Government of Tamil Nadu

Department of Health and Family Welfare

# Tamil Nadu Health Systems Project

(Supported by World Bank)

( 2005 – 2015 )

# Implementation Completion Results Report

September 2015

**Tamil Nadu Health Systems Project**

**Implementation Completion Results Report**

## 1. Introduction

1.1 The Government of Tamil Nadu proposed to implement a Health Systems Project in the mid 1990's to strengthen the then existing health care infrastructure in the secondary level public health institutions in the state and to address the issues prevailing namely (a) inadequate resource allocation (b) improving referral system including integration of primary level health care (c) strengthening planning and management (d) bringing in access and equity (e) improving quality of services (f) rationalization of human resources (g) bringing in public private partnerships (h) utilization of available information for taking administrative decisions (i) effectively containing the raising burden of non communicable diseases etc.,

1.2 A detailed project report titled 'Tamil Nadu Health Systems Development Project' at a total project cost of Rs.1086.00 crores was prepared by the Directorate of Medical and Rural Health Services in the year 1995 and the Government forwarded the same to Government of India for obtaining World Bank Aid to implement the project. After a prolonged and protracted consultations, discussions with Government of India, Union Planning Commission, World Bank, yearly revisions of the Project Report, many stakeholders workshops, and repeated World Bank Missions, the Tamil Nadu Health Systems Project came into being on 27.01.2005 to be implemented over a period of 5 years upto 30 September 2010. The total project cost was fixed at Rs.597.1552 crores.

1.3 During the preparatory phase prior to sanction, the following studies were made and workshops conducted to shape the project activities. (i) Social Assessment of Beneficiaries study (ii) Informal Private Health Sector Study (iii) Burden of diseases study (iv) Rational use of drugs Study (v) GPS Mapping of Health facilities (Public and Private) (vi) Facility Survey (All public hospitals in Secondary Care Sector) (vii) Tribal Health Study (viii) Study about Public Private Partnership (ix) Financial Management Study (Sponsored by World Bank). In addition to the above studies, the Government of Tamil Nadu had also conducted three major state level workshops on the following subjects (i) NGOs involved in Tribal Health Care activities and Tribal Community Leaders on activities to be implemented for Tribal Health development by the Project (ii) On Public Private Partnerships with Private & Public health care providers and Administrators (iii) Strategies to be adopted to contain Non Communicable Diseases (sponsored jointly by World Bank and Government of Tamil Nadu).

## 2. Project Rationale

2.1 The situational analysis showed that a majority of state's socially and economically disadvantaged population depends on the public health care system. The need for curative services for the poor in both urban and rural areas would therefore remain unmet where the public delivery system fails to address the need. The need, as seen in the epidemiological profile, was substantial, as certain communicable diseases have been showing rising trend, causing additional burden of disease on the state's already overburdened health care system. The public health system thus needed to be geared to deal with the dual burden of disease in the near future.

## 2.2 Project Objectives

The Goal of the Project was ' to improve the health outcomes of the people of Tamil Nadu especially the poor and disadvantaged by strengthening the health systems '. The objectives of the project were to assist the Government of Tamil Nadu to Significantly improve the effectiveness of the Public and Private health care systems in Tamil Nadu through (i) Improved access and service delivery particularly for the poor, disadvantaged and tribal groups (ii) Development of effective protocols to address key health challenges including non communicable diseases (iii) Improved oversight and system management and (iv) Public sector service efficiency measures.

## 2.3 Project Components, Sub Components & Activities

The Project consisted of the following Components, Sub Components & Activities

Component I: Increasing Access to and Utilisation of Health Services. Sub-Component 1. Reduction of maternal and neo natal mortality. Sub-Component 2. Improving Tribal Health. Sub-Component 3. Facilitating use of hospitals by the poor and the disadvantaged

Component II: Developing Effective Models to Combat Non Communicable Diseases and Accidents. Sub-Component 1. Health Promotion. Sub Component 2. Pilot testing of Non Communicable Diseases control. Sub-Component 3. Accident prevention and treatment.

Component III: Building the Capacity for Oversight and Management of the Health System. Sub-Component 1. Monitoring and evaluation. (i) Strengthening Health Management Information System (HMIS) Sub-Component 2. Improving quality of care Sub-Component 3. Health Care Waste Management. (HCWM) Sub-Component 4. Strategy development and implementation (i) Strategic planning (ii) PPP Management (iii) Health Insurance Pilot (iv) Project Management.

Component IV: Maximizing the Efficiency of the Public Sector to deliver essential services. Sub-Component 1. Rationalization of Secondary Care facilities. Sub-Component 2. Rationalizing of equipment. Sub-Component 3. Human Resource Planning & Development. Sub-Component 4. Enhancing Management of Public facilities

## 3. Additional Financing

3.1 The Government of Tamil Nadu originally mooted in 2007 to request the Additional Financing only to cover the activities which could not be carried out because of the reallocated funds to the Post-Tsunami Reconstructing Project. However given important achievement made under the project as part of its reform program, the Government of Tamil Nadu, with the strong support from the Government of India, decided to embark on a more ambitious undertaking and requested Additional Financing to consolidate the achievements made and to expand key activities state – wide. As a result, in its formal request made to the World Bank on October 14, 2009, the Government of Tamil Nadu proposed that the Additional Financing would support (i) the continuation of ongoing successful activities under the project; and (ii) the scaling up of several activities state-wide.

3.2 The rationale for Government of Tamil Nadu in requesting the Additional Financing from the World Bank was in large measure due to a successful collaboration with Bank through the original project which had introduced new approaches into the way the health sector functions, including promoting

collaboration with the Private sector, adopting quality assurance mechanism, testing the cost effectiveness of service provision, and close monitoring of the impact of these reforms

3.3 The Government had proposed Additional financing after the original Project was over. The Additional financing for three years was agreed to by the World Bank and the Project was extended upto 30 September 2013 with an additional financing amount of Rs.627.74 crores. This was further extended by a year upto 30 September 2014 and a third extension of Project implementation period was granted upto 15 September 2015 without any additional cost.

