for maximizing impact of these interventions and optimizing resources available.
- VII. To develop a scheme for building up a platform for Emergency Medical System (EMS) by modifying and up-scaling the on-going trauma care programme.

- VIII. To review ongoing schemes for Emergency Medical Relief, and intensify ATLS training programmes and expand mobile hospital and CBRN Centre for disaster management.
- IX. To deliberate and give recommendations on any other matter relevant to prevention and control of non-communicable diseases.
1. The Chairman may constitute various Specialists Group / Working Groups / Sub-groups/task forces etc. as considered necessary and co-opt other members to the Working Group for specific inputs.
 2. Working Group will keep in focus the Approach paper to the 12th Five Year Plan and monitorable goals, while making recommendations.
 3. Efforts must be made to co-opt members from weaker section especially SCs, Scheduled Tribes and minorities working at the field level.
 4. The expenditure towards TA/DA in connection with the meetings of the Working group in respect of the official members will be borne by their respective Ministry / Department. The expenditure towards TA/DA of the Working group Members would be met by the Planning Commission as admissible to the class 1 officers of the Government of India.
 5. The Working group would submit its draft report by 31st July, 2011 and final report by 31st August, 2011.

(Shashi Kiran Baijal)
Director (Health)

Copy to:

1. Chairman, all Members, Member Secretary of the Working Group
2. PS to Deputy Chairman, Planning Commission
3. PS to Minister of State (Planning)
4. PS to all Members, Planning Commission
5. PS to Member Secretary, Planning Commission
6. All Principal Advisers / Sr. Advisers / Advisers / HODs, Planning Commission
7. Director (PC), Planning Commission
8. Administration (General I) and (General II), Planning Commission
10. Accounts I Branch, Planning Commission
11. Information Officer, Planning Commission
12. Library, Planning Commission

(Shashi Kiran Baijal)
Director (Health)



Prevention & Control of Non-Communicable Diseases (NCDs)

**Proposal for the
12th Five Year Plan**

**Working Group on Disease Burden:
Non-Communicable Diseases (NCDs)**

**Directorate General of Health Services
Ministry of Health & Family Welfare**

CONTENTS

	Page
EXECUTIVE SUMMARY	3
MAIN REPORT	
Section 1: DISEASE BURDEN DUE TO NON-COMMUNICABLE DISEASES	10
Section 2: RISK FACTORS & DETERMINANTS OF NONCOMMUNICABLE DISEASES	50
Section 3: PROGRESS OF ONGOING NATIONAL PROGRAMMES FOR NCDs	67
Section 4: PLAN OF ACTION TO PREVENT AND CONTROL NCD DURING 12 TH PLAN	89
<i>Programmes for Prevention and Control of Life Style Chronic Diseases:</i>	
1. Cancer	94
2. Diabetes, Cardiovascular Diseases (CVD) & Stroke	101
3. Chronic Obstructive Pulmonary Diseases	105
4. Chronic Kidney Diseases	108
5. National Organ Transplant Program	117
6. National Mental Health Program	140
7. National Iodine Deficiency Disorders Control Program	149
8. National Program for Prevention & Control of Fluorosis	152
9. Oral Health	153
<i>Programmes for Disability Prevention and Rehabilitation:</i>	
10. Trauma Care facilities on National Highways	166
11. Prevention & Management of Burn Injuries	168
12. Disaster Preparedness and Response in Health Sector	175
13. Emergency Medical Services	187
14. Prevention and Management of Musculo-skeletal Disorders	216
15. Upgradation of Department of Physical Medicine & Rehabilitation	219
16. National Blindness Control Program	226
17. National Deafness Control Program	232
18. National Program for Health Care of the Elderly	237
19. Prevention & Control of Neurological Disorders (Epilepsy, Autism, Dementia)	240
20. Prevention & Management of Congenital Diseases	254
21. Prevention & Management of Genetic Blood Disorders (Sickle Cell Anaemia, Thalassemia, Haemophilia)	255
<i>Health Promotion and Prevention of NCDs and risk factors</i>	
22. National Tobacco Control Programme	259
23. Prevention and Control of Nutritional Disorders & Obesity	264
24. National Institute for Health Promotion and Control of Chronic Diseases	267
25. National Program on Patients' Safety	276
26. Establishment of Air Port Health Office/Port Health Office	279
Section 5: BUDGET REQUIRED TO PREVENT & CONTROL NCDs FOR 12 TH PLAN	289
Annex. 1: Monitoring and Evaluation of NCDs	309
Annex. 2: Broad Organizational Structure at National, State & District levels	321
Annex. 3: References	323
Annex. 4: Composition of Working Group on Disease Burden (NCD) & sub-groups	330

EXECUTIVE SUMMARY

1. Burden of NCDs

Non-communicable Diseases (NCDs) account for nearly half of all deaths in India. Among the NCDs, Cardiovascular Diseases (CVD) account for 52% of mortality (52%) followed by Chronic Obstructive Pulmonary Disease (COPD), Cancer, Diabetes and Injuries. Projection estimates have shown that unless interventions are made, burden due to NCDs will increase substantially. NCDs account for 43% of the DALYs. The potentially productive years of life lost (PPYLL) due to CVDs in the age group of 35-64 was 9.2 million in 2000 and is expected to rise to 17.9 million in 2030. Since the majority of deaths are premature there is a substantial loss of lives during the productive years as compared to other countries. Heart diseases, stroke and diabetes are projected to increase cumulatively, and India stands to lose 237 billion dollars during the decade 2005-2015.

Considering the high cost of medicines and longer duration of treatment NCDs constitute a greater financial burden to low income groups. Studies carried out in India have shown that the cost of treating NCDs such as diabetes has doubled from 1998 to 2005 particularly among urban households.

Road traffic injuries are increasing precipitously, and are estimated to account for as much as 25% of all health care expenditures in developing nations. Injuries and diseases of the musculoskeletal system account for more than 20% of patient visits to primary care.

More than 20% of the population has at least one chronic disease and more than 10% have more than one. Chronic diseases are widespread in people who are younger than 45 years and in poorer populations. Whereas socioeconomic development tends to be associated with healthy behaviours, rapidly improving socioeconomic status in India is associated with a reduction of physical activity and increased rates of obesity and diabetes. The emerging pattern in India is therefore characterized by an initial uptake of harmful health behaviours in the early phase of socioeconomic development. Such behaviours include increased consumption of energy-dense foods and reduced physical activity and increased exposure to risk factors.

Health-damaging behaviours such as smoking, drinking, consuming unhealthy diets (rich in salt, sugar and fats, and low in vegetables and fruits) are also found to be common among the low socioeconomic group. However, personal behaviours are not only a matter of personal choice, but may be driven by factors such as higher levels of urbanization, technological change, market integration and foreign direct investment.

Government Response to NCDs

Government of India had supported the States in prevention and control of NCDs through several vertical programmes. National Health Programmes for Cancer and Blindness were started as early as 1975 and 1976 respectively, followed by programme on Mental Health in 1982. However, in the 11th Plan, there was considerable upsurge to prevent and control of NCDs. During 11th Plan, an allocation of nearly Rs. 10 thousand crore was made for NCDs. New programmes were started on a low scale in limited number of districts. Convergence with public sector health system was a feature of these programmes. Some of the programmes were within the framework of National Rural Health Mission. New programmes focused on CVDs, Diabetes, Stroke, Tobacco control, deafness, trauma, burns, Fluorosis and geriatric problems. These programmes have given insights of problems and experiences in implementation that would be useful in upscaling and expanding programmes across the country.

Broadly, across programmes, following experiences were observed and lessons learnt in implementation of programmes, which need to be addressed during the 12th Plan:

1. Health promotion and prevention need to be given more attention to reduce the incidence of NCDs and their risk factors.
2. The States need to be given flexibility in implementation of the programmes based on their public sector health system, prevalence and distribution of NCDs and socio-cultural context. The flexibility would, however, will be within broad policy framework.
3. Convergence and integration would be critical in implementation of large number of interventions which would require unified management structure at various levels.
4. Integration of cross cutting components like health promotion, prevention, screening of population, training, referral services, emergency medical services, public awareness programme management, monitoring & evaluation etc. would save on costs and make implementation more effective.

2. Plan of Action to prevent and control NCDs during 12th Plan

3.1 Justification:

There is adequate evidence that NCDs are major contributors to high morbidity and mortality in the country. Risk factors including tobacco and alcohol use, lack of physical activity, unhealthy diet, obesity, stress and environmental factors contribute to high disease burden of NCDs which are modifiable factors and can be controlled to reduce incidence of NCDs and better outcomes for those having NCDs. Most of the NCDs like Cancer, Diabetes, Cardiovascular Diseases (CVD), Mental Disorders and problems relating to ageing are not only chronic in nature but also may have long pre-disease period where effective life style changes can turn around health status of individuals. Costs borne by the affected individuals and families may be catastrophic as treatment is long term and expensive. The economic, physical and social implications of NCDs

are significant justifying investment both for prevention and management of NCDs and well established risk factors.

The efforts made by Government of India and the States have not been able to check rising burden of NCDs. Investments during the 11th Plan and earlier plans have been more on provision of medical services which have not been adequate in the public sector. Private sector has grown particularly in urban settings but is beyond the reach of the poor and middle sections of the society. The present proposal is a comprehensive scheme that will be first major attempt to focus on health promotion and prevention of NCDs and their risk factors and comprehensive management of NCDs at various levels across the country. While Government of India's role will be policy formulation, population based multi-setoral interventions, technical and financial support, the onus of implementation will be with the States. Lessons learnt during the 11th Plan will be addressed and the programmes for various NCDs and their risk factors will be integrated and converged with public sector health system. As many programmes are either new or expanded after piloting in small number of districts and as NCDs are prevalent in rural as well as urban areas, it would be critical to have a separate implementation structure at various levels particularly during the 12th Plan though as an integral part of Public Sector Health System.

3.2 Strategies:

A comprehensive approach would be required for both prevention and management of NCDs in the country. It is proposed to continue ongoing efforts and introduce additional programmes to cover important NCDs of public health importance through following key strategies:

- Health Promotion for healthy life styles that preclude NCDs and their risk factors
- Specific prevention strategies which reduce exposure to risk factors
- Early Diagnosis through periodic/opportunistic screening of population and better diagnostic facilities
- Infrastructure Development and facilities required for management of NCDs
- Human Resources and their capacity building for prevention and treatment of NCDs
- Establish emergency medical services with rapid referral systems to reduce disability and mortality due to NCDs
- Treatment and care of persons with NCDs including rehabilitation and palliative care
- Health Legislation and population based interventions through multi-sectoral approach for prevention of NCDs
- Building evidence for action through surveillance, monitoring and research.

3.3 Scope

Most of the NCDs are prevalent across the country though there may be regional variations. The Plan of Action therefore would cover all States and UTs of the country in a phased manner during the 12th FY Plan. To ensure convergence and integration with public health services, a decentralized approach is proposed with District as the management unit for programs. Major

NCDs that are proposed to be covered during the 12th Plan are summarized in three broad categories:

(a) Programmes for Life Style Chronic Diseases & Risk factors

1. Cancer
2. Diabetes, Cardiovascular Diseases (CVD) & Stroke
3. Chronic Obstructive Pulmonary Diseases
4. Chronic Kidney Diseases
5. Organ and Tissue Transplant
6. Mental Disorders
7. Iodine Deficiency Disorders
8. Fluorosis
9. Oro-dental disorders

(b) Programmes for Disability Prevention and Rehabilitation

10. Trauma (including Road Traffic Accidents)
11. Burn Injuries
12. Disaster Response
13. Emergency Medical Services
14. Musculo-skeletal (Bone and Joint) Disorders
15. Physical Medicine & Rehabilitation
16. Blindness
17. Deafness
18. Health Care of the Elderly (Geriatric Disorders)
19. Neurological Disorders (Epilepsy, Autism)
20. Congenital Diseases
21. Hereditary Blood Disorders (Sickle Cell Anaemia, Thalassemia, Haemophilia)

(c) Health Promotion and Prevention of NCDs

22. Tobacco Control
23. Prevention and Management of Nutritional Disorders & Obesity
24. National Institute for Health Promotion and Control of Chronic Diseases
25. Patient safety programme
26. Establishment of APHO/PHO

3.4 Implementation

To ensure long term sustainability of interventions, the programmes would be built within existing public sector health system and wherever feasible introduce public private partnership models. Following will be major components of NCD programmes:

1. Primary Health Care: Health promotion, screening, basic medical care, home based care & referral system (integration with NRHM)
2. Strengthening District Hospitals for diagnosis and management of NCDs including rehabilitation and palliative care: NCD Clinic, Intensive Care Unit, District Cancer Centre, Dialysis Facility, Geriatric Centre, Physiotherapy Centre, Mental Health Unit, Trauma & Burn Unit, strengthening of facilities for Orthopaedic, Oro-dental, Eye and ENT Departments, Tobacco Cessation Centre, Obesity Guidance Clinic.

3. Tertiary Care for advanced management of complicated cases including radiotherapy for cancer, cardiac emergency including cardiac surgery, neurosurgery, organ transplantation etc.
4. Emergency medical care and rapid referral system including Highway Trauma Centres and 108 EMS services
5. Health Promotion & Prevention: Legislation, Population based interventions, Behaviour Change Communication using mass media, mid-media and interpersonal counselling and public awareness programmes in different settings (Schools, Colleges, Work Places and Industry).

Facilities developed at various levels and key functions are summarized below:

Facility	Development of Facilities	Key Functions for NCDs
Sub-centres	<ul style="list-style-type: none"> • Screening facility 	Health Promotion, Screening, Referral
PHCs	<ul style="list-style-type: none"> • Screening facility • Vision Centre 	Health Promotion, Screening, Follow-up, Referral
CHCs/Sub-district Hospitals	<ul style="list-style-type: none"> • NCD Clinic • Rehabilitation Unit 	Early Diagnosis, Home-based care, Managing common uncomplicated NCDs, Referral
District Hospital	<ul style="list-style-type: none"> • NCD Clinic, • Intensive Care Unit, • District Cancer Centre, • Dialysis Facility, • Geriatric Centre, • Physiotherapy Centre, • Mental Health Unit, • Trauma & Burn Unit, • Tobacco Cessation Centre • Obesity Guidance Clinic. • Strengthening of Orthopaedic, Oro-dental, Ophthalmology and ENT 	Early Diagnosis and Management of all NCDs except cancers requiring radiotherapy, complicated cases of renal diseases, cardiac cases requiring surgery, retinal diseases, NCDs requiring laser treatment, organ transplantations
Medical Colleges/ Tertiary level Institute	<ul style="list-style-type: none"> • Tertiary Cancer Centre • Cardiac Care Centre • Organ Transplant Facility • Nephrology, Endocrinology Neurology Department • Geriatric Department • Psychiatry Department • Glaucoma, Vitreoretinal Surgery • Burn/Trauma Department 	Comprehensive cancer treatment, cardiac care including cardiac surgery, neurosurgery, organ transplantation, tertiary level care for ENT, Ophthalmology, Geriatrics etc.

2.5 Coverage:

It is proposed to expand various schemes for NCDs to all 640 districts in a phased manner during the 12th Plan. To ensure convergence, common districts will be selected for all three major programmes. The schemes would be flexible to meet local requirements as there would be

variation in prevalence and availability of existing health infrastructure. Districts will be selected for each year of the Plan based on selected parameters including disease burden and availability of HR and facilities but in consultation with the States. Program-wise coverage targets are given below:

S.No	Program Component	Coverage by March 2012	Target by March 2017
1	Cancer	100 Districts	All Districts
2	Blindness	All Districts	All Districts
3	Mental health	123 Districts	All Districts
4	IDD (Iodated Salt)	71% popn.	100% Population
5	Tobacco	42 Districts	All Districts
6	Highway Trauma Centres	243 Centres	Cover major highways & accident prone roads
7	Deafness	203 Districts	All Districts
8	Fluorosis	100 Districts	All 230 Endemic Districts
9	Oral Health	25 Districts	All Districts
10	Diabetes, CVD, Stroke	100 Districts	All Districts
11	Health Care of Elderly	100 Districts	All Districts
12	Burn Injuries	6 Districts	All Districts
13	Upgradation of PMR	28 Med.Col.	All Govt. medical colleges
14	Disaster Response	New	Cover 22 vulnerable States
15	Organ & Tissue Transplant	New	11 OPDO & Biomaterial centres
16	Health Promotion	New	National Institute for Health Promotion & CCD
17	Patient Safety Program	New	All Districts
18	Airport/Port Health Office	New	All Intl. Airports, Ports and Land Borders covered
19	Neurological Disorders	New	All districts
20	Thalassemia, Sickle Cell Disease and Hemophilia	New	Pilot in selected endemic districts

Estimated Budget

It is envisaged that for comprehensive and sustainable programmes to prevent, control and manage important non-communicable diseases and key risk factors across the country, a large investment would be required during the 12th Plan. Rs. 58072 crore would be required over the period 2012-17. Cancer, Diabetes, Cardiovascular Diseases, Chronic Lung Diseases and Chronic Kidney Disease account for most of the mortality due to NCDs and would require substantial budget. Trauma, Disasters, Emergency Medical Services, Diseases of Bones & Joints, Mental Health and Health Care of the Elderly are disabling diseases and requiring investment for not only treatment but also rehabilitation.

NCDs have affected both urban and rural population though there may be some differences in prevalence. It is also important to invest on preventive programmes and health promotion to check occurrence of new cases and reduce at risk population. The proposal therefore seeks budget for activities across that will not only result in prevention of NCDs but also develop

facilities with capacity to manage NCDs. The programmes will reduce morbidity, disability and mortality due to NCDs and add on productive years for the population. The investment will be cost-effective in long run.

Nearly one-third of the budget would be required for primary health care in the rural areas. Secondary and tertiary level care is important to manage these chronic and fatal diseases and injuries and large share of the budget would be required to upgrade and strengthen District Hospitals, Medical Colleges and other Tertiary level institutions. Many of the NCDs occur due to exposure to risk factors like tobacco, obesity, unhealthy diet, lack of physical activity and stress. Adequate provision has been made for public awareness and behaviour change communication, an important step to prevent NCDs.

3.7 Expected Outcomes

The programmes and interventions would establish a comprehensive sustainable system for reducing rapid rise of NCDs, disability as well as deaths due to NCDs. Broadly, following outcomes are expected at the end of the 12th Plan:

- ✓ Early detection and timely treatment leading to increase in cure rate and survival
- ✓ Reduction in exposure to risk factors, life style changes leading to reduction in NCDs
- ✓ Improved mental health and better quality of life
- ✓ Reduction in prevalence of physical disabilities including blindness and deafness
- ✓ Providing user friendly health services to the elderly population of the country
- ✓ Reduction in deaths and disability due to trauma, burns and disasters
- ✓ Reduction in out-of-pocket expenditure on management of NCDs and thereby preventing catastrophic implication on affected individual and families

SECTION 1

DISEASE BURDEN DUE TO NON-COMMUNICABLE DISEASES

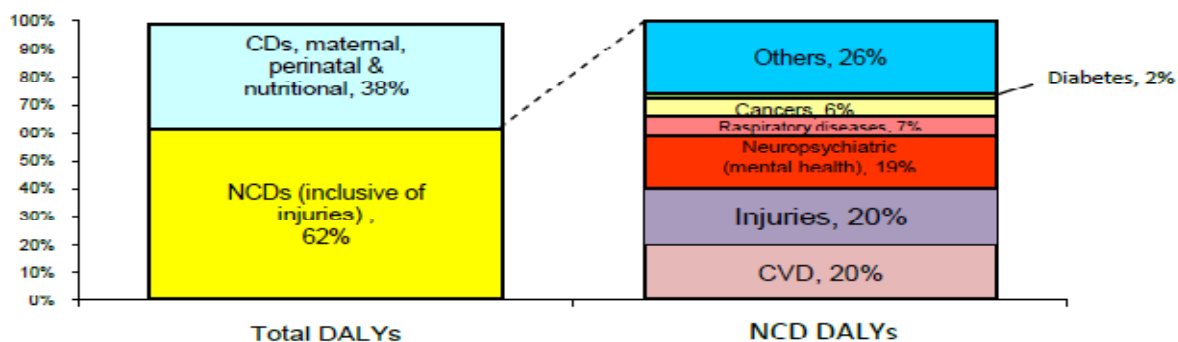
Chronic non-communicable diseases (NCDs) have replaced communicable diseases as the most common causes of morbidity and premature mortality worldwide. About 80% of the burden occurs in low / middle-income countries, and 25% is in individuals younger than 60 years. The global economic impact of NCDs is enormous: by 2015, just two diseases (cardiovascular diseases and diabetes) are expected to reduce global GDP by 5%. Approximately half of the total economic burden is reported to account for by CVD including stroke, ischemic heart disease and peripheral vascular disease, which together cause more deaths than HIV/AIDs, malaria and tuberculosis combined². In recognition of the increasing burden and importance of chronic diseases, in 2005 the World Health Organization (WHO) issued a plan for NCD prevention and control which “offers the health community a new global goal: to reduce death rates from all chronic diseases by 2% per year over and above existing trends during the next 10 years”³. This goal had been presented as a formal action plan to the 61st World Health Assembly in 2008⁴.

Central to any plan to reduce the impact of NCDs is definition of the specific diseases to be targeted. The WHO plan for NCDs focuses on diabetes, cardiovascular disease (CVD) including hypertension, cancer and pulmonary disease.

1.1 Burden of Non-communicable diseases

As of 2004, NCDs contributed half of the (50%) of the total mortality and are the major causes of death⁶. Among the NCDs, cardiovascular diseases are number one cause of mortality (52%). NCDs account for more than two fifth (43%) of the DALYs and among this group cardiovascular diseases, diabetes, cancers together account for 40% of the NCD related DALYs in India. Regional studies have reported that even in rural India the leading cause of death (32%) is NCDs followed by injuries and external cause of deaths (12%)⁷. Projection estimates from the WHO have shown that by the year 2030, CVDs will emerge as the main cause of death (36%) in India. Since the majority of deaths are premature there is a substantial loss of lives during the productive years as compared to other countries.

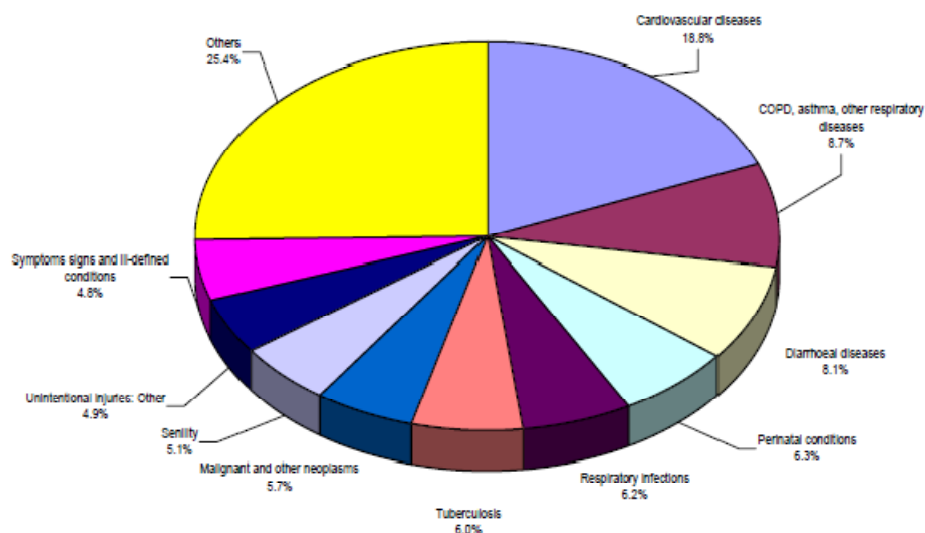
Graph: Pattern of overall DALYs (age standardized) and NCD related DALYs in India, 2004⁶



The salient features of the Causes of Death Survey (2001-03) conducted by the Registrar General of India were ⁸:

1. The overall non-communicable diseases are the leading causes of death in the country, constituting 42% of all deaths. Injuries and ill-defined causes constitute 10% of deaths each. However, majority of ill-defined causes are at older ages (70 or higher years) and most of ill-defined deaths are likely to be from non-communicable diseases.
2. In the case of non-communicable diseases, it is the Other States which have a higher proportion (50%) vis-à-vis the EAG states and Assam (33%). The mortality due to injuries is also more in proportion in Other States.
3. Urban areas have a lower number of deaths from communicable, maternal, perinatal and nutritional conditions but a higher proportion from non-communicable diseases (56%). Their proportion is less in rural areas (40%). Injuries constitute about the same proportion in both rural and urban areas.
4. Overall, the leading cause of death is cardiovascular disease (19%), followed by respiratory diseases (namely chronic obstructive pulmonary disease or COPD, asthma, other respiratory diseases; 9%), diarrhoeal diseases (8%), perinatal conditions (6.3%), respiratory infections such as acute pneumonia (6.2%), tuberculosis (6%), malignant and other neoplasms (5.7%), senility (5.1% – which is concentrated at ages 70 and higher), unintentional injuries: other (4.9%), and symptoms, signs and ill-defined conditions (4.8%).
5. Notable differences by gender are seen in the case of diarrhoeal diseases with 10% of women deaths against 7% of men deaths, tuberculosis with 5% of women deaths vis-à-vis 7% men deaths, and cardiovascular diseases with 17% women deaths versus 20% men deaths.

Fig: Distribution of major causes of deaths in India, 2001-2003 ⁸



Summary of Major NCD Burden Contributors in India ⁸

1. **Diabetes:** Prevalence, increasing in both urban and rural areas, is in the range of 5–15 percent among urban populations, 4–6 percent in semi-urban populations, and 2–5 percent in rural populations. Diabetes is particularly increasing among the marginalized and the poor.
2. **Hypertension:** Present in 25 percent of the urban and 10 percent of the rural population. The number of people with hypertension will rise from 118.2 million in 2000 to 213.5 million by 2025.
3. **COPD:** Prevalence among men is in a range of 2–9 percent in north India and 1–4 percent in south India. Among men, tobacco smoke is the major cause of COPD, while smoke from indoor combustion of solid fuels is the major cause for women.
4. **Cancer:** Over 70 percent of cases are diagnosed during the advanced stages of the disease, resulting in poor survival and high case mortality rates. Tobacco use is the major cause of cancer for both lung and oral cavity diseases.
5. **Smoking:** Prevalence is similar to other South Asian countries (men 33 percent, women 4 percent) while smoking prevalence among youth is higher (boys 17 percent, girls 9 percent). Smoking accounts for 1 in 5 deaths among men and 1 in 20 deaths among women, accounting for an estimated 930,000 deaths in 2010.
6. **Alcohol:** A study on CVD risk factors in industrial populations found higher alcohol consumption conferred a higher risk for CVD.¹¹ The reasons for the lack of protective effect found in other populations could include (i) unfavorable enzymatic metabolism of alcohol in Indians that is known to impact CVD, (ii) harmful drinking patterns with irregular heavy or binge drinking that is associated with CVD, and (iii) consumption mostly among the disadvantaged and poor who carry a higher risk of CVD than others.
7. **Injuries:** Road traffic injuries and deaths are on the increase along with the rapid economic growth. Annually, they result in more than 100,000 deaths, 2 million hospitalizations, and 7.7 million minor injuries. Nonfatal road traffic injuries are highest among pedestrians, motorized two-wheeled vehicle users, and cyclists. This is a major problem among young populations, with three-quarters occurring among 15–45 year olds, predominantly among men. If the present pace of increase continues, in 2010 150,000 deaths and 2.8 million hospitalizations are likely and, in 2015, these numbers will rise to 185,000 and 3.6 million.
8. **Diet:** Exact data on consumption of oils/fats at the individual and household level are missing. However, national aggregate statistics show high consumption of unhealthy oils. The share of raw oil, refined oil, and vanaspati oil (hydrogenated oil) in the total edible oil market is estimated at 35 percent, 55 percent, and 10 percent, respectively. Trans fats are added to vanaspati oil, which is widely used in the commercial food industry to lengthen shelf life.

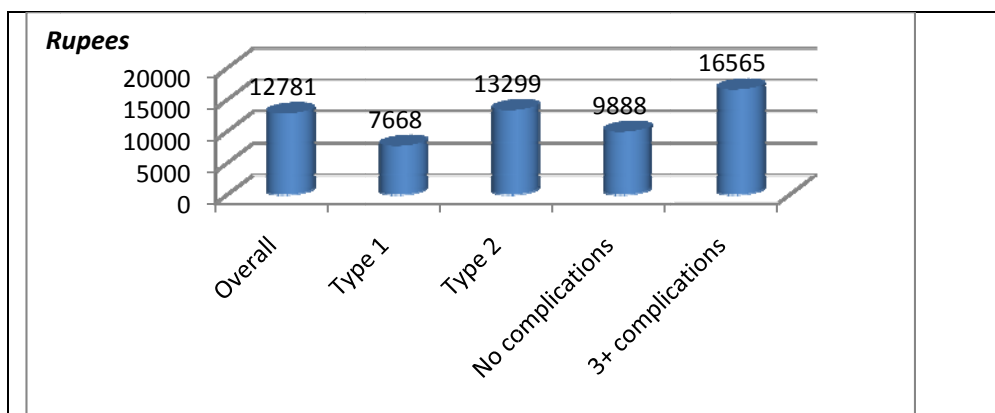
1.2 Impact of NCDs

With losses due to premature deaths due to heart disease, stroke and diabetes are projected to increase cumulatively, and India stands to lose 237 billion dollars during the decade 2005-2015³. India also loses a substantial number of lives during the productive years of its citizens. The potentially productive years of life lost (PPYLL) due to CVDs in the age group of 35-64 was 9.2 million in 2000 and is expected to rise to 17.9 million in 2030⁹. This estimate is more than the combined estimated loss in China, Russia, USA, Portugal, and South Africa (16.2 million). Further, WHO estimates that a 2% annual reduction in national-level chronic disease death rates in India would result in an economic gain of 15 billion dollars for the country over the next 10 years³. Modelling studies have shown that the per-capita income in India would increase by 87% if the CVD mortality rate per annum declines by one percent whereas a three percent annual decline would increase per-capita income by 218% by the year 2030. Similarly, road traffic injuries are estimated to result in economic loss of \$11,458 million (INR 550,000 million) or nearly 3% of GDP every year¹⁰.

Considering the high cost of medicines and longer duration of treatment NCDs constitute a greater financial burden to low income groups. Studies carried out in India have shown that the cost of treating NCDs such as diabetes has doubled from 1998 to 2005 particularly among urban households¹¹. Low income groups spent a higher proportion of their income on diabetes care (urbanpoor 34% and rural poor 27%). In addition, the highest increase in percentage of household income devoted to diabetes care was also found to be in the lowest economic group (34% of income in 1998 vs. 24.5% in 2005). The CREATE registry study on acute coronary syndrome highlighted that the poor are less likely to get evidence-based prescriptions after acute coronary syndrome due to high cost of the drugs¹². Smaller proportions of poor patients than rich patients received key treatments such as thrombolytics (52.3% vs. 60.6%), lipid-lowering drugs (36.0% vs. 61.2%), Angiotensin-Converting Enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) (54.1% vs. 63.2%) percutaneous coronary intervention (2.0 vs. 15.3%), and coronary artery bypass graft surgery (0.7% vs. 7.5%). Poor also had greater 30-day mortality (8.2% vs. 5.5%).

Acute events of cardiovascular diseases are associated with major health expenses owing to high cost of drugs, therapeutic procedures, other hospital expenses and wage losses. A study carried out in south India among CVD patients with an acute event showed that catastrophic health spending as a result of treating an acute event of cardiovascular disease was experienced by three fourths (72.9 %) of the households particularly the lowest socioeconomic group. Distress financing was low among the richest (36%) as compared to the poorest (51%). Income loss was highest among poor households. The impoverishment due to the care of NCDs has not been estimated. The World Health Survey has shown that, in India, impoverishment in general is the highest among households in middle expenditure deciles (fifth and sixth), which could be due to treatment cost of NCDs¹³. In India, the treatment costs for an individual with diabetes are 15–25% of their household earnings. One in four Indian families in which a family member has heart disease or stroke has catastrophic expenditure, pushing 10% of these families into poverty. Where families have no access to affordable care, they forego care or risk financial ruin; the poor end up suffering the worst¹⁴.

Fig: Cost of hospitalization due to diabetes rises with addition of each complication¹⁵



1.3 Burden due to Key NCDs

a. CANCER

Cancer is a major public health concern in India and has become one of the ten leading causes of death in the country. It is estimated that there are about 28 lakh cases of cancer at any particular point of time with 10 lakh new cases occurring every year. About 5 lakh deaths occur annually in the country due to cancer. As per WHO Report 2005, the estimated Cancer Deaths in India is projected to increase to 7 lakh by 2015. The burden of cancer is expected to further increase due to increase in life expectancy, demographic transitions and the effects of tobacco and other risk factors. 40 % of cancer cases are due to Tobacco use. The leading sites of cancer are the oral cavity, lungs, oesophagus and stomach among men and cervix, breast and oral cavity amongst women. *Recent estimates based on National Cancer Registry Program (ICMR)*¹⁶

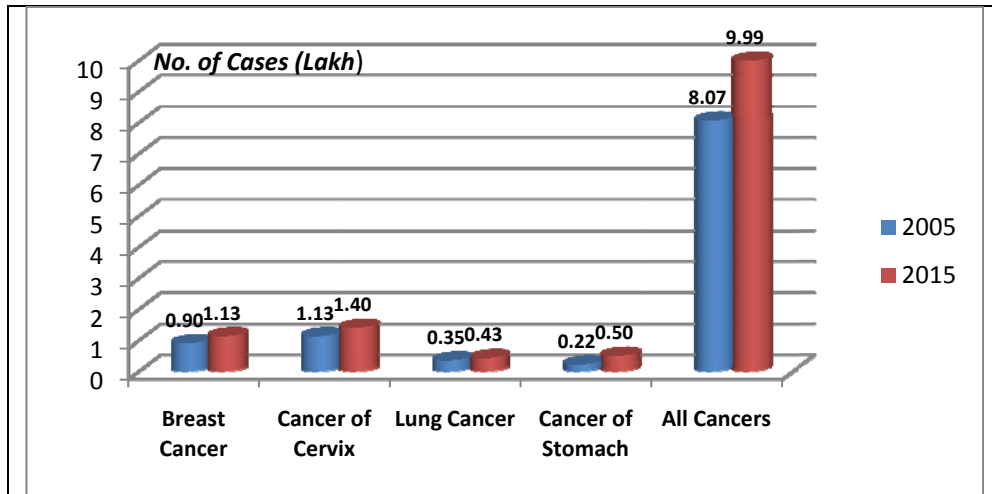
The leading site of cancers is varied in different parts of the country. Among males the leading site of cancer is Ca Lung in the PBCrore of Delhi, Mumbai, Bhopal, Kolkata, Bangalore, Chennai, Thiruvananthapuram. Ca Mouth is the leading site among males in PBCR of Ahmedabad. In North East, the leading site among males is Ca Oesophagus in Assam, Ca Stomach in Mizoram & Sikkim, Ca Lung in Manipur. The leading site of cancer among females is Ca Breast in PBCrore of Delhi, Mumbai, Bhopal, Kolkata, Bangalore, Chennai, Thiruvananthapuram & Ahmedabad. In North East the leading site among females is Ca Breast in Assam, Ca Lung in Mizoram & Manipur and Ca Stomach in Sikkim¹⁶.

Cancers account for 14% of the overall NCD mortality and 7% of the NCD related DALYs in India⁶. The pooled estimates for data of all six population based registries (Delhi, Mumbai, Chennai, Barshi, Bangalore and Bhopal) were 25.19 per lakh for men and 23.52 per lakh for women in 2004. The prevalence of cancer in India is estimated to be around 2.5 million, with over 800,000 new cases and 550,000 deaths occurring each year due to this disease in the country¹⁷. In India, cancers account for about of 3.3% of the disease burden and about 9% of all deaths. These estimates would change as many of the common risk factors for cancers, such as tobacco and alcohol consumption continue to become more prevalent in India. It is estimated that the number of people living with cancers will rise by nearly one- quarter between 2001 and 2016. Nearly 10 lakh new cases of cancers will be diagnosed in 2015 compared to about 807,000 in 2004, and nearly 670,000 people are expected to die¹⁰.

Since the commencement of the ICMRs National Cancer Registry Program (NCRP) in 1982, which covers only 7 percent of the Indian population, a brief report on time trends in incidence rates was presented in the consolidated report for 1990–96. The first systematic report on trends in incidence rates over 2 decades shows a steady and consistent increase in the age-adjusted incidence rates of certain cancers across all major urban registries. Among men, cancers of the prostate, colon, rectum and liver have shown statistically significant increase in incidence.

Cancer of the prostate is the leading site of cancer among men in most western countries as is cancer of the colon.

Disease Burden due to Cancers in India



Among women, cancers of the breast, corpus uteri and lung have shown a rise. While the first two of these cancers could be accounted for because of cohorts with later age at marriage, decreasing multi-parity and so on, the increase in lung cancer could be attributed to an increase in the use of tobacco by women. Lung cancer in women may also be increasing because of environmental exposure to smoke (passive smoking). Three other sites of cancer that have shown an increase in incidence rates in women are ovary, thyroid and gallbladder. The increase in gallbladder cancer is seen in registries that have recorded a comparatively lower incidence than Delhi, which showed an increasing trend only during the earlier years, with a decline in more recent years. There have been rising incidence rates for cancers of the brain as well as in tumours of the lymphoid and haemopoetic system, especially non-Hodgkin lymphoma in both men and women. The decline in the incidence of cancer cervix is seen across all registries including the rural registry at Barshi. This decline is observed in the absence of any organized screening or early detection programmes in the registry areas. The factors contributing to an increase in breast cancer could possibly be responsible for the decline in the incidence of cancer of the cervix. Another possible reason for the decline could be an increase in the number of child-births at institutions (as opposed to home deliveries) leading to improved maternal and maternity care including genital hygiene. This could be a result of the family welfare drive initiated by the government about 4 decades ago and which is continuing. Better genital hygiene, barrier contraceptive use and superior nourishment could all have contributed to the reducing incidence of cancer of the cervix.

TABLE: Estimated new cancers at all anatomical sites (ICD-10: C00–C96) ¹⁸

Year	Men	Women	Total
2008	447 399	498 773	946 172
2009	454 842	507 990	962 832
2010	462 408	517 378	979 787
2015	497 081	563 808	1 060 889
2020	534 354	614 404	1 148 758

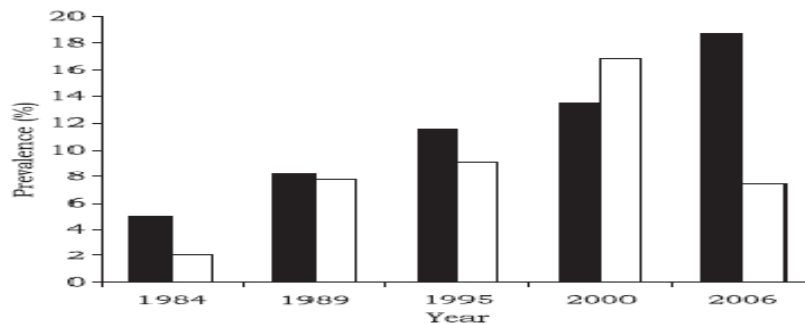
The common sites for cancer in India are oral cavity, lungs, esophagus and stomach in men and cervix, breast and oral cavity among women. Over 70% of the cases report for diagnostic and treatment services in advanced stages of the disease, resulting in poor survival and high mortality rates. Tobacco use is the major cause of cancer in India particularly for cancers of lung, oral cavity, esophagus, larynx, pancreas and bladder. Parts of India have the world's highest incidence of cancers of the gall bladder (Delhi), oral, and lower pharynx (Mizoram) ¹⁹.

b. DIABETES

Diabetes mellitus (*Madhumeha*) has been discussed even in Ayurveda (the ancient system of medicine in India) from ancient times as a urinary disorder characterized by sweetness of urine. Projection estimates show that the number of people with diabetes in India is 40.9 million and is expected to rise to 69.9 million by 2025²⁰. In the ICMR study on Assessment of Burden of NCDs in India²¹, the prevalence rates of diabetes varied from 103 per thousand to 124 per thousand in these studies. The overall prevalence rate of diabetes in urban and rural areas combined was estimated as 62.47 per thousand. The pooled estimates of prevalence rates for diabetes mellitus for urban and rural areas were found to be 118.02 per thousand and 38.67 per thousand respectively. It was estimated that there are 37.77 million diabetics in India in 2004; 21.4 million in urban areas and 16.36 million in rural areas. Diabetes accounts for 1.09 lakh deaths in a year. Diabetes mellitus is responsible for 11.57 lakh years of life lost due to the disease, and for 22.63 lakh DALYs during 2004. The estimated number of DALYs attributable to diabetes was 20.72 lakh in the year 2000. The estimates of number of DALYs in the present study were 22.63 lakh.

The first documented study on diabetes was a hospital based study from Kolkata in 1938 showing a prevalence of glycosuria as 1.3 percent. Population based surveys done in the early 1970s in different Indian cities and nearby rural areas reported prevalence of diabetes ranging from 1.2% to 2.5%. The first multicentric study in India was done by the Indian Council of Medical Research (ICMR) between 1972 and 1975, screening more than 34,000 individuals from six representative areas of India for capillary blood glucose level of above 170 mg/dl. This study reported a prevalence of 3.0 % in urban areas and 1.3% in rural areas. From these reports, it is evident that till the 1970s, the prevalence of diabetes was less than 3.0% even in urban areas. The rise in prevalence of type 2 diabetes was reported in 1980s, which accelerated after 1990s, showing rapid rises in the southern parts of the country²².

Fig: Changes in Diabetes and Impaired Glucose Tolerance prevalence in urban southern India²³



Several studies showed declining ages of diabetes reporting to around 30 years, and a concomitant rise in urban and rural populations²².

According to NFHS-3, self reported prevalence of diabetes in the age group of 35-49 was 2.1% among women and 2.7% among men suggesting substantial gaps in the awareness²⁴. In an ICMR-WHO six site study across four regions of the country on comprehensive NCD risk factors using WHO STEPS approach, the lowest prevalence of self-reported diabetes diagnosed by a physician was recorded in rural (3.1%) followed by peri-urban/slum (3.2%) and the highest in urban areas (7.3%, odds ratio (OR) for urban areas: 2.48, 95% confidence interval (CI): 2.21–2.79, $p < 0.001$). Urban residents with abdominal obesity and sedentary activity had the highest prevalence of self-reported diabetes (11.3%) while rural residents without abdominal obesity performing vigorous activity had the lowest prevalence (0.7%)²⁵. Increase in the prevalence of diabetes has also been reported among the marginalized and the poor. Urban locations have been observing a reversal of socio economic trends with the burden of disease increasing among the poor²⁶.

Diabetes substantially increases the propensity to macrovascular and microvascular complications, such as cardiovascular disease, cerebrovascular disease, retinopathy, nephropathy, neuropathy and foot problems, all of which account for considerable mortality and morbidity²⁷. Assuming 40 million people with diabetes in India, the prevalence of various complications would be: Retinopathy (7 million); Nephropathy (0.8 million); Neuropathy (10.4 million); Coronary heart disease (8.5 million); and Peripheral vascular disease (2.5 million). In addition, a third of the heart attack patients in India have concurrent diabetes¹². Fatality rate after myocardial infarction is greater in diabetic patients, and overall prognosis after coronary heart disease is worse. Hence, it has been proposed that diabetes should be considered as a coronary heart disease risk equivalent i.e. diabetic individuals without previous myocardial infarction have as high a risk of future heart attack or death as compared to non-diabetic subjects with previous myocardial infarction. Diabetes also increases the risk of stroke particularly ischemic type of stroke. Hence early detection and management of diabetes is important. Diabetic retinopathy was estimated to be 17.6% in a populations based study in Chennai in 2005, the prevalence of

neuropathy in urban population was 26.1% and the prevalence of coronary artery disease was 21.4% among diabetic subjects compared to 9.1% in subjects with normal glucose tolerance, whereas the prevalence of overt nephropathy was found to be 2.2% and that of microalbuminuria was 26.9%²².

A review of published literature has highlighted several barriers in addressing the growing burden of diabetes²⁸. Only 12% of the general population is aware of the risk factors of diabetes. Even among those with established diabetes only 40.6% were aware that it could result in organ damage. Even in tertiary care centers, poor glucose control was observed in half of the patients highlighting poor management of individuals with diabetes. Managing multiple risk factors in subjects with diabetes and other established CVD complications is particularly challenging and also adds to heavy financial burden to both the households and the health system.

As per International Diabetic federation there were 5.1 crore in 2010 expected to increase to 8 crores by 2030. It is estimated that the overall prevalence of diabetes is 62.47 per 1000 population of India.

c. HYPERTENSION

Elevated level of blood pressure is a major risk factor for cardiovascular diseases. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India²⁹. The meta analysis of eight studies carried out in urban areas gives a pooled prevalence rate of 164.18 per thousand and in rural areas was 157.44 per thousand. About 16% of ischaemic heart disease in the country is attributable of hypertension. 21% of peripheral vascular diseases and 24% of AMI cases could be attributed of elevated hypertension. The population attributable risk due to hypertension was found to be 29% for stroke²¹. Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10% rural subjects in India. At an underestimate, there are 31.5 million hypertensives in rural and 34 million in urban populations. A total of 70% of these would be Stage I hypertension (systolic BP 140–159 and/or diastolic BP 90–99 mmHg). Recent reports show that borderline hypertension (systolic BP 130–139 and/or diastolic BP 85–89mmHg) and Stage I hypertension carry a significant cardiovascular risk and there is a need to reduce this blood pressure²⁹.

Indian urban population studies in the mid-1950s used older WHO guidelines for diagnosis (BP ≥ 160 and/or 95mmHg) and reported hypertension prevalence of 1.2–4.0%. Subsequent studies report steadily increasing prevalence from 5% in 1960s to 12–15% in 1990s. Hypertension prevalence is lower in the rural Indian population, although there has been a steady increase over time here as well. Recent studies using revised criteria (BP ≥ 140 and/or 90mmHg) have shown a high prevalence of hypertension among urban adults: men 30%, women 33% in Jaipur (1995), men 44%, women 45% in Mumbai (1999), men 31%, women 36% in Thiruvananthapuram (2000), 14% in Chennai (2001), and men 36%, women 37% in Jaipur (2002). Among the rural populations, hypertension prevalence is men 24%, women 17% in Rajasthan (1994)²⁹. Hypertension diagnosed by multiple examinations has been reported in 27% men and 28%

women executives in Mumbai (2000) and 4.5% rural subjects in Haryana (1999). Over the years, from 1942 to 1997, there has been a significant increase in the mean levels of systolic blood pressure in the Indian population particularly among urban men aged 40–49 years (from 120.4 mmHg to 130 mmHg)³⁰. According to the estimates of the Indian Council for Medical Research, 24% of acute myocardial infarction, 29% for stroke and 21% of peripheral vascular diseases in the country are attributed to hypertension. Detection and management, though relatively easier, less than half (31-37%) the hypertensive subjects get to identify their hypertensive status. Less than half of the hypertensive subjects undertake any kind of medication and only half of them achieve good control³¹. There is a strong correlation between changing lifestyle factors and increase in hypertension in India. The nature of genetic contribution and gene– environment interaction in accelerating the hypertension epidemic in India needs exploration.

d. CARDIOVASCULAR DISEASES& STROKE

Cardiovascular Diseases (CVD) denotes a mix of conditions that includes acute myocardial infarction, angina pectoris, congestive heart failure, inflammatory heart disease and cerebrovascular diseases (stroke).

As of 2004, of the NCDs, cardiovascular diseases account for one fifth (22%) of the NCD burden in terms of DALYs in India⁶. Starting from a level of about 380 lakh cases in the year 2005, there may be as many as 641 lakh cases of cardiovascular disease (CVD) in 2015. The rates of prevalence of CVD in rural populations will be lower than in urban populations, but will continue to increase, reaching roughly 13.5% of the rural population in the age group of 60-69 years by 2015. The prevalence rates among younger adults and women (in the age group of 40 years and above) are also likely to increase. A crude estimate of mortality on account of CVD, which could throw some light on prevalence, also shows wide inter-state disparities; with Rajasthan and MP having higher mortality levels of 275 and 229 per 100,000 than Kerala and Karnataka, which were 187 and 175, respectively. Of course this also reflects the level of treatment and management facilities available¹⁰.

The number of cases of ischemic heart disease (IHD) is estimated to be about 22.37 million in India in the year 2004. These consist of 11.67 million cases in urban areas and 10.67 million cases in rural areas. The total number of DALYs attributable to IHD is estimated to be 16 million. The pooled estimates of prevalence rates for urban and rural areas were found to be 6.4% and 2.5% respectively. In urban areas, the pooled estimate of prevalence rate was 6.1% for men and 6.7% for women. In rural areas the pooled estimate for prevalence rate was 2.1% for men and 2.7% for women. The prevalence rate of stroke is 1.54 per thousand. The figures for YLL per hundred thousand are 496.3, and DALY per hundred thousand is 597.6. The total number of stroke cases in India in year 2004 is expected to be 9.3 lakh. The total number of DALYs attributable to stroke are estimated to be 6.37 million for the year 2004 in India²¹.

Fig: Burden of Cardiovascular diseases in India

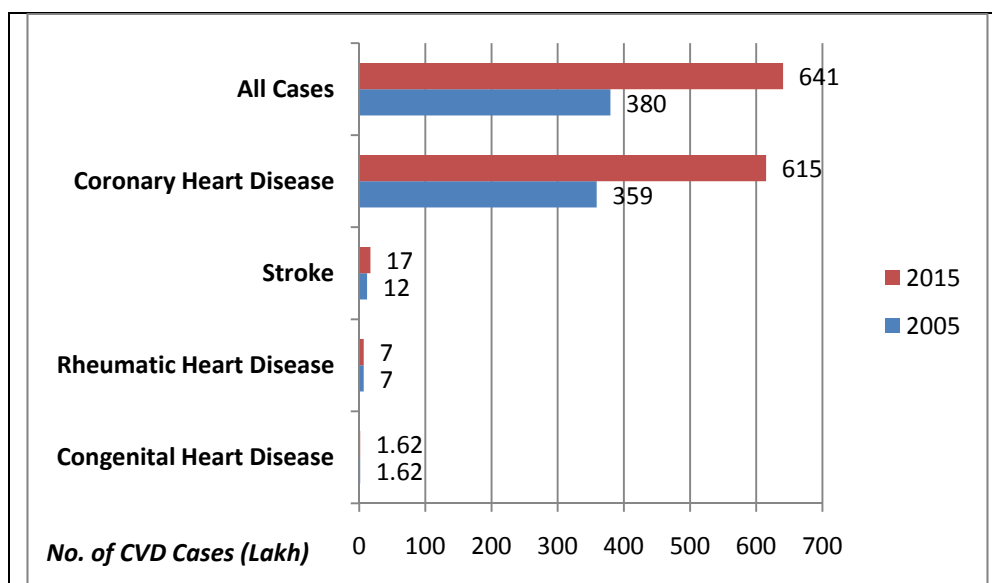


Table: The prevalence rates of stroke from various major epidemiological studies in India³²

Zone	Place	Rural/urban	Year	Population	Crude prevalence rate per 100,000	Age adjusted prevalence rate per 100,000
North	Rohtak, Haryana ¹³	Urban	1971-74	79,046	44	—
	Kuthar Valley, Kashmir ¹⁴	Rural	1986	63,645	143	244*
West	Mumbai, among the Parsis ¹⁵	Urban	1985	14,010	842	424*
	Mumbai ¹⁵	Urban	1997	145,456	220	—
East	Malda, West Bengal ¹⁷	Rural	1989-90	37,286	126	—
	Bartuipur, West Bengal ¹⁸	Rural	1992-93	20,842	147	—
	Kolkata ¹⁵	Urban	1998-99	50,291	147	334**
South	Vellore ¹²	Rural	1969-71	258,576	57	84#
	Gowribidinur, Karnataka ²⁰	Rural	1982-84	57,660	52	—
	Bangalore ²¹	Rural	1993-95	51,055	165	262#
	Bangalore ²¹	Urban	1993-95	51,502	136	—

During the last decade, the age-adjusted prevalence rate of stroke was between 250-350/100,000. Recent studies showed that the age-adjusted annual incidence rate was 105/100,000 in the urban community of Kolkata and 262/100,000 in a rural community of Bengal. The ratio of cerebral infarct to hemorrhage was 2.21. Hypertension was the most important risk factor. Stroke represented 1.2% of total deaths in India³².

In addition, CVDs in the Indian population are characterized by three facets: early occurrence (Indians acquire the disease at least ten years earlier than their western counterparts), higher case fatality (a comparatively higher proportion die after a heart attack as compared to the western population) and the occurrence of disease at lower risk factor threshold particularly overweight and obesity^{12, 33}. The prevalence of coronary heart disease is reported to be between 6.5- 13.2% urban India and 1.6 – 7.4% in rural India. Similarly stroke prevalence is between 136 – 842/ 100,000 population in urban areas and 143-165/ 100, 000 population in rural areas³⁴. Several well designed studies indicate a reversal of socio economic gradient for cardiovascular disease (which is a major contributor to NCD's) and its risk factors³⁵. The poorer sections of the society, the less educated and the rural population have high prevalence of smoking and in certain settings such as worksites, high prevalence of diabetes and high blood pressure are seen among less educated groups. While self reported surveys such as NFHS-3 suggest that it is the rich who have high prevalence of risk factors, well designed studies show the risk for heart attack is higher (more than twice) among the uneducated, under-educated and the poor. The differences observed between NFHS-3 and comprehensive surveys are largely due to low risk factor awareness and control among the less educated and poor²⁴.

As per NCMH, it is estimated that there were 2.9 crores CVD cases which are expected to increase to 6.4 crores by 2015. According to a WHO report (2002), cardiovascular diseases (CVDs) will be the largest cause of death and disability in India by 2020. It is estimated that the overall prevalence of hypertension, Ischemic Heart Diseases (IHD) and Stroke is 159.46, 37.00 and 1.54 respectively per 1000 population of India.

e. CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

COPD is a leading cause of morbidity and mortality worldwide and results in an economic and social burden that is both substantial and increasing. COPD prevalence, morbidity, and mortality vary across countries and across different groups within countries. The burden of COPD is projected to increase in the coming decades due to continued exposure to COPD risk factors and the changing age structure of the world's population. In 2010, almost 24 million adults over the age of 40 in India had COPD. It is expected this number to increase 34% to approximately 32 million by 2020. Prevalence rates varying from about 2 to 22 per cent in men and from 1.2 to 19 per cent in women have been shown in different reports.

Chronic Respiratory Diseases (CRD) mainly includes asthma and chronic obstructive pulmonary diseases (COPD, 'dama'). As of 2004, chronic obstructive pulmonary diseases (COPD) accounted for 5.2% of the total NCD burden and 12.2% of the NCD related mortality⁶. The estimated burden of asthma was 3 million DALYs (2.4% of the total NCD burden) and account for 1.1% of the NCD related deaths. A higher prevalence of asthma was observed among women

as compared to men (2.6% vs. 2.2%) and in urban areas than rural areas (2.6% vs. 2.2%) with a higher risk of having asthma among the poor than the rich³⁶. Projection of NCMH shows that asthma is expected to rise from 28.3 million in 2006 to 35.9 million by the year 2016. COPD is primarily a disease of the adult while asthma is seen largely among younger age group individuals. The prevalence of COPD among men in India ranges between 2.12% to 9.4% in north India and 1.4% to 4.08% in South India³⁷. A large multi-site study carried out by the ICMR has reported a higher prevalence of COPD among men (5.0%) than women (3.2%) aged above thirty five years³⁸. A higher prevalence was observed in low income groups as compared to the well-off (5.4% vs. 3.3%) and in rural areas as compared to urban regions (4.4% vs. 3.7%). According to the estimates of National Commission on Macroeconomics and Health (NCMH), the number of COPD cases in the country is to rise from 17.0 million in the year 2006 to 22.2 million by 2016¹⁰. More recently, in Phase I of the ICMR study titled “Indian Study on the Asthma, Respiratory symptoms and Chronic Bronchitis” (INSEARCH)³⁹ at Delhi, Bangalore, Kanpur and Chandigarh, the population based prevalence of ever asthma in subjects aged more than 15 years was 2.4 percent, and other respiratory related symptoms was 4.3-10.5 percent. Chronic bronchitis was diagnosed in 4.1 percent population, with a male to female ratio of 1.56 to 1. Some variations were seen in the population due to socioeconomic grouping and place of residence, but major differences were related to exposure to tobacco smoke and solid fuels combustion

Tobacco smoke is the most important cause for COPD and is the major cause of COPD among men. The smoke from combustion of solid fuels such as dried dung, wood and crop residue used for cooking and heating, is an important cause of indoor pollution which is responsible for a large number of COPD cases in the rural areas and women in particular. Air pollution due to exhausts from vehicles and industrial units; dusts, fumes and smoke from burning of crop residues in the field act as airborne allergens and irritants (for example, tobacco smoke) causing allergic responses triggering asthma and cause other chronic respiratory disease as well⁴⁰.

The spectrum of clinical manifestations of COPD is wide. There are great variations in the reported morbidity, which could partly be due to differences in the definition of a ‘case’. The data on mortality also underestimate COPD as a cause of death because the disease is more likely to be cited as a contributory rather than an underlying cause of death, or may not be cited at all. Depending on the severity of the disease, the 5-year mortality rate for patients with COPD varies from 40% to 70%. The three major causes of death have been identified as COPD itself, lung cancer and cardiovascular disease. Majority of the studies were confined to limited areas and do not represent the general population of that State or region. Table below presents the variation in prevalence rates reported by different researchers in India during (1975-2006). The prevalence of COPD is confined to adults 30 years of age and above.

According to the studies mentioned in the Table given below, the prevalence rates of COPD in males varied from 2.12% to 9.4% in studies conducted in north India and from 1.4% to 4.08% in south India. The respective ranges for females were 1.33%–4.9% in north India and 2.55%–

2.7% in south India. The median values of these prevalence rates are 5% for males and 2.7% for females. Thus, COPD is more common among males than females. The male to female ratio varied from 1.32:1 to 2.6:1 with median ratio of 1.6:1.

Table II. A summary of important field studies from India on prevalence of CB/COPD (published in the last 30 yr)

Authors	Population group	Age distribution (yr)	Subjects No. & Sex		Method of diagnosis	COPD (%) Prevalence	
			M	F		M	F
Joshi <i>et al</i> (1975) ²⁵	Punjab (Ind)	17-64	4270	0	Questionnaire	12.5	-
Bhattacharya <i>et al</i> (1975) ²⁶	U.P. (R)	30-70+	629	511	Questionnaire	6.7	4.5
Thiruvengadam <i>et al</i> (1977) ²⁴	Madras city (U)	5-60+	408	409	Interview	1.9	1.2
Vishwanathan & Singh (1977) ²⁷	Delhi (U)	5-94	552	441	Questionnaire	8.0	4.3
Radha <i>et al</i> (1977) ²⁸	New Delhi (U)	3-60+	1087	1011	Questionnaire & PEF	8.1	4.6
Nigam <i>et al</i> (1982) ²³	U.P. (R)	20-70+	775	649	Interview	9.0	4.5
Malik SK (1986) ²⁶	Chandigarh (U)	15-65+	2121	2251	Questionnaire & PEF	5.5	2.9
Jindal SK (1993) ¹⁹	Punjab (U)	15-70+	1475	1329	Questionnaire & PEF	5.0	2.7
Ray <i>et al</i> (1995) ⁵	Tamil Nadu (R)	30+	4857	5089	Questionnaire	4.1	2.5
Jindal <i>et al</i> (2006) ⁶	Multicentric*	≥35	18217	17078	Validated structured questionnaire	5.0	3.2

Superscript numerals denote reference numbers; PEF, peak expiratory flow; U, urban; R, rural
 *Bangalore, Chandigarh, Delhi, Kanpur

A strong association exists between tobacco smoking and the occurrence of COPD. The reported smoker: nonsmoker prevalence ratio varied from 1.6 to 10.2. Thus, smoking has been identified as a high-risk factor for COPD. Surveys in India have revealed that 29.4% of males and 2.5% of females are current smokers. However, in those 30 years of age and above, the prevalence of smoking in India is 40.9% for males and 3.9% for females. The difference in the prevalence of COPD among males and females could be due to the differences in their levels and type of smoking.

In these studies, indoor air pollution due to traditional domestic fuels was considered an important factor affecting the lung function of females in rural areas in prevalence studies of COPD. The occurrence of severe bronchitis among non-smokers was mainly due to their exposure to tobacco smoke either at home or at the workplace. The prevalence of COPD was much higher in heavy smokers than among those who smoked a lesser number of cigarettes. The odds ratio was 2.4 for the total population—4.7 for that seen among non-smokers. Similar observations were also made in large-scale studies conducted in the USA and Canada.

There is very limited data on the economic impact of the disease burden of COPD at a nation – wide level. However, one large-scale study was conducted in 2001 in the geographical area of

Hyderabad under the aegis of an IES project to study the health effects analysis of COPD including its economic burden.

The unit values of hospital admission for COPD were US\$ 122.23 towards medical costs and US\$ 14.30 for opportunity loss; outpatient visits cost the patients US\$ 8.26 for medicines and another US\$ 1.43 because of opportunity losses. These costs (reported for the year 2001) were used to arrive at the current cost of COPD. It was noted that, on an average, a person with COPD spent Rs 11,952 per year in 1992 and the same treatment cost Rs 23,300 in 1999. This increment in the cost of treatment was calculated on a pro rata basis for the period 1996–2016. In the present exercise, the same rate of change was applied for all other costs.

In this study the number of cases with chronic and severe COPD was estimated by using the projected population figures for the period 1996–2016. The expected changes in the mortality figures in India were considered in this exercise. Only the population of those 30 years of age and above was considered, and a constant percentage (26.82%) for the urban population was operated till 2016. Estimated number of patients with chronic and acute COPD and their distribution by sex and residence are shown in table below. Health providers/planners need to get ready to face a caseload of COPD of about 222.16 lakh in 2016—a majority of this would be from rural areas where the poverty levels are high. Estimated caseload according to the severity of COPD is also given below. In addition, there would be patients with acute COPD who need hospitalization and expert care.

Table 7. Estimated number of patients with chronic COPD (in lakh)

Year	Males		Females		Total	
	Urban	Rural	Urban	Rural	Urban	Rural
1996	23.4	63.8	11.2	31.6	34.6	95.4
2001	26.6	72.6	13.2	37.0	39.8	109.6
2006	30.2	82.3	15.1	42.6	45.3	124.9
2011	34.3	93.5	17.2	48.3	51.5	141.9
2016	39.4	107.6	19.7	55.4	59.1	163.0

Table 8. Estimated number of patients with acute COPD (in lakh) by sex and residence

Year	Males		Females		Total no. of acute cases		
	Urban	Rural	Urban	Rural	Urban	Rural	Total
1996	0.69	1.89	0.62	1.75	1.31	3.64	4.95
2001	0.78	2.13	0.72	2.02	1.50	4.15	5.65
2006	0.89	2.44	0.83	2.35	1.73	4.78	6.51
2011	1.03	2.82	0.97	2.72	2.00	5.54	7.54
2016	1.20	3.28	1.13	3.18	2.34	6.47	8.81

Table 9. Estimated number of patients with COPD by severity of the disease (in lakh)

Year	Severity of COPD			Total
	Mild	Moderate	Severe	
1996	75.67	33.28	21.06	130.01
2001	86.92	38.23	24.19	149.35
2006	99.04	43.57	27.57	170.18
2011	112.52	49.49	31.32	193.33
2016	129.30	56.87	35.99	222.16

f. CHRONIC KIDNEY DISEASE

Although chronic kidney disease (CKD) is not currently identified as one of those targets, there is compelling evidence that CKD is not only common, harmful and treatable but also a major contributing factor to the incidence and outcomes of at least three of these diseases targeted by WHO (diabetes, hypertension and CVD). CKD strongly predisposes to hypertension and CVD; diabetes, hypertension and CVD are all major causes of CKD; and major risk factors for diabetes, hypertension and CVD (such as obesity and smoking) also cause or exacerbate CKD. In addition, among people with diabetes, hypertension, or CVD, the subset who also have CKD are at highest risk of adverse outcomes and high health care costs. Thus, CKD, diabetes and cardiovascular disease are closely associated conditions that often coexist; share common risk factors and treatments; and would benefit from a coordinated global approach to prevention and control.

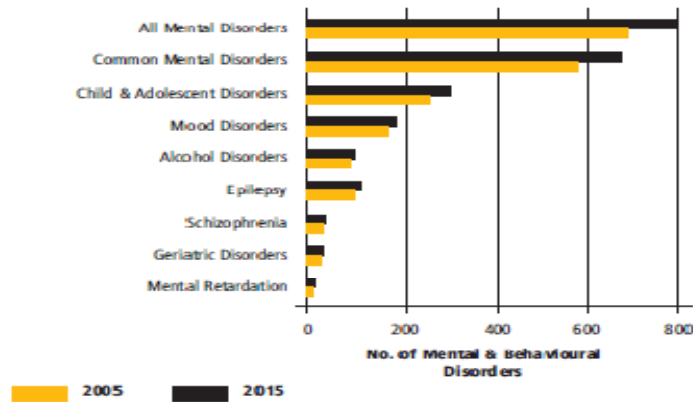
The incidence of end-stage kidney disease in India is estimated to be 150 to 175 per million population per year (or between 150,000 and 175,000 cases), and is attributable to diabetes in 30 – 40% of patients⁴¹. The studies show that the prevalence of moderate chronic kidney disease (CKD)-stage-3 onwards in India in adults is around 0.8%. The leading causes of CKD in India are diabetes (30%) and hypertension (20%)¹. Given projected increases in the prevalence of major risk factors for CKD (diabetes, hypertension and CVD), the prevalence of CKD in developing countries is expected to dramatically increase over the next two decades.

g. MENTAL DISORDERS

It is estimated that 6-7 % of the population suffers from mental disorders. As per metanalysis of studies on mental disorders by Reddy & Chandrashekhara (1998), the prevalence of mental disorders is 58 per 1000 in all ages. The World Bank report (1993) revealed that the Disability Adjusted Life Year (DALY) loss due to neuro-psychiatric disorder is much higher than diarrhoea, malaria, worm infestations and tuberculosis if taken individually. Together these disorders account for 12% of the global burden of disease (GBD) and an analysis of trends indicates this will increase to 15% by 2020⁴². One in four families is likely to have at least one member with a behavioral or mental disorder⁴². These families not only provide physical and emotional support, but also bear the negative impact of stigma and discrimination. Most of them

(>90%) remain un-treated. Poor awareness about symptoms of mental illness, myths & stigma related to it, lack of knowledge on the treatment availability & potential benefits of seeking treatment are important causes for the high treatment gap.

Mental health affects about 6.5% of the Indian population and is expected to increase due to stress on account of frequent disruptions in incomes, unemployment, lack of social support systems, etc. The National Commission on Macroeconomics and Health, 2005 estimated the burden due to mental ill health, as shown below¹⁰



Predominantly the age group of 25 — 44 years, except those specific to paediatric and geriatric age groups, are most vulnerable to mental health challenges. The productive state of individual in this period of the life cycle leads to severe degrees of unproductivity and its spiraling effects on quality of life with associated stigma. Certain mental illnesses will manifest more in women, like unipolar depression is higher among women in 15- 44 yrs, while schizophrenia and other mood disorders are more among men. Alcohol dependency and its hazardous use, drug abuse is exceptional to men. Increasing trends of its common usage among women in both urban and rural areas has been a recent phenomenon (1%-5 %).

The World Health Survey 2003 covered urban and rural population above 18 years of age in 6 States of India. A summary of its findings on psychosis and depression is provided below⁴³. The rates of treatment were lower in rural compared with urban areas (61.7% v. 47.5%), and higher in the higher income quartiles.

State	Psychosis		Depression	
	Need (% diagnosed)	Covered (% treated)	Need (% diagnosed)	Covered (% treated)
Assam	1.0	39.1	3.2	32.3
Karnataka	0.7	85.2	9.2	13.0
Maharashtra	2.2	48.7	27.3	9.6
Rajasthan	3.6	36.2	7.3	29.7
Uttar Pradesh	2.7	45.5	7.4	8.2
West Bengal	1.8	66.5	11.7	17.8

The gross disparity between the number of mentally ill persons and the available treatment facilities and trained professionals is reflected in the large 'treatment gap' in the community. The challenges of mental health care in India have been identified as follows⁴⁴;

1. Large 'unmet need' for mental healthcare in the community
2. Poor understanding of psychological distress as requiring medical intervention in the general population
3. Limited acceptance of modern medical care for mental disorders among the general population
4. Limitations in the availability of mental health services (professionals and facilities) in the public health services
5. Poor utilization of available services by the ill population and their families
6. Problems in recovery and reintegration of persons with mental illnesses
7. Lack of institutionalized mechanisms for organization of mental healthcare

h. IODINE DEFICIENCY DISORDERS

Iodine is essential micronutrient with an average daily requirement of 100-150 micrograms for normal human growth and development. On the basis of surveys conducted by the Directorate General of Health Services, ICMR, Health Institutions and the State Health Directorates, it has been found that out of 324 districts surveyed in all the 28 states and 7 UTs, 263 districts are endemic i.e. where the prevalence of Iodine Deficiency Disorders (IDD) is more than 10%. It is also estimated that more than 71 million persons are suffering from Iodine Deficiency Disorders. Thus, no States/UT in the country is free from IDD. Iodine is required for the entire population daily.

i. FLUOROSIS

Fluoride endemicity has been reported in about 230 districts of 19 States of the country. The affected population with fluorosis is about 66 million in the country. Based on excess level of fluoride content in No of districts, the States have been classified as mild, moderate and severe endemic States of Fluorosis. It affects all ages. States like Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, Tamil Nadu, West Bengal are affected from fluorosis.

Fluorosis brings about changes in skeletal system and teeth which becomes irreversible in due course of time. Therefore, the focus of management of fluorosis is on prevention, health promotion, deformity correction and rehabilitation.

j. ORO-DENTAL DISEASES

According to the World Health Report-2003, oral diseases qualify as major public health problems owing to their high prevalence and incidence in all regions of the world. The greatest burden of oral diseases is on disadvantaged and socially marginalized populations.

Poor oral health may have a profound effect on general health. Oral diseases have been linked to bacterial endocarditis due to transient bacteremia from oral focus. Also, inflammatory mediators in periodontal disease are not only involved in local tissue destruction but have the potential to modulate the course of cardiovascular, chronic obstructive lung and autoimmune diseases, diabetes mellitus and preterm birth. In addition, major impact on people's daily lives in terms of pain and suffering, impairment of function and quality of life due to missing, discolored or damaged teeth must be considered.

The economic impact of oral disease is also significant. Traditional treatment of oral disease is costly. In developing countries, resources are primarily allocated to emergency oral care and pain relief; if treatment were available, the costs of dental caries in children alone would exceed the total health care budget for children. Furthermore, oral diseases restrict activities at school and work, causing millions of school and work hours to be lost each year throughout the world.

Oral disease burden in India is very high due to several reasons. Many oral health surveys have been done from time to time from different regions: the comprehensive data on oral health was cited in the report by National Commission on Macro-economics and Health¹⁰ and Oral Health in India: Report of multi-centric oral health survey (Shah et al, 2007). According to these reports, prevalence of various oral diseases in the population is as follows:

S.No.	Disease	Prevalence
1	Dental Caries	40-45%
2	Periodontal diseases	>90% (Advanced disease in 40%)
3	Malocclusion	30% of children
4	Cleft lip and palate	1.7 per 1000 live births
5	Oral cancer	12.6 per lakh population
6	Oral submucous fibrosis (<i>pre-malignant and crippling condition of mouth</i>)	4 per 1000 adults in rural India
7	Dental Fluorosis	Endemic in 230 districts of 19 States
8	Edentulousness (tooth loss)	19-32% of elderly population >65 years
9	Oral lesions due to HIV/AIDS	72% of HIV/AIDS patients
10	Birth defects involving oro-facial complex	0.82 to 3.36 per 1000 live births
11	Others: <ul style="list-style-type: none">• Traumatic injuries• Mucosal lesions associated with radiation and chemotherapy• Morbidity and deformity following oral cancer surgery.	

Given the burden of oral diseases in our country and their impact, oral diseases need to be paid attention along with prevention and control of other non-communicable diseases under NRHM. Promotion of healthy lifestyles with respect to oral health needs to be considered. World Health Assembly in 2005 included Oral Health with other non-communicable diseases (NCDs) for health promotion & disease prevention strategies.

Congenital Anomalies:

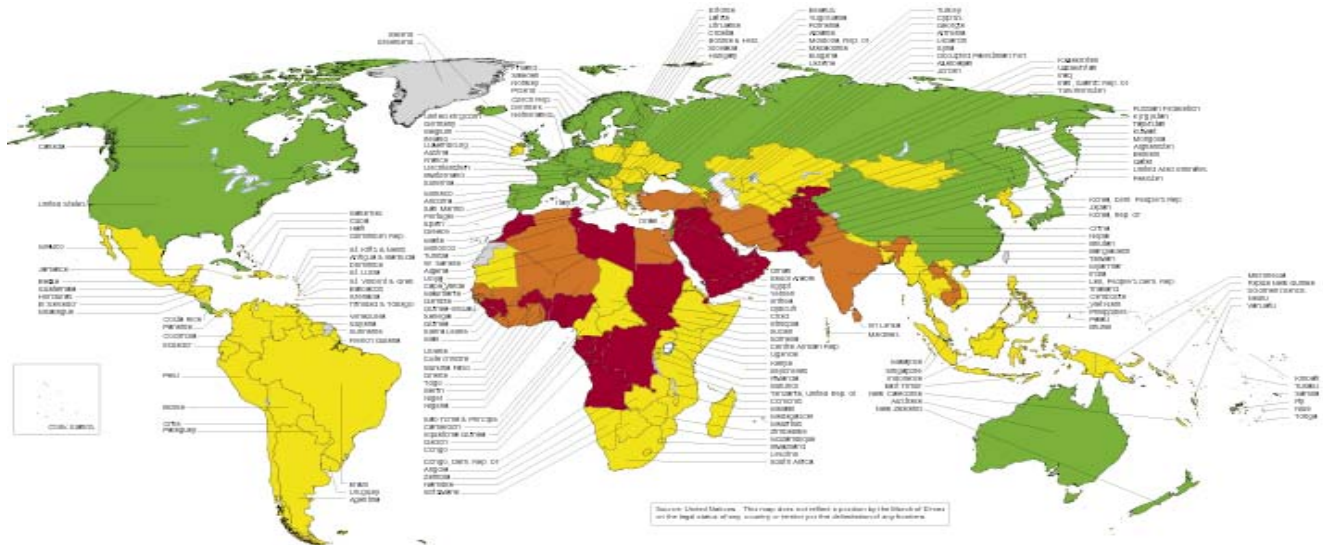
“Congenital anomalies (CA) which includes craniofacial anomalies (CFA) are major cause of infant mortality and morbidity, affecting 2-3% of all newborn babies.” (Source: Global registry and database on craniofacial anomalies-WHO). The treatment of congenital craniofacial defects has been prioritized by the WHO. According to WHO:

“Their impact on speech, hearing, appearance and cognition has a prolonged and adverse influence on health and social integration. The costs incurred from CFA in terms of morbidity, health care, emotional disturbance, and social and employment exclusion are considerable for affected individuals, their families and society.” (Source - Global strategies to reduce the health-care burden of craniofacial anomalies: Report of WHO meetings on International Collaborative Research on Craniofacial Anomalies; November 2000

Cleft lip and palate is one of the most common congenital deformities of the new born. Statistics suggest an increasing incidence of cleft lip and palate patients. The incidence of cleft lip and palate is reported to be highest in Afghans (4.9 per 1000 live births) and lowest in Negroid (0.04 per 1000 live births) population. In Caucasians it is reported close to 1.0 per 1000 live births. The approximate incidence of cleft lip and palate is around 1.4/1000 live births in India and for isolated cleft palate it is 0.3/1000 live births. According to rough estimates about 182 cleft children are born every day and about 40,000 cleft children are born every year in India. Since the treatment of the disease is long drawn and spans across more than 20 years of the patients life, the cumulative burden of disease is huge, possibly unimaginable.

Global burden of disease

More than 94 percent of the births with serious birth defects and 95 percent of the deaths of these children occur in low and middle income countries.



39 –52/1000 live births

52 – 60/1000 live births

61 – 70/1000 live births

70 – 100/1000 live births

NEUROLOGICAL DISORDERS
EPILEPSY 1000 live births
 The prevalence of epilepsy in India is about 1% of population⁵⁶. Prevalence rate of epilepsy is higher in rural population (1.9 %) as compared to urban population (0.6 %). Out of the total global disease burden of 7 million DALYs, 0.5% is contributed by epilepsy alone⁵⁷.

There exists a very severe form of epilepsy (Status Epilepticus-SE), which is a life-threatening condition in which the brain is in a state of persistent seizure. It is defined as one continuous unremitting seizure lasting longer than 5 minutes or the occurrence of 2 or more seizures without gaining consciousness between them⁵⁸. In a study conducted in Delhi out of 451 patients 30 (6.65%) were found to develop SE⁵⁹, and in another 243 patients it was 84 (38%)⁶⁰. In the USA out of 16 veteran medical centers and 6 affiliated hospitals 570 cases out of 1705 (33.4%) were found to be of SE⁶¹.

Mortality in epilepsy:

In a study conducted by Banerjee (2010) in Kolkata 309 incidence and 66 prevalence cases were studied. The total deaths in the study were 20. The annual mortality rate estimated in the study was about 7.63/100,000. The Standardized mortality ratio (SMR) was found to be 2.58/100,000. Mortality rate due to SE was reported to be 29%⁶². Sudden death due to the disease varied widely (2-18%) in another study⁶³. It is estimated that nearly 2-3 lakh patients may die due to epilepsy if they remain untreated.

Stigma associated with the disease:

Stigma is referred to as a severe social disapproval of personal characteristics or beliefs that are against cultural norms. Persons with epilepsy face stigma in many communities. In a study conducted by Radhakrishnan K (2000) a total of 1,175 persons were studied. Among these 31% thought epilepsy as a hereditary disorder, 27% as a form of insanity, 40% were denied employment due to their condition and 11% of the parents did not allow their child to play with epileptic children and 55% of the women concealed their epilepsy during marriage negotiations⁶⁴. Out of those who concealed, 18% were legally divorced and 20% were separated from their spouses because of the disease.

Cost of epilepsy (Economic burden):

The treatment of epilepsy includes both direct and indirect costs. Direct cost includes the cost of the hospitalization, treatment, medicines, homecare and ancillary services. The indirect cost includes loss of time and productivity, the income lost by the family members and the foregone leisure time. The cost attributed to pain, suffering and social stigma comes under intangible costs. The direct and the indirect cost of treatment represent 27.1 and 72.9% of the total cost treatment⁶⁵.

Krishna et al 2001 conducted a study on 184 patients and found that the annual cost per capita was \$ 27.51. 79.2% of the patients in the study had been given monotherapy and the first choice of the AED was phenytoin (93%). Radhakrishnan in 1993-95 studied 972 outpatients and found the annual cost per capita at about \$47.73. 76.4% patients had been given the monotherapy. The first choice of the AED was Carbamazepine in 44.2%, Valproic acid and phenytoin in 20-20% cases. 1% cases were treated with newer AEDs. 285 outpatients were studied by Thomas in 1998 and found \$53.75 annual cost. 75.5% of the patients were kept on monotherapy. CBZ was the first choice of treatment in 48% and phenytoin in 33% cases. 10% of the patients were tried with newer AEDs. It can hence be said that indirect costs would increase if the patient does not undergo effective treatment, and a small effort in improving the direct costs would bring down the total costs, including the indirect one.

Reason for unemployment:

A study conducted on 118 patients in Kerala shows that various reasons have been given by the patients for their unemployment. The reasons are summarized in the table given below:

Reason	Number (%)
Seizure related falls	34 (29.1)
Fatigue/drowsiness due to AEDs	46 (22.8)

Fear of seizures in workplace	44 (21.8)
Low education because of epilepsy	41 (20.3)
Frequent seizures	36 (17.8)
Denied job because of epilepsy	32 (15.8)
Lack of motivation to do job	32 (15.8)

I. AUTISM SPECTRUM DISORDERS (ASD)

Autism spectrum disorders (ASD) are a group of neuro- developmental disorders characterized by impaired communication and social interaction, restricted interests and repetitive behaviors, with onset before 3 years of age. Examples of ASD include Autism and Asperger syndrome. Although the degree of severity and impairment in ASD is highly variable, ASD have a substantial impact on the affected children and their families.

For decades after Kanner's original paper on autism was published in 1943, it was generally considered to be a rare condition with a prevalence of around 2-4 per 10,000 children. The first epidemiologic study of autism was done in England in 1966 and found the autism rate to be 4-5 per 10,000 children in the general population. Other community studies published before 1985 reported prevalence rates from 4-6 per 10,000. Studies published between 1985 and 1995 reported higher prevalence rates than studies published prior to 1985, with a mean of 11.8 per 10,000 children. A recent scientific review of studies on the prevalence suggested a conservative estimate for autism of 1 out of every 1000 children, with as many as 1 in 500 persons affected with some form of this disorder. ^{1,2} Most estimates that include people with similar disorders are two to three times greater. ³ Emerging in childhood, it affects about 1 or 2 people in every thousand and is three to four times more common in boys than girls. ⁴ Prevalence of autistic spectrum disorder in children aged 5-14 yrs in the UK in north east London has been reported as 19 per 10,000 children. ⁵

The prevalence of autism is on the rise as reported from all over the world. Whether this is because of increased awareness, increased detection rate or because of actual rise in prevalence is debatable.

An analysis was carried out using a national data source to compare the prevalence of autism with that of other disabilities among successive birth cohorts of US school-aged children 6 to 17 years

of age between 1992 and 2001. A disability category classification of autism, Intellectual disability (mental retardation), speech and language impairment, traumatic brain injury, or other health impairment, as documented by state departments of education and reported to the Office of Special Education Programs, US Department of Education was used. For the autism classification, there were birth cohort differences, with prevalence increasing among successive (younger) cohorts. The increases were greatest for annual cohorts born from 1987 to 1992. For cohorts born after 1992, the prevalence increased with each successive year but the increases did not appear to be as great. No concomitant decreases in categories of Intellectual disability (mental retardation) or speech/language impairment were seen. These data do not support the hypothesis of diagnostic shifting.⁶ Current estimates of global prevalence of ASD range between 50 to 60 per 10,000 school-aged children, making ASD a serious public health concern.⁷ In India, Epidemiologic studies are not available. However, few case series from tertiary care centers are available.

These children need multidisciplinary management. Autism has been identified as one of the four major disabilities by National Trust under ministry of social welfare. In fact, National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999 has provisions of legal guardianship of the four categories. The Ministry of Finance has also included income tax exemption for parents/ guardians of children with autism according to Section 80DD and Section 80U of the Income Tax Act 1961.

m. DEMENTIA

Dementia is a syndrome usually chronic, characterized by a progressive, collective deterioration of intellect including memory, learning, orientation, language, comprehension and judgment due to disease of the brain. It mainly affects older people; about 2% of cases start before the age of 65 years. After this, the prevalence doubles with the increase of every five year. Dementia is one of the major causes of disability in late life. The major sub-types of Dementia include, **Alzheimer's Disease** (50-75% cases), **Vascular Dementia** (20-30% cases), Dementia with Lewy Bodies (DLB) (<5%), and the uncommon sub-types of Dementia include Fronto-temporal Dementia (FTD) (5-10% cases), Creutzfeld Jakob and Huntington's disease etc.

Once considered a rare disorder, Alzheimer's Disease-AD is now seen emerging as a major public health and social problem that is seriously affecting millions of older people and their families. The global figures are estimated at 36 million people living with Alzheimer's and related disorders as per Alzheimer's Disease International-ADI world report 2010. By 2040, over 82 million elderly people are expected to have AD if the current numbers hold and no preventive treatments become available.

In India the population with Alzheimer's and related disorders is estimated to be around 3.7 million (2.1 million men and 1.5 million women) which are based on recent scientific studies validated by ADI. The cost of caring, has been conservatively estimated at present (as per

Dementia India Report 2010 brought out by Alzheimer's and Related Disorders Society of India, a NGO dedicated for the cause) **Rs.159 billion**, which is likely to go up to **Rs.327 billion** at the current cost estimates without any escalation by 2030. The indirect costs of caring are often not quantified in India due to more home based care through traditional family systems compared to western countries. Institutional care is seldom available across the country and wherever it is available could only cater to the fractions of the actually affected population. The diagnostic and simple screening techniques to detect early onset of Dementia is far from lacking due to inadequate knowledge and basic awareness about the disease. The challenges as assessed in India are broadly

- ❖ Growing epidemic
- ❖ Weakening Family care
- ❖ Lack of awareness
- ❖ Addressing the needs of caregivers
- ❖ Lack of treatment facilities and improvement of treatment gap for dementia
- ❖ High cost of care
- ❖ Scarcity of Human Resources for Mental health services
- ❖ Need for more research on dementia in India
- ❖ Develop alternate facilities for dementia care
- ❖ Advocacy: Enabling Govt. participation through focused strategies

n. CONGENITAL DISEASES

Congenital and hereditary genetic diseases are becoming a significant health burden in India, and hence there is a need for adequate and effective genetic testing and counselling services. In India's urban areas, congenital malformations and genetic disorders are the third most common cause of mortality in newborns. Factors contributing to this high prevalence include consanguineous marriages, high birth rate, improved diagnostic facilities, and a lack of expertise in genetic counselling.

Due to the high birth rate in India a very large number of infants with genetic disorders are born every year almost half a million with malformations and 21,000 with Down syndrome. A recent study carried out in three centers (Mumbai, Delhi and Baroda) on 94,610 newborns by using a uniform proforma showed a malformation frequency of 2.03%, the commonest malformations are neural tube defects and musculo-skeletal disorders. The frequency of Down syndrome among 94,610 births was 0.87 per 1000, or 1 per 1150. Screening of 112,269 newborns for aminoacid disorders showed four disorders to be the commonest--tyrosinemia, maple syrup urine disease and phenylketonuria. Screening of cases of mental retardation for aminoacid disorders revealed four to be the commonest--hyperglycinemia, homocystinuria, alkaptonuria, and maple syrup urine disease. Disorders, which deserve to be screened in the newborn period, are hypothyroidism and G-6-PD deficiency, while screening for aminoacid and other metabolic disorders could presently be restricted to symptomatic infants.

Congenital Heart Disease (CHD) refers to a problem with the heart's structure and function due to abnormal heart development before birth. Congenital malformations are the most common of all birth defects. CHD affects about 8-10 per 1000 live births and is a leading cause of infant mortality. The burden of CHD in India is enormous due to very high birth rate. This emphasizes the importance of this group of heart diseases. It is known that 180,000 children are born with CHD each year in India. Approximately 10% of present infant mortality in India may be accounted for the CHD alone.

o. HEREDITARY BLOOD DISORDERS

There are approximately 10,000-12,000 new thalassemia syndrome and 7,000-10,000 new sickle cell anaemia patients added every year in India. Moreover, approximately 1, 20,000 patients of Hemophilia are there in our country out of which 14,000 are registered. As the patients are mainly managed in bigger hospitals, this data from hospital and treating centres is likely to be an underestimate. As the services are being extended in the rural areas, more and more patients are likely to be identified. Moreover, many patients of severe genetic disorders like hemophilia, B thalassemia and sickle cell anaemia will survive to adulthood with availability of proper management and their number in society is likely to increase. As these hereditary blood diseases are lifelong conditions and have many dimensions, management of these are best achieved with close co-operation with voluntary organizations/NGOs representing the interests of these patients in the society.

p. TRAUMA

Expansion in road network, motorization and urbanization in the country has been accompanied by a rise in road accidents leading to road traffic injuries (RTIs) and fatalities as major public health concern. Today road traffic injuries are one of the leading causes of deaths, disabilities and hospitalization with severe socioeconomic costs across the world.

Road traffic injuries kill nearly 1.3 million women, men and children around the world every year and are responsible for hundreds of thousands of injuries and disability. World Health Organization estimates predict that road traffic injury will increase from being the ninth leading cause of death globally in 2004, to be the fifth leading cause of death by 2030. In 2004, road traffic injury was the tenth leading cause of death in the WHO South-East Region and was responsible for 2% of all causes of mortality.

As per the data of Ministry of Road Transport & Highways during the year 2009 there were around 4.9 lakh road accidents which killed 1,25,660 people and injured more than 5 lakh persons in India. These numbers translate into one road accident every minute and one road accident death every four minutes for India. Road traffic injuries and fatalities impose a huge economic burden on developing economies in particular.

Road traffic accidents since 1970 are summarized below in the Table.

Year	Total No. of Road Accidents (in numbers)	Total No. of Persons Killed (in numbers)	Total number of Registered Motor Vehicles (in thousands)	No. of Accidents per ten thousand Vehicles	No. of Persons Killed per ten thousand Vehicles
1970	114100	14500	1401	814.42	103.5
1980	153200	24000	4521	338.86	53.09
1990	282600	54100	19152	147.56	28.25
2000	391449	78911	48857	80.12	16.15
2003	406726	85998	67033	60.68	12.83

In India more than half of the road accident victims are in the age group (25-65 years), the key wage earning and child raising age group. The loss of the main bread earner and head of household due to death or disability can be catastrophic, leading to lower living standards and poverty, in addition to the human cost of bereavement.

As per the data of National Crime Record Bureau 8,96,18,000 vehicles are registered in the year 2008 in comparison to 7,27,18,000 vehicles in the year 2007. As per the report of National Crime Record Bureau – (2009) 4, 21,628 traffic accidents were reported during the year 2009, which killed 1, 26,896 people and injured 4, 68,849 Road traffic injuries and fatalities impose a huge economic burden on developing economies in particular. Injuries account for 11% of deaths and 13% of DALYs in India in 2004⁶. The precise number of people hospitalized and injured is not available for intentional injuries such as attempted suicides and homicides. According to NCMH, road traffic injuries (20%), suicide (27%), violence-related deaths (11%), burns (9%), poisoning (6%) and drowning (6%) were the major causes of injury deaths¹⁰. Road Traffic deaths and Injuries (RTIs) are on the increase along with the rapid economic growth. An incidence study on RTI carried out in the city of Hyderabad has shown that the incidence (per 100 persons/year) of non-fatal RTI was highest in pedestrians (6.4), motorized two-wheeled vehicle users (6.3), and cyclists (5.1)⁴⁰. RTIs in particular are a problem of the young with three-quarters occurring among 15 – 45 year olds, predominantly among men⁴⁵. RTIs every year result in death of more than 100,000 persons, 2 million hospitalizations and 7.7 million minor injuries. During 2007, road RTIs and suicides resulted in 114,590 and 122,637 deaths, respectively⁴⁶. If the present scenario continues, India will witness deaths of 150,000 persons and hospitalization among 2.8 million people by 2010, increasing further to 185,000 deaths and 3.6 million hospitalizations by 2015 due to RTI alone⁴⁵. Similarly the rate of suicides in the country is also on the rise. According to National Crime Records Bureau, the number of suicides in the country during the decade (1997–2007) has recorded an increase of 28.0% (from 95,829 in 1997 to 122,637 in 2007)⁴⁷. Other groups of injuries such as occupational injuries contributed to 2% of total deaths,

1.8% of total life-years lost due to disabilities and 2% of DALYs (11). It is also estimated that 19 fatal and 1930 non-fatal accidents (1:101) occur annually per 100,000 workers.

q. BURNS

Burn Injuries is a potential public health problem yet under-recognized in our country. It is the second largest group of injuries after road accidents. Burn injuries data is not available at national level as no such study has been conducted. However, based on extrapolation of patients reported at three burns units (Safdarjung, Dr. RML.& LNJP Hospital) of Delhi, it is estimated that annual burn incidence is approximately around 7 million in the country, out of which 10% (7 lakhs) need hospital admission. Approximately, 1.40 lakh die annually and 2.5 lakh get deformed due to burn injuries. The deformity is also not 100% correctable by surgery.

However, 90% of all burn injuries are preventable. The burn scenario is grave in India not only due to the high incidence but is also compounded by absence of organized burn care at primary and secondary health care level. Hence, the Program for Prevention of Burn Injuries has been started on pilot basis with scope for expansion at national level in 12th Five Year Plan based on the outcome of concurrent evaluation.

r. DISASTERS

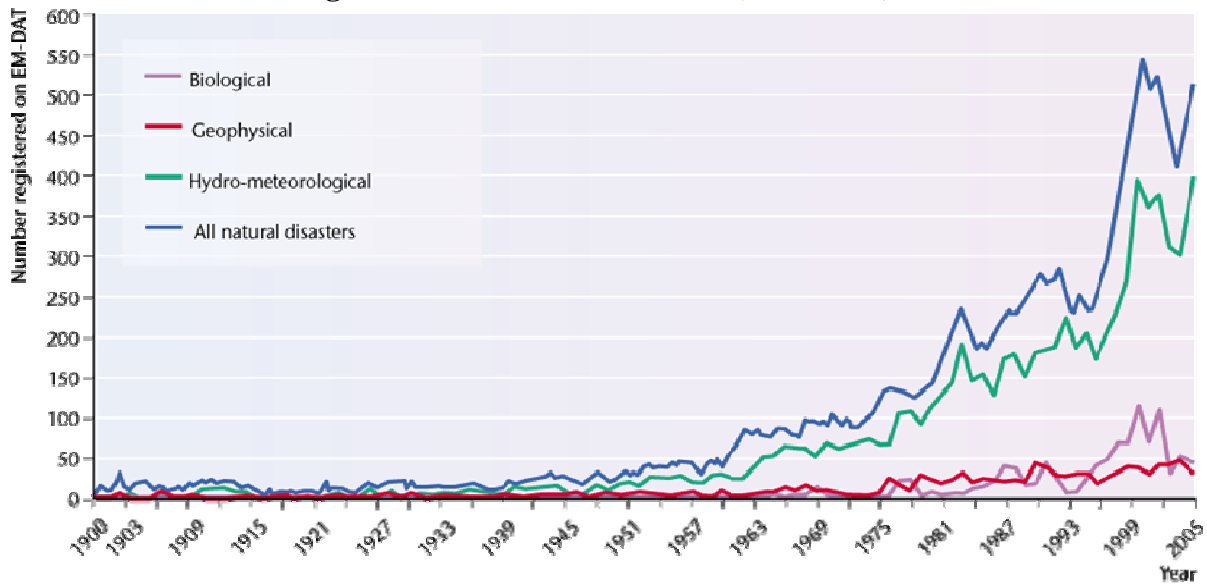
National Disaster Management Act (2005)⁴⁸ defines disaster as “a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area”.

A string of major disasters over the last decade in India had witnessed profound health consequences in terms of death, disease and injuries. The Bhuj earthquake in Gujarat in January, 2001 accounted for 13805 deaths, the Tsunami (2004) another 10749 deaths and the recent Pandemic Influenza, 2761 deaths (as on 20.6.2011). This apart, each year disasters account for loss of thousands of crores in terms of social and community assets.

Disasters: Global Scenario

Disasters that affect all parts of the globe causing harm to human and animal health, damage to property and environment, are most often natural but can also be man-made. Globally, natural disasters are increasing in frequency, severity and complexity. There is evidence based linkage³ to climate change causing extreme weather events like heavy rains, floods, flash floods, drought, cyclones, windstorms, heat and cold wave etc and further health impact in terms of increasing morbidity and mortality.

Fig: Global Trends of Disasters (1900-2005)



[Source: source - EM-DAT (www.emdat.be)]

Disasters: Indian Scenario

India has traditionally been vulnerable to natural disasters on account of its unique geo-climatic conditions. Some of the major disasters that struck the country include Latur (1993) and Bhuj (2001) earthquakes, Orissa cyclone (1999) and Indian Ocean tsunami (2004), flash floods in North Bihar (2008) and Leh, J&K (2010). The vulnerability profile shows that 68% of the cultivable land area is vulnerable to drought, 58.6% of the landmass vulnerable to seismic activity of moderate to very high intensity and 40 million hectares (12% land area) prone to floods. Of the 7516 km long coast line, close to 5700 km is prone to cyclones and tsunamis⁴⁹.

India has a high burden of communicable diseases, such as Tuberculosis, Malaria, Japanese Encephalitis, Chikungunya, Dengue, Meningococcal Meningitis and they often result in major outbreaks causing high morbidity and mortality. Diseases of international concern such as SARS (2003), Avian Influenza (2003) and Pandemic Influenza (2009) spread globally and also affected India. Of particular interest are the human-animal interface of zoonotic diseases. 75% of all emerging diseases in the past decade that affected human population were zoonotic in nature⁵⁰.

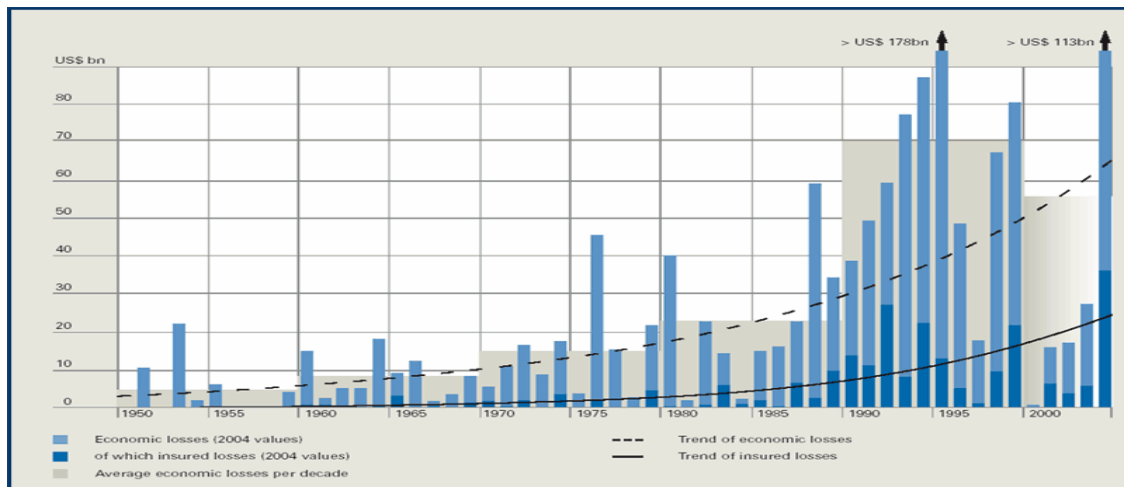
Among man-made disasters, methyl isocyanate gas tragedy (1983) in Bhopal, Madhya Pradesh is a grim reminder of what industrial accidents involving hazardous substances can cause. India's quest for energy through nuclear options means that our nuclear facilities need to have preparedness to respond to events of the magnitude witnessed at Chernobyl, Russia (1986) or Fukushima, Japan (2011). Terrorism, that too in the context of using chemical, biological, radiological and nuclear agents, is yet another area of concern.

Heightened vulnerabilities to disaster risks can be related to expanding population, urbanisation and industrialisation, development within high-risk zones, environmental degradation and climate change. In the context of human vulnerability to disasters, the economically and socially weaker segments of the population are the ones that are most seriously affected. Within the vulnerable groups, elderly persons, women, children-especially women rendered destitute, children, orphaned on account of disasters and differently abled persons are exposed to higher risks⁴⁹.

Impact of disasters

Disasters whether natural or manmade, causes both human and economic losses. Globally, the estimated loss was of US \$ 10 billion in 1950. In sharp contrast, this was about US\$ 180 billion for the year 2005.

Fig: Trends of Economic losses due to Disasters



[Source : Geo-natural catastrophes 2006: Analysis, assessments, positions, Munich Re]

India, though affected by major disasters, the impact has not been quantified in economic terms, but agreeably there have been substantial human and financial loss. Estimates available at one of the most-used international database -EM-DAT (www.emdat.be) is as under:

India - Natural Disasters from 1980 – 2010

No of events:	431
No of people killed:	143,039
Average killed per year:	4,614
No of people affected:	1,521,726,127
Average affected per year:	49,087,940
Economic Damage (US\$ X 1,000):	48,063,830
Economic Damage per year (US\$ X 1,000):	1,550,446

Public Health Impact of Disasters

Public health impact of disasters are manifested primary in the form of;

- deaths,
- injuries and
- population displacement exposing the displaced people to a number of public health implications including disease outbreak, psycho-social & mental health, maternal & child health and adolescent health issues, gender and extreme-age public health issues etc.

s. MUSCULO-SKELETAL DISEASES

In the last few decades, the Government of India has been successful in controlling most of the communicable diseases and achieved an increased life-span through its various programs. On the other hand, during the last two decades changes in life style and dietary habits has led to a rise in the incidence of non-communicable diseases like obesity, cardiovascular diseases, diabetes, hypertension, various cancers, stress and other psycho somatic disorders. The burden of MSD is global and looking at the gravity of the situation and due to its increasing prevalence associated with large personal and societal costs MSD is recognized as a significant public health problem.

Musculoskeletal Disorders (MSD) are one of the major causes of morbidity, having a substantial influence on health and quality of life, imposing an enormous burden of cost on the healthcare system. The existing research verifies that musculoskeletal conditions comprise over 150 diseases and syndromes usually associated with pain. These can broadly be categorized as joint diseases, spinal disorders and conditions resulting from trauma. Globally the burden of MSD contributes substantial disease burden and therefore to emphasis on the gravity of the situation WHO has declared 2000-2010 as the “Bone and Joint decade”.

Musculoskeletal conditions are highly prevalent and their impact is pervasive.

- These significantly affect the psychosocial status of affected people as well as their families and careers. Musculoskeletal conditions cause more functional limitations in the adult population in most welfare states than any other group of disorders.
- Health related quality of life in people with MSD has affected the working of people in the general population. The worst quality of life patterns were found for osteoarthritis (OA) of the hip or knee, osteoporosis, rheumatoid arthritis (RA), and fibromyalgia. Health related quality of life scores were lowest among those with multiple musculoskeletal diseases. Compared with other chronic diseases, patients with musculoskeletal disorders usually report the lowest health related quality of life. All MSDs involve pain and reduced physical functioning.
- The impact of MSD in the general population has been associated with disability and assessed by measures of health related quality of life surveys from the industrialized world has revealed a high prevalence of MSD and its negative effect as compared with other

common chronic conditions . The disaggregation by developing and developed regions, however, shows that while musculoskeletal conditions account for around 3.4 % of the total burden of disease in the developed world, they account for 1.7 % in the developing world.

- They significantly affect the psychosocial status of affected people as well as their families and careers. Musculoskeletal conditions cause more functional limitations in the adult population in most welfare states than any other group of disorders.
- Across the world, musculo-skeletal conditions affect hundreds of millions of people, at a huge cost to society (estimated at \$215 billion per year in the USA alone).

Magnitude of MSDs:

- MSDs are the most common cause of severe long term pain and physical disability affecting hundreds of millions of people around the world and a major cause of years lived with disability in all continents and economies. In the Ontario Health Survey, for example, musculoskeletal conditions accounted for 40% of all chronic conditions, 54% of all long-term disability, and 24% of all restricted activity days⁵¹. In surveys carried out in Canada, the USA, and in Western Europe, the prevalence of physical disabilities caused by a musculoskeletal condition repeatedly has been estimated at 4–5% of the adult population⁵².
- They are the most common cause of severe long-term pain and physical disability as they affect hundreds of millions of people around the world. The global prevalence of MSDs ranges from 14% to as high as 42%. Musculoskeletal impairments rank number one in chronic impairments in the United States and 1 out of every 4 people in developed and less developed countries reports chronic musculoskeletal pain.
- As per WHO estimates 2001 musculoskeletal conditions account for approximately 1.7 and 2.4 % of the burden of disease experienced by males and females, respectively, or across both genders, approximately 2 % of the global burden of disease. WHO estimates that 40% of people over the age of 70 years suffer from OA knee, 80% of the patients with OA have some degree of limitation of movement and 25% can't perform their major daily activity of living. Amongst the set of musculoskeletal conditions, OA accounts for the largest burden, approximately 52 % of the total in developing regions and 61 % in developed regions.
- COPCORD India with its vast experience of collecting community data on MSD and pain in both urban and rural regions describes the status and challenges of community rheumatology in India. Soft tissue MSD pains were found to be the dominant rheumatic ailment by almost all COPCORD surveys and not surprisingly the most frequent sites reported were those of knees and lower back; the prevalence was >5% with higher values reported from the rural survey.
- Bhigwan study reported mild, moderate and severe grades of disability in 74%, 15% and 6% of the MSDS subjects respectively; the main difficult activities in these rural subjects were walking, occupation, and hygiene care (squatting for ablution).

- In a recently completed multi-centric study by the ICMR (2007-11) has shown a prevalence of MSD's in 7.08% in Delhi, 11.52% in Dibrugarh and 9.53% in Jodhpur. These figures are indeed alarmingly high compared to any of the Non Communicable Diseases (NCD) in India. The prevalence of MSD was higher in urban area at Delhi and Dibrugarh as compared to Jodhpur where the prevalence was found to be higher in rural area. Across all the three study centres the prevalence of MSD was lowest in the age group 18-30 years and the rate gradually was found to increase from 40 years and above. According to the HAQ score 47.56% of the MSD patients in Delhi had moderate severity of disease. In Dibrugarh 63.75% of MSD patients had mild severity of disease and 44.68% in Jodhpur with mild severity of disease. About 9.31% of the patients in Delhi, 8.31% of patients in Dibrugarh and 4.32% of patients in Jodhpur reported absence from work due to MSDs. At least some functional limitation was observed in 84.10% patients in Delhi, 86.20% patients in Dibrugarh and 66.44% in Jodhpur.

Major contributors of MSD:

Low back pain is a major health and socioeconomic problem in western countries. A large study from the Netherlands reported an incidence of 28.0 episodes per 1 000 persons per year and for low back pain with sciatica an incidence of 11.6 per 1000 persons per year. Low back pain affects men more than women and is most frequent in the working population, with the highest incidence seen in those aged 25–64 years⁵³. New episodes are twice as common in people with a history of low back pain. Lifetime prevalence is 58–84% and the point prevalence (proportion of population studied that are suffering back pain at a particular point of time) is 4–33%. Back pain has a marked effect on the patient Fragility fractures have doubled in the last decade as 40% of all women over 50 years will suffer an osteoporotic fracture with the number of hip fractures rising from about 1.7 million in 1990 to 6.3 million by 2050 unless aggressive preventive programs are started. Osteoporotic hip fracture account for a large proportion of the morbidity, mortality and the cost of the disease. Back pain is extremely common in both industrial and developing countries, with up to 50 % of workers suffering an episode each year. Back pain causes 0.8 million disability adjusted life years (DALYs) each year and is a major cause of absence from work and of correspondingly high economic losses. Low back pain has reached epidemic proportions, being reported by about 80% of the people at some time in their life. Low back pain is also the most frequent cause of limitation of activity in the young and middle aged, one of commonest reasons for medical consultation, and the most frequent occupational injury. Back pain is the second leading cause of sick leave. The number of individuals over the age of 50 is expected to double between 1990 and 2020.

1. **Osteoarthritis (OA)** accounts for half of all chronic conditions in persons aged over 65 with about 25 % of people over the age of 60 have significant pain and disability from osteoarthritis. OA accounts for half of all chronic conditions in persons aged over 65.

Measured in terms of disability adjusted life years (DALYs), musculoskeletal disease condition –osteoarthritis is the 4th most frequent predicted cause of health problems worldwide in women and the 8th in men; OA is more common in women than men but the prevalence increases dramatically with age. 45% of women over the age of 65 have symptoms while radiological evidence is found in 70% of those over 65 years. OA of the knee is a major cause of mobility impairment, particularly among females. OA was estimated to be the 10th leading cause of non-fatal burden in the world in 1990, accounting for 2.8% of total YLD, around the same percentage as schizophrenia and congenital anomalies. The prevalence of OA increases indefinitely with age, because the condition is not reversible. Men are affected more often than women among those aged <45 years, whereas women are affected more frequently among those aged >55 years. Worldwide estimates are that 9.6% of men and 18.0% of women aged ≥ 60 years have symptomatic osteoarthritis and on society because of its frequency and economic consequences. A community-based cross-sectional study was carried out by in an urban resettlement colony in South Delhi to study the prevalence of knee osteoarthritis in women aged ≥ 40 years and treatment seeking behavior of women suffering from osteoarthritis found 47.3% of women (123/260) to be suffering from knee osteoarthritis. It was the sixth leading cause of years of living with disability at the global level, accounting for 3% of the total global years of living with disability. Its impact can be described by health state descriptions developed as part of the global burden of disease 2000 project disability.

2. **Rheumatoid Arthritis (RA):** The prevalence of) prevalence in most industrialized countries varies between 0.3% and 1%; in developing countries it lies at the lower end of this range. The Pune Bhigwan COPCORD study, reported a point prevalence of 0.55%, which was unexpectedly high for a rural population. The Delhi study reported a much higher prevalence of 0.75 urban population study from west Bengal had reported a crude prevalence of 0.3%. The prevalence of RA was found to be 5.5% in large government hospital based patient population evaluated over six year in south India.
3. **Rheumatic Muscular Skeletal Disorders :** In yet a recently conducted study in an urban slum population of Mumbai revealed that there is a substantial burden of Rheumatic Muscular Skeletal Disorders (RMSD) as 18% of the subjects were suffering from RMSD and it had a moderate effect on daily living in most of the subjects.. The prevalence of RMSD was 0.9% in 15-24 years and 11% among 25-34 years as compared to 41.1% in 45-54 years. Also the prevalence in the age group above 55 years was in the range of 29-33 % which is more than that in the younger age group below age 35. Rheumatoid arthritis is a more disabling disease with two-thirds of patients having mild-to-moderate disability and less than 10% having severe.

4. **Osteoporosis** :Although reliable epidemiological data are lacking, hospital data suggest that hip fractures are common in India. and occurs ten to fifteen years earlier than the western /developed nations .As reported by Mithal etal based on 2001 census, approximately 163 million Indians are above the age of 50; this number is expected to increase to 230 million by 2015. Even conservative estimates suggest that of these, 20% of women and about 10-15 % of men would be osteoporotic. The total affected population would, therefore, be around 25 million. If the lower bone density is shown to confer a greater risk of fracture, as is expected, the figure can increase to 50 million⁵⁴. The studies on magnitude and burden of musculoskeletal conditions at global level indicate that an estimated 1.7 million hip fractures occurred world wide in 1990, the figure is expected to exceed to 6 million by 2050⁵⁵. According to the World Health Organization worldwide, the lifetime risk for women to have an osteoporotic fracture is 30–40% , Occurrence of osteoporosis is 10 years earlier in Indian people than in the West. It currently affects approximately one in three women and one in five men over age 50. Because of related morbidity, disability, diminished quality of life, and mortality, osteoporosis and fractures associated with it are major public health concern Several studies from India have revealed that overall, Indians have poor bone health, and osteoporosis is common in India. Peak bone mass achieved during puberty is a strong predictor of development of osteoporosis in later years. High prevalence of vitamin D deficiency in India is a major contributor to low bone mass.
5. **Road traffic injuries** are increasing precipitously, and are estimated to account for as much as 25% of all health care expenditures in developing nations. Injuries and diseases of the musculoskeletal system account for more than 20% of patient visits to primary care. In developing countries, poverty with its attendant malnutrition, infectious diseases, ignorance and inadequate medical facilities are all associated with the occurrence of MSD.
6. **Overuse injuries**, also known as cumulative trauma disorders, occur when a tissue is injured due to repetitive sub maximal loading resulting from repetitive demand over the course of time. Year round growing number of young people participating in sports at an early age the incidence of overuseinjuries has risen in the near past. The ignorance about the existence of the nature of these is the main cause of negligence and management of these injuries In chronic or recurrent cases, continued loading produces degenerative changes leading to weakness, loss of flexibility, and chronic pain Thus, in overuse injuries the problem is often not acute tissue inflammation, but chronic degeneration

Constraints:

- Despite their enormous impact worldwide MSDs does not receive the attention due to perception that MSDs are less serious because unlike CVD, AIDS and cancer, they are largely chronic, nonfatal and tend to be seen as a consequence of ageing.

- With the rise of elderly population the burden would increase for the health care system and society.
- At present there is no medical focus on MSDs as a group. Most afflictions of the MSD are still being looked after by a variety of specialists ranging from Internist to Orthopaedician to Rheumatologist. The persons suffering from MSD are commonly cared for by Physiatrists and Geriatric Specialists.
- There is little defined attention specifically to MSDs. Policies and systems changes are needed to monitor the burden of MSDs and identify factors that influence the development or progression of MSDs or preventions of disabilities related to MSDs as well as to heighten the awareness and improve access regarding the importance of early diagnosis and appropriate management of MSDs. It is appropriate to put in place a system of care and services for the population affected with MSD.
- Services for MSD must be provided at all levels of health care delivery system where it is almost negligible for prevention, screening and diagnosis, early management, chronic care including residual rehabilitation and follow-up with availability of appropriate manpower, drugs investigation and equipments pertaining to MSDs.
- As musculoskeletal system account for more than 20% of patient visits to the health care delivery system efforts for strengthening means for prevention of many MSDs related functional limitations and disabilities at this level needs to be focused.

t. DISABILITIES

As we enter into the 2nd decade of the 21st century, the demographic and epidemiological transitions are continuing to progress thereby altering grossly the morbidity and disability prevalence. Unlike other public health programmes for designing of policy and implementation of the programme for People with Disability, the situation analysis needs to be undertaken in terms of not only number of disabled but also underlying health conditions, co-morbidities, access to general health care, secondary conditions and medical rehabilitation services.

In the Health Care Delivery System of India, medical care and rehabilitation services for People with Disabilities are less than optimum or simply do not seem to exist. There is a pressing need to develop capacity of varieties of trained health professionals and training institutions in this area with the objective of accessing services for the People with Disability.

Information on point prevalence is made available by Census and NSSO (National Sample Survey Organization). The reported prevalence of the disability as per Census is 2.13% of the total population and 1.9% of the total population as per NSSO, which seems to be a fraction of the population having disabilities as world disability report published on 9th June, 2011, states that the proportion of population with disability is rising and stands at 1 billion or 15% of the global population.

Systematic epidemiological, health system research studies need to be instituted for analyzing (collating) the needs of disabled in terms of health care and specific rehabilitation. The gross variance of this magnitude is obviously because of inclusion criteria to be identified on disabled.

General Assembly of United Nations has stressed in its regulation 63/150, 64/131, 65/156, the importance of improving disability statistics for better comparison of data at national and global levels in the purpose of policy designing, planning and evaluation from disability perspective. Therefore, it is necessary to initiate systematic epidemiological status health system, research studies and create mechanism for sharing and updating of the data between the different programmes divisions of the different Ministries.

The convention on the rights of the Persons with Disability in articles 20, 25 and 26 requires member states to develop means for continuing training for professionals and staff so to improve access to mobility devices, health care and rehabilitation services.

Trends in health condition associated with the disability:

- A) Communicable diseases- Communicable diseases with intensive public health interventions, universal immunization programme, the incidence of cluster of childhood diseases and especially paralytic polio-myelitis has come almost to the point of elimination.
- Poliomyelitis - There are more than 2 – 3 million persons afflicted with the polio-myelitis in the past who have disability and require rehabilitation services and access to health care facilities.
 - Leprosy – India is one of the countries which has not reached the bench mark of incidence of less than 1 per 10000 population. Here, too the backlog cases of hand and foot deformities require rehabilitation services and efforts have been made to integrate the programme.
 - Filariasis, Tuberculosis, HIV, encephalitis, etc. –have been contributing significantly to the morbidity and the disability.
- B) Non-communicable diseases- At this point, the Non-communicable diseases have a profound effect on disability with a pronounced increase which has projected its contribution into the burden of disability in the coming 20 years. Contrary to the popular assumption most chronic diseases are equally prevalent in rural population and in lower socio-economic strata. Rising incidences of diabetes, cardio-respiratory diseases contributed significantly to the morbidity and disability (66.5% of all years lived disability).

- C) Accidents and Injuries - Road traffic accidents and injuries due to violence and disasters are also significantly contributing to morbidity and disability. In India 1.6 lakh people die every year on the road and 2 to 3 million people are injured of which many end up with lifelong disability.

u. BLINDNESS

Of the total estimated 37 million blind persons (VA<3/60) in the world, 7 million are in India. Due to the large population base and increased life expectancy, the number of blind particularly due to senile disorders like Cataract, Glaucoma, and Diabetic Retinopathy etc. is expected to increase. Prevalence of Blindness has been gradually decreasing since inception of NPCB in 1976 as indicated below:

Year	Prevalence of Blindness (%)	Source
1976	1.49%	NPCB-WHO Survey
2002	1.10%	Rapid Assessment (GOI)
2007	1.00%	Rapid Assessment (GOI)
2020*	0.30%	

**Target*

As per information available from various studies, there are estimated 12 million bilaterally blind persons in India with VA<6/60 in the better eye, of which nearly 7 million are with Visual Acuity < 3/60. Main causes of blindness in this population are as follows:

Cataract	62.6%
Refractive Error	19.70%
Corneal Blindness	0.90%
Glaucoma	5.80%
Surgical Complication	1.20%
Posterior Capsular Opacification	0.90%
Posterior Segment Disorder	4.70%
Others	4.19%

v. DEAFNESS

Based on 2004 estimates ⁶, 275.7 million people have moderate to severe hearing loss. This represents approximately 4.2 percent of the world's population. Out of these, two-thirds live in developing countries. In addition, 360.8 million people have mild hearing loss. The total global YLD (Years lived with disability) for hearing loss is estimated to be 24.9 million or 4.8% of the

total YLD due to all causes. This makes hearing loss the second leading cause of YLD after depression and gives it a larger non-fatal burden than alcohol use disorders, osteoarthritis and schizophrenia. Hearing loss ranks seventh among persons aged >15 years, contributing to a total of just over 26 million years of healthy life lost, which is 5.5 per cent Daly's (Disability adjusted life years) from all causes.

As per WHO estimates, 2004, 6% of the Indian population suffers with moderate to severe hearing impairment, also termed as Disabling Hearing impairment. As per the NSSO (National Sample Survey Organisation estimates, 2002), 3,061,700 persons in India are afflicted with the hearing disability. This is 16.56% of the total number of 18.49 million disabled persons in the country.

As per a World Bank report, persons living with disabilities in India, including hearing impairment, have a much higher unemployment rate and child not attending school or dropping out. This compromises to severe loss of social and economic productivity of the country.

Hearing Impairment is mainly caused due to Congenital causes (mainly Rubella), Acute Suppurative Otitis Media, Chronic Suppurative Otitis Media, Secretory Otitis Media, Trauma and Noise induced hearing loss. Majority of these causes are preventable. Others can be treated through early identification and intervention. However there is shortage of trained manpower such as ENT specialist, Audiologists and Audiometric Assistants. The ENT department of Medical Colleges and District Hospitals are also not fully equipped for early identification, management and rehabilitation of Hearing Impaired.

At primary health care level, where the large number of cases of ear ailments such as ear discharges, wax, injuries etc. is reported, the medical officers are not trained to identify these common ear ailments and manage them appropriately.

w. GERIATRIC DISORDERS

The population of elderly persons is rapidly increasing world over and same is true for our country. As per Census 2001 total population above 60 years of age was 76.6 million which forms 7.5% of the total population in 2001. The elderly population was around 20 million in 1951 and since then it has increased fourfold. At the present pace of growth, it is likely to rise more rapidly in the coming years due to further increase in life expectancy and decline in fertility rate. According to estimated projection by Registrar General of India (RGI), the population of elderly above 60 years of age will increase from 7.5 to 12% of the total population by 2026. As per the multicentric study the burden of various diseases in elderly is as under:

Health Problems in elderly	Rural	Urban
Poor Vision	47.3	43.3
Bowel complaints	31.4	31.8
Hypertension	31.8	44.7
Anemia	19.8	13.8
Difficulty in Hearing	21.6	19.4
Arthritis	37.4	34.7
Diabetes	9.8	16.9
Depression	25.5	21.6
Urinary / Constipation	19.6	12.0
Weight Loss	23	16.2
Asthma	7.8	5.4
Fall / Fracture	9.3	8.2
COPD	5.9	3.6
TB	3.7	2.5
IHD	7.0	8.3

SECTION 2

RISK FACTORS AND DETERMINANTS OF NONCOMMUNICABLE DISEASES

An unprecedented opportunity exists to improve health in some of the world's poorest and most vulnerable communities by tackling the root causes of disease and health inequalities. The most powerful of these causes are the social conditions in which people live and work, referred to as the social determinants of health (SDH), as opposed to biological or genetic causes. Even in the most affluent countries, people who are less well off have substantially shorter life expectancies and more illnesses than the rich. These differences in health are an important social injustice. Poor social and economic circumstances affect health throughout life eg., poor education, stress, early life events, social exclusion, work, unemployment, poor housing, transportation, food, addiction etc. People further down the social ladder usually run at least twice the risk of serious illness and premature death as those near the top. Nor are the effects confined to the poor: the social gradient in health runs right across society, within each strata also. Both material and psychosocial causes contribute to these differences and their effects extend to most diseases and causes of death. These disadvantages tend to concentrate among the same people, and their effects on health accumulate during life. The longer people live in stressful economic and social circumstances, the greater the physiological wear and tear they suffer, and the less likely they are to enjoy a healthy old age. The Millennium Development Goals (MDGs) recognize the interdependence of health and social conditions and present an opportunity to promote health policies that tackle the social roots of unfair and avoidable human suffering.

Differentials in prevalence of serious morbidity (for 1000 population) by selected variables

Nature of illness	Sex		Place of Residence		Standard of Living			Caste				Total
	Male	Female	Rural	Urban	Low	Medium	High	SC/ST	MBC	BC	Others	
Hypertension	2.667	4.432	3.553	3.205	3.050	2.707	5.333	1.315	2.996	4.820	18.817	3.533
Coronary Heart Diseases	6.046	5.910	6.241	1.603	7.210	6.091	4.333	7.365	5.093	5.954	0.000	5.979
Malaria	14.225	15.697	14.978	14.423	18.857	14.212	11.333	15.255	18.574	11.908	8.065	14.947
Other Specific Fever	3.201	2.585	2.688	6.410	1.941	2.933	4.000	4.997	4.494	5.387	0.000	2.899
Jaundice	6.046	3.509	4.993	1.603	4.160	6.091	3.667	0.526	0.300	1.134	0.000	4.801
Paralysis	0.889	0.369	0.576	1.603	0.555	1.128	0.000	0.263	1.498	0.284	2.688	0.634
Cancer	0.356	1.108	0.768	0.000	1.109	0.226	1.000	3.682	3.895	3.969	8.065	0.725
Tuberculosis	4.090	3.878	4.129	1.603	3.605	4.963	3.000	1.315	0.300	0.000	5.376	3.986
Fits	0.356	1.108	0.768	0.000	0.832	0.902	0.333	0.263	0.599	0.851	0.000	0.725
Poisonous Bites	0.533	0.554	0.576	0.000	1.109	0.000	0.667	0.000	0.599	1.985	0.000	0.544
Diarrhoea	0.711	0.923	0.864	0.000	0.832	0.902	0.667	0.526	1.198	0.851	0.000	0.815
Liver And Kidney Problem	1.422	0.185	0.768	1.603	1.387	0.226	1.000	1.578	0.899	2.268	2.688	0.815
Others	1.245	2.031	1.632	1.603	2.219	0.902	2.000	1.841	4.793	2.552	0.000	1.631
Total	41.785	42.290	42.535	33.654	46.866	41.281	37.333	38.927	45.237	41.962	45.699	42.033

Source: Inequalities in Health, Rural Women's Education Center, Tamil Nadu, 2005
SC- Scheduled caste, ST- Scheduled tribe, MBC- Most backward castes, BC- Backward castes.

More than 20% of the population have at least one chronic disease and more than 10% have more than one. Chronic diseases are widespread in people who are younger than 45 years and in poorer populations. Whereas socioeconomic development tends to be associated with healthy behaviours, rapidly improving socioeconomic status in India is associated with a reduction of

physical activity and increased rates of obesity and diabetes. The emerging pattern in India is therefore characterised by an initial uptake of harmful health behaviours in the early phase of socioeconomic development. Such behaviours include increased consumption of energy-dense foods and reduced physical activity, increased exposure to risk factors for road traffic injury such as driving above the speed limit, after intake of alcohol, or without appropriate safety precautions like wearing seat belts or motorcycle helmets. After the early phase of socioeconomic development, increased health literacy and public awareness of chronic diseases will lead to richer people adopting healthier lifestyles more quickly than less educated and poorer population groups.

Health-damaging behaviours such as smoking, drinking, consuming unhealthy diets (rich in salt, sugar and fats, and low in vegetables and fruits) are also found to be common among the low socioeconomic group. However, personal behaviours are not only a matter of personal choice, but may be driven by factors such as higher levels of urbanization, technological change, market integration and foreign direct investment.

Table: Socioeconomic patterning of Non-communicable Diseases Risk Factors in a Rural population⁶⁷

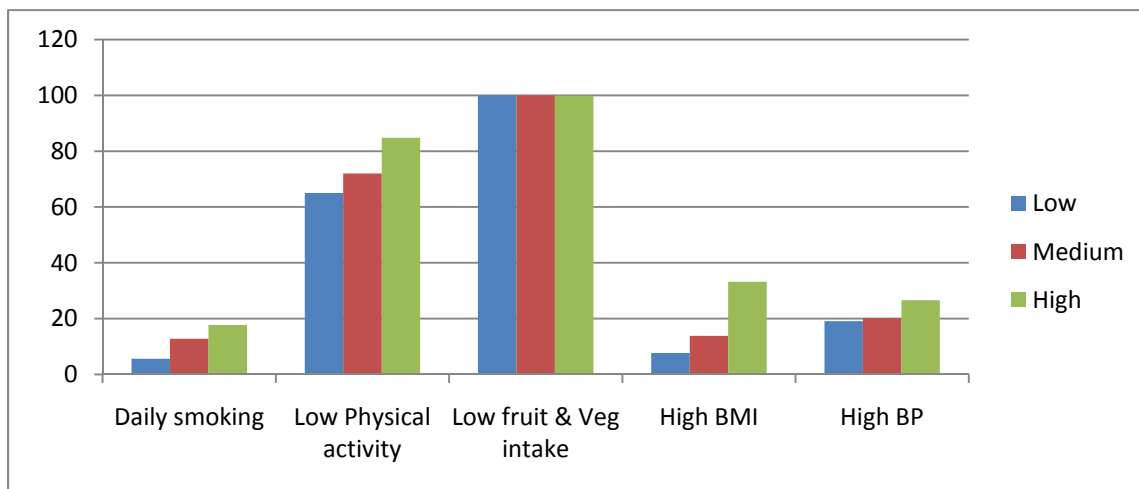
Parameter	Men's socioeconomic status			Women's socioeconomic status		
	Low (n-147)	Middle (n-358)	High (n-850)	Low (n-106)	Middle (n-143)	High (n-359)
Smoke tobacco	36.8	28.1	14.7	1.2	1.1	0.3
Chew tobacco	23.1	25.1	23.1	7.6	6.6	2.0
Alcohol use	33.7	26.9	20.1	11.2	8.1	2.5
Low physical activity	65.2	72.4	72.9	66.0	73.5	76.5
Low intake of fruits and vegetables	81.0	75.6	63.1	86.6	78.5	69.9
BMI > 25	5.0	9.9	25.4	13.3	19.2	35.0
High waist circumference	6.6	12.1	28.2	9.9	11.6	23.8
Total: HDL cholesterol \geq 4.5	23.6	23.4	38.5	32.2	32.3	35.7
Hypertension	17.6	17.1	20.8	17.8	20.5	25.3
Diabetes	1.8	3.3	8.0	3.9	5.1	5.2
Underweight	36.6	29.3	15.5	29.8	24.2	12.9
Short stature	36.0	19.2	16.2	33.0	29.5	20.3

Source: Kinra S et al, *BMJ* 2010;341:c4974

A survey undertaken at 7 sites in Tamil Nadu on NCD risk factors according to the level of urbanicity (low, medium and high) revealed an increase in the gradient of prevalence of major NCD risk factors from low to high urbanicity indicating to the influence of urbanization of ill health⁶⁸.

The differential in the development indicators are reflective of the social inequities existing in the population. These factors fuel unrest in some parts of the country and occasionally translate into armed conflicts in affected pockets. In addition, terrorism poses a major challenge to the security of the nation. The unrest and conflicts have the potential to add to the burden of injuries and mental ill health. Investing in basic infrastructure to boost the growth of the economy and facilitating equitable economic prosperity of all sections of the society is a potential solution for containing these challenges.

Most evidence on the social determinants is limited to epidemiological and descriptive studies which have demonstrated association and causation. What is lacking are studies demonstrating effectiveness of interventions in reducing these determinants and their health outcomes.



NCD RISK FACTORS

‘Risk’ is defined as a probability of an adverse health outcome, whereas ‘risk factor’ refers to an attribute or characteristic or exposure of an individual whose presence or absence raises the probability of an adverse outcome³. The World Health Report 2002 identifies top 20 leading risk factors in terms of the burden of disease according to the mortality status in the population⁷. Ezatti et al⁶⁹ estimated that in 2000, 47 per cent of premature deaths and 39 per cent of total disease burden resulted from the combined effects of the risk factors studied. Risk factors are present for a long period of time during the natural history of NCD. It is now well established that a cluster of major risk factors (tobacco, alcohol, inappropriate diet, physical inactivity, obesity, hypertension, diabetes and dyslipidaemias) govern the occurrence of NCD much before these are firmly established as diseases.

ICMR coordinated the implementation of the comprehensive NCD risk factor surveys in 7 States of India (Andhra Pradesh, Kerala, Tamil Nadu, Madhya Pradesh, Maharashtra, Mizoram and Uttaranchal) in 2007-2008 under the World Bank supported Integrated Disease Surveillance Project (IDSP) in urban and rural men and women aged 15-64 years. The risk factors surveyed

included tobacco, alcohol, diet, physical inactivity, blood pressure, weight, height and body mass index. The summary of this population based survey is given below:

NCD Risk Factor Profile in 7 States of India covered under IDSP (2007-08) ⁽⁵³⁾

State	AP	MP	MH	MZ	KE	TN	UTK
Individual Characteristics (%)							
Education -Illiterate	45	44	24	9	10	33	26
Urban (Male)	17	12	6	2	5	15	9
Urban (Female)	36	32	18	3	11	28	22
Rural (Male)	41	37	24	11	6	30	17
Rural (Female)	64	71	48	20	16	53	44
Behavioural Information (%)							
Current Tobacco users							
<i>Smokers</i>	18	22	10	44	13	14	20
Male	32	41	16	67	27	27	35
Female	4	1	3	19	0.2	*	5
<i>Smokeless tobacco users</i>	9	39	33	51	5	11	12
Male	14	54	41	47	7	14	21
Female	5	23	24	55	3	8	2
<i>Any form of Tobacco use</i>	24	47	37	68	16	22	28
Male	39	68	48	76	29	36	48
Female	8	23	24	60	3	8	7
Mean age of Initiation (in years)							
Smoking	19	19	20	17	20	20	19
Male	19	*	20	17	20	20	19
Female	14	19	20	19	*	*	19
Smokeless tobacco	20	20	20	18	20	20	20
Male	20	20	20	17	19	20	20
Female	23	15	20	18	*	20	20
Alcohol Consumption (%)							
Consumed Alcohol (last 30 days)	14	14	10	6	11	11	12
Male	27	24	16	11	24	21	24
Female	2	3	3	1	*	*	*
Consumed Alcohol (last 12 Months)	20	19	14	11	18	15	16
Male	37	33	24	21	36	30	32
Female	3	4	3	1	*	0.1	*
Consumed alcohol (%) (in last 7 days)							
<i>Binge Drinkers</i>	23	13	7	9	11	47	52
Male	24	14	7	8	11	47	52
Female	11	4	3	*	*	*	*
Mean age of Initiation Alcohol (in years)							
Male	20	20	21	21	22	21	21
Female	15	18	21	23	26	*	*
Fruits and Vegetables consumed(%)							
<i>Less than five servings per day</i>	88	83	76	85	87	99	89
Urban	86	71	74	79	82	98	88
Rural	90	88	77	91	92	99	89
Physical Activity (%)							
<i>Low Physical Activity</i>	68	42	81	71	76	66	67
Urban	78	68	86	79	79	71	92
Rural	64	32	77	63	75	62	58
Hypertension (%)							
<i>Pre hypertension</i>	43	47	47	58	47	43	46
Urban	46	45	50	62	48	44	45
Rural	41	46	45	54	46	42	47
<i>Stage I and II hypertension</i>	20	24	24	19	24	20	21
Urban	20	27	21	20	24	22	25
Rural	21	23	26	19	23	19	18
Physical Measurement - BMI (%)							
<i>Under weight</i>	23	39	23	14	16	25	28
Urban	18	27	18	13	14	18	19
Rural	27	44	27	16	16	30	32
<i>Over weight (grade I,II,III)</i>	13	8	13	10	27	23	14
Urban	17	20	17	12	31	32	27
Rural	10	4	10	9	26	15	9
<i>Central Obesity</i>	14	11	14	12	43	25	18
Urban	19	22	19	8	45	33	33
Rural	10	7	10	16	42	18	12

a. Tobacco

Tobacco is the foremost preventable cause of death and disease globally as well as in India. Globally approx. 6 million people die each year as result of diseases resulting from tobacco consumption and if urgent actions are not taken, the death toll could rise to more than eight million by 2030. It is estimated that more than 80% of these deaths occur in the developing countries. Tobacco has also been identified as the risk factor for 6 of the 8 leading causes of death. As per the tobacco control report (2004) nearly 8-9 lakh people die every year in India due to diseases related to tobacco use. However, as per newer studies nearly one million death annually can be attributed to smoking alone in this decade and majority of these deaths will occur in the most productive age group i.e. 30-69 years.

There is scientific evidence available to prove the health hazards to Second hand Smoke (SHS) or Environmental Tobacco Smoke (ETS). This is the smoke resulting from smoking by someone else and inhaled by the non smoker. SHS is known to contain more than 4000 chemicals, many of these are cancer causing substances (carcinogens). Inhalation of SHS results in cancer and heart diseases in adults, and Sudden Infant Death Syndrome (SIDS), acute respiratory diseases, exacerbation of asthma, middle ear diseases in children.

For the tobacco industry to survive it must hook new customers to replace those who die or quit. It must catch them young. Hence, India is a very fertile ground for the tobacco Industry as youth constitutes about 30 % of its population and they are therefore aggressively targeted by the tobacco Industry. There are studies to indicate that every day more than 5500 new youth in India get addicted to tobacco. Since tobacco Industry needs new replacement users its focus is on youth and they spend billions of dollars worldwide each year spreading its marketing net as widely as possible to attract and lure young customers.

Nearly 30% of cancers in males in India and more than 80% of all the oral cancer are related to tobacco use. The majority of the cardio vascular diseases and lung disorders are directly attributable to tobacco consumption. Other diseases which are associated with tobacco consumption are stroke, cataract, peripheral vascular diseases etc. Moreover tobacco use leads to impotence. Studies have indicated that incidence of impotence is 85% higher among smokers. Tobacco use by pregnant women leads to low birth weight babies, still births and birth defects.

The costs related to tobacco use are significant, as per the Health Cost Study conducted by ICMR/AIIMS in 1998-99 the cost of treatment of just three diseases caused by tobacco use i.e. cancers, lung diseases and cardiovascular diseases far exceeds the economic benefits from tobacco. It was estimated that the economic impact / health cost of these three diseases was Rs. 30,833 crores (extrapolated to rates of 2002-03), which far exceeded the tax revenue collection (approx. Rs. 27,000 crores) for the same year. The adverse socio-economic & health impact of

tobacco production or consumption outweighs any perceived benefit that the tobacco industry contributes to GDP of the country.

The economic impact of early death, disability and lost productivity contributes to the burden of poverty, retarding national development and further widening health inequities. Therefore, tobacco control is not only a public health priority, but also a key development issue.

There is no safe way to use tobacco – whether inhaled, sniffed, sucked, or chewed; whether some of the harmful ingredients are reduced; or whether it is mixed with other ingredients. Keeping in view the high mortality on morbidity and its economic implications the Government of India introduced the ‘Health Cess’ (2005-06) on tobacco products. Although huge substantial amount are generated by this cess but the same has not been routed for tobacco control purpose.

Tobacco: A risk factor for Non-communicable disease (NCD’s)

Tobacco use is also a leading risk factor for NCD’s and accounts for more than two-third of all new cases of NCD’s. Tobacco use alone accounts for one in six of all deaths resulting from NCD’s. Every day more than 1 billion people chew or smoke tobacco because of their addiction to nicotine, and about 15000 die from tobacco related disease; tobacco use accounts for half the health inequalities, as assessed by education, in male mortality.

The burden of NCD’s is increasing in low-income and middle-income countries like India, contributing to poverty and is becoming a major barrier to development and achievement of MDG’s. NCD’s disproportionately affects individuals who are poor thus increasing inequalities. There are studies in India which indicate that 25% of the families, who have a member suffering from cardiovascular disease are driven into poverty.

The implementation of the various components under FCTC has been identified as the most cost effective and evidence based strategy for reducing the burden of NCD,s and creating a tobacco-free world by 2040 bringing the prevalence to less that 5%. It is estimated that the implementation of all the components of FCTC would avert 5.5 million death over 10 years in 23 low income ad middle income countries where the burden of NCD’s is high.

Status of Tobacco use in India

In India tobacco is consumed in many forms, both smoking and smokeless, e.g. bidi, gutka, khaini, paan masala, hukka, cigarettes, cigars, chillum, chutta, gul, mawa, misri etc. India is also the second largest consumer and second largest producer of tobacco in the world, second only to China. As per the Global Adult Tobacco Survey (GATS-India) 2009-10 the prevalence of tobacco use among adults (15 years and above) is 35%. The prevalence of overall tobacco use among males is 48 percent and that among females is 20 percent. Nearly two in five (38%) adults in rural areas and one in four (25%) adults in urban areas use tobacco in some form. In absolute figures, the estimated number of tobacco users in India is 274.9 million, with 163.7 million users

of only smokeless tobacco, 68.9 million only smokers, and 42.3 million users of both smoking and smokeless tobacco.

Further as per the Global Youth Tobacco Survey (GYTS), 2006, 14.1% children in the age group of 13-15 years are consuming tobacco in some form and that the age of initiation into tobacco use has declined. It is, therefore, evident that the consumption of tobacco products in the country is increasing in all age groups and is a matter of grave concern.

Tobacco is widely used in several forms in India. Most common form is beedi followed by cigarettes. Bidis, along with smokeless tobacco account for 81% of the Indian tobacco market⁷⁰. According to NFHS-3 carried out during 2005-06, prevalence of tobacco use (all forms) was 57% in men and 10.8% in women²⁴. One third of men (33.4%) and 1.4% of women were cigarette/ bidi smokers. The number of adult current daily smokers is reported to be higher in the rural areas (31.3%) as compared to urban areas (21.5%)¹³. In addition, daily consumption of all forms of tobacco use was higher among the lower income quintile (41.8%) compared to higher income quintile (15.5%) and elderly population (43.9% among 65+ age group) compared to younger age group (14.7% among 18-24 age group). Tobacco use among children and adolescent group is another concern. Tobacco use (all forms) is reported to be higher in low education group³⁵. Fourteen percent of students in the age group of 13-15 years were reported to be using some form of tobacco. High prevalence of tobacco use among school students has been reported in the north eastern states like Nagaland (63%), Manipur (46.7%) and Sikkim (46.1%)⁷¹.

Tobacco use is a major cause for premature mortality. A large national case control study carried out in India has shown that among the 30-69 years age group, smoking was associated with a two fold difference in the risk for death between smokers and non-smokers decreasing their survival by eight years among women and six years among men⁷². Over half of the smoking related deaths occur among illiterate adults. Further, smoking accounts for 1 in 5 deaths among men and 1 in 20 deaths among women. By 2010, smoking is estimated to cause about 930,000 adult deaths in India; of these, about 70% will be between the ages of 30 and 69 years. Because of population growth, the absolute number of deaths in this age group is rising by about 3% per year.

Apart for cardiovascular diseases (CVDs), tobacco is reported to cause nearly half of the cancers among men and one fifth of cancers among women¹⁰. In addition, tobacco smoking is responsible for over 82% of Chronic Obstructive Pulmonary Diseases (COPD) burden in India particularly among men. Revenue collected from tobacco products annually in India is 1.62 billion USD (largely coming from taxation of cigarettes) whilst annual direct health cost of three tobacco related diseases (cancer, coronary artery diseases and chronic obstructive lung diseases) is 6.32 billion USD⁷³.

b. Diet and Nutrition

Diet is a significant modifiable risk factor for NCDs. An unhealthy diet high in saturated fats, salt and refined carbohydrates increases the risk of NCDs, particularly CVDs and diabetes. During the course of economic development, populations undergo nutrition transition characterized by an increase in the consumption of fats and simple sugars and a decrease in fruit and vegetable intake. Nutrition transition that is currently underway in Asian countries such as India is characterized by moving away from the traditional diets that are high in carbohydrates and low in fat, to a modern diet which has higher contribution of energy from fats and lower contribution of energy from complex carbohydrates⁷⁴.

An analysis carried out by Deaton et al has shown that there has been a sustained decline in per-capita calorie consumption during the last twenty five years⁷⁵. The proportionate decline was larger among better-off sections of the population. The decline of per-capita consumption largely applies to proteins, carbohydrates and many other essential nutrients with the sole exception of fat consumption which has increased steadily in both urban and rural areas. Even though the calorie consumption is declining, the nutritional status of the population appears to have improved as evident from the population anthropometric data. During 1975 to 2005, the proportion of adults with body mass index below 18.5 fell from 56% to 33% among men and 52% to 36% among women. Similarly, between 1975-79 and 2004-05, there have been reductions of around fifty percent in the prevalence of severe under nutrition, among children as well

Table: Time trends in per capita intake of nutrients in rural and urban India⁷⁶

Years	Energy (Kcal/person/day)		Carbohydrates* (gm/person/day)		Protein (gml/person/day)		Fats (gm/person/day)	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
1972-73	2266	2107	450	390	62	56	24	36
1983-84	2221	2089	433	377	62	57	27	37
1993-94	2153	2071	407	366	60.2	57.2	31.4	42
1999-00	2149	2156	397	369	59.1	58.5	36.1	49.6
2004-05	2047	2020	375	341	57	57	35.5	47.5

*Estimated = Total energy – (sum of energy from protein and fat)/ 4.

An upward trend has been observed in the height and weight of urban middle and upper class children⁷⁷. Despite this improvement in BMI, for both adults and children, anthropometric indicators of nutritional status in India are among the worst in the world. Close to half of all Indian children are underweight, about half suffer from anemia and India is among the most “undernourished” countries in the world. According to UNICEF, only Bangladesh and Nepal have higher proportions of underweight children than India. However, for comparable levels of under-nutrition, adverse outcomes may be different among different populations. Therefore, a

uniform definition of under-nutrition may overestimate the burden of childhood under-nutrition in South Asia⁷⁸.

Analysis of the NFHS-3 data show that the twin burden of under-nutrition and over-nutrition in India is observed more frequently in high income inequality states (based on GINI coefficient) such as Tamil Nadu, Maharashtra, Arunachal Pradesh, Kerala etc²⁴. The inequalities in the society increases the risk for NCDs as the risk starts from infancy, accumulates from early childhood and is influenced by risk factors acting at all the stages of the life span⁷⁹. Several studies have demonstrated the inverse relationship of low birth weight and under nutrition during early childhood to diabetes and cardiovascular diseases. As mentioned earlier, this increased risk of CVD and diabetes stems both from biological mechanisms and social determinants. Further poverty and low levels of education are major determinants of NCD. Poverty and lack of access to basic health amenities make a large section of the society vulnerable to NCDs that further has a trans-generational impact on the population.

Within the dietary profile, macronutrients such as fats/oils play an important role in the development of NCDs. For example, among fats, trans-fats and saturated fatty acids add to higher risk for coronary heart diseases. Although the exact data on consumption of these different types of oils/fats at the individual and household level is missing, national aggregates on consumption statistics show a high consumption of unhealthy oils in India. For example, the consumption of edible oil has risen from 9.7 million tons in 2000-01 to 14.3 million tons during 2007-08. The share of raw oil, refined oil and *vanaspati* oil (hydrogenated oils) in the total edible oil market is estimated at 35%, 55% and 10% respectively. Trans-fats, present in the popular *vanaspati* is widely used in the commercial food industry including sweets due to higher shelf life of products.

Fats/oils high in saturated fats such as butter/ghee, lard, coconut oil, palm oil etc accelerate the process of atherosclerosis. Dietary use of coconut oil is confined to southern states such as Kerala and Tamil Nadu, whereas, Palm oil is widely used and India is the second largest market for Palm oil in the world. The edible oil import statistics for the year 2007-08 shows that Palm oil accounts for 85% of the edible oil imports⁸⁰. The poor and the food industry use more Palm oil, due to its cost advantage over healthy oils such as sunflower oil, soya oil, groundnut oil, mustard oil, safflower oil and rice bran oil which are high in poly unsaturated and monounsaturated fatty acids. Re-heating and re-cooking vegetable oil is often practiced at both households and commercial food vendor level. These practices alter the healthy profile of fatty acids in the vegetable oils, increases the content of trans-fats and release free-radicals that increases the risk of both coronary heart diseases and cancers.

Household use of cooking oils has been reported by the ICMR-WHO survey that was carried out in six sites in India covering 44491 subjects during 2003-05. It is reported that a large proportion

of those surveyed used vegetable oils (83%) for cooking meals. The use of hydrogenated oils (such as *vanaspati*) was higher in urban areas (4.8%) compared to rural areas (1.7%) and is higher among the slum group (4.1%). Butter/ghee is used as the major cooking oil/fat by 0.6 - 0.7% of the participants. However these figures do not match with the national consumption statistics due to weakness in the methodology of assessing consumption.

Among dietary components, fruits and vegetable are protective against several NCDs but their intake is grossly inadequate among Indians⁸¹. Adequate consumption of fruits and vegetables (5 or more servings per one typical day) is reported to be higher in urban areas than rural population (27% vs. 21%)¹³. Insufficient intake of fruits (less than five servings a day) was higher in low income groups as compared to the high income groups (lowest quartile: 84.5%; highest quartile: 78.3%). The sharp rise in price of fruits and vegetables as compared to oils and fats has resulted in a negative impact on the consumption pattern among poor. The poor tend to reduce the consumption of vegetables and fruits that are healthy while the consumption of cheaper saturated oils tends to remain the same⁸². Nearly 10-15 per cent of the grains and 25 per cent of the fruit and vegetables in India perish each year due to lack of warehouse infrastructure in the rural areas⁸³. Agricultural policies and better rural storage and transportation is critical to ensuring adequate supply and affordability of such healthy foods to the masses.

A study in the areas of Delhi, Mumbai and Trivandrum, most diets consumed were of traditional regional food items and could be categorized as the Delhi, the “fruit and dairy” dietary pattern which was positively associated with abdominal adiposity and hypertension, Trivandrum, the “pulses and rice” pattern was inversely related to diabetes] and the “snacks and sweets” pattern was positively associated with abdominal adiposity and in Mumbai, the “fruit and vegetable” pattern was inversely associated with hypertension and the “snack and meat” pattern appeared to be positively associated with abdominal adiposity⁸⁴. The food items consumed did not appear largely “unhealthy” by Western standards, yet the cardio-metabolic risks were comparable to those seen in US and Europe.

c. Physical Activity

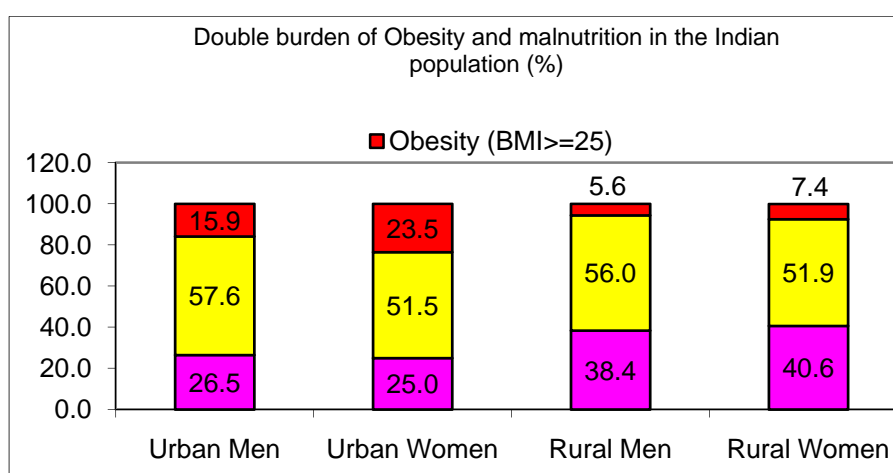
Physical activity is a key determinant of energy expenditure, and thus is fundamental to energy balance and weight control. A physically active life reduces the risk of coronary heart disease, type 2 diabetes, stroke, colon cancer and breast cancer⁸⁵. Thirty minutes of moderate-intensity physical activity 5 days per week is the minimum recommended to level of physical activity. However, rapid changes in urbanization and associated mechanization and sedentary jobs increase the level of physical inactivity in the population.

Due to methodological difficulties, reliable estimates of physical activity of individuals in relation to various domains of life at community level have been scanty. The World Health Survey which used standardized questionnaires reported that, overall in India, 29% of the

population were having inadequate physical activity (in all domains of life) particularly in the older age groups¹³. A quarter of men (24%) and one-third of women (34%) of women report inadequate physical activity (defined as 1-149 minutes of activity in the seven days preceding the survey). The proportion of respondents with inadequate physical activity is 39% in urban and 27% in rural areas. High income group in general were found to be physically inactive (28.6% vs. 24.7%) as compared to low income group. The NCD risk factor study carried out by the Indian Council for Medical Research has shown that work related sedentariness is high in urban (64.1%) and peri-urban areas (44.8%) as compared to rural areas (39.0%). The figures for leisure time physical inactivity were urban: 84.3%; peri-urban/slum: 87.9%; and rural: 86.0%⁸⁶.

d. Obesity and Overweight

Physical inactivity and inappropriate nutrition are directly reflected in the growing burden of overweight in the Indian population predominantly in the urban areas. Almost 30-65% of adult urban Indians are reported to be either overweight (BMI \geq 25) or obese (BMI \geq 30) or have central obesity⁸⁷. Studies among urban school children have also reported a rising trend in overweight and obesity (72, 73). Large national studies such as NFHS-3 reported higher prevalence of overweight (BMI \geq 25) among the well-off (23.6% in men & 30.5% in women) as compared to the poor (1.4% in men & 1.8% in women)²⁴. The prevalence of obesity (BMI \geq 30) was 1.3% of the population. NFHS-3 also highlights the co-existence of both malnutrition and obesity in the population. The World Health Survey also supports these findings which reported that a quarter of the men (24%) and women (29%) were below the standard body mass index weight of 18.5 kg/m²¹³. As described earlier, both underweight and overweight attribute a higher risk for NCDs in the life course.



Source: Results of the National Family Health Survey-3

Projection studies show that prevalence of overweight is expected to rise from 12.9% (134.8 million) in 2005 to 27.8% (290.7 million) by the year 2030. Similarly obesity figures will rise from 4.0% (42.2 million) in 2005 to 5.0% (52.1 million) by the year 2030⁸⁸. Though generalized

obesity based on high BMI measurement appear to be moderately low, the proportion of people with central obesity (higher waist circumference or pot belly) is high both in urban and rural population. Several small but well designed community studies report the prevalence of central obesity as high as 72% in urban men and 40% in urban women as against a lower rural prevalence of 55% in men and 36% in women⁸⁹. Central obesity is an important risk factor for diabetes and appears to better predict the risk of diabetes among Asian Indians⁹⁰.

India is in epidemiological, nutrition, socio-economic and lifestyle transition, all contributing to problem of obesity. Obesity has reached epidemic proportions in India in the 21st century, with morbid obesity affecting 5% of the country's population. India is following a trend of other developing countries that are steadily becoming more obese. Unhealthy, processed food has become much more accessible following India's continued integration in global food markets. Indians are genetically susceptible to weight accumulation especially around the waist. While studying 22 different SNPs (single nucleotide polymorphisms) near to MC4R gene, scientists have identified a SNP (single nucleotide polymorphism) named rs12970134 to be mostly associated with waist circumference⁹¹.

India has controlled the problem of severe under-nutrition to a substantial extent, but is now facing a rising epidemic of obesity. This epidemic is assuming serious proportions in cities and is affecting young adults and children⁹². Recent trends in Indian population indicate a rise in obesity both in children as well as adults. Almost 38-65% of adult urban Indians in Delhi fulfill the criteria for either overweight/obesity or abdominal obesity⁹³.

India shows that children aged 4 and 8 years who were born small and later showed accelerated growth had a propensity to abdominal obesity. The prevalence of Obesity and over weight is increasing rapidly worldwide. In 1995, there were an estimated 200 million obese adults worldwide but as of 2000, the number of obese adults has increased to over 300 million. In developing countries it is estimated that over 115 million people suffer from obesity-related problems. (WHO-2000)

Currently more than 1 billion adults are overweight and at least 300 million of them are clinically obese, according to reports by the World Health Organization. Obesity is a complex condition, one with serious social and psychological dimensions, that affects virtually all age and socioeconomic groups. It imposes an economic burden on both developed and developing countries. In the analyses carried out for World Health Report 2002, approximately 58% of diabetes and 21% of heart disorders and 8-42% of certain cancers globally were attributable to excess weight.

State and Gender-wise % of overweight/obese persons as per National Family Health Survey (2007) are given below:

S. No.	States	Males (%)	Females (%)
1.	Punjab	30.3	37.5
2.	Kerala	24.3	34.0
3.	Goa	20.8	27.0
4.	Tamil Nadu	19.8	24.4
5.	Andhra Pradesh	17.6	22.7
6.	Sikkim	17.3	21.0
7.	Mizoram	16.9	20.3
8.	Himachal Pradesh	16.0	19.5
9.	Maharashtra	15.9	18.1
10.	Gujarat	15.4	17.7
11.	Haryana	14.4	17.6
12.	Karnataka	14.0	17.3
13.	Manipur	13.4	17.1
14.	Uttarakhand	11.4	14.8
15.	Arunachal Pradesh	10.6	12.5
16.	Uttar Pradesh	9.9	12.0
17.	Jammu and Kashmir	8.7	11.1
18.	Bihar	8.5	10.5
19.	Nagaland	8.4	10.2
20.	Rajasthan	8.4	9.0
21.	Meghalaya	8.2	8.9
22.	Orissa	6.9	8.6
23.	Assam	6.7	7.8
24.	Chattisgarh	6.5	7.6
25.	West Bengal	6.1	7.1
26.	Madhya Pradesh	5.4	6.7
27.	Jharkhand	5.3	5.9
28.	Tripura	5.2	5.3
	All States	12.1	16.0

The incidence of obesity in India is about 9% and is mainly concentrated in urban areas. While a third of Indian population still falls below the poverty line, there has been a steady growth of the relatively affluent urban middle class now estimated to number over 200 million. Assuming that the “upper middle class” in India number around 100 million (half the number of middle class) it

may be said that there are roughly 50 million over weight subjects belonging to the upper middle class in the country today according to a report by WHO (2003).

The Nutrition Foundation of India (NFI), a food-policy NGO, estimates that about 45% of women and 29% of men in urban areas are overweight. The obesity rates across the country are rapidly escalating. 55% of women in India between the age group of 20 and 69 years old are overweight, which is also home to half of all undernourished people in the world.

Overweight among middle-class adults in India is already a major problem. The prevalence of abdominal obesity is 29 per cent among middle-class men and 46 per cent among women⁹⁴.

Consequences of obesity on various NCDs

Obesity is defined as having a body mass index of more than 30 kg/m², is a condition in which excessive body fat accumulates to a degree that adversely affects health. (WHO, 2000) Obesity has been linked with the development of many Non-Communicable Diseases and this section reviews the effects of obesity in the genesis of these NCDs. It is estimated that the direct medical cost associated with obesity in the United States is US \$100 billion per year⁹⁵.

Obesity is positively associated to many chronic disorders such as hypertension, dyslipidemia, type 2 diabetes mellitus, coronary heart disease, pregnancy, bone metabolism and certain cancers^{96,97}.

Obesity Hypertension and Cardiovascular Diseases

Adipose tissue has a central role in lipid and glucose metabolism and produces a large number of hormones and cytokines, e.g. tumour necrosis factor-alpha, interleukin-6, adiponectin, leptin, and plasminogen activator inhibitor-1⁹⁸.

Obesity and lack of physical exercise through its effects on adipose tissue dysfunction leads to low plasma HDL-c (high density lipoprotein cholesterol) and elevated TG, all independent vascular risk factors, lead to the genesis of *hypertension and CVDs*. Dysfunctional adipocytes of obese subjects produce AGT and angiotensin II. Angiotensin II may impair intracellular insulin signaling similarly to TNF-a and FFAs leading to reduced glucose uptake and diminished adipocyte differentiation⁹⁹. These are closely associated with abdominal obesity and can often be controlled by dietary changes and weight reduction.

Obesity and Diabetes Mellitus, Dyslipidemia and metabolic syndrome

Obesity is commonly associated with Dyslipidaemia, metabolic syndrome (MetS) and type 2 diabetes mellitus (T2DM). The predominant features of dyslipidaemia in these disorders include increased flux of free fatty acids (FFA), raised triglyceride (TG) and low high density lipoprotein cholesterol (HDL-C) levels. Insulin resistance (IR) appears to play an important role in the

pathogenesis of dyslipidaemia in obesity, Metabolic Syndrome and Type 2 Diabetes mellitus¹⁰⁰. Hypolipidaemic drug combinations (including statins with cholesterol ester protein inhibitors, niacin, fibrates or fish oil, as well as fibrate-ezetimibe combination) on the residual vascular risk in patients with obesity, MetS or T2DM.

Obesity and Pregnancy

Overweight and obesity during pregnancy raises the risk of gestational diabetes and complications during delivery. Lifestyle factors like physical activity may ameliorate many of these risks through its beneficial effects on the glucose homeostasis¹⁰¹.

Obesity and Bone Metabolism

Obesity is associated with low-grade chronic inflammation as the expression of a pro-inflammatory cytokine, tumor necrosis factor- α (TNF- α), is elevated in the adipose tissue of obese mice which provided the first evidence of a link between obesity and inflammation¹⁰². As obesity is associated with chronic inflammation, excessive fat accumulation is detrimental to bone mass. The increased circulating and tissue pro-inflammatory cytokines in obesity may promote osteoclastic activity and bone resorption through modifying the receptor activator of NF- κ B (RANK)/ RANK ligand/osteoprotegerin pathway¹⁰³.

Further, high-fat intake may interfere with intestinal calcium absorption and therefore decrease calcium availability for bone formation. The decreased bone mass with obesity may be due to increased marrow adipogenesis at the expense of osteoblastogenesis, and/or increased osteoclastogenesis because of up-regulated production of pro-inflammatory cytokines

Obesity and Cancer

Obesity has been linked to cancer which has been shown by some recent studies. Cells of White Adipose Tissue (WAT) secrete soluble molecules (adipokines) that could stimulate tumor growth. Interleukin-6 is strongly linked to inflammation-associated colorectal cancers, such as those associated with inflammatory bowel disease (IBD). Further, the endocrine/paracrine signaling by WAT could provide a mechanism by which obesity-related metabolic disorders drive cancer. Data from these studies suggest that the recruitment of WAT-derived cells by tumors may at least partially account for advanced cancer progression in obese individuals¹⁰⁴.

There is evidence that obesity may be linked to breast cancer. This is because a ready supply of adipose tissue-derived angiogenic adipokines, notably VEGF (Vascular endothelial growth Factor), leptin, and the production of inflammatory cytokines by infiltrating macrophages that occurs in adipose tissues with obesity, promotes the paracrine stimulation of vascular endothelial growth needed for adipogenesis that is favorable for breast tumorigenesis¹⁰⁵.

e. Alcohol

Alcohol consumption has both health and social consequences via intoxication and alcohol dependence. Overall there is a causal relationship between alcohol consumption and more than 60 types of diseases and injury. Alcohol is a risk factor for oesophageal cancer, liver cancer, cirrhosis of the liver, homicide, stroke, psychiatric illness and motor vehicle accidents worldwide¹⁰⁶. According to South-East Asia Regional Information System on Alcohol and Health, 25% of road accidents in India are alcohol-related, and 20% of accident-related head injury victims seen in emergency rooms of hospitals have consumed alcohol prior to the accident¹⁰⁷. In addition, alcohol-related problems account for 17.6% of the case load of psychiatric emergencies. Further, the prevalence of alcohol use disorders among people who committed suicide in the city of Chennai was as high as 34%.

The per capita consumption of alcohol per year in India is estimated to be of two litres per adult. Community based studies have reported that alcohol use ranges between 25% and 40% in north India and 33% and 50% in south India, with a higher prevalence among the less educated and the poor. The proportion of frequent heavy drinkers, who consume five or more standard drinks in four or more days per week is estimated to be 1.3%¹³. Punjab, Andhra Pradesh, Goa and north-eastern states have the highest consumption figures¹⁰⁸. The prevalence of alcohol is reported to be lowest in Gujarat (7%) and the highest is in the north-eastern state of Arunachal Pradesh (75%). Low prevalence in Gujarat is likely to be due to underreporting due to the prevailing ban on alcohol in the state. For example a study carried out in the villages around Navsari town in Gujarat has shown that 60% of the healthy men were using alcohol¹⁰⁹. The prevalence of alcohol use among women has been less than five percent in India. About 80% of alcohol consumption is in the form of hard liquor with high concentrations of alcohol. Furthermore, country liquor accounts for 60% of alcohol consumption with the poor being the predominant consumers. It is estimated that the Indian Government spends nearly 5 billion USD (INR 224 billion) every year to manage the consequences of alcohol use, which is more than its total excise earning – 4.8 billion USD (INR 216 billion). Clearly Indian society is losing more than it is gaining due to alcohol¹¹⁰.

Although moderate consumption of alcohol appears to be protective for heart attacks in western populations it appears to be either neutral or conferring higher risk among South Asians¹¹¹. The results from a large sentinel surveillance study on CVD risk factors in the Industrial population also shows higher risk associated with alcohol consumption and CVDs¹¹². This is possibly related to the binge drinking practices in India.

f. Unsafe Health Care

Unsafe health care is becoming a serious global public health issue. As many as one in 10 patients is harmed while receiving hospital care in developed countries (WHO). In USA (2000)

estimated 44,000 – 98,000 medical error deaths occur annually (more than deaths from highway accidents, breast cancer, or AIDS).

Health Care Associated Infections (HCAI) complicate between 5 and 10% of admissions in acute care hospitals in industrialised countries. The risk of HCAI is upto 20 times higher in developing countries. At any given time, 1.4 million people worldwide suffer from infections acquired in hospitals and at least 50% of HCAI could be prevented through the promotion of best practices in hand hygiene and infection control (WHO).

Ventilator-associated pneumonia (VAP) occurs up to 17 times more frequently in developing than in developed countries, with an excess mortality rate as high as 27%.

Every year **unsafe injections** result in 1.3 million deaths worldwide mainly due to Hepatitis B, Hepatitis C and HIV. In India, nearly two-thirds of injections are administered in unsafe manner (62.9%). Waste disposal was found to be unsatisfactory at the health facilities (53%) at the terminal level for plastic syringes and disposable needles and was found to be least at immunisation clinics (49%)⁶⁶.

Burden of unsafe Surgical care:

Globally, about 234 million major surgical operations are conducted a year. (one operation for every 25 persons). 7 million patients annually may have post-operative complications and 1 million patients would die every year during or after an operation. Half of all harmful events affecting patients are related to surgical care. Half of these events are preventable if standards of care are adhered to and safety tools, such as checklists, are used. Surgical site infections are the most frequent in developing countries with rates of up to 25% of all surgical procedures. In developing countries, at least 50% of medical equipment is unusable or only partly usable- resulting in substandard diagnosis & treatment (WHO).

Approximately 20% of hospital waste is biomedical waste, which is hazardous /infectious in nature. Because of its composition, there are significant risks associated with Biomedical Waste (BMW). Infections are the most common health hazard associated with poor waste management. 5 to 10% of HIV is transmitted through unsafe blood. Many States in the country are lagging behind in implementation of the Safe waste management practices and lack systems for development.

SECTION-3

REVIEW OF ONGOING NATIONAL PROGRAMMES FOR PREVENTION & CONTROL OF NON- COMMUNICABLE DISEASES

Government of India had supported the States in prevention and control of NCDs through several vertical programmes. National Health Programmes being implemented during the 11th Plan, their current status and allocation during the 11th Plan are summarized below:

S.No	Year of Launch	National Health Program	Current Status	Allocation 11 th Plan (Rs. Crore)
1	1975	National Cancer Control Program	Integrated with NPCDCS in 2010-11	2400.00
2	1976	National Blindness Control Program	Ongoing in all districts	1550.00
3	1982	National Mental Health Program	Revised Program (2003) being implemented in 123 districts, 60 courses in med.Col.& 11 Centres of Excellence	1000.00
4	1986	National Iodine Deficiency Disorders Control Program	Availability of iodated salt 100%. At present,71% population using iodated salt.	155.40
5	2007	National Tobacco Control Program	Being implemented in 42 districts in 21 states; 9 states have cells, 5 testing & one research lab; media campaign	471.92
6	9 th Plan	Trauma Care Facility on National Highways	140 Trauma Care Centres set up along golden quadrilateral highways & NE and SW highways in 11 th Plan	732.95
7	2006-07	National Deafness Control Program	Initiated in 25 districts. Expanded to cover 203 districts by March 2012	100.00
8	2007-08	National Program for Prevention and Control of Fluorosis	Initiated to cover 100 districts	68.00
9	2007-08	Pilot Project on Oral Health	The Program could not take off	25.00
10	2010-11	National Program for Prevention & Control of Cancer, Diabetes, CVD, Stroke	Initiated to cover 100 districts by March 2012	1660.50
11	2010-11	National Program for Health Care of the Elderly	Initiated to cover 100 districts by March 2012	1000.00
12	2010-11	Pilot Program for Prevention of Burn injuries	Piloted in Assam, Haryana, H.P. in 1 med. Col. & 2 Distt. Hosp. each	5.09
13	2010-11	Upgradation of Department of PMR in Medical Colleges	In 28 medical colleges (15 covered during 2010-11; rest in 2011-12)	—
14	2010-11	Disaster Management/Mobile Hospitals/ CBRN	Technical specifications and operational details finalized	—
15	2010-11	Organ and Tissue Transplant	Model network for organ procurement & distribution in progress . Biomaterial centre for tissue being established	—

Progress and achievements during 4 years of the 11th Plan for each program is given below:

1. National Cancer Control Program (1975)

National Cancer Control Programme (NCCP) is a centrally sponsored scheme which was initiated in the year 1975, with priorities given for equipping the premier cancer hospital/institutions. Later the programme was modified in the year 1984-85 with emphasis on primary prevention and early detection of cancer. The District Cancer Control Programme was introduced during 1990-91 and later modified in 2000-01. NCCP was evaluated in 2004 and the programme was further revised w.e.f 1st January 2005. So far, NCCP has supported 85 Oncology Wings in medical colleges including 27 Tertiary Cancer Centers across the country. As per Atomic Energy Regulatory Board there are 250 institutions having radiotherapy facilities with 450 Radiotherapy machines (50% Pvt. + 50% Govt.). To financial support the poor and the needy cancer patients a Health Ministers cancer fund have been started. The NCCP is being evaluated.