## 4. Project Implementation

### 4.1 Component 1, Increasing Access and Utilisation of Health Services. Sub-Component

### 1. Reduction of maternal and neo natal mortality.

The Government of Tamil Nadu had designated 66 Government hospitals throughout the state as 24 hours Comprehensive Emergency Obstetric and Newborn Care (CEmONC) centres in the year 2004 to provide guaranteed service to the pregnant mothers accessing these hospitals without resorting to further referral. This step was expected to bring down maternal and neo natal mortality and morbidity in the state. The Tamil Nadu Health Systems Project had taken up the CEmONC Services earnestly from 01.04.2005 and taken steps to strengthen the CEmONC centres with additional buildings, equipment and skilled human resource. In addition the Project had sent proposals to Government and established CEmONC services in 32 more hospitals during the year 2008 and 27 more hospitals in the year 2009. Thus a total of 125 hospitals spread throughout Tamil Nadu are offering definitive services to the pregnancy mothers accessing them without resorting to referral except for those requiring super specialty services which are not available. The project had (a) constructed maternity blocks in 113 hospitals at a cost of Rs.172.50 crores (b) provided equipment for labour wards and maternity blocks at a cost of Rs.35.83 crores. (c) Provided 508 specialist Doctors and 562 staff nurses on contract basis in addition to the already available Doctors and Nurses in the CEmONC centres. (d) The Project provided regular training for Women Medical Officers and Staff nurses on labour ward skill development and neo natal resuscitation. A total of 803 Doctors and 4266 Staff nurses were trained in this. (e) Ultra sonography training has been provided to 904 Medical Officers (f) Neo natal Resuscitation training has been provided to 435 Paediatric Physicians. (g) Regular regional review meetings were conducted to review the progress of the performance of the centres. So far 45 regional review meetings have been conducted in 6 regions in the state. (h) Three sensitization workshops each year on CEmONC were conducted throughout the state during the years 2006 and 2007 (h) Monthly performance report was obtained from each of the hospitals and proper feedback provided. (i) A watch on the availability of the required number of O.G. specialist, Paediatric Physicians, Anaesthetists in each of the hospitals was ensured with the Director of Medical and Rural Health Services. (j) All maternal and neo natal deaths were thoroughly enquired into through monthly video conferences apart from the maternal death audits conducted by the District health authorities and District Collector to ascertain Medical and Non Medical causes leading to the death of the mother / infant. (k) Availability of the required blood in the Blood Banks in these centres was also monitored.108 Emergency Ambulance Services are being utilized to transport the pregnant mothers to the appropriate institutions free of cost. The Project had conducted 56 workshops on CEmONCs which included reviews, lectures and seminars. The Project had brought out 14 books for training programmes and for reference purposes for CEmONC services alone. The list of books is given below (i) Baseline Survey Report – 2005-06 (ii) Mid term Evaluation Survey (iii) Final Evalution Survey (iv) Referal out Study conducted by NIE in the year 2007-08 (v) Second Referal out Study conducted by NIE in the year 2010-11 (vi) Guidelines on Blood Transfusion in Obstetrics (2014) (vii) Guidelines and Protocol for High Risk Pregnancies (2010-11) (viii) Delivering Joy (2009) (ix) Mechanical Ventilation (2012) (x) An

Overview of Obstetric Ultra Sound (2009) (xi) Facility Based New Born Care Training (xii) Handbook on Operationalisation of Neonatal Intensive Care Units (xiii) CEmONC Training module for FRU Level Health Care (xiv) Recertification format for CEmONC centres.

The Project had undertaken 5 surveys and studies in respect of CEmONC programmes. They are Base Line Survey, Mid-term Evaluation, Final Evaluation and two referral out studies.

The Project had taken up High Risk Mothers tracking scheme from July 2014 which is a focused intervention in the ante natal period to monitor the condition of the High Risk Mothers throughout the ante natal period and to ensure safe delivery in the appropriate hospital which has proved to be a successful intervention to be continued as this has resulted in the reduction of MMR upto 40% in the pilot districts where this scheme is implemented.

**Constraints :** The major problem in CEmONC was making available the required number of specialist doctors in the hospitals. This issue is being addressed by the Government.

**Result** : During the course of the Project the number of complicated maternal admissions, number of ultra sonograms done, number of blood transfusion given and number of night caesareans had increased and the referral outs from the hospitals had reduced as illustrated in Table No.1 below.

The MMR for the year 2004-06 : 111 The IMR for the year 2005 : 37
The MMR for the year 2011-13 : 79 The IMR for the year 2013 : 21

**Table 1 : CEmONC Performance 2007-08 to 2014-15**

| Details | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 upto Sept 15 |
|---|---|---|---|---|---|---|---|---|---|
| Total Mat.Admis | 2,17,004 | 2,01,737 | 2,09,069 | 2,09,101 | 2,27,353 | 2,51,236 | 2,79,605 | 2,79,571 | 142,207 |
| Com.Mat.Admis | 1,07,649 | 1,09,644 | 1,23,418 | 1,20,971 | 1,33,442 | 1,54,246 | 1,85,065 | 1,88,568 | 92,973 |
| Deliveries | 1,39,115 | 1,29,335 | 1,32,545 | 1,30,630 | 1,41,132 | 1,57,693 | 1,69,980 | 1,70,879 | 83,266 |
| LSCS | 38,590 | 42,494 | 50,121 | 53,039 | 62,233 | 73,504 | 87,768 | 90,113 | 44,302 |
| Night LSCS | 9,242 | 9,536 | 11,406 | 11,921 | 15,173 | 18,763 | 24,719 | 22,985 | 10,434 |
| Mat.Deaths | 97 | 83 | 84 | 73 | 81 | 50 | 52 | 47 | 24 |
| Ref. In. Mat.Cases | 55,880 | 61,008 | 63,979 | 60,537 | 64,515 | 62,944 | 69,424 | 71,028 | 32,438 |
| Ref. Out. Mat.cases | 6,405 | 6,884 | 6,613 | 6,221 | 6,497 | 9,072 | 9,011 | 11,222 | 6412 |
| Blood transfusion for OG cases | 15,849 | 17,824 | 22,283 | 21,818 | 27,806 | 38,897 | 48,232 | 52,083 | 27,343 |
| Scan for OG Cases | 73,479 | 76,535 | 1,02,509 | 1,21,370 | 1,44,623 | 2,13,992 | 2,77,956 | 3,02,545 | 1,41,408 |
| Neonatal Admissions | 1,41,474 | 1,33,868 | 1,38,921 | 1,39,829 | 1,41,890 | 1,24,454 | 1,16,641 | 1,03,344 | 46,024 |
| Com. Neo.Admis | 25,647 | 29,073 | 33,192 | 36,860 | 44,231 | 49,127 | 58,494 | 60,842 | 30,899 |
| Neonatal Death | 1,515 | 1,525 | 1,840 | 1,461 | 1,424 | 1,617 | 1,548 | 1,262 | 459 |
| Neo Natal Refer.In | 11,955 | 16,394 | 14,241 | 17,422 | 17,007 | 24,596 | 17,063 | 16,415 | 7929 |
| Neo Natal Refer.Out | 2,168 | 2,338 | 2,403 | 3,284 | 3,798 | 5,717 | 5,453 | 5,963 | 2831 |