The Palliative care services in the Tertiary facilities of the country were evaluated and it was found that more than 60 percentage of cancer patients registering at Regional Cancer Centers are in need of palliative care. But less than 50 % of Regional Cancer Centers have any palliative care facilities. Most of the states have very few services in public or private sector. The state of Kerala is an exception. All the districts in Kerala have palliative care services developed through collaboration between the government machinery and local NGOs. This project is supported by National Rural Health Mission.

Keeping in view the preventable common risk factors of Cancer and other Non Communicable Diseases (NCDs), the Ministry has formulated a National Programme for Prevention and Control of Cancers, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) after integrating the NCCP with National Programme for Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke (NPDCS). The programme will have two components, one is cancer and the other is Diabetes, Cardiovascular Disease and Stroke (DCS). The outlay for Cancer is Rs. 731.52 crores from the total outlay of Rs. 1230.90 crores for NPCDCS during 2010-11 & 2011-12. There is 80:20 sharing basis by Centre & State Govt. respectively.

The major components of the programme is to strengthen 100 districts in 21 States for cancer care services, strengthen 65 centres as Tertiary Cancer Centres throughout the country, establish NCD cells for monitoring the programme implementation at the selected States/Districts and promote IEC for creating awareness generation among the community about cancer and its available services. Funds have been released to 30 districts taken up during 2010-11 and will be released to 70 districts taken up during 2011-12.

2. National Blindness Control Program (1976)

National Programme for Control of Blindness (NPCB) was launched in the year 1976 as a 100% centrally sponsored programme with the goal to reducing the prevalence of blindness. India was the first country to launch the National Programme for Control of Blindness in 1976 with the goal of reducing the prevalence of blindness.

In order to bring out an improvement in the quality of services, substantial efforts have been made through following initiatives:

- Banning outdoor surgical camps;
- Emphasis on IOL implantation in cataract surgery at institutional level and greater coverage for women and underprivileged sections of the society etc.
- High quality instruments and equipment provided for all eye care units under NPCB.

Achievements during 11th Plan

SNo.	Component	Target	Achievement (2007-11)
1	Cataract operations (lakh)	300	231.20
2	School Eye Screening (Spects to School Children) (lakh)	15	21
3	Collection of Donated Eyes (thousand)	265	170
4	Regional Institutes of Ophthalmology (new)	3	2
5	Medical Colleges supported	150	150
7	PHC/Vision Centres	3000	2725
8	Eye Surgeons trained	2000	1500

Program Constraints:

There are constraints to further reduce prevalence of blindness. Some of the key constraints are described below:

1. Unequal distribution of Eye Surgeons

There are an estimated 12,000 Eye Surgeons in India for more than 1 billion population with an average of ratio of 1 surgeon for about 1,00,000 population. However, there is wide disparity between urban and rural areas. Eye surgeon- population ratio varies from 1:20,000 in urban area to 1 in 2,50,000 in rural areas. This disparity has led to significant differences in services offered/sought by the public.

2. Insufficient number of paramedical eye care personnel.

While desired eye surgeons- paramedic ratio should be 1:3 to 1:4 but there are less number of qualified paramedics as compared to eye surgeons. The surgeon therefore have to sometime perform job like refraction, pre-operative care and undertaking diagnostic tests, which can generally be carried out by paramedical personnel.

3. Sub Optimal Coverage by Govt. Institutions

Government facilities, NGO and private sector are usually located in urban/ semi-urban areas. Geo-physically remote and socio-economically backward population remains underserved. NGO sector has been contributing affectively to reduce backlog of cataract from the country including NE Region.

4. Inadequate service provision for Eye Diseases other than cataract

Cataract intervention has been given the highest priority attention under the National Programme for Control of Blindness and the problem of Corneal Blindness, Glaucoma and Diabetic Retinopathy have not been adequately addressed. Similarly Pediatric Ophthalmology and low vision have also received a lower priority.

5. Lack of Public Awareness

Rural, illiterate and under privileged population are not fully aware about various interventions that are available to restore vision of the blind. Integration with primary health care is also limited and therefore rural health workers are not motivating potential beneficiaries.

RAAB (Rapid Assessment of Avoidable Blindness: (2006-07)

The National Program for Control of Blindness (NPCB) has consistently based its projections and program implementation on evidence collected by reputed eye care institutions through population based surveys over the past three decades. For the first time in the country, a Rapid Assessment of Avoidable Blindness was undertaken. This methodology improves upon the methodology used in Rapid Assessment and allows causes of blindness to be established. This is achieved by coupling an eye examination by an ophthalmologist to the methodology used in rapid assessments. Therefore, data can be comparable to both the rapid assessment as well as the detailed surveys conducted earlier.

It was observed that overall, the prevalence of low vision, economic blindness and social blindness had decreased in the districts covered compared to the earlier surveys. Lowest prevalence of all blindness (social + economic) was seen in Solan (Himachal Pradesh), Bhatinda (Punjab) and Palakkad (Kerala). Pooling data of all districts together the prevalence of blindness as defined by the National Program for Control of Blindness has shown a reduction of 6% in overall prevalence of blindness above the age of 50 years. This reduction is significant as there is an increasing life expectancy in India which translates into more and more people living beyond 50 years of age. Since a significant proportion of blindness in India is age related, any reduction above the age of 50 years is a direct gain from the strategies adopted by the National Program in the country.

The prevalence of blindness was observed to be 1.34 times higher in females compared to males. It is difficult to state whether this is due to a true rate of higher incidence among females or

because of lack of access to services. Though a larger number of surgeries were reported of women, this would be expected as 55% of the respondents were female. The prevalence of blindness increased with age, with those above 70 years having a 16 times higher risk of being blind compared to those aged 50-54 years.

Cataract surgical coverage showed a significant increase compared to the previous surveys with 82.3% having at least one eye operated among those who had a vision < 3/60 and were blind from cataract. This is much higher than the previous surveys. In RAAB, analysis was also presented for cataract surgical coverage using the NPCB definition of blindness. For the first time this is being used in the country as it was felt that this would act as a baseline for future surveys as more and more people would get operated before they reach a stage of vision < 3/60.

The survey showed that the gains in Southern States (Andhra Pradesh, Kerala and Tamilnadu) and in high performing States like Gujarat continued to improve over the years.

Performance in the States of Orissa (Ganjam district) and West Bengal (Malda district) needs to be augmented so that the gains of the technological revolution in eye care can be effectively harnessed across the country.

There is a distinct increase in IOL surgeries in the past five years when results are compared to the earlier surveys. This is a welcome sign as more and more ophthalmologists are now adept at IOL implants than previously. Most of the survey districts have achieved more than 80% IOL rate in the past five years. However, though the total number of surgeries was higher among women, the IOL rate was 5% higher among men. This gender disparity needs to be addressed through innovative approaches.

A large proportion of individuals were not using spectacles after surgery and there were many who in-spite of an IOL implant needed correction as they showed significant improvement with a pinhole.

Cataract remains the single largest cause of blindness, low vision and one eye blindness in India if the data of the 16 districts are pooled together. The trend is observed across all districts also. Results indicate that the country should continue to prioritize cataract surgical services and their augmentation. The support to other blinding conditions should not be at the cost of cataract as any slackening may prove catastrophic in the long run.

Lack of awareness and affordability still continue to be barriers to the uptake of cataract surgery in many parts of the country and efforts need to be made to surmount these barriers so that no person needlessly remains blind because of lack of knowledge or the lack of access due to financial constraints.

Extrapolating the results to the population of all ages across the country, it is evident that there has been a perceptible reduction in the prevalence of blindness in the country in spite of increased life expectancy. The country seems headed in the right direction and attention to problem regions on a priority basis will provide a further impetus to blindness control efforts in India. Prevalence of Blindness in general population is 1.0%.

3. National Mental Health Program (1982)

The Government of India launched the National Mental Health Programme (NMHP) in 1982, with the following objectives:

- To ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future, particularly to the most vulnerable and underprivileged sections of the population;
- To encourage the application of mental health knowledge in general healthcare and in social development; and
- To promote community participation in the mental health service development and to stimulate efforts towards self-help in the community.

The NMHP was restructured to include the following schemes in 2003 :

- District Mental Health Programme (DMHP)
- Modernization of State Run Mental Hospitals
- Upgradation of Psychiatric Wings of Medical Colleges/General Hospitals
- IEC

The Manpower Development Schemes- Centres Of Excellence And Setting Up/ Strengthening PG Training Departments of Mental Health Specialities were implemented during the 11th five year plan, thus placing additional emphasis on strengthening the mental health manpower in the country. The schemes under the programme are described briefly below:

District Mental Health Programme (DMHP): DMHP is the core component of NMHP and provides basic mental health services at the community level. Presently the DMHP is being run in 123 districts across the country. Based upon evaluation conducted by an independent agency in 2008 and feedback received from a series of consultations it was to revise and consolidate DMHP on new pattern of assistance with added components of Life skills education in schools, College counselling services, Work place stress management and suicide prevention services. These components are in addition to the existing components of clinical services, training of general health care providers and IEC activities. 123 District were approved for funding support, out of which 16 district are dysfunctional due to pending utilisation of funds and rest are carrying out basic mental health activities as per provision of under the scheme.

Modernization of State Run Mental Hospitals – Most of the state run mental hospitals in the country were established long time back and were in dilapidated state, lacking even basic amenities for the patients. A sum of upto Rs. 3crores per hospital, on the basis of benchmark of requirement and level of preparedness was made available under this scheme. The grant would cover activities such as construction/repair of existing buildings, purchase of equipment, provision of infrastructure such as water- tanks and toilet facilities, purchase of cots and equipments. It did not cover expenses in the nature of salaries and recurring expenses towards running the mental hospitals and cost towards drugs and consumables. During the 11th plan, 23 State run Mental Hospitals were funded for modernization of mental hospitals.

Upgradation of Psychiatric Wings of Medical Colleges/General Hospitals - Every medical college should ideally have a Department of Psychiatry with minimum of three faculty members and inpatient facilities of about 30 beds as per the norms laid down by the Medical Council of India etc. Out of the existing medical colleges in the country, approximately one third do not have adequate psychiatric services. One time grant of up to Rs. 50 Lakhs was made available for upgradation of psychiatry wings of medical colleges/general hospitals.71 Psychiatric Wings of Medical Colleges/General Hospitals were funded for up gradation during 11th Plan

IEC activities – dedicated funds were made available for IEC activities under NMHP for awareness generation regarding treatability of mental health disorders and removal of stigma related to mental illness.

Manpower Development Scheme In order to improve the training infrastructure in mental health, Government of India has approved the Manpower Development Components of NMHP for 11th Five Year Plan. It has two schemes delineated below.

Centres of Excellence (Scheme A) - Under Manpower Development Component at least 11 Centres of Excellence in mental health were to be established in the 11th plan period by upgrading existing mental health institutions/medical colleges. A grant of upto Rs.30 crore is available for each centre. The support includes capital work (academic block, library, hostel, lab, supportive departments, lecture theatres etc.), equipments and furnishing, support for faculty induction and retention for the plan period. The proposal of the State Governments for these centers must include definite plan with timelines for initiating/ increasing PG courses in Psychiatry, Clinical Psychology, PSW and Psychiatric Nursing. 10 centres have been funded under this scheme.

Current status: - 10 centres have been selected and grant has been released for establishment, 1 centre is in pipeline of submitting state commitment.

(Scheme B)- Setting Up/ Strengthening PG Training Departments of Mental Health

Specialities: To provide an impetus for development of Manpower in Mental Health other training centres (Government Medical Colleges/ Government General Hospitals/ State run Mental Health Institutes) would also be supported for starting PG courses in Mental Health or increasing the intake capacity for PG training in Mental Health. The support would involve physical work for establishing/improving department in specialities of mental health (Psychiatry, Clinical Psychology, Psychiatric Social Work, and Psychiatric Nursing), equipments, tools and basic infrastructure, support for engaging required/deficient faculty etc. Till date 23 courses have been supported under this scheme.

Target: Strengthening/setting up of 120 PG departments of Psychiatry, Clinical Psychology, Psychiatric Social Work and Psychiatric Nursing during the 11th five year plan.

Current status:

Psychiatry – 7 (established) +1 (in pipeline) = 8

Clinical Psychology – 5 (established) + 5 (in pipeline) = 10

Psychiatric Social Work – 3 (established) + 5 (in pipeline) = 8

Psychiatric Nursing – 5 (established) + 6 (in pipeline) = 11

Gap Analysis

No. of departments yet to established w.r.t. the target along with estimated cost:

Psychiatry (30-8) = 22 departments

Clinical Psychology (30-10) –20 departments

Psychiatric Social Work (30-8) – 22 departments

Psychiatric Nursing (30-11) – 19 departments

4. National Iodine Deficiency Disorders Control Program (1986)

The Government of India is implementing a 100 per cent Centrally assisted National Iodine Deficiency Disorders Control Programme (NIDDCP) with the following objectives:-

1. Surveys to assess the magnitude of the Iodine Deficiency Disorders.
2. Supply of iodated salt in place of common salt.
3. Resurvey after every 5 years to assess the extent of Iodine Deficiency Disorders and the Impact of iodated salt.
4. Laboratory monitoring of iodated salt and urinary Iodine excretion.
5. Health education and Publicity.

On the recommendations of Central Council of Health in 1984, the Government took a policy decision to iodated the entire edible salt in the country by 1992. The programme started in April, 1986 in a phased manner. The Central Government is implementing ban notification on the sale

of non-iodated salt for direct human consumption under Prevention of Food Adulteration Act, 1954 with effect from 17th May, 2006. The annual production and supply of iodated salt in our country is 55 lakh metric tones per annum during 2009-10.

The National Iodine Deficiency Disorders Control Programme (NIDDCP) was evaluated by the National Institute of Health & F.W., New Delhi during 2007-08. The Directorate General of Health Services, State Health Directorate, Health Institutions, Indian Council of Medical Research have conducted district level IDD Survey in the various parts of the country and reported significant reduction in the Prevalence of IDD. The visible goiter is drastically reduced in the entire country. The consumption of iodated salt at the community level was evaluated by the National Family Health Survey, 2005-06 and indicated the consumption of adequately iodated salt at the community level was about 51% while salt having nil and inadequate iodine was about 49%. Further, the Coverage Evaluation Survey, 2009, UNICEF revealed adequately iodated salt consumption in the country was about 71% and the salt having nil and inadequate iodine was about 29%.

It may be pointed out that in both the studies the consumption of adequately iodated salt is the rural population is far below in comparison to urban population. We have to focus more on rural population where the National Rural Health Mission (NRHM) has been playing a very important role and NIDDCP is under part 'D' component of National Disease Control Programmes of NRHM. Thus, the activities carried out during 11th Plan have shown significant improvement in implementation of the NIDDCP, a 100% Centrally Assisted Programme, in the country.

5. National Tobacco Control program (2007)

In 2003 Parliament enacted "Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act (COTPA) in 2003, to reduce consumption of tobacco products in society, protect the youth and children from tobacco use and protect the health of non smokers from the harmful effects of second hand smoke etc. The specific provisions under this Act include:

- a) Ban on smoking in public places.
- b) Ban on direct/indirect advertisement of tobacco products.
- c) Ban on sale of tobacco products to children below 18 year.
- d) Ban on sale of tobacco products within 100 yards of the educational institutions.
- e) Specified health warnings including pictorial warnings on tobacco products.
- f) Testing of tobacco products for tar and nicotine.

In order to facilitate the effective implementation of the Tobacco Control Laws and to bring about greater awareness about the harmful effects of tobacco and to fulfill the obligation(s) under the WHO-FCTC, the Ministry of Health and Family Welfare, Government of India implemented the National Tobacco Control Programme (NTCP) in 2007- 08. Currently the programme is under implementation in 21 out of 35 States/Union territories in the country covering 42 districts. In the first phase of the Programme state as well as district cells were established however in the 2nd phase covering 12 states only district tobacco control cells were established.

The main components of the NTCP with an outlay of Rs. 182 crores, during the 11th FYP are given below:

a. National level

- i. Public awareness/mass media campaigns for awareness building and behavioral change.
- ii. Establishment of tobacco product testing laboratories, to build regulatory capacity, as required under COTPA, 2003.
- iii. Mainstreaming the program components as a part of the health delivery mechanism under the National Rural Health Mission framework.
- iv. Mainstream Research & Training on alternate crops and livelihoods in collaboration with other nodal Ministries.
- v. Monitoring and Evaluation including surveillance e.g. Global Adult Tobacco Survey (GATS) India.

b. State level

Dedicated tobacco control cells for effective implementation and monitoring of anti tobacco initiatives.

c. District level

- i. Training of health and social workers, NGOs, school teachers etc.
- ii. Local IEC activities.
- iii. Setting up tobacco cessation facilities.
- iv. School Programme.
- v. Monitoring tobacco control laws.

WHO Framework Convention on Tobacco Control (WHO- FCTC)

The Government of India ratified the treaty WHO-Framework Convention on Tobacco Control (FCTC) in February, 2004. FCTC enlists key strategies for reduction in demand and reduction in supply of tobacco. Some of the demand reduction strategies include price and tax measures & non price measures (statutory warnings, comprehensive ban on advertisement, promotion and sponsorship, tobacco product regulation etc). The supply reduction strategies include combating

illicit trade, providing alternative livelihood to tobacco farmers and workers & regulating sale to / by minors.

Mid Term review of NTCP by Planning Commission

The Planning Commission in the Mid-Term Appraisal of the National Tobacco Control Programme Tobacco Control Programme has remarked that even though all the provisions of the Act, have been implemented including ban on smoking in public places, health warnings on unit packs of cigarettes and other tobacco products including pictorial warnings, except regulation of nicotine and tar contents in tobacco products, however the district level programme, is yet to be implemented in most of the districts. Compliance with provisions of the Act is still a major challenge as the personnel in different parts of the State and District Administration lack sensitisation to the significance of this programme. The cessation services to encourage quitting tobacco are inadequate.

An independent monitoring of implementation of COTPA in 21 States, where National Tobacco Control Programme is under implementation has revealed that only about half of the states (52%) have mechanism for monitoring provisions under the law and reporting. Although 15 states have established challaning mechanism for enforcement of smoke-free rules, out of which only 11 states collected fines for violations of ban on smoking in public places. Further, only 3 states collected significant amount of fines for such violations. Similarly steering committee for implementation of section-5 (ban on Tobacco advertisements, promotion and sponsorship) has been constituted in 21 states but only 3 states collected fines for the violation of this provision. Similarly enforcement of ban on sale of tobacco products to minors and ban on sale of tobacco products within 100 yards also remains largely ineffective in many states. Setting up of tobacco cessation facilities at district level is also a big challenge. Less than half of the states under the programme have established tobacco cessation facilities at district level.

6. National Deafness Control Program (2006-07)

The programme has been expanded to 176 districts of 16 States and 3 U.T. in a phased manner. By the end of this 11th F.Y.P. (i.e by March 2012), the programme would be expanded to cover a total of 203 districts. Progress made by the programme in different components of the programme is summarized below:

(a) Training:

Trainings for all levels of manpower have been planned in the programme. The trainings have been planned to take place in a cascade manner for the following groups of personnel:

- Sensitization training for ENT doctors and Audiologists at the District level
- Skill based training for ENT doctors and Audiologists at the District level
- Obstetricians and Paediatricians at the Secondary and Primary levels.
- Primary level doctors posted at the CHCs and PHCs

- MPWs, PHNs, AWWs
- Anganwadi workers, ASHA
- Parents of disabled children

Training material in the form of training manuals and training lectures have been developed and field tested.

Training of medical officers, PHN, AWW, MPW, ASHA and school teachers (level 4 to 7 staff) was undertaken by RCI in 2007-08 in all the 25 districts in Pilot phase of the programme. In the expansion phase, the responsibility of training was transferred to the states, for which funds were provided to the state health societies.

In the expansion phase, the states of Uttarakhand, Karnataka and Gujarat initiated the training upto level 4 (i.e. Medical Officers). Beyond level 4 only the state of Assam, Uttarakhand and Andhra Pradesh are being organizing trainings in the districts. Tamil Nadu has conducted first level of trainings.

(b) Screening camps

Screening camps are carried out at district through support of NGOs as per the guidelines. Regular screening camps have been conducted by the states of Tamil Nadu, Karnataka, Chandigarh, Sikkim and Andhra Pradesh. Very few screening camps have been organized by the other states.

(c) Procurement of Equipment

To strengthen the ear & hearing care services at the community level, the district hospitals, CHC and PHC are being strengthened through provision of suitable equipment under the programme. States namely Sikkim, Uttarakhand, Karnataka, Tamilnadu , Assam, Gujarat and Chandigarh have procured the equipments specified within the Programme. However, there is delay in procurement by other states due to problems in procedural formalities at state level and cost considerations. Process of procurement has been completed in 40 districts of 9 states and is under process in the remaining 136 districts of other states.

(d) Recruitment of manpower

Two additional personnel i.e. Audiometric Assistant (AA) and Instructor for Speech & Hearing Impaired (IHS) are being placed at the district hospital on contract basis to carry out audiological and ear related work under the programme. However, only 40 AAs and 4 IHS have been recruited so far. Recruitment is low due to non availability of local candidates and low honorarium.

(e) Hearing Aids

Under the programme, fitting of free hearing aids on identified children up to the age of 15 years with free service for a period of one year is being undertaken at the level of the district hospital.

2459 hearing aids were distributed in the 22 pilot districts of the programme. The state of Uttar Pradesh and Manipur could not distribute the Hearing aids due to poor implementation of the programme in these states.

(f) Awareness campaign:

- IEC materials in form of posters / pamphlets have been distributed to the states for further dissemination. Mass Media campaigns have been carried out in different regional languages. 6.2 lakh posters have been distributed in the various states.
- 6 video films and 3 audio spots have been developed addressing the various themes related to ear & hearing.
- National Institute of Health & Family Welfare, New Delhi conducted the “Impact assessment of the IEC campaign done for NPPCD” in 4 states (Tamilnadu, Gujarat, Assam and Uttarakhand) where in it was observed that awareness generation was not satisfactory due to low impact of TV and radio media. Significant factors in this are the short duration of awareness campaign and low frequency of telecasting of the spots on the TV and Radio.

(g) Monitoring & Supervision

Mechanism of Monitoring and Supervision of the programme activities at various levels has been developed. However, the quarterly progress reports are not been submitted by the states on regular basis due to lack of dedicated manpower under the programme.

7. Trauma Care Facility on National Highways

Road Safety Initiatives by the Government of India

The Department of Road Transport is also contemplating to set up national and State level Road Safety and Traffic Management Boards by enacting the National Road Safety and Traffic Management Act. These Road Safety Boards are to be set up for the establishment of National and State level Road Safety and Traffic Management Boards for the purpose of orderly development, regulation, promotion and optimization of modern and effective road safety and traffic management systems and practices including improved safety standards in road design, construction, operation and maintenance, and production and maintenance of mechanically propelled vehicles and matters connected therewith or incidental thereto.

The safety of road users is primarily the responsibility of the concerned State Government. However, the Ministry of Road Transport & Highways has taken several steps to improve road safety for road users which are as under:

- Refresher Training for heavy vehicle drivers
- Model Driving Training Schools
- National Highway Accident Relief Service Scheme (NHARSS)
- Road Safety Equipments
- Publicity Measures and Awareness Campaign on Road Safety

Initiatives taken by NHAI on Safety.

- NHAI Ambulances are stationed at 50 Km of completed national highway stretch through operation and maintenance contract.
- The Ambulances provided are stocked with essential medicines, requisite equipments and paramedical staff to help the victims in case of the accident.
- The ambulances are having the telephone and helpline numbers of the nearby hospitals in the 50 km. length.
- The helpline numbers are also displayed all along the completed corridor.

Prevention and control of road traffic injuries requires an integrated and coordinated approach between all concerned ministries and departments. The new understanding of road traffic injuries reveal that if systematic programmes can be put in place, it is possible to prevent road crashes. A road safety management authority is crucial to guide, coordinate, integrate, monitor and evaluate several activities, without which road safety cannot improve.

Since Road Traffic Injuries happen due to several causes, the solution are also several. Different types of interventions need to be implemented in an integrated manner to obtain maximum results It is an accepted strategy of Trauma Care that if basic life support, first aid and replacement of fluids can be arranged within first hour of the injury (the golden hour), lives of many of the accident victims can be saved. The critical factor for this strategy is to provide initial stabilization to the injured within the golden hour. The time between injury and initial stabilization is the most critical period for the patient's survival. Thus disability and death following road accidents are preventable to some extent. Strategic activities to achieve this objective include:

- Initial stabilization by trained manpower available within a defined period of time,
- Rapid transportation and
- Medical facilities to treat such cases.

Review status of ongoing programme

“The Government will strive to achieve its target that all persons involved in road accidents benefit from speedy and effective trauma care and health management. The essential functions of such a service would include the provision of rescue operation and administration of first aid at the site of an accident, the transport of the victim from accident site to an appropriate nearby hospital.”

Strategies to improve emergency medical services along national highways is as under:

- i. To improve communication system available with police and other emergency services as a means to reduce response times and to assist in planning and implementation of Traffic Aid Post Scheme.

- ii. To train police, fire and other emergency service personnel such as those on ambulances and paramedics in basic first aid for road crash victims.
- iii. To develop local and regional trauma plans based on study of post-accident assistance and consequences for road traffic accident casualties.

The Ministry of Health & FW started a pilot project (1999) during the Ninth five year plan to augment and upgrade the accidents and emergency services in selected State Govt. hospital that are located in most accident prone areas of national highways. The scheme envisaged providing financial assistance (Rs.150.00lakhs) for upgrading emergency services of selected Government hospitals.

In the light of the feedback received and the general consensus that emerged during consultations with various stakeholders, it is proposed to design and develop a network of Trauma Care Centres that would in the first phase cover the entire Golden Quadrilateral connecting Delhi-Kolkata-Chennai-Mumbai-Delhi and North-South-East-West Corridors. This project would be a major stepping stone in moving towards the desired objective of bringing down preventable deaths in road accidents to around 10%. Subsequently and after evaluation of the project, National Highways [other than GQ & NS-EW corridor] with substantial number of accidents &:

- Connecting two capital cities
- Connecting major cities other than capital cities
- Connecting ports to major cities
- Connecting industrial townships with capital cities could also be covered by the proposed network/system of trauma care.
- The present Scheme covers entire Golden Quadrilateral and North-South and East-West corridors. Subsequently, after evaluation of the project, other National Highways with substantial traffic density would be taken up.
- During 11th Plan, So far 113 Government Hospitals (out of 140 identified hospitals) have been provided financial assistance amounting to Rs.281.34 Crores for different approved component for trauma care facilities in 15 states which are at various stages of progress. Out of 113, in 16 Government hospitals trauma center are partial operational for Trauma Care facilities.
- One advance life support ambulance is provided by Ministry of Surface Transport at each of the trauma care centers, while NHAI is providing one basic life support ambulance at every 50 kms of the highways. Recently, Ministry of Road Transport & Highways one Advance Life support Ambulance to be deployed in 70 identified hospitals in various states.
- Year wise budget allocation viz-a-viz the expenditure incurred on the scheme during 11th Plan is as under:

Year	Funds allocated (Rs. crores)	Funds released (Rs. crores)
2007-08	42.00	37.00
2008-09	120.00	110.34
2009-10	55.00	55.00
2010-11	79.00	79.00
2011-12	100.00	--

8. National Program for Prevention and Control of Fluorosis (2007-08)

National Programme for Prevention and Control of Fluorosis was approved in the year 2007-08 for 100 districts with an amount of Rs.680 crores with the following objectives:-

- To collect, assess and use the baseline survey data of fluorosis of Deptt. of Drinking Water Supply for starting the project.
- Comprehensive management of fluorosis in the selected areas.
- Capacity building for prevention, diagnosis and management of fluorosis cases.

The following strategies are adopted for implementing the programme:-

- Training:- Impart training to health personnel for prevention, health promotion, early diagnosis and prompt intervention, deformity correction and rehabilitation.
- Capacity Building:- Capacity building of district and medical college hospital for reconstructive surgery and rehabilitation.
- Laboratory Support Development:- Establishment of diagnostic facilities in the District hospitals
- I.E.C. :- Health Education for prevention and control of Fluorosis cases

9. National Program for Prevention & Control of Cancer, Diabetes, Cardiovascular Disease and Stroke (2010-11)

A pilot programme, the National Programme for Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke (NPDCS) was initiated on life style diseases like Diabetes, Cardiovascular Diseases and Stroke in 2008 under new initiatives. The objectives of the pilot project were to model the impact of providing preventive, promotive and treatment services at peripheral centres to reduce the risk of developing these chronic diseases and appropriate management. It was started in 10 states with one district each namely, Assam (Kamrup), Punjab (Jalandhar), Rajasthan (Bhilwara), Madhya Pradesh (Jabalpur), Karnataka (Shimoga), Tamilnadu (Kancheepuram), Kerala (Thiruvananthapuram), Andhra Pradesh (Nellore), Madhya Pradesh (Jabalpur), Sikkim (East Sikkim).

Keeping in view that Cancer, Diabetes, Cardiovascular Diseases and Stroke have common preventable risk factors, a National Programme for Prevention and Control of Cancers, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) has been formulated after integrating the National Cancer Control Programme with the pilot programme of NPDCS. The programme will have two components, one is cancer and the other is Diabetes, Cardiovascular Disease and Stroke (DCS). The outlay for DCS is Rs. 499.38 crores from the total outlay of Rs. 1230.90 crores for NPCDCS during 2010-11 & 2011-12. There is 80:20 sharing basis by Centre & State Govt. respectively.

The major components of the programme is to strengthen 100 districts in 21 States for early diagnosis & prompt treatment of cancer, diabetes, hypertension and acute cardiovascular diseases, establish NCD clinics at CHCs & District Hospitals for screening, diagnosis and management of these disease. Opportunistic Screening for diabetes and high blood pressure will be provided to all persons above 30 years including pregnant women of all age groups at the point of primary contact with any health care facility. Support is given for promotion of healthy life style through IEC among the community about DCS, its risk factors and its available services. Funds have been released to 30 districts taken up during 2010-11 and will be released to 70 districts taken up during 2011-12.

10. National Program for Health Care of the Elderly (2010-11)

The existing health care facilities for older people in our country in terms of infrastructure, skilled manpower are almost none existing. Dedicated and separate health infrastructure is available only in a few medical colleges/institution. Some institutions are running geriatric clinics for the elderly.

Taking into consideration the rising population of elderly and keeping in view the recommendations made by “National Policy on Older Persons” as well as provisions made under the “Maintenance & Welfare of Parents & Senior Citizens Act 2007”, a new initiative was taken to start a national programme “National Programme for Health Care of Elderly” (NPHCE) during 2010-11 & 2011-12 for an amount of Rs. 288 out of which 20% is State Govt. share. Major components of the programme are to establish geriatric department in 8 regional medical institutions of the country and strengthening health care facilities for elderly at various levels of 100 identified districts of the country. Funds have been released to 30 districts during 2010-11 and will be released to 70 districts during 2011-12.

11. Pilot Program for Prevention of Burn injuries

The Pilot Programme for Prevention of Burn Injuries (PPPBI) was launched as new initiative during the XIth Plan in the year 2010-11 on pilot basis in 3 states viz. Assam, Haryana and Himachal Pradesh covering one Medical College and 2 district hospitals each as below. The three states were selected as they represent diverse nature of the country.

Himachal Pradesh- Tanda Medical College, Hamirpur District & Mandi District
Haryana- Rohtak Medical College, Panipat district & Gurgaon district
Assam- Gauhati Medical College, Nagoan district & Dhubri district

Objectives-

- To reduce incidence, mortality, morbidity and disability due to Burn Injuries.
- To improve the awareness among the general masses and vulnerable groups especially the women, children, industrial and hazardous occupational workers.
- To establish adequate infrastructural facility and network for BCC, burn management and rehabilitation.
- To carry out Formative Research for assessing behavioral, social and other determinants of Burn Injuries in our country for effective need based program planning for Burn Injuries, monitoring and subsequent evaluation.

Components-

- Preventive Programme: This component is being implemented through Central Health Education Bureau and Awareness Programme in School for generating awareness.
- Treatment Programme: This component includes capacity building of healthcare manpower and quality burn injury management at all the levels of Health-care delivery system.
- Rehabilitation Programme: Rehabilitation services to be provided at district and state level to restore functional capacity of the burn patients.

The total outlay for two years of the 11th Five Year Plan (i.e. 2010-11 & 2011-12) is Rs. 29.70 crore. Allocation for 2010-11 was 19.38 crore out of which Rs.5.25 crore were sanctioned. Allocation for 2011-12 is 10.32 crore.

Progress:

1. Establishment of burn units-

During 2010-11, GOI have released Rs. 5.06 crore (30% of sanctioned budget) to the medical college/district hospitals of the identified 3 states towards construction & procurement.

In Medical College, Rohtak and District Hospital, Panipat, construction plan has been finalized and construction work taken up. However in Rohtak, the Trauma Centre building where burn unit was to be located temporarily is not yet ready and will take some more time. In District Hospital, Gurgaon, the agreed space on 2nd floor terrace could not be used. Hence, inspection visit needs to be conducted for alternative site in the hospital campus. Medical College, Tanda, District Hospital, Mandi and District Hospital, Hamirpur the Construction work has been taken up on the identified land/space. Pending construction, space has also been earmarked for burns unit & beds have been provided to the patients.

In Medical College, Guwahati, renovation of existing medical ward as burn's unit is complete. Construction work has been taken up in District Hospital, Nagaon. However, as the District Hospital, Dhubri has been declared as a Medical College by the State govt. approval of state authorities is still awaited. As establishment of new burns unit will take time, the states have been requested to start providing burn services at the earliest by identifying space for temporary locating the unit and earmarking 2-4 beds for burn cases. Rs. 0.65 cr. was transferred to CHEB in 2010-11 for carrying out the planned activities under education and prevention component. CHEB has prepared IEC material for 5 audio spots, 2 video spots and for charts, leaflets & posters in consultation with expert committee. The material has been produced by DAVP and ready for dissemination.

The 6 days training programme schedule for Surgeons/Medical Officers to be trained under the programme have been prepared. 2 Surgeons/Medical Officers each from the Medical Colleges / District Hospitals would be trained during July - August 2011 in Delhi. Burn Injury Management protocol which will be distributed as part of the training programme is being prepared by experts.

Concurrent evaluation of the pilot program would be carried out during 2011-12.

12. Upgradation of Department of PMR in Medical Colleges

Health Sector has been consistently initiating several projects / programmes on pilot basis to assess the most appropriate training and services delivery system to be evolved for integration into the health care delivery system. The following is the brief of such initiatives-

- 1) A Project with the objective of integrating Community Based Rehabilitation as a component of primary health care through the strengthening of the referral system at the district and sub-district level was undertaken during the 8th Five Year Plan to be translated into a National Programme of Rehabilitation as an activity of AIIPMR.

During the 10th Five Year Plan period, the scheme "Upgradation of facilities in the department of PMR in Medical College" amounting to Rs.5.2 Crores was approved in 2004. The scheme aims at creating an independent Dept. of PMR within the existing Medical College set-up and augmenting / strengthening the Dept. through acquisition of essential equipment and manpower for comprehensive rehabilitative services. During the year 2006-07 following medical colleges were taken up for the creating and strengthening of the PMR Dept.

- JIPMER, Pondicherry
- Govt Medical College and Hospital, Chandigarh
- Lady Harding Medical College & Associated Hospitals, New Delhi
- UCMS, Delhi

- 2) The scheme for strengthening of Physical Medicine and Rehabilitation department in 30 medical colleges is envisaged with an aim to build up infra-structure and rehabilitation

team. In all, 21 medical colleges have been identified for establishing / up-gradation of P.M.R. department. The scheme involves signing of memorandum of understanding with State Governments for providing adequate space and logistic support in medical colleges and designation of Nodal Officer and grant for financial assistance for procurement of equipment and engagement of manpower on contractual basis as shown in the table below:

1	Silchar Med. College, (Assam)
2	GB Pant hosp. Agartala
3	NEIGRIHMS, Shillong
4	S.N. Medical College, Agra
5	LLRM Med College, Meerut
6	B.R.D. Medical College, Gorakhpur
7	M.K.C.G. Med College, Behrampur (Orissa)
8	B.J. Med. College, Ahmedabad
9	Surat Municipality Medical College
10	R.N.T. Med. College, Jodhapur (Rajasthan)
11	S.N. Med. College, Jodhapur, (Rajasthan)
12	JIPMER, Puducherry
13	Gandhi Med. College, Bhopal
14	GM Med. College, Chandigarh
15	Lady Hardinge Medical College, New Delhi
16	VCSG Govt. Medical Sciences & Research Institute, Garhwal (UK)
17	Guru Nanak Dev Hospital Govt. Medical College, Amritsar
18	Goa Medical College & Hospital
19	UCMS & GTB Hosp, Delhi
20	S.V. Medical College, Tirupati
21	RML Hosp, New Delhi

A team constituted by the DGHS visited the medical colleges identified by the State Govt. to inspect the availability of the adequate space and other requirements, only upon receipt of the inspection report, funds were released to the State Govt.

As envisaged in the 10th Five Year Plan the district and community health care based rehabilitation centers could not be started as it took considerable efforts and time for building up the department in medical colleges since it involved sensitization and seeking favorable response from the State Government authorities and medical colleges and lack of proper commitment for selection of faculty, procurement of the equipments and preparation of sites for installation, etc. The following constraints were experienced for setting up the Dept. of PMR in the various Medical colleges:

- Non-availability of Specialists in PMR which necessitated mid course correction.
- Non-availability of other categories of paramedical personnel viz. speech therapist, psychologist, prosthetist, orthotist etc.

- Inadequate communication and co-ordination with the Central Implementation Cell, the State and Medical College authorities.
- Non receipt of periodic feedback from the medical colleges regarding the status of upgradation and commencement of services.

Despite the above constraints, the challenge for building up capacity for providing quality in rehabilitation services will have to be carried forward vigorously in the years to come as anticipated as it may take number of years or considerable time to harness such services which are different from other types of health services in the Health Care System.

13. Patient Safety Programme

There have been some initiatives for safety of patients seeking health care services in the Public Sector as given below:

- Patient Safety committees have been formed in three central government institutions in Delhi namely Dr Ram Manohar Lohia Hospital, Safdarjung Hospital and Lady Harding Medical College & associated Hospitals. The committee is headed by Medical Superintendent / Additional Medical Superintendent. Beside Hospital experts, the members of committee also include representative of a Non Govt. Organization, One Journalist and one patient or his or her attendant. These hospitals conduct meetings of their patient safety committees to review the various patient safety issues, adverse events reported, actions taken and maintain records of all the meetings of their patient safety committees. Globally accepted interventions like Hand Hygiene, surgical safety etc. have been introduced.
- Trainings in Patient Safety including Hand hygiene, infection control and Bio-medical waste management are being conducted in these hospitals. Two Training Modules for Doctors have been developed through IGNOU. Self learning modules in the area of Health Care Waste Management for doctors, nurses and paramedical and Group D employees have been developed.
- Following Patient safety Performa introduced
 - Check list for safety of surgical patients in the ward and OT (Modified version of WHO Surgical Safety check list)
 - Patient Safety Evaluation Performa : Feedback from patient /attendant at discharge
 - Adverse Event Reporting
 - Patient Safety Monitoring Proforma
 - “Do not use” list from Joint commission introduced to avoid prescription reading mistakes
- A National Consultation Workshop on Patient Safety has been held from 10th May to 12th May 2010 at SGPGI Lucknow and guidelines developed for implementation of the identified Patient Safety Priorities.
- Adverse Event Reporting cells created

- Process correction studies undertaken in casualty /trauma centre and based on the studies improvements done.
- Global Call for Action on Hand Hygiene is being observed as a World Hand Hygiene Day on 5th May since last year.
- Patient Safety and Infection Control have been included in the Indian Public Health standards for CHC, Sub-district and District Hospitals.
- A National Policy for containment of Antimicrobial Resistance developed by NCDC
- National Initiative for Patient Safety (NIPS) was launched by Department of Hospital Administration, AIIMS in September 2009 and under this the department has been holding four workshops on patient safety in a year for multidisciplinary teams from medical colleges and tertiary care hospitals. So far more than 60 medical colleges and tertiary care hospitals in public as well as private sector have been trained in these workshops. Till now more than 400 healthcare professionals from these institutes including doctors (surgeon, physician, anaesthetist and microbiologist), administrators and nurses have participated in these workshops.

Lessons Learnt:

Broadly, across programmes, following experiences were observed and lessons learnt in implementation of programmes, which need to be addressed during the 12th Plan:

1. Health promotion and prevention which would reduce the incidence of NCDs, need to be given more attention.
2. The States need to be given flexibility in implementation of the programmes based on their public sector health system, prevalence and distribution of NCDs and socio-cultural context. The flexibility would, however, will be within broad policy framework.
3. Convergence and integration would be critical in implementation of large number of interventions which would require unified management structure at various levels.
4. Integration of cross cutting components like health promotion, prevention, screening of population, training, referral services, monitoring & evaluation, IEC etc. would save on costs and make implementation more effective.

SECTION 4
PLAN OF ACTION TO PREVENT AND CONTROL
NON-COMMUNICABLE DISEASES DURING THE 12TH FIVE YEAR PLAN

Strategic Approach to Prevent & Control NCDs in 12th FYP

There is adequate evidence that NCDs are major contributors to high morbidity and mortality in the country. Risk factors including tobacco and alcohol use, lack of physical activity, unhealthy diet, obesity, stress and environmental factors contribute to high disease burden of NCDs which are modifiable factors and can be controlled to reduce incidence of NCDs and better outcomes for those having NCDs. Most of the NCDs like Cancer, Diabetes, Cardiovascular Diseases (CVD), Mental Disorders and problems relating to ageing are not only chronic in nature but also may have long pre-disease period where effective life style changes can turn around health status of individuals. Costs borne by the affected individuals and families may be catastrophic as treatment is long term and expensive. The economic, physical and social implications of NCDs are significant justifying investment both for prevention and management of NCDs and well established risk factors.

The efforts made by Government of India and the States have not been able to check rising burden of NCDs. Investments during the 11th Plan and earlier plans have been more on provision of medical services which have not been adequate in the public sector. Private sector has grown particularly in urban settings but is beyond the reach of the poor and middle sections of the society. The present proposal is a comprehensive scheme that will be first major attempt to focus on health promotion and prevention of NCDs and their risk factors and comprehensive management of NCDs at various levels across the country. While Government of India's role will be policy formulation, population based multi-setoral interventions, technical and financial support, the onus of implementation will be with the States. Lessons learnt during the 11th Plan will be addressed and the programmes for various NCDs and their risk factors will be integrated and converged with public sector health system. As many programmes are either new or expanded after piloting in small number of districts and as NCDs are prevalent in rural as well as urban areas, it would be critical to have a separate implementation structure at various levels particularly during the 12th Plan though as an integral part of Public Sector Health System.

Strategies:

A comprehensive approach would be required for both prevention and management of NCDs in the country. It is proposed to continue ongoing efforts and introduce additional programmes to cover important NCDs of public health importance through following key strategies:

- Health Promotion for healthy life styles that preclude NCDs and their risk factors
- Specific prevention strategies which reduce exposure to risk factors
- Early Diagnosis through periodic/opportunistic screening of population and better diagnostic

facilities

- Infrastructure Development and facilities required for management of NCDs
- Human Resources and their capacity building for prevention and treatment of NCDs
- Establish emergency medical services with rapid referral systems to reduce disability and mortality due to NCDs
- Treatment and care of persons with NCDs including rehabilitation and palliative care
- Health Legislation and population based interventions through multi-sectoral approach for prevention of NCDs
- Building evidence for action through surveillance, monitoring and research

Scope of programmes on NCDs

Most of the NCDs are prevalent across the country though there may be regional variations. The Plan of Action therefore would cover all States and UTs of the country in a phased manner during the 12th FY Plan. To ensure convergence and integration with public health services, a decentralized approach is proposed with District as the management unit for programs. Major NCDs that are proposed to be covered during the 12th Plan are summarized in three broad categories:

(a) Programmes for Life Style Chronic Diseases& Risk factors

1. Cancer
2. Diabetes, Cardiovascular Diseases (CVD) & Stroke
3. Chronic Obstructive Pulmonary Diseases
4. Chronic Kidney Diseases
5. Organ and Tissue Transplant
6. Mental Disorders
7. Iodine Deficiency Disorders
8. Fluorosis
9. Oro-dental disorders
10. Neurological Disorders (Epilepsy, Autism)
11. Congenital Diseases
12. Hereditary Blood Disorders (Sickle Cell Anaemia, Thalassemia, Haemophilia)

(b) Programmes for Disability Prevention and Rehabilitation

13. Trauma (including Road Traffic Accidents)
14. Burn Injuries
15. Disaster Response
16. Emergency Medical Services
17. Musculo-skeletal (Bone and Joint) Disorders
18. Physical Medicine & Rehabilitation
19. Blindness
20. Deafness
21. Health Care of the Elderly (Geriatric Disorders)

(c) Health Promotion and Prevention of NCDs

22. Tobacco Control
23. Prevention and Management of Nutritional Disorders & Obesity
24. National Institute for Health Promotion and Control of Chronic Diseases
25. Patient safety programme
26. Establishment of APHO/PHO

Programms Components:

To ensure long term sustainability of interventions, the programmes would be built within existing public health sector and wherever feasible introduce public private partnership models. To ensure universal coverage including rural population and underprivileged urban poor, the schemes will be implemented through Public Sector Health System. Following will be major components of NCD programmes:

1. Primary Health Care: Health promotion, screening , basic medical care, home based care & referral system
2. Strengthening District Hospitals for diagnosis and management of NCDs including rehabilitation and palliative care: NCD Clinic, Intensive Care Unit, District Cancer Centre, Dialysis Facility, Geriatric Centre, Physiotherapy Centre, Mental Health Unit, Trauma & Burn Unit, strengthening of facilities for Orthopaedic, Oro-dental, Eye and ENT Departments, Tobacco Cessation Centre, Obesity Guidance Clinic.
3. Tertiary Care for advanced treatment of complicated cases, radiotherapy for cancer, cardiac emergency including cardiac surgery, neurosurgery, organ transplantation etc.
4. Emergency medical care and rapid referral system including Highway Trauma Centres and 108 EMS services
5. Health Promotion & Prevention: Legislation, Population based interventions, Behaviour Change Communication using mass media, mid-media and interpersonal counselling and public awareness programmes in different settings (Schools, Colleges, Work Places and Industry).

Facilities and functions at various levels are summarized below:

Facility	Development of Facilities	Key Functions for NCDs
Sub-centres	<ul style="list-style-type: none"> • Screening facility 	Health Promotion, Screening, Referral
PHCs	<ul style="list-style-type: none"> • Screening facility • Vision Centre 	Health Promotion, Screening, Follow-up, Referral
CHCs/Sub-district Hospitals	<ul style="list-style-type: none"> • NCD Clinic • Rehabilitation Unit 	Early Diagnosis, Home-based care, Managing common uncomplicated NCDs, Referral
District Hospital	<ul style="list-style-type: none"> • NCD Clinic, • Intensive Care Unit, • District Cancer Centre, • Dialysis Facility, • Geriatric Centre, • Physiotherapy Centre, • Mental Health Unit, • Trauma & Burn Unit, • Tobacco Cessation Centre • Obesity Guidance Clinic. • Strengthening of Orthopaedic, Oro-dental, Ophthalmology and ENT 	Early Diagnosis and Management of all NCDs except cancers requiring adiotherapy, complicated cases of renal diseases, cardiac cases requiring surgery, retinal diseases, NCDs requiring laser treatment, organ transplantations
Medical Colleges/ Tertiary level Institute	<ul style="list-style-type: none"> • Tertiary Cancer Centre • Cardiac Care Centre • Organ Transplant Facility • Nephrology, Endocrinology Neurology Department • Geriatric Department • Psychiatry Department • Glaucoma, Vetrioretinal Surgery • Burn/Trauma Department 	Comprehensive cancer treatment, cardiac care including cardiac surgery, neurosurgery, organ transplantation, tertiary level care for ENT, Ophthalmology, Geriatrics etc.

Coverage:

It is proposed to expand various schemes for NCDs to all 640 districts in a phased manner during the 12th Plan. To ensure convergence, common districts will be selected for all three major programmes. The schemes would be flexible to meet local requirements as there would be variation in prevalence and availability of existing health infrastructure. Districts will be selected for each year of the Plan based on selected parameters including disease burden and availability of HR and facilities but in consultation with the States. Program-wise coverage targets are given below:

S.No	Program Component	Coverage by March 2012	Target by March 2017
1	Cancer	100 Districts	All Districts
2	Blindness	All Districts	All Districts
3	Mental health	123 Districts	All Districts
4	IDD (Iodated Salt)	71% popn.	100% Population
5	Tobacco	42 Districts	All Districts
6	Highway Trauma Centres	243 Centres	Cover major highways & accident prone roads
7	Deafness	203 Districts	All Districts
8	Fluorosis	100 Districts	All 230 Endemic Districts
9	Oral Health	25 Districts	All Districts
10	Diabetes, CVD, Stroke	100 Districts	All Districts
11	Health Care of Elderly	100 Districts	All Districts
12	Burn Injuries	6 Districts	All Districts
13	Upgradation of PMR	28 Med.Col.	All Govt. medical colleges
14	Disaster Response	New	Cover 22 vulnerable States
15	Organ & Tissue Transplant	New	11 OPDO & Biomaterial centres
16	Health Promotion	New	National Institute for Health Promotion & CCD
17	Patient Safety Program	New	All Districts
18	Airport/Port Health Office	New	All Intl. Airports, Ports and Land Borders covered
19	Epilepsy	New	All districts
20	Thalassemia, Sickle Cell Disease and Hemophilia	New	Pilot in selected endemic districts

Expected Outcomes:

The programmes and interventions would establish a comprehensive sustainable system for reducing rapid rise of NCDs, disability as well as deaths due to NCDs. Broadly, following outcomes are expected at the end of the 12th Plan:

- ✓ Early detection and timely treatment leading to increase in cure rate and survival
- ✓ Reduction in exposure to risk factors, life style changes leading to reduction in NCDs
- ✓ Improved mental health and better quality of life
- ✓ Reduction in prevalence of physical disabilities including blindness and deafness
- ✓ Providing user friendly health services to the elderly population of the country
- ✓ Reduction in deaths and disability due to trauma, burns and disasters
- ✓ Reduction in out-of-pocket expenditure on management of NCDs and thereby preventing catastrophic implication on affected individual and families

Details of each programme are given below:

A. PROGRAMMES FOR PREVENTION & CONTROL OF CHRONIC DISEASES:

1. Cancer

Cancer pattern is varied in different parts of the country with increasing urbanization, sedentary habits & life style behavior it is becoming a major life style problem. At this juncture the country is equipped with only 450 radiotherapy machines in 250 institutes, where as the requirement is 1160 (1 per million population). The experts felt that Cancer should be a notifiable disease for the whole country like the State of West Bengal.

It is essential that at all levels of the health facilities there is availability and accessibility of facilities for prevention, early detection, diagnosis, treatment and follow up of common cancers. The common cancers namely Oral, breast & cervix cancers can be easily prevented and detected early with simple measures and appropriated training of health professionals. Awareness generation on early warning signals, risk factors will help reduce at least 1/3rd of the common cancers. Regular Oral Clinical/ Self/ Examination for prevention of Oral Cancers, regular Physical examination of the breasts for Breast Cancers and r will help in reducing the morbidity on common cancers.

At this juncture emphasis on availability of HPV vaccine at district level may not be required as simple advice on personal hygiene and early symptoms of Cervix Cancer and training of Health worker in VIA techniques will help in prevention & early detection of cervix cancers. Health promotion & life style changes will help in reducing NCDs including cancers. Palliative care is an important and essential part of cancer care therapy, at least 10% of the budget need to be earmarked for these services at level of cancer care services. For availability of health professionals at the districts it may be made mandatory that there be 1 year posting at district hospitals after completion of the courses in Oncology in Medical/Surgical/Radiotherapy/Medical Physicist after which the degrees would be provided.

For radiotherapy, Linear Accelerator requires higher maintenance compared to Cobalt machine and the down time of Cobalt machines is much lower than a Linear accelerator, so Cobalt machine is preferred. It is essential that at the tertiary level for Radiotherapy there should be at least the three: a Cobalt, a High Density Radiotherapy & a Treatment Planning System. In addition to these three any other radiotherapy equipment may be sought according to the requirements. Where feasible Linear Accelerator may be sought.

The District cancer services will be expanded to all 640 Districts. 100 Tertiary Cancer Centres will be strengthened in Govt. Medical Colleges & NGO Institutions Hospitals for comprehensive cancer care services across the country, 20 State Cancer Institutes will be established for all specialized cancer services, Training of specialists & Research during the 12th plan period. Support will be provided for 3 National Cancer Institutes including Chittaranjan National Cancer Institute (CNCI). The National Cancer Registry will be expanded to all Tertiary Cancer centres

and cancer institutions. At all levels of health facilities provision is being kept for palliative care services including provision specific beds, training and development of required manpower for these services.

- a. **Cancer Services at District Hospitals:** At present the programme is being implemented in 100 districts across 21 States. The programme will be expanded to all the 640 districts in the country. Under this scheme, District Cancer Centre will be established at the selected districts to provide common diagnostic services, basic surgery, chemotherapy and palliative care. District Surgeon, Physicians, Gynaecologist will be trained in management most of the common cancers including palliative care. In addition to the existing manpower support is provided for contractual staff.

District hospital is being strengthened for prevention, early detection and management of common cancers especially oral cancer, breast cancer & cervix cancer. Nurse/Health worker will be trained in awareness generation on early warning signals of cancers, Oral self examination, Physical examination of breasts and VIA techniques for cervix cancer. Nurses will be given special training in Stoma care. For diagnosis of Cervix Cancer, white light source will be used as recommended by TMH. It is hand held device that works on regular 220V AC electricity with a bakelite casing for halogen bulbs for shadow free illumination of the cervix.

For palliative care there will be dedicated 4 beds at the district hospital. Doctors, Nurses & Health worker will be trained in basic palliative care. One of the doctors in the District hospital need to have a 2 weeks training in palliative care. Along with the local NGOs home care programme will be organized to empower the patient and their families. Necessary medicines including Oral morphine should be made available in the District by amendment of State regulations. Support will be provided for Chemotherapy drugs required for cancer patients in addition to support for a Day care Chemotherapy facility for patients on chemotherapy regimens. Laboratory investigations which are not available at the districts can be outsourced. A home base team consisting of nurse and counsellor (from DCS) would be trained in chronic, debilitating and progressive cancer patients.

Support would be given for

- White Light Source (bakelite casing with halogen bulbs)
- Manpower: 1 Medical Oncologist, 1 Cytopathologist, 1 Cytopathology technician, 2 Nurses for Day care
- Day care Chemotherapy facilities (4 beds)
- Chemotherapy drugs patients @ Rs. 1 lakh per patient for 100 patients/ year/ district
- Outsourcing of Laboratory investigation including Mammography
- Miscellaneous activities including TA/DA, home based palliative care

- b. **Tertiary Cancer Centres (TCC) Scheme:** Support will be given for 100 Govt. Medical Colleges/ NGO Institutions/erstwhile RCCs or institutes supported under Oncology wing scheme to be strengthened as Tertiary Cancer Centres across the country to provide comprehensive cancer care services. The institute/ hospital should have at least 100 general beds or should be 50 bedded exclusively cancer hospital with three years of experience in cancer treatment. There could be exemptions made for hilly/ difficult areas/ NE states and in States where there are no cancer treatment facilities. The TCC should be well within 300 km of identified districts under NPCDCS. The institute should have well equipped and functional departments of Medicine, Surgery, Gynecology & Obstetrics, ENT, Anesthesia, Pathology and Radiology. These departments can be part of the institute or part of hospital attached with a Government Medical College in near vicinity in the same city which has entered into a formal understanding with TCC.

These institutes will be supported with a capital grant for construction, equipments related to cancer care services including palliative care & pathology services. Support will also be given for Human Resource development, drugs, consumables etc as a recurring amount. These institutes will have a Palliative Care unit with at least 4 in- patient beds and 2 beds in Day care for palliative care. There will be dedicated staffs in the palliative care unit: 2 Doctors, 6 nurses, a part time Pharmacist & a part time Physiotherapist. There will be OPD services for palliative care, 3 days per week and home care facilities. At least 10% of the total budget for TCC will be for Palliative care services including availability of opioids drugs e.g oral morphine. These centres will also ensure availability of opioids drugs including oral morphine in the district centres.

The TCC will give an undertaking to ensure generation of cancer care health professionals by the 3rd year (2014-15) of the 12th five Year Plan. They shall initiate/increase courses in MD/MS/Mch/DM (Surgical oncology, Medical Oncology, Radiotherapist, Palliative Care, Diploma courses in Palliative Medicine, Pathologist, Medical Physicists etc.). They shall initiate/increase courses in Oncology Nursing and Diploma courses in Palliative Nursing. They should function as institutes to generate cyto-technicians, cyto-pathologists and other paramedicals for cancer care services.

These centres will be referral centres for the District Hospitals and provide comprehensive cancer care services. These institutes will also be training and research centres for cancer care. The TCCs will coordinate with other institutions, NGOs, medical colleges and the general health care delivery infrastructure in conduction of cancer related activities including peripheral outreach services in their respective geographical areas/ region.

- c. **State Cancer Institutes (SCI):** Support will be given to 20 centres in the country to function as Centres of Excellence. These centres will be state-of-the-art treatment centre for different cancers including site specific specialties, minimal access surgery, multidisciplinary groups and Oncology Nursing care for better delivery of treatment, better outcome results and optimum use of resources.

The institute/ hospital should have at least 150 general beds or should be 100 bedded exclusively cancer hospital with three years of experience in cancer treatment. The institute should have well equipped and functional departments of Medical Oncology, Radiation Oncology, Surgical Oncology and supportive departments of Medicine, Surgery, Gynecology & Obstetrics, ENT, Anesthesia, Pathology and Radiology. The erstwhile Government RCCs/TCCs may be upgraded to State Cancer Institutes.

Like the TCCs these institutes will also have a dedicated Palliative Unit with 10 beds, 4 day care beds, dedicated staff (3 doctors, 10 Nurses, 1 full time Pharmacist and Part time Physiotherapist) for palliative care services. The SCI will ensure availability of opioids drugs including oral morphine. These centres will also ensure availability of opioids drugs including oral morphine in the district centres. There will be OPD services for palliative care, 3 days per week and home care facilities. At least 10% of the total budget for SCI will be for Palliative care services.

These institutes will be supported with a capital grant for construction, equipments related to cancer care services including palliative care & pathology services. Support will also be given for Human Resource development, drugs, consumables etc as a recurring amount. The SCI will give an undertaking to ensure generation of cancer care health professionals by the 3rd year (2014-15) of the 12th five Year Plan. They shall initiate/increase courses in MD/MS/Mch/DM (Surgical oncology, Medical Oncology, Radiotherapist, Palliative Care, Diploma courses in Palliative Medicine, Pathologist, Medical Physicists etc.). They shall initiate/increase courses in Oncology Nursing and Diploma courses in Palliative Nursing. They should function as institutes to generate cyto-technicians, cyto-pathologists and other paramedicals for cancer care services.

These centres will be referral centres for the TCC/District Hospitals and provide specialized cancer care services. These institutes will also be training and research centres for cancer care. The SCIs will coordinate with other institutions, NGOs, medical colleges and the general health care delivery infrastructure in conduction of cancer related activities including peripheral outreach services in their respective geographical areas/ region.

- d. **National Cancer Institute (NCI):** Support will be given for 3 National Cancer Institute in the country one in the North, one in the South & one in the east of India. These will be apex centres for providing training, research and in generating quality manpower related to cancer care services.

NCI will be state of art research & referral which will have comprehensive cancer care facilities. The institute will have department in Medical Oncology, Surgical Oncology, Radiation Oncology, Rehabilitation & Palliative care centre. NCI will also have focus in Urooncology, Gastrointestinal Oncology, Gynaecological Oncology, Community Oncology, Nuclear Medicine, Cell & Tumor Biology, Cancer Immunology, Radiation research etc. Wherever necessary the Medical Social Worker will facilitate the treatment of cancer patients. There will be Bone Marrow transplant facilities for Leukemia, Lymphoma patients supported with blood transfusion. There will be supportive departments in Anaesthesia, Pathology, Microbiology, Biochemistry, Blood Bank etc. There will be enough scope for recreation/ spritual for all kinds of cancer patients from children to adults. To start with the NCI will have 300 beds with day care facilities and will be expanded to accommodate 500 beds.

The institutes will also have a dedicated Palliative Unit Department for training & research in palliative Care. There will be dedicated staff (5 doctors, 30 Nurses, 2 full time Pharmacist, 2 Physiotherapist, 4 Social workers and other supportive and administrative staff) for palliative care services. The NCI will ensure availability of opioids drugs including oral morphine. At least 10% of the total budget for NCI will be for Palliative care services.

There will be Administrative block, Research block, Academic block, OPD and other service blocks. There will also be facility for a 200 rooms budget hotel, a hyper market, basement parking, a pedestrian plaza. The institute will work in close association with the Tertiary Cancer Centres in the country.

The administration of NCI will be headed by Director who will be assisted by a Joint Director. There will be Medical Superintendent of the Hospital Block assisted with an Assistant Medical Superintendent. There will be a Administrative Officer, Accounts Officer along with other support staffs. Each clinical department will have a Professor assisted by Associate Professor and Assistant Professor. There will be Senior & Junior Residence too. There will be Chief Medical Officer, Medical Officer, Research Associates, Scientist, Veterinary Surgeon and Technical staffs at NCI. The Nursing Services will be headed by the Nursing Superintendent (NS) and assisted, Deputy Nursing Supdt (DNS) and Asst. Nursing Supdt (ANS). The ward duties will be carried out by the nursing sisters and the staff nurses.

The Nursing Council of India norms of staffing will be adhered while calculating manpower requirement for different nursing units.

Establishment of NCI will have comprehensive cancer care facilities in Surgical, Medical, Radiation and Community Oncology and Palliative care. The institute will have facilities for Research & Development, Training and Capacity Building. There will be research fellows in areas of Epidemiology, Biostatistics, Cell Biology, Molecular Biology, Genetics, Pathogenesis, Cancer Screening etc. The institute will also have course on Oncology Nursing. The institute will be good source of quality manpower in cancer research. There will be 1-2 research fellowship per year in the different areas related to cancer research totaling to 8-10 per year.

In view of the status of the institute as an apex centre for referral and research, the most sophisticated, state of the art instruments will be procured for both the research and clinical divisions. These institutes will be supported with a capital grant for construction, equipments related to cancer care services including palliative care & pathology services. Support will also be given for Human Resource development, drugs, consumables etc as a recurring amount.

National Cancer Institutes will give an undertaking to ensure generation of cancer care health professionals by the 3rd year (2014-15) of the 12th five Year Plan. They shall initiate/increase courses in MD/MS/Mch/DM (Surgical oncology, Medical Oncology, Radiotherapist, Palliative Care, Diploma courses in Palliative Medicine, Pathologist, Medical Physicists etc.). They shall initiate/increase courses in Oncology Nursing and Diploma courses in Palliative Nursing. They should function as institutes to generate cyto-technicians, cyto-pathologists and other paramedicals for cancer care services. These centres will be referral centres for research and treatment and provide specialized cancer care services.

Chittaranjan National Cancer Institute (CNCI) is an autonomous organisation jointly funded by Government of India and the Government of West Bengal. Support will be given for the existing institute to be up gradated and for a 2nd campus hospital to accommodate the increasing patient load. This will be the NCI for the east of India. There will be one established in the North & South of India.

- e. **Human Resource Development:** Training will be provided at Tertiary Cancer Centers/ State Cancer Institute for the health professionals for cancer care services. (District Surgeons/Physicians/Gynecologists, District Radiotherapist, Medical Physicist and Cyto-pathologist/Cyto-technician).

- f. **Monitoring & Supervision:** Monitoring and supervision of the programme will be carried out at different levels through NCD cell through reports from the state, regular visits to the field and periodic review meetings. State and District NCD cell will be established at the selected States/ Districts for monitoring programme implementation.
- g. **National Cancer Registry Programme & Research:** At present Population based cancer registry is present only in 23 institutes mostly in the urban area. The programme will be expanded to all TCCs and Cancer Treatment Institutes in the country for having a data base for cancer cases in the country including rural areas. Support would be provided for research activities related to cancer including surveillance.
- h. **IEC activities:** Awareness generation about cancer will be done in the community through Inter Personal Communication, education, mass media etc.

2. Diabetes, CVD & Stroke

At present the programme is being implemented in 100 districts across 21 States. The working group recommended that each of the health facility should be strengthened for prevention, early detection and management of Diabetes, Cardiovascular Disease and Stroke (DCS). The staff in these facilities will be trained to handle these diseases. Each of these facilities will have a generic drug list for management of these diseases. A standard regimen would be followed to handle each stage of these diseases. The programme will be expanded to all the 640 districts in the country.

- a. **District Hospital up-gradation:** District hospital is being strengthened /upgraded for management of Diabetes, Cardiovascular Disease and Stroke (DCS). Health professionals will be trained in awareness generation on early symptoms, screening of and home based care of these diseases. All districts will have NCD clinic on a daily basis for screening, counseling and awareness generation about DCS.

Each district hospital will have a 4 to 10 bedded multi Purpose Medical Intensive Care & Stroke Unit (ICSU). There will be 2 beds dedicated for stroke patients. These beds will also be utilized for patients of COPD and elderly with NCD problems. In addition to the existing staff support is given for contractual manpower. The District Physician will be trained in management of DCS. The Specialist proposed on contractual can be either a full time or visiting specialist according to the availability. Under the NPHE, there are 2 Consultants on contractual; their services also could be utilized for NCD services. One of the consultants may be MBBS trained in PMR whose services can be utilized for rehabilitative services of NCD patients.

The nurses will be trained in management of DCS and Special training will be given for Nurse in the ICSU. Health workers will be trained in awareness generation on early symptoms of these diseases, screening of diabetes & hypertension and home based care. The districts will be supported with certain essential drug list including TPA for Stroke patients. All districts will have support for a CT scan through PPP mode. Under this scheme support will be given for:

- NCD Clinic for screening, diagnosis and management of DCS.
- Opportunistic Screening for diabetes and high blood pressure to all persons above 30 years including pregnant women of all age groups.
- Developing/Strengthening and equipping Multipurpose Intensive Care & Stroke Unit (ICSU).
- Strengthening/Outsourcing of Laboratory investigations which are not available at the districts

- Availability of life saving drugs @ Rs. 50000/month
- Transport of Referred/Serious patients
- IEC activities
- Home based care for bed ridden cases.
- Contractual Manpower (Specialist-1, Nurses-3, Physiotherapist-1, Counselors-1, DEO-1 & Care Coordinators-1)
- Training of health professionals.
- Miscellaneous cost for communication, TA/DA, POL, contingency etc.

b. **District NCD programme:** The health facilities below the districts will be supported for prevention, early detection and management of DCS.

- **Community Health Centres (CHCs):** NCD clinic will be set up at CHCs for diagnosis and management of Cardiovascular Diseases (CVD), Diabetes & Stroke. Opportunistic Screening will be done for diabetes and high blood pressure to all persons above 30 years including pregnant women of all age groups. Strengthening/Outsourcing of Laboratory investigations which are not available at the districts. Each CHC will be supported with contractual staff (1 Doctor, 2 Nurses, 1 Counselor and 1 DEO) and will be trained for management of DCS. Home based care will be for bed ridden cases. The services of the Rehabilitation worker under NPHCE will be utilized for rehabilitating the DCS & COPD patients. Support is also being provided for transport of referral cases, IEC activities, consumables etc. Essential drugs required for DCS will be made available at each of these CHCs.
- **Primary Health Centres (PHCs):** Opportunistic Screening will be done for diabetes and high blood pressure to all persons above 30 years including pregnant women of all age groups. Each PHC will be provided with Glucometer for screening of Diabetic patients. Doctors, Nurses & health workers will be trained for management of DCS. Support is provided for strengthening/outsourcing of laboratory investigations not available at these PHCs. Home based care will be for bed ridden cases. Support is also being provided for transport of referral cases, IEC activities, consumables etc. Essential drugs required for DCS will be made available at each of these PHCs.
- **Sub Centres (SCs):** Opportunistic Screening will be done for diabetes and high blood pressure to all persons above 30 years including pregnant women of all age groups. Each SC will be provided with Glucometer for screening of Diabetic patients. Health workers will be trained for management and prompt referral of DCS. Home based care will be for bed ridden cases. Support is also being provided for transport of referral cases, IEC activities, consumables etc. Essential drugs required for DCS will be made available at each of these SCs.

c. **District Dialysis Facility:** Support will be given for Dialysis Facility at districts through PPP mode.

d. Strengthening of Medical Colleges:

It is proposed to strengthen Government Medical colleges all over the country to provide specialized tertiary care facilities in NCDs and also to work as resource centre for training and Research. Each medical college will be assessed for existing infrastructure, human resources and facilities to identify gaps for support under the programme. Each medical college will be supported for essential equipments and facilities required for investigations and management of NCDs. Capacity will be built to provide high quality services for Cardiology, Nephrology and Neurology.

The state/UT shall develop a clear cut referral protocol for cases needing further referral from the district hospital level to tertiary care level. Each medical college will be linked with districts in its catchment area for providing following services:

- i. High Quality Tertiary Care: Medical Colleges shall provide quality services for key NCDs including diabetes, heart diseases, stroke and complications including due to these diseases through OPD services, acute and chronic care and other specialized interventions including surgery etc.
- ii. Training: Medical colleges shall serve as resource centres for undertaking training of State/District level officials on various aspects of the NCDs. Detailed training strategy, containing training module for all health functionaries at all levels shall be developed and shared with the states for implementation through state training centers/ nodal training centers and selected medical colleges.
- iii. Research: shall participate in the Operational research on various aspects of programme implementation and management and also in academic research on the underlying patho-physiology of diabetes, heart disease and stroke and the effectiveness of prevention interventions which will enhance the evidence base for the development of effective program and services. Research on sleep disorders and its linkages with the NCD's would also be encouraged Medical colleges shall submit research proposals through State level committee.
- iv. Monitoring & Evaluation: Selected medical colleges will be involved in monitoring, Disease Registry and evaluation studies to assess effectiveness of the programme.

For budgetary purpose, an average capital grant of Rs. 3 crore and recurring grant of Rs. 1 crore per year for human resources, training, consumables and maintenance is proposed for support to Medical Colleges.

- e. **Monitoring & Supervision:** Monitoring and supervision of the programme will be carried out at different levels through NCD cell through reports from the state, regular visits to the field and periodic review meetings. National, State and District NCD cell will be established for monitoring programme implementation.
- f. **Human Resource Development:** Training will be provided for the health professionals in the various health facilities for management of Diabetes, Cardiovascular Disease and Stroke (DCS). Home carer's should also be given training for care of the bedridden patients. The staff of 108 ambulance established in various parts of the country should also be trained in Stroke management. Medical colleges would be encouraged to conduct courses on Community Diabetology & Cardiology for generation of trained manpower.
- g. **Surveillance & Research:** Support will be given for surveillance & research on NCDs. Emphasis should be given on research on programme outcomes.
- h. **IEC activities:** Awareness generation about Diabetes, Cardiovascular Disease and Stroke (DCS) & Health promotion will be done in the community through Inter Personal Communication, education, mass media etc.

3. Chronic Obstructive Pulmonary Disease (COPD)

COPD is of great public health importance, because it is largely preventable if identified in the early stages and treated properly. In the initial stages, no abnormal signs are seen. If not detected and attended to with proper medication, deterioration slowly sets in as it progresses into the moderate form with breathlessness and/or wheezing on moderate exertion. The disease is gradually progressive with each episode of exacerbation leading to further respiratory disability and, ultimately, death¹⁰.

A strong association exists between tobacco smoking and the occurrence of COPD. In 80% of the cases tobacco smoking is responsible for COPD³⁷. Tobacco use being a major preventable cause of premature death and disease. Bringing in behavioral change and life style changes will reduce the mortality and morbidity of NCDs including COPD.

The clinical course of COPD is characterized by a variable number of acute exacerbations which may be rather frequent. Each exacerbation may also result in structural alterations contributing to the irreversibility of airway obstruction causing an increase in respiratory and systemic morbidity, increased rate of lung function decline, systemic effects and premature mortality. Though no disease modifying drug is available as yet, early and comprehensive management with antibiotics, anti-inflammatory drugs and other supportive drugs may help in reducing morbidity and mortality of an acute exacerbation,. Therefore, emphasis is placed on primary and secondary prevention especially by reducing smoking and other noxious exposures³⁷.

Capacity building of peripheral health workers/providers for detection of mild cases of COPD and initiation of basic treatment with inexpensive drugs would go a long way in early detection and prevent disease progression to moderate and severe forms. Despite the lack of reversibility of the disease, patients often report symptomatic improvement with medication¹⁰.

The key aims of COPD treatment are to improve quality of life, increase the capacity for exercise and ultimately, reduce morbidity and mortality for COPD patients. The Global Initiative for Chronic Obstructive Lung Disease (GOLD), a collaborative project of the World Health Organisation and the National Heart, Lung and Blood Institute (USA), has developed the GOLD Guidelines which aim to:

- Relieve symptoms;
- Prevent disease progression;
- Improve exercise tolerance and health status;
- Prevent and treat complications;
- Prevent and treat exacerbations; and
- Reduce mortality.

Proposed Programme Objectives of COPD control program:

- a. To prevent and control COPD through behaviour and life style changes.
- b. To provide early diagnosis and management of COPD.
- c. To build capacity at various levels of health care for prevention, diagnosis and treatment of COPD.
- d. To train human resource within the public health setup viz doctors, paramedics and nursing staff to manage COPD and
- e. To establish and develop capacity for rehabilitative care.

Components of COPD control program

Community Awareness through IEC about smoking, biomass fuel exposure and its association with COPD for early detection and initiation of treatment.

Capacity building of PHC for early diagnosis of mild to moderate of COPD. Appropriate referrals of severe cases to District Hospitals/ Medical Colleges. Support for:

- Pulse oximeter (portable) – 1 and funds for consumables (batteries etc.).
- Training of Health Worker for prevention, early diagnosis & management and prompt referral of COPD cases.
- Treatment of mild to moderate of COPD cases.
- Training in Pulmonary Rehabilitation (breathing exercise, Yoga etc.)
- Referral services.
- IEC on cessation of smoking and use of biomass fuel exposure

Capacity building of CHC for early diagnosis of mild to moderate of COPD. Appropriate referrals of severe cases to District Hospitals/ Medical Colleges. Support for:

- Financial assistance for
 - Spirometry-1
 - Pulse oximeter Hospital model-1
 - Pulse oximeter (portable) - 1
 - Nebulizer – 1
 - Non-invasive ventilator- 1
 - Miscellaneous amount for drugs, consumables (batteries etc.).
- Training of Health Worker for prevention, early diagnosis & management and prompt referral of COPD cases.
- Treatment of mild to moderate of COPD cases.
- Training in Pulmonary Rehabilitation (breathing exercise, Yoga etc.)
- Training of ECG technician in Spirometry
- Referral services.

- IEC on cessation of smoking and use of biomass fuel exposure

Capacity building & strengthening of District Hospital:

- Financial assistance for
 - Spirometry-1
 - Pulse oximeter Hospital model-1
 - Pulse oximeter (portable) - 1
 - Nebulizer – 1
 - Non-invasive ventilator- 1
 - Invasive Ventilator - 1
 - Miscellaneous amount for drugs including vaccination for Pneumococcal & Influenza, consumables (batteries etc.).
- Training of Doctors, Nurses & Health Worker for early diagnosis of COPD
- Treatment of COPD.
- Laboratory Investigations/ Outsourcing
- Pulmonary Rehabilitation (breathing exercise, Yoga etc.)
- IEC on cessation of smoking and use of biomass fuel exposure.

Human Resource Development: Training of the various health professionals for management of COPD at the different health facilities. (District/ CHC/PHC/SC).

4. Chronic Kidney Disease (CKD)

Central to any plan to reduce the impact of NCDs is definition of the specific diseases to be targeted. The WHO plan for NCDs focuses on diabetes, cardiovascular disease (CVD) including hypertension, cancer and pulmonary disease. Although chronic kidney disease (CKD) is not currently identified as one of those targets, there is compelling evidence that CKD is not only common, harmful and treatable but also a major contributing factor to the incidence and outcomes of at least three of these diseases targeted by WHO (diabetes, hypertension and CVD). CKD strongly predisposes to hypertension and CVD; diabetes, hypertension and CVD are all major causes of CKD; and major risk factors for diabetes, hypertension and CVD (such as obesity and smoking) also cause or exacerbate CKD. In addition, among people with diabetes, hypertension, or CVD, the subset who also have CKD are at highest risk of adverse outcomes and high health care costs. Thus, CKD, diabetes and cardiovascular disease are closely associated conditions that often coexist; share common risk factors and treatments; and would benefit from a coordinated global approach to prevention and control.

Justification:

Prevention and management of CKS should be included as an integral part of programmes to prevent and control NCDs due to following reasons:

i. CKD is common in India

CKD is classified into stages 1-5, with stages 1 and 2 requiring the presence of kidney damage such as proteinuria as well as reduced GFR¹¹³. Many authors now refer to “moderate”, or clinically significant, CKD as stage 3 (GFR <30-59 ml/min) and 4 (GFR 15-29 ml/min) with <60 ml/min chosen as a cutoff because it represents loss of about 50% of normal renal function, although there is now ample evidence of increased risk in earlier stages¹¹⁴. The role of proteinuria as well as GFR measurements in assessing CKD is particularly important since people with Stage 1-2 CKD and proteinuria have worse outcomes than people with stage 3 and no proteinuria, and development of both ESRD and CVD are predicted much more accurately by proteinuria measurements than by GFR. The leading causes of CKD in India are diabetes (30%) and hypertension (20%)¹¹⁴. Given projected increases in the prevalence of major risk factors for CKD (diabetes, hypertension and CVD), the prevalence of CKD in developing countries is expected to dramatically increase over the next two decades.

ii. CKD is harmful and expensive to manage

It is now well established that only a small minority of people with CKD will develop ESRD, due to the competing risk of accelerated atherosclerosis. A much greater problem is now well-documented 8-10 fold increase in CVD mortality in CKD populations, thus strongly linking CKD to cardiovascular disease (CVD), the second and largest target in the WHO Plan^{13, 115}.

Further, the most obvious societal effect of CKD is the enormous financial cost and loss of productivity associated with ESRD.

It is also well known that CKD is associated with extremely high morbidity and mortality even in its earlier stages¹¹⁶. Mortality for ESRD patients is 10 to 100 times greater than in age-matched controls with normal kidney function. This situation is even worse in India as ESRD constitutes a ‘death sentence’ since RRT is often unavailable or unaffordable. Nearly 1 million people die with ESRD each year in developing nations¹¹⁷. At the individual level, CKD affects all facets of health; physical (increased burden of CVD morbidity & mortality) and social (low quality of life, decreased productivity and job losses, family pressures and mental disorders)¹¹⁸.

iii. CKD is treatable

In the last decades, ample evidence from clinical trials and meta-analyses have shown the efficacy of several management options for CKD to reduce risk of progression to ESRD and to lower CVD risk¹¹⁹. These treatments are based on the control of its established modifiable risk factors. Control of proteinuria with inhibitors of the renin-angiotensin system is highly effective for slowing the progression of diabetic and non-diabetic CKD.

iv. CKD disproportionately affects the poor

In addition to the well-documented relationships linking poverty with hypertension, diabetes and CVD, low socioeconomic status is also associated with CKD. Sadly, CKD already disproportionately affects the poor and the socially disadvantaged – a situation that is expected to worsen over the coming decades.

v. Awareness of CKD is low

As with many NCDs, awareness of CKD is also low, generally <20%, even at more advanced stages. Awareness rates among those with CKD stages 3 or 4 is higher if co-morbid diagnoses of diabetes and hypertension were present, but even then they are quite low (20% and 12%, respectively). Awareness of CKD in developing nations including India is markedly lower, which probably serves as a barrier to accessing appropriate care even where available.

vi. CKD dramatically increases the risk of adverse outcomes among people with other NCDs

The majority of patients with CKD have diabetes, hypertension, and/or CVD¹²⁰. Just as costs are highest among people with CKD superimposed on other chronic diseases, the presence of CKD (reduced eGFR or proteinuria) identifies the subset of people with diabetes, hypertension, or CVD who are at the highest risk of adverse outcomes but are least likely to receive appropriate treatment. Therefore, where resources are limited in countries like India, the presence of CKD could be used to identify people with diabetes, hypertension and/or CVD in which intervention might be most beneficial and economically attractive.

Thus, CKD meets accepted criteria for a major public health problem¹²¹, based on the tremendous burden of death and disability that it causes, its inequitable distribution among the poor, and the existence of effective and affordable treatments that are not available to a large proportion of those affected. It is closely linked to other major NCDs recognized by WHO such as diabetes, hypertension and CVD – but which independently increases the likelihood of adverse outcomes and high health care costs, suggesting that it can be used to identify the highest risk subset of patients, who may benefit most from treatment. Further, optimal management of these other NCDs may require modification when CKD is also present.