*(Source : TNHSP Data)*

**Sub-Component 2: Tribal Health Development**. The Government of Tamil Nadu was quite concerned about improving the health of Tribal population which constitutes 1% of the total population of the state. Of this 1% half the Tribal population were living in the plains who do not have problems in accessing health care. However, those who were living in the hills and remote inaccessible areas do have access problems. Tribal health development was one of the activities included in the Project report. The TNHSP planning team as per the decision taken during the discussions with the World Bank had organized a **'Tribal Stake Holders Consultative Meeting'** on 21 October 2003 in which the Tribal leaders, NGOs working for Tribals, Administrators and planners participated. The meeting helped the Project to formulate the **'Tribal Health Development Plan'**. Based on the plan the following activities have been included in the Project Implementation Plan (PIP) document. It was decided to carry out all the following activities by partnership with Non Governmental Organisations (NGOs) under **Public Private Partnership (PPP)** mode. The activities planned were

(i) Mobile outreach health services in Tribal areas
(ii) Sickle cell anemia intervention programme
(iii) Bed grant scheme for NGO run hospitals in Tribal areas
(iv) The Tribal patients counselors in health facilities in Tribal areas

As planned all activities were being run through the NGOs selected by the Committee headed by the District Collector in the respective districts. Under mobile outreach services the NGOs were provided with a vehicle and funds for operating a mobile Health team consisting of a doctor, a staff nurse, a lab technician and a driver. The team visited one Tribal village daily and covered all Tribal villages in the area and offer medical services. Based on the success of these programmes Mobile outreach health services were increased from 12 to 20. Under the Bed grant Scheme the Tribal patients could get inpatient treatment including surgeries and delivery coverage in the designated NGO run hospitals in the Tribal areas free of cost and the cost was reimbursed by the project. The Bed grant hospitals were increased from 3 to 4. The sickle cell Anemia is a genetic disorder affecting certain sections of the Tribal people. The project through the selected NGOs undertook the screening of the population for the disease, Pneumococcal Vaccination for those affected by the disease, regular supply of hydroxyl urea tablets, admission for sickle cell crisis which may include frequent blood transfusions. The number of NGOs providing sickle cell anaemia treatment was increase from 2 to 3 during the additional financing period. The project also employed Tribal counselors in the Health institutions in Tribal areas to counsel the Tribal patients accessing these hospitals and to guide them by allaying their anxiety and apprehensions. The Tribal patient counselors were increased to 42 from 32. A total of 5 consultative workshops were conducted with the Tribal community leaders, officials from line department and implementing officials in the districts along with the NGO partners. Regular quarterly review meetings were conducted by the Project Director with the NGOs and District level Health officials to improve the Tribal Health activities

**Result** : The performance of the Tribal Health Development activities over the years is given in the following tables which indicate the increased access to health institution for the Tribal population provided by the project through the above activities.

**Tribal Mobile Out Reach Services**

| S. No | Activities | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 (Jul 15) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | No. of vehicles | 12 | 12 | 12 | 12 | 18 | 18 | 20 | 19 | 20 |
| 2 | No.of OP Treated | 137543 | 266040 | 274791 | 240347 | 280905 | 301090 | 337230 | 248320 | 69047 |
| 3 | No.of persons referred | 4177 | 19306 | 7414 | 3491 | 3161 | 5350 | 5068 | 5086 | 1618 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | No.of AN Check up | 2057 | 4233 | 4165 | 3822 | 4291 | 5784 | 4578 | 7145 | 2085 |
| 5 | No.of PN Check up | 1410 | 4905 | 4008 | 3387 | 2245 | 3871 | 3176 | 3061 | - |
| 6 | Lab. Investigation | 29167 | 33262 | 45860 | 45150 | 56890 | 74016 | 58667 | 79534 | - |

*(Source : TNHSP Data)*

**Sickle Cell Anemia**

| S.No | Activities | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 (Jul 15) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | No. of NGOs | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 2 | Primary screening (No. of persons). | 4225 | 3224 | 3249 | 2857 | 3669 | 4676 | 894 | 1248 |
| 3 | Secondary confirmative test. | 1939 | 671 | 583 | 517 | 561 | 854 | 184 | 135 |
| 4 | Positive for secondary confirmative test. | 78 | 43 | 61 | 33 | 22 | 15 | 25 | 18 |

*(Source : TNHSP Data)*

**Bed Grants - (Treatment given for Inpatient)**

| S.No | Activities | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 (Jul 15) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | No. of NGOs | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 3 | 3 |
| 2 | No.of Inpatients Treated | 503 | 1141 | 1355 | 906 | 2125 | 2749 | 3106 | 2329 | 498 |

*(Source : TNHSP Data)*

**Tribal Patient Counselors Performance**

| S.No | Activities | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 (Jul 15) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | No. of counseling Centre | 30 | 30 | 30 | 32 | 42 | 42 | 42 | 42 |
| 2 | No . of counselors | 30 | 30 | 30 | 32 | 42 | 39 | 39 | 39 |
| 3 | No. of patient counselled | 80512 | 250613 | 270836 | 487477 | 429524 | 417018 | 192264 | 66553 |

*(Source : TNHSP Data)*

**Sub Component 3 :** Facilitating use of hospitals by the poor. In order to improve the accessing of health care institutions by the poor and to guide them the Project had posted 3 Patient Counselors in

each of the CEmONC hospitals and hospitals located in the districts in the Tsunami affected areas. A total of 492 patient counselors were posted through NGOs. All these counselors were providing guidance to the patients as well as counseled them on prevention of diseases and life style modification. They counseled the pre and post operative patients, antenatal and postnatal mothers also. However, their services were discontinued from October 2011 as they could not be taken into the regular department.