The rationale for including CKD in the strategy for NCDs

1. Measuring GFR and albuminuria in populations at risk for NCDs would meaningfully enhance risk prediction
2. Measuring GFR and albuminuria in populations at risk for NCDs is practical and inexpensive
3. Targeted population-based screening for CKD using dipstick urinalysis and GFR testing appears to be cost effective
4. Identification of CKD would change management of NCDs and improve outcomes
5. Health systems of developed countries have already learned a great deal about how to identify and treat CKD
6. Health systems of developing countries are already scaling up efforts to identify and treat CKD
7. Existing efforts to raise awareness about CKD will also raise awareness of the NCD epidemic

Action plan for the Future

It is ironic that many government programs that reimburse the enormous cost of Renal Replacement Therapy often provide little or no incentive to conduct inexpensive early detection and prevention programs that have the potential to reduce those costs in the future. There is strong evidence supporting the detection and treatment of CKD as a key component of the NCD strategy. The major benefits will occur in individuals at high risk and in developing countries like India. Simple and inexpensive measurements of GFR and proteinuria can be used for case-finding, especially in high-risk populations including people over 55 and those with diabetes, hypertension, cardiovascular disease and a family history of kidney disease. Inexpensive, cost-effective interventions are available to treat individuals found to have CKD, to target reductions in proteinuria, and to control traditional CVD risk factors. Such interventions will reduce the risk of both ESRD and CVD.

The general steps necessary to accomplish these goals are outlined in the WHO 2008-2013 Action Plan for the Prevention and Control of Non-communicable Diseases. Initiatives to optimize early detection and prevention of CKD should be included in such plans if their impact

is to be fully realized. Doing so will reduce the burden of ESRD and early mortality in CKD patients– and thereby improve health to the maximum extent possible.

Objectives & Strategies

Based on experience of existing programme and WHO guidelines, the programme will focus on following four areas:

1. Assessing the magnitude of CKD in India
2. Increasing awareness about CKD
3. Screening for CKD in high risk population and its management
4. Increasing dialysis facilities for patients of ESRD

The **objectives** of the programme are:

1. To establish the database of CKD in India
2. To promote screening for CKD in high risk population
3. To assess the impact of management on CKD progression, morbidity and mortality
4. To compare the effect of generic drugs with branded on retardation of CKD progression
5. To establish the database of dialysis facilities in India
6. To train required manpower for dialysis facilities in India
7. To establish newer standalone dialysis facilities in India
8. To standardize the dialysis care in India
9. To monitor and audit CKD care and dialysis facilities in India

Following strategies would be adopted:-

1. Assessing the magnitude of CKD in India
2. Enhancing the CKD awareness in community
3. Increasing the CKD screening through change in attitude and approach
4. Building up human resource - Training of required manpower for screening of CKD in high risk and dialysis program
5. Assessing the impact of CKD on other NCDs

Activities

National and regional workshops on issue of CKD and its prevention along with dialysis would be carried out with purpose of advocacy in community. Steps would be taken to make provision for diagnostic tests at affordable and subsidized cost to CKD patients in the public sector health care delivery system. Financial assistance for drugs including erythropoietin has also been kept separately. Rastriya Arogya Nidhi (RAN) would be modified to make provision for dialysis in private centres and financial assistance on regular basis. A CKD registry would be initiated. Collaboration with National Board of Examinations & IGNOU would be done for various training programs. Training would be required in the field of dialysis.

Main activities under the programme are given below:

1. Developing IEC material and organize information campaign for CKD and dialysis
2. Screening for CKD in high risk groups like diabetes, hypertension, patients with family history of kidney disease, persons above 65 years and patients presenting with complaints related to kidney diseases
3. Development of system to make available diagnostic tests and drugs free to persons with BPL category and at affordable cost to others
4. Establishing dialysis facilities in each district hospital
5. Strengthening of existing dialysis facilities in Government sector
6. Establishing CKD registry with an aim to assess need, morbidity and mortality in CKD and impact of CKD on other NCDs
7. Developing network with organ transplant centre (level I - III) for increasing the organs transplant
8. Networking of the dialysis centers throughout country
9. Improving the standard of dialysis and auditing its delivery system to patients
10. Training dialysis physician and dialysis technician through a structured programme.
11. To undertake activities related to policy/programme correction as & when required.

Components

1. Scheme for promotion of awareness for CKD
2. Financial assistance to institutions for diagnostic tests to be made available to patients with CKD and patients on dialysis
3. Financial assistance for drugs to CKD patients of various stages
4. Build up networking of hospitals at Level I-III and different dialysis unit to state and national office
5. Develop a manpower training program for dialysis physician and dialysis technician
6. CKD and dialysis surveillance system through CKD and dialysis registry

Training Plan

Training of personnel (Human Resource Development) is an important aspect for the success of the program. There are mainly two aspects (i) increasing the opportunities for training programs for different categories and (ii) training the existing personnel for skill in the area of dialysis. Training would be required in the field of Dialysis for the following:

1. Dialysis physician
2. Dialysis Nurse/ Technician

IEC Activities

Awareness is required for prevention of CKDs. Despite the 1.23 billion-population size and high incidence of ESRD, India is yet to make any major headway in the government run dialysis

program and CKD prevention program in the country. It is necessary to improve awareness about the CKD and its prevention so that requirement of dialysis can be decreased along with decreased morbidity and mortality of patients with CKD.

1. National and district level IEC would be done through TV/Radio/Print media. Website would also be created for mass scale information about factors causing CKD, its clinical features, its impact on other NCDs and its effect on morbidity and mortality of patients. This should be part of other common NCD program. The main thrust of IEC would be to change the attitude of public about various NCDs along with CKD. Details would be worked out separately.
2. Some state level units would be asked to carry out State level IEC. Dissemination of information about CKD prevention and success of dialysis would also be done.
3. Various workshops would be held all over India. An estimate amount of Rs. 5 Lakhs for each workshop is required. Rs. 50 Lakhs needs to be allocated for this purpose for first year.

Promotion of Care for CKD and Dialysis

- Mass Media Campaign for creating awareness of CKD and approach to its prevention
- Engage the support of various nephrology associations, medical associations etc for making this awareness
- Organize discussions on TV & Radio channels
- Lobby with NCERT and CBSE for a small reference to CKD in the curriculum
- Lobby with MCI for reasonable reference to CKD in undergraduate curriculum
- Success stories for patients who are maintained on dialysis for years

Expected Outcome

1. Awareness in public about prevention of CKD and its prevention
2. Early detection and management of CKD accessible and affordable to the public.
3. New Dialysis units established and older ones strengthened (At least some centers in each metro)
4. Rate of dialysis acceptance at least 100 pmp at the end of 12th five year plan
5. Quality of dialysis good and uniform throughout country
6. Networking of the dialysis centers
7. Training of personnel in dialysis
8. Affordable drugs for management of CKD and dialysis

India with its vast population and increasing percentage of end stage organ disease (ESOD) due to high prevalence of NCDs has to adopt two-pronged strategy for management of ESOD, especially end stage kidney disease. On one hand, it should build up capacity for reduction of

ESOD, on the other end; it should build up a system for management of ESOD. While former will need lifestyle modification, behavioral changes, improved information campaign etc. through various NCD prevention and control programs being implemented separately; later will need capacity building for renal dialysis, organ retrieval and transplantation. Deceased Organ Retrieval as well as living donors' promotion is going to be main area for improving supply. More transplant centre, dialysis centre, transplant surgeons and nurse will build up the capacity of improved services. Free or subsidized diagnostic services & immunosuppressive drug supply will ensure better outcome of transplant services.

India is also taking steps towards managing its population burden of diseases contributing to end-stage organ failure. Despite limited budgetary support for public health, several comprehensive prevention initiatives have been implemented. Examples include the National Rural Health Mission and the National Program for Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke, which is going to include CKD also. Additional initiatives include an integrated disease surveillance program, introduction of universal HBV vaccination, a tobacco law and program initiative and a national alcohol policy. Inter-sectoral health promotion efforts will also contribute to decreasing the burden of these diseases.

Activity-wise physical targets for key indicators on coverage, output and outcomes

Availability of Dialysis services	100 Districts or 1/6 th of population
Free services to poor & needy	35% of population
Prevention of Kidney disease	Integrated with the NPCDCS Program
Early detection of kidney disease	Integrated with the NPCDCS Program
Human Resource	Training of Dialysis Physicians course through IGNOU; annual production 50 trainees per year
	Increase in the seats of DNB & DM Nephrology

Output – Availability of Dialysis facilities

Outcome – Maintenance of patients on dialysis till transplant is done

National Program for Prevention and Control of Cancer, CVD, Diabetes & Stroke is establishing vertical structure for implementation and monitoring of the NCDs. There would be National, State and District cells for administrative functions while there would be NCD clinics at District Hospitals & Community Health Centres (CHCs) for clinical functions including early detection and treatment. It would be difficult to create parallel structure for all NCDs separately and it is proposed that interventions for kidney patients would be done through these mechanisms at all levels. The allocation of budget proposed for NPCDCS appears to be sufficient and it would cater for Kidney investigations, drugs and other common interventions.

It is recommended that Kidney should be included besides cancer, Diabetes, CVD & Stroke in the name of the program NPCDCS.

Prototype of Dialysis (stand alone) centre

Advisory group meetings were held to develop prototype for standalone dialysis centers. The aim is to provide long term high quality hemodialysis facility for general public (& Govt. beneficiaries) at reasonable affordable cost. A Price per Treatment (PPT) package would cover the supply of dialysis equipment and dialysis disposables for a specific clinic project. In this business model, Government does not make an outright purchase of capital equipment for a dialysis clinic and instead, Government enters into a contractual agreement to lease its capital equipment requirements to private hemodialysis provider company or patient brings his own dialysis disposables. During the contractual period, Government purchases its dialysis consumable requirements exclusively from private partner . There has to be a fixed term of payment to private partner, say every month or say 30 day.

The concept is to set up a chain of dialysis centers that would have a non nephrologist dialysis trained physician present at the centre round the clock. In the US there are a large number of stand-alone dialysis centers. In India, this concept would initially be piloted in the CGHS at Delhi. Cover of a nephrologist would be provided through government run hospitals like RML Hospital, AIIMS, MAMC etc.

A tie up could be made with identified agency for provision of services including equipments, manpower and consumables etc. while the responsibility of Govt. would be to provide space. This would be done in 100 districts. The patients from Below Poverty Line (30%) would be treated. There would be one standalone dialysis centre operationalised in 100 districts with private public partnership. In due course of time dialysis is envisaged up to all Distts. States would be encouraged to have dialysis facilities through decentralized National Rural Health Mission planning.

The average cost of dialysis in Delhi is as follows:

Item	Cost
Average cost of Dialysis	₹ 1000
Per dialysis cost for Haemo dialyser (₹ 600 for 4 time use)	₹ 150
Haemodialysis fluid used in each dialysis	₹ 200
Saline drip used in each dialysis	₹ 100
Inj. Heparin in each dialysis	₹ 50
Total cost of Each dialysis	₹ 1500
Cost of investigations and medicines	₹ 600
Total cost per dialysis including investigations & medicines	₹ 2100

Till the time dialysis facilities are developed, chronic kidney patients who are below poverty line would be paid for dialysis on per case basis. Reputed large Hospital in the region would be taken on retainership basis and paid per case basis. For this purpose if 1000 dialysis per month are to be supported the expenses would be about Rs. 2100 each dialysis session x 1000 sessions per month x 12 = Rs. 2.5 Crores per year. This model would be shifted to private public partnership wherein 1000 dialysis per month per centre would be assured. Govt. would provide the land/building and everything else would be vendors responsibility.

Total budget required for 12th five year plan (2012-17) would be Rs. 1350 Crores

5. National Organ Transplant Program

India with its vast population and increasing percentage of End Stage Organ Disease (ESOD) due to high prevalence of NCDs has to adopt two-pronged strategy for management of ESOD, especially End Stage Renal Disease (ESRD). On one hand, it should build up capacity for reduction of ESOD, on the other end, it should build up a system for management of ESOD. While former will need lifestyle modification, behavioral changes, improved information campaign and pharmacological interventions etc. through various NCD prevention and control programs being implemented separately; (It is important to be aware that there is no prevention and control program for CKD as it is still not considered a NCD disease) later will need capacity building for dialysis and organ retrieval and transplantation. Deceased Organ Retrieval is going to be main area for improving supply, although living organ transplant particularly for kidney and to some extent for liver needs to be continued. More dialysis centres and its staff, transplant centre with transplant surgeons and nurses will build up the capacity of improved services. Free or subsidized diagnostic services & immuno-suppressive drug supply for the poor and needy will ensure better compliance and outcome of transplant services.

Strategies for implementation

1. Based on experiences of existing program and/or WHO guidelines, there would be three main areas of the proposed National Organ Transplant Program (NOTP):
2. Increasing the availability of organs from cadaver donors
3. Capacity building for retrieval of organs and transplantation
4. Post-transplant services to transplant recipients and living donors

Strategies:

- Enhancing the facilities for organ transplantation throughout India
- Establishing network for equitable distribution of retrieved deceased organs.
- Increasing the organ availability through change in attitude and facilitating the retrieval of deceased organs.
- Building up human resource - Training of required manpower i.e. transplant surgeon, nephrologist, dialysis physician, transplant coordinators & others.
- Acceptable incentives & facilities to the transplant donors and recipient on follow up.

Objectives:

- To organize a system of organ procurement & distribution for deserving cases for transplantation.
- To promote deceased organ donation.
- To train required manpower.
- To establish new transplant facilities & strengthen existing units.
- To protect vulnerable poor from organ trafficking.

- To monitor organ transplant services and bring about policy and programme corrections/ changes whenever needed.

Activity-wise physical targets for key indicators on coverage, output and outcomes

There would be apex national autonomous organization 'National Organ Procurement & Distribution Organisation' (NOPDO) at the centre. There would be ten regional autonomous organizations 'State Organ Procurement & Distribution Organisation' (SOPDO) governed and assisted by NOPDO. Each SOPDO will have a zonal units (as required depending on population and load) which will be responsible for specific activity in the zone. Each zonal unit would look after few hospitals in their respective jurisdiction for organ retrieval/transplantation.

Operation of each SOPDO will remain confined to one states or UT in current five year plan. They will look after dialysis, organ retrieval & transplantation within the zone. One new transplant centre would be established and one would be strengthened in Govt./Pvt. NGO sector based on Govt. recommendation.

An organ transplant registry would be initiated. Collaboration with National Board of Examinations & IGNOU would be done for various training programs. Training would be required in the field of transplantation & Dialysis. Co-ordination is required from other ministries e.g. surface transport, Govt. and private airlines, IT Ministry, Govt. reimbursement schemes, insurance etc. A co-ordination committee could be formed to look into the actions and co-operation required from various ministries and departments. National and regional workshops on issue of organ transplantation would be carried out with purpose of advocacy at all levels for various stakeholders.

Certificate of recognition to the donors will be given by the transplant centre on behalf of the appropriate authority. Steps would be taken to make provision for diagnostic tests at affordable and subsidized cost to the transplant recipients and donors patients in the public sector health care delivery system. Free annual health check to living donor & free treatment of all donor related complications would be promoted.

Rashtriya Arogya Nidhi (RAN) would be modified to make provision for transplantation in private centres and financial assistance on year to year basis. Financial assistance for immunosuppressant drugs has also been kept separately which would benefit about 5000 patients every year @ Rs. 1 Lakh/yr. Medical Insurance for the donors may be funded by the recipient.

Activities:

1. Developing IEC material and organize information campaign for organ donation (deceased donation) & also on preventing organ trafficking.

2. Development of organ procurement & distribution system through State located empowered functionally independent State Organ Procurement & Distribution Organization (SOPDO), which are autonomous in functioning.
3. Development of organ retrieval teams in each SOPDO, which should be empowered legally, logistically financially for organ retrieval, safe storage, transport and report availability to SOPDO.
4. Establishing 10 new facilities for Kidney & 2 new for liver Transplantation in Govt./Pvt. sector.
5. Strengthening of 10 existing kidney & 2 existing liver transplantation facilities in Govt./Pvt. sector.
6. Developing network with trauma care centre (level I - III) for increasing the organs procurement.
7. Networking of the transplant centers for organ sharing.
8. Training retrieval team members, transplant surgeon, dialysis physician, nurse, grief counselor, coordinator and dialysis technician through a structured programme. Leading centres e.g. Sir Ganga Ram Hospital, I P Apollo and Medanta Medicity etc. to be involved in training program.
9. Establishment of the umbrella National Organ Procurement & Distribution Organisation (NOPDO) within Dte.G.H.S. Initially for co-coordinating with SOPDOs. Later it would be autonomous organization.
10. To undertake activities related to policy/programme correction as & when required.
11. To start scheme for promoting/facilitating deceased donation & protecting donors/transplant surgeons.
12. To organize an organ transplantation surveillance system through registry.

Geographic criteria of cadaver organ allocation

The organ donation criteria follow a system in which priorities are decided as follows:

- 1° Emergency
- 2° Hospital
- 3° City
- 4° Region
- 5° Area
- 6° General turn

Co-ordination mechanism

- National Coordination - Central Administration
- Regional Coordination
- Local coordination
- Hospital coordination

- Professionals
 - (a) Kidney transplant
 - (b) Heart transplant
 - (c) Lung transplant
 - (d) Liver transplant
 - (e) Pancreas
 - (f) Cornea
 - (g) Other organs / tissues such as small bowel
- Transplant coordinators
- Other stakeholders
 - (a) Social Agents
 - (b) Mass media – print & tele
 - (c) Patient Associations
 - (d) Religious institutions
 - (e) Judges/Lawyers
 - (f) Other institutions
 - (g) Corporate houses / Industry (CSR- corporate social responsibility)
- General Population

Components of NOTP

1. Build up structure (prototype) of NOPDO/ SOPDO/organ retrieval team / renal transplant unit/- Network with ICU of level I & II trauma centre, & transplant centre/ stand-alone renal dialysis unit.
2. Develop a manpower training program for NOTP, consisting of training of a dialysis physician, transplant surgeon (kidney/ Liver/ Heart etc.), Anesthetist, Intensivist, transplant histopathologist, transplant nurse, transplant co-coordinator (both donor & recipient), organ retrieval team, staff of NOPDO & SOPDO.
3. Financial assistance to institutions for infrastructure including machinery & equipment for development of transplant facilities would be provided through SOPDOs.
4. Financial assistance to patients for maintenance therapy of immunosuppressive drugs.
5. Scheme for promotion of organ donation/ protecting donor's health/ protecting transplant surgeon/protecting vulnerable poor.
6. Protecting the rightful interests of the personnel (Health care workers) lawfully involved in the Transplant activities (as per THOA)
7. Organ transplant surveillance system through registry.

Component Details

National Organ Procurement & Distribution Organisation (NOPDO)

Function: National Organ Procurement & Distribution Organisation (NOPDO) would function as apex centre for the all India activities in organ procurement and transplantation. It would be governed by Governing Body at Centre. It would lay down policy guidelines and protocols for various functions. The data from SOPDO would be compiled and published. The allocation of organs would be confined to areas/ States under respective SOPDO.

Manpower:

A chief Executive Officer (CEO) would head the NOPDO along with Biomaterial centre (Tissue bank). CEO would be assisted by 2 SAG level officers separately for NOPDO & Tissue Bank. There would be 6 contractual consultants (salary up to Rs 80,000 which is equivalent to junior specialist entry level salary as per 6th pay commission) (1-IEC, 1-co-ordinator & procurement, 1-demand listing & distribution, 1-data management & statistics, 1 – research, publication & media management, 1-finance). These consultants will have respective departments with their support staff.

Staff details

1	Director/In-charge (full time)	1	HAG Scale
2	Deputy Director General (Technical)	1	SAG Scale
3	Joint Director (Technical)	1	NFSG Scale
4	Consultant (Coordination & Procurement)	1	Dy. Secretary Scale
5	Consultant (Finance)	1	-do-
6	Consultant (IEC/Media)	1	-do-
7	Consultant (Data management & Statistics)	1	-do-
8	Consultant (Research/Publication)	1	-do-
9	Consultant (Logistic Management)	1	-do-
10	Data Entry Operator cum Assistants	10	As per prevailing rates

Each consultant would be responsible for respective area and would be In charge of that unit.

Activities:

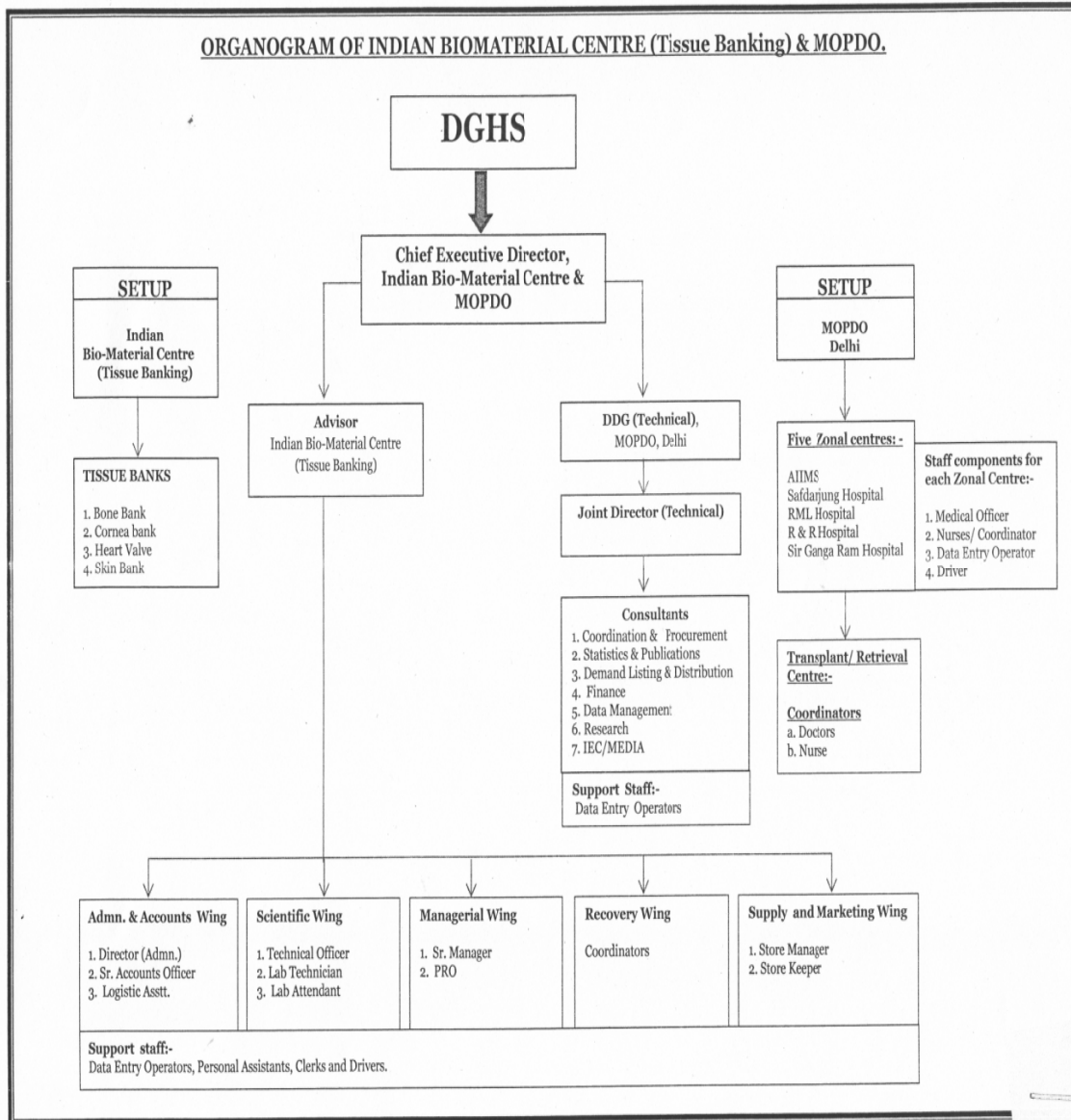
NOPDO would undertake all activities to prepare and launch various components of the programme. It would also engage consultants by outsourcing. It would have cell for kidney, liver & heart organs, dealing with policies, quality control etc. It would comprise of bio statisticians, finance & accounts, IT, media, legal consultants and Data Entry Operators. Tissue bank will be under NOPDO.

NOPDO would be apex level body for the policy and guidelines, inter regional coordination, training, budget allocation, data compilation and analysis etc. There would be six divisions namely Co-ordination & Procurement, Finance, IEC/Media, Data management & Statistics, Research/Publication, demand listing & distribution. NOPDO would have advisory role related to Transplant of Human Organ Act and would not assume the regulatory role. Training would be organised in systematic manner which is explained later.

Intensive awareness campaign would be carried out to promote deceased organ donation so that at the time of sudden death or in brain stem dead patients the organ donation is agreed by relatives. Details about IEC have been described later.

Organization Structure of NOPDO

Functioning of NOPDO will be with following organizational structure:

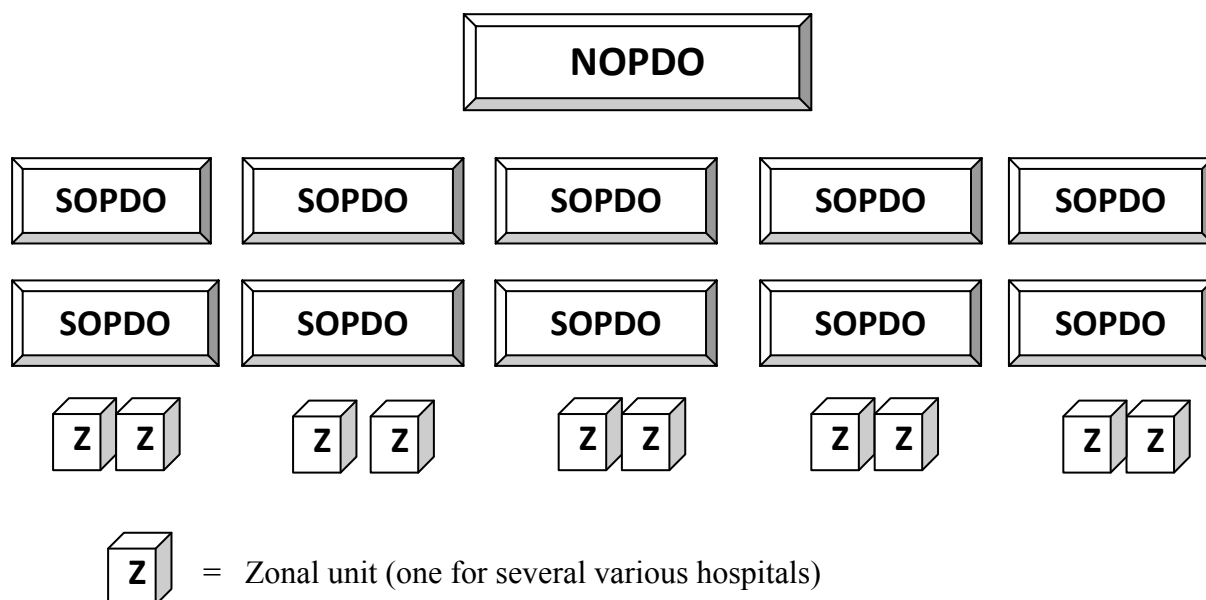


SOPDO package

The proposed programme will operate through SOPDO, which will be structure like MOPDO, but having a territorial limitation as predefined for each SOPDO. The SOPDO package will consist of SOPDO, transplant centre & retrieval centre.

Each SOPDO will have a capacity to expand, as the programme will grow in size, & more and more transplant being done within SOPDO area. It is considered feasible to support a package of SOPDO, zonal centre & transplant/retrieval centre, one each in 10 states/UTs as identified in program. SOPDO will list monitor and distribute organs, zonal centre will coordinate retrieval team, retrieval centre & transport & transplant centre will perform transplantation.

There would be autonomous organizations ‘State Organ Procurement & Distribution Organisation’ (**SOPDO**) governed and assisted by NOPDO. Each SOPDO will have one zonal center which will be responsible for specific activity in the zone. In States of bigger size, even 2-3 zonal centers will be established in next five year plan. Each zone will be bound by border of states/cities. Each zonal center would look after 1-2 hospitals in their respective jurisdiction for organ retrieval/transplantation during current plan. In next plan, number of centers for transplant & retrieval will be increased.



There will be initially 10 SOPDO (list next page) having their own territorial coverage. Each SOPDO would have its notional territorial boundary. Targets of organ procurement would be fixed population wise maximum reaching to 1 organ procurement per million populations (PPM) during current five year plan up to 2012. These targets would be flexible from region to region. Each regional centre will be autonomous, independent, fully centrally funded unit having organogram similar to NOPDO & similar staff structure.

Locations

The SOPDO would be located in the cities mentioned below at 10 places initially. Its coverage will be confined to Metro cities & big cities during 12th five year plan because of availability of other essential supportive services. These cities will cut across different states & UT. Operation of each SOPDO will remain confined to a state or UT in 1st phase.

Organisational structure of SOPDO would be as follows:

1	Director/In-charge (full time)	1	SAG Scale
2	Joint Director (Technical)	1	NFSG Scale
3	Consultant (Coordination & Procurement)	1	Dy. Secretary Scale
4	Consultant (IEC/Media)	1	-do-
5	Consultant (Data management & Statistics)	1	-do-
6	Consultant (Research/Publication)	1	-do-
7	Consultant (Logistic Management)	1	-do-
8	Data Entry Operator cum Assistants ⁴	10	As per prevailing rates

Area requirement for SOPDO = 1500 sq ft. (10 rooms)

There will be State governing council where Secretary (Health) will be chairman & there shall be one special invitee from NOPDO. The Governing body would be similar to NOPDO.

SOPDO locations in 12th five year plan

State – Jurisdiction area	SOPDO location city
GNCT Delhi	Delhi
Maharashtra	Mumbai
Tamil Nadu	Chennai
West Bengal	Kolkata
Andhra Pradesh	Hyderabad
Gujarat	Ahmedabad
Punjab, Haryana & UT Chandigarh	Chandigarh
Kerala	Thiruvanthapuram
Uttar Pradesh	Lucknow
Karnataka	Bangalore

There are about 200 Kidney, 30 liver and 14 heart transplant centres in India. In case of transplant centre/retrieval centre being located in private hospital, state Govt. will be permitted to do so, but through private public partnership (PPP) mode and MOU would be signed between institutions, State Govt. & Central govt. The identification, monitoring & supervision of such private hospitals will be done by Dte.G.H.S. (centre), Director Health Services (State Govt.) and Director of private institute. Any deficiency will be reported to State health system through SOPDO.

SOPDO financial aspects

2 regular officers @ Rs. 10 Lakhs per year x 2 = Rs. 20 Lakhs

5 Consultants/Manager @ Rs. 6 Lakhs per year x 5 = Rs. 30 Lakhs

6 Prog. Asstt. @ Rs. 1.8 Lakh per year x 6 = Rs. 9 lakhs

Electricity/Water/POL/communications/staionary/travel/misc = Rs. 20 Lakh per yr.

Rent Rs. 1 Lakh per month x 12 = Rs. 12 Lakhs

Total Recurring cost = 20+30+9+20+12 = **91 lakh per year**

Zonal centre

Zonal Centres would be below the level of SOPDO functioning at the identified transplant centre in the area served by SOPDO. Minimum one zonal centre would be required for coordination of retrieval, transport and transport of organs. They will network for organ procurement with retrieval, procurement and transplantation centers according to the priority indicated by SOPDO. Thus each SOPDO would have one zonal centre to begin within the current plan.

Financial package for zonal centres: Cost of one zonal center is given below.

Building

Suggested structure with 6 rooms (Call Centre, Grief counseling room, data management room, transplant co-ordinator/ manager room, pantry, waiting area, toilet, meeting area/seminar room) Approx. area requirement = 1100 sq. feet. Layout Map design drawing enclosed.

It shall be taken on rest and the cost is reflected in recurring expenditure.

The institutions would modify suitable as per available space and requirements.

Cost estimates

S.No.	Item	Cost (Rs. lakh)
1	Civil Work	15
2	Electrical	5
3	Furniture	5
4	Split ACs (8 no.)	5
5	Plasma Screen	5
6	PA System	5
7	Computers	5
8	Server	3
9	UPS	2
10	projector, refrigerator, fax, photocopier etc	2
11	Advanced life support ambulance	50
12	Software/Hardware for customized video conferencing etc	10
	Total	112

Total non-recurring cost per centre (one time) = Rs. 112 Lakhs

Manpower requirement: Two types of mechanism could be followed:-

1. Regular appointment (requires creation of post)
2. Ad hoc appointment (requires availability of vacant positions)

Financial requirements of Regular/Adhoc appointment in the 1st phase are as follows:

SNo	Post	Prerevised Pay Scale	No	Monthly Pay-Rs.	Total monthly pay
1	Director (Medical)	12,000-375-16,500	1	65000	65000
2	Manager/ co-ord.	10,000-325-15200	1	50,000	50,000
3	Medical Officer	8,000-275- 13,500	2	40,000	80,000
4	Med. Social Worker	5,500-175-9,000	5	25,000	1,25,000
5	Stenographer	4,000-100-6,000	1	20,000	20,000
6	Data Entry Operator	4,000-100-6,000	2	20,000	40,000
7	Driver	3,050- 80- 4,590	1	8,500	20,000
	Total		13		4,00,000

Recurring expenditure for Manpower @ Rs. 4 Lakhs/ month (Rs. 48 lakhs per year)

Electricity/Water/POL/communications/stationery/travel/misc = Rs. 10 Lakh per yr.

Rent Rs. 50,000 per month x 12 = Rs. 6 Lakhs per year

Recurring cost = 48+10+ 6 = 64 Lakhs per year

Total expenditure = Rs. 176 Lakhs for first year & subsequently Rs. 64 Lakhs per year

Technical SOPDO package

Working of network

To facilitate organ transplantation in safest way in shortest possible time:

1. Maintaining the waiting list of patients requiring/ needing transplants
2. Facilitating Multi organ retrieval from a Brain stem death donor. Co-ordination from procurement of organs from a donor till the transplantation into a recipient
3. Dissemination of information to all concerned hospitals, organizations and individuals
4. Creating awareness, promotion of organ donation and transplantation activities.
5. Matching of recipients with donor & organ allocation as per the designed policy.
6. Post-transplant patients & donor family (in case of live donors) follow-up for assessment of graft rejection, survival rates etc.
7. Monitoring of transplantation activities in the region and maintaining data- bank
8. To operate various schemes for organ donation, donor health check-up & safeguarding vulnerable population.
9. To assist in data management for organ transplant surveillance & organ transplant registry.
10. Distribution of organs within region.

Establishing and strengthening transplantation centres

The establishment of a new transplant centres would be considered in big cities preferably in Govt. sector based on Govt. recommendation. The centers would be identified later based on the State Govt. recommendation. One new renal transplant centre would be established while

another one would be strengthened/ upgraded in each SOPDO. (No strengthening or upgrading is proposed since liver centers are few and are comparatively new ones.) It is estimated that expenditure for strengthening/ up gradation would be about 50% of the cost required for infrastructure and equipment for a new transplant centre. However it would be based on facility survey for gap identification. The likely expenditure is as follows:-

New Renal & Liver Transplantation unit - Expenditure for new facility except land at each centre has been estimated as follows:-

Table showing the likely expenditure on transplantation units (amount in Rs. crores)

S.No.	Item	Renal per unit cost	No. of units	Total cost	Liver per unit cost	No. of units	Total cost
1	Infrastructure	15.0	10 + 2	150 + 15 = 165	20.0	2+2	40+20 = 80
2	Equipment	10.0	10 + 2	100 + 10 =110	15.0	2+2	30+15 = 45
3	Manpower	1.50	10+2	18	3.0	2+2	12
4	Recurring cost	0.25	10+2	3	0.5	2+2	2
				296			149

Total expenditure on transplant units = 296 + 149 = **Rs. 445 crores**

Strengthening of existing one transplant centre will be 50% cost of the new centre. Thus in each SOPDO, one renal transplant unit would be established and one would be strengthened. Liver transplant units would be one each (new + strengthening) in north and south region.

In case of private institutions, private public partnership would be done and MOU would be signed between institution, State Govt. and Central Govt. for establishing the facilities and monitoring of the same.

Expenditure at each SOPDO (in Crores)

Item	Non recurring	Recurring (per year)	Recurring (5 years)
SOPDO	0	0.91	4.55
Zonal Centre	1.12	0.64	3.2
Total	1.12	1.55	7.75

Total expenditure SOPDO State package for 10 SOPDO 7.75 x 10 = Rs. 77.5 crores

Organ procurement and transplant registry

This registry will be on line with similar registry maintained in other countries so that entries of registry bear global comparability besides having National & Regional relevance. It will have entries for all types of organ procurement, matching, distribution, transplantation, & complication

on globally acceptable format. It will also maintain entries of transplant centers, transplant surgeon, dialysis physician & dialysis centre & other contributory system within national healthcare, which are directly relevant to NOTP. The National Registry will be electronically connected to its regional registries, each of which will operate independently except for National data feeding & fund sharing.

Data required for Global observatory on donation and transplantation

Organizational System

- Official body or specific organization responsible for overseeing and coordination donation and transplantation activities about organs, tissues and cells. Activities, report and funding of this organization.
- National Technical Committees / Advisory Boards or Ethical Committees dedicated to donation and transplantation activities.
- Surveillance system and reporting of adverse events in the process of transplantation, reactions and untoward consequences in organ transplant recipients.
- Surveillance system of donation complications in live organ donors.
- Registries for collection and analysis of data on donation and transplantation activities.
- National / provincial standards or written instructions or guidance for transplants from deceased or living donors.
- National training programs to harmonize practices for staff involved in organ procurement and transplantation.

Legislative System

- Specific legislation for donation and transplantation activities.
- Role of the National Health Authorities in the regulation and oversight of the donation and transplantation activities, included authorization and licence for transplantation.
- Legal requirements for quality, efficacy and safety of the donation and transplantation procedures.
- Legal requirement for consent to donation from deceased and living donors.
- Legal requirements and restrictions for living donation.
- Penalties in the event of commerce with donated organs, cells and tissues. Explicit prohibition of organ trafficking in the legal framework.
- Distribution and allocation criteria for organs, tissues and cells.
- Confidentiality and traceability specified by law.
- Import and export of organs, cells and tissues controlled by law.

Activity data

- Number of transplantation centres.
- Organ donation activity.

- Organ transplantation activity (kidney, liver, heart, lung, pancreas, small bowel, multivisceral).
- Donation and transplantation activity on tissues and cells.

Deceased organ donation registers by general public in their lifetime

Indian Organ Donor Register would become a Register of consent, enabling individuals to record their legal decision to becoming an organ or tissue donor after death. The Register will be operational as a consent register as soon as possible. The Donor Register will ensure that consent (or objection) to donating organs and/or tissue for transplantation can be verified 24 hours a day, seven days a week by authorised medical personnel, anywhere in India. In the event of death, information about decision will be accessed from the Donor Register, and provided to family.

National Transplantation Register: National data would be compilation of the State Govt. registers about the transplantation done in their respective jurisdictions. In due course of time this would be periodically updated online through software on day to day basis.

DONOR INFORMATION: Basic data, BD tests, image tests, laboratory, serologies, time at CCU, medical history, clinical situation, drugs, ...

ORGAN EVALUATION: Recovered/no (causes); implanted/no (causes)

WAITING LIST

Recipient characteristics: age, weight, blood group, diagnosis

WL movements: Urgency, active, excluded, transplant, death

OFFERS: Center, criteria, acceptance, causes no acceptance

FOLLOW-UP REGISTRIES

- Transplantation results
- Analyze factors related with graft and patient survival
- Collaboration framework for tx teams
- Participation in International Registries

These are required for different organs – kidney, liver, heart etc.

An amount of Rs. 100 crores is being kept for this purpose. This amount would be used for infrastructure, manpower, computers and software development, technical services etc. including the recurring costs in running the program.

National level inter-sectoral stakeholders meetings

Various stakeholders would be invited for national level inter-sectoral meetings. The stakeholders would include following:-

1. Surface transport
2. Railways
3. Licensing authorities

4. Professional associations
5. National Board of Examination
6. Transplant Centers
7. Professional councils e.g. MCI etc.
8. others

National training programs (Training of Trainers) for Transplant Surgeon (3 diff. categories)/ Transplant Coordinator/ Dialysis Physician/ Dialysis Nurse/ Technician/ Organ retrieval team/ Staff of NOPDO/ROPDO/

Rs. 10 lakh each training x 10 = Rs. 1 Crores (non recurring)

Immunosuppressant & erythropoietin supply mechanisms

The cost of continuous treatment with immunosuppressive drugs is unaffordable. Steps would be taken for increasing availability of immunosuppressant drugs and erythropoietin free of cost/affordable cost (as the case may be) to transplant recipients. These steps may include reduction of excise duty, custom duty, sales tax etc. for reducing the cost. Efforts would be made to provide drugs at cheaper rates to patients through co-operatives similar to Rajasthan model or through National Rural Health Mission.

Common drugs used:

1. Cyclosporine
2. Tacrolimus
3. MMF
4. Prednisolone
5. Azathioprine
6. Erythropoietin
7. ATG
8. Simulect
9. Antifungal & antibiotics
10. Recombinant Factor VII (Novoseven) etc.
11. Immunoglobulins
12. Gancyclovir and Valgancyclovir
13. Bortozumab

Common immunosuppressive protocol for organ transplant is Cyclosporine/ Tacrolimus and MMF/Azathioprine with Prednisolone. The trademarks and companies are as follows:-

- Cyclosporine - Sandimmune (Novartis)
- Panimmune (Panacea biotech)
- Tacrolimus- Pangraf (Panacea), Vingraf (Emcure), Prograf (Astellas)

- MMF- Cellcept (Roche), Mycept (Panacea)
Prednisolone – common drug
- Azathioprin – Azoran, Imuran

Individual drug costs

- Cyclosporine (av. 100 mg BD)- monthly cost- approx 5000-6000/ month
- Tacrolimus (av 2-3 mg BD) approx cost Rs 4000/ month
- MMF (av 1 gm BD), approx cost Rs 6000/ month
- Prednisolone 10 mg/day , approx cost Rs 100/month
- Azathioprine- 100 mg/day , approx cost Rs 500/ mont

Regimen costs

- Standard CyA +MMF +Prednisolone = Rs 10- 12,000/ month
- Tacrolimus +MMF + Prednisolone = Rs 10-12,000/month
- CyA/Tacro + Azathioprine + Prednisolone = Rs Rs 5000-6000/month

First year expense with drugs is Rs 1.5 to 2 lakh (live unrelated donors) with related donors; the cost is Rs 50,000 less. In subsequent years, the cost is approx Rs 1 lakh per year.

Duration of immunosuppressive therapy

In renal transplant drugs are used as long as graft is functioning- life long till graft lasts (average 8-10 years)

List of brand names and manufacturers are annexed. For the promotion of generic immunosuppressant & erythropoietin, private public partnership (PPP) would be evolved. Discussions have been held with three major suppliers of these drugs. They informed that they are supplying drugs to Govt. institutions at about 72% of MRP rates since 28 % expenses (of MRP) are incurred for distribution and retail. Suggestions received included adoption of patients by companies and provision of drugs at cheaper rates to the deserving patients who cannot afford the treatment. Such patients could be certified by Govt. institutions or doctors. Discussion with companies revealed that it is not possible to reduce the price of common immunosuppressant drugs and erythropoietin in general. Custom duty could be reduced in case of bulk imports and finished products and companies would pass on the benefit to the consumer. They have also suggested reducing the VAT, excise duty and sales tax and similarly the benefit would be passed on.

Companies would provide the details about what is possible from their side. The modalities would be worked out in due course of time based on the details from the companies concerned.

We may keep provision for financial assistance to 5000 needy and poor patients (out of expected 30,000 transplant cases) every year for immunosuppressant therapy. An amount of about

Rs.10,000 is spent on average by a patient every month on immunosuppressant therapy. Rs. 1.2 lakh per patient per year would be required. For 5000 patients for 2 years period of five year plan the requirement would be @Rs. 1.2 Lakh x 2 year x 5000 = Rs. 120 Crore.

It is envisaged that other patients would manage the expenses through insurance or their own sources besides various Govt. schemes. Rashtriya Arogya Nidhi (RAN) would be modified to make provision for transplantation in private centres. Patients on regular dialysis or on continuous medication with immunosuppressant should be provided yearly financial assistance rather than one year as existing at present. At present the grant for kidney transplant for supporting 3 months of dialysis + Donor workup + Expenditure for renal transplant procedure + one year immunosuppression cost. is given. The efforts would be made to enhance the grant as well as provide financial assistance on regular basis for follow up medication etc.

Training Plan

Training of personnel (Human Resource Development) is most important aspect for the success of the program. There are mainly two aspects (i) increasing the opportunities for basic training programs for different categories and (ii) training the existing personnel for skill in the area of transplantation in various categories.

Training would be required in the field of transplantation & Dialysis for the following:

Year-wise break up of no. of trainees and cost of various training programs

S. No.	Trainees No.	Total Cost (Rs. crore)
Training OPDO/SOPDO directors	15	2.0
Transplant Surgeons	40	3.0
Tr. Co-ord.	400	5.0
Transplant physicians	200	10.0
Nurse	500	10.0
Pathologist/Immunologist	50	2.5
Anesthesiologists, intensivists, radiologist etc.	50	2.5
Total		35.0

Promotion & care of organ donation

Awareness is required for prevention of NCDs, legal provisions of THOA & organ donation. Despite the one billion-population size and a high accident rate, India is yet to make any major headway in the harvesting of human organs. It is generally perceived that social and cultural factors inhibit people from donating their organs or those of their loved ones who have tragically predeceased them. Religious considerations and the Hindu belief in re-birth minus the missing organs are also contributing factors that come in the way of a robust organ donation programme

in the country. To dispel these misconceptions, it is necessary to improve awareness about the donation of human organs and thereafter to motivate people to donate organs.

- Mass Media Campaign for creating awareness about organ donation so that the general public is made aware that human organs can be donated to save lives. This campaign would be sustained from time to time. Engage ‘celebrities’ to promote organ donation. This would encourage people to be inspired to emulate such celebrities
- Engage the support of religious sects/leaders. Sects like the Radha Swamis of Beas (Punjab) are supporting organ donation actively.
- Ask TV & Radio channels to organize discussions free of cost and to show TV serial regarding the success of organ donation and transplantation.
- Lobby with NCERT and CBSE for a small reference to organ donation in the curriculum
- Awareness about Legal Provisions – people should be aware of the law on donation of organs and the penalties for illegal transactions
- FAQs : e.g. who can donate, location of authorized transplant centers etc.

Financial aspects for promoting organ donation

- i. Rashtriya Arogya Nidhi (**RAN**) would be modified to make provision for transplantation in private centres. Patients on regular dialysis or on continuous medication with immunosuppressant should be provided **yearly** financial assistance rather than one year as existing at present. At present the grant for kidney transplant is 1.8 lakhs and Rs. 10,000 for first year only is given. The efforts would be made to enhance the grant as well as provide financial assistance on **regular basis** for follow up medication etc..
- ii. Incentives to Live Donors and the next of kin of deceased donors.
- iii. Medical Insurance for the donors may be funded by the recipient
- iv. Enhance insurance cover to 10-12 lakhs for a common man.

IEC/Media Campaign

1. NOPDO/National level IEC would be done through TV/Radio/Print media. Website would also be created for mass scale information about rights, benefit, legal protection of donors besides functioning of NOPDO. An amount of Rs. 5 Crores every year would be required for National level IEC. For two years the requirement would be Rs. 10 Crores. The main thrust of IEC would be to change the attitude of public about deceased organ donation. Details would be worked out separately.
2. Ten SOPDO units would be asked to carry out State level IEC. Dissemination of positive information about organ donation, organ retrieval & transplantation, various legal requirements before donation or retrieval, & penalty & punishment for agents involved in forced/illegal retrieval & transplantation would also be done. An amount of Rs. 10 crore per SOPDO would be required. 10 SOPDOs would require Rs. 100 Crore for two years. For this purpose media plan would be made by professional agencies e.g.

NICEF etc. SOPDO will hire the agency for this purpose and approve the same at their level. Focus campaign would be carried out in respective States through organized media.

3. Ten Advocacy workshops would be held all over India. An estimate amount of Rs. 5 lakhs for each workshop is required. Rs. 50 lakhs needs to be allocated for this purpose.

Item wise details

- Cost of making 5 TV spots in 10 regional languages = apprx. Rs. 50 lakhs
- Cost of TV broadcasting 5 spots/week at 10 locations= apprx. Rs. 10 crores
- Development of 5 radio messages at 10 locations = apprx. Rs. 1 lakhs
- Cost of Radio broadcasting 5 spots/week at 10 locations=apprx. Rs. 1 crores
- 24 advertisements in newspapers in 15 languages in a year= apprx. 10 Crores
- Personal contact program
- Specific programs
- Organ pledging
- Brain stem death declaration
- Organ retrieval/organ transplantation/organ trafficking/Incentive schemes

Total amount required for IEC is Rs. 110 Crores

Establishment of a Biomaterial Center for advance tissue banking

India is having good number of such bone banks/tissue banks which are operating in different states for 5 to 10 years. Even in Delhi there are bone banks in All India Institute of Medical Sciences and Sir Ganga Ram Hospital. There are similar bone banks in Chennai, Mumbai and Andhra Pradesh. There are large number of Eye Banks which are developed both under private and government sector in different cities under National Programme for Control of Blindness. Therefore, this is the right time for India to go for establishment of a National Biomaterial Center. Moreover, tissues are included in THOA also.

This center will take care of following tissue allografts

- i. Bone and bone products e.g. deep frozen bone allograft, freeze dried bone allograft, dowel allograft, AAA Bone, Duramater, facialata, fresh frozen human amniotic membrane, high temperature treated board cadaveric joints like knees, hips and shoulders, cadaveric cranium bone graft, loose bone fragment, different types of bovine allograft, used in orthodontics
- ii. skin graft
- iii. Cornea
- iv. Heart valves
- v. vessels

This is a highly technical body, which is to be headed by a Medical Specialist preferably having degree of orthopedics and experience in the field of bone banking, sterilization, storage and distribution. The structure of this organization is as follows:

There would be four divisions of the ITBBMC as follows:-

1. Bone bank
2. Cornea bank
3. Heart valve Bank
4. Skin Bank

The administrative structure would be common while the technical processing and supply mechanism would be separate.

Staffing of a Biomaterial Center

There will be one HAG, one SAG level medical officer along with 30 other officials including scientists / technicians. There would be four sub divisions in scientific wing which would work for respective banks namely Bone, Heart Valves, Cornea, Skin banks. Overall administrative structure would be common while the laboratories setup would be different for each of the different units of tissues.

Budget

The budgetary requirements have been estimated for the three year remaining period of year 2009-12 in the 11th five year plan. Further details would be firmed up after the approval is received and money is allocated for this purpose.

- (a) Construction cost for two stories (floors) building with 1500 sq. meter area. The estimated cost would be Rs. 250 Crore
- (b) Cost of salary of staff: Initially key staff would be taken while most of the staff would be required in the third year when the bank would be fully functional. Class IV staff would be either contractual or outsourced. The year-wise details are given in the table below.

Table showing manpower requirement and expenditure

S.No.	Post	Revised Pay Scale (Rs.)	No.	Monthly Pay (Rs.)	Total monthly Pay (Rs.)
1	Executive Director (HAG)	67000- 79000	1	130000	130000
2	Advisor (SAG level)	Pay band 4 (Rs 39200-67000) Grade pay 10000	1	120000	120000
3	Director (Admn,)	Pay band 4 (Rs 39200-67000) Grade pay 8700	1	90000	90,000
4	Senior Manager	Pay Band 3 (15600-39100) Grade pay 7600	1	60000	60000
5	Technical Officers	Pay Band 3 (15600-39100) Grade pay 7600	4	60000	240000
6	Store Manager	Pay Band 3 (15600-39100) Grade pay 6600	2	55000	55000
7	Sr. Accounts Officer	Pay Band 3 (15600-39100) Grade pay 6600	1	55000	55000
8	Coordinators	Pay Band 3 (15600-39100) Grade pay 5400	4	50000	200000
9	Lab Technician	Pay band 2 (8700 – 34800) Grade Pay 5400	4	25000	100000
10	PRO	Pay band 2 (8700 – 34800) Grade Pay 5400	1	25000	25000
11	Store Keeper	Pay band 2 (8700 – 34800) Grade Pay 5400	2	25000	50000
12	Clerks/D.E.O.	Pay band 2 (8700 – 34800) Grade Pay 4200	3	20000	60000
13	Attendants	Pay band 2 (8700 – 34800) Grade Pay 4200	6	20000	60000
14	Driver	Pay band 2 (8700 – 34800) Grade Pay 4200	1	20000	60000
15	Class IV	Outsourced/hired	2	10000	20000
	Total		34		13,20,000

Yearly salary = Rs. 13.2 lakh x 12 months = Rs. 1.58 crores per year

For three years = Rs. 1.58 Crores x 2 years = Rs. 3.16 Crores

(c) Consumables: Consumables like chemicals, reagents, gloves, storage envelopes, labels, gases, soaps and detergents etc. would be required as per need. The estimated cost of consumables is about Rs. 1 Crores for 2 years.

- (d) Contingency: There could be unforeseen expenditure which has not been envisaged this time. Therefore an amount of Rs. 1 Crores is being kept for contingency.
- (e) Overhead (Electricity / Water): Electricity would be required for lighting, refrigeration, air-conditioning etc. An amount of Rs. 0.5 Crores is proposed for overheads for 2 years.
- (f) Research: This is research intensive field. New types and shapes of grafts could be used. Newer modalities can be tried in tissue grafting. An amount of Rs. 5 crores is being kept for research studies.
- (g) Training: An amount of Rs. 1 crore can be kept for training of various health personnel in India and abroad.
- (h) Irradiation/Storage/Transport of Tissue: An amount of Rs. 0.5 crore may be kept for this purpose for next two years. Irradiation would be done by outside agency for which payment would be made on per specimen basis including transportation cost.
- (i) Quality control: An amount of Rs. 0.5 crore may kept for quality control including development of guidelines, manuals and inspections etc.

Component-wise expenditure (Biomaterial Centre)

Component	Total (Rs. crore)
Construction	250
Staff	25
Equipments	100
Consumables	25
Contingency	25
Overheads	25
Research	20
Training	10
Irradiation	10
Quality control	10
Total	500

An amount of Rs. 500 Crores would be required in 12th five year plan.

Bio-vigilance, tracking safety & quality assurance of Tissue Transplantation

It involves the process of donation, verification, procurement, processing, preservation, storage, distribution, and application of Tissues and Cells

- Register of authorised centres
- Minimum standards of quality and safety
- Qualification and training
- Inspections and sanctions
- Imports / Exports

Supervision of human tissue and cell procurement

- Accreditation, designation, authorization or licensing of Tissue and cell preparation process
- Inspections and control measures
- Traceability
- Import/ Export
- Register and reporting obligations
- Notification

Donor Selection and evaluation

- Principles governing tissue and cell donation
- Consent
- Data protection and confidentiality
- Selection, evaluation and procurement

Provisions on the quality and safety

- Quality Management
- Responsible Person
- Personnel
- Tissue and cell reception
- Tissue and cell processing
- Tissue and cell storage conditions
- Labelling, documentation and packaging
- Distribution
- Relations with 3rd parties

Exchange of information, reports and penalties

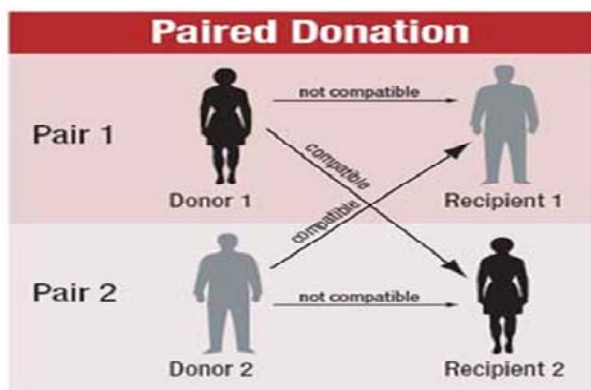
- Coding of information
- Reports
- Penalties
- Consultation of Committees
- Technical requirements and their adaptation to scientific and technical progress
- Consultation of one or more scientific committees
- Final provisions
- Transposition
- Annex on information to be provided on the donation cells and /or tissues

There are several actions required for bio vigilance, tracking, safety and quality assurance regarding tissue which becomes obligatory after THOA amendment bill is passed as well as international commitments.

An amount of Rs. 50 crores is being kept for this purpose. This amount would be required for various activities including infrastructure, manpower, networking software and hardware etc. including the running expenses.

SWAP – living donor organ program

1. SWAP or paired donation (exchange of donor organs between two recipient families) is alternative to solve the scarcity of cadaveric donors.
 2. Decrease the number of patients in the waiting list for renal and liver transplants.
- SWAP would be permissible after the THOA amendment bill 2009 is passed by Parliament. Any two or more pairs with their own legally permissible donors (related or emotionally related donors with approval of authorisation committee) can cross exchange their pairs for organ donation. If this is not possible between 2 pairs then it could be between many more such pairs. In this regard, paired donation registries have to be maintained.



An amount of Rs. 10 crore is being kept for this purpose

Expected Outcomes

1. Public awareness about prevention of NCDs, legal provisions of THOA & organ donation
2. Early detection and management of NCDs accessible and affordable to the public.
3. New organ Transplantation units established and older ones strengthened.
4. THOA Act and Rules changed for facilitation organ donation, registration of organ retrieval centres, clear cut procedures and policies for various processes regarding organ transplantation
5. Networking of the centers for organ sharing established
6. Training of personnel in transplantation and Dialysis done
7. Dialysis facilities established at 10 centers in the metros and major cities.
8. Rules & Regulations for tissues and cells made
9. Recognition and incentives to the donors operationalised
10. Affordable Immuno-suppressive therapies.
11. Establishment of the NOTP Head Quarter and Governing body
12. Rate of organ transplantation increased from 0.4 pmp to 2 pmp in 5 year time.

6. NATIONAL MENTAL HEALTH PROGRAM

Vision – To provide basic and comprehensive mental health care at all levels.

Mission –

1. Integration of Mental Health services with general health
2. Improving availability of mental health manpower
3. Promotion of community participation in service delivery
4. De-stigmatization of mental disorders through awareness generation
5. Strengthening of preventive psychology

Introduction to 12th plan

The 12th FYP will envisage strengthening of 11th Mental Health plan with expansion and few modifications in existing components. On Contrary to the 11th plan, current plan will focus on functional and service delivery aspects of NMHP then infrastructural aspects. The plan has been build up from the experiences gained through past plan periods. It has both carry over components with modifications and newly introduced components. The model of plan is inclusive and integrative of community health approach.

New Proposed Components

- Public Private Partnership programme.
- Long term community treatment / Rehabilitation Services.
- Integration of NMHP Components with NRHM and NPPCD.
- Mental Health Services
 - Strengthening of Under graduate courses in medical colleges
 - Strengthening of Post graduate courses in medical colleges
- Help-Line and Public Information Services
- Mental Health Emergency Services
- Integration of other Neuro-sciences facilities to COEs

Carry over components of 11th FYP

- I. **DMHP (Community out-reach programme)**-The component is focus point of community mental health care has shown direct impact on service delivery. DMHP envisages to provide basic mental health care services at the community level. Since its inception during 9th plan, only 123 districts have been covered under the scheme. Steps were taken to consolidate the existing DMHPs and improving availability of mental health manpower during the 11th five year plan. As per direction of EFC, no new district was taken up under the e DMHP scheme during the 11th plan. There has been large demand from many of the states for DMHP scheme. It is proposed to expand DMHP to all the districts during the 12th FYP in a phased

manner to cover the entire country. This would ensure uniform coverage and access to basic mental health services. Every year 123 new districts may be taken up for under DMHP. This will serve to cut down the existing loads on Tertiary care centres and will help in early recognition and treatment hence better outcome of Mental illnesses. The DMHP services are further strengthened by introducing new components, revised salaries and provision of appointing MO on contract under DMHP. Flexibility to programme will be provided by creating provision of “programme flexi-pool” to carry out need based additional activities. The district hospitals will be supported to provide 10 bed inpatient facility. 2 MOs and 4 Nurses will be provided to DMHP team for the purpose.

The District health authorities will facilitate incorporation of mental health services to general health services at district level to help dissemination of services at grass root level.

There are two main components of DMHP :

1. Service provision i.e. identification, diagnosis and treatment of mental disorders. There is provision of mental health clinic (outdoor services) and inpatient services at the district level. The district mental health clinic would provide referral support to the primary health care teams and the inpatients services would be available for patients needing acute care within the district including emergency psychiatry services. 10 beds will be made available for the same in the district level.
2. Out-Reach Component DMHP will undertake following outreach activities:
 - a. Satellite clinics: 4 satellite clinics per month at CHCs/ PHCs by DMHP team for service delivery, supervision and support to Primary health care level. This will help in sensitisation and training of primary health care workers.
 - b. Targeted Interventions: Life skills education & counselling in schools, College counselling services, Work place stress management, suicide prevention services will be provided at District and Sub-district level. *States may propose state specific targeted interventions according to regional needs in their PIPs.* 4 visits to provide Need based Targeted interventions services to CHC/PHCs e.g. suicide prevention clinics, school and college mental health services, stress management etc.
 - c. Sensitization training of health personnel: The District mental health team will carry training activities in imparting mental health skills to health care personnel at the district level. The trained primary health care team will in turn conduct the sensitization of community leaders and members of PRIs. This will not only build the capacity of health staff in early identification and appropriate referrals of mental health disorders but will also help in de-stigmatisation of mental illnesses. Sensitization classes will be conducted by team of trainers’ for 2 days at CHC level by using training material standardised at central level. 1 sensitization programme will be conducted every month for 5 years until all health staff below district level gets sensitised.

- d. Awareness camps: It will be carried out in the community for purpose of dissemination of awareness regarding mental illnesses and related stigma through involvement of local PRIs, faith healers, teachers, leaders etc. Sensitization classes will be conducted by team of trainers' for 2 days at CHC level by using training material standardised at central level. 1 sensitization programme will be conducted every month for 5 years until all health staff below district level gets sensitised.
- e. Community participation: The DMHP team will build coalitions in the district for provision and improvement of mental health services. Linkages will be developed with Self-help groups, family and caregiver groups, NGOs working in the field of mental health. The sensitization of enforcement officials for Mental Health Act regarding legal provisions will also be undertaken to ensure effective implementation.

The roles and responsibility of DMHP team will also be to undertake following tasks at district and Sub district level:-

1. Provision of essential drugs: The availability of basic essential drugs will be ensured at the primary health centers and the stock will be checked periodically by the DMHP team during their visits for outreach activities.
2. Simple recording system: Records for registration of cases seen in the PHC and CHC (new and follow up) will be sent to DMHP at regular intervals. This will be collated at the state mental health cell and forwarded to Central Mental Health Division/CBHI.
3. Monthly reporting, monitoring and feedback-

The DMHP team will hold regular meetings with PHC/CHC staff to review the progress of mental health care delivery, logistics, supplies, follow up and field level activities. Regular feedback will also be provided to the primary health care doctors and staff. The meeting will also should provide opportunity to sort out logistic difficulties and issues of coordination with different stakeholders. Composition of DMHP Team is given below:

<u>Medical:</u>	Psychiatrist	1
	Medical officer	2
<u>Paramedical:</u>	Nurses	4
	Psychiatric Social Worker	1
	Clinical Psychologist	1
	Programme Manager	1
	Programme Assistant	1
	Record keeper	1

DMHP Component of NMHP suffered major set-backs in previous plan periods to implement the community mental health services, in view of this additional component of Manpower

development scheme was introduced in 11th FYP under Scheme “A” and “B” to fill up the existing gap and strengthen the community mental health services which envisage starting PG courses in mental health. However, in addition to production of man power there should be effective manpower retention policy to prevent migration of mental health professionals to western countries which has happened in past few decades. It is noted that without good retention policy achievements of programme will be futile. Manpower development scheme itself has suffered man power retention problem of experts in public sector because of following reasons

- Lack of new posts in state and central medical colleges/institutes/hospitals
- In appropriation salaries package to mental health professionals under NMHP
- Lack of growth opportunities in long term

In order to ensure operationalisation of mental health services at district and sub district level, additional provision under PPP model i.e availing services of local private psychiatrist/ CP/ PSW/ DPN (private medical colleges/practitioner) on payment of honorarium basis (on number of cases/ fixed days OPD basis) will also be made. Annual 10% increment in remuneration of DMHP staff will also be factored in with additional provision of freedom to do private practice after duty hours to incentivise the staff and facilitating continuous and sustained availability of mental health services.

New salary structure under programme

SNo.	Designation	Existing Salary p.m.	Proposed Salary p.m.
1	Psychiatrist	50,000	70,000
	Trained Medical Officer	30,000	55,000
2	Clinical psychologist	30,000	45,000
	Trained Psychologist	18,000	25,000
3	Psychiatric social worker	30,000	45,000
	Trained social worker	18,000	25,000
4	Psychiatric Nurse	25000	45,000
	Trained Nurse	15,000	25,000
5	Programme Manager	25,000	30,000
6	Programme Assistant	8,000	25,000
7	Record Keeper	10,000	13,000
8	State Programme Coordinator	-	50,000

Salaries are subject to 10% yearly increment to all grades as per existing policy. There is provision of additional 10% increments to best performing professionals as reward and Additional Support to poor performing DMHP through flexi-pool.

Targets – Operationalising 123 districts / year.

- II. **STRENGTHENING CMHA/SMHA** – There will increase funding to strengthen functional aspects of state cell and central cell. SMHA will help monitor mental health services and issues pertaining to implementation of Mental health Act and Human Rights. There is provision of appointing additional staff for secretarial and monitoring purpose. The bigger states (more than 20 districts) will be provided with greater financial support.
- III. **MAN-POWER DEVELOPMENT SCHEME**– The NMHP will continue support of funding to departments to start / expand PG courses of mental health hence, Scheme B is carried over whereas Scheme A of Man Power Development is dropped. The targets will be to expand / establish 30 PG courses in each PG departments in mental health. The financial support will be provided based on 11th plan guidelines.
- IV. **Trainings and Research Activities**- The training will be provided to DMHP team in clinical and managerial skills to help them learn and understand common mental disorders, plans, policies and implementation of the same. Their training will also focus on techno-managerial, supervisory and leadership skills. Trainings will be carried out every year and will include “Refresher trainings” of existing staff for capacity building and “Standard training” to new members of the team. Trainings will be standardised and will be delivered by identified centres meant for providing training and manpower development. TITs of the identified centres will be organized centrally before taking up further modular trainings. Sensitisation programme of community health workers under DMHP may be outsourced to NGOs working in mental health. The trainings will build the capacity of DMHP staff and they will also be able to train the primary health care staff in an effective manner. The support for undertaking epidemiological mental health researches to gather evidence based data from different region of the country, this will help understand regional needs and framing future plan for various parts of the country.
- V. **I.E & C** – The component will be strengthened through increase in funding at Central and District Level. The districts may develop their state specific IEC material, nodal institutes will provide support to develop and disseminate information by forming state level IEC committee. The central level dedicated website will be introduced under DGHS to provide on hands information on mental health resources, activities, plans, policy and programmes. Extensive mass media activities will be supported at district and sub-district level. The support for TV / RADIO programmes on mental health in vernacular languages through local channels.

VI. **Monitoring & Evaluation**– Monitoring and Evaluation is the most important component for success of any programme. Till now the mechanism for Monitoring and Evaluation of NMHP was not properly defined. The 12th plan will envisage strict monitoring system through creation of MHIMS (mental health information monitoring system). This will be an online data monitoring system and will also facilitate bilateral communication between participating units. MHIMS is expected to bring significant improvement in the programme implementation as possibility of mid course correction based on the feedback will improve. A State level coordinator will be appointed for monitoring DMHPs and to facilitate coordination and management between different DMHPs units. He/She will ensure monthly evaluation of reports from the districts, M&E and will be helpful in solving technical problems at various levels. They will in turn coordinate with State Mental Health Authorities and state nodal officers. Periodic review of the functioning and requirements of DMHP units will be undertaken in collaboration with SMHAs. An independent evaluation of schemes under NMHP will be undertaken at the end of 12th five year plan.

New Components of NMHP 12th FYP

I. **PPP MODEL** – In view of existing shortage of manpower in public sector and increase community participation PPP model will be encouraged at different levels in 12th plan. There is sufficient data to prove efficacy of PPP model. The model will be helpful in service delivery, advocacy and trainings. Guidelines will be framed to establish the model.

LEVELS	AREAS OF PARTICIPATION
District level	Advocacy, local IEC, Rehab. Services and service delivery mechanism,
State level	Sensitization of Community health workers, 108 emergency services
Country level	Research, IEC, Dedicated Help line

II. **Rehabilitation Services/Long term community treatment services** –

The Rehabilitation of treated mentally ill will be supported under the plan. Patients with Chronic debilitating Mental illness constitute about 20% of treated psychotic cases they are generally non-responders or minimal responders to treatment. They constitute sub category of wandering mentally ill persons. They require enormous support and constant supervision to carry out self care and daily activities. It poses significant burden of disease on families and carers, leading to “burn-out” of families / carers. This sub-group requires separate attention to maintain the continuum of care for such people. Currently there is gap between treatment and long term rehabilitation/ care services which

consequent to homelessness and wandering mentally ill. There is virtually non existence of half way / dedicated rehabilitation homes in the country.

The schemes may be set up under PPP model for supporting and establishment of day care services and rehabilitative services. SMHA will be given responsibility to monitor such facilities with service provision from DMHPs and Mental health Service component. The destitute mentally ill patients requiring long term psychiatric care will be kept under direct supervision of psychiatric social worker and psychiatric nurse. CP and psychiatrist in facilities would provide part-time services. Guidelines will be prepared to create partnership with private sector.

III. Integration of NMHP components with NRHM-

DMHP till date is restricted to 123 Districts across the country and has limitations in terms of manpower and financial constraints. The best way of reaching out to community for providing basic mental health services is to integrate different components of NMHP with NRHM.

Integration mechanism is proposed as given under :

NRHM	NMHP
School Health	School mental health services (life skills training)
MCH/RCH	Post partum disorders
Adolescent friendly clinics	Premenstrual disorders for females& life skills trainings, stress management, suicide prevention
National Programme for Health Care of the Elderly	Geriatric mental health
NPPCCD	Counsellor at the CHC level may undertake mental health counselling
IEC	IEC of NRHM

IV. Mental Health Services –

The new component of mental health services are included to improve service delivery by providing flexibility of choice of service delivery components according to the needs of area, these services will be delivered through medical colleges departments preferably those who have already been supported earlier under upgradation of medical college wings component of NMHP. Two types of service delivery packages are as under:-

- Basic Mental Health Services package- Medical colleges without mental health services will be supported to appoint mental health professionals and deliver basic mental health services on DMHP pattern.

- Advanced Basic Mental Health Services package – Medical colleges with PG departments will be supported in delivery of services to reach out tribal areas, Specific population groups, Jail screenings, disaster management program and insurgency ridden areas. The component will help providing extensive exposure of community mental health to under trainee PG students. The services will be provided under supervision of faculty members.

Mental Health services may be tailored and proposed through state PIPs according to reach and needs of district. The financial support of 10 Crore / year will be kept under the component and proposals will be invited from government medical colleges under the component. Flexibility to the components will be provided by creating provision of “*programmeflexi-pool*” to carry out additional activities under NMHP.

V. **Mental Health Help Line –**

A country wide 24 hours dedicated help line for public to provide information on mental health resources , emergency situation and crisis management , information pertaining to destitute mentally ill patients , registration of complaints on Human Rights Violation of mentally ill and assistance on medico-legal issues. The helpline would provide enormous support in emergency situations and reduce treatment gap and generate awareness. This will also help in creating country wide data base. The helpline service will be provided in partnership with Private sector and remuneration will be done on number of case managed.

VI. **108 Emergency Ambulance Services -**

Services of 108 Ambulance will be partnered to pick and drop acute agitated violent patients from homes / roads to nearest mental health facility for treatment. The staff of ambulance will be sensitised to restrain and control such patients with help of family(where available) or police/medical officer/staff (where not available). Ambulance staff will be sensitised to the issues related to involuntary treatment/ restrain. The terms and condition will be same as applicable to TOR signed by states. The funds for running these services will be provided through programme officer of DMHP.

VII. **Up-gradation of Centre of Excellences(COEs) –**

The COEs upgraded in 11thFYP will be further supported to provide basic Neurology and Neuro- surgical facilities, the service delivery will be through hiring human resource on contract. This will include extending infra structure and providing assistance for purchase of technical and non technical instruments. This will be help building speicalised tertiary care services and would provide referral linkages to district hospitals.

Out Come Indicators (Evaluation after End of Every Financial Year)

Central level Programme outcome Indicators:-

1. Number of States with mental health policy initiative.
2. Percentage of financial contribution provided by state government on mental health.
3. Percentage of Districts taken over by State governments after completion of 5 year funding.
4. Number increase as result of Manpower Development scheme in Psychiatry
5. Number increase as result of Manpower Development scheme in Clinical Psychology
6. Number increase as result of Manpower Development scheme in Psychiatric Social Worker
7. Number increase as result of Man Power Development scheme in Diploma Psychiatric Nursing
8. Percentage utilisation of NMHP funds / year

State level programme indicators :-

1. Number of fully functional DMHP.
2. Number of cases/year seen in OPD of Mental health Institutions
3. Bed Occupancy Rate of Mental health Institution/Hospital/Medical
4. Bed Occupancy Rate of Dept of psychiatry in medical colleges
5. Number of DMHP reviews/ years by SNOs
6. Expenditure done under various heads of DMHP/year
7. Monthly cases attended on Dedicated mental health Help line
8. Number of trainings done under DMHP/Year
9. Percentage utilisation of DMHP funds / year

District Level Programme outcome Indicators

1. Number of Disability Certification granted / month
2. Number of Targeted Intervention activities done per district / month
3. Number of IEC activities at District Level /month
4. Number of OPD Cases registered in district hospital/month
5. Bed occupancy rates/month in district hospital
6. Number of referrals made to tertiary care centres/month
7. Number of cases brought to District hospital through 108 Emergency Ambulances
8. Percentage utilisation of DMHP funds / year
9. Number of Post vacant under DMHP

7. National Iodine Deficiency Disorders Control Program

Under the 12th Five Year Plan new initiatives stated in 2011-12 have been included to ensure that 100% population consumes adequately iodated salt at the household level which is very low at present in comparison to neighboring countries as per WHO/UNICEF report.

Program Goal

The following goals of National Iodine Deficiency Disorders Control Programme (NIDDCP) taking into account the MDG for the 12th Plan are proposed:

- To bring down prevalence of IDD below 5% in the entire country by 2017 AD.
- To ensure 100% consumption of adequately iodated salt (15 PPM) at the household level.

Activities & components of NIDDCP

1. IDD Surveys :

It is proposed to continue the existing IDD survey amount of financial assistance to the states and UTs Rs 1.00 lakh per district during the 12th Plan in view of the increase in the cost of Petrol/Diesel and other activities. Hence, it is estimated that an amount of Rs 643 lakh will be required during the entire Five Year Plan period for one time IDD survey/resurvey of 643 district of the country.

2. Establishment of IDD Control Cells

For the effective implementation of NIDDCP, it essential for the State Governments to ensure that the IDD Control Cell is fully established with one Technical Officer(IDD), one Statistical Assistant and one LDC-cum-Data Entry Operator to implement and monitor various components of NIDDCP such as Surveys/Resurveys, monitoring the quality of iodated salt and health education. The estimated funds requirement for IDD control cell @ Rs.12 lakh per State/UT will be $12 \times 35 = \text{Rs.}360$ lakh per annum. For five years, Rs. 16 crore will be required.

3. Establishment of IDD Monitoring labs

Establishment of IDD Monitoring labs with one Laboratory Technician and one Lab Asstt. @ Rs 7 lakh per lab for existing 35 States/UTs. The estimated funds required is Rs.245 lakhs per annum. For 12th Plan period the estimated amount will be $\text{Rs. } 245 \times 5 = \text{Rs.}1225$ lakh.

4. Training Programme

So far DTe.GHS has been conducting training programme in the management of NIDDCP for the State level Programme Officers/Technical Officer as well as in the management of IDD monitoring Labs for the Lab Technicians at the State level through WHO funds. In the 12th Plan it is proposed to include the training component under NIDDCP for district level functionaries as the salt being tested by ASHA at the household level. An amount of Rs.1 lakh for district level training of medical and paramedicals is proposed. Amount required will be Rs. 6.43 crore.

5. Production and Distribution of Iodated Salt

The Annual production of iodated salt has almost reached the target of 55 lakh MT during 2009-10. It is proposed to strengthen the labs during the 11th Plan period and continue the sanctioned posts of technical and other staff under the programme. A provision of Rs 15 crores @ Rs.3.0 crore per annum has been proposed in the 12th Plan for quality control of iodated salt production level under Salt Commissioner.

6. Health Education and Publicity

Health Education activities under NIDDCP have been intensified in association with the Song and Drama Division, Directorate of Field Publicity, DAVP, Railway reservation ticket and the All India Radio to promote the consumption of iodated salt in the remote and backward areas, besides, telecast of IDD spots through Doordarshan, Prasar Bharati. It is proposed that during the 12th Five year Plan period besides the above organizations IEC activities will also be carried out through the Private TV Channels. An amount of Rs.20,000 lakh for five year Plan @ Rs.4000 lakh per annum at the Central level is proposed.

7. Qualitative iodated salt testing at the community level for creating awareness

A Salt testing kit(STK) to show the presence of iodine in iodated salt has been developed as an effective tool for creating awareness and monitoring of iodine content of salt among the community. In order to insure 100% consumption of iodated salt at the community, it is proposed to distribute about 12 salt testing kits to each ASHA/ AWW/Health worker at the community level. The number of ASHA in the country is about 8.4 lakh. The cost of one Salt Testing Kit is about Rs.12/-. The approximate cost for the procurement of STK @ Rs.1200 lakh per annum will be Rs.60,00 lakh for the 12th Plan period.

8. Incentive to ASHA for Community Level Awareness of Iodated Salt:

For creating awareness and sustainable demand of adequately iodated salt at the household in the community and its regular monthly monitoring, an amount of Rs.25 per month to each ASHA for testing of 50 salt samples per month is proposed. An amount of Rs.300 per ASHA per annum is required. Rs. 126 crore will be required for this purpose during the 12th Plan.

9. Strengthening of Central IDD Control Cell

1. For the effective implementation of NIDDCP and regular monitoring of the programme in States/UTs, it is essential to review the post of Technical Asstt. (IDD), Investigator (IDD), Field Assistant IDD etc. The post of consultant (IDD), Programme Assistant(IDD), Data Processing Assistant on consolidated salary of Rs.50,000/- P. M., Rs.25,000/ P. M., Rs.20,000/- P. M. respectively are to be continued during 12th Plan.
2. To upgrade the post of Adviser (Nutrition), National Programme Officer of NIDDCP to

SAG Grade and that of RO(IDD) to Group 'A' with Grade pay Rs.5400.

3. To create one post of DADG, Group 'A' (Micronutrient Malnutrition) with the Grade Pay of Rs.6600/- for monitoring quality control of iodated salt, implementation, IEC and surveys etc. of NIDDCP.

10. Health Education and Publicity by the State/UT's Health Directorate

An amount of Rs.1,00,000/- per district is proposed for Health Education and Publicity including celebration of Global IDD Prevention Day on 21st October every year. Thus amount required will be Rs.1,00,000 x 643 x 5 = Rs.3215 lakh.

Evaluation of the Performance

The National Iodine Deficiency Disorders Control Programme (NIDDCP) was evaluated by the National Institute of Health & F.W., New Delhi during 2007-08. The Directorate General of Health Services, State Health Directorate, Health Institutions, Indian Council of Medical Research have conducted district level IDD Survey in the various parts of the country and reported significant reduction in the Prevalence of IDD. The visible goiter is drastically reduced in the entire country. The consumption of iodated salt at the community level was evaluated by the National Family Health Survey, 2005-06 and indicated the consumption of adequately iodated salt at the community level was about 51% while salt having nil and inadequate iodine was about 49%. Further, the Coverage Evaluation Survey, 2009, UNICEF revealed adequately iodated salt consumption in the country was about 71% and the salt having nil and inadequate iodine was about 29%.

It may be pointed out that in both the studies the consumption of adequately iodated salt is the rural population is far below in comparison to urban population. We have to focus more on rural population where the National Rural Health Mission (NRHM) has been playing a very important role and NIDDCP is under part 'D' component of National Disease Control Programmes of NRHM. Thus, the activities carried out during 11th Plan have shown significant improvement in implementation of the NIDDCP, a 100% Centrally Assisted Programme, in the country. The proposed activities of 12th plan will further improve the nutritional iodine status of the people and prevent physical and mental retardation. This will be improving human resource development and productivity of the country.

Expected Outcomes

The expected outcomes of NIDDCP at the end of the 12th Five year plan are as follows:

1. Prevalence of iodine deficiency disorders in all districts is expected below 5%.
2. The Visible goiter in the country will disappear.
3. No cretin due to nutritional iodine deficiency will be borne in the country.
4. Nutritional iodine status will improve significantly to prevent physical retardation in children.

8. National Program for Prevention and Control of Fluorosis

The activities of the 11th Plan 100 districts are to be continued during the 12th Plan. The Programme will be expanded in remaining endemic districts of the country.

Goal: To prevent and control Fluorosis cases in the country

Activities of the 12th Plan

A. Central Coordination Cell

The Central Coordination Cell consists of one Consultant on consolidated pay of Rs.50,000-60,000 per month and one Data Entry Operator @11,000 – 13,000 per month. The total expenditure for Central Coordination Cell including the travel, contingencies, etc. for a year will be about Rs.17 lakhs.

District level activities:

1. Assessment of prevalence of fluorosis in endemic districts. For this, there is one Consultant at a consolidated salary of Rs.40,000-50,000 per month for the plan period. For three field staff investigator who will be appointed for the survey period of six months the amount required will be Rs.1.98 lakhs. The travel and contingencies expenditure are Rs.3.02 lakhs. Thus, for assessment of fluorosis cases in a district, an amount of Rs.11 lakhs will be required.
2. Medical Management of Fluorosis including treatment, surgery and rehabilitation for which estimated budget is Rs. 25 lakh
3. Laboratory Diagnostic facilities for Management of cases: The recurring expenditure for contractual appointment of one Lab Technician @ Rs.10,000 per month or payment of honorarium to lab technician who will do this work. The reagents cost about Rs.3.8 lakh. Thus the recurring cost of the expenditure of laboratory at districts level will be Rs.5.0 lakh. Non-recurring expenditure of laboratory which is an amount of Rs.10 lakh consist of the equipment given below is required.
 - Ion-meter Table Top (specific for fluoride estimation in biological fluid)
 - Table Top Centrifuge without refrigeration
 - Digital pH Meter
 - Metaler Balance
 - Mixer
 - Incubator
 - Pipettes/Micropipettes
4. Training of medical and paramedical personnel at district level @ Rs. 3.00 lakh
5. Health Education & Publicity at District level: Rs.2.00 lakh
6. Coordination meeting every year @Rs 2.0 lakh for each district

Expected Outcome

- Managed and rehabilitated the fluorosis case in programme district.
- Capacities of laboratory testing build-up in programme districts.
- Health Sector manpower in Govt. set up trained in programme districts.
- Improved information base of public in programme districts.

9. Oral Health

Given the burden of oral diseases in our country and their impact, oral diseases need to be paid attention along with prevention and control of other non-communicable diseases under NRHM. Promotion of healthy lifestyles with respect to oral health needs to be considered. World Health Assembly in 2005 included Oral Health with other non-communicable diseases (NCDs) for health promotion & disease prevention strategies.

Core strategies:

1. Promote access to improved oral healthcare
2. At PHC level, either specially trained dental hygienist or staff nurse may deliver simple preventive, interceptive and curative oral health services (like pain relief, ART, early diagnosis of oral cancer and HIV/AIDS related oral lesions and their referral) in addition to giving oral health education.
3. Strengthening existing CHCs and formulation of Indian Public Health Standards, defining personnel, equipment and management standards for oral health care provision.

Supplementary strategies:

1. Promotion of public private partnerships for achieving public health goals.
2. Reorienting dental education to support rural health issue.

Promote access to improved oral healthcare

One of the major criticisms of oral disease preventive measures has been the isolated and compartmentalized approach adopted, essentially separating the mouth from the rest of the body. This uncoordinated approach at best leads to duplication of efforts. The WHO Global Strategy for prevention and control of non-communicable diseases and the common risk factor approach is a new strategy for managing prevention and control of oral diseases. The common risk factor approach recognizes that chronic non-communicable diseases such as obesity, heart disease, stroke, cancer, diabetes and oral diseases share a set of common risk factors. This approach provides a rationale for partnership working in oral and general health education through ASHA. Training of ASHA workers with respect to oral health is necessary to equip her with the necessary knowledge and skills to achieve this objective.

The content, personnel involved in training and the methodology- all these issues need to be considered. Oral disease prevention methods, identification of common oral conditions, emergency care and referral can be included in induction, periodic and on-the-job training of ASHA workers. The training cascade i.e. Block Training Team (BTT), District Training Team (DTT) and State Training Team (STT) should also consist of dental personnel such as dentists posted in CHCs, district hospitals, students and staff in dental colleges and private practitioners. Training material may consist of training manual, audio-visual aids, models etc.

The job responsibilities and compensation of ASHA workers with respect to oral health should be defined. ASHA should perform the dual responsibility of referring dental patients from village community to the CHC, as well as undertake IEC activities. Cash incentives can be provided to ASHA for referral of cases. IEC activities should be monitored through a duty roster mentioning the number of times the activity has been performed in a given time-period. IEC material can be prepared in the form of flip charts, posters and booklets in a separate workshop with resource personnel under NRHM.

Strengthening existing CHCs for oral health care provision

The Community Health Centres (CHCs) which constitute the secondary level of health care were designed to provide referral as well as specialist health care to the rural population. In order to combat the oral disease burden, particularly in rural areas, oral healthcare service provision is necessary at CHC level. Various national and international studies have shown that service provision at community level is a feasible strategy to overcome financial, social and other barriers to access care (references shall be provided).

In order to ensure quality of services, the Indian Public Health Standards have been set up for CHCs so as to provide a yardstick to measure the services being provided there. Presently, dental care has not been included under the “Assured Services” to be provided in CHC under IPHS. A mention has been made of “optional” dental clinic in the outpatient department. There is a need for setting of IPHS standards for compulsory oral health care provision at CHC. A detailed plan for budgetary requirements, manpower, type of services to be provided at CHCs, space, infrastructure, furniture, equipments, instruments, recurring expenditures on consumable hospital supplies and dental materials needs to be formulated.

Oral health care at Primary Health Centre (PHC)

The Primary Health Centres (PHCs) were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care. PHC is the first contact point between village community and the Medical Officer. The PHCs are established and maintained by the State Governments under the Minimum Needs Programme (MNP)/ Basic Minimum Services Programme (BMS). They are established on the basis of national norm of one PHC for every 30,000 rural population in the plains, and one PHC for every 20,000 population in hilly, tribal and backward areas for more effective coverage.

There are 22,370 PHCs functioning as on March 2007 in the country, achieving an average coverage of 33,191 population per PHC. At present, a PHC is manned by a Medical Officer supported by 14 paramedical and other staff. It acts as a referral unit for 6 Sub Centres. It has 4 - 6 beds for patients. The functions of the primary health center include the 8 "essential" elements of primary health care including medical care, Maternal and Child Health (MCH) including family planning, safe water supply and basic sanitation, prevention and control of locally

endemic diseases, collection and reporting of vital statistics, health education, National Health Programmes, referral services, training of village health workers and basic laboratory services.

In addition to other health problems, the oral disease burden of this population needs to be considered. With an average prevalence of dental caries of 50% in all the age groups, approximately 15,000 people in a catchment area of a PHC would require restorations/extractions. About 45% of adults (60% of the population) i.e. 8100 persons would require oral prophylaxis. As many as 7% of the population i.e. up to 2100 people may suffer from oral premalignant and malignant lesions.

Oral health care with emphasis on preventive and promotive aspects needs to be provided at PHC level. This would include oral health education, tobacco cessation counseling, oral prophylaxis, and pain relief, early identification of oral precancer/ cancer and other common oral diseases and referral. Also, a minimally invasive procedure using hand instruments – Atraumatic Restorative Technique (ART) may be carried out to restore carious teeth. These services can be provided by an extended-duty dental hygienist. Till the time enough number of extended-duty hygienist can be produced, these services can be provided by trained nurses. Also, adoption of suitable number of PHCs (minimum 3) by each dental institution for carrying out oral health education and screening should be made mandatory. Existing PHCs need to be upgraded with respect to equipments and materials for carrying out the above procedures.

The cost involved in making oral health care provision at PHC would include that of extended training of dental hygienists and nurses (to include health education, tobacco cessation counseling, basic pharmacology, ART), salaries of dental hygienists or nurses (as per the State rules), one-time expenditure on PHC extension/ up gradation for oral health care provision and dental equipments and recurring expenditure on consumables and maintenance.

The monitoring and evaluation would include process indicators such as percentage of PHCs with dental hygienist/ trained nurse and dental equipments. Outcome indicators such as number of times IEC activity and oral prophylaxis performed in a given time-period and number of referred dental patients/ dental hygienist need to be evaluated. This would require maintenance of records and its monthly submission to District HQ. Annual survey of oral health knowledge, attitude, practices and oral hygiene status of the catchment area would be useful impact indicators.

Oral health care at Community Health Centre (CHC)

The Community Health Centres (CHCs) constitute the secondary level of health care and are designed to provide referral as well as specialist health care to the rural population. CHCs are being established and maintained by the State Government under MNP/BMS programme. Each CHC covers a population of 80,000 - 1.20 lakh population (one in each community development block).

As on March 2007, there are 4045 CHCs functioning in the country. It is manned by four medical specialists i.e. Surgeon, Physician, Gynecologist and Pediatrician supported by 21 paramedical and other staff. One anesthetist and one Medical Health Administrator are also employed on contractual basis. Recently, an Ophthalmic surgeon has been added at CHC level. It has 30 in-door beds with one OT, X-ray, Labour Room and Laboratory facilities. It serves as a referral centre for 4 PHCs and also provides facilities for obstetric care and specialist consultations.

Indian Public Health Standard (IPHS) have been set up to provide a yardstick to measure the services provided at CHC. As per the IPHS standards, all “Assured Services” as envisaged in the CHC should be available, which include routine and emergency care in Surgery, Medicine, Obstetrics and Gynaecology and Paediatrics in addition to all the National Health programmes.

Unfortunately, dental care has not been included under the Assured Services to be provided at CHC. However, if the oral disease burden of the population served at CHC is considered, it is tremendous. With an average prevalence of dental caries of 50% and average DMFT of 1 in children (34% of population), 40,800 restorations would be required. With an average prevalence of dental caries of 50% and average DMFT of 3 in adults (60% of population), 2,16,000 restorations would be required. 28,800 children would require preventive therapy in the form of fluoride varnish and pit and fissure sealing, if provided to children up to 9 years of age (24%). About 45% of adults (60% of the population) i.e. 32,400 persons would require oral prophylaxis. 30% of geriatric population (8% of the population) i.e. 2880 persons would require prosthetic care. As many as 7% of the population i.e. up to 8400 people may suffer from oral premalignant and malignant lesions.

Therefore, there is a need to provide routine and emergency care in dental surgery at CHC level. This would include oral health education and School Health Education Programme as an outreach activity, identification of oral pre cancer/cancer and other common oral diseases, oral prophylaxis, dental extractions, biopsy of oral lesions, restorations and application of topical fluorides. 1 dental surgeon along with 1 chair-side assistant is a necessary requirement to provide the above mentioned services. Also, public-private partnership should be considered for providing removable prosthesis.

The cost involved would include one-time expenditure on CHC extension and dental equipment, salaries of dentists and recurring expenditure on consumables and maintenance.

The monitoring and evaluation would include process indicators such as percentage of CHCs with dentists, chair-side assistants and dental equipments. Evaluation of outcome indicators such as number of out-patients attended, dental procedures and outreach activity performed in a given time-period would require maintenance of records and monthly submission to District

HQ. Annual surveys of oral health knowledge, attitude, practices and oral health status of the catchment area of the CHC would be useful impact indicators.

IEC, Education and Training

The ASHA worker covers about 1000 population and works in close coordination with ANM, AWW and other health workers. Since her primary role is to inform community, counseling on health issues, mobilization and facilitation in terms of health care delivery and distribution of essential drugs, she would be of extremely help in generation of oral health awareness, facilitation for oral health care services utilization and emergency pain relief. Therefore, the roles expected from ASHA as a part of her ongoing health promotion activities can be

- Instructions on oral hygiene
- Simple methods of prevention of oral problems
- Dietary counseling
- Counseling on tobacco
- Early identification and referral
- Infant dental care instructions
- Oral care for pregnant mothers
- Instructions during school programme on dental caries prevention
- Analgesics for toothache

She can be empowered with the required competencies during the induction and on-job trainings. Village Health and Sanitation Committee members must be sensitized on oral health using a reference manual and short discussion so that they can declare oral health as a theme periodically during village health days etc. Oral health instructions may also be converged with HIV/AIDS, School health, adolescent health, RCH, Geriatric health and other NCD IEC activities. She must be provided with check list containing probable opportunities and starting points for discussion on oral health. ASHA must be given following items:

- Reference chart
- Laminated leaflets on basic details of common dental problems
- Flip chart for educating the community
- Larger charts for display at appropriate locations
- Training manual with following contents
 - Explaining oral cavity
 - Common oral diseases & linkage with general health
 - Methods to provide basic oral health care & pain relief
 - Methods to provide oral health care at home
 - Tips on tobacco counseling
 - Information on tooth friendly diet and role of carbohydrates
 - Information on Infant dental care, geriatric dental care

Training

- ASHA worker has to undergo 23 days induction training during first year and then she is updated with new skills and knowledge every year during on job trainings.
- The induction training is undertaken at District Institute of Health and Family Welfare or similar training institutes by a Block Training team (BTT) comprised of ANM, AWW, Health Educators, Members of SHG and NGO's etc. The members of block training team may be empowered on oral health related training by the District Training Team (DTT).
- Both BTT and DTT should be provided with a reference manual on oral health and can co-opt oral health professionals for such trainings.
- The DTT is trained as Master trainers at state level by the State Training Team at higher centers like State Institute for Health and Family Welfare (SIHFW). The Dental teaching institutions in the state can help the SIHFW in forming the training guidelines, development and contents of IEC materials, reference manuals, training manuals etc. for further training of DTT and BTT.

Monitoring

- Monitoring can be effectively done by panchayati raj institutions at grass root level.
- Oral health indirect indicators (attendance at dental health care facility in the locality, number of referrals) may be used for monitoring and evaluation.

Additional Suggestions:

- Incentives for best performing ASHA/ICDS/SHG/ CBO etc. to be decided by PRI, preferably on the lines of Nirmal Gram Puraskar out of the untied funds
- Individuals adopting good health seeking behaviour also can be rewarded
- In order to give incentives to patients to report to dental health care facilities, modalities for free distribution of tooth paste & brush through PPP will be devised.
- A pilot can be undertaken for training through teleconferences in states equipped

List of Equipments

District Hospital

S.No.	Item
1.	Electrically Operated Fully Programmable Dental Chair
2.	Autoclave
3.	Storage Cabinet
4.	Dental X-ray Unit with Day-light Manual Developer
5.	Panoramic with Cephalometric X-ray unit
6.	Electro Cautery Unit
7.	Digital Pulp Tester
8.	Digital Apex Locator
9.	Surgical Micromotor

Dental lab for making dentures and orthodontics appliances

S.No.	Item
1.	Model Trimmer With Carborandum Disc
2.	Dental Lathe (2 speed)
3.	Hanging Motor
4.	Lab Micromotor
5.	Vibrator
6.	Dewaxing Bath
7.	Acrylizer
8.	Hydraulic Press

Sub-District Hospital/ CHC

S.No.	Item
1,	Electrically Operated Fully Programmable Dental Chair
2.	Autoclave
3.	Storage Cabinet
4.	Dental X-ray Unit with Day-light Manual Developer
5.	Electro Cautery Unit
6.	Surgical Micromotor

PHC (If Dental surgeon is appointed at PHC as per recommendation)

S.No.	Item
1.	Electrically Operated Fully Programmable Dental Chair
2.	Autoclave
3.	Storage Cabinet
4.	Dental X-ray Unit with Day-light Manual Developer
5.	Electro Cautery Unit

Establishment of Comprehensive Cleft Care Centers

PURPOSE

Cleft lip and palate is a congenital defect which can be seen, felt and heard. Cleft lip and palate are among the most common birth defects. Approximately one newborn in around 700 has cleft lip, cleft palate, or both. In India the disease burden of clefts of the maxillofacial region is approximately 190 cleft children born each day and 45,000 each year. Nevertheless, many families have never heard of cleft lip or palate until their child is born. It can be a scary and confusing time. Among some races and people it is still considered a curse of God. It involves facial appearance, the teeth and occlusion, and speech and hearing. The planning and management for future treatment begins shortly after birth.

Health is defined in the WHO constitution of 1948 as: A state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity. When treatment is well planned and coordinated over time, the result is very promising and satisfying.

The Clinic would provide the best possible course of treatment, with a confident, healthy child as the ultimate goal.

The team approach is the logical answer to the problems of the cleft child and his parents. Indeed, it is the only one. Total rehabilitation of the child with cleft is so complex that many different aspects must be brought into unison by as many different specialists. Rehabilitation is progressive, not static; each age period has a unique set of problems and full participation from all members is required at all times to tackle the situations correctly.

The primary purposes of the Clinic are:

- provide periodic interdisciplinary evaluations
- determine and prioritize treatment needs
- coordinate and follow up on treatment
- Counseling of parents and family members.
- facilitate treatment in their local community

The team could provide a comprehensive diagnostic and treatment services for children up to age 21 who have:

- A cleft lip and/or palate
- A sub-mucous cleft palate
- Speech concerns (for example, hyper-nasal speech)
- Cranio- Facial abnormalities or abnormal head shape
- Micrognathic or Macrogathic jaw
- Dental concerns related to the above conditions

The Cranio maxillofacial surgical clinic would comprise of several different members. The team members all have different parts to play in the care of babies, children, young people, and their families. Services to adults would also be offered.

Interdisciplinary Cranio maxillofacial surgical clinic comprises of:-

- Oral & Maxillofacial Surgeon
- Plastic/Pediatric Surgeon
- Orthodontist
- Pediatrician
- Otolaryngologist (Ear, Nose, Throat)
- Prosthodontist
- Pedodontist
- Neurosurgeons
- Ophthalmologists
- Audiologist (Assesses hearing function)
- Speech-Language Pathologist
- Radiologist
- Geneticist
- Pediatric Nurse
- Anthropologists
- Psychologist
- Social Worker

COMPREHENSIVE PROTOCOL FOR CLEFT LIP PALATE MANAGEMENT

AGE	ORTHODONTICS	GENERAL DENTAL CARE	ORAL SURGERY & PLASTIC SURGERY	E.N.T & AUDIOLOGY	SPEECH THERAPY
BIRTH	<ul style="list-style-type: none"> Records Feeding Plate Appliances if Indicated 	<ul style="list-style-type: none"> Advice on Dental care Preventive Measures Diet Counseling 	<ul style="list-style-type: none"> Evaluation Counsel Parents 	<ul style="list-style-type: none"> Behavioural Audiometry Tympanometry Acoustic Reflex Test ENT Checkup Audio Monitoring 	<ul style="list-style-type: none"> Case History PreverbL Skills Pre-Speech/Language Counselling
3 MONTHS – 1 YEAR			<ul style="list-style-type: none"> Lip and Palate Repair 	<ul style="list-style-type: none"> Localisation Audiometry 	
1 YEAR	<ul style="list-style-type: none"> Records 	<ul style="list-style-type: none"> Regular Checkup 		<ul style="list-style-type: none"> Tympanometry ABR Audio Mointoring Grommets 	<ul style="list-style-type: none"> Language Assessment Articulation Assessment Resonance Assessment
3 YEARS	<ul style="list-style-type: none"> Records 			<ul style="list-style-type: none"> Play Audiometry Tympanometry 	
5 YEARS			<ul style="list-style-type: none"> Decision on Re-Pharyngoplasty, Lip Revision and Palatal Fistula Closure 	<ul style="list-style-type: none"> ABR Audio Mointoring 	
7 YEARS	<ul style="list-style-type: none"> Records X-Rays Interceptive Orthodontics if Indicated 				

8-9 YEARS	<ul style="list-style-type: none"> • Records • Decision regarding Alveolar Bone Grafting (ABG) • Pre-ABG Ortho • Post ABG Ortho • Post ABG Records 	<ul style="list-style-type: none"> • Periodontal Assessment • Extractions if indicated 	<ul style="list-style-type: none"> • Alveolar Bone Grafting 	<ul style="list-style-type: none"> • Play Audiometry • Tympanometry • Acoustic Reflex Test • Audio Mointoring 	Follow Up
10 YEARS	<ul style="list-style-type: none"> • Follow up 	<ul style="list-style-type: none"> • Regular Checkup 	<ul style="list-style-type: none"> • Follow up 		
12-14 YEARS	<ul style="list-style-type: none"> • Definitive Ortho Treatment for Non-Surgical cases 				
16 YEARS			<ul style="list-style-type: none"> • Decision Regarding Lip, Scar or Nose Revision 		
18 – 20 YEARS	<ul style="list-style-type: none"> • Records • Decision regarding Orthognathic Surgery • Pre-surgical Ortho • Post Surgical Ortho 	Fixed or Removable Denture Work	<ul style="list-style-type: none"> • Orthognathic Surgery • Dental Implants 		
21 YRS	<ul style="list-style-type: none"> • Final Check • Full Records 		<ul style="list-style-type: none"> • Final Check • Full Records 		

ESTABLISHMENT OF CLEFT CARE CENTRES IN INDIA

In spite of the vast resources of human capital in the field of medical sciences, there remains a gap in the management of these disorders. As we now know, management of cranio-maxillofacial disorders requires an interdisciplinary team approach – between medical, dental, nursing and paramedical and paradental fields. Thus there is an urgent need to set up Dental health care infrastructure / Cranio- maxillofacial centres which would specialize in the management of cranio- maxillofacial disorders in various Medical Colleges in every part of India.

It is herewith proposed, that the Government consider:

1. A **National Research and Development (R&D) Centre** in Delhi to be established at The All India Institute of Medical Sciences, New Delhi, under the leadership of Dr. O. P. Kharbanda (Head of Department, Department of Orthodontics and Dentofacial Orthopedics)
2. A **National Coordinating Centre** to be established at Lady Hardinge Medical College (Sucheta Kriplani Hospital), New Delhi under the leadership of Dr. Pravesh Mehra (Head of Department, Department of Dentistry and Maxillofacial Surgery)
3. Ten **Service Centres** spread across 5 geographical regions of the country namely North, South, West, East and North East.
4. A **Pilot Project External Evaluation Committee** proposed to evaluate the functioning and outcome of the proposed centres over a period of five years

National Research and Development (R&D) Centre (AIIMS, New Delhi)

This facility will be required in Delhi to oversee the Research and Development aspect of the cleft care programme. This centre will also function as a base for exchange of education and research programmes with other centres in the country and abroad.

The prime objectives of the R&D Department will be:

- Identify the right interventional strategy for the right age from the day the child is born.
- Design protocol specific to / suitable for the Indian demographics and Health Care Facilities
- Collect, Collate data with respect to the genetic or anti-partum causes of cleft lip and palate, carry out statistical analysis and identify suitable intervention that can be replicated in the Indian setup
- To monitor and evaluate the performance of the coordinating centre and the ten service centres being established.
- Identify current national and international trends in cleft diagnosis and treatment and disseminate relevant knowledge to the service centres.

- Coordinate with partner institutions*and eventually assist the Directorate, Health Services, Ministry of Health and Family Welfare in auditing the project.

Partner Institutions

- ICMR
- Dept. of Biotechnology
- Directorate General Health Services, Ministry of Health, Govt. of India

National Coordinating Centre (Lady Hardinge Medical College, New Delhi)

Objectives

- Be model institution for dissemination of cleft awareness and comprehensive cleft care.
- Be the coordinating centre for the 10 service centres across India.
- Identify interventional strategies to reduce the overall morbidity and mortality related to craniofacial clefts in India.
- Minimize the secondary complications of cleft lip and palate.
- Generate data for the R&D department.
- Identify pre-surgical, surgical and post surgical interventions and assist the R&D unit in devising the Indian Protocol.

Service Centres

Objectives

- Be centres of comprehensive cleft care for masses.
- Identify interventional strategies to reduce the overall morbidity and mortality related to craniofacial clefts in India.
- Minimize the secondary complications of cleft lip and palate.
- Generate data for the R&D department.
- Identify pre-surgical, surgical and post surgical interventions and assist the R&D unit in devising the Indian Protocol.

S. No.	Region	States & Cities Identified
1.	North	Jammu and Kashmir (Srinagar); Uttar Pradesh (Lucknow)
2.	South	Andhra Pradesh (Hyderabad); Kerala (Thiruvananthapuram)
3.	East	West Bengal (Calcutta); Bihar (Patna)
4.	West	Gujarat (Ahmedabad); Maharashtra (Nagpur)
5.	North- East	Meghalaya (Shillong); Manipur (Imphal)

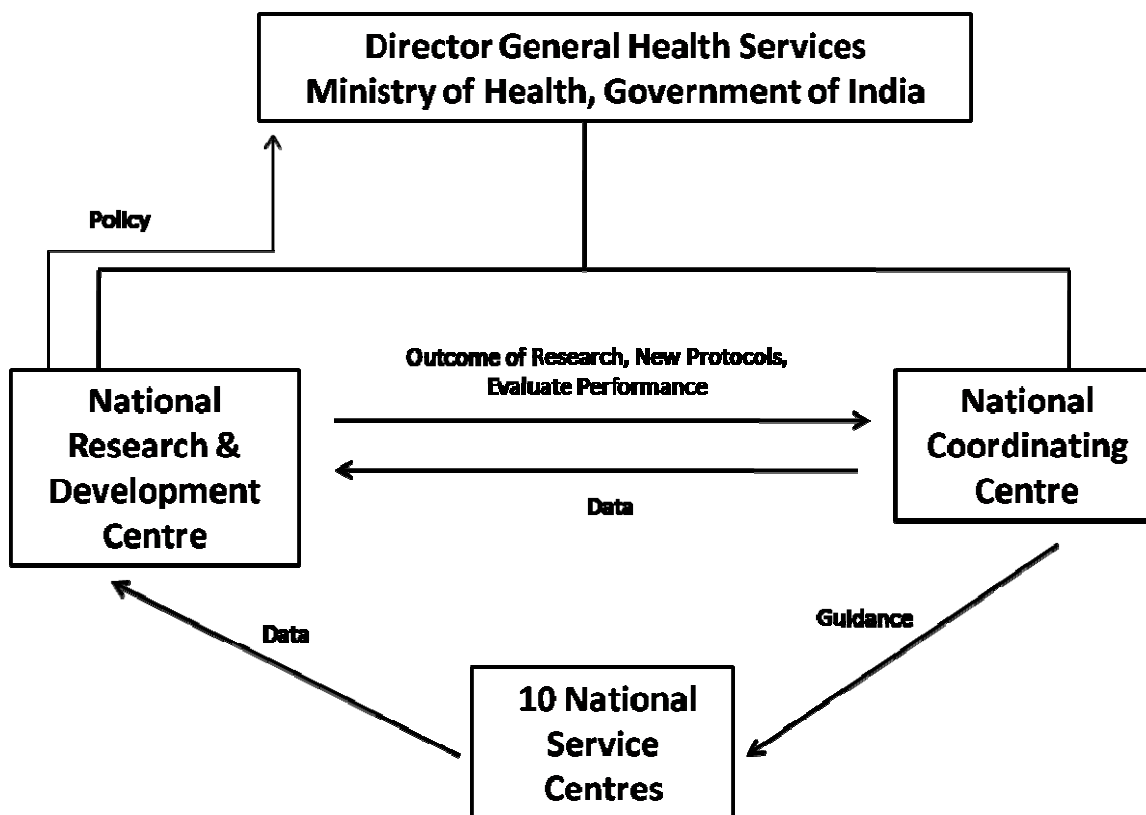
These States are chosen on the basis of high incidence of Cranio- maxillofacial disorders. There is very little support from the State Governments to patients/ families suffering from such disorders. All would be State Government based Medical Colleges / Hospitals, and thus would provide affordable, accessible, acceptable, quality based equity cranio- maxillofacial disorder health care in the most effective and efficient manner.

Pilot Project External Evaluation Committee

An external evaluation committee is proposed to evaluate the functioning and outcome of the proposed centres over a period of five years. The committee will convene thrice during this time, first after 2 years of project commencement and then twice at intervals of 1.5 years.

Proposed Committee Members:

1. Dr. S. P. Aggarwal (Director, Green Park Dental Institute and Research Centre)
2. Dr. Mahesh Verma (Principal, Maulana Azad Institute of Dental Sciences, Delhi)
3. Lt. Gen. Dr. Paramjit Singh Retd. (Director Principal, Rayat bahara Dental College, Mohali)
4. Dr. S. P. Bajaj (Plastic Surgeon, Jaipur Golden Hospital, Delhi)
5. Dr. V. K. Tiwari (Professor, Plastic Surgery, Safdarjung Hospital. New Delhi)
6. Dr. Rajender Sharma (Professor, Deptt. of Rehabilitation, Safdarjung Hospital, New Delhi)



PROGRAMMES FOR DISABILITY PREVENTION AND REHABILITATION

10. Trauma Care Facility on National Highways

Based on analysis of the 11th Plan, the strategies proposed for the 12th plan are as follows:

- The construction activity is taken 2-3 years time causing delay in release of funds for equipments which takes round about a year for procurement. The funds are released in the phase manner which delays the entire project. In order to augment the pace of implementation of scheme it is proposed that the funds for construction & equipment may be released in first phase. The procurement of equipment may be initiated on completion of the civil structure upto terrace. The funds for the other component like manpower, communication, Legal assistance may be released in second phase on receipt of audited UC & SOE for construction and equipment.
- Prioritizing the identification of hospitals for developing trauma care facilities based on the deprived States, backward States, far flung areas, hilly & tribal area. The list of the deprived States & Districts is identified under NRHM.
- To identify the 160 Government Hospitals on the national highways (other than GQ, NE, SW corridors) are as - connecting capital to Airport/Seaport, connecting two major cities other than capital – connecting Capital to major industrial township cities in 12th Five year Plan.
- Capacity building at State-level by identifying State Trauma Resource Centre in each State. The L-1 Centres would be hub for the training of doctors, nurses etc. besides the State Trauma Resource Centre will also be involved to impart training.
- Integrating pre-hospital care with the scheme of Emergency Medical Services initiated by EMR Division.
- Establishing communication linkage with the mobile units, highways locations and the designated trauma centres.
- To assist the States to develop and manage an appropriate trauma referral system.
- To develop, implement and maintain statewise and National Injury Surveillance System.
- To develop Trauma Registry in JPN Apex Trauma Centre and PGIMER RML Trauma Centre and gradually expand it to other institutions.

The priority for identifying district

- Deprived States & District (list from NRHM).
- Far flung area
- Hilly & Tribal Area

Activity wise physical targets for key indicators on coverage:-Broadly, the annual targets would be as under:

Year	Activity
2012-13	<ul style="list-style-type: none"> ▪ Convey ‘in-principle approval’ for 160 institutions and sign MOUs with State Govts. ▪ Survey & identification of 46 new institutions ▪ Sensitization of personnel of 113 trauma centers sanctioned in 11th Plans in injury surveillance. ▪ Release of funds for 46 Trauma Centre for construction and equipment and spill over cases of 11th plan.
2013-14	<ul style="list-style-type: none"> ▪ Inspection of 62 new institutions for implementation ▪ Sanction & release funds for 62 institutions. ▪ Compile and publish data on injury surveillance.
2014-15	<ul style="list-style-type: none"> ▪ Inspection of 52 new institutions for monitoring implementation ▪ Sanction & release of funds for 52 institutions ▪ Compile and publish data on injury surveillance ▪ Mid Term appraisal.
2015-16	<ul style="list-style-type: none"> ▪ Annual inspection of 160 institutions ▪ Compile and publish data on injury surveillance
2016-17	<ul style="list-style-type: none"> ▪ Appraisal of project ▪ Handing over all liabilities to State Govts. ▪ Finalisation of project for 160 new institutions to be implemented in the 12th FY Plan. ▪ Publish report on project implementation and injury surveillance.

11. Prevention & Management of Burn Injuries

The program needs to continued and expanded in the 12th Plan because-

- Total number of burn injury cases annually in India is approximately 70 lacs (7 million) and the cases are on increase
- In India approx. 1.4 lacs people die of burn every year
- More than 7 lacs burn injury cases require admission every year
- 70% of all burn injuries occur in most productive age group (15-35yrs).
- 4 out of 5 burnt cases are women & children.
- 80% of cases admitted are a result of accidents at home (kitchen related mishaps).
- Amongst all traumas, burn cases have highest duration of hospital bed occupancy.
- Cost of hospitalised burn injury case management is extremely high which may cost enormous financial burden to the country.
- The rehabilitation of the individual may be a challenging and daunting task.

In view of the above, the program is proposed to be expanded in the 12th Plan period at national level in a phased manner covering the District Hospitals and Govt. Medical Colleges (approx.150) spread across all the states. However, to avoid duplication of services, districts where medical college is already functioning, the district hospital will not be taken up for establishing burn's unit. Further, the high focus districts (i.e districts with poor health infrastructure) and the states showing willingness for implementing the program, having enough load of burn cases and scope for establishing burn unit in terms of availability of land/space would be included for implementation on priority. The remaining states/districts would be taken up for implementation in subsequent years. Hence, approximately 150 Government Medical Colleges and 492 district hospital would be taken up for implementation in phased wise manner as follows-

12 th Plan	Year	Additional Medical Colleges	Additional District Hospitals	Cumulative no. of Medical Colleges	Cumulative no. of District Hospitals
By March 2011		-	-	3	6
During 12 th plan	2012-13	20	50	23	56
	2013-14	35	100	58	156
	2014-15	40	120	98	276
	2015-16	35	130	133	406
	2016-17	17	86	150	492

Before inclusion of the Medical Colleges/ district hospitals, a central team consisting of an expert, architect and representative from MoH&FW/Dte.GHS so formulate would conduct an inspection visit for examining facilities available and gap analysis.

Strategies for implementation-

The programme will be implemented at National level with following objectives-

2. To reduce the incidence, mortality, morbidity and disability due to Burn Injuries.
3. To improve the awareness among the general masses and vulnerable groups especially the women, children, industrial and hazardous occupational workers.
4. To establish adequate infrastructural facility and network for BCC, burn management and rehabilitation.
5. To monitor and supervise the programme at various levels of implementation and carry out Operational Research for assessing risk factors for burn injuries and its management for effective need based planning.

The programme will be continued with the following components-

1. Preventive Programme: This component is being implemented through Central Health Education Bureau (CHEB) and Awareness Programme in School for generating awareness.
2. Treatment Programme: This component will include capacity building of healthcare manpower and quality burn injury management at all the levels of Health-care delivery system.
3. Rehabilitation Programme: Rehabilitation services to be provided at district and state level to restore functional capacity of the burn patients to optimum.
4. Monitoring and supervision: Development of mechanism for monitoring and supervision of programme activities at central, state and district level for better implementation of the programme.

- 1. Preventive Programme (IEC)**: More thrust will be given on IEC component of the programme. It is proposed to keep IEC budget for the states for carrying activities at various level. CHEB would be the nodal agency for IEC activities.

The Central Health Education Bureau (CHEB) will carry out detail planning of IEC, provide leadership and develop core messages, mass media and advocacy events. The Central Health Education Bureau will maintain coordination with State Health Education Bureau (SHEB)/IEC Bureau. IEC would be implemented at state level through support of SHEB/IEC Bureaus.

Following activities have been proposed under this programme-

- Situational Analysis is proposed to be carried out in all the states in the first year of the Plan period. This Situational analysis is proposed to be the basis for selecting specific messages, selecting communication networks and planning a relevant IEC strategy.
- Impact assessment (4 events) of the IEC initiatives taken under the NPPBI is proposed to be conducted at the end of each plan year.
- Terminal evaluation of the IEC initiatives taken under the NPPBI during the entire plan period 2012-17 is proposed to be carried out in the fifth year of plan period. This evaluation will be a part of total programme evaluation.
- Electronic media: Doordarshan, AIR, Cable TV, Internet, Mobile phone SMS. CCTVs at the railway stations, hospitals, schools and other public places are the available Medias, which could be used for educating the masses starting from urban to rural areas. Scroll bar messages on the prevention of burns could also be given through DD, Cable TV etc.
- Print Media: Newspapers advertisements, magazines, posters, charts, folders will be used for disseminating information on burns.
- Melas, Rallies and Quiz, Folk Media etc.
- Orientation training programme for medical and education professionals and mass awareness programme for general public and school children, Public meeting / lecture for general public.
- Awareness campaign for school children.
- Outdoor publicity in form of Hoardings, Wall Paintings, Neon Signs, Kiosks, Bus Panels, etc

Following manpower would be required for CHEB to be engaged on contractual basis to carry out above activities-

- Consultant-one @Rs,50000/-per month.
- Programme Assistant– One @Rs.25000/-PM
- Data Entry operator –1 @ Rs.15000/-PM
- Support staff/MTS- 1@ Rs.8000. P.M

Cost proposed for the educational and preventive component for 12th Plan would be for Rs 209.60 crore.

2. Treatment Programme: For quality management and rehabilitation of burn injuries at various levels of Health-care delivery system, certain additional requirement of physical infrastructure (construction/renovation of burn units), trained manpower, equipments & materials would be provided to the medical colleges and district hospitals.

Additional space will be located in Medical colleges and District Hospitals for establishment of burn's unit where such facilities do not exist and all such places will be provided with equipment required for burns management and rehabilitation. It shall be the responsibility of the states to provide for adequate land / build up structure which can be suitably modified for creating the burns unit at medical college and district hospitals levels. Financial support will be provided by MOH & FW for construction of burn's unit.

To implement the programme, it is imperative that additional medical, nursing and paramedical manpower would be required. Financial support for recruitment of manpower on contractual basis for the period specified will be provided by MOH & FW.

Each district will be provided with an advanced life support (ALS) system ambulance if not already available. This will create a burn support system for the village, primary health center, CHC and district level. This will also be utilized to transport serious burn patients from the place of injury to the district or the designated burns unit. These ambulances will be provided with multi disciplinary workers who will be running the ambulance and helping in dressing the serious burns patients to the district or at designated burns unit.

Construction- Rs. 1.00 crore for construction of burn unit at one district hospital and Rs.1.95 crore for medical college have been proposed.The cost involved for 12th Plan would be Rs 772.65 crore.

Equipments- Rs.0.48 crore for procurement of equipments at one district hospital and Rs.0.98 crore for medical college have been proposed.The cost involved for 12th Plan would be Rs 371.58 crore.

Recruitment of manpower-Rs.0.62 crore for recruitment of contractual manpower at one district hospital and Rs.1.79 crore for medical college have been proposed.The cost involved for 12th Plan would be Rs. 1712.62 crore.

Training: To improve the quality of burn management, a network of trained manpower from Medical colleges and District Hospitals will be created. The training plan is detailed as follows:

- Training in first aid to burn cases for Ambulance drivers, Multipurpose Workers, Nursing staff, Dressers, OT Technicians, and other Paramedical staff at the Medical Colleges & Districts.
- Training in first aid to burn cases for Ambulance drivers, Multipurpose Workers, Nursing staff, Dressers, OT Technicians, and other Paramedical staff at the District Hospitals.

- Medical College Level: Training of the workers in Medical College Hospitals will be done by the Surgeons who are already trained in Burn care or who receive training under the programme.
- District Level Training: Training of the district level workers will be done at district hospitals by the Surgeons and Medical officers trained in burn care under the programme.
- The National Level Training: Two Surgeons / Medical Officers from each district shall be trained by the Burns & Plastic surgeons at burns units of Dr. R.M.L. Hospital, L.N.J.P. Hospital or Safdarjung Hospital or any Medical College/ Selected Training hospitals in the country having such facilities.

The training will be conducted by each Training centres closest to the district hospitals. If required, on-the-job training of the medical college workers will also be done at existing burn centres. Orientation training for the primary level workers will also be done at district centre by the trained Surgeon / Medical Officers.

The expenditure for training of Surgeons inclusive of TA/DA against this component would cover the cost of training material / module / literature / sample stock of consumables / demonstration material etc. and would be provided to each trainee (Surgeon / Medical Officer from District) in a Kit.

Rs. 50,000 for training of surgeons/medical officers/paramedical staff per district has been proposed. The cost involved for 12th Plan would be Rs 3.21 crore

Gained from the experience of the pilot programme, in many district hospitals and Medical Colleges, burn services could be started immediately, albeit at a slightly lower level, by altering/ renovating existing space, and that a full fledged burn unit as envisaged in the plan would take much longer time to establish. Therefore, under construction component funds may be kept either for renovation/alternation of existing structure, or for new construction as the case may be. Further, to start burn services immediately and expeditiously in the infrastructure already available in Medical Colleges / District Hospitals provision may be kept for simultaneous release of funds for construction work, procurement of equipments and recruitment of manpower.

- 3. Rehabilitation Programme:** To restore the burn patients back into the society to their normal functional capacity as what existed prior to the burn injury. This rehabilitation services is to be provided at district and state levels. The budget is included in the Burns Injury management program as stated above.

It is proposed that for proper program implementation there should be a provision of payment of incentive in the form of monthly allowance / honorarium to surgeons managing burn cases at district hospitals. Burn management is an unpleasant task and the district surgeon needs to be incentivized for their work in providing this service. The incentive may be either an increment in pay scale or a fixed incentive of Rs 1000/- per month, which can be disbursed to all district surgeons receiving burn management training or it could be linked to submission of a Medico-legal case record from the district, which would also help in case monitoring and surveillance. An incentive of Rs.1000/- per month for three surgeons/medical officers for each district for management of burn cases is proposed. The cost involved for 12th Plan for this component would be Rs 2.27 crore.

4. Monitoring and supervision- For strengthening monitoring & supervision of the programme at various levels and also facilitating implementation of the program following structure would be required-

1. Central Burn Cell at Dte GHS, New Delhi (already existing) with following staff

- Program Manager/ Nodal officer/DDG
- National Consultant-2
- Program Assistant-2
- DEO-2
- Peon/Helper-1

State Burn Cell with following staff -

- State Program Manager (probably from state health directorate)
- Consultant-1
- DEO-1

District level Cell- District Program Manager (probably a technical expert)

Cost involved- Nil

Program Implementation Committee- Following Committees would be required at various levels under the program-

- a) **Central level-** National Monitoring & Advisory Committee (already existing)- The Committee will consist of an expert group from well established burns units and other eminent authorities in the field of burns injury management. This group will interact through frequent meetings at the centre and will be advising the Program officials for monitoring, supportive measures and other issues essential for smooth functioning of the program.
- b) **State level-** State Implementation Committee will act as advisory body for monitoring, supporting and dealing with core issues for smooth functioning of the program at state

level. The Director/ Jt. Director of Health Services, Director/ Jt. Director of Medical Education, Executive Engineer/Architect from state PWD, State IEC Officer and the State Programme Manager could be the members of the Committee.

- c) **District level-** District Co-ordination Committee would function for addressing issues at district level. The Committee would comprise of CMO, Medical Superintendent of district hospital/Principal of medical college and District Program Manager.

Monitoring & Evaluation

A National Burn Registry would be formulated through a common process of administrative channel of sub centre / PHC to CHC to District Hospital / CMO to State Cell to Central Cell, Dte.GHS and State Health Education Bureau to Central Health Education Bureau based on the availability of data through a regular feedback mechanism of reporting.

Mid-term Evaluation of the programme for assessing progress of various activities is proposed to be carried out in third year (2014-15) of the 12th five year plan. Evaluation would cover approximately 25% of the implementing medical colleges/district hospitals. Cost involved for this activity would be Rs. 3.00 crore

Expected outcome-

- Establishment of fully fledged Burns Care Services in the Medical Colleges and district hospitals
- Availability of trained manpower at the Medical Colleges and district hospitals
- Increased awareness regarding prevention of Burns Injuries, safety measures and availability of services through IEC.
- Establish out-reach burn care services through mobile burn care delivery system (ALS ambulances)
- Reduce the incidence of burn injuries and the consequences thereby reducing the burden on Govt. exchequer and improving the quality of life of the community.

12. Disaster Preparedness and Response in Health Sector

Preamble:

National Disaster Management Act (2005)⁴⁸ defines disaster as “a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area”.

A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk. Risk assessment and management would require a collaborative approach from all concerned stakeholders at all levels. This also underscored the need to adopt a multi dimensional endeavour involving diverse scientific, engineering, financial and social processes; the need to adopt multi disciplinary and multi sectoral approach and incorporation of risk reduction in the developmental plans and strategies.

Disaster management occupies an important place in this country’s policy framework as it is the poor and the under-privileged who are worst affected on account of calamities/disasters. Disasters retard socio-economic development, further impoverish the impoverished and lead to diversion of scarce resources from development to rehabilitation and reconstruction. The steps taken by the Government of India have been translated into a National Disaster Framework culminating into the Disaster Management Act, 2005, encompassing institutional mechanisms, disaster prevention strategy, early warning system, disaster mitigation, preparedness and response and human resource development. The common strategy is to flow through the planning process of relevant stakeholders including health sector.

Thus this action plan follows the dictum of DM Act and Disaster Management Policy⁴⁹ of a paradigm shift from a relief centric approach to that of prevention, preparedness, mitigation, response, recovery, rehabilitation and reconstruction.

The foregoing paragraphs summarize the legal, institutional and operational framework for disaster management in India with focus on health sector.

Legal and Policy Framework

Constitution: Under the constitution, disasters and health are State subjects.

National Disaster Management Act, 2005

The National Disaster Management Act was enacted in 2005. It provides for legal, institutional and operational arrangements including capacity development at central, state,

district & local levels for prevention, preparedness, mitigation, response, recovery, rehabilitation and reconstruction following natural and manmade disasters.

Transaction of Business Rules:

In exercise of the powers conferred by clause 3 of article 77 of the constitution, Transaction of Business Rules have been framed which provides for the Standing Committee of the Cabinet on Management of Natural Calamities to oversee all aspects relating to management of natural calamities including assessment, programme development, implementation, and monitoring¹³⁴.

The National Crisis Management Committee (NCMC) under Cabinet Secretariat and headed by Cabinet Secretary is the Apex Committee in Government of India that deals with major crisis which have serious or national ramifications. It will be supported by the Crisis Management Groups of the Central Ministries. As per the Crisis Management Plan of the GOI, Ministry of Health and Family Welfare is the nodal ministry for biological disasters.

Relevant Acts supporting Disaster Management

A number of legislations, other than those stated above, support management of disasters.

At the global level, International Health Regulations [IHR] (2005) adopted by the World Health Assembly on 23 May 2005 came into force on 15 June 2007. The purpose and scope of IHR (2005) is to prevent, protect against, control and provide a public health response to the international spread of disease and to avoid unnecessary interference with international traffic and trade¹³⁵.

At the national level, some of the important Acts like the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1983 and the Environment (Protection) Act 1986 and Rules (1986) provide for protection of Water, Air and environment respectively. The Environment Protection Act, 1986 also provides for the Biomedical Waste (management and Handling) Rules 1998 with a view to controlling the indiscriminate disposal of hospital/biomedical wastes.

At the State and District level, the Epidemic Diseases Act (Act 111 of 1897) provides for prevention and spread of dangerous epidemic diseases. Relevant portions of the Indian Penal Code (IPC) [1860] may be invoked as and when the need arises.

Disaster Management Policy

Disaster Management Policy for the country was unveiled in 2009 by National Disaster Management Authority. The policy advocates a paradigm shift in Disaster Management from relief centric approach to a proactive regime emphasis on preparedness, prevention and

mitigation. It also calls for a holistic approach and recommends incorporation of disaster management into the sustainable development planning by all concerned departments.

Institutional Framework

The institutional mechanism at Central, State and District level for Disaster Management in general and specific to health are:

At Central Level

National Disaster Management Authority (NDMA): The National Disaster Management Authority was established in year 2005, under the provision of National Disaster Management Act 2005. Prime Minister is the ex-officio chairperson. Powers are vested with the authority to perform certain functions that include laying down of national policy and guidance for disaster management, approval of the national plan and plans of various ministries, capacity development, coordination with various agencies to ensure implementation of national policy and guidelines. It also has a lead role to initiate the institutional measures for prevention, mitigation and preparedness with a view to generate a holistic, integrated and preventive approach to disaster management.

Institutions established under the DM Act by NDMA

The Disaster Management Act also provides for the line ministries in the Central Government to develop plan and implement the same to support capacity development for *prevention, preparedness, mitigation, response, recovery, rehabilitation and reconstruction*. A National Disaster Response Force (NDRF) has been constituted with specialized capacities to respond to natural, manmade and Chemical, Biological, Radiological and Nuclear (CBRN) disasters. Under the Act, National Institute of Disaster Management (NIDM) provides for human resource development, academic and research support.

Ministry of Health and Family Welfare (MoH&FW): This is the nodal ministry for biological disasters. It also has the supporting role to provide medical / health care to mitigate health impact of other types of disasters.

State Level

State Disaster Management Authority (SDMA): The SDMA, being set up under the provision of DM Act, provides for the same powers as envisaged for the NDMA, to carry out similar functions at the State level.

State Health Department: This is the nodal department for managing health sector *prevention, preparedness, mitigation, response, recovery, rehabilitation and reconstruction* for disasters.

District Level

District Disaster Management Authority provides for the convergence of all sectors at district level to develop and execute the operational plan for prevention, preparedness, mitigation and response.

Operational Framework

Public Health Delivery System in India

Under the Indian constitution, clear responsibilities have been delineated between the Central and State Governments keeping in mind federal structure of the country. Health being a State subject, the State Governments (through state, district and block level public health institutions and state owned medical colleges) are primarily responsible to meet the public health needs (both preventive and primary, secondary and tertiary curative care) of the population and manage the public health delivery system on day-to-day basis and also meet the emergency public health needs of the population.

The Union Ministry of Health and Family Welfare support the state in terms of advocacy, laying down guidelines, standard operating procedures, capacity building and provide logistic support on selective basis. The specialized central government hospitals and institutions provide tertiary care facilities in the selected cities and also in the selected specialities. These institutions in the process of its functioning also act as reservoir for large pool of medical manpower which facilitates emergency mobilization during crisis situation.

Besides the health system response to mass casualty events, the MoHFW also supports the State Governments in addressing issues relating to pandemics, epidemics / outbreak of diseases in terms of capacity development, rapid emergency public health needs assessment, surveillance and response, outbreak investigation, laboratory support, health system response, logistics (drugs, equipment and vaccines) and risk communication. Besides MOHFW, also carries out research activities relevant from the public health point of view through the Indian Council of Research (ICMR).

Besides MoHFW, the major Central organizations having Health units like those in Indian Railways, Employees State Insurance Corporation and Ministry of Defence are factored in for health sector response if the need arises. Ministry of Defence in particular acts as first responders based on State Government's request. In addition to the public sector involvement, the private sector also plays a significant responsibility in the public health delivery system in India. Approximately, 70 percent of health services are provided by private sector on payment basis. Private hospitals are better organized and equipped since they are permitted to generate their own resources.

The financing norms for disaster relief are governed by funds stipulated by the Ministry of Finance, namely Calamity Relief Fund (CRF) and National Calamity contingency Fund (NCCF). The norms for CRF/NCCF has been clearly laid down and includes the items like (i) outreach services through relief camps, (ii) prevention of epidemics (iii) replacement of damaged drugs ad equipments and (iv) immediate restoration of primary health care facilities.

Strengthening of health delivery system to meet the routine and emergencies public health needs

As per the National Disaster Management Act, the state and the district authorities are responsible to operationalize the disaster management plan at the community level. Ministry of Health & FW being the nodal ministry for biological disasters and support ministry for other disasters has initiated a series of steps to strengthen the overall health delivery system at primary, secondary and tertiary level which would contribute to the surge capacity of the state and district health delivery system to meet the public health needs of the vulnerable population especially during any emergency situations.

Salient features of the programmes and projects that got initiated in the 11th Plan relating to strengthening public health delivery system that facilitate emergency public health emergency management are:

1. **National Rural Health Mission (NRHM).** The NRHM is a flagship programme in mission mode to provide support to states for strengthening system of health care in rural areas through provision of physical infrastructure, human resources, equipment, emergency transport, drugs, diagnostics etc. The upgradation involves new construction/renovation of sub-centres, primary health centres, community health centres and district hospitals. An important component which contributes to disaster preparedness, apart from the human resource and infrastructure strengthening, is emergency transport system which has been made operational in 12 states with assistance of 2919 ambulances. In addition, 1674 ambulances have been provided to the states for working at PHCs, CHCs, Sub-districts and District hospitals. Also 1031 mobile medical units are operational in various states under NRHM.
2. **AIIMS like institutions for tertiary level health care and programme for strengthening of medical colleges:** – Under the Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) (Phase-I) six AIIMS like institutions are being set up in the states of Bihar (Patna), Chhattisgarh (Raipur), Madhya Pradesh(Bhopal), Orissa (Bhubaneswar), Rajasthan (Jodhpur) and Uttrakhand (Rishikesh) at an estimated cost of approximately Rs. 820 crore per institution. The construction is in full swing and these institutions are likely to become functional by December, 2012. In addition, under this scheme, 13 existing

medical colleges are also being strengthened. This would provide much needed tertiary care support during disasters. Phase II of this programme is under consideration.

3. **National Highway Trauma Care project-** The programme thrives to have trauma centres and pre-hospital care along the golden quadrilateral and north, south, east, west corridors. These highways pass through some of the most vulnerable disaster prone districts. So far 113 select government hospitals have been provided financial assistance for establishing trauma centres to the tune of Rs.281 crores in the 11th Plan. For the 12th Plan an amount of Rs. 1476 crores have been projected. The ambulances required under this project and to be stationed on the highways and trauma centres are being supported by Ministry of Road Transport/National Highway Authority of India.
4. **Burns Management Programme:** A pilot programme for prevention of burn injuries has been started in the 11th Five Year Plan with an allocation of 29.70 crores. Under this pilot project, one medical college and two district hospitals each in the states of Haryana, Assam and Himachal Pradesh have been taken up for creating infrastructure and human resource for burn management. The programme would be scaled up under the 12th Five Year Plan.
5. **Blood Transfusion Services:** National AIDS Control Organization (NACO), currently supports a network of 1127 blood banks, 155 component separation units, 795 district level blood banks and 28 model blood banks. It has supported modernization of all major blood banks at state/ district levels. In addition it is proposed to establish blood storage Centres in 3222 CHCs (presently 685 blood storage centres are functional).
6. **Integrated Disease Surveillance Project (IDSP):** The IDSP was launched in November 2004 with the objective of strengthening Disease surveillance system for epidemic prone diseases to detect and respond to outbreaks. The major components are (i) integrating and decentralization of surveillance activities (ii) strengthening of public health laboratories (iii) human resource development for use of information technology for data management. The network covers the entire country with 776 data centres, 24X7 call centres and a media scanning cell.

Gaps:

Though there are overall improvement in the health delivery structure, still there are wide inter- state / intra state variation. The primary and community health care infrastructures are not construed to support mass casualty events. There is wide differential among the states in the range and quality of services provided by the district level hospitals. Medical college hospitals or other tertiary care institutions run by the state health department or municipalities

are overwhelmed even with the routine load and their surge capacity is limited. Apart from infrastructure shortcomings, the human resource manning these institutions, at all levels, are not sensitized to act as first responders, triage, manage cases and do appropriate referral. There is also need to mitigate the impact of disasters on health infrastructure (hospitals) through structural and non structural modalities. A major gap is the preparedness and response for chemical, biological, radiological and nuclear disasters. For communicable disease outbreaks, surveillance and response capacity need to be strengthened further.

Scope and Limitations: The action plan addresses specific activities particularly those which provide for specialized capacities targeted to fill the gaps in health sector preparedness and response to disasters. It does not address overall health sector capacity development which is being undertaken under various projects and programmes as detailed in para 4.1.2.

Goal: The goal of 12th plan document for health sector preparedness and response to disasters is to reduce mortality and morbidity by increasing communities' resilience to disasters.

Objectives

Overall Objective: The overall objective is to strengthen capacities of the health sector to prevent, remain prepared to respond and to mitigate the adverse outcome of disasters.

Specific Objectives

- To build capacities in human resource at all levels to respond to health aspects of disasters by 2015.
- To institutionalize uninterrupted continuing medical care to victims of disasters where hospital buildings have been affected by 2015.
- To ensure disaster resilience, structural and non structural , in Central Government hospitals by 2020.
- To strengthen health sector communication in 15 vulnerable states through strategic health operation centres by 2017.
- To develop specialized capacities for handling CBRN disasters for the country from centres identified in vulnerable States/ Districts by 2018.
- To develop health sector specific IEC materials for creating awareness among public by 2013.
- To provide rapid health assessment and response through quick response medical teams in disaster settings by 2013.

Activities

1. Human Resource Development

Capacity building activities proposed in this plan includes training of grass root level functionaries as medical first responders; the health workers and pre hospital service providers in basic life support; doctors at district level and above hospitals (in vulnerable districts) in cardiac and trauma life support; hospital administrators in hospital preparedness and public health personnel on public health emergency management. The basic and advance life support courses have already been rolled out on pilot basis and would be expanded across the country through identified regional hospitals. The training of trainers has been affected for hospital preparedness. The course for health managers on public health emergencies would be advanced through the support from World Health Organization.

2. Mobile Hospital

Mobile hospital is a pre-fabricated, self-contained, container based 100 bedded hospital which can be deployed by road, rail or air during a disaster which has affected the health facility. The container based hospital includes medical, surgical, diagnostic, operation theatres, intensive care, imaging services and other supportive services that include kitchen and sanitary services. This can be deployed in minimum time possible and would provide medical care to the victims of the disasters who could not be otherwise attended to by the health facility which has been affected by the disaster.

3. Safe Hospital Initiative

The safe hospital initiative would address the structural and non structural component. The structural component would endorse issuing guidance to the States for constructing hospitals/ health facilities in the vulnerable zones using laid down building bye-laws / codes. For existing hospital buildings, standards as advised by NDMA would be followed for retrofitting. During the plan period the Central Government hospitals would be assessed for retrofitting. Non structural components would include guidance to health facilities for proper anchorage of equipments, ensuring their functionality and training of staff.

4. Strategic Health Operation Centre (SHOC)

There is a felt need in establishing a command and control centre in health sector to address the post-disaster public health needs during acute emergency phase, relief and recovery phase through improved, coordinated communication network amongst the different levels of public health administration and institutions involved with the health sector disaster management. It would be necessary to meet the communication needs with fail proof information technology with adequate redundancy. This technology need to be robust, both terrestrial and satellite

based that has connectivity to all the district headquarters of vulnerable States with high speed data transfer, voice and video conference facility.

SHOC would also fulfil the need to collect and manage data that would create evidence for future planning.

5. Risk Communication

The risk communication activity would focus on communicating the risk to the population at-risk. Generic IEC materials on simple public health measures would be communicated through print and visual media. Prototype IEC materials that are disaster specific would be developed and kept ready, to be rolled out at appropriate time.

6. Management of CBRN Disasters

For managing chemical, biological, radiological and nuclear disasters, six centres of excellence would be established on regional basis that would address tertiary care, teaching, training and research requirements. Requisite human resources would be identified, recruited and trained to handle CBRN exposure/ injuries. These centres would also have the capacity to provide outreach services for districts/ cities other than those identified as vulnerable districts / cities. In addition prioritized districts / cities with nuclear power plants or those vulnerable to terrorist attacks would have basic facilities for detection, protection, decontamination, decorporation, treatment/ stabilization and referral. Other activities would include securing stockpile of drugs and equipments for all identified facilities and creating awareness among medical practitioners and general public on prevention and protection aspects of chemical, biological, radiological/ nuclear exposure.

7. Rapid Health Assessment and Response

Training would be provided to health administrators on Rapid Health Assessment. It would be ensured that trained Rapid Response Teams are available to respond quickly during disasters.

Implementation Plan

The implementation would span through the 12th plan period and beyond. Human resource development for managing health consequences of disasters would be top priority and taken up immediately. The capital investment in terms of infrastructure creation / strengthening would be spread across the plan period. Gantt chart for the proposed activities is given below:

Financial Year	2013-14				2014-15				2015-16				2016-17				2017-18			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activities																				
Human Resource Dev.																				
ATLS																				
<i>Establishment of Centres</i>																				
<i>conduct of trainings</i>																				
ACLS																				
<i>Establishment of Centres</i>																				
<i>Launching of trainings</i>																				
BLS																				
<i>Establishment of Centres</i>																				
<i>Launching of trainings</i>																				
First Responders Trainings for ASHAs and Health Workers																				
<i>Development of training module</i>																				
<i>Launching of trainings</i>																				
HOPE																				
<i>Launching of trainings</i>																				
PHEMAP																				
<i>Launching of trainings</i>																				
Mobile Hospital																				
<i>Procurement of mobile hospital</i>																				
<i>Recruitment of staff</i>																				
Safe Hosp. Initiatives																				
<i>Non structural mitigation guidances</i>																				
<i>Retrofitting</i>																				

Financial Year	2013-14				2014-15				2015-16				2016-17				2017-18			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Strategic Health Operation Centres (SHOC)																				
<i>Establishment of SHOC in Centre</i>																				
<i>Establishment of SHOC at identified vulnerable States</i>																				
CBRN																				
Centres of Excellence																				
<i>Establishment of Centre of excellence</i>																				
<i>Human resource development recruitment</i>																				
<i>Human resource training</i>																				
Strengthening identified hospitals																				
<i>CBRN facility expansion in these identified facilities</i>																				
<i>Human resource training</i>																				
<i>Secure stockpile of drugs and equipments</i>																				
<i>Strengthen and fast track research for drug development</i>																				
<i>Awareness generation amongst professional and general public</i>																				
<i>Community based psychological care</i>																				

Monitoring

EMR Division of Directorate General of Health Services would implement the programme on disaster preparedness and response in health sector. The programme would be monitored through a set of input / process / output indicators.

S.No	Activity	Input and Process Indicators	Output / outcome Indicators
1	Developing Human Resource Component	1. No. of training labs identified. 2. TOT planned	1. No. of training labs made functional 2. No. of TOTs conducted 3. No. of Trainers trained 4. No. of Trainings done in each category 5. Capacity built of different categories of s each specific training.
2	Mobile Hospitals	1. Specification finalized 2. Procurement procedure undertaken	1. No of mobile hospitals procured in the last 2. No. of patients attended-category/Specialty 3. No. of operative procedures done specialty 4. No. of Nosocomial Infections confirmed 5. Intra-operative mortality observed
3	Safe Hospital Initiative		
	Non-structural	1. No. of hospitals identified for non-structural measures. 2. Guidelines prepared and circulated.	1. No. of hospitals implementing non structur 2. No. of hospitals following the mandated gu 3. No. of staff aware of these plans
	Retrofitting	1. No. of hospitals identified to undergo retrofitting. 2. Guidelines circulated to all health care facilities in vulnerable zones	1. No. of units retrofitted and functional
4	Communications		
	SHOC	1. Vulnerable states identified for establishing SHOC. 2. SOP finalized for SHOC	1. No. of SHOC centres identified against t %. 2. % of SHOCs following SOP.
	Print/Visual media	1. No. of prototype IEC material developed.	1. Prototypes rolled out during disaster throug 2. Utilization of IEC budget Assessment of BCC
5	CBRN		
	Centre of Excellence (COE)	1. Number of Centres planned 2. Minimum standards established for COE. 3. Budget sanctioned	1. No. of units completed per year as per time 2. No. of staff of different categories recruited 3. No. of trainings done 4. Number of mock drills conducted 5. %utilization of budget. 6. Capacity to handle CBRN enhanced.
	Strengthening existing hosp. for CBRN in 50 Districts/Vulnerable cities	1. No. of districts identified based on vlnerability profile. 2. Minimum standards laid down	1. % vulnerable districts covered with CBRN 2. Number of mock drills conducted. 3. Specialized capacity attained to manage C in vulnerable districts.
6	Rapid Health Assessment (RHA) and Emergency Response		
		1. Funds allocated 2. Collaboration with NRHM to train Health Workers/ASHAs as med. first responders.	1. RHA SOP prepared 2. QMRTs identified and trained upto district 3. % of Districts covered with trained QMRTs 4. % of trained QMRTs utilized in a disaster e

13. Emergency Medical Services

The world war field planning for carrying war casualties, coupled with progress in automotive industry provided an opportunity to the resource rich countries to develop and refine organized emergency medical care for the civilians. Emergency Medical Services (EMS) got evolved to reflect change from a simple transportation system ferrying the patient to a point of care to one where patients were provided with emergency medical care with life saving support systems during transportation. The key feature is timely response in attending to the patient. It further got integrated with the point of care ensuring that the standards of emergency care received during transportation are continued uninterrupted at the point of care. The two components of EMS, facilitated by timely communication, form a chain to provide emergency care delivery, the outcome of which is likely to be sub-optimal, with increased mortality and morbidity unless they are well conceptualised and organised to suit the country's needs and resources.

Global Scenario

The emergency medical services evolved over time in the last century showed resource rich countries developing capacities to attend to an emergency case in a given setting (domestic, work place, road side, incident site, hospital etc) and transport him/her along with continuum of emergency care to a defined point of care facility within defined time, moving away from the traditional golden hour concept (reaching within the first hour) to the platinum 10 minutes concept. Countries like USA, UK and Israel have over 30 years of experience in system development for EMS, yet there are constraints. Further efforts in these countries were to integrate the pre hospital services with emergency departments of hospitals and to develop capacities among medical and paramedical professionals to manage emergencies. Now, the Emergency Medicine has emerged as a separate and distinct discipline.

A large number of models available globally undermine the fact 'no size fits all'. Many countries follow the Anglo American Model where trained 'Emergency Medical Technicians' perform standardized life saving skills during transportation by road or air (air or heli ambulances)[eg USA]. The Franco German model followed in Germany, France and Scandinavian countries follow a more hands on approach with emergency physicians providing advanced pre hospital care.

The levels of care also ranges from providing non invasive basic life support to advance mobile coronary care, neonatal care or specialized hazardous material life support.

The operational mechanism also varies from 100% Government owned and operated (NHS, UK) to varying elements of public private partnerships. This include those operated by hospitals; voluntary organizations like Red Cross and St Jon ambulance (Ireland, Germany, Austria) and those stand alone systems operated by private organizations.

WHO estimated that without proper emergency services at first referral level, up to 10% of the population will die from injury and 5% of pregnancies will result in maternal death.

Indian Scenario

Current Status

In India Emergency Medical Services is relatively a new concept. The most dominant model is that initiated by the then IT corporate, Satyam Computers who established a Emergency Medical Research Institute [EMRI], brought in information technology for communication and vehicle tracking etc and trained human Resource. The implementation through pilot project in Andhra Pradesh, saw its expansion, with Government of India adopting the model for National Rural Health Mission. Presently, under the PPP mode, EMRI has its operation in 11 states with 2858 ambulances [Andhra Pradesh (752), Gujarat (476), Karnataka (517), Tamil Nadu(428), Goa(22), Madhya Pradesh(94), Assam(282), Meghalaya(30) and Uttarakhand (114), Himachal Pradesh (107), Chhattisgarh(36)].Rajasthan has 164 supported by service providers other than EMRI.

In their area of work, EMRI provides pre hospital emergency care (basic life support) from incident site to an appropriate hospital. Being a component of NRHM, the services were initially planned for rural population (one ambulance for 100,000 population) with emphasis on obstetric emergencies. However, in many States where EMRI is operational, the services are provided in major towns and cities that too, to provide only transportation with the paramedic capable of doing first aid procedures.

Few more service providers namely ZIQITSA (Bihar, Kerala, Rajasthan), AAA Foundation (Ambulance Access for All) in Mumbai and Emergency and Accident Relief Centre, Tamilnadu operates on PPP mode.

In the formative stages the Central Government provided 100% capital expenditure and 95% of the operational expenses. From the year 2009-10 onwards, the State would be bearing 40% of the cost during first year, scaling to 60% and 80% for 2nd and 3rd year and subsequently to be owned up by the concerned State Government.

SWOT analysis

- Strengths
 - Political will to provide services
 - A model has been established under PPP mode
 - More number of States are getting covered.
- Weakness
 - Lack of Integration with hospital services
 - No standards for pre hospital or Emergency Department (ED) care
 - The hospitals do not have emergency physicians. The present concept of 'casualty' is based on specialty care provided by specialists from basic and advanced specialties attending the victim at ED on call basis.

- Lack of qualified Emergency Medical Technicians capable of performing invasive life saving measures. Human Resource not competent to provide basic / advance life support.
- The present ambulance deployment could serve only a small percentage of population.
- Lack of fiscal management for a sustainable system.
- Opportunities
 - Improve quality of emergency health care services in India
 - To establish a techno legal regime to regulate EMS
 - Provide equitable pre hospital services to poor and marginalized population
 - Use alternate financing options such as insurance.
- Threats
 - Lack of trust, failure to strengthen government institutions and integration of pre-hospital and hospital services coupled with demand generation would establish private players with sole profit motive.
 - Spending on emergency health care by way of out of pocket expenses would further drain the savings of poor and marginalized population.

Strategic Approach

- Evolve EMS policy : techno legal, regulations, rules, standards and guidelines
- Provide emergency medical care at site of event/ incidence through outreach pre hospital care services and integrate it with appropriate emergency medicine departments of hospitals.
- Expand on the existing ambulance services under NRHM.
- Explore Public Private partnership in programme delivery.
- Innovative financing options for sustainability.

Scope and limitations:

The response time of 15-30 minutes is based on the data generated by EMS in the State of Gujarat. The large inter-state and intra state differentials in health delivery system, even more so pronounced between urban/ rural areas, would limit standardized application of EMS across India.

The sub district and district hospitals has to the backbone of EMS. The Emergency Departments of these hospitals has to get a complete face lift with competent emergency physicians, nurses and technicians manning them.

The geographic spread of some districts, road conditions and difficult terrains would necessitate the introduction of cost intensive alternates like heli ambulances to meet the laid down standards.

Objectives

Overall Objective:

To establish Emergency Medical Services in India with response time ranging from 10 to 30 minutes.

Specific Objectives: By the end of the XII plan period:

- Evolve EMS Policy: techno legal, regulations, rules, standards, guidelines and financing norms .
- Set up Institutional mechanism for EMS at National/ State/ Districts and strengthen administrative units of the departments.
- Establish capacities for creating large number of Emergency Medical Technicians / Ambulance Officers envisaged in the programme.
- Plan and implement EMS pilot project in 10 districts including 2 difficult terrain districts.
- Strengthen the emergency departments of identified hospitals pilot project areas.
- Evaluate pilot, and prepare a vision document for implementing Emergency Medical Services across India.

Policy formulation

Legal Framework

The Supreme Court in a series of connected matters has made rulings on emergency care. The Law Commission in its 201 report on “Medical treatment after accidents and during emergency medical condition and women in labour” have recommended a law to compel hospitals and medical practitioners to attend on victims of accidents those in emergency medical condition and women under labour. Law Commission also circulated model law for the States to adopt.

The State of Gujarat enacted the Gujarat Emergency Medical Services Act in April 2007 which provides for emergency medical services in that State and for that purpose established Gujarat Emergency Medical Services Authority and the city and district emergency medical councils in the State.

A national consultation collaborating with Ministry of Law would provide policy guidance for Central/ State law, rules and regulations governing provision of emergency medical services in India.

Institutional Framework

Government is responsible for providing effective emergency services. This could be accomplished through proposed institutions as detailed below, existing institutions at primary, secondary and tertiary level along with other partners-private and non-governmental. The

coordinated institutional framework need to ensure policy, continuing standards, clinical guidelines, standard operating procedures, records, quality and audit.

National Emergency Medical Services Authority

For the purpose of providing emergency medical services in the country, a National Emergency Medical Services Authority would be established with a senior technical officer, ex officio or otherwise, as Chairperson, as decided by the Government with appropriate members. The function of the authority would be to oversee all aspects relating to provision of Emergency Medical Services in India.

State /City/District Emergency Medical Councils

For providing emergency medical services in every state, city and districts, State / City/ District Emergency Medical councils would be set up. The functions of the councils would be to ensure provision of emergency medical services in their respective States/ cities/ districts. At the city and district level the councils will focus on the operational aspects of the scheme ensuring that all the components are functional optimally.

Strengthening Central and State Health Directorates

Central Level

For managing the programme, an EMS division would be established in DGHS with an officer equivalent to the rank of Addl DG heading it. A post of Joint Secretary would be created in the ministry to administer all programmes connected thereto or incidental therewith. The existing Emergency Medical Relief (EMR) Division and Highway Trauma Programme would be merged into EMS division, elevating the post of Director, EMR to a Joint Secretary equivalent post (SAG level) , supported by two Directors one for EMR and other for EMS.

State Level

Each state will have a Director, Emergency Medical Services to supervise and control emergency medical services. In addition he / she would also meet the requirement of prevention, preparedness, mitigation, response, recovery and rehabilitation from health consequences of disasters, for which as of now, there is no earmarked personnel or organization within the health department.

District / City level

Each District/ City would have an Emergency Medical Services Officer implementing and monitoring the emergency medical services in the district / city.

Programme Components

A. Pre-Hospital Services

Pre hospital services would include all services provided from incident site till handing over the patient to the emergency department of the hospital. The services would be established after assessing the appropriateness of modality of transport from the incident site to the point of care, the basic indicator being the response time. The modalities of transport are:

Ambulance Services

- (a) Life Support Ambulances: India has now manufacturing units having capacity to fabricate good ambulances but there is no uniform standards. The EMS would follow uniform standards across the country. The patient cabin area ambulance must be adequate to accommodate patient (6'2" length) and roof height must not hinder advanced life support measures. The head end should be free to seat the doctor / EMT to perform head end manouvours. Besides that it should have enough space to accommodate one ambulance officer. Standard specifications for a life support ambulance are provided at **Annexure I**. the standard operating procedure both for patient interventions would be clearly laid down.

There would be one ambulance for 50,000 population. For response time of 15 -30 minutes, one ambulance could be considered to cover an area of 5-10 km. radius. The terrain, accident vulnerability of the area for RTAs and disasters would be considered before fixing the number of ambulances required for a particular area.

- (b) Heli / fixed wing aircraft ambulances

For difficult terrains, where patients cannot be transported through road with in the prescribed response time, heli ambulances would be put into services. Heli Ambulances/ fixed wing aircraft ambulances are cost intensive and have their own limitations. For example the operating cost of heli ambulance is about INR 5.00 crores per year. As the Ministry of Health would not be in a position to operate or maintain heli/ air ambulances, these services would be outsourced.As a test case, two districts with difficult terrains would be included in the pilot project.

- (c) Two Wheeler ambulances

Two-wheeler ambulance service would target busy metros where four wheeler ambulances find difficult to reach due to blocked traffic. The EMTs on two wheelers would reach the spot faster and attend to immediate emergency requirements till such time the four wheel ambulance reaches the incident site. These ambulances would be equipped with communication gadgets, first aid kits, splints, cervical collars, life saving kits, resuscitation kit and portable suction machine.

Ambulance Stations:

Ambulance Stations would be parking, resting and communication hub for the ambulance officers. These stations would be at easy to access locations (petrol pumps / fire stations/ Government office complexes/ hospitals). Each ambulance station would have two rooms of 15'x15' dimensions with attached bathroom. Each Station will have one ambulances to provide uninterrupted services on 24x7 basis. An ambulance station would cover an area of 5/10 Sq Km radius.

Inter-Hospital Transfer

Hospitals may continue to receive emergencies other than those brought in by EMS (till such time the services are well established and accepted by the population). The life support ambulances would be made available to identified hospitals for inter hospital transfer.

B. Emergency Department (ED)

The archaic term 'Casualty' should be replaced with 'Emergency Department'. The speciality of Emergency Medicine is distinct and comprises of more than caring for 'war casualties' as the name was originally intended to be.

The most commonly available system for emergency patient care worldwide is the hospital-based ED, a place which intends to facilitate medical and surgical care to all people who seek immediate attention for acute health problems. Therefore, the department needs to be conducive to prompt and efficient patient care. It is important to realise that this does not end with establishing four walls and facilities but involves planning, organising, staffing, training and quality control. Even though District Hospitals have functional Emergency Rooms, many such areas do not provide standard emergency care due to lack of planning, trained staff and equipments. Therefore, it is of utmost importance that emergency services in the District Hospitals be upgraded, for better outcome.

- a. Emergency Services: The emergency department would provide well-organized medical, paediatric, (including neonatal) surgical, obstetric, trauma care and anaesthetic services.
- b. Physical facilities: Physical facilities should include reception, triage area, treatment area, operating theatres, labour and delivery room, high dependency area, blood bank, laboratory, diagnostic imaging, sterilization, water, electricity, safe waste disposal and communications. The district hospitals would be upgraded to the required level and equipped adequately. The physical facility requirement for an emergency is at *Annex.II*.

- c. Equipment and instrument: The District hospital would be equipped with surgical instruments for minor surgery, major surgery, obstetrics and gynaecology surgery, orthopaedic surgery, anaesthetic equipment, resuscitation equipment and monitoring equipment. Recommendations for minimum equipment requirement for a District Emergency Department are *Annexure-III*.
- d. Supplies system: There would be uninterrupted supply of essential drugs, blood and intravenous fluids and other consumables
- e. Personnel: Clinical personnel with appropriate qualification and training in emergency medicine, general surgery, orthopaedics and traumatology, obstetrics and gynaecology; anaesthesia and resuscitation should be available along with adequate number of nurses and support staff. Evaluation of training needs and coordinated plan for continuing medical education, especially for enhancing skills, should be an ongoing programme. The duties and responsibilities of the staff should be well defined. The practice of emergency care is team work and all personnel need to work together to achieve expected standards of emergency care.
- f. Quality Assurance: A quality assurance system to improve the quality and equity of patient care needs to be in place. Standard treatment protocols and standard operating procedures are essential in the ED to ensure safe patient care especially for inexperienced physicians or nurses. Protocol Manuals are available and an indigenously developed one is most suitable and practical. Moreover it is prudent to implement treatment protocols in concurrence with the various departments of the hospital. The department should have standard operating procedures and treatment protocols for most of the emergencies that present to the department and it is recommended that all clinical personnel of the ED follow the same such that standardised and uniform clinical management is ensured. Proper digital record management and clinical audit also assures quality service in hospital systems.

C. Triage

Triage is the process of getting the right patient to the right place at the right time with the right care provider. In disaster settings where there are multiple emergencies, effort would be to provide the most effective care for the greatest number of patients. In non disaster settings, the efforts of emergency department would be to provide the best care for each individual patient. The guiding principles would be to identify patients requiring immediate care, determine the appropriate area for treatment and facilitate patient flow through the emergency and avoid unnecessary congestion. A 3 stage uniform coding would be followed for patients requiring immediate care, those requiring monitoring for worsening of conditions and those

who could be managed in out-patient departments. Every emergency department nurse would be trained in triage. Guidelines on triage are at *Annexure-IV*.

D. Human Resource Development

The crucial gap in human resource is the Emergency Medical Technicians [EMT] without which any ambulance, however advanced it may be, would only serve the purpose of transporting the patient. As of now, the paramedics in ambulances providing services under NRHM have no legal sanctity to provide for advance life support medical interventions and only perform first aid. To raise a breed of EMTs, technically competent to handle emergencies and to imbibe a culture of EMS is the biggest challenge for the EMS programme. The EMTs should be placed at a pedestal equivalent to nurses. For the time being nurses desirous of working as EMT would be provided one year in-service training in emergency medicine followed by six months internship. Nurses by way of their training are better placed to handle human emergencies. A curriculum developed by the sub group for EMT is at *Annexure-V*.

Apart from EMTs, the human resource at the emergency departments needs to be reoriented for the new job. Details of patients staffing Emergency Department and their training requirements are at *Annexure –VI*.

3. Communication System

Communication system would be the nerve centre of the EMS. It would be realized through satellite based, terrestrial band-width based and truncated radio system. It provides for receiving call, dispatch of the ambulance, communication to and fro from ambulance and hospital, tele/video conferencing, ambulance tracking and data management.

(a) Command and Control Hub System Architecture Ambulance Call Centre (ACC)

It is intended to use Geographical Information System (GIS) and Global Positioning System (GPS) technologies to track the Ambulance Vehicles and graphically display its position on the map at the Ambulance Control Centre (ACC). The proposed system must have an open architecture and be based on Web Browser technology, capable of scaling up. It would have CLI (calling line identity) enabled and CTI (Computer Telephony interface) enabled with features like least call routing, automatic call distribution, trunk guard, emergency calling; direct inward / outward system access; single digit operator calling; blank call recall; live call monitor etc. The configurations should provide for enabling telemedicine operations within the network and identified centre. The control room would house servers, switches, backup power system, dispatch etc and work stations for the call taker, call dispatcher and supervisor. Workstations would be required for all

call takers / dispatchers, supervisor, data entry, and administrator positions

The Mobile Data Terminal (MDT) –Ambulance

The MDT will be located in driver cabin in the ambulance and the laptop / mobile computing device / I pad will reside in patient's cabin; there would be two data channels, GPS Receiver and digital camera. There would be back up digital Trunking Radio System.

Suitable bandwidth would ensure teleconferencing from the ambulance. The windows/browser based software interface would allow the attending officer to record the name and other details. The system would be able to send visuals of the patient (extend of trauma) and the procedures being done with in the cabin through a camera to the central control room and the specialist station and get real time feed back to the ambulance. The medical equipments defibrillator + monitor combo, ECG machine, Transport ventilator, Pulse oxymeter, and glucometer etc) would be tele-medicine compliant and be able to interface through the mobile computing device/laptop / I pad / data card.

Data Terminal-Hospital

The data terminal within the hospital would reside in the communication control room. It would provide three way communication with ambulance / the ambulance station, the central control centre and higher referral centre.

Ambulance Tracking system

The Ambulance Tracking System (ATS) would consist of three Sub-systems viz., (i) Ambulance Call Centre / Control Room (ACC) Sub-System, (ii) Vehicle Sub-system and (iii) Communication Sub-System. The specifications are such that it can be scaled up for the future to address the need of a fleet of 15000 ambulances operating through multiple control rooms.

Communication Sub-System

The data communication channels would be based on the 3G/ EDGE/ /GPRS/ GSM or CDMA technologies. This could be taken from any service provider who should ensure dedicated connectivity. The Block Diagram of the Ambulance Communication System is at *Annexure VII*.

Toll Free Number

The telecommunication department would provide with a nation-wide applicable 3 digit call number which would replace the existing multitude of 3 digit/ four digit numbers.

Implementation Plan

The XII plan period would focus on developing the techno legal regime and implementation of EMS in 10 districts and their evaluation. Towards the end of the plan period the Institutional frame work of National authority and the State councils would take shape. Expansion of EMS to district/ cities would be taken up in subsequent plans.

Specifications for Ambulance**PART - A**

Item No.	Description	Quantity
1.00	<p>Ambulance 3350 mm WB, fitted with TD 2650 FTI, Turbocharged, Intercooled DI Diesel Engine Bharat Stage –IV</p> <p>TECHNICAL PARAMETERS FOR AMBULANCE:</p> <ul style="list-style-type: none"> - Type of Body: Monocoque - Minimum Engine Capacity: 2596 CC - Emission Norms: BS-IV - Engine Output: 70 HP @ 3200 rpm - Torque : 195 Nm @ 1800-2000 rpm - Turning Radius: 6.5 Mtrs. - Brakes : Four piston disc brakes with wear indicator <p>DIMENSIONS:</p> <ul style="list-style-type: none"> - Wheel Base: 3350 MM - Overall Length : 5235 MM - Overall Width: 1975 MM - Overall Height: 2550 MM - Front Overhang: 720 MM - Rear Overhand: 1165 MM - Min. Ground Clearance: 190 MM - Fuel Tank Capacity: 70 Ltr. 	01 Units

PART – B**Equipments to be installed in the Ambulance**

S.No.	Particulars	Qty.
1.	Scoop Stretcher	01 No.
2.	Foldable spine board	01 No.
3	Folding Stretcher	01 No
4.	Deluxe extremity vacuum splint Kit Model: D-S1749, <u>Set Contents:</u> (a) 2 Splints(leg, arm and wrist/ankle) (b) 1 Double action pump (c) 1 Adapter (d) Carrying case	01 No.
5.	Combi collar: Adjustable Cervical Collar model	01 No..
6.	Aluminium AAA type O2 Cylinder,	01 No.
7.	O2 Regulator (Imported Pin and Index flow regulator)	01 No.
8.	BP Instruments (Wall Mounted –Aneroid)	01 No.
9.	Stethoscope	01 No..
10.	Defibrillator + Monitor [12 lead ECG, NIBP, O2 saturation with standard accessories	01 No.
11	Transport Ventilator	01 No.
12	Infusion pump	01 No..
13	Nebulizer	01 No.
14.	Resuscitation bag (ambu bag, airways & mask of different size including paediatric, Endo Tracheal tubes of different sizes)	01 No.
15.	Electrically operated suction pump	01 No.
16.	First Aid Box (dressing materials/antiseptic lotion/analgesic etc.)	01 No.
17.	Linen/Blanket	01 No.
18.	Laryngeal mask airways of all sizes	01 No.
19	Burns Shield	01 N.o

PART - C

S.No.	Particulars	Qty.
1.	Patient Cabin: Interior top and side wall panelling done in GFRP (Glass Fiber Reinforced Polymer). Fibre thickness 6mm,	01 No.
2.	Patient Cabin: Water proof plywood with Vinyl flooring	01 No..
3.	AIR CONDITIONING (Patient Cabin only) Micro bus blower, 508, Heavy duty condenser– 1No. Heavy duty drier – 1No. Heavy duty electrical fan for condenser– 1No. Key Switch – 1No. with complete wiring and insulation.	01 No.
4.	Engine Room: 135AH Alternator,	01 No.
5.	Patient and Driver Cabin: Complete wiring, Sleeves with channel routed. SCB (Short Circuit Breaker) Switch for 220V ac line & 12V. Fuses with fuse box for all 12v lights.	01 No.
6.	Patient Cabin: 800VA, High Frequency Inverter, Pure Sine Wave output, with 90AH sealed mobile lead acid maintenance free battery.	01 No..
7.	Patient Cabin: Fibre cup-boards to fix ventilator / monitor / defibrillator / and suction with concealed 220v plug points (5 Nos) and O2 outlets with alarm panel (1No.)	01 No.
8.	Patient Cabin: 12v fan for Doctor and Patient	02 Nos.
9.	Patient Cabin: Medicine rack, 3 drawers with containers for keeping bandage, gauzes and other sterile items.	01 No..
10.	Patient Cabin: Medicine rack, 4 drawers with containers for keeping medicine, ampoules, vial etc.	01 No.
11.	Patient Cabin: S.S.Wash Basin, electrically foot switch operated with 25 litre water tank capacity	01 No.
12.	Patient Cabin: Anti skit and shock absorbing mat for keeping medical equipments like ventilator, monitor, defibrillator, infusion and syringe pump.	01 No.
13.	Patient Cabin: Retractable Doctor seat with safety belt	01 No.
14.	Patient Cabin: Multifunction stretcher/ trolley	01 No..
15.	GAS SOURCE: Complete gas pipelining with tubing embedded in panel having superior STAINLESS STEEL outlet points for oxygen (1No.O2 outlet for oral mask and 1 No. O2 outlet for ventilator) with Rail Mounting Systems (RMS) for loading and unloading the 2 Nos. of “D” type bulk cylinders. (cylinders are not included) Low O2 Alarm, O2 failure alarm, O2 Cylinder pressure Manometer and 0.2 micron dust filter	01 No.
16.	Patient Cabin: Overhead Fibre Cupboard with glass door in RHS of the ambulance to store medical equipments accessories.	01 No.
17.	Patient Cabin: CFL Tube Light (220V, 36W)	04 Nos.
18.	Patient Cabin: patient examination light(12v, 55w)	01 No.
19.	Patient Cabin: IV Bottle hook with bottle holder	02 Nos.
20.	Patient Cabin: Dust Bin Holder: Disposable Polythene bag for syringe & Needle Waste. Disposable polythene bag for other bio waste. Fire Extinguisher(Non refillable)	01No. 01No. 01 No.
21.	Red and Blue high illuminating LED side blinking lights	10Nos.
22.	Patient Cabin: Patient attender seat (3 seater) with safety belt and cup-board	01 No..