**Component II : Sub Component 1 : Health Promotion** : During Phase I of the Project the health promotion activities were taken up mainly for informing the community to access CEmONC services, on life style modifications for prevention of Non Communicable Diseases, facilities available under Tribal Health interventions of the Project and provision of signage, information boards etc., to the hospitals. The health promotion included, in addition to the above, community based, school based and work place based activities also which are discussed in the Non Communicable Diseases activity. Before undertaking the IEC activities a community needs assessment study was conducted using audience centered quantitative and qualitative research methodology through structured interviews and focus group discussions. The following IEC materials were developed and utilized (i) Posters on antenatal care (ii) IEC creative relating to awareness on CEmONC (iii) Hospital Signage (iv) IEC for patient counseling services (v) 108 Emergency Ambulance Services (vi) Free Mortuary Van Services (vii) Bio Medical Waste Management (viii) Posters, Bus boards, Fillip charts, Radio jingles and T.V Commercials on Cardio Vascular Diseases Prevention Diabetes and Cancer.

**Result :** The behavior change communication activities of Tamil Nadu Health Systems Project were very effective ascertained from the fact of increased people accessing the health facilities and from the end line survey reports on CEmONC, Tribal Health and NCD Programmes.

**Component II : Sub Component 2 : Non Communicable Diseases Programme :**

Tamil Nadu has been undergoing double burden of disease as the incidence of communicable diseases was on the decline and there was an alarming rise of the incidence of Non Communicable Disease especially Hypertension, Diabetes mellitus, Cancers and Road traffic accidents. The Government had desired to include all the above diseases in the project implementation plan. In the discussions held during the pre-sanction stages of the project it was mutually agreed to pilot prevention, screening and treatment of Hypertension and cervical cancer only that too only in two districts each. Several workshops on Non Communicable Diseases were conducted and the modalities for going ahead with the NCD programme was finalised for implementation during the original project.

**Hypertension pilot**

The Hypertension pilot was carried out in the districts of Virudhunagar and Sivagangai following a survey on the awareness of the community regarding risk factors leading to Non Communicable Diseases, in four districts out of which Villupuram and Theni districts were taken as control districts. The emphasis was more on behavior change communication in the community for creating awareness about the risk factors of NCD and to bring out lifestyle modification. Simultaneously screening for hypertension, treatment and follow up were also carried out. Training programmes were conducted for health care providers and patient counselors and staff nurses were employed to assist the Medical Officers in the programme. School based, community based and work place based activities were carried out by the project in the above two districts by hiring the services of a NGO, M/s Gandhigram Institute of Rural Health and Research.

**Cervical cancer**

Cervical cancer screening of women in the community along with awareness creation was carried out in Theni and Thanjavur districts. Simple but reliable VIA/VILI technique was employed instead of conventional, time consuming PAP smear method. Training programmes were conducted for women medical officers, staff nurses and village health nurses. Detailed protocols on treatment, administration and referrals were worked out. Women link Volunteers were employed to sansitise women in their house hold and to send to health institutions for screening. All men and women 30 years of age and above were screened for Hypertension in the pilot districts Virudhunagar and Theni districts. Women 30 years and above were screened for cervical cancer in Theni and Thanjavur districts.

The pilots were carried out for a period of 30 months from April 2007. The pilots were concurrently evaluated by **National Institute of Epidemiology, Chennai** an unit of **ICMR**. The cost benefit analysis was carried out by **Public Health Foundation of India, Delhi**. The performance of the pilot programme is given below.

Hypertension pilot in Virudhunagar and Sivagangai districts

| No. of persons screened | No. of persons positive for hypertension |
|---|---|
| **12,31,259** | **77,757** |

*(Source: TNHSP-NCD cell data)*

Cervical Cancer pilot in Theni and Thanjavur districts

| District | No. of women screened | No. found VIA/VILI positive | Biopsy confirmation & treated |
|---|---|---|---|
| **Theni** | **1,96,559** | **5090** | **241** |
| **Thanjavur** | **2,91,525** | **15743** | **942** |

*(Source: TNHSP-NCD cell data)*

Based on the success of the pilot programme it was decided to scale up the NCD intervention programme in all districts of Tamil Nadu. It was also decided that the following four diseases were to be taken up during the pilot. They are (a) Hypertension (b) Diabetes mellitus (c) Cervical Cancer (d) Breast Cancer. As the original TNHSP project was to end by 30 September 2010 the Government had proposed for additional financing for three more years and one of the main subject to be taken up was NCD programme. This was agreed to by the World Bank and proposals were submitted to Government for scaling up NCD programme and orders were obtained.

**Upscaling**

The programme was upscaled to the entire state in two phases covering 16 districts in 2011 and the remaining 16 districts in 2012. Based on the lessons learnt during the pilot like ensuring dedicated human resources, uninterrupted supply of medicines and reagents, timely supply and regular maintenance of equipment, periodic reorientation of staff, follow up of positive patients etc. were addressed in the scale up.

**Objectives**

The overall objectives of the Non Communicable Programme were

(a) To reduce the morbidity and mortality due to Hypertension, Diabetes mellitus, Cervical Cancer, Breast Cancer in the community by providing screening, treatment and follow up services through a well designed NCD intervention program using standard screening and treatment protocols.
(b) To create awareness in the community through health promotion activities for prevention.

**Scope**

(a) Opportunistic screening for all men aged 30 years and above for Hypertension & Diabetes Mellitus and women in addition for Cervical and Breast Cancer.
(b) Follow up and treatment of all screened positive individuals.
(c) Integrating the counseling for individuals on Life Style Modification along with the treatment.
(d) Behavior change Communication (BCC) through strategies aiming at the community for creating awareness regarding modifiable risk factors leading to Non Communicable Diseases.

**Approach**

A four pronged approach namely (i) Clinic based (ii) School based (iii) Community based & (iv) Work place based approach was planned.

**Clinical intervention**

(a) Under the clinical intervention approach, services are provided free of cost to all individuals attending any of the Government health facilities which includes 1753 PHCs, 270 GHs and 19 Government Medical Colleges and ESI dispensaries and Hospitals besides 100 selected Municipal health facilities in the state.

**School based intervention**

(a) Chapters on Non Communicable Diseases incorporated into the syllabus of VI, VII and VIII standards.
(b) School Club formed in every school.
(c) Activities focused on creating of awareness on NCD related unhealthy life styles and adoption of healthy practices among the school children.
(d) Awareness creation activities like exhibition, rally, IEC display, contests were conducted in every school health clubs in about 16369 Government School in every State during the academic years 2013-14 and 2014-15 through Sarva Shikshya Abhiyan (SSA) wing of Education department of Tamil Nadu.

**Community based Intervention**

(a) The Self Help Group Women in Tamil Nadu were sensitised on Non Communicable Disease and encouraged to undergo screening for themselves in the nearby Government health facilities through organized sensitization session by trained Community Professionals (CPs) & Community Resource Persons (CRP).
(b) This was carried out through Tamil Nadu for Corporation for development for women (TNCDW) and Tamil Nadu Pudhu Vazhvu Project (TNPVP) under Rural Development Department.
(c) A total of 2,93,993 Self Help Groups were covered in Tamil Nadu.

**Work place based Intervention**

(a) The sensitization session and BCC activities were carried out to create awareness among employees in about 400 selected work places during 2013 by hiring the services of Gandhigram Institute of Rural Health & Trust, Dindigul.
(b) This was intervention which had its own limited scope but the lessons learnt were useful for the Project.

**Female NCD Staff Nurses**

In order to assist the Medical officers in the NCD intervention programme 2432 female NCD Staff Nurses posts have been created for the health institutions exclusively for this programme and nurses have been posted on contract.

**NCD Online Screens**

It was also planned to use information technology extensively for the programme and online screens have been developed for screening, referral out, investigations, treatment and follow up of patients.

(a) NCD online screens were developed and deployed on the existing HMS platform
(b) Clinical decision support system (CDSS) integrated with the screens for the assistance of physicians and NCD staff nurses
(c) NCD Screens deployed for use in 1753 PHCs and 267 GHs.
(d) In Phase III implementation of HMIS, all Medical college hospitals were also linked.
(e) The list of NCD screens including 'Reporting screens' is enclosed in Annexure II.
(f) The screens were revised as per the need based on feedback from end users and additional screens like 'Follow up screens' were also subsequently designed and deployed for effective data capturing.

**Training**

The entire process of upscaling was comprehensively supported by a cascade of trainings at all levels to train all cadres of health functionaries under the Department of Health & FW. Various training modules were designed, pre-tested, printed and deployed to meet the training needs of various categories of staff. The trainings focused on the general aspects of the program or on required skills to be imparted for those staffs handling procedures related to screening and confirmation. The training cascade had the standard pattern Training of Trainers (TOT) for the master trainers who in turn would train the staff at the district level. The flow chart showing the cascading of the training is presented below.

| Name of the training | Category | TOTAL TRAINED |
|---|---|---|
| General NCD Training | Medical Officers | 6403 |
| | NCD Staff Nurses | 2201 |
| | Other Staff Nurses | 11049 |
| | Pharmacists | 2380 |
| | Laboratory Technicians | 1748 |
| | Auxiliary Nurse & Midwife | 1532 |
| | Field Staffs | 11642 |

| | | |
|---|---|---|
| Skill based training on Colposcopy & Cryotherapy | Obstetrician & Gynaecologist | 530 |
| | Female Medical Officer | 111 |
| Skill based training on VIA/VILI & CBE procedures | Female Medical Officer | 1024 |
| | NCD Staff Nurse | 2030 |
| | Other Staff Nurse | 7985 |
| | Auxiliary Nurse & Midwife | 888 |
| ELCOT (Online) Training | Staff Nurses | 3471 |
| State level Training for IDSP Data Managers on NCD online screens | Integrated Disease Surveillance Project Data Managers | 33 |
| One day CME Programme for Gynaecologists in the state on Cancer screening and follow up | Gynaecologists | 271 |
| State level training for CRPs and CPs (Community Based Intervention ) | Community Professionals, Community Resource Persons and APMs | 213 |
| District level training for CPs and CRPs (Community Based Intervention ) | Community Professionals | 2092 |
| | Community Resource Person | 4184 |
| Stage III Sensitization SHG women | Tamil Nadu Corporation for Development of Women | 146238 |
| | Tamil Nadu Pudhu Vazhvu Project | 104238 |
| Regional level Refresher training for Staff Nurses | Staff Nurses | 2344 |
| One day State Level Training on Revised NCD Online screens for Master trainers | District Project Management Unit Coordinator | 25 |
| | Technical Coordinator (IT) | 36 |
| | Integrated Disease Surveillance Project | 28 |
| Two days training for AD Statistics and IDSP Managers | Assistant Director of Statistics | 27 |
| | District Statistical Assistants | 11 |

| | | |
|---|---|---|
| | Integrated Disease Surveillance Project Managers | 33 |
| NCD training for staff nurses in Private Empanelled Hospitals | Staff nurses | 980 |
| State level training for master trainers for patients pathway to standard protocol | Master trainers | 116 |

*(Source: TNHSP-NCD cell data)*

**Training Modules prepared under NCD intervention programme**

i. Manual for programme managers (English)
ii. Clinical manual for medical and paramedical staff (English)
iii. Manual on Colposcopy & Cryotherapy for medical professionals (English)
iv. Manual on VIA/VILI & CBE procedures for medical and paramedical staff (English)
v. Module for Lab Technicians and Pharmacists (Tamil)
vi. Module for Field health staffs(Tamil)
vii. Module for ANM(Tamil)
viii. Module for CPs/CRPs for community based intervention(Tamil)
ix. Manual for Workplace based Intervention (Tamil)

**Concurrent Evaluation of NCD interventions program by NIE**

(a) Concurrent Evaluation of NCD Program and monitoring of data was carried out by National Institute of Epidemiology through the 32 Statistical Assistants appointed @ one per district

(b) The NIE also carried out nine different surveys as listed in the table below:

| Intervention | Name of survey |
|---|---|
| i. School based activity | • Baseline |
| | • Endline |
| ii. Community based activity | • Baseline |
| | • Endline |
| | • Concurrent evaluation |
| iii. Workplace based activity | • Process evaluation |
| iv. Clinic card abstraction survey | • Part of Concurrent evaluation |
| v. Patient exit survey | • Part of Concurrent evaluation |
| vi. Coverage survey | • Part of Concurrent evaluation |