23.	Complete painting work	01 No.
24.	Sticker work (Classic – I model)	01 No.
25.	UV radiation resistant sun control film	01 No.
26.	Designer bigger foot rest for easy access into the patient cabin.	01 No.
27.	Blue and Red Siren Lights, 100W Siren amplifier, Public Address System, 100w Siren Speaker	01 No.
28.	Handheld Spot Light	01 No.
29.	Cool / Warm Boxes	01 No..
30.	Patient Cabin: Two way communication EPABX, with table top phone	01 No.
31.	<u>VEHICLE TRACKING SYSTEM</u> : Model: Cansys –RVTS 30 GPS satellite data is streamed continuously to our server using GPRS giving a real time, on-line trace of vehicle movement. VTS 30 uses SMS in case of GPRS link failure. Cansys – RVTS 30 can be used by operators having Intra city / urban area operations. (Server charges will be charged separately) or any superior model combatable with the Control room Ambulance Tracking System	01 No.
32.	Driver Cabin: Unitex mat upholstery work	01 No.
33.	Driver Cabin: 12V Oscillating fan and 12V/18w Tube light	01 No.

Setting up Emergency Medicine Department at District Hospital

THE INFRA-STRUCTURE OF THE ED

1. **Location:** The ED should be strategically located so that there is adequate visibility and easy approachability for patients. It should have direct and easy access to service areas such as the radiology department including CT facility, laboratories, blood bank, intensive care units, operation theatres, hospital lifts and pharmacy. The following are the minimum requirements:
2. **A reception area** and registration counter situated close to the entrance of the ED.
3. **Triage area:** Patients coming to an ED have a wide range of illnesses with varying degrees of severity and it is important to examine a critically ill patient before a patient who is comparatively more stable. Triage is important in a busy ED because it helps to categorise patients according to their severity of illness so that an unstable patient can be examined before a more stable one regardless of what time the two patients arrived in the department.
4. **Resuscitation Area** where patients who have had a cardiac arrest, patients in shock or poly-trauma patients can be resuscitated. This room should be of an adequate size so that at least two patients can be simultaneously resuscitated. It should have the required resuscitation drugs and equipment, a defibrillator with external pacer, cardiac monitor and pulse oximeter.
5. **Main Patient care area** where all patients can be examined and treated. This should have a number of cubicles or beds isolated by curtains for privacy. There should be oxygen, suction and monitoring facilities for each bed because most patients coming to an ED will require oxygen and monitoring.
6. **Central nursing station** - where all the patients can be easily monitored by the medical and nursing staff. There should be cabinets where commonly used medications, syringes, needles, intravenous cannulae and sets are kept.
7. **Trauma care area** where trauma patients can be examined and treated. Facilities for application of splints and Plaster of Paris casts should also be available.
8. **Sterile procedure room** where minor surgery and sterile procedures under conscious sedation can be performed.
9. **Observation Area** which has beds or trolleys, where patients can be observed for up to twenty four hours in the ED. This room should have adequate monitoring facilities. Patient toilets should be attached.
10. **Operating Theatres**-Should have an operating theatre to perform minor and major procedures.

11. **Labour and delivery ward and Neonatal management facility:** The District hospital should have facilities for normal delivery and complications arising due to pregnancy and to safeguard the health of new born.
12. **Isolation area** where patients with infectious diseases can be managed.
13. **High dependency area:** About 10 beds should be high dependency beds to manage all critical patients.
14. **Pharmacy** attached to the department.
15. **Doctors Duty Room** with lockers and wash rooms.
16. **Security station** located at the entrance to ensure safety of the department. The security staff can help to restrict the entry of unnecessary visitors in to the ED and can also handle untoward incidents.
17. **Store rooms** for the department
18. **Support Services**
 - Continuous oxygen supply
 - Blood bank and laboratory
 - Diagnostic imaging
 - Autoclave and other means of sterilization
 - Safe waste disposal
 - Water, electricity and communications.

Equipments / consumables required for an Emergency Department at District Level

Equipments and instruments

- **Surgical** Instruments are needed to cover all common surgical, orthopaedic and obstetrical procedures. Several sets of duplicate instruments may be needed to allow continuous provision of services during sterilization.
- **Anaesthesia** :A dedicated set of anaesthetic apparatus is required which provides a source of oxygen, inhalation anaesthesia and the ability to ventilate the lungs, Paediatric anaesthesia system.
- **Resuscitation equipment** : Oxygen, Oxygen concentrator, Resuscitation kit (Adult and paediatric resuscitators), Suction machine, Transport ventilator, Laryngoscope Macintosh blades 1-3(4), Laryngeal masks (multiple sets).
- **ICU / Monitoring equipment** :Defibrillator with pacer, ventilator, multichannel monitor, ECG machine, blood pressure and pulse oximeter, Infusion pumps.
- **Imaging equipments**: CT scan, X-ray unit, Portable Ultrasonogram
- **Laboratory equipments**: Automated Analyser, BGA, Cell counter, Na/K Analysis
- **Miscellaneous** : Trolley beds, Wheel Chairs, bedside cabinets, drug trolleys, Dressing trolleys

All equipment and instruments require continuing maintenance, technical support, consumables and spare parts.

Triage Guidelines, suitable for India

Introduction

Triage is derived from the French 'Trier', meaning "to sort." It is a brief clinical assessment that determines the sequence in which patients should be seen in the field or in the Emergency Department. Conventional queuing service is based on a 'first-come-first-served' basis. However, in clinical practice that would be unsuitable since an unstable patient, waiting for his turn in the queue is bound to deteriorate significantly if there is delay in medical attention. The philosophy of triage is to ensure that 'the sickest is seen first' and is based on quick evaluation of the patient. The patient's overall appearance, history of illness and/or injury, vital signs and mental status are crucial markers in triage decision.

Triage in the Emergency Department

Triage includes focused physical examination appropriate to the organ system, referred to in the chief complaint. For example, patients who have complained of earache must have an examination of the ear. Patients with a sore throat must have their throat examined. Triage should be routine daily operation and all patients presenting to an Emergency Department should be triaged on arrival by a specifically trained and experienced registered nurse. Triage findings must be recorded on the patient's medical record, which then becomes a permanent part of the hospital's medical record system.

Triage for India

Although many systems exist, a simple 3-tier system is recommended. It is in practice in India since 1997 and has been found to be efficient and practical. Using this system, the patient's vital signs, chief complaint, and other key indicators are evaluated by the triage nurse, and the patients are classified into an appropriate III - tier Priority category.

Category I (obvious life-threatening emergency): The physician must examine the patient with zero delay. Case examples include cardiac arrest, continuous seizures, acute severe chest pain, haematemesis, sudden loss of consciousness, major trauma with hypotension, etc.

Category II (Potential for life-threatening emergency):

The possibility of an occult or pending emergency condition. Although some of these patients initially may appear to have not-so-serious chief complaints, about 25% of these patients have high-risk conditions. The patient needs full evaluation and treatment by a physician within 10 minutes of arrival, since there could be potential instability to the vital observations. Case examples include dyspnoea, high fever, acute abdominal pain, acute confusion, severe pain, serious extremity injuries, large lacerations, etc.

Category III (non-life-threatening emergency): These patients' presentation need emergency care but provide no reason to consider the possibility of threat to life or limb. These patients need to be seen by an EM physician on a first-come first served basis in the Consultation Room. Case examples include chronic, minor, or self-limiting disorders, medication refill, skin disorders, mild adult upper respiratory tract symptoms, mild sore throat, blood pressure check, etc.

Guidelines for Triage

Some of the observations which indicate high risk emergency are:

- General appearance - Patient looks unwell, patient's skin looks poorly perfused, patient shows signs of dehydration
- Vital signs - Grossly abnormal
- Mental status - Evidence of abnormality
- Acute inability to walk
- Respiratory rates must be carefully counted. High respiratory rates are one of the most sensitive indicators of severely ill or injured patients.
- Patients with severe pain should be categorised as Priority I and should immediately be seen in the ED by a physician. The person performing triage should not judge whether the person might be exaggerating his or her pain.
- Each patient's temperature must be taken and repeated if it does not match the clinical condition, for example, as in the case of a patient who feels warm but has a normal temperature.
- Patients assigned to a waiting room should have vital signs retaken every 2 hours, on the most urgent categories of triage. Failure to do so may result in patients who progress to critical illness while sitting in the ED waiting room.

Curriculum for Diploma for Emergency Medical Technician (EMT)

Description of the course

Diploma for Emergency Medical Technician is for

- Two years for 10+2 candidates with science subjects with biology
- One year for BSc Nursing

This will be followed by six months compulsory internship in both categories

Selection criteria:

1. B. Sc Nursing will be given preference
2. B.Sc(Physics, Chemistry & Biology)
3. Selection of the candidates for admission to the course will be made on merit, on all India basis in government hospitals
4. No of seats: 30 in each batch at each center.
5. Reservation for SC/ST/OBC categories shall apply as per government rules

Age for Admission:

The age should be minimum 17 yrs at the time of applying for admission.

Medium of Teaching: English

Staffing

Full time teaching Faculty in the ratio of 1:6

Minimum faculty: Five faculty by name should be available for the course.

Chief Co-ordinator: Emergency physician /Anesthesiologist/ Gen Surgeon/Gen Physician

Coordinators : Orthopedics surgeon, Emergency physician/ Physician/ cardiologist etc

Roles of All Faculty should be defined clearly. Instruction manual for faculty must be made.

Course objectives: At the end of the course the student will be able to

- Describe the concepts and principals of Emergency Medical Care
- Perform basic and advanced life/limb saving skill in pre-hospital & hospital setting
- Apply clinical knowledge and practical skills to real life scenarios.
- Conduct research in pre-hospital and in hospital emergency care
- Maintain emergency case registry and use it for improvement in prevention and care of emergency patients
- Assist and plan development of Emergency department /Units
- Assist, Teach and supervise work of EMT students.
- Maintain and operate all types of ambulances equipment and vehicle including driving.

Budget: There should be budgetary provision for Audiovisual aids, stationary, Library, secretarial help, contingency expenses etc

Physical facility

1. Lecture Hall Adequate size

2. Library- permission to use institute library having current text books, internet, trauma journal, Emergency medicine journals etc.
3. Teaching Aids:
 - Desk top/Laptop Computer with printer,
 - LCD projector
 - Video recorder with accessories
 - Internet facility
 - Photocopier facility
 - Simulation equipments
 - Manikins
 - Airway/intubation trainer
 - Bag mask ventilation
 - Basic Life Support
 - Advance life support
 - Intravenous assess
 - Any other as per requirement
 - Moulage material
4. Office facility: Desktop computer with printer, Secretarial assistance, Stationary, Telephone, Fax

Clinical Facility

Medical College/teaching institute should have the following:

- 500 beds hospital
- Emergency department/trauma ED
- Ambulances:

Distribution of course:

For two years

Theory & Clinical practice	40/60 %, 32weeks/52 Weeks
Internship	6 months
Examination (including preparation)	4 weeks
Leaves	as per rules
Public Holidays	

Condition for Admission to Examination

- I. Theory and practical attendance: As per rules.
- II. Internship attendance: As per rules
- III. Log book to be made as per guidelines

Examination

1. To be conducted by both internal and external examiners.
2. Semester System with 20% of total grade as per grading system in internal assessment
3. Assessment should be as grading and report, not marks with written detail report on all the objectives of examination .

The objective of the examination is to assess following:

1. Knowledge :Assess the knowledge of basic concepts, theory, and principles of Emergency medical care
2. Comprehension; Candidate should be able to recall the knowledge and discuss as per patient requirement
3. Application : The candidate should be able to apply this knowledge to specific situations
4. Analysis: Candidate should be able to divide a problem into its component parts
5. Synthesis: Candidate should have the ability to combine theory and practical skills to solve complex situations
6. Evaluation : Candidate should be able to judge whether an action finally taken is good or bad for the ultimate outcome of the victim.
7. Last but not the least, Does the candidate have positive attitude for care of emergency patient .

Number of days/hours

It is commonly assumed that these are 180 working days in a year including the days earmarked for admissions and examination. It is presumed that these will be minimum of 360 days for theory & practical teaching in 2 years & with 6 working hours a day, the total member of working hours in a year will be – (360 x 6 = 2160 hours) based on this a 2yrs course.

The 2year course shall have 4 modules as under

S.No.	Module	Days x hours	Total hours
1.	Module 1	90 x 6	540
2.	Module 2	90 x 6	540
3.	Module 3	90 x 6	540
4.	Module 4	90x 6	540
Total =			2160

EXAMINATION SCHEME (2year Course)

Paper	Name of Paper	Hours	Theory	Practical	Total
			Marks	Marks	Marks
Paper I	Module – I	3 hrs.	40	60	100
Paper II	Module II	3 hrs.	40	60	100
Paper III	Module III	3 hrs.	40	60	100
Paper IV	Module IV	3 hrs	40	60	100
Total Marks			160	240	400

QUALIFYING MARKS

60% in theory with 80% in practical for each module. Failed student may be allowed to appear in that module for maximum of 2 attempts .Unsuccessful candidates shall have to re-appear in all modules .

AWARD OF CERTIFICATE **Emergency Medical technician**

The certificate shall be awarded by the admitting institution after the candidate has qualified in all the modules successfully and after completion of the compulsory internship.

CURRICULUM

Course	24months
Internship	6 months

Module 1:		Basic Sciences
Instruction Hours	-	540 hrs
Theory/Practical Ratio		40:60(216:324 hrs)
Module II		Medical Emergencies
Instruction Hours	-	540 hrs
Theory/Practical Ratio		40:60(216:324 hrs)
Module III	-	Surgical emergencies
Instruction Hours	-	540 hrs
Theory/Practical Ratio		40:60(216:324 hrs)
Module IV	-	Emergency Setup, Ethics
Instruction Hours	-	540 hrs
Theory/Practical Ratio		40:60(216:324 hrs)

MODULE I

Topics

- Clinical Anatomy and applied Physiology:
 - Respiratory system
 - Cardiovascular system
 - Neurological System
 - Gastrointestinal system
 - Endocrine system
 - Musculoskeletal system
 - Genitourinary system
 - Reproductive system
 - Sensory organs
 - Electrolyte physiology
- Biochemistry in relation to lab investigations
- Pharmacology
 - Pharmacokinetics
 - Anaesthetic agents
 - Analgesic/ Anti inflammatory agents
 - Antibiotics, Antiseptics

- Drug reaction and toxicity
- Drugs used in emergency
- Principles of drug administration and care of drugs
- Microbiology:
 - Immunity
 - Infection (Bacterial, Viral, Fungal)
 - Communicable disease
 - Principle of asepsis, sterilization and disinfection
 - Diagnostic tests in microbiology
 - Standard safety measures and biomedical waste management
- Clinical Pathology including hematology
- Blood transfusion and blood products
- Basic Life Support:
 - Scene safety
 - Checking for breathing, pulse
 - Chest compression
 - Giving breaths: Mouth to mouth, Mouth to mask and Bag and mask
 - AED application and usage
 - Special situations: Hypothermia, Drowning, Electrocutation

Practical and Tutorials:

- Osteology
- X-Ray, ECG and ABG Basics
- Monitoring
- Drugs
- Techniques of culture collection
- Laboratory investigations
- Sterilisation methods
- Infection control: Hand washing, cross contamination
- Basic Life Support

MODULE II

Topics

- Pre-hospital resuscitation
- Emergency preparedness
- Setting and management of emergency department system
- Triage
- Interfacility transportation
- Ambulance transport and services
 - Planning of ambulance service
 - Planning men and material for ambulance
 - An ideal ambulance
- Air transport
- Disaster management
- HAZMAT management
- Medico-legal and ethical issues in emergency

- Legislations and regulations related to emergency care
- Consumer protection act
- Negligence and malpractice
- Medico legal aspects
- Records and reports
- Role of EMT in legal issues
- Organ retrieval
- Research and statistics

MODULE III

Topics: Medical Emergencies

- Respiratory: COPD, Asthma, Respiratory failure, Misc
 1. Control of Airway
 2. Suctioning Techniques
 3. Oxygen Therapy
 4. Nebulisation
 5. Setting of ventilator
- Cardiovascular: Acute Coronary Event, Chest pain, Shock of different etiology, Tachycardia, Bradycardia, Cardiac arrest
 1. Scenario based teaching
 2. Defibrillation
 3. Intravenous canulation
 4. Cardiac Drugs
 5. Overview of temporary pacing
 6. Cardioversion
- Fluid electrolyte and acid-base imbalance
- Gastrointestinal: GI bleed, Abdominal pain, Vomiting, Diarrhoeas
- Urinary: Acute retention, CRF
- CNS: Stroke, Encephalopathy, Seizures, Coma
- Poisoning, Snake bite
- Behavioral emergencies:
 - Suicide
 - Homicide
 - Substance abuse: Alcohol and drugs
 - Panic attack
 - Sexual assault
 - Acute depression
 - Post traumatic stress disorder (PTSD)
- Fever, Sepsis
- Myopathies, Diabetic Ketoacidosis, Hypoglycemia
- Obstetric and gynaecological emergencies
- Pediatric emergencies

MODULE IV

Topics: Surgical Emergencies

- Abdominal Trauma: Blunt, Penetrating
- Chest Injuries
- Head and spine Injuries
- Musculoskeletal injuries
- Hemorrhagic Shock management
- Acute abdomen: Perforation, Torsion, Peritonitis, Renal colic, pancreatitis, cholecystitis
- ENT trauma, foreign body removal, Retropharyngeal abscess, epiglottitis, stridor, Sudden hearing loss
- Eye trauma: Foreign body, perforating injury, sudden visual loss, acute glaucoma attack
- Burns

Procedures Assisted:

- Chest tube insertion
- Lumbar puncture
- Arterial Blood gases sample collection
- Tracheostomy
- Central venous cannulation

Procedures Performed:

- Airway management: Opening and securing of airway
- Needle thoracocentesis
- Needle cricothyrotomy
- Cardiac monitoring
- Defibrillation
- Heimlich's maneuver
- Peripheral intravenous cannulation
- Gastric Lavage
- Splint application
- Care of traction

STAFFING OF THE EMERGENCY DEPARTMENT (District Hospital)

Chief Emergency Medical Officer (CEMO). The Chief coordinating multidisciplinary services under critical and stressful circumstances is complex and requires the services of a senior consultant with sufficient years of clinical / administrative experience. Some of the responsibilities of the CMO are:

- To coordinate and integrate the medical, nursing and paramedical divisions of the department.
- To be the bridge between the ED and the hospital management.
- To lay down policies and procedures for patient care and to ensure its implementation.
- To supervise and coordinate the various duties, shifts and responsibilities of the medical staff
- To obtain necessary materials and equipment for the department

Emergency Medical Officers (EMO): It is recommended that the superseded term ‘Casualty Medical Officer’ be re-designated as ‘Emergency Medical Officer’. The main responsibility of the medical officer is to ensure that all patients coming to the department are stabilised and adequately treated with minimum amount of waiting time. It is recommended that these EMOs be provided with a minimum of 3 months of training in managing common medical emergencies in the Emergency Department of a Medical College, with full financial support from the Govt. The number of medical officers appointed will depend on the patient load and design of the department.

Emergency Physicians/ General physicians; Paediatricians, General surgeons, Orthopaedic surgeons, obstetricians, Anaesthetists: From the district hospital or visiting specialist arranged through firm contractual agreements.

Nursing Matron: The Nursing matron is responsible for coordinating the various nursing activities. She prepares the duty roster and ensures that the appropriate nursing staff be posted to the various facilities of the department.

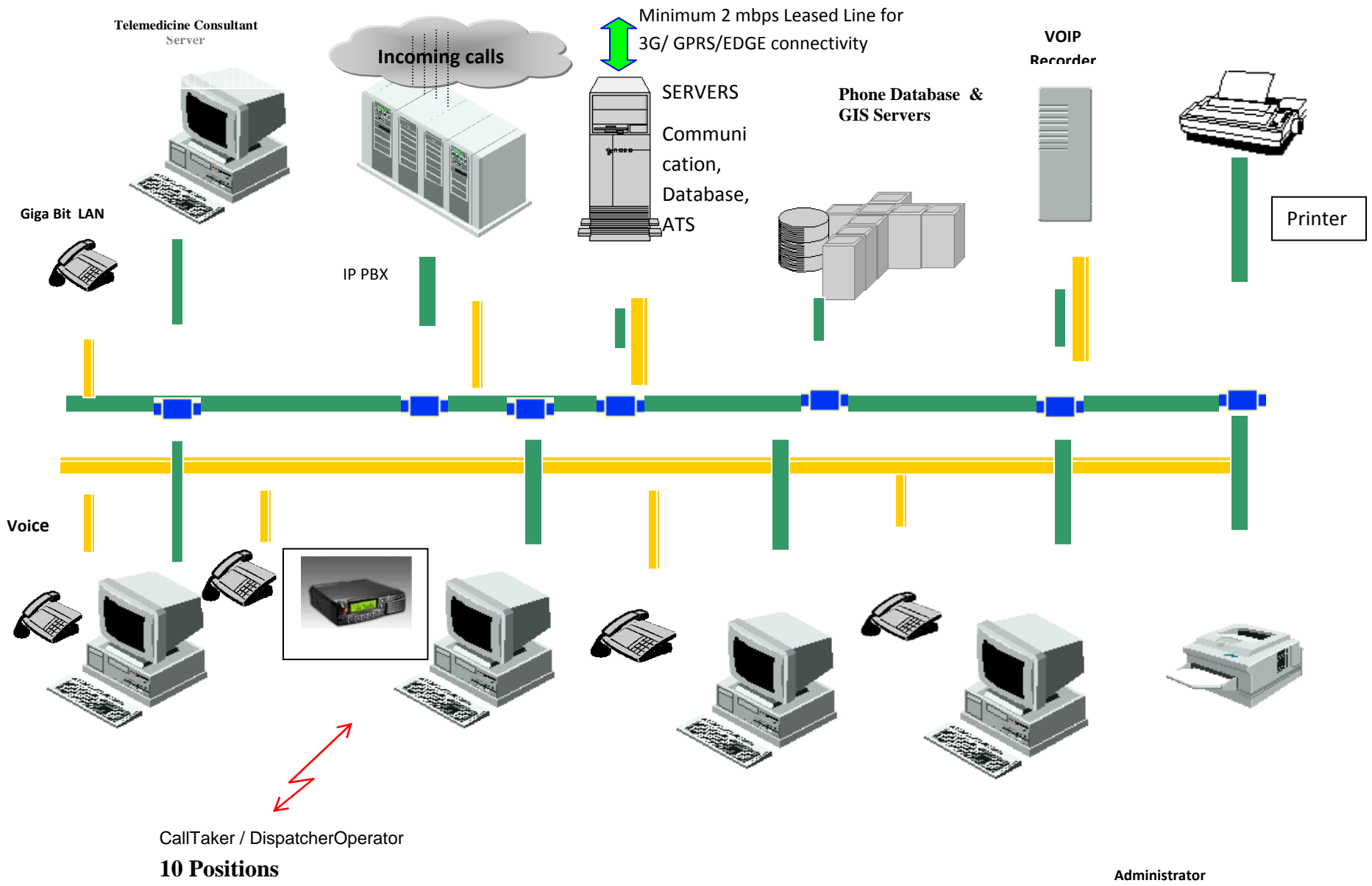
Nurses: The number of nurses depends on the case load of the department. They should have ongoing training in emergency procedures, investigations and patient stabilisation. Further, they should ensure the replacement of all appropriate drugs in the resuscitation cart as well as miscellaneous disposables. Nurses should ensure the working condition of monitors and other electronic equipment and notify malfunction. They shall take care of Triage.

Emergency Medical Technicians: Emergency Medical Technicians (EMT) are trained members of the Team who work on Ambulances as well as in the EDs; they respond to emergency calls, perform certain on-site medical procedures and transport patients to hospital in accordance with established protocols and guidelines. They are trained in the knowledge and skills to assist medical and nursing personnel in the Emergency Department.

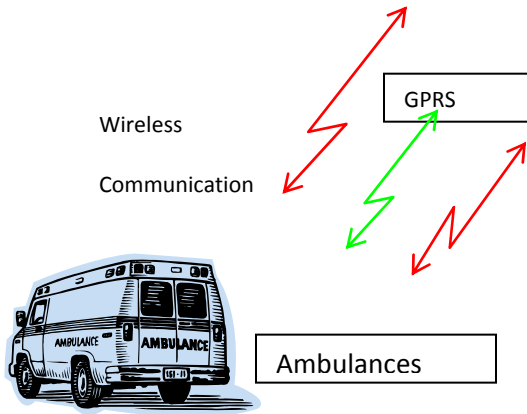
Operating room personnel, Laboratory and imaging technicians

Ancillary staff: Some of the responsibilities of these staff are:

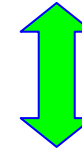
- To transfer patients from the ambulance into the department and to Radiology and to the wards, when they are admitted
- To carry blood samples to the laboratories, collect blood from the blood bank; collect blood investigation reports from the laboratory and X- ray, CT and MRI films reports from the radiology department.
- To bring the old records of patients from the medical records department.
- To maintain the overall cleanliness of the department.



Data Entry



Supervisor



GPRS/Leased Line



Hospitals



BLOCK DIAGRAM OF ACC SYSTEM

14. Prevention and Management of Musculo- Skeletal Disorders (MSD)

Justification:

Musculoskeletal complaints are the common reason for consulting a doctor and account for about 10% to 20% of primary care visits. They are the leading cause for long-term absence from work (> 2 weeks) in many countries. They are also among the leading causes of long-term disability. Their direct and indirect cost is considerable and their management utilizes a significant part of the gross national product of many countries.

As a public health measure, it is important to detect and manage early and prevent the musculoskeletal diseases by disseminating information & IEC to adopt and encourage bone health through appropriate exercises at all ages, promote calcium intake and ensure adequate exposure to sun light. These three are the crucial elements in determining peak bone mass. There is thus an urgent need for greater public awareness in this regard. For the middle aged and elderly, early detection and treatment of osteoporosis and management of rheumatic diseases at an early stage with available agents can significantly reduce the risk of fractures, deformities and associated morbidity and mortality. This in totality justifies the need for developing a program on a district model for Musculo- skeletal disorders in the country.

Objectives:

1. To build capacity at all levels of health care delivery system focusing on district and sub-district level hospitals for providing services for prevention, screening and diagnosis, early management, chronic care including residual rehabilitation and follow-up with availability of appropriate manpower, drugs investigation and equipments pertaining to MSDs.
2. Creating awareness in the community on the importance of MSD as a public health problem

Components:

1. Setting up of district and sub-district level MSDs care unit in all the districts by the end of 12th five year plan in a phased manner
 - (a) District MSDs care unit at district level hospital through the provision of appropriate manpower for MSD like 1 Physiatrists / Physician / Orthopedic Surgeon from the existing strength and 1 Physiotherapist / Rehabilitation therapist /Occupational Therapist, 1 BMD Technician, 1 Data entry operator, 3 field rehabilitation workers on contractual basis; and specialized diagnostic facilities and treatment facility such as BMD for early diagnosis of Osteoporosis and specialized Laboratory facilities for early diagnosis of RA. MSD (RA, LBA etc)
 - (b) Sub District MSDs care unit at CHC by assigning one existing doctor and on contractual basis 2 Community Multi Rehabilitation Workers, 1 X-Ray Technician, 1 Dark Room Asst. and 1 nurse at CHC and siagnostic facility such as X Ray to be placed at CHCs for screening of MSDs (osteoarthritis, RA, LBA and osteoporosis).

2. Creation of awareness of MSD and its impact by use of IEC activities at district and sub-district MSD care unit regarding ADL modifications and health educations related with MSD so that patients can be educated regarding their ergonomics and life style modifications and thereby prevention of MSDs could be possible at this level which could further limit the burden of disabilities related to MSDs.
3. Provision of specific drugs at district and sub-district level pertaining to MSDs like commonly use NSAIDs, bisphosphonates, DMARDs. Special provision for providing Calcium and Vitamin D to infants and women of both child bearing age and post menopause for both prophylactic and therapeutic purpose.
4. Training:
 - a) At State Level: Training for sensitization and programme concept on MSD of Physiatrists / Physician / Orthopedic Surgeon of district hospitals for 1 day In the Medical College with an established Dept of PMR
 - b) At District Level: Training of 1 - 2 Medical Officer of each CHC and for 5 days at district level hospital in MSD care unit for MSDs assessment, prevention, early diagnosis and intervention.
5. Management information system for monitoring and evaluation through a structured data base mechanism for gathering information on availability of manpower, logistics, performance and other relevant information pertaining to the programme.

Strategies:

The proposed strategy is to establish district and sub-district MSD care unit by respective states and to integrate it with the existing health care system at PHC and CHC level.

(a) Infrastructure:

Directorate of Health Services of the States will be responsible to provide services for MSD at district and sub district levels utilizing existing health healthcare delivery system by establishing district and sub-district level MSDs care units. Initially services will be provided at District level and CHC level and the state Government will identify the districts and CHC to be included in a phased manner.

(b) Human Resources:

District MSD care unit

- Specialist (from existing pool): Physiatrist/ Orthopaedician/Medical specialist to be trained in the PMR /orthopaedics/rheumatology departments of Medical Colleges.
- Physiotherapist/Occupational Therapist/ Rehabilitation Therapist: (1 on contract)
- BMD Technician (1 on contract)
- Field Rehabilitation Workers (3 on contract)
- Data entry operator (1 on contract)

Sub- district MSD care unit (At CHC)

- Medical officer (from existing pool) trained at district MSD care unit
- X ray Technician (1 on contract)
- Dark Room Assistant (1 on contract)
- Community Multi-purpose Rehabilitation Workers (2 on contract)

- Nurse (1 on contract)

(c) Investigation facilities

Proposed strategy is to assess and provide the basic investigations facilities pertaining to MSDs at district and sub-district in first phase of the 12th five year plan.

District MSD care unit Specialized diagnostic facilities and treatment facility such as

- (c) BMD for early diagnosis of Osteoporosis
- (d) Specialized Laboratory facilities for early diagnosis of MSD

Sub- district MSD care unit (At CHC& PHC)

- X- Ray Facility
- Basic Hematological investigation facility for MSD

(d) Drugs

Proposed strategy is to assess and provide the specific drugs at district and sub-district level for prevention and treatment of MSDs like commonly used NSAIDs, bisphosphonates, calcium, Vitamin D, DMARDs etc.

Training

- At State Level training will be provided for sensitization for MSD to Physiatrists / Physicians / Orthopedic Surgeon of district hospitals for 1 day In the Medical College having an established Department of PMR
- At District Level training of Medical Officers of CHC for MSDs assessment, prevention, early diagnosis and intervention.

Monitoring and Evaluation

Development of a management information system for monitoring and evaluation through a structured data base mechanism for gathering information on availability of manpower recruited, position of trained manpower, logistics in terms of availability of BMD and X Ray machines, laboratory facilities and availability of consumables performance, performance indicator including epidemiological information and other relevant information pertaining to the programme.

This would facilitate to understand the burden of repetitive stress injuries/MSDs at all levels (school, college, professionals and community) All sub- district MSD care units will transmit the statistical data of MSD to the respective district MSD care unit where it will be compiled and send to the Directorate of Health services of the state.

Expected Outcome

The programme at the end of the 12th FYP would facilitate the following:

- Establishment of MSD Units at District and Sub district level which would in turn would be accessible to the community at large.
- Creation of awareness in the community on prevention and remedial measures for MSD
- Mechanism for nutritional supplements for prevention of MSD especially osteoporosis
- Reduction of MSD and thereby prevention of residual disability
- Creation of a pool of trained manpower and infrastructure for combating MSD

15. Upgradation of Department Of Physical Medicine & Rehabilitation In Medical Colleges

Expansion of scheme

During the 12th Five Year Plan, it is proposed to expand the scheme of establishment / upgradation of PMR department in 150 medical colleges (including the 21 medical colleges taken up during the 11th Plan) with the main objectives of setting up of full-fledged department of PMR in medical colleges. Based on the response, necessity of services and willingness of the states/ medical colleges for implementing the program the medical colleges will be selected on priority. The phase-wise inclusion of medical colleges would be as shown below in the table:

Medical Colleges	2012-13	2013-14	2014-15	2015-16	2016-17	Total
New	10	30	35	25	20	120
Cumulative	40	70	105	130	150	150*

150* medical colleges include 30 medical colleges that are targeted to be covered in 11th Plan and 120 new medical colleges proposed to be covered in the 12th Plan. It is proposed to provide resources to 150 medical colleges under the Central / State Governments or Municipal Corporation in the forthcoming Five Year Plan including further support to the recently supported PMR department in 21 medical colleges.

II. Establishment / up-gradation of four centers of excellence (model Rehabilitation Institution in various regions of the country / AIIPMR like institutions) with emphasis for

1. Neuro rehabilitation (strokes)
2. Cardio-vascular rehabilitation
3. Spinal Cord Injury Rehabilitation
4. Cerebral Palsy and other Neurological Disorders in Child
5. Amputee rehabilitation

These institutions will impart training disability prevention, detection and early intervention for undergraduate and post-graduate medical students and other health professionals.

General Objectives-

- 1) To build capacity in the Medical Colleges for providing comprehensive rehabilitation services and to train adequate manpower required at all levels of Health Care Delivery System.
- 2) To build State of Art rehabilitation centers for providing quality services to conduct research and development, initiate epidemiological and HSR studies and to evolve evidence based practices.

Sub Objectives

1. To set up an independent Department of Physical Medicine and Rehabilitation in Central / State Governments or Municipal Corporation totaling around 150 colleges.
2. To train medical and rehabilitation professionals in the districts in adequate numbers for providing secondary and tertiary level rehabilitation services.
3. Training programme on Disability Prevention, Detection and Early Intervention at Undergraduate & Postgraduate level for all Medical Officers in the participating District.
4. To train the District level Specialists and Health Professionals in disability assessment computation, prevention and Rehabilitation through CBR.
5. Provision of Rehabilitation Services in the setting of rehabilitation services in a comprehensive manner so that all clinical departments are involved and thereby to evolve a strategy of continuation of care even in the domiciliary and community set up.
6. To upgrade and develop apex PMR departments in four regions of the country for acting as a Model teaching and training centers with comprehensive service delivery system include inpatient services, Rehabilitation Surgery and community based rehabilitation services.

Targets

1. Setting up of independent Physical Medicine and Rehabilitation Department in 150 medical College/Training Institutions during the end of the 12th Five Year Plan.
2. Training of 1000 Medical doctors and allied health professionals in disability assessment and early identification.
3. Develop Linkages and registration of Medical Rehabilitation to impairments and functional limitation arriving out of acute and chronic conditions undertaking treatment at Medical Colleges.
4. Development of 4 Centers of the excellence (AIIPMR like Institution) in various regions of the country.

Strategy

1. It is proposed that the Govt. Medical colleges are selected in consultation with the respective states.
2. Ministry of Health & Family Welfare, Govt. of India will identify the location of the Centers of Excellence after carefully studying the availability of the trained manpower in the region for upgrading the Institutions to the level of international standards.
3. Training of Medical College students at UG level in Medical Rehabilitation by PMR faculty of the medical college.
4. Provision of Medical Rehabilitation Services to PWD viz. Medical, P.T., O.T., S.T., fitment of aids and appliance, mobility aids, counseling and follow-up.
5. Training of Medical Officers in disability assessment and computation for issue of disability certificates.

Implementation strategy-

- a) Directorate of Medical Education of respective states along with the college authorities will identify the medical college in the district for establishing Rehabilitation Services.
- b) An inspecting team consisting of experts from the MoH&FW, Govt. of India will visit the concerned medical colleges and assess the existing facilities including space within the college premises for establishing the Department of PMR. The medical college will have to provide their space and infrastructure for the Department. Subsequent capacity building of the Medical College in terms of equipment and manpower keeping in conformity of MCI norms and PMR guidelines will be evaluated by the inspecting team.
- c) A Memorandum of Understanding between the competent authority of the State Govt. and Govt. of India will be signed for initiating the scheme.
- d) Once funds are released to the medical college as per the inspection team recommendation, components wise funds will be utilized by the authorities maintaining all codal formalities as per norms including procurement, manpower, recruitment, etc. as laid down under the guidelines.
- e) All expenditure to be accounted for and submitted to the MoH&FW through the statement of expenditure component- wise and Utilization Certificate in GFR 19A form duly audited.
- f) Procurement of items will be made as per recommendation of the inspecting team.
- g) Recruitment of manpower on contractual basis will be done as per guidelines adopting state recruitment procedure and for all non-technical posts, if recommended, would be outsourced.
- h) Service department will be started first and will be converted into a full-fledged “teaching unit” after adequately trained manpower are put in place. This will be carried out in phased manner.
- i) Annual review meeting of state level Nodal Officers will be held to take stock for the implementation along with feedback from the Nodal Officers for improvisation and improvement of the strategy.
- j) Having experienced the shortage of medical personnel training in the rehabilitation as stated earlier to be one of the main constraints, it is proposed to include training component into the scheme so that the faculty from the medical colleges designated as Nodal Officer for their PMR department will undergo orientation, in equipping them with the knowledge and skills of programme management on PMR. This will be only be required in the event of a qualified PMR Faculty being not available.
- k) Medical colleges already inducted in 11th Plan would be taken during the 12th Plan only when adequate manpower i.e. qualified PMR expert / orthopedic surgeon / pediatrician / general surgeon / medical specialist with six months training in designated PMR institute are appointed as independent in-charge of the department in the event of the non availability of a regular qualified PMR Faculty.

Phase of implementation:

A full-fledged “teaching unit” or a non teaching department of PMR, will be developed in a phased manner. Given below are the requirements for a well developed department but starting of a departing or its development can be planned according to the sources available and requirement of the facilities in the area.

Phase-I: For establishing the Dept. with the appointment of a designated HOD for the Dept. of PMR.

Phase-II: After Dept has been established independently & all posts or PH I filled up.

Phase-III: After functioning independently and all posts of PH II filled up.

Staff & Facilities(to be Inducted Phase-wise)-

Staff	Phase I	Phase II	Phase III
Asst. Professor	1	-	-
Sr. Resident	1	-	-
Jr. Resident	1	-	-
Physiotherapist	1	-	-
Occupational Therapist	1	-	-
Speech Therapist/Audiologist	1	-	-
Orthotist/Prosthetist	1	1	-
Clinical Psychologist	1	-	-
Staff Nurses	2	-	-
Medical Social Worker	1	-	-
DEO cum Record Assistant	1	-	-
Orthoptic/Prosthetic	2	-	-
Multi-tasking Worker	1	-	-
Indoor Facilities (Beds)	6	10	14

Component-wise budget requirements-**1. Recruitment of manpower:-****A. Central Level**

Sl. No	Name of Post	Proposed monthly pay (Consolidated)	No. of Posts	Annual Expenditure
1	Consultant	60000	2	1440000
2	Programme Assistant	30000	1	360000
3	Data Entry Operator	15000	2	360000
	Total	130000	6	2160000

B. Medical College Level (For recruitment of manpower on contract basis in PMR department)

Sl. No	Name of Post	Proposed monthly pay (Consolidated)	No. of Posts	Annual Expenditure
1	Assistant Professor	55000	1	660000
2	Sr. Resident	45000	1	540000
3	Jr. Resident	38000	2	912000
4	Physiotherapist	20000	1	240000
5	Occupational Therapist	20000	1	240000
6	Speech Therapist / Audiologist	20000	1	240000
7	Clinical Psychologist	20000	1	240000
8	Orthotist & Prosthetist	20000	2	480000
9	Staff Nurse	20000	2	480000
10	Medico Social Worker	20000	1	240000
11	DEO cum Record Assistant	15000	1	180000
12	Orthotic/Prosthetic Technician	12000	2	288000
13	Multi-Tasking Staff	9000	2	216000
	Total	354000	18	4956000

2. Procurement of equipments-Rs.0.55 crore for procurement of equipments for each medical college have been proposed. Equipments would be supplied in phased manner as given below-

1st year of inclusion: Rehabilitation equipment for diagnosis & treatment, Workshop equipments.

2nd year of inclusion: Audio-logical & Psychological Tools, Teaching material including A-V aids.

List of equipments is given below:

Medical-

1. OT equipment (as per requirement)
2. Dia. Ultrasound
3. Port. X-ray
4. Cystocopy Set
5. EMG & Evoked Potential
6. Urodynamics
7. Gait analyzer
8. Ventilators
9. Cardio pulmonary monitors
10. Balance master

Physiotherapy-

1. Short – wave diathermy
2. Wax heating Chamber
3. Hydroculator
4. Ultrasonic therapy

5. Neuromuscular stimulator
6. TENS lumbar and cervical traction
7. Infrared
8. Crutches, walker
9. Parallel bars and other ambulatory
10. Various exercise therapy
11. Dumbbells, pulleys, weights, suspension, systems quadriceps table.
12. Shoulder wheel
13. Ramp & Stairs
14. Exercise mats

Occupational Therapy-

1. Hand grip strength kit
2. Cerebral Palsy
3. Finger climbers
4. Vertical & horizontal sanding
5. Medicinal ball
6. Assessment (ndt) kit
7. Standing co-ordination
8. Activity board
9. Co-ordination activities kit for hand functions
10. Prevocational evaluation cortical function evaluation/treatment
11. Transfer boards
12. Tit-table
13. Computers for measurement
14. Biofeedback

Vocational Centre-

1. Carpentry
2. Book binding
3. Typing and short hand
4. Computer repairing
5. Candle making
6. Knitting machine
7. Sewing machine
8. Painting
9. Watch-repairing

Teaching Aids and books-

1. Computer with printer
2. LCD projector
3. Laptop compute
4. Library with 100 Books/Periodicals & television

- 3. Office expenses and maintenance-** Equipments viz. desktop computer with printer, fax machine, photocopier, fax, modem, internet connection etc. have been proposed for central cell and medical colleges required for carrying out day to day office activities. This would be one time budget. However, consumables required would be recurring budget. Total cost involved would be Rs 4.40 crore.

4. Material & supplies- Rs. 2.00 lakhs have been proposed for material & supplies for each medical college each year. This would be recurring expenditure. Total cost proposed for this component is Rs. 10.00 crore.

Apex Institutions (Centre of Excellence) for Medical Rehabilitation-

It is proposed to Establish National Centres for Medical Rehabilitation in field of Medical Rehabilitation in 4 different parts of the country either by up-gradation of the existing Institution or by starting new centres in response to scaled up needs of disabled population.

- The centre will have highly trained manpower in the respective field and state of art technology for providing rehabilitation intervention to various categories of disabled as the specific needs of various categories of disabled are different.
- It is necessary to have focuses approach to viz. stroke and neuro rehabilitation, cardio vascular rehabilitation, amputee rehabilitation, spinal cord injuries autism and spectrum disorder etc. Each centre is proposed to have separate unit for above category of disabled and treatment guidelines on the basis of evidence, conduct research, interact with various engineering Institution periodically for designing, manufacturing of aids and appliances, assistive devices and independence devices for physically disabled.

Highly trained manpower in rehabilitation in specific areas is the need of the hour considering the fact that there is huge demand in the private sector for experienced rehab personnel. India being a premier medical tourism destination, even for western countries, the creation of centre of excellence to match international standard will also have to be taken along with proposed up-gradation of PMR department in medical colleges.

Approximately budget requirement for each institution would be Rs. 50 crores excluding land cost. Budget for 4 such institution would be Rs.200 crores.

16. National Blindness Control Program

India is committed to reduce the burden of avoidable blindness. The proposal is to modify pattern of assistance to effectively reduce prevalence of blindness and develop infrastructure and Eye Care services delivery system during 12th Five Year Plan.

Focus Areas:

- ✓ **Cataract:** Cataract is the leading cause of blindness contribution around 62.6% of the total cases in 50+ populations. In spite of all out efforts, there is a backlog of cataract in the country due to various reasons including inadequate eye care infrastructure, ophthalmic manpower. It has, therefore, been proposed to continue assistance for control of assistance with the involvement of NGO sector and private practitioners
- ✓ **Refractive Error:** Refractive Errors comprises a major part of avoidable blindness, which can be reduced by providing proper attention towards this problem. It has, therefore, been proposed to provide assistance for control of Refractive Error.
- ✓ **Low Vision:** keeping view large number of low vision cases, it has been proposed to assistance for control of Low Vision.
- ✓ **Corneal Blindness and other emerging diseases** like **Glaucoma, Diabetic Retinopathy**, and causes of **Childhood Blindness** like Congenital Cataract, Squint, Amblyopia etc. needs immediate attention to eliminate avoidable blindness from the country. Among the emerging causes of blindness, diabetic retinopathy and glaucoma need special mention. 6% of India's population is expected to be diabetic. 20% of diabetics have diabetic retinopathy and this number is likely to grow in future. Prevalence of blindness due to glaucoma is estimated to be 4% in persons aged 50 years and above.

Addressing Constraints under NPCB:

- To meet the requirement of additional eye surgeons, it is proposed to continue the 250 eye surgeons sanctioned in the 11th plan and upscale the number of surgeons to 650 in all District hospitals on contractual basis
- To meet the deficiency of ophthalmic assistants, it is proposed to appoint 425 additional ophthalmic assistants in District Hospitals and PHCs/Vision Centres.
- To make NPCB more comprehensive, assistance for eye diseases other than cataract was initiated during the 11th Plan. It is proposed to continue the same initiative during the 12th plan.
- For more public awareness about eye care and utilization of eye care services, IEC activities will be intensified through print, audio-visual media as well as mid-media and interpersonal counseling.

New Initiatives & expansion of existing services during the 12th Plan

1. Multi-Purpose mobile ophthalmic units to be introduced at all the districts level to reach the remote areas not covered by existing facilities and to be involved in all the following activities
 - a. Screening Eye Camp

- b. School Eye Screening
 - c. Transporting Patients for treatment
 - d. On the spot refraction and provision of glasses
 - e. Diagnosis of diseases like diabetic retinopathy, glaucoma etc.
 - f. Display of IEC NPCB messages on its outer panels
 - g. Monitoring of NPCB activities by DPMs
2. Construction of dedicated Eye units in District Hospitals in North-Eastern States, Bihar, Jharkhand, J&K, Himachal Pradesh, Uttarakhand and few other States where dedicated Operation Theaters are not available as per demand.
 3. Appointment of the following personnel (Contractual):

1.	Ophthalmic Surgeons	In all District Hospitals.
2.	Ophthalmic Assistants	
3.	Ophthalmic Assistants	In PHCs/Vision Centers, where they are not available.
4.	Eye Donation Counselors	In Eye Banks under Government Sector and NGO Sector
5.	Data Entry Operatorss	For all the districts
6.	Driver cum Assistant	One for each district

4. Grant-in--aid to NGOs for management of other Eye diseases under “New Initiatives” as follows:-

Diabetic Retinopathy (a & b)	Amount in `
a). flouroscein Angiography only	Upto ` 1000/- per person
b).Angiography plus complete laser treatment	Upto ` 3000/- per person
Keratoplasty and vitreo-retinal surgery	Upto ` 5000/- per person
Other major Eye Diseases (ROP,Squint etc.)	Upto ` 1500/- per person

5. Involvement of Private Practitioners under NPCB .
6. Maintenance of Ophthalmic Equipments supplied to Regional Institutes of Ophthalmology, Medical Colleges, District/Sub-District Hospitals, Vision Centres.

Component wise comparative statement of 11th Plan and 12th Plan showing proposed increase in the existing norms and new initiatives during 12th Plan is given below:

Training of Human Resources (Eye Surgeons, PMOAs, ANMs and Asha Workers)

For a population of more than one billion in the country there are an estimated 20,000 eye surgeons. It is estimated that the ratio of eye surgeons in urban area is 1:20,000 and 1:2.5,0000 in rural areas,. In order to strengthen the NPCB during the 12th Plan, it has been planned to train 2500 eye surgeons in the under mentioned field of Ophthalmology to provide specialized service to Indian population in the field of eye care.

1. ECCE/IOL Implantation
2. Small Incision Cataract Surgery

3. Phaco-emulsification
4. Low Vision Services
5. Glaucoma Diagnosis and Management
6. Pediatric Ophthalmology
7. Indirect Ophthalmology & Laser Techniques
8. Medical Retina and Vitreoretinal Surgery
9. Eye Banking and Corneal Transplantation
10. Oculoplasty
11. Strabismus Diagnosis Management both Medical and Surgical

Similarly training programme have been developed for the PMOAs, ANMs and ASHA at the State level to keep them abreast with the new developments in their respective fields to benefit the public at large.

IEC

Since NPCB is a successfully run centrally sponsored programme, people from all walks of life should become aware of its various activities like free cataract surgery with Intra Ocular Lens (IOL), free spectacles for school children and old persons, diagnosis and treatment of corneal opacities, diabetic retinopathy, glaucoma, squint etc, It is highly desirable that the information about NPCB activities reaches every nook and corner of the country

Operational Capabilities

Various programme activities are implemented at central, state and district level. Organizations responsible for programme implementation at various levels are indicated below:-

Central Level

At the central level, the National Programme management Cell in DGHS/ MoHFW would be the responsible organization.

State Level

The scheme is proposed to be implemented through the State Government. A State Programme Cell is already in place for which five posts including that of a Joint Director (NPCB) have been created. A State Health Society at the State level and District Health Societies at district level have been established in the States/UT's.

State Health Society

Secretary (Health)	Chairman
Director of Health Services	Vice – chairman
Representative of Finance Department	Member
One reputed expert in Ophthalmology	Member
One representative of NGO	Member
Nominee/Representative of MOHFW	Member
Joint Director (NPCB)	Member Secretary

The function of State Health Society would be to monitor and supervise implementation of

NPCB in the State, release and monitor flow of funds, expenditure and functioning of District Health Society, implement training and IEC activities in the State and recommend grant-in-aid to NGO for non recurring grants. The mechanism would also enable the government of India to release funds for District Health Societies through the State Health Societies. This would also release pressure on the Central Government to focus more on programme monitoring and quality issues.

District Level

The responsible unit of implementation of the programme at the district level is the District Health Societies. It is the District Health Society which is responsible for coordinating different agencies and monitoring implementation of the programme by pooling in all the resources available.

There is a proposal to create additional posts in the Government sector during the 12th plan, like one Ophthalmologist, one Ophthalmic Assistant, one Data entry operator in the Dist. Hospital, one driver cum assistant for multi-purpose district mobile unit, one Ophthalmic Assistant in PHC/Vision Centres, Eye Donation Counselors in Eye Donation Centres on contractual basis.

Strategic Initiatives for improved implementation:

- Development of Mobile Ophthalmic Units in NE States, Hilly States & difficult Terrains for diagnosis and medical management of eye diseases.
- Involvement of Private Practitioners in Sub District, Blocks and Village Level.
- Maintenance of Ophthalmic Equipments supplied to Regional Institutes of Ophthalmology, Medical Colleges, District/Sub-District Hospitals, PHC/Vision Centres.
- All diabetics should be referred for regular fundus examination from all Medicine departments across the country and necessary IEC material to be developed for implementing the same.
- Delink all Central government hospitals & Medical colleges of Delhi from Delhi State Health society and be funded @ Rs 80 lac directly from center.
- In order to procure uniform and high quality cost effective equipment a Rate Contract to be established in the Central cell in NPCB for all major equipment –to be specified. A technical committee to be set up at central level for specifications.
- Eye banks should be established in all existing RIOs.
- Strengthening of existing RIOs on priority and link the medical colleges for training and development.

Expected Outcomes:

- It is proposed to perform 350 lakh Cataract operations during the period 2012-17 of which minimum of 90% operation will be by Intra Ocular Lens implantation.
- About 60 lakh school children with refractive error and presbyopic middle aged poor persons will be provided free spectacles. Presbyopic glasses to be provided as a new initiative to all BPL persons requiring corrective glasses for sharp near vision.

- Network of eye care infrastructure and commodity assistance in the form of equipments, consumables and drugs will be established to increase capacity of the state in providing comprehensive eye care services to the community.
- Increase in eye donations by strengthening eye banks and eye donation centres.
- Training of adequate number of eye care personnel.
- Reduction in disability years and increasing productivity

Physical Targets	11th Plan	12th Plan
Cataract Surgery	300 lakh	350 lakh
Spectacles to School Children	15 lakh	50 lakh
Collection of Donated Eyes	2,65,000	3,00,000
Spectacles for near work to old persons (Once in every five years)	Nil	10 lakh

Year-wise Physical Targets during the 12th Plan (2012-2017)

	2012-13	2013-14	2014-15	2015-16	2016-17	TOTAL
Strengthening of Facilities						
Regional Institutes of Ophthalmology	4	4	4	4	4	20
Medical Colleges (Pediatric Ophth. /Low Vision, other sub specialties)	30	30	30	30	26	146
District Hospital for IOL surgery SICS/ Phaco Emulsification	130	130	130	130	111	631
Sub- district Hospital for IOL surgery	20	20	20	20	20	100
Primary Health Center (Vision Center) (Govt.+NGO)	600	600	600	600	600	3000
Eye Banks	4	4	4	4	4	20
Eye Donation Center	20	20	20	20	20	100
Non recurring GIA to NGO for setting up/expanding eye care units in Urban	2	2	2	2	2	20
Non recurring GIA to NGO for setting up/expanding eye care units in Semi urban/Rural	2	2	2	2	2	
Development of Dedicated Eye Units.	6	6	6	6	6	30
District Mobile Ophthalmic Units	130	130	130	130	111	631
Services						
Cataract Surgery & other diseases Intervention (in Lakh)	65	65	70	75	75	350
Specs to school children (in lakh)	3	3	3	3	3	15
Collection of Donated Eyes (in thousand)	50	50	50	50	265	265
Training						
Training of Eye Surgeons	500	500	500	500	500	2500
Nurses in Ophthalmic techniques	250	250	250	250	250	1,250
Refresher Training of Ophthalmic Assistants / Ophth. Nurses.	600	600	600	600	600	3,000
Management training of State and District Programme Managers	200	200	200	200	200	1000
Medical Officers PHC, CHC, DH	1000	1000	1000	1000	1000	5000
ASHA & AWW (ICDS)	1000	1000	1000	1000	1000	5000

17. National Deafness Control Program

In the 12 F.Y.P. it is proposed to implement the programme in entire country in a phased manner, however high focus districts would be included on priority basis, with the proposed strategy as under:

- A. Prevention through behavior change communication (BCC)
- B. Capacity building (Human Resource and equipments) at different level of Health care delivery system for early identification, management and rehabilitation.
- C. Monitoring and evaluation

A. Prevention through behaviour change communication (BCC)

The common causes of Hearing Impairment are mainly due to Congenital (mainly Rubella), Acute Suppurative Otitis Media, Chronic Suppurative Otitis Media, Secretory Otitis Media, Trauma and Noise induced hearing loss. Majority of these causes are preventable through raising awareness among the Health Care Providers and the community. For such awareness generation, various categories of mass media, community education and interpersonal communication approaches are proposed to be used.

Interpersonal communication would be carried out through health care providers and grass root functionaries i.e. ASHA, AWW, SHG/ Youth Club, panchayat members etc. for which education material would be developed to facilitate IEC/BCC activities.

B.Capacity building (Human Resource and equipments) at different level of Health care delivery system for early identification, management and rehabilitation

The capacity building for early identification and management of hearing impaired personnel, and rehabilitation of profoundly impaired will include

B.1 Training:

Seven types of training are proposed as under for various categories of health professional/ personnel at different levels of health care facilities during 12th plan. Training /sensitization of Anganwadi workers and their supervisors, teachers, ASHA and parents of disabled children will be undertaken through the budget proposed under BCC/NRHM

- Sensitization training for ENT doctors and Audiologists at the District level
- Skill based training for ENT doctors and Audiologists at the District level
- Obstetricians and Paediatricians at the Secondary and Primary levels.
- Primary level doctors posted at the CHCs and PHCs
- MPWs, PHNs, AWWs
- Anganwadi workers, ASHA
- Parents of disabled children

B.2 Manpower support

It is proposed to strengthen the ear care services at district and CHC level by providing manpower support such as one Audiologist, one Audiometric Assistant and one Instructor for hearing impaired at each district.

Audiologist: A technical person with 4 years graduation in Audiology & Speech language pathology. The job responsibility of the Audiologist will be as under:

- Provision of audiological services
- Organizing of screening camps
- Assist in training programmes
- Monitoring and Evaluation of the Programme
- Maintenance of Database

Audiometric Assistant: A technical person with 1 year diploma in Audiology /Audiometric Assistant, if Audiologists cannot be employed/ available under the programme. The audiometric assistant will provide support to CHC by visiting on fixed day in screening of HI persons. The job responsibility of the Audiologist will be as under:

- Assist in providing audiological services
- Assist in conduct of screening camps
- Assist in training programmes
- Monitoring and Evaluation of the Programme
- Maintenance of Database

Teacher for the Young Hearing Impaired: It is proposed that a teacher may be inducted on contractual basis, to look after the therapy and training of the young hearing impaired children at the district level. The job responsibility of the Audiologist will be to provide training, therapy and early education for the young hearing impaired children.

B.3 Equipments

To strengthen the early detection and management of hearing impaired, health care facilities will be provided the financial support to procure the equipments. The details are as under:

PHC: For screening of ear morbidity and detection of Hearing loss, the equipment required would be:1) Head Light, 2) Ear Specula, 3) Ear Syringe, 4) Otoscope, 5) Jobson Horne Probe, 6) Tuning fork, 7) Noise Maker

CHC: For screening of ear morbidity and detection of Hearing loss, the equipment required would be: Head Light, 2) Ear Specula, 3) Ear Syringe, 4) Otoscope, 5) Jobson Horne Probe, 6) Tuning fork, 7) Noise Maker, 8)Screening Audiometer

District hospital: The District hospital is an important center for the management of ear problems and deafness cases, which are referred from the health care facilities at various levels. The equipment provided at the district hospital level is as follows:

- a. Microscope

- b. 2 sets of Microdrills with 2 hand pieces and burrheads
- c. 2 sets of Micro – ear surgery instruments
- d. Pure Tone Audiometer
- e. Impedance Audiometer
- f. OAE machine
- g. Sound treated room

Medical College: It is envisaged that Medical college has to play greater role under the in order to improve the quality of services a greater involvement of medical colleges is essential. It is envisaged that the each state should identify one medical college as a mentoring and referral centre for 3-5 districts (based upon geographical factors and faculty strength of the medical college). The role of the medical college should include:

Availability of advanced audiological facilities must be ensured at the level of the medical college. Wherever such facilities are lacking, they will need to be facilitated under the programme. A list of equipments will be charted out from which each medical college may choose as per their requirement.

B. 4 Rehabilitation and Hearing Aid provision:

- ◆ All patients who are identified as having an ear problem that either requires surgery, hearing aid fitting or rehabilitative therapy will be referred to the ENT doctor and Audiologist at the district level.
- ◆ Those who need surgery will be given the appropriate treatment at the district hospital.
- ◆ Complicated cases that cannot be adequately handled at the District hospital will be further referred to the Medical College for expert treatment.
- ◆ Patients who suffer with Sensorineural hearing loss that is not amenable to medical or surgical correction and which requires hearing aid, will be fitted with the same at the district level. This will include children who are suffering with Bilateral sensorineural hearing loss.
- ◆ The hearing aids will be issued as per the criteria developed for implementation of the program. It is proposed that collaboration with the Ministry of Social Justice & Empowerment will be established for this purpose.
- ◆ The requirement for Speech therapy and Hearing therapy will be met with by the Audiologist and Instructor for hearing Impaired at the District level.
- ◆ Provision has been kept to involve ASHA/ Other link workers in identification of Hearing Impaired. Accordingly incentive will be paid for assisting in fitting of HA and there maintenance.

B.5 Ear Screening Camps

Screening camps will be organized by the team of District ENT specialist and Audiologist at least one each month.

- ◆ Screening camps will be organized at the PHC/CHC and District level for screening the general population in respect of ear problems, hearing impairment and deafness.

- ◆ Detection and treatment of common ear problems.
- ◆ Spreading awareness regarding ear problems, early detection of deafness, available treatment and health care facilities for referral of such cases.
- ◆ Education of community, especially the parents of young children regarding importance of right feeding practices, various common ear problems, early detection of deafness in young children and available treatment for hearing impairment/deafness.
- ◆ Education of Panchayat members, members of Mahila Mandals and Youth leaders.

B.6 Referral services:

Effective linkages would be developed from peripheral level to district level with the help of functionaries and personnel from grass root level (AWW, ASHA and sensitized parents and PRIs), subcentre level (Male and female MPWs), PHC level Medical officers, Public health nurses, School teachers and School health doctors, private practitioners and District level officers.

C. Monitoring and Supervision

One of the lacunae of the programme during its implementation in the 11th 5 year plan, has been the lack of a suitable mechanism for implementation and monitoring of the programme at all levels. In order to overcome this shortcoming, there is a strong need for creation of suitably empowered Programme implementation Committees with monitoring cells at the various levels within the health care delivery system. The following actions are proposed:

C.1 Strengthening Monitoring & Supervision - Monitoring of the programme components may be strengthened at all the level by creating Monitoring Cell at Central level, State level and District level.

- i. Monitoring Cell at Central level
 1. National Consultants 2 (Rs 60000/- per mth)
 2. Programme Assistants 2 (Rs 30000/- per mth)
 3. Data Entry Operator 1 (Rs 12000/- per mth)
- ii. Monitoring Cell at State level
 1. Consultant 1 (Rs 50000/- per mth)
 2. Programme Assistant: 1 (Rs. 25000/- per month)
 3. Data Entry Operator 1 (Rs 12000/- per mth)
- iii. Monitoring Cell at District level
 1. Consultant 1 (Rs 40000/- per mth)
 2. Data Entry Operator 1 (Rs 12000/- per mth)

C.2 Advisory Committee:

The advisory committee will be constituted at central , state and District level to advise, review and monitor the Program Implementation. The committee will consist of subject experts programme officers, Administrators etc.

D. Public Private Partnership

Public Private Partnership model will be adopted for early identification and management of Hearing impaired children at the district level involving private ENT specialist wherever ENT specialists are not present in the district hospital.

E. Coordination with NRHM

- For effective implementation and monitoring of programme
- Timely release of funds
- Involvement of training centers for training of health care personnels under the programme.
- Involvement of ASHA and other voluntary health care workers
- Involvement of IEC officer for creating awareness under the programme.

F. Research & Evaluation

Operation Research will be conducted with respect to different aspects of programme and its components to assess its suitability in different areas. The recommendations of these will be integrated in the programme strategies for further implementation of the programme. The programme will also be evaluated at the end of 3rd and 5th year about its achievements.

G. Key Indicators for Activities wise physical targets on coverage, output/outcomes

G.1 Manpower training:

- Number of different health care personnel available in the district
- Number of different health care personnel trained under the programme.

G.2 Capacity building:

- Number of District Hospitals, CHCs and PHCs provided with the equipment under the programme and there usage verified by the Central observers.

G.3 Rehabilitation:

- Number of Hearing Impaired identified for the provision of Hearing Aid
- Number of persons rehabilitated with hearing aids and therapy under the programme
- No of Hearing Impaired children rehabilitated by Hearing & Speech therapists.

G.4 Service Delivery:

- a. Decrease in the prevalence of hearing loss in the districts. (Assessed on the basis of the Family based proformas maintained by the MPWs at the Sub centre level and the School based proformas filled by the school teachers).
- b. Number of screening camps organized in a district.
- c. Persons identified & treated with hearing loss and ear diseases at the Screening camps
- d. Number of ear cases referred for diagnosis and treatment to the PHCs, CHCs and District Hospitals.
- e. Number of patients who received treatment at the District Hospital and the State Medical Colleges.

18. National Program for Health Care of The Elderly

Health facilities will be strengthened at all levels to handle the increasing problems of the elderly. The manpower and the facilities under the NPCDCS will also be utilized to improve the health of the elderly.

Health care facilities at District: At present the programme is being implemented in 100 districts covering 21 states. Keeping in view the recommendations made in National policy on older Persons and Maintenance and Welfare of Parents and Senior Citizens Act 2007, the programme will be extended to all the districts covering all the states /UTs. 540 more districts will be covered under the programme.

Geriatric services in District Hospital: District hospital is being strengthened /upgraded for management of the elderly. Health professionals will be trained in problems in the elderly and home based care of the bedridden cases. All districts will have 10 bedded Geriatric Ward and a Geriatric OPD on a daily basis for care of the elderly.

Under the NPCDCS, each district hospital will have a 4 to 10 bedded multi Purpose Medical Intensive Care & Stroke Unit (ICSU). Geriatric patients requiring Intensive care will also be managed in the ICSU. In addition to the existing staff support is given for contractual manpower. There will be 2 Consultants taken under contract, one of them will MD Physician and the other M.B.B.S trained in PMR for rehabilitation services. There will be 6 Nurses, 1 Physiotherapist, 2 Hospital Attendants and 2 Sanitary Attendants taken on contract who will be trained in geriatric services and their services also could be utilized for NCD services.

The districts will be supported with certain essential drug list for NCD under NPCDCS & COPD which will be utilized for the health care of the elderly. Local NGOs/ community leaders will be roped in geriatric services. Under this scheme support will be given for:

- 10 bedded Geriatric Ward and a Geriatric OPD
- Drugs and consumables, Machinery, Rehabilitative appliances
- Transport of Referred/Serious patients
- IEC activities
- Home based care for bed ridden cases.
- Contractual Manpower (Consultant Medicines- 2, Nurses-6, Physiotherapist-1, Hospital Attendants- 2and Sanitary Attendants-2)
- Training of health professionals.
- Miscellaneous cost for communication, TA/DA, POL, contingency etc.

District Programme for Health Care of the Elderly: Under this scheme, Geriatric Clinics will be set up in selected CHCs and PHCs. Aids and appliances required by elderly will be made available from the recurring grant. As per the NSSO survey around 8 % of the elderly are bed ridden. It is proposed to provide support for home-based care for rehabilitative

services at the door step of such elderly patients. In case of emergency, ambulance and referral services will be provided to the elderly persons

- **Community Health Centres (CHCs):** Geriatric clinic will be set up twice a week at CHCs. A Rehabilitation Worker will be taken up on contract for Physiotherapy and medical rehabilitation services for the elderly. CHC will also be supported with certain appliances and aids for the elderly. Domiciliary visits for bed-ridden elderly and counselling to family members for care such patients by the rehabilitation worker. The services of the staff under the NPCDCS will also be taken to facilitate the geriatric services at the CHCs. Support is also being provided for transport of referral cases, IEC activities, consumables etc. Essential drugs required for NCDs under the NPCDCS will also be utilized for the geriatric patients.
- **Primary Health Centres (PHCs):** PHC Medical Officer will be in-charge for coordination, implementation & promoting health care of the elderly. A weekly geriatric clinic will be arranged at PHC level by trained Medical Officer. Support will be given with certain appliances and aids for the elderly. Home based care will be for bed ridden cases. Support is also being provided for transport of referral cases, IEC activities, consumables etc.
- **Sub Centres (SCs):** The ANM / Male Health Workers posted will be trained for Health Care of the Elderly. Annual check-up of all the elderly at village level need to be organized by PHC/CHC. Support will be given with certain appliances and aids for the elderly. Home based care will be for bed ridden cases. Support is also being provided for transport of referral cases, IEC activities, consumables etc.

Developing Geriatric Department in Medical college of each States/UTs:

It is proposed to develop 12 additional Regional Geriatric Centres in selected Medical Colleges of the country in addition to 8 Regional Geriatric Centres being developed during the 11th Plan. The regions and Medical College proposed are:

- Chandigarh- PGIMER, Chandigarh
- Uttar Pradesh- KGIMS, Lucknow
- Jharkhand- Ranchi Medical College, Ranchi
- West Bengal- Kolkatta Medical College, Kolkata
- Andhra Pradesh- Nizam Institute of Medical Sciences, Hyderabad
- Karnataka- Bangalore Medical College, Bangluru
- Gujarat- B.J. Medical College, Ahmadabad
- Maharashtra- Government Medical College, Nagpur
- Orissa- S.C.B. Medical College, Cuttack
- Tripura- Agartala Medical College, Agartala
- Madhya Pradesh- Gandhi Medical College, Bhopal
- Bihar- Patna Medical College, Patna

These centres will provided tertiary level of care for referred cases, undertake training programmes and research in the field of Geriatrics. Each of these Medical college will

have department of Geriatrics with 30 beds and OPD facilities including academic and research wing. These institutes will ensure initiation of 2 PG seats for MD in Geriatric Medicine. Support will be provided for Construction/renovation/extension of the existing building and furniture of department of Geriatrics. Support will be provided for Machinery and Equipment and Video Conferencing Unit. Financial assistance will be given for the Drugs and consumables, Research Activities, Human Resources (Contractual) and training to faculty members and doctors from district hospitals. All Government Medical Colleges will be encouraged to start geriatric unit.

4. National Institute of Aging (NIA): The proposal for National Institute of Aging could not be considered during 11th Plan. It is proposed to support development of National Institute of Aging in New Delhi and Chennai attached to AIIMS and Madras Medical College respectively.

5. Human Resource Development: MD in geriatric medicine is already a MCI approved course. Medical colleges to be covered under the scheme of Regional Geriatric Centre will have provision for 2 PG seats in Geriatric Medicine. Apart from this, a 6 month certificate course in geriatric medicine will be developed for training of in service candidates in these colleges. Every medical college will train 6 candidates at a time and there will be 2 session each year.

6. Research

Research areas will be identified on priority which will include clinical, programmatic and operational research. A special research project on alzheimers disease will also be initiated as a multi-centric study. Grants made available to Regional Geriatric Centres will be used for this purpose.

Expected Outcomes

- 20 institutions with capacity to produce 40 postgraduates in MD in Geriatric Medicine per year
- Additional 6400 beds in District Hospitals and 1000 beds in Medical Colleges for the Elderly
- Geriatric Clinics in the OPD and Physiotherapy units in 640 District Hospitals and more than 2000 Geriatric clinics in CHCs/PHCs
- Free aids and appliances to elderly population
- Improvement in life expectancy and better quality of life of the elderly population

19. Prevention and Control of Neurological Disorders

19.1 Epilepsy

There is need to initiate interventions for managing epilepsy which will improve health outcomes and alleviate untoward social issues related to it. The issues described below justify initiation of programme to prevent and manage Epilepsy in India.

Treatment gap despite availability of medicines in India:

Treatment gap is broadly classified into primary and secondary. 78% of persons with epilepsy are affected by this gap¹²². In a highly literate population of Kerala a treatment gap of 38% has been found¹²³. Hackett RJ in 1997 found a treatment gap of 50% in Calicut district of Kerala. In Kuthar valley of south Kashmir a treatment gap of 75% was found¹²⁴. 65% treatment gap was found in the Baruipur block of west Bengal¹²⁵. A very high treatment gap of 90% was found in West Bengal districts¹²⁶. More treatment gap in epilepsy results in status epilepticus, death, stigma, loss of quality of life and social alienation.

Various reasons have been given for the discontinuation of treatment leading to the treatment gap. 90% of the patients discontinue due to the cost factor, 21% due to unemployment, 20% due to frustration, 21% due to lack of medicines and 10% due to marital disharmony¹²⁷. Treatment gap has been found to be higher in the rural areas and in the low income countries¹²⁸.

The main problems faced by the health care professionals are lack of diagnostic facilities (51.9%), treatment compliance (28.2%), non-availability of new AEDs (17.3%), lack of educational services (17.3%), and training (40.4%), and non-availability of epilepsy surgery by 17.3%¹²⁹.

Affordable treatment is available :

Phenytoin, Carbamazepine, Phenobarbital and Valproic acid has been the choice of first line of treatment in most of the cases. 80% of the patients remain free from seizures on first drug, and additional 13% on a combination of two drugs. In other words 93 % of epilepsy cases are controlled with 1-2 medicines¹³⁰. 90% of the seizure free patients took only the moderate dose of the drugs¹³¹. If the patient has been properly treated it would result in a seizure free life. The patient would not have personal or social stigma and the unnecessary cost of the treatment would be curtailed¹³². Phenobarbital has been the first choice of treatment in 96% of the developing countries, Phenytoin in 68.2%, CBZ in 42.6% and Valproic acid in 22.5%¹³³.

Objectives:

- 1.** To reduce the treatment gap of epilepsy in the country.
- 2.** To promote public awareness about epilepsy: alleviation of myths and misconceptions, provision of treatment and prevention.
- 3.** To build capacity at all levels of human resource on prevention and management of epilepsy.

Strategies:

1. Training:

Health workers in the community can be effectively trained to identify cases and persuade them to seek treatment. Physicians at PHCs, CHCs and District Hospitals will be trained for public health aspects, prevention, differential diagnosis and diagnosis of epilepsy, particularly of generalized tonic clonic convulsions. Doctors will receive training by the GEMIND (Guidelines for epilepsy management in India- IES) and ETP (Epilepsy teaching program) on various aspects of management of epilepsy and reduction of treatment gap of epilepsy. The district medical officer will be considered as the core person to be trained in all aspects stated (public health aspects, prevention, differential diagnosis and diagnosis of epilepsy, particularly of generalized tonic clonic convulsions, febrile convulsions etc.) who in turn will provide training to the PHC doctors on essential components. Thus the emphasis will be to "train the trainers -TOT" (M. Gourie-Devi, 2003).

Personnel involved in monitoring and data collection will also be trained in the use of various scales for monitoring change.

2. Awareness generation:

Intensive health awareness campaign will be carried out to promote public awareness about epilepsy, its prevention, benefits of treatment, myths and misconceptions etc. Communication needs assessment will be carried out to understand gaps in knowledge and attitude towards epilepsy and treatment practices. IEC will be through multi-media including print and electronic media. Street plays and the railway network and public transportation will be deployed. The role of the chapters of the Indian epilepsy association (IEA) will be harnessed.

3. Provision of Medicines

Free supply of Antiepileptic drugs (AEDs) will be provided to ensure the management of epileptic patients. First line of drugs will be made available at selected PHCs, CHCs and all District Hospitals. If required, second line of drugs can be prescribed at Medical Colleges and Tertiary Care hospitals.

4. Strengthening Medical Colleges/District Hospitals :

Government Medical colleges/District Hospitals will be strengthened with Portable EEG machine and a Technician. Each Medical college will cater 4-5 districts. Role of the medical colleges will be in diagnosis, management and training for epilepsy. A neurologist and a technician from the medical college will visit to the district hospitals periodically for EEG and management of complicated cases.

Continued follow-up of patients on treatment and referral system from primary level to secondary/tertiary level hospitals will be developed under the programme.

Approximate cost of Firstline medicines for epilepsy and their costs are given below, which will be made available at all levels of care.

First Line Drug for management of Epilepsy

1. Phenobarbital at 120mg/day @ Rs. 8/day

2. Carbamazepine at 1000 mg/day @ Rs. 11/day
3. Valproic Acid at 1000 mg/day @ Rs. 12/day
4. Phenytoin at 300 mg/day @ Rs. 11/day
5. Intranasal Midazolam at 0.5 mg/day @ Rs 250/spray bottle
6. Intranasal Midazolam at 0.5 mg/month @ Rs 250/spray bottle

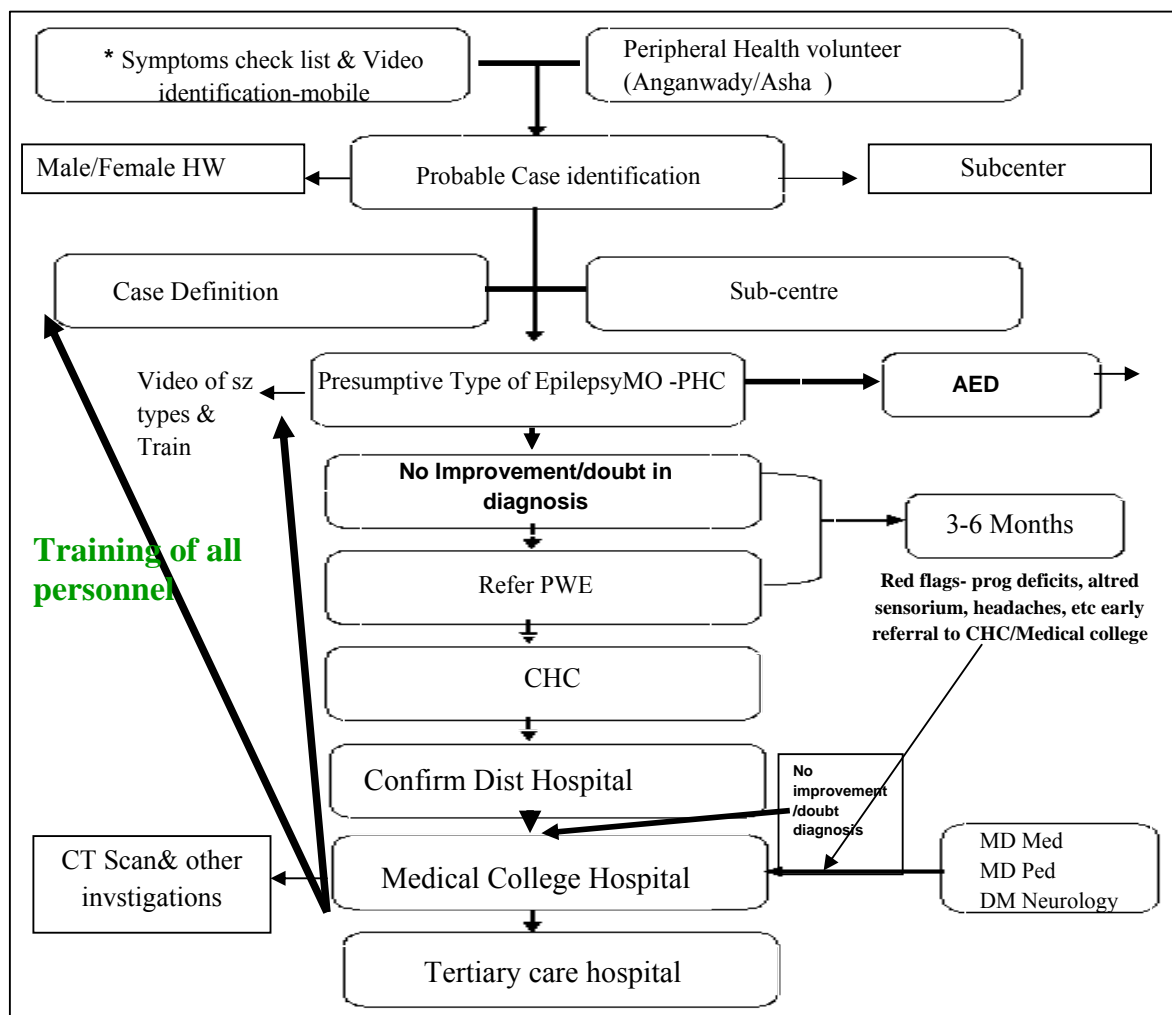
Government Medical colleges/District Hospitals will be strengthened with Portable EEG machine and a Technician. Each Medical college will cater 4-5 districts. Role of the medical colleges will be in diagnosis, management and training for epilepsy. A neurologist and a technician from the medical college will visit to the district hospitals periodically for EEG and management of complicated cases.

Continued follow-up of patients on treatment and referral system from primary level to secondary/tertiary level hospitals will be developed under the programme.

Second line medicines for treatment of epilepsy and their current prices are given below:

Drug dosage	Current price (Rs.)
Lamotrigine 200mg/day	32/-
Leviteractam 3000mg/day	59/-
Topiramate 100mg/day	20/-
Clobazam 30mg/day	21/-
Lacosamide 600mg/day	47/-
Gabapentin 2400mg/day	83/-

Below is the proposed flow chart for patient follow up : Bottom up approach



(*Case definition- Anand K, 2005 – Epilepsia, Seizures in both adults and children)

Top Down:

↓	Institutions in the country region-wise
↓	Medical College (Each Medical College could adopt one – three districts (based on the distribution of colleges) Government Colleges to be given more responsibility.
↓	District as a Unit
↓	Complete coverage to be ensured (through Health / ASHA Workers).
↓	IEC activity / models for awareness to be culturally specific need to be emphasized.

Monitoring Indicators:

National programme on epilepsy will be monitored and evaluated on the following indicators:

1. Physicians and the doctors at the PHCs, CHCs and District Hospital trained for management of epilepsy.
2. Number & % of patients diagnosed and those provided anti-epileptic drugs (by gender)
3. Number of patients who were investigated by EEG

19.2 Management of Developmental Delays including Autism:

Introduction

Developmental delay is one of the most common conditions encountered by pediatricians in clinical practice. Early identification and diagnosis have implications for treatment, genetic counseling and estimation of the risk of recurrence, management of possible associated conditions, prognostication and prevention, both at the individual and community level.¹³⁴

In developing (Low and Middle Income (LAMI)) countries,¹³⁴ as childhood mortality has decreased, developmental difficulties, including disabilities, disorders, or delays in cognitive, language, social-emotional, behavioral, or neuromotor development that begin during early childhood are increasingly recognized as important. Research in Western countries has shown contributors to morbidity across the life span.¹³⁵⁻¹³⁹

Burden of the Problem

The World Health Organization (WHO) estimates that about 10% of the world's population has some form of disability¹³⁴.