*(Source: TNHSP-NCD cell data)*

**Books Published**

| S.no. | Name of the book |
|---|---|
| **1** | Documentation and Dissemination of a **Best Practice on Cervical Cancer** by Tamil Nadu Health Systems Project with documentation support by Ministry of Personnel, Department of Administrative Reforms & Public Grievances, GOI |
| **2** | Documentation and Dissemination of a **Best Practice on Cardio Vascular Diseases** by Tamil Nadu Health Systems Project with documentation support by Ministry of Personnel, Department of Administrative Reforms & Public Grievances, GOI |

*(Source: TNHSP-NCD cell data)*

**Logistics including Reagents, Equipments & Drugs**

- Reagents, Consumables and Equipments were supplied through TNMSC directly to the health facilities.
- NCD drug Pass books were issued to each health facility to separately indent and receive required drugs as detailed below for NCD programme from respective TNMSC drug warehouses.
- Patient Welfare Funds used for managing acute shortage of drugs, reagents & minor repair of equipments and any interim needs.

**Quality Control of Labs (External/Internal Quality Assurance Scheme- EQAS/IQAS)**

- EQAS and IQAS is being implemented in 777 Government labs which includes 20 Medical college Hospitals, 266 Government Hospitals and 491 PHCs through Quality Control wing under Department of Clinical Biochemistry, Christian Medical College.
- The non performing as well as poorly performing labs are monitored both at district and state level to improve the quality lab services related to NCD program.

**Bottlenecks and issues addressed during Implementation phase**

- Ensuring more regular referrals by doctors in the Out Patient Department of all eligible patients to the NCD clinic.
- Promoting greater utilization of NCD screening through IEC and by ensuring the consistent availability of a dedicated, easily identifiable/locatable space for the NCD clinic.
- Challenges faced by freshly graduated staff nurses tasked with manning the NCD clinic in handling the patient load in terms of screening, counseling and data collection (and, in PHCs, drawing blood for diagnostics).
- More complete follow-up of suspected patients directed for lab investigations to ensure that they access lab tests, and making it easier for them to do so.
- Ensuring 30 days supply of medicine for Hypertension and DM.
- Ensuring computer access for NCD staff nurses in PHCs.
- Adherence to protocol and whole lot of other issues addressed through refresher training.
- In case of diabetes, loss of individuals during screening, follow-up for treatment of those with the disease and identification of complications were some challenges.
- Follow-up of Hypertensive patients for regular treatment.
- In case of Cancer Cervix, women were lost when referred for colposcopy and further investigations.
- Completion of screening for all four diseases in case of women without losing them.
- Issues with optimal use of NCD online screens and analysis of NCD data by implementing officials
- A multi-layered monitoring system has been established with the NCD cell at TNHSP leading the activity.
- Outstanding colposcopy loads addressed by organizing fixed day clinics, provision of community health worker support in accessing care, institutionalization of colposcopy calendars for lower referring and higher level referee institutions to systematize patient flow, training of additional female medical officers in colposcopy and cryotherapy techniques.
- Timely reception of biopsy results in case of cervical and breast cancer.
- The process pathway was thoroughly studied through stakeholders meeting at State level and follow up protocol was developed and finalized. State level training on follow-up protocol completed and district level trainings are planned
- Follow-up of patients through mobile number to enable them to return for Fasting Blood Sugar (FBS) or for VIA-VILI (in cases where they have declined on the day of HT screening) or women who are VIA / VILI positive can be followed up.
- Smooth transition from manual registers to online system.
- Addressing issues related to performance of labs under EQAS for CVD related lab investigations.
- Transition of data monitoring activities from NIE to IDSP staff.

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**Key Challenges and Mid – course corrections made**

- Recruitment hurdle and attrition of NCD staff nurses overcome by outsourcing.
- Periodical training programme for addressing gaps in knowledge and skills.
- Skill based training on Colposcopy & Cryotherapy to Female Medical Officers to overcome the shortage or non availability of Gynecologists.
- Issues with online screens, data capture, tracking defaulters, and reporting solved by frequent meetings between NCD team and TCS.
- Implementation issues addressed by meetings, inspections & video conferencing.
- Display boards for the beneficiaries to inform services available and protocol boards for health staff for adherence.
- Adopting Colposcopy calendar by mapping referral institutions with Government hospitals / Medical college hospitals providing Colposcopy services was implemented to overcome backlog in Colposcopy services.
- The process pathway was thoroughly studied through stakeholders meeting at State level and a follow up protocol was developed and finalised. State level training on follow-up protocol completed and district level trainings are planned.
- Follow up of patients through line- listing and tracking them online.
- Comprehensive exit plan to sustain the program through National Programme for Control of Diabetes, Cancers and Stroke (NPCDCS).

**IEC Activities carried out**

IEC activities in the form of mass media (TV Commercials and Radio spots), print materials (Posters, Stickers, Flipbooks and Pamphlets, Outdoor media (through display boards and Bus back panels) and Street plays are deployed to create awareness and to promote health seeking behavior in the community.

**Performance of NCD Programme :**

| Disease | Total Screened | Total Positive |
|---|---|---|
| **Hypertension** | 29590362 | 2840642 |
| **Diabetes Mellitus** | 23467953 | 976757 |
| **Cancer Cervix** | 10424002 | 357448 |
| **Cancer Breast** | 12702566 | 155568 |

*(Source: TNHSP-NCD cell data)*

**State Level Screening and detection of Positive cases**

**From July 2012 to September 2015**

| State Level Screening and detection of Positive cases from July 2012 to September 2015 | | | |
|---|---|---|---|
| | **Total Number screened** | **Number detected Positive in screening** | **Positivity Rate** |

| S. No | Year | HT | DM | CaCx | CaBr | HT | DM | VIA/ VILI+ | CBE+ | HT PR | DM PR | VIA/ VILI + PR | CBE + PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2012 | 2034924 | 989798 | 285019 | 665846 | 159908 | 46827 | 12784 | 7477 | 7.86 | 4.73 | 4.49 | 1.12 |
| 2 | 2013 | 9446394 | 6812606 | 3123492 | 4023771 | 968543 | 325543 | 137411 | 52379 | 10.25 | 4.78 | 4.40 | 1.30 |
| 3 | 2014 | 11209121 | 9663482 | 4407657 | 5058518 | 1118794 | 386745 | 143587 | 62123 | 9.98 | 4.00 | 3.26 | 1.23 |
| 4 | 2015 | 6338425 | 5538858 | 2440267 | 2747361 | 545209 | 199401 | 59568 | 31351 | 8.60 | 3.60 | 2.44 | 1.14 |
| | Total | 29028864 | 23004744 | 10256435 | 12495496 | 2792454 | 958516 | 353350 | 153330 | 9.62 | 4.17 | 3.45 | 1.23 |