In India, 3.8% of the population has some form of disability. Reported prevalence of various forms of developmental disabilities varies from 2.5% to 9.5 % in our country. More common survey under NSSO 2002 in India showed a prevalence rate of 1.77% disabilities among all age groups¹³⁰ among children of the lowest socioeconomic class families when compared with the next-to-lowest class families.¹³⁸ In a Nationwide house to house survey of 3560 children 0–6 years of age at Delhi, disability was identified in 6.8% of those assessed.¹⁴⁰ As reported by Sachdeva et al in a Cross sectional descriptive study conducted in field practice areas of Aligarh on 468 children aged 0–3 years, as many as 7.1% of the children screened positive for global developmental delay. Maximum delay was observed in the 0-12 month age group (7.0%).

In community based study from Kerala on 12520 children upto 5 years, there were a total of 311 children with developmental delay, deviation, deformity or disability giving a prevalence of 2.5% (95% CI, 2.22 – 2.77).¹⁴¹ The prevalence of developmental disabilities up to 2 years was 2.31 (95% CI, 1.91 – 2.71) and from 2 – 5 years 2.62% (95% CI, 2.25 – 2.99).¹⁴² Speech and language problems were observed to be the most common disabilities (29.8%).

Hospital based study conducted on 200 apparently healthy children below 2 years of age attending immunization and well baby clinic in Bhopal reported prevalence of developmental delay in 9.5 % of apparently healthy children as early as three months of age by TDSC.¹⁴³

Retrospective analysis of case records of 100 consecutive children attending Early Intervention Clinic in Chandigarh reported 88% of the assessed children to be mentally retarded, 50% had cerebral palsy, 25% had epilepsy and 26% had other co-morbid physical disorders.¹⁴⁴ Learning disorders, ADHD, behavioral problems (mainly temper tantrums and

disobedience) and autism were seen in 24%, 12%, 10% and 4% children respectively. In majority of the children, age of acquiring speech functions was delayed even though structure and function of speech mechanism was relatively preserved

Environmental causes:

De-novo mutations and advanced parental age as a risk factor for ASD also suggest a role for environment. The existence of inborn genetic vulnerabilities in metabolic pathways may lower the threshold at which the influence of environmental factors may be felt, leading to an impact of environment that differs across the population based on genetic substrate.

A number of environmental agents like heavy metals have been shown to demonstrate neurotoxic effects either in human or laboratory animal studies. Exposure to environmental agents with neurotoxic effects can result in a spectrum of adverse outcomes from severe mental retardation and disability to more subtle changes in function depending on the timing and dose of the chemical agent. Their role is biologically plausible because they are known to disrupt enzyme functions, alter cellular signaling processes generate oxidative stress leading to apoptosis. Heavy metal poisoning is likely to be a major public health problem among Indian children especially those presenting with autistic spectrum disorders.

The economic and other costs associated with neurobehavioral disabilities are tremendous. Therefore, there is an urgent need to identify potentially treatable and preventable environmental causes of at least some of these neurodevelopment disabilities.

Justification for programme

Research in Western countries has shown that children and their caregivers benefit from developmental monitoring during health visits in a number of ways:

- (1) If the child is developing typically, clinicians can provide reassurance, support parenting competence, and provide anticipatory guidance;
- (2) If the child is at developmental risk or has an established or emerging delay or difficulty, this can be detected early and addressed; and
- (3) In both situations, caregivers can be supported and informed about how to enhance their child's development¹⁴⁰⁻¹⁴⁵

The proposed programme will address following issues relating to ASD

1. **Late referral of majority of children with developmental disabilities:** Mean age of the children attending the Early Intervention clinic has been reported to be 4 years,¹¹ which indicates that majority of the children are either referred late or that parents try out all other options before bringing over the child to EIP.
2. **Need for a uniform screening tool in the country:** The prevalence of developmental delay reported by various authors in different studies varies over a wide range. This could be a result of a lack of uniformity in the instruments employed to assess developmental performance.

It has been reported that pediatricians more often referred children, who were more than 3 years of age or children with more severe disabilities, for special services. It may be possible that pediatricians rarely use developmental or behavioral screening tests, preferring to rely more on developmental surveillance in the context of normal health care provision.¹³⁷ For screening at community level, there is a need for a standard uniform development screening tool.

3. **No National guidelines for incorporating developmental screening into existing health care:** In high-income countries, an important strategy for the early detection and management of developmental difficulties has been the integration of developmental monitoring of children (i.e., standardized screening and surveillance) into health care.¹⁴⁰⁻¹⁴⁵ To date, however, methods designed specifically for developmental monitoring of young children by health care providers in developing countries are lacking.^{135-139, 146-148}
4. **Focus on identification of the domain of developmental delay targeting at specific intervention not yet practiced in India:** It's vital to look at any dissociation between the domains of development (Speech and Language, Motor, Fine Motor, Personal and Social, Global). Identifying the patterns of developmental delays in children can aid in the diagnoses of neurodevelopment disorders and help anticipate the overall outcome of a child's disability.
5. **Evidence in the form of multicentric studies representative of the entire country still lacking in India:** The major focus of work in India has been the identification of generic disabilities through the administration of short screening tools by community based "grass roots" workers, such as community health workers (CHWs) and anganwadi workers (AWWs), or other grass roots workers depending on the cultural context. However all the studies have been reported from an individual institution/state and no study is yet available in India which is a representative sample of the entire country. Hence, this project would be the first multicentric study with representation from all parts of the nation.
6. **Need for convergence at the community level, awareness raising and the involvement of local government:** A large population in the South East region is rural based. It has been observed from the country reports at UNESCAP/JICA meetings on disability in 2003, that there is significantly higher prevalence of disability in general (3 – 5 times more) among the rural population in the region as compared to the urban.¹⁴⁰ Traditional western models of urban, informed health seeking behavior have not been commonly observed in the countries, due perhaps to many exclusionary factors associated with the stigma related to developmental delay and lack of awareness among professionals, policy makers, families and civil society. For spreading awareness, networking with ongoing national programs (Integrated Child Development Scheme, Family planning, etc.) is very important. Anganwari workers, multipurpose health

workers, Auxiliary Nurse Midwives and Non Government Organizations working in the community need to be educated.

7. Emphasis on parent participation in both the detection of early symptoms and during intervention: Only 9% families were aware of the early signs of developmental delay, provision of disability certification and various welfare facilities provided by the central and state governments. Parents of the children with development delay are a rich resource in the community and are the child's best and first teacher. Their concerns regarding delays/deviations in development have usually proved to be right. It is therefore logical and cost effective to involve them at every step of the planning and implementation process and treat them as co therapists.

8. Human resource development for developmental screening and intervention in India
In last 20 years, in India there has been a recognition that the quality and relevance of services for persons with disabilities is heavily dependent on a regular supply of well trained service providers and that investments in the development of human resources is the best strategy for the sustainability of rehabilitation services in the long run. This project also aims at training the grass root health workers along with the medical professionals at the secondary and tertiary levels of health care.

Developmental delays including autism disrupt the entire family unit. The diagnosis for underlying etiology is very challenging as etiology is multifactorial. Early diagnosis and team management are necessary but the specialists involved in diagnosis and management like developmental pediatrician, child neurologist, child psychologist, geneticist, occupational therapist, physiotherapist, speech and language pathologist, radiologist, social welfare personnel and requisite resources are usually not available under one roof especially at peripheral level. Searching for diagnosis and management drains the resources of families. There is, therefore a burning need to develop centres of expertise which can liaison with peripheral health care centers to provide easily available right intervention.

Programme objectives:

1. Screening of children from 0-6 years of age for developmental disabilities including autism.
2. Training of community based health workforce (AWW, ASHA, ANM, male health worker) for developmental delays and disabilities using culturally acceptable simple tools.
3. Strengthening of pediatric department of Medical College

Programme Strategies:

- 1. Building skills and knowledge about early warning** signs called red flags of autism, training on use of diagnostic scale DSM IV TR for autism amongst pediatrician by child neurologists. The red flags include not developing:
 - Babbling by 12 months

- Gesturing (e.g., pointing, waving bye-bye) by 12 mo
- Single words by 16 months
- Two-word spontaneous (not just echolalic) phrases by 24 months
- Loss of any language or social skills at any age.

Community based health workers will be trained to identify the developmental delays.

2. Screening of children below 6 yrs of age:

Children from 0-6yrs of age for developmental disabilities including autism with the help of community based workers. The settings of immunization clinic, anganwadis, and antenatal clinics may be used for the purpose. After preliminary screening suspected children for developmental delays will be referred to nearest tertiary health care facility or medical college.

Number of screening tests has been constructed for use in LAMI countries to identify disabilities in children. There is reported no single ideal screening instrument. These instruments may need to be adapted to be culturally appropriate.

3. Child Development Resource Centre

Child Development Resource Centres will be set up in Govt. medical colleges in a phased manner as multi-disciplinary centre to provide support and rehabilitative services to children and families affected by developmental delay disorders. Each medical college will be provided support for hiring following contractual manpower:

- Clinical child psychologist
- Occupational therapist
- Audiologist
- Speech therapist.
- Counselor
- Data Manager

Support will also be provided for infrastructure renovation and essential tools and equipments. The programme will be linked with existing programmes on child health and NCDs.

19.3 Dementia

Challenges to manage growing problem of Dementia can be addressed through a nation-wide programme with following objectives and strategies:

Objectives:

1. Nation-wide promotion of awareness, knowledge and understanding of the disease
2. Enable a human rights perspective for the people affected with the disease
3. Recognizing and strengthening the key roles of families and care givers
4. Enabling early detection, prioritize access to health and social care to the affected patients and their family members
5. Ensuring holistic treatment after diagnosis to the affected
6. Promote prevention of the disease, through ensuring research and improvements in public health

Strategies for achieving the above objective

- 1) Provide public information about the symptoms, non-pharmacological treatment methods and the course of the disease
- 2) Reduce stigma by promoting understanding and awareness
- 3) Provide training and tools to healthcare professionals (including social workers), para medical personnel and family caregivers in managing people with Dementia-PWD
- 4) To encourage early assessment, diagnosis, appropriate care, and access to optimal non-pharmacological treatment through humanitarian means of love and affection.
- 5) Provide a legislative framework to regulate and protect the rights of those people with dementia who lack the capacity to manage their everyday lives through exclusive ***Dementia India Report brought out by Alzheimers' Related Disorders Society of India, a National organization, dedicated to the cause since 1992, with an outreach in 15 locations all over India including all Metro cities and few mega cities.***
- 6) Prioritize research into Alzheimer's disease and other form of dementia through developing exclusive regional centres dedicated for the disease in Major cities of India.
 - These regional centres shall provide access to primary and secondary health care services, responsive to the needs of people with dementia.
 - These centres shall promote access to a range of options for long-term care that prioritize maintenance of independence, home and community –based care and support for family care givers.
 - These regional centres shall ensure all care environments, including (acute) hospitals and long term care institutions, safe places for people with the disease by standardizing the care parameters
 - Engage in training people and disseminate up to date knowledge from time to time.
 - These centres shall also ensure a standard of living adequate for health and well being, including food, clothing, housing and medical care for people with the disease from its vicinity.

Activities: Specific activities thus designed essentially include the following:

1. IEC:

Dementia Awareness campaign throughout the country through talks, interactive sessions, radio/TV programmes, wall writings etc. The knowledge base about the disease is extremely low especially in Medium, small towns, rural areas. Even large cities, the knowledge is very limited about the disease. This leads to low detection ratio of affected elderly who are often

consigned to the status of senility, which is commonly attributed to old age. Such kind of fixed ideas, myths, and fallacies surrounding memory loss or insignificant behaviours needs to be dispelled in an interactive mode and needs to be emphasized, that all elderly are vulnerable to such situations, irrespective of their family backgrounds, status and lifestyles. More so, there is also complete ignorance of such disorder, hence Radio/TV programmes, Wall writings on screening/treatment service availability in the near vicinity by Panchayats, Urban Local Bodies shall ensure increased knowledge leading to access of available facilities and more correct and early diagnosis shall be possible memory problems.

There are around 620 Districts all over India, it is proposed to have around 2 events each month in each district amounting to around 25 events (talks, interactive sessions, radio/TV Programmes, wall writings etc during the whole year. Thus during each year, there shall be 15500 sensitization exercises done covering an intended elderly population of each district. Large awareness programmes at Regional level need to be organized on an annual basis. Since detection of Dementia, a number of evidence based researches have been conducted world over. The large awareness programmes shall actually be conferences at Regional Level which shall show case such recent developments taken up globally in the form of presentations, papers and poster sessions. After an expert group analysis, a plenary session shall be scheduled at the end of each sessions as well as end of the conference.

The participants are expected to be Doctors from all over the country, para medical staff, care givers, NGOs working in the field etc and visiting lecturers from prominent research Institution on the subject of Dementia. Each year four regional conferences shall be held to keep abreast the stakeholders informed on the innovations, development and invention of medicines etc. The deliberations at the end of each conference shall be published as compendium in different volumes to act as future repository for people seeking up to date information.

2. Training:

Bi-annual Training of doctors on the nuances of Dementia and its treatment trends

The care givers, family members of patients have always had horrible stories to share, when it comes to managing patients with Dementia by even educated doctors. The doctors who are little aware of Dementia, often complicate the treatment procedures of a person with Dementia, by the time they realize the course of treatment should have been different, enough damage is done. To essentially improve upon the knowledge base on handling, managing and treating people with Dementia, it has been proposed to have a training programme exclusively for doctors on a bi-annual basis. This training shall be held at all districts levels, with the help of expert organizations (ARDSI-National Office) in the field. The total number of trainings envisaged has been estimated as 1240 trainings in 620 districts.

Bi-annual training of nurses/para-medical staff on the nuances of Dementia and its efficient handling needs

The patient majorly remains under the care of nurses, para-medical staff. There is a great need to suitably train these care providing nurses and other staff on sensitive, correct and appropriate handling of People with Dementia. The various stages of Dementia requires

different type of care, which shall be methodically put in to a training module and shall be taken up at each district level on a biannual basis, thus during each year 1240 trainings shall remain concluded.

3. Setting up of memory clinics at each District Hospitals

Memory loss among elderly is commonly ignored and does not get diagnosed at right times leading to aggravated conditions by the time it is detected. This is mainly because of lack of knowledge and also lack of facilities. There are many methods to diagnose, however, the common evaluation is done through a small questionnaire which looks into the cognitive memory in terms of long and short time happenings, occupational, recollection, time periods etc. This lucid questionnaire is famously known as Mini Mental State Examination-MMSE, which gives a fair picture on severity of the memory impairment. However, the examination where this test is conducted needs to be established in each geriatric ward of all District Civil Hospitals of India. This will allow the benefit of early detection of memory disorders and for planning the right type of prognosis. A total of 620 such memory clinics shall be established and the persons manning the clinics shall be adequately trained by experts from Alzheimer's Related Disorders Society of India.

4. Setting up of four Regional centres of Excellence to look exclusively into Dementia related ailments

In India, there are only two Govt. institutions imparting Geriatric courses for medical students. For Dementia, there is not even a single institution offering any specific courses. Dementia management, as has been empirically evidenced, requires personalized care, which essentially differs from person to person. There are lots of efforts made using non-pharmacological interventions, which needs to be consolidated and condensed for education, moreover, lots of evidence based regional researches are required to assess prevalence, incidences, control, prevention etc. In addition the severity of the disease across different age groups of 60-65, 65-70, 70-80, 80-85 and so on needs to be methodically assessed to bring about a demographic profile and effect of the disease. Many short term, long term training programs on dementia management needs to be evolved to benefit various categories of care givers.

To realize all the above needs, a Regional centre of Excellence in Dementia care and management in four major cities has been envisaged. The detailed intervention, possible outcome and financial implications are given below:

SNo	Type of Activity	Objectives	Proposed Deliverables/ outcome	Requirements/inputs
1	Dementia Awareness camps in each Districts (through talks, interactive sessions, radio programmes, wall writings etc)	<ul style="list-style-type: none"> To spread knowledge about Dementia and its various subgroups To urge people with memory problems for early clinical diagnosis To disseminate information on facilities available on a permanent basis. 	<ul style="list-style-type: none"> Talks interactive sessions, radio programmes with doctors and interactive telephonic consultation, wall writings Public announcement trolleys All the above resulting more people availing diagnosis and treatment facilities at districts levels 	<ul style="list-style-type: none"> Resource persons Radio time slot Provision for wall writings Announcement trolleys in panchayats and urban local bodies. 620 districts X 25 programmes per district (including manpower)
2	Large awareness programmes at Regional level on an annual basis	<ul style="list-style-type: none"> To spread knowledge about Dementia and world wide developments To update and cross share information through various case studies Involve non-clinical stakeholders to contribute to the need of dementia patients 	<ul style="list-style-type: none"> Seminars with plenary sessions Participation of experts Discussion of up to date topics Knowledge sharing 	<ul style="list-style-type: none"> Resource persons from various expert streams from all over India and overseas Venue event costs for two days
3	Bi-annual Training of doctors on the nuances of Dementia and its treatment trends	<ul style="list-style-type: none"> To spread knowledge about Dementia and its various subgroups To train doctors to identify possible patients with memory problems and refer them for advanced diagnosis To train doctors on successful running of memory clinics. 	<ul style="list-style-type: none"> Seminars with plenary sessions On the job exposure Ability to handle problems faced by elderly with memory deficiencies. 	<ul style="list-style-type: none"> Exclusive geriatric wards which are inclusive of treatment facilities for various forms of Dementia. Resource persons at each civil hospital levels Diagnostic facilities (memory clinic etc) Ensuring participation of doctors from each CHCs at Block levels.
4	Bi-annual training of nurses/para-medical staff on the nuances of Dementia and its efficient handling needs	<ul style="list-style-type: none"> To spread knowledge about Dementia and its various subgroups To train nurses in efficient handling of possible patients with memory problems To train nurses on enabling successful assistance in running of memory clinics. 	<ul style="list-style-type: none"> Seminars with plenary sessions On the job exposure Ability to handle problems faced by elderly with memory deficiencies. 	<ul style="list-style-type: none"> Exclusive geriatric wards which are inclusive of treatment facilities for various forms of Dementia. Resource persons at each civil hospital levels Diagnostic facilities (memory clinic etc) Ensuring participation of nurses and care givers from each CHCs at Block levels.

5	Setting up of memory clinics at Each district Civil/general hospitals	<ul style="list-style-type: none"> • To screen for possible patients with memory related problems • To enable early identification of patients 	<ul style="list-style-type: none"> • Functional memory clinics are able to screen patients with memory problems efficiently and are able to refer for further diagnosis 	<ul style="list-style-type: none"> • A separate place designated for memory clinic within the Geriatric wards. • Full functional memory clinic with two trained professional managing it
6	Setting up of four Regional centres of Excellence to look exclusively into Dementia related ailments	<ul style="list-style-type: none"> • To have best diagnosis facilities • To have best behavioural and social research facilities • To have best Neuroscience unit. • To have best psychiatric facilities • To have exclusive care giving facilities with a 50 bedded capacity • To disseminate knowledge gained in treating unique patients in forums and seminars. 	<ul style="list-style-type: none"> • The centres of excellence are able to treat acute and chronic cases of Dementia and all its sub groups. 	<ul style="list-style-type: none"> • Best talents with neuroscience, psychiatry and research background • A campus sprawling in around 5000 Sq mts with four floors. • A group of talented para-medical support staff • A group of talented administrative staff • Meeting halls • A group of talented visiting doctors of various specializations to look at various common problems the patients suffer from like cardiology, diabetes, Pulmonary, stomach ailments etc.

20. Prevention and Management of Congenital Diseases

Objectives

1. Facilities for management of congenital level in selected institutions.
2. Human Resource & capacity building for pre-natal diagnosis and management.
3. Information, Education & Communication (IEC) for prevention of congenital disorders
4. Developing a state level registry for congenital disorders.

Strategies for implementation:

1. Strengthening of Medical Colleges/institutions for diagnosis and management of Congenital Disorders

Based on prevalence of congenital disorders, capacity of existing institutions and scope for strengthening, 20 medical colleges/institutions will be strengthened by additional human resources, infrastructure, equipment and other items required for management of congenital disorders.

2. Development of Laboratory Services for pre-natal diagnosis of congenital disorders

Facilities for pre-natal diagnosis of congenital disorders will be made available in all Government medical colleges.

3. Training of Human Resources for prevention, diagnosis and management of congenital disorders

20 premier medical institutions strengthened for management of congenital disorders will also be involved in training of human resources at various levels for prevention, diagnosis and management of congenital disorders.

4. IEC: Knowledge and awareness about predisposing factors that attribute to congenital disorders would be enhanced through IEC activities through mass media and interpersonal communication. Parental pre-marital and pre-natal counseling would be implemented through existing maternity services

5. Registry, Monitoring and Supervision:Registry of congenital disorders will be initiated that will give actual data on type of congenital disorders, their risk factors and distribution across the country. This will help to monitor congenital disorders averted, cases managed and their survival

21. Prevention & Management of Genetic Blood Disorders

Objectives

5. Management of individual cases.
6. Carrier detection in the community & Pre-natal diagnosis.
7. Human Resource & capacity building.
8. Information, Education & Communication (IEC) of patients, family, community and the influential political and religious members of the community.
9. Developing a state level registry for these disorders.

Policies and Strategies for implementation:

1. Strengthening of Medical Colleges/hospitals for diagnosis and management of Hereditary Blood Disorders

To provide comprehensive care service including diagnosis and management of Hereditary Blood Disorders, 120 Medical Colleges/hospitals will be strengthened to cover entire country. These Centres will be strengthened in a phased manner. 30 new centres each year of the 12th FYP will be selected for the purpose. Unit of following professional will be required to provide such services.

- Haematologist/ Biochemist/Pathologist
- Physician/Paediatrician/
- Blood bank medical officer
- Physiotherapist
- Social worker
- Day-care nurse
- Dentist
- Orthopaedic Surgeon
- General Surgeon
- Psychiatrist/genetic counselor.

A research Officer of Medical background and a laboratory technician will be recruited for the support of the unit

The help of other specialities (Dentists, orthopaedic and general surgeons, gynaecologists and endocrinologists will be required more often than other specialities) may be sought as and when required. Core members of comprehensive care facility may meet once a week/fortnight to discuss or sort out difficult cases. If a patient needs admission after Day-care management, he /she may be admitted.

The severe haemophilia patients require approximately 20,000 units of factor concentrates for on demand therapy per patient per year. As there are presently 14,000 recorded/registered patients with severe haemophilia, provision for this amount of concentrate shall be made at district hospitals/tertiary centres. Each Medical college/District Hospital will be supported with Rs. 20 lakh as one time grant and Rs.1 crore / year as recurring budget for Human Resource, drugs, reagents and other consumables.

2. Development of Molecular Genetic Lab. for confirmatory diagnosis

Molecular genetics laboratory shall be developed at 20 medical colleges which shall act as final referral centre for designated districts. These Molecular genetics laboratories will be developed in phased manner with 5 new each year of the 12th FYP. In the first year of the plan, institutes which already have some infrastructure like AIIMS, CMC Vellore, KEM Mumbai, PGI, Chandigarh and at Calcutta will be strengthened.

These Institutes will also train gynaecologists/sonologists to do the prenatal diagnostic procedures for prenatal diagnosis for hereditary disorders. The department of Haematology, AIIMS, New Delhi may coordinate the Quality Control for the diagnosis of Haemoglobinopathies and Haemophilia. National Institute of Immunohaematology (NIIH), Mumbai may coordinate the Quality Control for molecular testing.

Each Molecular Genetic Lab will be supported with Rs. 25 lakh as one time grant and Rs.20 lakh /year as recurring budget for Human Resource, drugs, reagents and other consumables.

3. Training:

There is need to have training centres for comprehensive care of hereditary disorders throughout the country. The centres like All India Institute of Medical Sciences, New Delhi, PGIMER, Chandigarh and National Institute of Immunohaematology (NIIH), Mumbai could serve as nodal training centres since these centres are already carrying out such comprehensive care. Counsellors may be trained in the psychiatric department of different medical colleges (tertiary care centres). A fully fledged DM (Clinical Genetics) programme may be developed at one of the tertiary care centres. An amount of Rs.25lakh each year will be required for this scheme.

4. IEC:

Targeted IEC would be required that includes Interpersonal communication, advocacy through group leaders and religious leaders, proper signages in hospital and health care facilities etc.

5. Registry, Monitoring and Supervision:

Registry of hereditary blood disorders will be initiated that will give actual data. Eventually the state should develop its own data base of patients so that regular budgeting can be done for all the activities needed to manage and contain such disorders. Govt. of India would provide technical guidelines/protocols for management of various disorders. NCD division at centre will be responsible for this. A Technical resource group will be constituted for the purpose. State and District NCD cells would take care of day to day management with the help of focal persons for these disorders.

6. Formation of an Advisory Committee for management and Control:

To provide technical advice for all NCDs, A common Advisory Committee would be formed that would include at least three members of each specialised field. The committee shall direct, supervise and advice the management and community control of these diseases. The

committee may be constituted at National, State and District level. Each of the committee, there may be

- Members from voluntary organizations/NGOs.
- Director Medical Education and Director Health Services in case of State level committee, Dean of Medical Colleges in tertiary level and Medical Superintendent in district level committees.
- Doctors: haematologist/ physician/ paediatrician/ biochemist/ pathologist/ public health specialist.
- Representative from state blood transfusion centre at each level or blood bank medical officers, as the case may be.
- Other officials (finance, tribal welfare, social welfare, etc.) who may be of help for smooth functioning of the programme.
- Community leaders.

Equipment required at Medical colleges/hospitals for diagnosis of hereditary blood disorders

S.No.	Equipment	Estimated Cost (Rs. lakh)
1	Biorad: High Performance Liquid Chromatography (HPLC Instrument)	12.00
2	Cell Counter	5.00
3	Thermal Cycler	5.00
4	Laminar Flow	2.50
5	Gel Documentation System	6.00
6	Centrifuge	3.00
7	Gel Electrophoresis System	1.00
8	Platelet Aggregometer	6.00
9	Automated Coagulometer	12.00
10	Incubator	2.00

Investigations at Medical colleges/hospitals for diagnosis of hereditary blood disorders

S.No.	Investigation	Cost (Rs.)
1	Complete blood Cell Count	35.00
2	HPLC for hemoglobinopathies	300.00
3	Prothrombin and Activated Partial thromboplastin time	50.00
4	Coagulation Factor Assay	200.00
5	Platelet Aggregation	500.00
6	Polymerase chain reaction (PCR) for mutation screening and carrier detection	2000.00

List of 20 medical colleges where molecular genetics laboratory shall be developed & which shall act as final referral centres for designated districts, is given below:

1.	Andhra Medical College, Visakhapatnam
2.	Govt. Medical College, Chandigarh
3.	Pt. J.N.M. Medical College, Raipur
4.	All India Institute of Medical Sciences, New Delhi
5.	Maulana Azad Medical College, New Delhi
6.	University College of Medical Sciences, Delhi
7.	Pd. BD Sharma Postgraduate Institute of Medical Sciences, Rohtak
8.	Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow
9.	Seth GS Medical College, KEM, Mumbai
10.	BJ Medical College, Pune
11.	Armed Force Medical College, Pune
12.	Institute of Medical Sciences, BHU, Varanasi
13.	KG's Medical College, Lucknow
14.	Medical College, Calicut
15.	Seth GS Medical College, Mumbai
16.	SCB Medical College, Cuttack
17.	Medical College, Calcutta
18.	Post Graduate Institute of Medical Sciences, Chandigarh
19.	Center for Cellular and Molecular Biology, Hyderabad
20.	Regional Medical Research Centre for Tribals (ICMR), Jabalpur

(B) HEALTH PROMOTION AND PREVENTION OF NCD& RISK FACTORS

22. National Tobacco Control Program

Vision: To create a tobacco free Nation

Mission: To reduce demand and supply of tobacco products to protect and the masses.

To reduce the prevalence of tobacco use

To implement the COTPA across the country.

In order to carry forward the momentum generated by the NTCP during the 11th FYP and baseline data generated through the GATS-India Survey, indicating high level of prevalence of tobacco use, it is imperative to upscale the programme in the 12th FYP. The proposed plan is being developed keeping in mind the learning's of the 11th FYP, the global best practices and the International obligations under WHO-FCTC. The goal of the National Tobacco Control Programme is to reduce the prevalence of the tobacco use by 5% at the end of the 12th FYP and the broad objectives are as under

- To build up capacity of the States / Districts to effectively implement the Anti tobacco initiatives;
- To train the health and social workers;
- To undertake appropriate IEC/BCC and mass awareness campaigns, including in schools, workplaces, etc.;
- To set up a regulatory mechanism to monitor/ implement the Anti Tobacco Laws;
- To establish tobacco product testing laboratories;
- Treatment of tobacco dependence
- To conduct Adult Tobacco Survey for surveillance, etc.

It will facilitate the effective implementation of the Tobacco Control Laws and to bring about greater awareness about the harmful effects of tobacco and to fulfill the obligation(s) under the WHO-FCTC.

a. National level

1. Public awareness/mass media campaigns for awareness building and behavioral change.
2. Establishment of tobacco product testing laboratories.
3. Advocacy, inter-sectoral linkages and National Tobacco Regulatory Authority (NTRA).
4. Research.
5. Monitoring and evaluation including GATS.
6. Expansion of cessation facilities
7. Tobacco Quitline and helpline

b. State level

Dedicated tobacco control cells for effective implementation and monitoring of anti tobacco initiatives in the state.

c. District level

1. Training of health and social workers, NGOs, school teachers, enforcement officers etc.
2. IEC activities.

3. Setting up & expansion of tobacco cessation facilities.
4. School Programme.
5. Monitoring tobacco control laws.

d. CHC level

1. To integrate tobacco control strategies at CHC/PHC level under the NCD package of programmes.
2. Since tobacco is a risk factor for a number of disease viz. NCD, TB, IEC awareness and other similar activities under those programme will have a component of tobacco. Hence efforts will be directed for convergence of the programme at grass-root level with NRHM, other NCD programme

Strategies & Manpower requirement

National Level

Public awareness/mass media campaigns for awareness building and behavioral change: The main objective of this programme is to create awareness about the harm effects of tobacco usage, second hand smoke and various provisions under the Act using a variety of media. This can be only developed through sustained round the clock IEC/BCC campaign targeting youth, women and vulnerable population through development of appropriate communication strategy, organizing awareness and sensitization camps using a mix of the media and other traditional methods so as to promote health seeking behavior.

Establishment of tobacco product testing laboratories: Section 7(v) of the Indian Tobacco Control Act mandates compulsory depiction of nicotine and tar on tobacco product packages, which is in sync with the Articles - 9 & 10 of the WHO-FCTC. Four regional referral labs and one Apex lab for research is proposed to be established. The strategy adopted is to build the capacity of the existing labs rather than creating stand alone labs for tobacco testing. The global best practices and the strategies developed by the WHO-FCTC guidelines and the recommendation of the specialist tobreg/toblabnet will be looked into while developing the protocol and framing the rules.

Advocacy, intersectoral linkages and NTRA :Tobacco control is beyond a health issue as there are number of Ministries of the government who can directly or indirectly be involved is the demand and supply reduction strategy viz. Ministry of Finance – taxation, Ministry of Agriculture – crops, Ministry of Rural Development – vocational training/ livelihood promotion, Department of Education, Ministry of Labour – vocations training & administering Bidi workers welfare funds etc. it is felt that there is a need to do advocacy with them and bring them on board so that their policies are aligned to the cause of public health.

It is felt that for effective monitoring of various provisions of COTPA, a dedicated set up under the Government of India having quasi-judicial powers is required. Further, since the tobacco products are proposed to be regulated for nicotine and tar content, there is a strong felt need to establish an independent mechanism, i.e. National Tobacco Regulatory Authority

(NTRA). The proposed NTRA will be the nodal agency for monitoring and coordination with States on proper implementation of the Anti Tobacco Laws. It will also serve as the agency for following up on violation of the provisions, and will closely liaise with State Governments / Legal machinery for appropriate administrative / legal action. The NTRA would include representatives from Ministries like Commerce, Labour, Revenue, Agriculture, Expenditure, I&B, HRD, Law, Consumer Affairs and Small Scale Industries, etc. in their ex-officio capacity.

Research: Research on critical and cross cutting issues like alternative livelihoods to people engaged in the tobacco sector, alternative cropping system, occupational health hazards of bidi rolling, smokeless tobacco, health cost study, and other new and emerging needs to build evidence can be taken up during the 12th FYP.

Monitoring and evaluation including GATS: As a part of surveillance of tobacco use GATS will be undertaken up on a timely basis to evaluate the programme. Further, in order to monitor the programme a monitoring format will be developed and data from CHC/ district level and state level will be compiled. A separate monitoring format for the TCC shall also be developed.

Expansion of cessation facilities: As per the GATS 46.6% of tobacco users who visited healthcare provider were interested in quitting smoking, and 45.2% were interested in quitting smokeless tobacco use. In addition, 38.4% of smokers and 35.4% of smokeless tobacco users made an attempt to quit tobacco use in the past 12 months. Very small percentage of tobacco users was able to access counseling services to quit tobacco use. Further, only 46.3% of smokers were advised by the health care provider to quit smoking and only 26.7% of smokeless tobacco users were advised to quit smokeless tobacco use by the health care provider. In order to address the huge demand and supply mismatch on the availability of cessation services, it is envisaged that under the 12 FYP new cessation facilities will be established in 400 medical/dental and academic institutions, PHC, CHC.

Quit-line/ Helpline: In order to address to huge miss match between demand and supply of cessation services, it is proposed to establish quit-line /help line that will provide online services to those who want to quit. The latest state of Art system will be outsourced for the same. It will be established keeping in view the global best practices and the learning's from countries who have successfully established such system.

Programme Management & Implementation Strategy

Community Health Centre; under the 12 FYP at CHC level the infrastructure for NCD and NRHM will be used to create awareness about the harmful effects of tobacco usage. The screenings camps under NCD strategy will also be used to create about the tobacco. The counselors under NCD will also be used for cessation

District Tobacco Control Cell: The District Tobacco Control Cell (DTCC) established at District level will be the focal point of all the activities carried out at district and sub-district level. The DTCC will be manned by Social Worker, Psychologist/ counselor, Consultant and DEO/ Progm Asst. the total budget for each Cell each year is Rs. 38.44 Lakhs. Each year 150 new DTCC will be established under the programme. At the end of the FYP about 600 DTCC will be established covering almost all the district of the country.

Key components at District Level:

- Training of health and social workers, NGOs, school teachers, enforcement officers etc.
- Local IEC activities.
- Setting up & expansion of tobacco cessation facilities.
- School Programme.
- Monitoring tobacco control laws.

Key Deliverables activity wise

- Each year the programme will be covered in 150 new districts by the end of the programme 600 district of the country will be covered.
- 600 state tobacco cell cum cessation centres to be established covering all districts of the country.
- 2400 trained manpower will be available for tobacco control intervention at district level.
- More than 60% of the government schools will be covered through the school programme.
- More than 80% of the districts will have monitoring mechanisms.

Manpower at District Level

- Social worker
- Psychologist/ counselor
- Consultant
- Programme Asst / DEO

State Tobacco Control Cell: The State Tobacco Control Cell (STCC) will be established in the 26 of the remaining states where the STCC have not been established under the 11th FYP. STCC will monitor and review all the activities under NTCP carried out in the state. Each STCC will have a nodal officer , identified by the Government, and it will be further be supported by State programme Manager, Consultant, DEO/ Progm Asst and a legal officer. The total budget for each STCC per year will be Rs. 36.40 Lakhs.

Key components at State Level:

- IEC and Advocacy
- Training of key stakeholders including enforcement officers, schools teachers etc.

Key Deliverables activity wise

- All the states 35 states/UT's will be covered by NTCP and state level Tobacco control cells cum cessation centres will be established.
- States will develop state specific plans for implementation of the NTCP.
- Legal officer will be available at each state to look into the legal issues at state level.
- Diverse stakeholders will be sensitized and involved in tobacco control efforts at state level.
- State specific IEC strategy and convergence with other NCD programme will be developed.

Manpower at State Level

- State Programme Manager
- Programme Assistant/ DEO
- Legal officer

National Tobacco Control Cell: The NTCP envisages setting up of a National Tobacco Control Cell (NTCC) at the level of Ministry of health & family Welfare for overall planning, strategizing, coordination, implementation and monitoring of the NTCP. NTCC will also be responsible for National level mass media, conducting research, GATS, setting up labs for tobacco product testing, fighting up the legal cases and carrying Advocacy with other stakeholder Ministry to align their policy for tobacco control. The focal point for the NTCC will be a senior officer, Joint secretary/ Addl DG from the Health Ministry and will be supported by contractual consultant for Policy, State Coordination, Legal Advisor, IEC & advocacy and support Staff in form of data manager. The annual budget for this will be Rs. 98 crore

Key Deliverables activity wise

- Labs will be started for tobacco product testing.
- IEC /Mass media campaigns will be carried out at regular period to sensitize the youth, masses and vulnerable population, evaluation will be done at the end of all the campaigns.
- 2nd ATS will be carried out for evaluation of the NTCP.
- New evidences shall be created through research on Health cost, alternative livelihood and alternative cropping.
- NTRA to provide a framework and strengthen the enforcement of the tobacco control will be established.
- 400 cessation centres in different medical /dental colleges, CHC, PHC will be established.

Manpower at National Level

- IEC & Advocacy Coordinator
- Training Coordinator
- Consultant – Policy
- Consultant – State Coordination
- Legal Consultant
- Data Manager/Junior Consultant

23. Prevention and Control of Nutritional Disorders and Obesity

The important nutritional disorders of public health significance are Protein Energy Malnutrition/under Nutrition, Nutritional Anaemia, Iodine Deficiency Disorders, Vitamin 'A' Deficiency, overweight/obesity and Diet Related Chronic Non-Communicable Disorders.

Goal: To prevent and control nutritional disorders both under-nutrition and overweight in the country.

Objectives:

- To enhance public awareness about causes and consequences of nutritional disorders and obesity on health
- To set up facilities for assessment and counseling for prevention and management of nutritional disorders and obesity
- To set up physical activity promotion avenues with adequate infrastructure to demonstrate the same
 - To initiate population based interventions for prevention of nutritional disorders and obesity

Programme Strategies

- Strengthening of National Nutrition Cell
- Setting of District Nutrition Cell
- Advocacy and IEC activities through mass media, mid-media and interpersonal counseling
- Assessment, counseling and follow-up of overweight and obese students as integral part of School Health Programme
- Promotion of physical activities and healthy diet at schools, colleges, work places and other institutions/organizations
- Set up Obesity Guidance Clinic linked with NCD clinic in District Hospitals
- Coordination with other Ministries like Food Processing, HRD, Sports & Youth, AYUSH etc. for population based interventions
- Facilities for investigation and management of secondary causes of Obesity

Activities:

1. Strengthening of Nutrition and IDD Cell of the Directorate

In order to plan, implement, monitor and coordinate National Programme for Prevention and Control of Nutritional Disorders, five Consultants viz. Consultant (Nutrition), Consultant (Over-weight & Obesity), Consultant(Micronutrients), Consultant(Junk Food and Nutraceuticals) and Consultant(Health Education) with consolidated salary in between Rs.60,000-80,000 per month; Five Programme Investigators at consolidated salary Rs.40,000-50,000 per month and five Programme Assistant at consolidated salary of Rs.30,000-40,000 are proposed.

2. Setting up District Nutrition Cells

In order to implement the activities of National Programme for Prevention and Control of Nutritional Disorders at the community level in letter and spirit one District Nutrition Consultant in 640 districts of the country is proposed at consolidated salary of Rs.40,000 per month. In addition, funds are provisioned for operational costs including travel within the district for monitoring and coordination.

3. Supply of Equipments

The Body Mass Index(BMI) will be measured by taking weight in Kg/Height in metre². The machine for weight and height measurement is needed for measurement for Body Mass Index(BMI). There are about 12 lakh anganwari centres, 10 lakh primary schools and 8.5 lakh ASHAs totalling to 30.5 lakhs in the country. The programme will fund procurement of about 2 lakh sets for distribution within the health sector up to sub-centre level. Other sectors will procure these funds from their own sources (ICDS and Education Sector)

4. Community Based Interventions

- Advocacy on the importance of nutrition through healthy food options.
- Enhancement of nutrition knowledge of caregivers, children and teachers etc in the community through various intervention like lectures, group discussions, healthy food stall, display of healthy lifestyle on bulletin boards, talks by health experts, celebration of health week etc. Public should be made aware about serving size, quality of food and nutrition labeling.
- Coordination with other ministries like- agriculture, food processing, FSSAI, WCD etc to collaborate and plan effective population based strategies for the prevention and control of obesity in India.

5. Information, Education & Communication

- Generating awareness and education of the masses including parents, children, teachers and community on counseling for healthy lifestyle and healthy eating practices.
- Mass awareness through print and electronic media about causes, prevention and management of obesity
- Restrictions on advertisements related to unhealthy food
- Public awareness through mid-media and community based approaches like role plays, street shows etc.
- Development of website on healthy life style

6. School Health Programme

- Convergence with School Health Programme particularly on laying emphasis on importance of physical activity in schools through regular physical activity classes, regular PT/exercises, competitive sports. Physical activity/NCC/NSS and outdoor sports to be considered as an essential part of the curriculum

- Advocacy for restriction of unhealthy food in school canteens and neighborhood and availability of healthy food options
- Organize regular health check-up including height, weight, BMI, hemoglobin, blood pressure, blood glucose and triglycerides

7. Nutritional Services in the Health Sector

- Obesity guidance clinics set up in District Hospitals and Medical Colleges run by qualified Nutritionist. Nutritional counseling as an integral component of NCD Clinics at CHC level also. Hospital based counseling sessions should be complemented by family based counseling particularly for children at risk
- Simple BMI calculators made available in all district hospitals, medical colleges, health centres, schools and work places.
- Organize training of health service providers in nutrition and related issues.

Expected Outcome:

- Obesity Guidance Clinic in all District Hospital (640) and Medical Colleges (150)
- Facilities for assessment of obesity and overweight persons in health care facilities, schools, workplaces etc. to encourage regular assessments
- Reduction in persons with obesity and obesity related problems
- Enhanced public awareness about causes, prevention and management of obesity

24. National Institute For Health Promotion & Control of Chronic Diseases

Background

The Central Health Education Bureau (CHEB) is a subordinate organisation of Directorate General of Health Services (Dte. GHS), Ministry of Health and Family Welfare (MOH&FW) established in the year 1956. The objective of the organisation was to plan and formulate programmes for the promotion of health education through training of health professionals, school teachers and facilitate behavioural research in the field of health education.

Over the period of time there has been epidemiological and demographic transition due to increase in life expectancy leading to ever increasing geriatric population. These coupled with life style changes have led to increase in incidence, prevalence and mortality due to non-communicable diseases notable cardiovascular diseases, diabetes, renal diseases, cancers and other degenerative diseases. Most of these diseases can be altered by health lifestyles for which continuous multisectoral approach is required for promoting health and changing behaviours. Health Promotion focuses primarily on the social, physical, economical and political factors that affect health and include such activities as the promotion of physical activity, healthy living, good nutrition, healthy environment and control of tobacco and alcohol consumption etc. The goal of Health Promotion is to improve the quality of life of individuals and communities. This goal can be achieved by mitigating the impact of risk factors associated with the broad determinants of health as they lead to illness and premature death.

According to WHO, the most cost effective and economically productive intervention for non-communicable diseases are health promoting interventions, which could be in the form of one of the following:

Promotion:

- Health Education
- Healthy Diet
- Physical activity
- Avoidance of Tobacco Consumption
- Avoidance of Alcohol Consumption
- Genital Hygiene for Cervical Cancer
- Self examination method for Breast Cancer

Prevention:

- Early detection of disease
- Diagnosis of pre-Cancerous condition
- Diagnosis of pre-Diabetic status
- Diagnosis of pre-Hypertension
- Diagnosis of abnormal blood lipid
- Diagnosis of grade-I, grade-II fatty liver changes
- Diagnosis of over-weight / border line obesity

- Diagnosis of pre- COPD status
- Diagnosis of pre-dementia status
- Diagnosis of pre-stroke status
- Diagnosis of early osteoporosis

Care:

- Strengthening of centers for treatment facility including emergency care facility.
- Palliative care in terminal stage of the disease.
- Medical rehabilitation care.

Justification:

Considering the gravity of the situation, GOI has initiated various National Programmes on NCDs which are proposed to be further expanded during the 12th Plan. The main focus of the programmes is to bring behavioural change in the life style of the community by various health promotional measures. Redevelopment of CHEB would strengthen programme implementation by providing evidence based technical support. The institute would also provide need based technical assistance to other communicable and non communicable disease programmes.

National Institute of Health Promotion & CCD shall be the main coordinating and facilitating agency for all the Health Promotion related activities of the Government of India. The guidelines related to Health Promotion would be formulated and disseminated to all concerned Ministries and States/UTs. Although, Health Promotion is a multifaceted activity and requires inter-sectoral collaboration, the key roles of NIHP & CCD would be:

- Plan, formulate and coordinate Health Promotional activities with main focus on prevention and control of chronic diseases;
- Job-oriented Training of required health / non health professionals
- Analyse available information required for health promotional activities, identify gaps and conduct/facilitate socio-behavioural research relating to Chronic Diseases.
- Multi-sectoral approach in Health Promotion with other sectors including Ministries of Environment, Agriculture, Women and Child Development, Human Resource Development, Rural Development, Transport, Defence, Home Affairs, Empowerment & Social Justice, and Urban development etc.

In view of the above background it is proposed to develop CHEB as National Institute of Health Promotion and Control of Chronic Diseases to fulfill its redefined roles and responsibilities as a premier institute of the country for Health Promotion.

Vision of National Institute of Health Promotion & CCD

“Promoting Health by changing life style for the people in India”

Mission of National Institute of Health Promotion & CCD

To function as an apex institute to promote the health of population through integration of health promotion into the sectoral policies and development plans, advocacy, capacity building and research.

Aim & Objectives

To be the centre of excellence in India, for promoting health by changing lifestyle of the people through developing personal skills, strengthening community action, reorienting health services and creating supportive environment, backed by healthy public policies.

Specific Objectives:

1. To review and analyze existing sectoral policies to develop healthy public policies, carry out advocacy with allied sectors in order to incorporate requisite health components in respective policies & plan for health promotion strategies that:
 - Involve community in planning, policy-making, delivery and evaluation of health promotion strategies.
 - Strengthen community action
 - Build upon health promotion policies impacting on daily life patterns and local traditions of the communities
 - Utilization of evidence in making decisions related to policy, advocacy and programme interventions
2. To create networks & foster alliances with stakeholders /partners and liaise with stakeholders in States/UTs/Local Bodies/ civil societies in:
 - Formulating and implementing health promotion policies and plans of action
 - Implementation of existing health promotion-related legislations and regulations,
 - Generating finance from alternative sources.
 - Support, foster and sustain local, regional and global partnerships, alliances and networks in harnessing new technical knowhow in order to expand multi-sectoral collaboration to promote health.
3. To conduct, facilitate and build the capacity for conducting research in areas of:
 - Health Behavior.
 - Measures needed to tackle the identified determinants of health.
 - Impact of sectoral policies on health and its determinants
 - Efficacy and Effectiveness of health promotion interventions
 - Cost-effectiveness and sustainability of programme interventions.
4. To build a competent health promotion work force comprising specialists, practitioners and functionaries at different levels and in different sectors aiming at :
 - Developing knowledge and skills for advocacy and mediation with people's representatives; policy makers, managers, implementers in Govt. , Non Govt. ,private sectors & civil society

- Assessing the impact of sectoral policies on health and its determinants
 - Accessing and using available information and evidence while planning and implementing and evaluating interventions.
 - Use of Conventional & IT enabled on line trainings in collaboration with globally available internationally recognized courses in health promotion.
5. To develop communication strategies based on the life patterns, culture and languages of communities using lifecycle approach to enable :
- individuals, families and communities to perceive the threat of environment and risk factors to health
 - Change in behavior to adopt healthy and avoid risky practices.
 - Sustenance of healthy life style practices
 - Documentation of best available practices in communication strategies and their appropriate utilization at local level.
 - Identification through national and inter-national literature review of the best available health promotion intervention strategies and their applications.
6. To empower specific vulnerable and high-risk groups by formulating setting-specific strategies to enable them to promote their health:
- Through ideal setting and infrastructure to support the promotion of health of a large audience by influencing "physical, mental, economic and social well-being";
 - By formulating “workplace wellness programs”.

Structure of National Institute of Health Promotion & CCD

Keeping in view the objectives of the National Institute of Health Promotion , the following divisions/departments have been proposed and the details of the objectives and activities of the divisions are annexed.

1. Policies, Planning Strategy Development and Co-ordination Division
2. Health Promotion Research Division
3. Human Resource Development Division
4. Health Communication Division
5. Division for Healthy settings
6. Administrative & Finance Division

Details of each Division are given hereunder:

1.Policies, Planning Strategy Development and Co-ordination Division

Objectives	Activities
<ul style="list-style-type: none"> • To plan and develop evidence based health promotion strategies among different population groups and settings by involving multiple sectors in the country. • To advocate/advise policy makers on policy measures to prepare, strengthen and re-orient health systems (structures and processes to integrate health promotion technologies and activities) to practice health promotion in the country. • To advocate policy makers in non-health sectors to appreciate the impact of their policies on the health of the people and to develop and implement re-distributive and welfare policies to address determinants of health. • To Advocate/advise the policy makers to create enabling environments in different settings (Schools, work places, industries, hospitals etc.) to promote healthy behaviours/life styles (physical activity, healthy diet, no tobacco, or excessive consumption of alcohol and responsible sexual behaviour etc.) among the people • To develop necessary linkages, convergences and networks for collaborative work and to develop/create new institutions, technologies, methodologies and tools/ or improving/upgrading existing institutions to build strong health promotion infrastructure and its institutionalization in the country. • To Formulate nutrition policy for healthy India. 	<ol style="list-style-type: none"> 1. Identifying Policy needs to take care of the changing disease profile of India especially emerging Non-communicable Diseases 2. Review of existing policies (both health & non-health) which have a bearing on health e.g. National Health Policy, National Population Policy, National Policy for Older persons National Nutrition Policy, National AIDS Prevention and Control Policy, National Blood Policy etc. and suggest modifications needed. e.g. The National Nutrition Policy of WCD ministry mentions the problem of over-nutrition but does not mention any intervention programme for this. National Health Policy 2002, talks about increase in expenditure on health, equity, IEC and school health but does not talk about Lifestyle diseases which contribute a significantly to morbidity and mortality. 3. To prepare, strengthen and re-orient the existing health systems for health promotion work in terms of Governance (to improve access to health), Financing, equity, Capacity building in coordination with HR development division and Service delivery. 4. Identify priority areas for action for the next five years in respect of Health promotion in the existing Policies and programmes especially for non-communicable diseases. 5. Formulating new Policies based on the data generated by the Health Promotion Research Division in the identified priority areas. 6. Designing Policy strategies and guidelines 7. State consultations, meetings/advocacy workshops :Development of New Policies as well as review of existing policies will require State consultations, meeting/advocacy workshops with different stakeholders (administrators, professionals, experts, public representatives, politicians, NGOs and interest groups); Arrive at an Inference/Consensus and then recommendation to the Govt. 8. Planning for development of Health promotion Infrastructure-Improvement/up gradation of old/ existing buildings for Health Promotion ; establishment of new institutions e.g. Area Specific/population-based/settings-based/problem specific Health Promotion units at different levels i.e. State, districts and local. Policies for Use of new Technology like ICT (Information and Communication Technology) to equitably improve health literacy, by building the ICT capacity of health professionals and communities and maximize the use of available ICT tools 9. Networking, Partnerships and Inter-sectoral Coordination:To develop necessary linkages, networks and Partnerships in the priority areas for action with both National and International organizations 10. Coordination with the sectors within and outside the health system to facilitate inter-sectoral action in the areas like food –security, nutrition, urban planning, integrated rural development, public transport, recreation and entertainment spaces, food adulteration etc 11. Consultancy and Advisory Services in respect of Health promotion

2. Health Promotion Research Division

Objectives	Activities
<ol style="list-style-type: none"> 1. To plan, design and conduct research studies on the determinants of health as well as health related behaviour, attitudes, beliefs & knowledge among members of the community with regard to desirable health practices in order to feed and support the policy makers / planners and programme implementers across the various sectors for developing, integrating and strengthening health promotion. 2. To coordinate, develop & strengthen the capacity at the central & state levels as well as South East Asia region to gather evidence through research on health promotion in order to support policy, advocacy and programmes of interventions pertaining to health promotion. 3. To plan, design and conduct research studies on various health promotional initiatives focussed on different settings for health promotion (schools, workplaces, hospitals ,specific vulnerable &high risk groups etc.) with a view to ensure their maximum utilization . 4. To conduct evaluation studies on various healths' promotion initiatives taken in the country as well as on training's initiatives to provide feedback to the programme implementers in respect of cost – effectiveness, sustainability, effectiveness and efficacy of health promotion interventions. 5. To collect, review and analyse the information on health promotion research in order to document and disseminate to all stakeholders including practitioners, funders, policymakers, researchers and the general public and allied. 6. To plan, facilitate and conduct evidence based research studies to explore the efficacy and mechanism of local, regional and global partnership, alliances and networks with a view to develop, strengthen and expand multi-sectoral collaboration in harnessing new technical know-how to promote health. 7. To collaborate with universities, research and training institutions to promote research studies on various issues pertaining to health and health promotion in order to function as a knowledge hub of health promotion research. 	<p>Policy Research Policy research will include studies which provide evidence for policy-makers to develop and implement public policy for improving the health of the population.</p> <p>Population Health Research To explore patterns of health related behavior, attitudes, beliefs & knowledge of the community and Assessment of Health Promotion Needs</p> <p>Programme Development & Evaluation Generate data for for evaluating ongoing health programmes and developing health promotion interventions in collaboration with practitioners, policymakers & local communities in the identified areas as listed under the ingredients.</p> <p>Health Services Research Studies examining health services provision, with a particular focus on equity of access.</p> <p>Research networking Collaboration and coordination with other institutes for Research.</p> <p>Training Need Assessment in relation to Health Promotion in different focus areas for various stakeholders</p> <p>Documentation and dissemination of information related to health promotional research to all stakeholders.</p> <p>Diet and Nutrition Research</p> <ul style="list-style-type: none"> • food and diet survey in the country specially all States/UTs covering districts, regional diversities, recipes, nutritional disorders per se, survey, operational research, newer techniques and modifications, etc. Implementing nutrition related components of various National Programmes for chronic diseases. • To conduct Diet and Nutrition Survey to find out relationships between different types of determinants including social determinants and nutritional disorders • Research/ other data generation on nutrition

3. Human Resource Development Division

Objectives	Activities
<ul style="list-style-type: none"> • Prepare and standardize training curriculum for the training of various categories of personnel from health and allied fields and peoples representatives • Sensitize the govt .officials especially those involved in decision making policies at national and state level to the need of coordinating the efforts of various ministries for health promotion. • provide training in health promotion through long and short term training programmes for both technocrats and bureaucrats to equip them with knowledge on various health promoting aspects requiring policy level decision • To develop health promotion field laboratory for the trainees – • To utilize the same laboratory for field work of various divisions of NCHP • To provide need based health promoting services to the selected field area throughout the year 	<ol style="list-style-type: none"> 1. Identify Human Resource needed for Health promotion and develop training programmes accordingly e.g. Experts in Policy areas, Social Scientist Strategies development, Research, Bio-statisticians etc. 2. Curriculum development for Training for various stakeholders in the focus areas as mentioned under Ingredients. 3. Conduct In service training programs for medical and paramedical professionals, teachers and other stakeholders 4. Conduct Need based Orientation and Sensitization courses for different stakeholders including Schools, Panchayati Raj Institutions and Community members. 5. Off campus training programs 6. Collaboration with other institutions, organizations and Health Promotion Foundations, both national and international for training purpose. 7. Conducting seminars; symposiums conferences etc 8. Use of Exhibition Ground as Field Practice area for Health promotion training.

4. Health Communication Division

Objectives	Activities
<ul style="list-style-type: none"> ▪ To assess the health communication needs of different strata of target audiences through operational research in collaboration with ICMR and other Research and Academic centres of excellence. ▪ To design and disseminate different tools of health communication for empowering people to have better control of their health and determinants of health ▪ To develop and promote the communication linkages with the policy makers, planners, managers and users of Health Promotion initiatives in the country ▪ To suggest tenable/feasible media plan at national level for facilitating health Communication on different health issues as per need ▪ To share the information on health communication needs with all the Stake-holders. ▪ To suggest need-based, settings based, issue based, population based Communication interventions for operationalization. ▪ To function as resource centre for health communication related data base, viz. Health communication research findings, evidences of health promotion actions, IEC/BCC instruments developed and used by different Stake-holders. ▪ To network with national and international players in this field.To map the NGO's and Private players in this field and create a vibrant network of these agencies. ▪ To develop and maintain vibrant and interactive Website on Health Promotion ▪ To bring out a monthly newsletter and other publication for wider dissemination amongst the Stake holders ▪ To create awareness about Healthy and Junk Foods, Diet Related Chronic Disorders, prevention of nutritional disorders ▪ To understand the current stressful situations and evolve steps methods, strategies for corrective healthy eating habits for overall improvement in the health and mental well beings of the community at large. 	<ul style="list-style-type: none"> • Designing evidence based health communication Strategies for different health programmes. • Designing & production of Print & Audio Visual materials. • Pre testing of the prototype Health Education Tools and Techniques • Communicate key messages for Healthy living through media. • Documentation and Resource centre for NCDs • Networking and Coordination with all stakeholders. • Monitor and follow up the communication initiatives • Create & Maintain vibrant Website on Health Promotion • To design and organize Health communication campaigns and allied events on focus areas mentioned above. • Use of exhibition ground for Health promotion • Undertake Need based IEC and BCC Projects.

5. Division For Healthy Settings & Environment

Objectives	Activities		
<ul style="list-style-type: none"> ● To help formulate healthy public policies aimed at creating supportive environments for different settings eg. School colleges, workplaces, health facilities village's cities etc. ● To help build appropriate infrastructure and partnership mechanisms for implementation of health promotion programmes/policies for different settings. ● To provide orientation and training to various stakeholders to ensure their broadest possible commitment and participation. ● To develop community-based health and nutrition education and promotion activities/interventions that is tailor-made for different settings. ● To strengthen, revise and develop school curriculum as per the health promotional needs of children. ● To formulate interventions aimed at improving the access to essential health and nutrition care ● To identify the social determinants of physical and environmental problems under different settings, and initiate dialogue with policy-makers with the aim to have them addressed. ● To help forge strong linkages among political leaders and different ministries as well as local administrations. 	1. To identify health promotion needs in respect of different health settings 2. To develop health promotion strategies for different settings e.g		
	Name of setting	Health promotion needs	Possible Strategies
	Schools/ colleges/ Universities	Adolescent Health Healthy behaviour Life Skill education Educating specially challenged children	Interpersonal communication Organizing Declamations, seminar, workshops, Involvement of youth groups e.g. Nehru Yuva Kendra, Campaigns, Provision of special schools and educators for specially challenged children
	Hospitals Health centres	Patient Safety and Infection Control Healthy and Safe Hospital environment	Hand Hygiene Promotion, Safe Waste Disposal, Safe Surgeries, Green buildings, Landscaping , Solar Energy, Horticulture, Water Harvesting, Disabled friendly, Disaster preparedness
	Workplaces	Healthy environment and healthy individuals	Executive Health programmes, fitness and yoga centres, De-Stress workshops. Provision of crèche and feeding areas
	Airports	Healthy and Safe environment; Food Hygiene and safety	Smokers lounge, mock fire drills, Disaster preparedness, Disabled friendly features, regular Food surveillance
	Hotels Restaurants	Healthy and Safe environment	Smokers lounge, Fire fighting measures. safe exit plan, wellness centres, Spa, fitness centre, swimming pool
		Food Safety	Awareness & actions for safety of food
	Tribal and Hilly Settings	Hygiene, women and child health, nutrition	Mid-media, Folk Media, interpersonal communication in local dialects etc
	Market place	Healthy environment	Clean toilets, General Sanitation, Disabled Friendly, Safe products, Fire prevention, Zoning, Safe food, Display information on food products, Waste disposal, Safe water
	Fairs and Mela		Crowd Management, Sanitation Chlorination of water etc.
	Rural settings / Village	Healthy environment	Rain water Harvesting, Use of Solar energy, Gobar Gas plants, Smoke-free chulhas, Healthy habits, Sanitary toilets, Nutrition, Health Checkups etc.
3. Advocacy for creation of enabling environment for promoting Healthy Lifestyles in different settings. 4. To provide mechanisms for communities to identify key areas to be addressed and organize themselves and through partnerships address health and environment issues (Participatory Learning for Action). 5. To facilitate different settings for networking and information sharing 6. To provide technical support and assist in pilot projects			

25. National Programme on Patient's Safety

Objectives:

1. To achieve a successful, healthy outcome of patient care
2. To make the health care safe and error-free
3. To implement the globally accepted interventions to ensure the following
 - Safety in Clinical Procedures
 - Hand Hygiene,
 - Surgical Safety,
 - Injection and Blood Safety,
 - Safe management of Bio-medical Waste (BMW) and
 - Medication SafetyThese measures are also directed towards hospital infection control.
4. To achieve comfort and peace of mind for patients and providers.

Tools already available for implementation

- Globally accepted guidelines for Hand Hygiene, infection control, surgical safety from WHO.
- Patient Safety and Infection control training module (developed through IGNOU)
- Report of National Consultation Workshop on Patient Safety including guidelines.
- Waste Management rules, guidelines and self learning modules

Strategies

It has been envisaged to implement various patient safety activities at the three levels:

- At central level
- At medical college level
- District hospital level

Creation of Central Patient Safety Cell: A central patient safety cell shall be created to act as repository of information and data collected through voluntary and non punitive reporting mechanisms throughout the hospitals in the country. The cell will be equipped with one consultant, one data entry operator and necessary infrastructure and equipments. This cell will also provide technical inputs to the stakeholders with the help of experts on various issues related to all the aspects of patient safety. Later on such cells can be created at regional or state levels once the necessary expertise is developed in this subject at these levels. Development, printing and dissemination of Policies and guidelines will also be undertaken by the central cell. The cell will also undertake monitoring and evaluation.

Patient safety committee - Each hospital willing to participate in this program must show its commitment by forming a Patient safety committee which will among other things oversee the functioning of Hospital Infection control committee. The hospitals must designate a trained nurse as Infection control nurse exclusively for infection control work. The committee will also do the gap analysis in their respective institutes with the help of a checklist developed for the same or through some standardized proforma. The aspects covered must

relate to, among other things, infrastructure and policies and procedures being followed. Hospitals will be required to organize regular meetings of the patient safety committee to review various patient safety issues, adverse events reported, actions taken and maintain records of all the meetings of their patient safety committees

Research: – Under the programme the globally accepted interventions for ensuring Patient Safety shall be implemented, however, it is appropriate to know the magnitude of the problem to know the baseline existing situation in the country so that the progress of the programme can be assessed periodically. Research activities will be undertaken for this. Patient Safety surveys will also be undertaken at the level of each medical college and district hospital to identify the gaps and take appropriate corrective measures. Research shall also be undertaken to develop appropriate models for implementing various strategies.

Awareness generation - it is necessary to create requisite awareness regarding the problem so as to draw the attention of all the stakeholders as well as community in general. Different methods can be adopted to achieve the same. Awareness generation shall be undertaken at all three levels; National, medical college and District Hospital.

- a. IEC - Information can be disseminated by all possible means e.g. through posters, booklets, promotional CD etc. Media, both electronic as well as print, may be used to create impact among the general public. professional bodies like IMA, Nursing associations etc. can also be utilized for spreading the message among healthcare professionals. Appropriate IEC tools shall be developed at both National and State level to improve awareness.
- b. Advocacy workshops for all stakeholders shall be organized or academic forums like conferences etc. shall be tapped to promote patient safety. In this endeavor the services of professional medical associations and similar bodies will help in creating awareness and training programmes. A strong message gone from them will have ripple effect. Moreover, the participation of these bodies will result in "buy in" of the concept of patient safety among healthcare professionals.
- c. Patient safety day shall be celebrated to highlight its importance in the country every year.

Training – Master trainers will be identified at National Level and if necessary capacity building of Nodal officers of the programme and Master trainers shall be organized. Master trainers will impart Training of Trainers through workshops to train the identified trainers/ programme officers from States/Medical colleges regarding the concepts of patient safety to implement the steps in their institutions for providing safe patient care. These trained professionals shall act as Patient Safety Champions/Ambassadors for further training at the level of medical colleges/district Hospital level so as to percolate the practices at all levels of care including District Hospitals, Sub-district Hospitals and Community Health Centers.

Regional Patient safety centers - Some of the medical colleges and hospitals can be encouraged to assume the role of Regional centers and they can adopt hospitals in their region for propagating the patient safety culture.

Upgradation of existing infrastructure - Financial support shall be provided to the medical colleges and district hospitals for upgradation of the existing infrastructure including procurement of equipments to facilitate safe practices e.g. provision of hand washing facility, needle destroyers, procurement of color coded bags for BMW management etc.

Activities of the Programme

To implement the above strategies, the activities of programme at the three levels will be as given under

Central level

1. Development, Printing and dissemination of Policies and guidelines
2. Organization of Training of trainers workshops
3. Organization of Advocacy Workshops/conferences
4. Development, Printing and dissemination of IEC tools
5. IEC activities at National level
6. Grants for Patient Safety Research projects
7. Monitoring and Evaluation

Medical Colleges

All 149 medical colleges will be covered during the 12th Plan.

District Hospitals: All 640 district hospitals will be covered during the 12th Plan
Grant-in-aid under this head shall be spent on the following activities:

1. Support for provision of Hand washing Facilities
2. Purchase of Hand Rub
3. Creation of Adverse reporting Cell
4. Purchase of BMW management equipments: autoclave, microwave, shredder, trolleys
5. Waste Bins & Bags and Puncture proof containers
6. Support for Sterilization facilities
7. Hub cutter and Needle destroyer
8. Provision of Oxymeter
9. Printing of check lists, performa
10. Support for Infection surveillance and infection control activities
11. Development of SOPs
12. Purchase of PPE
13. Purchase of mercury free equipments, Mercury Spill Management Kit etc.
14. Maintenance of Equipments

26. Establishment of additional Airport Health Organizations (APHOs), Port Health Organizations (PHOs) and Land Border Quarantine Centres

Background

It is a well known fact that some communicable diseases spread from one country to another through international traffic and trade routes. Many of such diseases are very fatal and also have potential to spread very rapidly. The history is full of such instances where diseases prevalent in a country has spread to other countries causing severe damage to the mankind . Recent outbreak of swine flu pandemic is still poised to be threat to the world security. In order to prevent cross country spread of such infectious diseases, traffic restriction are being applied to the travelers and cargo since the time immemorial. However, these restrictions were not based on scientific evidences till WHO introduced international Sanitary Regulations in 1951. These sanitary regulations were renamed as International Health Regulations (IHR) in 1969 and since then are being applied by all the member countries throughout the world for the purpose of protecting their countries from invasion of dangerous infectious diseases from abroad. Since diseases enter through airports/ ports/land borders being are the main entry point of international traffic, IHR(2005) has prescribed Setting up of health units at these entry points in the time frame of 2012 which is mandatory for the member countries..

Regulatory provision

In compliance to IHR every country make its own regulations on the principles set down in the IHRs. In our country there are 2 set of rules known as “Indian Aircraft (Public Health) Rules, 1954, and “Indian Port Health Rules, 1955” to be applied at international Airports and ports respectively. The aircraft rules are also applied to the land borders. Already there are 21 such health units functioning in our country since 1950s at various airports, ports and land border of the country for implementation of statutory regulations.

Aims & Objectives

The basic main aim of these health units is to implement provisions contained in International health regulations (IHR) as well as Indian Aircraft (Public Health) Rules and Indian Port Health Rules which are analogous to these IHRs in order to prevent and control international spread of public health emergencies of international concern with minimum interference to the traffic and trade.

Existing infrastructure

There are 21 such health units already functioning at various airport, ports and land borders of the country established under the regulatory provision. These are known as Airport Health Organization (APHO) at airports, Port Health Organization (PHO) at ports and Border Quarantine Centres at the land border The detail of these organizations are as below:

APHOs: There are 7 APHOs functioning at various international airports of the country at Delhi, Kolkata, Chennai, Mumbai, Tiruchirapalli, Bengaluru, Hyderabad. Three more

APHOs are ready to be operational and awaiting allotment of space by the Ministry of Civil Aviation. These are Lucknow, Ahmedabad, and Trivandrum. Ministry of Civil Aviation has been requested to provide space for these organizations. Out of these 10 airports 5 (Bengaluru, Hyderabad, Lucknow, Ahmedabad, and Trivandrum) are under plan scheme.

PHOs: There are total 10 such organizations functioning at Mumbai, JNPT NavaSheva, Kolkata, Kandla, Chennai, Cochin, Mandapam Camp, Tuticorin, Marmagoa and Visakhapatnam. Out of these 10 units 2 are working under plan scheme i.e Tuticorin and Navsheva

Land quarantine border: Attari border Quarantine Centre at Amritsar is the only land border functioning at Attari border on the India Pakistan border.

Functions: Following are the major functions of Port/Airport Health Organizations

1. Isolation and Quarantine work: The health screening of international passengers .
2. Disinfection, disinsection and deratting of aircrafts and ships.
3. Supervision of sanitation, drinking water supply, anti-mosquito and anti-rodent work .
4. Dead body clearance.
5. Administration of yellow fever vaccine and issue of yellow fever vaccination certificate at identified yellow-fever vaccination centres.
6. Isolation and the quarantine arrangements .
7. To attend medical emergencies.
8. VVIP food inspection.
9. Inspection of food stuff, catering establishments inside the premises of airport and ports under the Prevention of Food Adulteration Act.
10. Sampling of imported food items and forwarding the lab analysis report, as and when requested by custom authorities.
11. Licensing of eating establishments within the local limits of airports as per the provisions of PFA Act, 1955.

The Organizations use to keep constant vigil on all the factors leading to outbreak of diseases of international concern and take all preventive measures to safeguard country's health. The effective roles played by APHOs and PHOs in preventing the spread of SARS and swine flu in India is well known.

Need for strengthening the existing organizations

At present, there are 10 APHOs and 10 PHOs and one border quarantine centre are in place. Most of these unit were established way back in 1950s and since then are functioning with almost same sanctioned manpower even though the workload has increased manifold during all these years due to increase in the international traffic. There is urgent need to strengthen the organizations in terms of technical manpower.

Need for continuation of existing units

Out of the 21 units 7 are working under plan scheme and being statutory in nature , continuation of the organization is essential till these schemes are converted in to non plan scheme.

Need for creation of additional APHO/PHOs

At present, there are 25 airports, 12 ports and 7 international land borders catering to international traffic where as the health units are functioning only at 10 airports, 10 ports and one Land border. If the remaining 23 entry points to international traffic are not equipped with proper health infrastructure, the whole purpose of existing units will be diluted. Further, like custom and immigration, these are statutory organizations and every airport/port/Land border needs to be established under provision of Indian Aircraft (Public Health) Rules and Indian Port Health Rules. The list of these places is given below:

List of new International Airports, Ports & Land borders		
Airport	Port	Land Border
1. Amritsar	1. New Mangalore port	1. Raxaul (Bihar)
2. Calicut	2. Paradeep (Orissa)	2. Jogbani (Bihar)
3. Cochin		3. Akhaura (Tripura)
4. Coimbatore		4. Petrpole(West Bengal)
5. Varanasi		5. Dawki (Meghalaya)
6. Goa		6. Moreh (Manipur)
7. Jaipur		
8. Nagpur		
9. Pune		
10. Srinagar		
11. Gaya		
12. Port Blair		
13. Guwahati		
14. Bagdogra		
15. Patna		

Proposal for consideration of 12th Plan

Continuation of existing plan scheme

There are 2 plan schemes already running to operationalise 7 (6 +1) such units. As explained above, these are performing statutory nature of functions and hence needs to be continued. Detail of these units is mentioned under the heading of Existing Infrastructure. Total expenses required for these two schemes during the 12th plan will be to the tune of Rs. 12 crores approx.

Strengthening of existing plan and non plan units

As mentioned in the proposal, there are 21 units of APHOs/PHOs functioning at various international airports/ports and land border of the country. These units were created way back in 1950s and since then these are working with the same manpower, although, the workload has increased tremendously due to increase in the international traffic. In view of this, there is an urgent need to strengthen the technical manpower in terms of medical officers, health inspectors and nurses of these organizations. As per the guidelines, the

additional manpower strength has been calculated. There is a need of 39 medical officers, 38 health inspectors and 16 nurses additionally required for which an amount of Rs 20.5 crores approximately will be needed during the entire Five Year Plan. Details of the proposal are given below.

Introduction

The APHOs/PHOs are the statutory health units of ministry of health and FW functioning at various international ports and airports of the country under provision of Indian Aircrafts (Public Health) Rules 1954 and the Indian Ports Health Rules, 1955. The objective of these units is to protect the country from invasion of dangerous infectious diseases like swine flu from abroad. At present, there are 10 APHOs and 10 PHOs and one border quarantine centre are in place. Most of these unit were established way back in 1950s and since then are functioning with almost same sanctioned manpower even though the workload has increased manifold during all these years due to increase in the international traffic. Details of these airports and their location are given below: Out of these 21 units, 7 units are functioning under Plan scheme which was approved in 2004.

Airport Health Organizations (APHOs): There are 10 APHOs functioning at various international airports of the country at Delhi, Kolkata, Chennai, Mumbai, Tiruchirapalli, Bengaluru, Hyderabad, Lucknow, Ahmedabad, and Trivandrum.

Port Health Organisations (PHOs) : There are total 10 PHOs functioning at Mumbai, JNPT NavaSheva, Kolkata, Kandla, Chennai, Cochin, Mandapam Camp, Tuticorin, Marmagoa and Visakhapatnam.

Land quarantine border: Attari border Quarantine Centre at Amritsar
The load of international traffic has tremendously increased during the last few decades. However, the staff strength has not increased since their inception. Consequently, the units are not able to discharge the statutory functions smoothly due to paucity of technical staff. But otherwise are fully equipped in terms of infrastructure to undertake these responsibilities. Under such circumstances when there is emergence of a dangerous diseases like swine flu, Avian influenza, SARS etc. it is felt necessary to strengthen these units in terms of technical manpower. In this connection, the guidelines have been framed by Directorate General of Health Services for the minimum requirement of manpower in the existing circumstances of repeated outbreak of dangerous diseases of international concern.

Minimum technical staff required as per laid down criteria for each unit :

Post	Minimum Requirement	To be filled during 12th plan	To be filled in during 13th plan
Medical Officer	7	4	3
Nursing staff	4	1	3
Health inspector	8	4	4
Total	19	10	9

Additional Manpower and financial implication

Accordingly, the details of existing strength of various types of manpower and the required strength have been calculated and are reflected in the following table:

Medical Officer

S. No.	Name of Organisation	Existing Strength	Proposed Strength in 12 th plan	Additional requirement	Expenditure per head p.m.	Expenditure on additional strength p.m.	Expenditure per annum on the excess strength
1.	APHO, Chennai	2	4	2	52,844	1,05,688	12,68,256
2.	APHO, Tiruchirapalli	2	4	2	52,844	1,05,688	12,68,256
3.	PHO, Chennai	2	4	2	52,844	1,05,688	12,68,256
4.	PHO, Kandla	2	4	2	52,844	1,05,688	12,68,256
5.	PHO, JNPT, Sheva	3	4	1	52,844	52,844	6,34,128
6.	PHO, Cochin	2	4	2	52,844	1,05,688	12,68,256
7.	PHO, Vishakhapatnam	2	4	2	52,844	1,05,688	12,68,256
8.	PHO, Mandpam Camp	1	4	3	52,844	1,58,532	19,02,384
9.	PHO, Marmagoa	1	4	3	52,844	1,58,532	19,02,384
10.	ABQ, Amritsar	2	4	2	52,844	1,05,688	12,68,256
11.	PHO, Tuticorin	1	4	3	52,844	1,58,532	19,02,384
12.	APHO, Bangalore	1	4	3	52,844	1,58,532	19,02,384
13.	APHO, Hyderabad	1	4	3	52,844	1,58,532	19,02,384
14.	APHO, Lucknow	1	4	3	52,844	1,58,532	19,02,384
15.	APHO, Ahmedabad	1	4	3	52,844	1,58,532	19,02,384
16.	APHO, Trivendrum	1	4	3	52,844	1,58,532	19,02,384
TOTAL		25	64	39		20,60,916	2,47,30,992

Health Inspector

S. No.	Name of organisation	Existing Strength	Proposed Strength	Additional requirement	Expenditure per head p.m.	Expenditure on addl. manpower p.m.	Expenditure per annum on addl. strength
1.	APHO, Tiruchirapalli	1	4	3	26,851	80,553	9,66,636
2.	PHO, Chennai	0	4	4	26,851	1,07,404	1,288,848
3.	PHO, Mumbai	2	4	2	26,851	53,702	6,44,424
4.	PHO, Kolkata	2	4	2	26,851	53,702	6,44,424
5.	PHO, Kandla	2	4	2	26,851	53,702	6,44,424
6.	PHO, JNPT, Sheva	2	4	2	26,851	53,702	6,44,424
7.	PHO, Cochin	2	4	2	26,851	53,702	6,44,424
8.	PHO, Vishakhapatnam	1	4	3	26,851	80,553	9,66,636
9.	PHO, Mandpam Camp	1	4	3	26,851	80,553	9,66,636
10.	PHO, Marmagoa	1	4	3	26,851	80,553	9,66,636
11.	PHO, Tuticorin	2	4	2	26,851	53,702	6,44,424
12.	APHO, Bangalore	2	4	2	26,851	53,702	6,44,424
13.	APHO, Hyderabad	2	4	2	26,851	53,702	6,44,424
14.	APHO, Lucknow	2	4	2	26,851	53,702	6,44,424
15.	APHO, Ahmedabad	2	4	2	26,851	53,702	6,44,424
16.	APHO, Trivendrum	2	4	2	26,851	53,702	6,44,424
TOTAL		26	64	38		1020338	1,22,44,056

Staff Nurse

S. No.	Name of organisation	Existing Strength	Proposed Strength	Additional requirement	Expenditure per head p.m.	Expenditure on additional manpower p.m.	Expenditure per annum on the additional strength
1.	APHO, Tiruchirapalli	0	1	1	26,851	26,851	3,22,212
2.	PHO, Mumbai	0	1	1	26851	26851	3,22,212
3.	PHO, Kolkata	0	1	1	26851	26851	3,22,212
4.	PHO, Kandla	0	1	1	26851	26851	3,22,212
5.	PHO, JNPT, Sheva	0	1	1	26851	26851	3,22,212
6.	PHO, Cochin	0	1	1	26851	26851	3,22,212
7.	PHO, Vishakhapatnam	0	1	1	26851	26851	3,22,212
8.	PHO, Mandpam Camp	0	1	1	26851	26851	3,22,212
9.	PHO, Marmagoa	0	1	1	26851	26851	3,22,212
10.	PHO, Tuticorin	0	1	1	26851	26851	3,22,212
11.	APHO, Bangalore	0	1	1	26851	26851	3,22,212
12.	APHO, Hyderabad	0	1	1	26851	26851	3,22,212
13.	APHO, Lucknow	0	1	1	26851	26851	3,22,212
14.	APHO, Ahmedabad	0	1	1	26851	26851	3,22,212
15.	APHO, Trivendrum	0	1	1	26851	26851	3,22,212
16.	APHO, Chennai	0	1	1	26851	26851	3,22,212
17.	ABQ, Amritsar	0	1	1	26851	26851	3,22,212
TOTAL		0	16	16		4,56,467	54,77,604

As far as the overhead expenses and recurring and non-recurring costs on these organizations is concerned with respect to infrastructure and equipments, existing organizations are fully equipped and there will not be any additional overhead expenditure.

Setting up of 23 new units under 12th plan

Background

It is a well known fact that some communicable diseases spread from one country to another through international traffic and trade routes. Many of such diseases are very fatal and also have potential to spread very rapidly. The history is full of such instances where diseases prevalent in a country have spread to other countries causing severe damage to the mankind. Recent outbreak of swine flu pandemic is still poised to be threat to the world security. In order to prevent cross country spread of infectious diseases, traffic restriction are being applied to the travelers and cargo since the time immemorial. However, these restrictions were not based on scientific evidences till WHO introduced international Sanitary Regulations in 1951. These sanitary regulations were renamed as International Health Regulations (IHR) in 1969 and since then are being applied by all the member countries throughout the world for the purpose of protecting their counties from invasion of dangerous infectious diseases from abroad. Since diseases enter through airports/ ports/land borders which are the main entry point of international traffic, IHR(2005) has prescribed Setting up of health units at these entry points in the time frame of 2012 which is mandatory for the member countries.

At present, there are 25 airports, 12 ports and 7 international land boarders catering to international traffic where as the health units are functioning only at 10 airports, 10 ports and

one Land border. If the remaining 23 entry points to international traffic are not equipped with proper health infrastructure, the whole purpose of existing units will be diluted. Further, like custom and immigration, these are statutory organizations and every airport/port/Land border needs to be established under provision of Indian Aircraft (Public Health) Rules and Indian Port Health Rules.

Reasons and justifications

With the globalization of trade and traffic, there has been manifold increase in the international traffic and with this the probability of international spread of diseases from one country to other has also increased. The spread of such diseases can be prevented by applying appropriate health measures to the traffic and cargo in a scientific manner at the entry point of international traffic which are Airports, Ports and land borders.

Along with increase in the volume of traffic, there has been emergence and re-emergence of a number of deadly diseases of international concern like SARS, Swine Flu, Avian Influenza, Ebola Virus disease etc. These diseases spread very rapidly and can assume the pandemic form in a short span of time unless necessary preventive and control measures are undertaken in time. If any of these diseases are introduced in the country, the extent of human loss as well as economic damage will be unimaginable. Hence, the establishment of health organizations has indirect benefit on the country's economy by preventing large scale morbidity and mortality.

Infrastructure requirement for Organizational setup

There are already 18 units functioning in the country many of which were established way back in 1950. Basic requirement for setting up these organizations are mainly manpower and space.

Requirement of space

- space for discharging health screening responsibility;
- space for administrative office,;
- space for isolation and quarantine facilities including Yellow Fever vaccination.

For this purpose, a minimum space of 600 sq. feet of space is required both in arrival and departure hall of the point of entries and 1500 sq meter of constructed space for isolation and quarantine facilities within the airport premises at each airport. The organizations are being set up under statutory requirement and hence, it is the responsibility of the respective administrative agencies at airport/port/land borders for providing rent free space.