**Colposcopy and follow up report (July 2012 – September 2015)**

| Colposcopy and follow up report (July 2012 - September 2015) | |
|---|---|
| Total No. of VIA/VILI Positive Cases | 346765 |
| Total No. of Colposcopy Done | 184920 |
| Total Number of Biopsies taken | 70682 |
| Total No of Biopsy/ ECC sent for HPE | 63608 |
| Total No of result received from Lab | 51042 |
| Normal | 41192 |
| CIN I | 4180 |
| CIN II | 1801 |
| CIN III | 1180 |
| Diagnosed as Neopastic based on HPE | 2204 |
| Refered to higher institution | 3230 |
| No of Cryotherapy Done | 1288 |
| No of Conisation Done | 455 |
| No of Hysterectomy Done | 1853 |
| No of Chemotherapy given | 756 |
| No. of Radiotherapy given | 691 |

*(Source: TNHSP-NCD cell data)*

**Result**

Apart from the number of persons benefited out of the NCD programme, by which many people were screened for NCD, many were diagnosed as having NCD and are undergoing treatment thereby they are prevented from getting complications like Stroke, Myo Cardial Infarction, Kidney failures, full blown Cancers etc. Crores of peoples have been sensitized regarding risk factors leading to NCDs and advised life style modification. As this programme is an ongoing one more and more people will be benefited resulting in their health outcomes and economic wellbeing also.

**Component II : Sub Component 3 : Accident Prevention & Treatment**

Tamil Nadu stands second in the number of fatalities due to Road Traffic Accidents (RTA) in India. The number of two wheelers among all vehicles is very high and large number of serious injuries and fatalities were being reported among the two-wheeler riders. The key area to be addressed in the health system was to avoid delay in providing immediate trauma care to the victims which would reduce incidence of morbidity and mortality.

**Objectives of the Scheme :**

The Project aimed to providing immediate medical aid at the accident spot and transportation of the injured person to hospital, creating infrastructure in the hospitals throughout the state to ensure that all trauma care related facilities are in a state of readiness to help the accident victims. An effective BCC was needed for safe driving and accident prevention.

**Proposed Action Plan :**

i. Stepping up BCC activities to spread awareness about safe driving and accident prevention.
ii. Starting a series of accident relief centers in the National and State Highways.
iii. Strengthening Emergency Management Services in the Hospitals by providing infrastructure, skill development, following standards treatment protocols for treatment of emergency and poisoning cases and IEC activities.
iv. Establishment of Poison information cell as 30% of medical emergencies are due to poisoning. The cell would be conducting the training in basic life support to medical and Para-medical staff. All the ICUs in the Districts HQ hospitals will be strengthened under the project to enable effective management of poisoning cases.

**Activities Undertaken :**

A two day workshop on Road Traffic Accidents Prevention and trauma care was conducted by TNHSP on 25.04.2006 at Chennai. The objectives of the workshop was to analyse the road traffic injuries and to workout strategic approaches and future plan for prevention of RTA. The workshop was attended by World Bank Officials, TNHSP Officials, HOD from National Institute of Mental Health and Neurological Sciences, Bangalore, Additional D.G.P. State Traffic Planning Cell, Joint Police Commissioner Traffic, Officials from Metropolitan Transport Corporation, Road Transport Department, Automobile Association of South India, Motor Vehicle Maintenance Department, Highway Research Station, DMS, DME etc.

As the Government of Tamil Nadu has taken up implementation of a separate 'Road Sector Project' funded by World Bank this activity by TNHSP was dropped except for conducting a Helmet usage study in ten major cities for ten months. 108 Emergency Ambulance Services was subsequently established to transport the accident victims from the accident spot to the hospitals. The trauma care wards of all major hospitals were strengthened through the Government of India trauma care programme. As many as 66 secondary care hospitals were provided with dedicated 'Poison Treatment Centers' apart from the availability of such centers in all medical College Hospitals.

**Component III : Building the Capacity for Oversight and Management of Health Care System.**

Sub Component 1 : Strengthening Monitoring and Evaluation by strengthening Health Management Information System (HMIS)

**Objectives :**

a. To deliver evidence based health care to the people by using a judicious combination of

information technology and hospital management system

b. To provide information based support through real time data for implementation of reforms by health administrators and policy makers

**Scope :**

Prior to the implementation of HMIS, in Government Hospitals, patient records were entered manually and maintenance/retrieval of manual records were time consuming and inaccurate. Monthly reports were sent as hard copy and this remained as a challenge for data compiling and analysis. No real time data for monitoring the hospitals were available, drugs and equipment inventory were not accurate. HMIS eased this process and give the Tamil Nadu Health Care system a significant leverage in efficient management across the entire state.

The HMIS application was envisaged as a single State Health IT system. A totally centralized web based system on fully open source technologies was decided upon to optimize investments and more importantly, overcome the maintenance and skills availability at district/hospital level.