Manpower requirement

Doctors, health inspectors and supportive staff required for each unit are given below:

Manpower Requirement Per unit on regular basis

Type of Manpower	Number Required	To be filled in Phase-I	To be filled in Phase-II
1. Medical Officer	7	4	3
2. Nursing staff	4	2	2
3. Lab Technician	2	1	1
4. Health inspector	8	4	4
5. LDC/UDC	3	2	1
6. Food inspector	1	1	0
Total	25	14	11

Staff per unit to be outsourced

Name of the posts	Number required	To be filled in Phase-I	To be filled in Phase-II
Health Assistant	8	4	4
Ward Assistant	8	4	4
Field Worker	8	4	4
Peon	1	1	-
Data Entry Operator	1	1	-
Safaiwala	1	1	-
Driver	3	2	1
Total	30	17	13

Requirement of regular manpower and financial implication per year

Type of Manpower	Total requirement	To be filled in Phase-I	To be filled in Phase-II	Financial implication per annum Phase-I	Financial implication per annum Phase-II
1. Medical Officers	23x7= 161	23x 4 =92	23x 3 =69	58339776	43754832
2.Nursing staff	23x4=92	23x 2=346	23x 2 =46	14821752	14821752
3. Lab Technician	23x2=46	23x 1=23	23x 1 =23	7410876	7410876
4.Health inspectors	23x8= 184	23x 4=92	23x 4 =92	29643504	29643504
5. LDC/UDC	23x3=69	23x 2=46	23x1=21	8427384	4213692
6. Food Inspector	23x1=23	23x1=23	Nil	7410876	Nil
Total	575	322	253	126054168 Approx. 12.60 crore	99844658 Approx. 9.98 crore

Total requirement of out sourced staff and financial implication per year

Type of manpower	Number required	To be filled in Phase-I	To be filled in Phase-II	Financial Implication per year Phase-I	Financial Implication per year Phase-II
Health Assistant Rs 12000/- pm	23x8=184	23x4=92	23x4=92	132.48 lacs	132.48 lacs
Ward Assistant Rs 10000/-pm	23x8=184	23x4=92	23x4=92	110.4 lacs	110.4 lacs
Field Worker Rs 10000/- pm	23x8=184	23x4=92	23x4=92	110.4 lacs	110.4 lacs
Peon Rs 8000/- pm	23x1=23	23x1=23	-	22.08 lacs	-
Data Entry operator Rs 10000/- pm	23x1=23	23x1=23	-	27.60 lacs	-
Safaiwala Rs 8000/- pm	23x1=23	23x1=23	-	22.08 lacs	-
Driver Rs 12000/- pm	23x3=69	23x2=46	23x1=23	66.24 lacs	33.12 lacs
Total	690	391	299	491.28 lacs (Rs. 4.91 crore)	386.4 lacs (Rs.3.86 crore)

Staffing norms

The functioning of these organizations are of statutory nature and therefore require round the clock deployment of the staff because of round the clock movement of flights/ships. Apart from statutory functions related to passenger screening which are performed round the clock, there are many routine functions to be performed during daytime. Important day time routine works are; Vaccination, Supervision of sanitation and food hygiene, Dead body clearance, Licensing of catering units within the premises of airport/port and vector control activities etc.

For round the clock arrangement, at least four sets of manpower of all categories are required. Further, strength of the categories of manpower in each shift depends on the passenger load. Based on the past experience, bare minimum strength of manpower is being proposed uniformly for all the units to maintain round the clock functions. The posts will be of floating nature and would be distributed according to work load.

A meeting of experts under the Chairmanship of DGHS formulated minimum core requirements in terms of space and manpower at each airport, port and land borders. The space and manpower suggested by this committee will be the basis for deciding the total requirement for this purpose. Deployment of manpower will be done in two phases and as mentioned above, the post will be of floating nature so that adjustment of staff can be made depending upon the passenger load at a particular place. some post carrying higher responsibilities will be of permanent nature and rest of the posts will be out sourced. Details of these posts are at annexure- III.

Timelines

All the units will be established during 12th plan period. However, manpower deployment will be in 2 phases. The 1st phase of manpower deployment will be completed during 12th plan period whereas 2nd phase will be implemented in 13th plan period.

Non recurring expenses:

Purchase of necessary material and equipment for establishing a fully operational unit. Minimum office automation with furniture, computers, printers, fax, etc will be required. Besides the above, necessary equipment will also be required for vector control measures like sprayers, equipment for checking breeding of mosquitoes, etc. A lumpsum amount Rs. 1 crore for each unit is proposed for each unit. Following articles will be procured for Each unit:

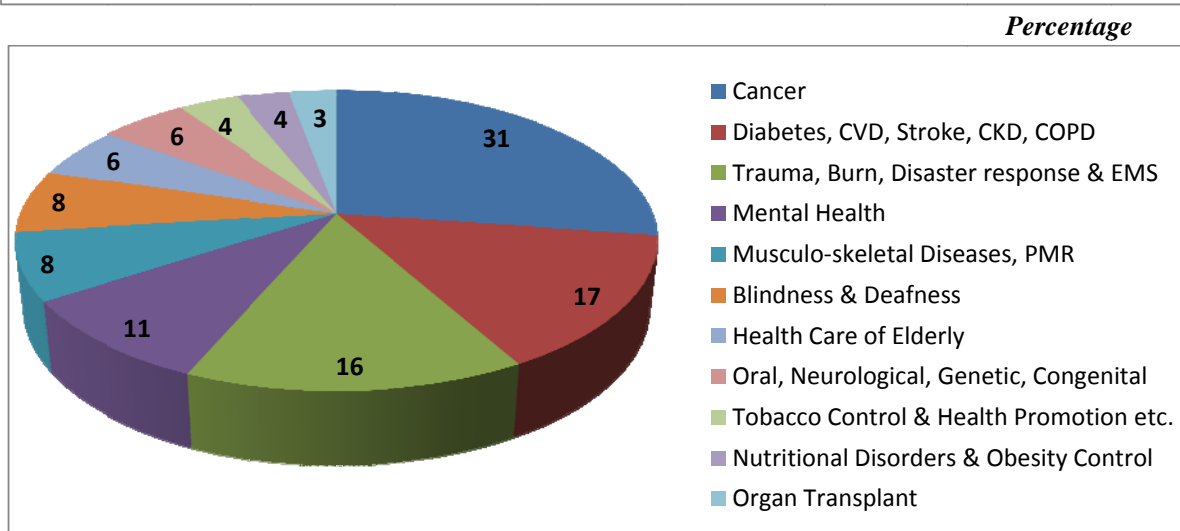
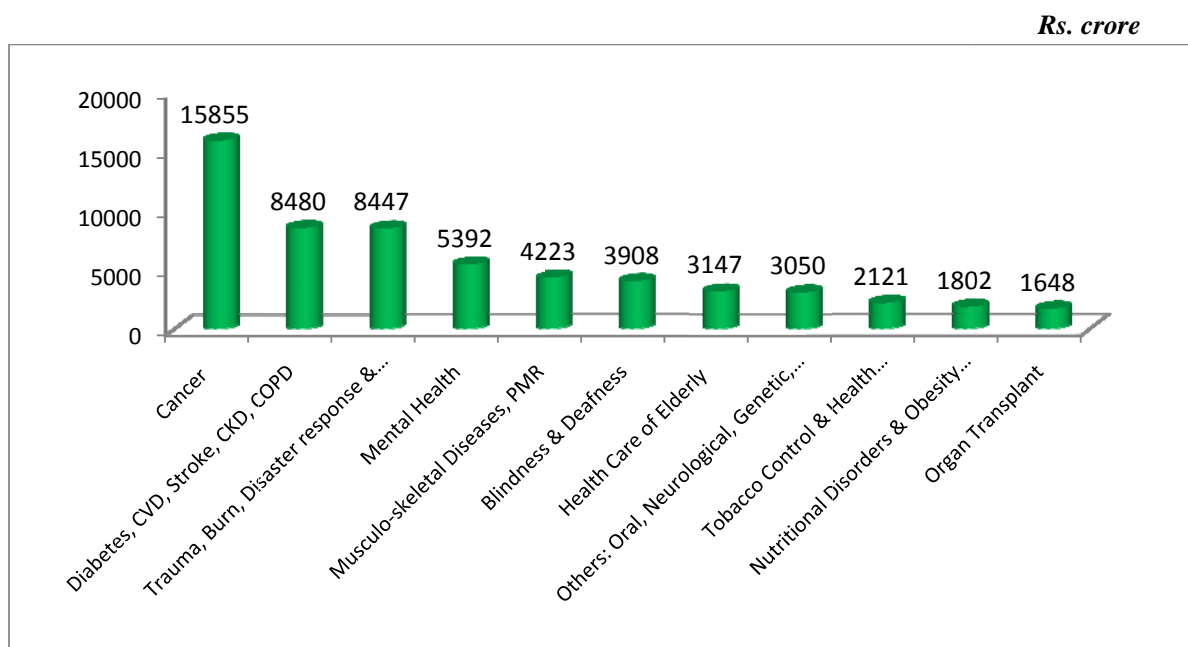
- Furniture & Electrical Fixtures including fans, ACs, De-freezer
- Computer, FAX, Photocopier, Conferencing & communication System
- Equipped Ambulance
- Insecticides Spray Machines, Beds, Ventilators, ECG Machines.

Designation	Average basic pay +NPA	DA 51%	HRA 30%	TA	AA	Monthly emoluments for each post	Yearly emoluments for each post	Total No. of posts	Total Yearly emoluments
Medical Officer (15600-39100)+ 5400	26250	13387	7875	4832	500	52844	634128	17x3=51	32340528
Staff Nurse (9300- 34800)+ 4200	13500	6885	4050	2416	-	26851	322212	17x2=34	10955208
Lab Technician(9300-34800)+ 4200	13500	6885	4050	2416	-	26851	322212	17x1=17	5477604
Health Inspector(9300-34800)+ 4200	13500	6885	4050	2416	-	26851	322212	17x4=68	21910416
Food Inspector (9300-34800)+ 4200	13500	6885	4050	2416	-	26851	322212	Nil	Nil
Health Assistant(5200-20200)+ 1900	7100	3621	2130	2416	-	15267	183204	17x4=68	12457872
Ward Assistant (5200-20200)+ 1900	7100	3621	2130	2416	-	15267	183204	17x4=68	12457872
LDC +DEO+Accountant (5200- 20200)+ 1900	7100	3621	2130	2416	-	15267	183204	17x1=17	3114468
Driver(5200- 20200)+ 1900	7100	3621	2130	2416	-	15267	183204	17x2=34	6228936
Field Worker (5200-20200) + 1800	7000	3570	2100	906	-	13576	162912	17x4=68	11078016
TOTAL								425	116020920

SECTION 5
BUDGET REQUIRED FOR PREVENTION & CONTROL OF
NON-COMMUNICABLE DISEASES FOR THE 12TH FIVE YEAR PLAN

Disease-wise Budget:

It is envisaged that for comprehensive and sustainable programmes to prevent, control and manage important non-communicable diseases and key risk factors across the country, a large investment would be required during the 12th Plan. Rs. 58072 crore would be required over the period 2012-17. Cancer, Diabetes, Cardiovascular Diseases, Chronic Lung Diseases and Chronic Kidney Disease account for most of the mortality due to NCDs and would require substantial budget. Trauma, Disasters, diseases of bones & joints, mental disorders and health care of the elderly are disabling diseases and requiring investment for not only treatment but also rehabilitation. Disease-wise Budget required during the 12th Plan is depicted in graphs below:

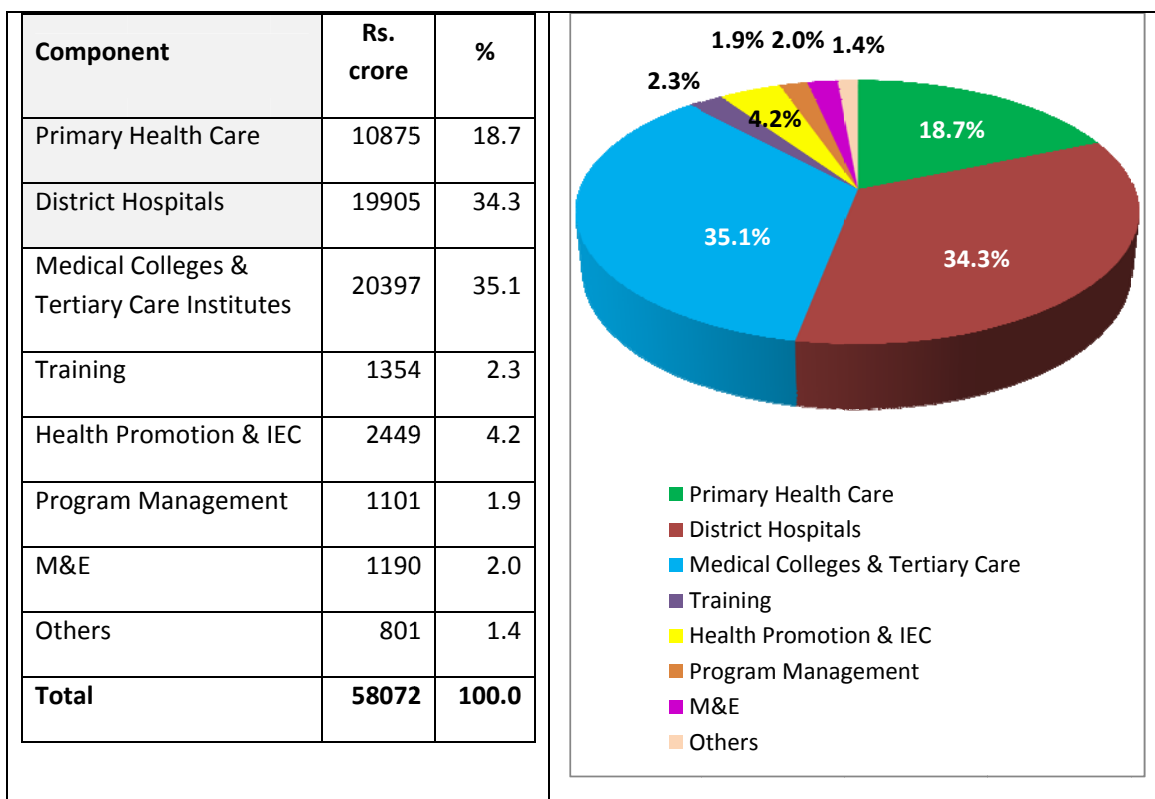


Component-wise Budget:

NCDs have affected both urban and rural population though there may be some differences in prevalence. It is also important to invest on preventive programmes and health promotion to check occurrence of new cases and reduce at risk population. The proposal therefore seeks budget for activities across that will not only result in prevention of NCDs but also develop facilities with capacity to manage NCDs. The programmes will reduce morbidity, disability and mortality due to NCDs and add on productive years for the population. The investment will be cost-effective in long run.

Nearly one-fourth of the budget would be required for primary health care in the rural areas. Secondary and tertiary level care is important to manage these chronic and fatal diseases and injuries and large share of the budget would be required to upgrade and strengthen District Hospitals, Medical Colleges and other Tertiary level institutions.

Many of the NCDs occur due to exposure to risk factors like tobacco, obesity, unhealthy diet, lack of physical activity and stress. Adequate provision has been made for public awareness and behaviour change communication, an important step to prevent NCDs. Component-wise budget is shown in table and graph below:



Programme-wise Budget: Budget for each programme is given in details below:

Prevention and Control of Cancer

Rs. in Crore

Component	Unit Cost	No.	Total
National Cancer Institute (Minimum 400 beds)			
Capital Grant (one-time) for construction/ equipment	800.00	2	1600.00
Recurring Grant (HR, Drugs, Consumables, maintenance, training etc.) @125 cr./year	125.00	2	1250.00
Total for National Cancer Institutes			2850.00
CNCI, Kolkata (including 2nd campus)	1000.00		1000.00
State Cancer Institutes (Minimum 150 beds)			
Capital Grant (one-time) for construction/ equipment	150.00	20	3000.00
Recurring Grant (HR, Drugs, Consumables, maintenance, training etc.) @25 cr./year	25.00	20	2500.00
Total for State Cancer Institutes			5500.00
Tertiary Cancer Centres (Minimum 50 beds)			
Capital Grant (one-time) for construction and equipment (e	15.00	100	1500.00
Recurring Grant (HR, Drugs, Consumables, maintenance, training etc.) @ 2 cr./year	2.00	100	1000.00
Total for TCCs			2500.00
District Cancer Centres (Minimum 10 beds)			
Capital Grant (one-time) for equipment/ renovation	0.50	640	320.00
Recurring Grant (HR, Drugs, Consumables, maintenance, training etc.) @1.5 cr./year			
Year 1-100 existing and 100 new districts	1.50	200	300.00
Year 2: 200 existing and 100 new districts	1.50	300	450.00
Year 3: 300 existing and 100 new districts	1.50	400	600.00
Year 4: 400 existing and 100 new districts	1.50	500	750.00
Year 5: 500 existing and 140 new districts	1.50	640	960.00
Total for DCCs			3380.00
Cancer Registry, Monitoring and Research	50.00	5	250.00
Training of specialists (Central Activity)	25.00	5	125.00
IEC Activities	50.00	5	250.00
Total for Cancer Control during 2012-17			15855.00

Prevention and Control of Diabetes, CVD & Stroke

Rs. in Crore

	Component	Unit Cost	No.	Total
1	District Hospital Upgradation (NCD Clinic, Cardiac Care Unit etc.)			
1.1	Capital Grant (one-time) for equipment (1.5 cr) and renovation (0.5 cr)	2.00	640	1280.00
1.2	Recurring Grant (HR, Drugs, Consumables, maintenance, training etc.) @0.5 cr./year			
	Year 1-100 existing and 100 new districts	0.50	200	100.00
	Year 2: 200 existing and 100 new districts	0.50	300	150.00
	Year 3: 300 existing and 100 new districts	0.50	400	200.00
	Year 4: 400 existing and 100 new districts	0.50	500	250.00
	Year 5: 500 existing and 140 new districts	0.50	640	320.00
	Total for District Hospital upgradation			2300.00
2	District NCD programme: NCD Clinic at SDH/CHC, Screening for NCDs, Glucometers, Kits, Medicines, Referral etc.			
	Capital Grant (one-time) for equipment and renovation @Rs. 20 lakh/district	0.20	400	80.00
	Recurring Grant (HR for NCD Clinic at CHCs, Kits, Drugs, screening, referral etc.) @ 1 cr./year			
	Year 1-100 existing and 100 new districts	1.00	200	200.00
	Year 2: 200 existing and 100 new districts	1.00	300	300.00
	Year 3: 300 existing and 100 new districts	1.00	400	400.00
	Year 4: 400 existing and 100 new districts	1.00	500	500.00
	Year 5: 500 existing and 140 new districts	1.00	640	640.00
	Total for District NCD programme			2120.00
3	Strengthening of Medical Colleges			
3.1	Non-recurring grant for Cardiology, Endocrinology and Neurology Departments	3.00	149	447.00
3.2	Recurring Grants for HR, Training, Consumables	1.00	149	745.00
4	State NCD Cell @ 25 lakh/year	0.25	28	35.00
5	District NCD Cell @ 20 lakh/year			
	Year 1-100 existing and 100 new districts	0.20	200	40.00
	Year 2: 200 existing and 100 new districts	0.20	300	60.00
	Year 3: 300 existing and 100 new districts	0.20	400	80.00
	Year 4: 400 existing and 100 new districts	0.20	500	100.00
	Year 5: 500 existing and 140 new districts	0.20	640	128.00
	Total for District NCD Cells			443.00
6	IEC Activities	20.00	5	100.00
7	Surveillance, Monitoring and Research	8.00	5	40.00
8	Training	10.00	5	50.00
9	National NCD cell	2.50	5	12.50
	Total for NCD Control during 2012-17			6292.50

Prevention & Control of Chronic Obstructive Pulmonary Diseases

	Component	Unit Cost (Rs. lakh)	No.	Total (Rs. crore)
1	Support to selected Primary Health Centres			
	Finger Pulse Oximeter (1)	0.05	10000	5.00
2	Support to Community Health Centres/SDH			
2.1	Capital: Spirometer (1.0), Pulse Oximeter (0.50), Finger Pulse Oximeter-2 (0.10), Non-invasive Ventilator (3.0), Nebulizer-Heavy duty hospital model (0.20)	4.80	2000	96.00
2.2	Recurring expenditure for drugs, consumables, maintenance etc.			
	Year 1-400 new centres	1.00	400	4.00
	Year 2: 400 existing and 400 new centres	1.00	800	8.00
	Year 3: 800 existing and 400 new centres	1.00	1200	12.00
	Year 4: 1200 existing and 400 new centres	1.00	1600	16.00
	Year 5: 1600 existing and 400 new centres	1.00	2000	20.00
	Sub-total for CHCs/SDH			156.00
3	Support to District Hospitals			
3.1	Capital: Spirometer (1.0), Pulse Oximeter (0.50), Finger Pulse Oximeter-2 (0.10), Invasive Ventilator (10.0) Non-invasive Ventilator (3.0), Nebulizer-Heavy duty hospital model-2 (0.40)	15.00	640	96.00
3.2	Recurring Grant (Drugs, Consumables, vaccination, maintenance, training etc.)			
	Year 1-100 existing and 100 new districts	25.00	200	50.00
	Year 2: 200 existing and 100 new districts	25.00	300	75.00
	Year 3: 300 existing and 100 new districts	25.00	400	100.00
	Year 4: 400 existing and 100 new districts	25.00	500	125.00
	Year 5: 500 existing and 140 new districts	25.00	640	160.00
	Total for District Hospitals			606.00
4	IEC Activities	1000.00	5	50.00
5	Surveillance, Monitoring and Research	100.00	5	5.00
6	Training	300.00	5	15.00
	Total for COPD during 2012-17			837.00

Management of Chronic Kidney Disease

	Component	Cost (Rs.)
A	Average cost of Dialysis	1000
B	Cost for Haemo dialyser per dialysis (Cost of haemodialyser is Rs 600; used 4 times)	150
C	Haemo dialysis fluid used in each dialysis	200
D	Saline drip used in each dialysis	100
E	Inj. Heparin used in each dialysis	50
F	Investigations & Medicine	600
	Total cost per dialysis	2100

	Component	Cost (Rs. crore)
1	Annual cost of 1000 dialysis per month per centre	2.50
1.1	Cost of Dialysis @1000 dialysis per month *100 Centres for 5 years	1250.00
2	Training @ Rs. 2 crore per year	10.00
3	IEC & health education @ Rs. 2 crore per year	10.00
4	M&E and Research @ Rs. 2 crores per year	10.00
5	Cost of investigative methods specially urine testing strips for 100 districts	70.00
	Total Programme Cost	1350.00

National Organ Transplant Programme

<i>Rs. crore</i>			
S.No.	Component	No.	Total
1	National Organ Procurement & Distribution Org.	1	25.00
2	State Organ Procurement & Distribution Org.	10	78.00
3	Bio-material Centres (National Centre (300 cr.) and 10 State Centres @ 20 Cr.)	11	500.00
4	Establishment /strengthening of Transplant Centres/Units	30	445.00
5	Immuno-supressant Drugs		200.00
6	Registry, Monitoring and Research		150.00
7	Bio vigilance, safety & QA in Tissues		50.00
8	SWAP living organ donor program		10.00
9	Training		35.00
10	IEC Activities, Meetings, Workshops		155.00
	Total Budget		1648.00

National Mental Health Programme

Recurring Budget for District Mental Health Programme (DMHP) per year		
S.No.	Component	Rs. Lakh
1	Personnel & Operational Costs (Clinical Services)	92.80
2	Drugs	40.00
3	Rehabilitation Services (NGOs)	14.90
4	Work Place Management	4.00
5	Suicide Prevention programme	4.00
6	Training & Sensitization	2.00
7	IEC	2.00
8	M & E	2.00
9	Staff travel	2.00
10	Ambulance Services (108)	4.00
11	Flexi-pool	10.00
	TOTAL	177.70

Budge Estimates for DMHP for 5 years	Rs. crore		
Non-recurring (10 bedded ward, OPD Clinic and Child Mental Health Clinic in DH & Clinic in SDH)	92.00	642	590.64
Recurring			
Year 1-123 existing and 100 new districts	177.70	223	396.27
Year 2: 223 existing and 100 new districts	177.70	323	573.97
Year 3: 323 existing and 100 new districts	177.70	423	751.67
Year 4: 423 existing and 100 new districts	177.70	523	929.37
Year 5: 523 existing and 119 new districts	177.70	642	1140.83
Total for DMHP			4382.76

Total Budget for National Mental Health Programme

Rs. crore

S.No.	Component	Budget
1	NMHP (Schemes A, B)	575.00
2	NMHP (support to NGO/CBOs)	100.00
3	DMHP covering all [642]districts	4382.00
4	Support to SMHA	50.00
5	Support to MHRC and state panels	155.00
6	Implementation, technical support	30.00
7	M&E, MIS and Research	50.00
8	IEC activities (at Central level)	50.00
	Total	5392.00

National Iodine Deficiency Disorders Control Programme

Rs. crore

	Component	Unit Cost (Rs. lakh)	No.	Total
1	State IDD Control Cell @12 lakh p.a.	12.00	35	21.00
2	Surveys/Resurveys by States @1 lakh per district	1.00	643	6.43
3	IDD Monitoring Labs @ 7 lakh p.a.	7.00	35	12.25
4	IDD cell DGHS @ Rs. 50 lakh p.a.	50.00	5	2.50
5	Salaries to Staff to Salt Commissioner's Organizations	300.00	5	15.00
6	IEC Activities by States/Uts @ 1 lakh/district	1.00	643	32.15
7	IEC Activities with other agencies	4000.00	5	200.00
8	Training @ 1 lakh per district	1.00	643	6.43
9	Salt Testing Kits each @ Rs.12 *10000000	1200.00	5	60.00
10	Incentives to ASHA/AWW/HW @Rs. 300 p.a.		8.4 lakh	126.00
	GRAND TOTAL			481.76

National Program for Prevention & Control of Fluorosis

Rs. crore

	Component	Unit Cost (Rs. lakh)	No.	Total
1	Central Coordination Cell @17 lakh p.a.	17.00	5	0.85
2	District Level Programme			
	Cost of 26 new districts	58.00	26	15.08
	Running Cost of existing districts @40 lakh	40.00	100	40.00
2.1	Total in 1st year			55.08
	Cost of 26 new districts in year 2	58.00	26	15.08
	Running Cost of existing districts @40 lakh	40.00	126	50.40
.2	Total in 2nd year			65.48
	Cost of 26 new districts in year 3	58.00	26	15.08
	Running Cost of existing districts @40 lakh	40.00	152	60.80
2.3	Total in 3rd year			75.88
	Cost of 26 new districts in year 4	58.00	26	15.08
	Running Cost of existing districts @40 lakh	40.00	178	71.20
2.4	Total in 4th year			86.28
	Cost of 26 new districts in year 5	58.00	26	15.08
	Running Cost of existing districts @40 lakh	40.00	204	81.60
	Impact Evaluation of the Programme			75.00
2.5	Total in 5th year			97.43
	Total for 5 years			381.00

Oral Health

	Component	Unit Cost (Rs. lakh)	No.	Budget (Rs.crore)
1	Strengthening of Dental Clinics in Distt. Hospitals			
1.1	NR grant: renovation, dental chair, equipment (7 lakh)	7.00	640	44.80
1.2	Recurring grant pa for HR (8 lakh), consumables (5 lakh)			
	Year 1-100 new districts	13.00	100	13.00
	Year 2: 100 existing and 100 new districts	13.00	200	26.00
	Year 3: 200 existing and 100 new districts	13.00	300	39.00
	Year 4: 300 existing and 150 new districts	13.00	450	58.50
	Year 5: 450 existing and 190 new districts	13.00	640	83.20
	Sub-total Distt Dental Clinics			264.50
2	Setting up Dental Clinics in SDH/CHC			
	NR grant: renovation, dental chair, equipment (3.5 lakh)	3.50	2000	70.00
	Recurring grant: HR (4 lakh), consumables (2 lakh)			
	Year 1-400 new centres	6.00	400	24.00
	Year 2: 400 existing and 400 new centres	6.00	800	48.00
	Year 3: 800 existing and 400 new centres	6.00	1200	72.00
	Year 4: 1200 existing and 400 new centres	6.00	1600	96.00
	Year 5: 1600 existing and 400 new centres	6.00	2000	120.00
	Sub-total Dental Clinics in SDH/CHC			430.00
3	Annual check-up of School Children	1.50	640	48.00
4	IEC Activities	400.00	5	20.00
5	Training	100.00	5	5.00
	Total Budget			767.50

Comprehensive Cleft Palate Units

Rs. Crore

	Component	Unit Cost (Rs. lakh)	No.	Budget
1	Strengthening of Medical Colleges/ hospitals for diagnosis and management of Genetic Blood Disorders			
1.1	NR Grant for Equipment	0.20	120	24.00
1.2	Recurring grant for HR, drugs, reagents and other consumables			
	2012-13	1.00	30	150.00
	2013-14	1.00	30	120.00
	2014-15	1.00	30	90.00
	2015-16	1.00	30	60.00
	Total Recurring Cost			420.00
2	Development of Molecular Genetic Lab. for confirmatory diagnosis			
2.1	NR Grant for Equipment	0.25	20	5.00
2.2	Recurring grant for HR, drugs, reagents and other consumables			
	2012-13	0.25	5	6.25
	2013-14	0.25	5	5.00
	2014-15	0.25	5	3.75
	2015-16	0.25	5	2.50
	Total Recurring Cost			17.50
3	Training	0.25	5	1.25
4	IEC	0.50	5	2.50
5	Registry, Monitoring & supervision	0.50	5	2.50
	Total			448.75

Trauma Care Facilities on National Highways

	Component	Budget (Rs. crore)
1	New Trauma Centre on National Highways	
	L-I	382.32
	L-II	668.12
	L-III	589.05
2	Trauma Centres on Accident Prone Roads	
	L-II	700.00
	L-III	500.00
3	Consultants	2.78
4	Mid-term Appraisal	2.00
5	Surveillance & Registry	150.00
6	State Resource Trauma Centre	280.00
7	Neuro-rehabilitation Centres (5)	350.00
8	Rehabilitation Centre at Trauma centre	150.00
9	IEC	100.94
	TOTAL	3875.21

Prevention and Management of Burn Injury

Rs. in Crore

	Component	Unit Cost	No.	Total
1	Burn Unit in Medical Colleges			
1.1	Construction	1.950	147	286.65
1.2	Equipment & Furniture	0.925	147	135.98
1.3	Human Resources for Medical Colleges			
	Year 1-3 existing and 20 new Medical Colleges	1.79	23	41.17
	Year 2: 20 existing and 35 new Medical Colleges	1.79	55	98.45
	Year 2: 55 existing and 40 new Medical Colleges	1.79	95	170.05
	Year 2: 95 existing and 35 new Medical Colleges	1.79	130	232.70
	Year 2: 130 existing and 17 new Medical Colleges	1.79	147	263.13
	Total for Human Resources in Medical Colleges			805.50
	Total for Medical Colleges			1228.13
2	Burn Unit in District Hospitals			
2.1	Construction	1.000	486	486.00
2.2	Equipment	0.288	486	139.73
2.3	Human Resources for District Hospitals			
	Year 1-6 existing 50 new District Hospitals	0.62	56	34.72
	Year 2: 56 existing and 100 new District Hospitals	0.62	156	96.72
	Year 3: 156 existing and 120 new District Hospitals	0.62	276	171.12
	Year 4: 276 existing and 130 new District Hospitals	0.62	406	251.72
	Year 5: 406 existing and 86 new District Hospitals	0.62	492	305.04
	Total for Human Resources in District Hospitals			859.32
	Total for District Hospitals			1485.05
4	Rehabilitation			2.27
5	Training			3.21
6	IEC Activities			209.60
7	Monitoring & Evaluation			3.00
8	State Cell			0.55
9	Central Cell			1.85
	Total Budget			2933.65

Health Sector Preparedness and Response to Disasters

Rs. crore

	Component	Unit cost	No. of units	Budget
1	Mobile Hospitals (one in each region to cover 22 vulnerable States)	40.00	4	160.00
1.1	Human Resources for Mobile Hospitals	3.30	5	16.50
2	Safe Hospital Initiative			
2.1	Non-structural			1.00
2.2	Retrofitting	10.00	6	60.00
3	CBRN Medical Management Centres with capacity to manage Disasters	70.00	6	420.00
3.1	Human Resources for CBRN Medical Mgm Centres	6.20	3	18.60
4	Strengthening existing hospital for CBRN in 50 Districts/ Vulnerable cities	2.00	50	100.00
5	Strategic Health Operation Centre (SHOC)	3.00	15	45.00
6	Human Resource Component : Training			20.00
7	IEC Activities			40.00
	Total Budget			881.10

Prevention & Management of Musculo-skeletal Disorders

Component	Central	State	District	Sub-district	Total (Rs. crore)
Building renovation	0.00	0.18	64.00	104.80	168.98
Major diagnostic equipment	0.00	0.00	340.00	1362.00	1702.00
Major treatment equipment	0.00	0.00	102.00	113.50	215.50
Support tools	0.03	0.26	17.00	22.70	39.99
Office equipment	0.02	0.26	3.40	0.00	3.68
Manpower	0.73	10.16	287.38	1036.06	1334.33
Lab. Consumables	0.00	0.00	48.30	121.40	169.70
Training	0.00	1.30	11.25	0.00	12.55
Office admn expenses	0.01	0.39	1.67	5.56	7.63
Monitoring /evaluation	0.13	0.25	3.34	0.00	3.71
IEC	1.00	8.75	7.00	11.14	27.89
Equipment maintainence	0.00	0.55	1.94	0.00	2.49
Total	1.91	22.09	887.28	2777.16	3688.44

Upgradation of Department of PMR in Medical Colleges

	Targets/Components	Unit Cost (Rs. lakh)	Budget Required (Rs. crore)					Total
			2012-13	2013-14	2014-15	2015-16	2016-17	
	Target (New)>>		10	30	35	25	20	
	Target (Cumulative)>>		40	70	105	130	150	
1	Upgradation of PMR in Medical Colleges							
1.1	Equipment	55.00	5.50	16.50	19.25	13.75	11.00	66.00
1.2	Human Resources	49.56	19.82	34.69	52.04	64.43	74.34	245.32
1.3	Material & Supplies	2.00	0.80	1.40	2.10	2.60	3.00	9.90
1.4	Office Expenses & Maintenance	2.50	1.00	1.75	2.63	3.25	3.75	12.38
	Sub-total Med. Col.		27.12	54.34	76.01	84.03	92.09	333.60
2	Apex PMR Institutes	5000	40.00	40.00	40.00	40.00	40.00	200.00
3	Central cell	0.24	0.24	0.24	0.24	0.24	0.24	1.20
4	Total		67.36	94.58	116.25	124.27	132.33	534.80

National Blindness Control Programme

	Component	Unit Cost (Rs. lakh)	No.	Budget (Rs. crore)
	Non-recurring Cost			
1	Regional Institute of Ophthalmology	150.00	20	30.00
2	Medical College	80.00	146	116.80
3	District Hospital Upgradation	40.00	631	252.40
4	Sub-district Hospitals (New)	20.00	100	20.00
5	Vision Centres	1.00	3000	30.00
6	Eye Banks (New)	25.00	20	5.00
7	Eye Donation Centres (New)	1.00	100	1.00
8	Non-rec. GIA to NGO Hospitals (New)	50.00	16	8.00
10	Construction of dedicated eye ward	100.00	30	30.00
11	Multi-purpose District Mobile Ophth. Unit @ Rs. 30 lakh	30.00	100	30.00
11	Teleophthalmology Unit @ Rs. 60 lakh	60.00	60	36.00
	Recurring Costs			
1	GIA to NGOs for Cataract Surgery @1500		108 lakh	1620.00
2	GIA for other eye diseases @3000		2.0 lakh	60.00
3	Vitreoretinal surgery & corneal transplantation @5000		1 lakh	50.00
4	Free Spectacles to school children @Rs. 200		50 lakh	100.00
5	Free Spectacles for near work to old persons @ Rs. 100		10 lakh	10.00
6	Collection of Donated Eyes @2000 per pair		3.00 lakh	60.00
7	Ophthalmic Surgeon @50000 pm for 2-5 years	6.00	600	90.00
8	Ophthalmic Assistant @12000 pm for 2-5 years	1.44	1200	43.20
9	Eye Donation Counsellors @12000 pm for 2-5 years	1.44	200	7.20
10	Training of Eye Surgeons @80000/trainee	0.70	400	20.00
11	Training of Nurses/Oph.Asst. & other staff	0.10	3000	3.00
12	Maintenance of Oph. Equipment upto 20 lakh	20.00		10.00
13	Management of State Health Society (large)	14.00	25	17.50
14	Management of State Health Society (small)	7.00	10	3.50
15	Central Programme cell	100.00	5	5.00
16	MIS, Moniotring, Evaluation, Surveillance	40.00	5	2.00
17	Support to Distt.Blindness Control Society @25500 pm	3.06	630	96.40
18	IEC Activities	4000.00	5	200.00
	TOTAL			2957.00

National Programme for Prevention & Control of Deafness

Rs. crore

Components/Year	2012-13	2013-14	2014-15	2015-16	2016-17	Total
IEC	21.06	23.06	25.06	27.06	29.84	126.08
Training	17.80	6.50	6.50	8.85	-	39.65
Manpower	11.00	25.60	29.20	41.36	46.31	153.47
Equipments	69.61	26.70	26.70	32.81	-	155.82
Hearing Aid	23.02	30.69	38.38	48.80	48.80	189.69
Screening Camps	8.00	10.00	12.00	14.00	13.53	57.53
Monitoring	14.63	37.03	45.47	53.95	59.37	210.45
PPP	2.00	2.00	2.00	2.00	2.00	10.00
Research & Evaluation	-	1.50	2.00	2.00	2.50	8.00
Total	168.21	165.17	190.4	236.09	208.08	950.69

National Programme for Health Care of the Elderly

Rs. crore

	Component	Unit Cost	No.	Total
1	District Hospital (Geriatric Clinic & Ward)			
1.1	Capital Grant (one-time) for equipment (0.5 cr) and renovation & furnishing (0.5 cr)	1.00	400	400.00
1.2	Recurring Grant (HR, Drugs, Consumables, maintenance, training etc.) @ 50 lakh./year			
	Year 1-100 existing and 100 new districts	0.50	200	100.00
	Year 2: 200 existing and 100 new districts	0.50	300	150.00
	Year 3: 300 existing and 100 new districts	0.50	400	200.00
	Year 4: 400 existing and 100 new districts	0.50	500	250.00
	Year 5: 500 existing and 140 new districts	0.50	640	320.00
	Total for District Hospitals			1420.00
2	District Geriatric Programme:			
2.1	Capital Grant for setting up Geriatric Clinic at SDH/ CHC/PHC, equipment etc. @Rs. 20 lakh/district	0.20	400	80.00
2.2	Recurring Grant (HR for Geriatric Clinic at CHCs, aids, medicines, homebased care, referral @ 50 lakh			
	Year 1-100 existing and 100 new districts	0.50	200	100.00
	Year 2: 200 existing and 100 new districts	0.50	300	150.00
	Year 3: 300 existing and 100 new districts	0.50	400	200.00
	Year 4: 400 existing and 100 new districts	0.50	500	250.00
	Year 5: 500 existing and 140 new districts	0.50	640	320.00
	Total for District NCD programme			1020.00
3	Regional Geriatric centres in Medical Colleges			
	Capital Grant (one-time) for construction, furnishing, equipment, video-conferencing for 12 new Regional Geriatric Centres	4.00	12	48.00
	Recurring Grant (HR, Medicines, Training, Research @ 2 cr./year			
	Year 1-8 existing and 4 new centres	2.00	12	24.00
	Year 2: 12 existing and 4 new centres	2.00	16	32.00
	Year 3: 16 existing and 4 new centres	2.00	20	40.00
	Year 4: 20 centres	2.00	20	40.00
	Year 5: 20 centres	2.00	20	40.00
	Total for Regional Geriatric Centres			224.00
4	Medical & Health Care for Old Age Homes	0.045	500	112.50
5	National Institute of Ageing (2)	150.00	2	300.00
6	IEC Activities	5.00	5	25.00
7	Monitoring & Evaluation	1.00	5	5.00
	Total for NCD Control during 2012-17			3106.50

Prevention & Control of Nutritional Disorders & Obesity

	Component	Unit Cost Rs. lakh)	No.	Budget (Rs. crore)
1	Nutrition Cell in Dte.GHS @ Rs. 100 lakh p.a.	100.00	5	5.00
2	District Nutrition Cell @Rs.9.8 lakh p.a.	9.80	640	313.60
3	Equipment for Body Mass Index at Sub-centres, PHCs, CHCs and Urban Health Units	0.02	200000	40.00
4	Obesity Guidance Clinic in District Hospital and Medical Colleges			
4.1	Capital Grant (one-time) for equipment and furnishing 0.50 lakh)	0.50	790	3.95
4.2	Recurring Grant (Nutritionist @ 20,000 P.M. and School Obesity Prevention Initiative, Investigation & management of secondary obesity and local IEC)			
	Year 1-100 existing and 100 new clinics	20.00	100	20.00
	Year 2: 200 existing and 100 new clinics	20.00	250	50.00
	Year 3: 300 existing and 100 new clinics	20.00	400	80.00
	Year 4: 400 existing and 100 new clinics	20.00	600	120.00
	Year 5: 500 existing and 140 new clinics	20.00	790	158.00
	Total for Obesity Guidance Clinics			431.95
5	IEC Activities	1500.00	5	75.00
6	Training of doctors, nurses, ANMs, teachers etc.	1000.00	5	50.00
7	M&E and Nutritional Surveillance, Research	500.00	5	25.00
	Total during 2012-17			940.55

National Institute for Health Promotion & Control of Chronic Diseases

Budget Allocation	<i>Rs. crore</i>					
	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Civil Works	24.00	22.00	0.00	0.00	0.00	46.00
Equipment, Furniture Fixtures	2.30	3.50	0.00	0.00	0.00	5.80
Salaries, Office Exp., Consultancy	3.00	3.00	3.00	3.00	3.00	15.00
Resource and Documentation division	0.50	0.50	0.50	0.50	0.50	2.50
Advocacy, Publication	1.00	1.00	1.00	1.00	1.00	5.00
Health Promotion Research	2.50	2.50	2.50	2.50	2.50	12.50
Human Resource Development	1.50	1.50	1.50	1.50	1.50	7.50
Health Communication	2.50	2.50	2.50	2.50	2.50	12.50
Healthy Settings & Environment	1.00	1.00	1.00	1.00	1.00	5.00
Policies, Planning & Co-ordination	2.00	2.00	2.00	2.00	2.00	10.00
Total Budget	40.30	39.50	14.00	14.00	14.00	121.80

Patients' Safety Programme

	Component	Unit Cost (Rs. lakh)	No.	Budget (Rs. crore)
1	Grant to Medical Colleges			
1.1	Patient Safety Survey	2.00	149	2.98
1.2	Infrastructure upgradation	10.00	149	14.90
1.3	Training @ Rs. 2 lakh/year	2.00	149	14.90
1.4	IEC @ Rs. 2 lakh /year	2.00	149	14.90
	Sub-total Medical Colleges			47.68
2	Grant to District Hospitals			
2.1	Patient Safety Survey	1.00	640	6.40
2.2	Infrastructure upgradation	5.00	640	32.00
2.3	Training	1.00	640	32.00
2.4	IEC	1.00	640	32.00
	Sub-total District Hospitals			102.40
3	Central Activities			
3.1	Office equipment & furnishings			0.07
3.2	Human Resources & Office Expenses	10.00	5	0.50
3.3	Training of Trainers	70.00	5	3.50
3.4	IEC Activites	60.00	5	3.00
3.5	M&E, Supervision and Research	25.00	5	1.25
	Sub-total Central Cell			8.32
	Total Budget			158.40

Establishment of APHO/PHO & Land Border Quarantine Centres

				<i>Rs. crore</i>
	Component	Unit Cost	No.	Total
1	Development of new APHO/PHO			
1.1	Non-recurring grant for furniture, fixtures, equipment, ambulance etc. of new units	1.00	23	23.00
1.2	Recurring Costs: Salaries & Operational Costs of new units	9.04	23	207.86
2	Continuation of Existing plan scheme			12.00
3	Recurring Costs Salaries & Operational Costs of 7 existing units			20.50
	Total Budget			263.36

National Tobacco Control Programme

Rs. crore

	COMPONENT	National level	State Cells	District Cells	Total
1	IEC	310.00	9.51	185.05	504.55
2	Laboratory Support	150.00	0.00	0.00	150.00
3	HR & Management				
3.1	National & State	2.75	40.68	0.00	43.43
3.2	District level	0.00	0.00	381.73	381.73
4	Training	0.00	9.51	132.18	141.68
5	M&E, Research	30.00	9.51	105.74	145.25
6	Others	0.00	0.00	211.49	211.49
	TOTAL	492.75	69.20	1,016.19	1,578.14

Annexure 1

Monitoring and Evaluation of NCDs

Monitoring of programmes for prevention and control of non-communicable diseases and their determinants will provide the foundation for advocacy, policy development, program planning, monitoring and evaluation. Monitoring is not limited to tracking data on the magnitude of and trends in non communicable diseases, it also includes evaluating the effectiveness and impact of interventions and assessing progress made.

An evaluation of the implementation of the plan and outcomes will be carried out at the mid of the plan and at the end of the plan period. The mid-term assessment will offer an opportunity to learn from the experience, taking corrective measures where actions have not been effective and reorienting parts of the plan in response to unforeseen challenges and issues.

Under the group of NCDs, each programme will have specific programme monitoring indicators. The overall broad indicators for monitoring and evaluation on prevention and control of non communicable diseases are mentioned below:

1. Established unit for the prevention and control of non communicable
2. Diseases (with dedicated staffing and budget at National, State and District level
3. Effective surveillance mechanisms built within National health information system
4. Establishing and strengthening effective mechanisms of intersectoral action for improving health care for people with non-communicable diseases
5. Strengthening of health care facilities at all levels for diagnosis, investigation and management of NCDs
6. Training of health care providers in comprehensive management of NCDs
7. Developing complete smoke-free legislation covering all types of places and institutions
8. Bans on tobacco advertising, promotion and sponsorship.
9. Developing national food-based dietary guidelines.
10. Developing national recommendations on physical activity for health.
11. Providing smoking cessation support (including counseling and/or behavioural therapies) into primary health care
12. Early detection and screening programmes for NCDs
13. Access to affordable essential medicines for NCDs, including those needed for pain relief and palliative care (like oral morphine).
14. Provision of diagnosis and investigation facilities at PHCs, CHCs and District Hospitals for NCDs.
15. Prevalence of tobacco use among adults aged 25–64 years.
16. Prevalence of low consumption of fruit and vegetables among adults aged 25–64 years.
17. Prevalence of low levels of physical activity among adults aged 25–64 years.
18. Prevalence of overweight/obesity among adults aged 25–64 years.
19. Prevalence of raised blood pressure among adults aged 25–64 years.
20. Prevalence of raised fasting blood glucose concentration among adults aged 25–64 years.

Circulated for discussion at Moscow meeting, April 2011

The agenda was also recently discussed in Meeting of Health Ministers in Moscow in April 2011. The table below summarizes discussions among the WHO and other partners to date on proposed NCD targets and their indicators and main data sources. These targets focus on mortality, morbidity, key risk factors, health service delivery, and NCD related policy. For each indicator a target has been suggested for 2025. The targets were proposed based on

scientific review of the current situation and trends, combined with a careful assessment of feasibility. Using the same set of indicators, targets by the end of 12th FY plan are proposed (March 2017).

Proposed NCD Targets and Indicators

S.No.	Indicator	Target 2025 (Rec. by WHO)	Target 2017	Source
1	Premature mortality from cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases from age 30 to 70	15% relative decline	5%	Death registration system, with medical certification of causes of death or surveys with verbal autopsy
2	Prevalence of diabetes mellitus among persons aged 25+	10% relative reduction	3%	Survey (with biomarkers)
3	Prevalence of raised blood pressure among persons aged 25+	20% absolute reduction	8%	Survey (with biomarkers)
4	Prevalence of current daily tobacco smoking among persons aged 15+	25% relative reduction and below 20% prevalence .	20% and prevalence below 15%	Survey
5	Prevalence of obesity	No increase compared to 2010 levels	No increase	Survey
6	Prevalence of physical inactivity	10% relative reduction	2%	Survey
7	Prevalence of raised total cholesterol among 25+ persons	20% relative reduction	5%	Survey (with biomarkers)
8	Primary care management of cardiovascular risks	50% reduction in coverage gap	20%	Survey (with biomarkers)
9	Coverage of cervical cancer screening	50% reduction in coverage gap	20%	Survey
10	Comprehensive tobacco control measures that protect the entire population, including high tobacco product tax, large pictorial health warning labels, comprehensive smoke-free legislation and ban on all forms of tobacco advertising, promotion and sponsorship.	100% of countries have implemented all four of these components	All districts covered	Policy review
11	Regulations and controls on the reduction of salt and replacement of trans fatty acids with PUFA in manufactured food.	100% of countries have implemented these components	Control measures initiated	Policy review
12	Comprehensive alcohol controls including taxation and pricing policies decreasing affordability of alcohol; comprehensive and legally binding restrictions on alcohol advertising and marketing of alcoholic beverages; comprehensive restrictions on access to alcoholic beverages.	100% of countries with comprehensive alcohol control policies implemented	Control measures initiated in all States	Policy review

Expected Outcomes

It is expected that NCD programmes will have significant impact on morbidity and mortality due to NCDs. Some key expected outcomes at the end of the 12th Plan are indicated below:

Programme Area	Programme Component	Expected Outcome
Health Promotion and Control of Life style Chronic Diseases	Cancer	Early detection leading to increase in cure rate
	Diabetes	Early detection and management, reduction in complications
	CVD & Stroke	Reduction in incidence and mortality
	COPD & CKD	Reduction in mortality
	Tobacco Use	Reduction in tobacco use in adults & youth
	Mental disorders	Improved mental health; improved management of severe mental diseases
	Oral Health	Reduction in oral and dental disorders
	Fluorosis (Endemic)	Reduction in prevalence and no. of endemic districts
	IDD	Universal coverage with iodated salt
Disability Prevention and Rehabilitation	Blindness	Reduction in prevalence of blindness
	Deafness	Reduction in prevalence of deafness
	Highway Trauma	Reduction in deaths and disability due to trauma
	Burn Injuries	Reduction in deaths and disability due to burns

Key Monitoring Indicators and Targets (wherever applicable) for each Programme:

Cancer			
S.No.	Monitoring Indicators A30	Status by March 2012	Target by March 2017
1	National Cancer Institutes established	0	2
2	No. of State Cancer Institutes established	0	20
3	No. of Tertiary Cancer Centres supported and functioning	27	100
4	No. of District Cancer Centres set up	100	640
5	No. of patients seeking chemotherapy from District Hospitals		
6	No. of specialists trained in cancer management		500
7	No. of District Teams trained in cancer management		640
8	No. of institutes networking on Cancer Registry	27	122
Prevention and Control of Diabetes, CVD & Stroke			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of District Hospitals upgraded (NCD Clinic, ICU)	100	640
2	No. of NCD Clinic at SDH/CHC/PHCs	800	2500
3	No. of Medical Colleges strengthened for management of NCDs	0	149
4	No. of State NCD Cells established	21	35
5	No. of District NCD Cells established and functioning	100	640
6	No. & % of additional staff recruited in District Hospitals	100	640
7	No. of Medical Officers of SDH/CHCs/PHCs trained	800	2500
8	No. of Nurses & technicians of District Hospitals trained	100	640
9	No. of sub-centres with trained ANM/MHW	20000	100000
10	Annual Risk Factor Surveillance conducted	1	5

Chronic Obstructive Pulmonary Disease & Chronic Kidney Disease			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Primary Health Centres with Finger Pulse Oximeters	0	10000
2	No. of Community Health Centres/SDH with Spirometer and Pulse Oximeter	0.05	2000
3	No. of District Hospitals with Spirometer, Pulse Oximeter, Ventilators, Nebulizer etc.	0	640
4	No. of District Hospitals with facility for Dialysis	Limited	640
Organ Transplant			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	National Organ Procurement & Distribution Org. set up	0	1
2	No. of State Organ Procurement & Distribution Org. set up	0	10
3	No. of Bio-material Centres set up	9	11
4	No. of Transplant Centres strengthened/established	Limited	30
5	No. of Specialists trained in Organ/Tissue Transplant		
Mental Health			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of counseling center and ward set up in district hospitals	123	640
2	No. of Additional Staff recruited out of no. sanctioned	0	10
3	No. of staff trained in Mental Health	9	11
4	No. of students undergoing MD in Psychitry per year		

Iodine Deficiency Disorders			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of districts where Surveys/Resurveys conducted		643
2	No. of IDD Monitoring Laboratories established		35
3	No. of District Teams trained		643
4	No. of salt testing kits distributed		1 crore
Fluorosis			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	Initiate programme in endemic districts incl. surveys	100	230
2	Facility for management of Fluorosis in District Hospitals	100	230
3	No. of patients with fluorosis treated		
Oral Health			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Dental Clinics in District Hospitals strengthened	0	640
2	No. of Dental Clinics in SDH/CHC set up	0	2000
3	No. of personnel given training in Oral Health	0	2640
4	No. of Cleft Palate Care Units set up	0	10
5	Centre for Congenital Birth Defects and Craniofacial Deformities established	0	1

Epilepsy			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of District Hospitals supported for treatment of epilepsy	Limited	640
2	No. of Medical Colleges supported for 2nd line treatment	Limited	149
3	No. of EEG Machine & other equipment supplied	Limited	790
4	No. of EEG Technicians appointed	Limited	790
5	No. of District Team of Trainers trained	0	640
Hereditary Blood Disorders			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Medical Colleges/ hospitals strengthened for diagnosis and management of Genetic Blood Disorders	0	120
2	Molecular Genetic Lab. Established for confirmatory diagnosis of Genetic Blood Disorders	0	20
3	No. of personnel trained in diagnosis and management of Sickle cell anemia, Hemophilia and Thalassemia		
Trauma Care			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of New Trauma Centre (L-I, L-II, L-III) set up		20+50+90
2	No. of Neuro-rehab Centres established	0	1 (Apex) 4 (Regional)
3	Trauma Registry set up and maintained		
4	No. of road traffic accidents provided treatment		

Prevention & Management of Burns			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Medical Colleges with Burn Units	Limited	147
2	No. of Burn Units set up in District Hospitals	Limited	492
3	No. of Burn Cases provided treatment as in-patients		
Health Sector Response to Disasters			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of CBRN Medical Management Centres established		6
2	No. of training labs made functional		
3	No of mobile hospitals procured		4
4	No. of units retrofitted and functional		6
5	No. of Strategic Health Operation Centre (SHOC) set up		15
6	No. of Trainers trained		
7	No. of staff of different categories recruited		
8	No. of personnel trained in each category		
9	No. of vulnerable districts covered with CBRN facility		50
10	No. of districts covered with trained QMRTs		6
Musculo-skeletal Disorders			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of MSD Units set up in District Hospitals	Limited	640
2	No. of MSD Units set up in CHCs	0	4520
3	No. of MSD Cases provided treatment as in-patients		
4	No. of MSD Cases provided rehabilitation services		
5	No. of personnel trained in each category		

Physical Medicine & Rehabilitation			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	Upgradation of PMR in Medical Colleges	30	150
2	Apex PMR Institutes	0	4
3	No. of staff appointed		
4	No. of cases treated in PMR Department		
Blindness Control			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Regional Institute of Ophthalmology strengthened		20
2	No. of Eye Deptt. of Medical College strengthened		146
3	No. of Eye Deptt. of District Hospitals upgraded		631
4	No. of new Vision Centres set up		3000
5	No. of new Eye Banks supported		20
6	No. of dedicated eye ward and OT constructed		30
7	No. of Multi-purpose District Mobile Ophth. Unit set up		100
8	No. of Teleophthalmology Units set up		60
10	No. (&% of IOL) cataract surgeries performed		3.50 crore
11	No. of school children with refractive errors given glasses		50 lakh
12	No. of old persons given free Spectacles for near work		10 lakh
13	No. of donated eyes collected and utilized		3.00 lakh
14	No. of additional eye surgeons and other staff recruited		600
16	No. of Nurses and Ophthalmic Assistants trained		3000

Deafness Control			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of health care personnel trained under the programme.		
2	No. of District Hospitals provided equipment		640
3	No. of CHCs/PHCs provided equipment		
4	No. of Hearing Impaired persons identified		
5	No. of persons rehabilitated with hearing aids and therapy		
6	No. of Hearing Impaired children rehabilitated by Hearing & Speech therapists.		
7	No. of screening camps organized		
8	No. of persons identified with hearing impairment, referred and treated following screening camps		
Health Care of the Elderly			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of District Hospital with Geriatric Clinic & Ward	100	640
2	No. of Geriatric Clinic set up at SDH/CHC/PHC		2000
3	No. of Regional Geriatric centres in Medical Colleges	8	20
4	National Institute of Ageing established	0	2
5	No. of Old Age Homes supported for Health Care	0	1400
6	No. of persons treated in Geriatric Clinics (in- & out-patients)		
7	No. of bed-ridden elderly provided home based care		

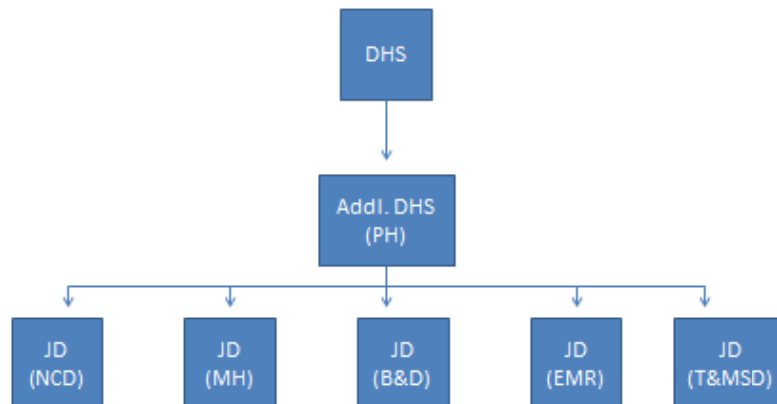
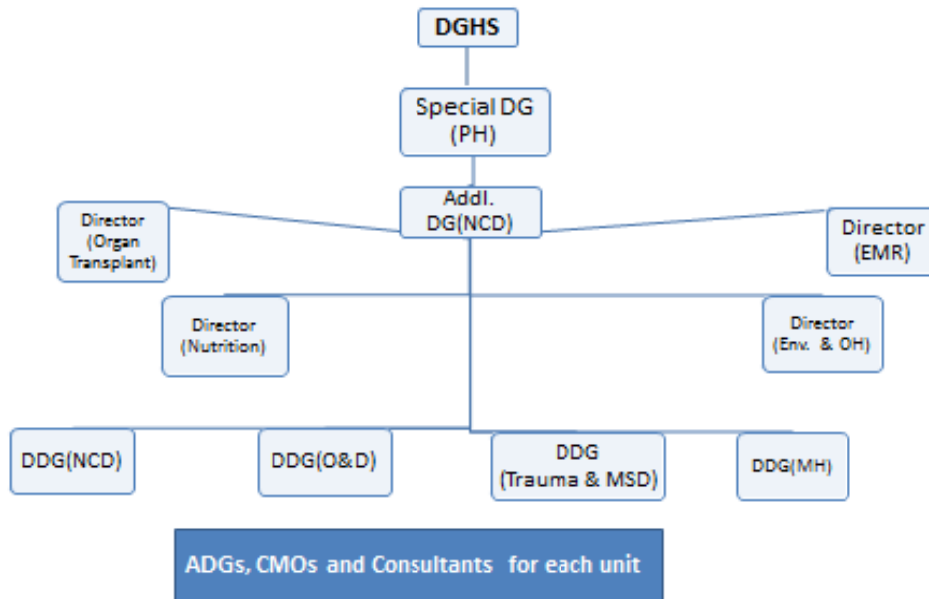
Tobacco Control			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of State Tobacco Control cells established		35
2	No. of District Tobacco Control cells established		640
3	No. of tobacco product testing laboratories set up		
4	No. of tobacco cessation centres set up		
5	Global Adult Tobacco Survey conducted		
Obesity			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Obesity Guidance Clinic set up in District Hospitals		
2	No. of Nutritionists appointed in District Hospitals		
3	No. of nurses and teachers trained		
4	No. of persons attended Obesity Guidance Clinics		
National Institute for Health Promotion & Control of Chronic Diseases			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	Civil Works for NIHP-CCD completed & institute functioning		
2	No. of additional staff recruited and continuing		
3	No. of publications and documents published by NIHP		
4	No. of Health Promotion Research studies completed		
5	No. of training programmes organized		
6	No. of personnel trained by each category		

Patient Safety			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Medical Colleges complied with Patient Safety norms		149
2	No. of District Hospitals complied with Patient Safety norms		640
3	No. of staff received training on Patient Safety guidelines		
Development of APHO/PHO/Land Border Quarentine Centres			
S.No.	Monitoring Indicators	Status by March 2012	Target by March 2017
1	No. of Air Port Health Organizations developed	10	25
2	No. of Port Health Organizations developed	10	12
3	No. of Land Border Quarantine Centres developed	1	7
4	No. of persons recruited against additional posts		
5	No. of staff trained		

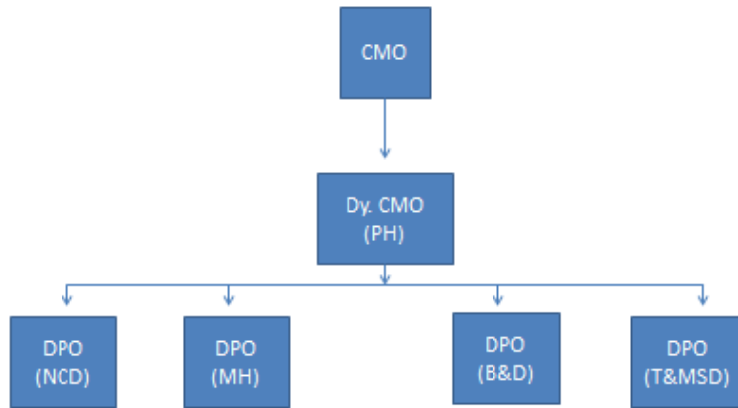
Annexure 2:

ORGANIZATION STRUCTURE

Organizational Structure at National Level



Organizational Structure at State Level



Organizational Structure at District Level

ANNEXURE 3

REFERENCES

1. Patel V, Chatterji S, Chisholm D, Ebrahim S, Gopalakrishna G, Mathers C, Mohan V, Prabhakaran D, Ravindran RD, Reddy KS. Chronic diseases and injuries in India. *Lancet* 2011; 377: 413–28.
2. Anderson, G.F. & Chu, E. Expanding priorities--confronting chronic disease in countries with low income. *N Engl J Med* 356, 209-211 (2007).
3. World Health Organization. *Preventing chronic diseases: a vital investment*. Geneva: 2005
4. World Health Organization. 2008-2013 action plan for the global strategy for the prevention and control of noncommunicable diseases : prevent and control cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. (2008).
5. Gupta R, Joshi P, Mohan V, Reddy KS, Yusuf S. Epidemiology and causation of coronary heart disease and stroke in India. *Heart* 2008 January; 94(1):16-26.
6. World Health Organization. MORTALITY AND BURDEN OF DISEASE ESTIMATES FOR WHO MEMBER STATES IN 2004. https://www.who.int/entity/healthinfo/global_burden_disease/gbddeathdalycountryestimates2004.xls 2009.
7. Joshi R, Cardona M, Iyengar S, Sukumar A, Raju CR, Raju KR, Raju K, Reddy KS, Lopez A, Neal B. Chronic diseases now a leading cause of death in rural India--mortality data from the Andhra Pradesh Rural Health Initiative. *Int J Epidemiol* 2006 December;35(6):1522-9
8. Report on causes of deaths in India 2001-2003. Office of the Registrar General of India, Govt. of India, 2010.
9. University of Sydney, Initiative for Cardiovascular Health Research in The Developing Countries, Mailman School of Public Health, The Earth Institute at Columbia University. *A Race Against Time: The Challenge of Cardiovascular Disease in Developing Economies*. Trustees of Columbia University in the City of New York; 2004.
10. Ministry of Health & Family Welfare GoI. *Report of the National Commission on Macroeconomics and Health*. New Delhi: 2005.
11. Ramachandran A, Ramachandran S, Snehalatha C, Augustine C, Murugesan N, Viswanathan V, Kapur A, Williams R. Increasing expenditure on health care incurred by diabetic subjects in a developing country: a study from India. *Diabetes Care* 2007 February;30(2):252-6
12. Xavier D, Pais P, Devereaux PJ, Xie C, Prabhakaran D, Reddy KS, Gupta R, Joshi P, Kerkar P, Thanikachalam S, Haridas KK, Jaison TM, Naik S, Maity AK, Yusuf S. Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data. *Lancet* 2008;371(9622):1435-42.
13. International Institute for Population Sciences, World Health Organisation, World Health Organisation(WHO)-India-WR Office. *World Health Survey, 2003 INDIA*. Mumbai: IIPS; 2006.
14. Mahal A, Karan A, Engelau M. The economic implications of noncommunicable disease for India. Washington: World Bank, 2010

15. Kapur A. Cost of Diabetes in India - The CODI Study. In: Kapur A, Joshi JK, editors. *Proceedings of the Novo Nordisk Diabetes Update*. Bangalore: Healthcare Communications Ltd; 2000 p. 71-7.
16. National Cancer Registry Program (ICMR), 2008
17. Nandakumar A. *National Cancer Registry Programme. Indian Council for Medical Research, Consolidated report of the population based cancer registries 1990-96*. New Delhi: Indian Council of Medical Research; 2009.
18. Ramnath T, Nandakumar A. Estimating the burden of cancer. *Natl Med J Ind* 2011; 24(2): 69-71.
19. The Atlas of Cancer in India. <https://canceratlasindia.org/map.htm> 2009.
20. International Diabetes Federation. *Diabetes Atlas*. 3 ed. Brussels: International Diabetes Federation; 2006.
21. ICMR study on Assessment of burden of Non-Communicable Diseases in India, 2004.
22. World Health Organisation. Development and updation of diabetes atlas in India, 2007.
23. Ramachandran A, Snehlata C. Current scenario of diabetes in India. *J Diabetes*; 2009 (1): 18–28
24. International Institute for Population Sciences, Macro International. *National Family Health Survey (NFHS-3) 2005-06: India*. Mumbai: IIPS; 2007.
25. Mohan V, Mathur P, Deepa R, Deepa M, Shukla DK, Menon GR, Anand K, Desai NG, Joshi PP, Mahanta J, Thankappan KR, Shah B. Urban rural differences in prevalence of self-reported diabetes in India—The WHO–ICMR Indian NCD risk factor surveillance. *Diab Res Clin Pract* 2008
26. Misra A, Pandey RM, Devi JR, Sharma R, Vikram NK, Khanna N. High prevalence of diabetes, obesity and dyslipidaemia in urban slum population in northern India. *Int J Obes Relat Metab Disord* 2001 November;25(11):1722-9.
27. Unnikrishnan R, Mohan V. Treatment of diabetes mellitus: beyond glycaemic control. *Natl Med J India* 2007 November;20(6):304-6.
28. Raheja BS, Kapur A, Bhoraskar A, Sathe SR, Jorgensen LN, Moorthi SR, Pendsey S, Sahay BK. DiabCare Asia--India Study: diabetes care in India--current status. *J Assoc Physicians India* 2001 July;49:717-22.
29. Gupta R. Trends in hypertension epidemiology in India. *J Hum Hypertension* (2004) 18, 73–78.
30. World Health Organization. *The Atlas of Heart Disease and Stroke*. Geneva: World Health Organization; 2004.
31. Perkovic V, Huxley R, Wu Y, Prabhakaran D, MacMahon S. The burden of blood pressure-related disease: a neglected priority for global health. *Hypertension* 2007 December;50(6):991-7.
32. Banerjee TK, Das SK. Epidemiology of stroke in India. *Neurology Asia* 2006; 11 : 1 – 4
33. Prabhakaran D, Yusuf S, Mehta S, Pogue J, Avezum A, Budaj A, Cerumzynski L, Flather M, Fox K, Hunt D, Lisheng L, Keltai M, Parkhomenko A, Pais P, Reddy S, Ruda M, Hiquing T, Jun Z. Two-year outcomes in patients admitted with non-ST elevation acute coronary syndrome: results of the OASIS registry 1 and 2. *Indian Heart J* 2005 May;57(3):217-25.

34. Gupta R, Joshi P, Mohan V, Reddy KS, Yusuf S. Epidemiology and causation of coronary heart disease and stroke in India. *Heart* 2008 January;94(1):16-26.
35. Reddy KS, Prabhakaran D, Jeemon P, Thankappan KR, Joshi P, Chaturvedi V, Ramakrishnan L, Ahmed F. Educational status and cardiovascular risk profile in Indians. *Proc Natl Acad Sci U S A* 2007 October 9;104(41):16263-8.
36. Aggarwal AN, Chaudhry K, Chhabra SK, D'Souza GA, Gupta D, Jindal SK, Katiyar SK, Kumar R, Shah B, Vijayan VK. Prevalence and risk factors for bronchial asthma in Indian adults: a multicentre study. *Indian J Chest Dis Allied Sci* 2006 January;48(1):13-22.
37. Jindal SK, Aggarwal AN, Gupta D. A review of population studies from India to estimate national burden of chronic obstructive pulmonary disease and its association with smoking. *Indian J Chest Dis Allied Sci* 2001 July;43(3):139-47.
38. Jindal SK, Aggarwal AN, Chaudhry K, Chhabra SK, D'Souza GA, Gupta D, Katiyar SK, Kumar R, Shah B, Vijayan VK. A multicentric study on epidemiology of chronic obstructive pulmonary disease and its relationship with tobacco smoking and environmental tobacco smoke exposure. *Indian J Chest Dis Allied Sci* 2006 January;48(1):23-9.
39. ICMR study Indian Study on the Asthma, Respiratory symptoms and Chronic Bronchitis-(INSEARCH- 2006-09), 2010.
40. Dandona R, Kumar GA, Ameer MA, Ahmed GM, Dandona L. Incidence and burden of road traffic injuries in urban India. *Inj Prev* 2008 December;14(6):354-9.
41. Agarwal et al. 2005; Agarwal and Srivastava 2009.
42. World Health Report, 2001
43. Arokiasamy P, Guruswamy M, Roy TK, Lhungdim H, Chatterji S, Nandraj S. *Health system performance assessment: World Health Survey 2003, India*. Mumbai: International Institute for Population Sciences (IIPS), World Health Organization, World Health Organization-India Office; July 2006
44. Murthy RS. Mental health initiatives in India (1947-2010). *Natl Med J Ind* 2011; 24 (2): 98-107.
45. Gururaj G. *Road Traffic Injury Prevention in India. Publication 56*. Bangalore, India: NIMHANS; 2006.
46. National Crime Records Bureau MoHAGoI. *Accidental deaths and suicides in India*. New Delhi: 2007.
47. Government of India. *National Nutrition Policy 1993*. New Delhi: Government of India; 1993.
48. Government of India (2005). *National Disaster Management Act*, New Delhi: Ministry of Law and Justice.
49. Government of India (2009). *National Policy on Disaster Management*. New Delhi: National Disaster Management Authority, Ministry of Home Affairs
50. World Health Organisation (2011). *Zoonosis and veterinary public health: The control of neglected zoonotic diseases*. Geneva. World Health Organisation retrieved on 29th June 2011 from http://www.who.int/zoonoses/control_neglected_zoonoses/en/
51. Badley EM, Rasooly I, Webster GK. Relative importance of musculoskeletal disorders as a cause of chronic health problems, disability, and health care utilization: findings from the 1990 Ontario Health Survey. *Journal of Rheumatology* 1994;21:505-14.

52. Reynolds DL, Chambers LW, Badley EM, Bennett KJ, Goldsmith CH, Jamieson E, et al. Physical disability among Canadians reporting musculoskeletal diseases. *Journal of Rheumatology* 1992;19:1020-30.
 53. Van den Velden J, De Bakker DH, Claessens AAMC, Schellevis FG. [A national study of illness encountered in general practitioners' surgeries. Basic report: morbidity in general practice] Utrecht: NIVEL; 1991 In Dutch.
 54. Malhotra & Mitthal *Indian J Med Res* 127, March 2008, pp 263-268
 55. WHO TRS -919
 56. Meta analysis- of all studies performed in almost all corners of India from the, Sridharan R, 1999.
 57. Leonardi M 2002 et al, Pahl K et al 2005, World health report 2004.
 58. *Annals of Emerg Med* 2004
 59. S. Gulati, 2011
 60. Tripathi M, 2010.
 61. D.Treiman, 1998.
 62. Kalitha J, 2010, UK Mishra, 2008
 63. Tomson, 2004
 64. Santosh D, 2007
 65. Thomas SV, 2001
 66. India CLEN Study 2002-04.
- Section 2**
67. Kinra S et al, *BMJ* 2010;341:c4974
 68. Allender S, Lacey B, Webster P, Rayner M, Deepa M, Scarborough P, Arambepola C, Datta M, Mohan V. Level of urbanisation and noncommunicable disease risk factors in Tamil Nadu, India. *Bull WHO* 2009. Article DOI: 10.2471/BLT.09.065847
 69. Ezzati M, Hoorn SV, Rodgers A, Lopez AD, Mathers CD, Murray CJ. Comparative Risk Assessment Collaborating Group. Estimates of global and regional potential health gains from reducing multiple major risk factors. *Lancet* 2003; 362 : 271-80.
 70. *Report of the expert committee on the economics of tobacco use.*
 71. Ministry of Health & Family Welfare GoI. *Tobacco Control in Schools in India. (India Global Youth Tobacco Survey & Global School Personnel Survey, 2006.* 2006
 72. Jha P, Nguyen S. *Avoidable Mortality in India. CMH Working Paper Series. Paper No. WG5 : 1.* 2001
 73. http://www.searo.who.int/EN/Section1174/Section2469/Section2482_13967.htm 2009.
 74. Drewnowski A, Popkin BM. The nutrition transition: new trends in the global diet. *Nutr Rev* 1997 February;55(2):31-43.
 75. Deaton A, Drèze J. *Nutrition in India: Facts and Interpretations* 2008. 2008. Ref Type: Serial (Book, Monograph)

76. Misra A, Singhal N, Sivakumar B, Bhagat N, Jaiswal A, Khurana L. Nutrition Transition in India: Secular Trends in Dietary intake and their Relationship to Diet-related Non-Communicable Diseases. *J Diabetes*. 2011 Jun 7. doi: 10.1111/j.1753-0407.2011.00139.x
77. Marwaha RK, Tandon N, Singh Y, Aggarwal R, Grewal K, Mani K. A study of growth parameters and prevalence of overweight and obesity in school children from delhi. *Indian Pediatr* 2006 November;43(11):943-52.
78. Nandy S, Miranda JJ. Overlooking undernutrition? Using a composite index of anthropometric failure to assess how underweight misses and misleads the assessment of undernutrition in young children. *Soc Sci Med* 2008 May;66(9):1963-6.
79. Aboderin I, Kalache A, Ben-Shlomo Y, Lynch J W, Yajnik CS, Kuh D, Yach D. *Life Course Perspectives on Coronary Heart Disease, Stroke and Diabetes: Key Issues and Implications for Policy and Research*. Geneva: World Health Organization; 2001.
80. http://www.seaofindia.com/oilimport_data/Import_data_2007-08.pdf 2009
81. Shah B. ICMR-WHO Multi-Centric Study on Risk factors for Non-Communicable Diseases based on STEPwise Approach. www.who.int/entity/chp/steps/IndiaSTEPSReport_6Centers.pdf 2009
82. Gupta R, Misra A, Pais P, Rastogi P, Gupta VP. Correlation of regional cardiovascular disease mortality in India with lifestyle and nutritional factors. *Int J Cardiol* 2006 April 14;108(3):291-300.
83. <http://indiaimage.nic.in/pmcouncils/reports/food/mreport.htm> 2009.
84. Daniel CR, Prabhakaran D, Kapur K, Graubard BI, Devasenapathy N, Ramakrishnan L, George PS, Shetty H, Ferrucci LM, Yurgalevitch S, Chatterjee N, Reddy KS, Rastogi T, Gupta PC, Mathew A, Sinha R. A cross-sectional investigation of regional patterns of diet and cardio-metabolic risk in India. *Nutrition Journal* 2011, 10:12
85. <http://www.who.int/dietphysicalactivity/pa/en/index.html> 2009.
86. WHO India-ICMR. NCD RF surveillance 2003-04. www.whoindia.org/ncd_surveillance_ncd_rf_surveillance_report.pdf 2009.
87. Misra A, Khurana L. Obesity and the metabolic syndrome in developing countries. *J Clin Endocrinol Metab* 2008 November;93(11 Suppl 1):S9-30.
88. Kelly T, Yang W, Chen CS, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. *Int J Obes (Lond)* 2008 September;32(9):1431-7.
89. ICMR Taskforce. Collaborative Study of coronary heart diseases. ICMR Taskforce, 1996.
90. Huxley R, James WP, Barzi F, Patel JV, Lear SA, Suriyawongpaisal P, Janus E, Caterson I, Zimmet P, Prabhakaran D, Reddy S, Woodward M. Ethnic comparisons of the cross-sectional relationships between measures of body size with diabetes and hypertension. *Obes Rev* 2008 March;9 Suppl 1:53-61.
91. Chambers JC et al., 2008.
92. Yajnik, 2001; Yadav, 2008
93. (Swati et al., 2008)
94. Shetty PS, 2002; Swati et al., 2008

95. Wolf AM and Colditz GA: Current estimates of the economic cost of obesity in the United States. *Obes Res* 1998, 6(2):97-106.
96. Kopelman PG: Obesity as a medical problem. *Nature* 2000, 404(6778):635-643.
97. Messerli FH, Christie B, DeCarvalho JG, Aristimuno GG, Suarez DH, Dreslinski GR and Frohlich ED: Obesity and essential hypertension. Hemodynamics, intravascular volume, sodium excretion, and plasma renin activity. *Arch Intern Med* 1981, 141(1):81-85.
98. Hajer GR, van Haeften TW, Visseren FL. Adipose tissue dysfunction in obesity, diabetes, and vascular diseases. *Eur Heart J*. 2008 Dec;29(24):2959-71.
99. Ran J, Hirano T, Fukui T, Saito K, Kageyama H, Okada K, Adachi M. Angiotensin II infusion decreases plasma adiponectin level via its type 1 receptor in rats: an implication for hypertension-related insulin resistance. *Metabolism* 2006; 55: 478–488.
100. Athyros VG, Tziomalos K, Karagiannis A, Mikhailidis DP. Dyslipidaemia of obesity, metabolic syndrome and type 2 diabetes mellitus: the case for residual risk reduction after statin treatment. *Open Cardiovasc Med J*. 2011;5:24-34. Epub 2011 Feb 24.
101. Gradmark A, Pomeroy J, Renstrom F, Steingra S, Persson M, Wright A, Bluck L, Domellof M, Kahn SE, Mogren I, Franks PW. Physical activity, sedentary behaviors, and estimated insulin sensitivity and secretion in pregnant and non-pregnant women. *BMC Pregnancy Childbirth*. 2011 Jun 16;11(1):44.
102. Hotamisligil GS, Shargill NS and Spiegelman BM: Adipose expression of tumor necrosis factor-alpha: direct role in obesity-linked insulin resistance. *Science (New York, NY)* 1993, 259(5091):87-91.
103. Cao JJ. Effects of Obesity on Bone Metabolism *J Orthop Surg Res*. 2011 Jun 15; 6(1):30.
104. Schäffler A, Schölmerich J, Buechler C. Mechanisms of disease: adipokines and breast cancer - endocrine and paracrine mechanisms that connect adiposity and breast cancer. *Nat Clin Pract Endocrinol Metab*. 2007 Apr;3(4):345-54.
105. Vona-Davis L, Rose DP. Angiogenesis, adipokines and breast cancer. *Cytokine Growth Factor Rev*. 2009 Jun;20(3):193-201. Epub 2009 Jun 10.
106. Gutjahr E, Gmel G, Rehm J. Relation between average alcohol consumption and disease: an overview. *Eur Addict Res* 2001 August;7(3):117-27.
107. World Health Organization Regional Office for South-East Asia. South-East Asia Regional Information System on Alcohol and Health. http://www.who.int/entity/substance_abuse/publications/en/india_pdf 2007; Available at: URL: http://www.who.int/entity/substance_abuse/publications/en/india.pdf
108. Indian Alcohol Policy Alliance. Alcohol Atlas of India. http://www.indianalcoholpolicy.org/alcohol_atlas_download.html 2008.
109. Patel JV, Vyas A, Cruickshank JK, Prabhakaran D, Hughes E, Reddy KS, Mackness MI, Bhatnagar D, Durrington PN. Impact of migration on coronary heart disease risk factors: comparison of Gujaratis in Britain and their contemporaries in villages of origin in India. *Atherosclerosis* 2006;185(2):297-306.
110. Gururaj G, Girish N, Benegal V. *Burden and Socio-economic impact of alcohol: The Bangalore study, South East Asia Regional Office, World Health Organisation*. World Health Organization Regional Office for South-East Asia; 2006.
111. Joshi P, Islam S, Pais P, Reddy S, Dorairaj P, Kazmi K, Pandey MR, Haque S, Mendis S, Rangarajan S, Yusuf S. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. *JAMA* 2007 January 17;297(3):286-94.

112. http://www.whoindia.org/LinkFiles/Non-communicable_Diseases_and_Mental_Health_NCD_risk_CVD_surveillance_for_industrial_settings.pdf 2009.

Section 4

113. Keith, D.S., Nichols, G.A., Gullion, C.M., Brown, J.B. & Smith, D.H. Longitudinal follow-up and outcomes among a population with chronic kidney disease in a large managed care organization. *Arch Intern Med***164**, 659-663 (2004).
114. Hallan, S.I., *et al.* Combining GFR and albuminuria to classify CKD improves prediction of ESRD. *J Am Soc Nephrol***20**, 1069-1077 (2009).
115. Levey, A.S., Astor, B.C., Stevens, L.A. & Coresh, J. Chronic kidney disease, diabetes, and hypertension: what's in a name? *Kidney Int***78**, 19-22 (2010).
116. Tonelli, M., *et al.* Chronic kidney disease and mortality risk: a systematic review. *J Am Soc Nephrol***17**, 2034-2047 (2006).
117. Barsoum, R.S. Chronic kidney disease in the developing world. *N Engl J Med***354**, 997-999 (2006).
118. Chen, C.K., *et al.* Depression and suicide risk in hemodialysis patients with chronic renal failure. *Psychosomatics***51**, 528-528 e526 (2010).
119. Meguid El Nahas, A. & Bello, A.K. Chronic kidney disease: the global challenge. *Lancet***365**, 331-340 (2005).
120. Collins, A.J., *et al.* United States Renal Data System 2008 Annual Data Report. *Am J Kidney Dis***53**, S1-374 (2009).
121. Schoolwerth, A.C., Engelgau, M.M. & Hostetter, T.H. A public health action plan is needed for chronic kidney disease. *Adv Chronic Kidney Dis***12**, 418-423 (2005).
122. (Ray BK 2002)
123. (Radhakrishnan K, 2000).
124. (Koul R 1988)
125. (Saha SP, 2003)
126. (Pal DK, 1998).
127. Mani KS, 1998).
128. Bull WHO 2010; 88:260–266.
129. Atlas of Epilepsy-2005, WHO
130. (Kwan P, 2000).
131. (Kwan P, 2001).
132. (Tripathi M, 2010).
133. (Tripathi M, 2009).
134. Government of India (1961).Transaction of Business Rules. New Delhi. Cabinet Secretariat.
135. World Health Organization (2005). International Health Regulations. Geneva: World Health Organization.