**List of Sub activities**

i. HMS - Hospital Management System

ii. MIS - Management Information System

iii. CMS – College Management System

iv. UAS – University Automation System

**Evolution of the activity :**

With the HMIS in place, managing infrastructure, equipment, admissions, surgeries, deliveries etc., all the records were tracked with ease. The record of each patient was transferred from ward to ward based on requirement. Lab testing and results could also be noted and remain in the system to be accessed if needed later. Thus management of the outpatient through this system has made hospital work flow more effective and less time consuming. Tamil Nadu Health Systems Project had envisaged the advantages of HMIS and had included in the project implementation plan which was approved by the World Bank. The Project had obtained Government orders and M/s Tata Consultancy Services were selected by following World Bank procurement procedures for development of software application, training of health care providers, to provide technical inputs for hardware & connectivity and for handholding the system. The firm had prepared software application for HMIS. Since establishment of web based HMIS in all health institutions and their controlling Offices, will be a very big task, it was decided to take up the districts in phases as follows

(a) Pilot 5 Hospitals

(b) Phase I : 5 Districts

(c) Phase II : 26 Districts

Though the software application is compatible for primary care and tertiary care hospitals it was decided to take up only secondary care hospitals during the original phase. After preparing the software application M/s TCS had provided specifications for hardware, servers and connectivity and the same were procured. The procurement was carried out by Tamil Nadu Medical Services Corporation Ltd. (TNMSC) for pilot and phase I and by Electronic Corporation of Tamil Nadu (ELCOT) for phase II and phase III. After successful completion of phase II activity, phase III activity comprising of College Management System University Automation System in addition to HMS & MIS was taken up in the additional financing period

**Training :**

The Training modules were prepared for Registration, Pharmacy, Lab , Radiology, Ward Management, Stores, Blood Bank, Bio, Medical Waste Management, Diet, Clinical, Pharmacy and for MIS Ancillary Module, Clinical Module, Finance Module & Personnel Module were prepared.
The number of health care providers given training were as follows :

| S.No | Categories | Subject | No.Persons Trained |
|---|---|---|---|
| 1 | Health care providers | HMS Training | 8245 |
| 2 | District level, Hospital level Administrators | HMS Training | 394 |
| 3 | DMS Institutions | HMIS Training | 2084 |
| 4 | DPH Institutions | HMIS Training | 1673 |
| 5 | Family Welfare Offices | HMIS Training | 50 |
| 6 | Corporation and UHP | HMIS Training | 233 |
| 7 | DME Institutions | HMIS & HMS Training | 8197 |
| | **Total** | | **20876** |

*(Source: TNHSP- HMIS data)*

**Books published**

a. A book on HMIS "Documentation and Dissemination of A Best Practice " has been published with the support of grant for Good Governance from the Dept. of Administrative reforms & Public grievances, Ministry of Personnel, Public grievances and Pensions.
b. A documentary film on HMIS has been produced by the Dept. of Administrative reforms & Public grievances, Ministry of Personnel, Public grievances and Pensions.
c. The Project Paper was selected for oral presentation at eAsia Conference 2009 held at Colombo, Srilanka, during December 24, 2009.
d. The Project Paper was selected for an oral presentation at the MedeTel 2010 conference at Luxembourg during April 1416,2010.

**Helpdesk setup**

A help desk was set up to

a. Receive HMIS breakdown calls and rectify the same
b. Monitor the individual hospital connectivity status.
c. Co-ordinate with individual district Techncial Co-ordinator (I.T).
d. Send and receive communication from TNHSP Headquarters
e. Receive breakdown calls pertaining to various Bio- Medical equipments from 270 hospitals & Co-ordinate with TNMSC / JD / DD / Directorates for rectification
f. Facilitate smooth functioning of HMIS by interacting with user and application developers / other vendors.
g. Consolidate weekly, monthly & daily reports on HMIS activities & submit the same to the Project Director.
h. Helpdesk monitors the use of Software / Hardware supplied under HMIS scheme. Follow- up of police case related to the theft of TNHSP articles
i. Organizes training session with TNeGA /ELCOT for users of HMIS.
j. Takes part in the monthly meeting with IT Secretary / M.D

**Application support and maintenance**

a. The Phase-III of the Project Included development of Specialty screens for HMS (only OP workflow) for the tertiary care hospitals attached to 20 Govt. medical colleges which includes allied 47 DME institutions. For the tertiary care institutions Speciality EMR screens have been developed for 46 specialities.
b. Implementation of a University Automation System for Tamil Nadu Dr.MGR Medical University with a College Management System &, Management Information System for the 20 Govt. medical colleges and MIS & CMS are operational in these colleges. The University module is being effectively used for all major academic and student related activities including online issue of hall tickets and mark sheets, examination related activities, result publication etc.
c. TNMSC/HMIS interface application was developed and online indenting screen has been provided for all secondary and tertiary care hospitals to enable online drug indenting with the TNMSC warehouse.
d. Steps were taken to integrate with digital radiography stations provided through equipment section of TNHSP to 72 secondary care hospitals so as to enable the long awaited PACS (Picture Archival & Communication System) .
e. Participation in the GOI meetings on the implementation of SNOMED CT health standards as per guidelines of GOI Ministry of Health& Family Welfare Dept. Tamil Nadu will be the pilot state for SNOMED CT implementation.
f. For the NCD programme screening and follow up screens, forms for cancer screening have also been developed. The data available before online entries were implemented can be entered by back end entries, thus the actual data is available for reference online.
g. Thus IT enablement of hospitals in the Tamil Nadu districts had created an accurate real time database which could then be used as a basis of timely information for drawing up health-related policies and budgets by the State bureau. This initiative strives to strengthen the patient and the hospital database such that it ably supported the strategic management of the health system of the state. The easy access to epidemiological data about each individual patient, enabled proactive and efficient management of communicable and non-communicable diseases. This would be very effective and result-oriented during the eventuality of an epidemic.
h. Early intervention and swift response by the health directorates, guided by accurate information would aid in handling emergencies and such other situations thus the Health department of Tamil Nadu is not only providing for quality health care but also ensuring infrastructure support to sustain this care through IT enablement of the hospitals.
i. Critical parameters captured and made available in real-time, across the health chain, distinctly aids quality and timely decision making by the health directorates.

**Performance of the activity**

**Current Usage of HMIS:**

Currently all the Primary Health Centres are reporting through the MIS effectively and all the reports are collected by the Directorate of Public Health (DPH) through the MIS. In the secondary care hospitals the usage of HMS application is to the tune of 65 to 70% due to the challenges faced. All the secondary care reports are collected by the Directorate of Medical & Rural Health Services (DM&RHS) through MIS. The institution performance is monitored through the Institutional Services Monitoring Report (ISMR) of MIS. The tertiary care institutions have begun to utilize few components of MIS viz. personnel module, CEmONC reports etc. At present 7 tertiary care institutions are utilizing the HMS application effectively.

**HMIS**

**Doctors Online**

a. Saves a lot of time-need not write prescription, write on each drug token, write the lab investigations separately and also note down the OP number/diagnosis on the register
b. Drugs/lab investigations can be grouped into packages and more often a package may be prescribed.
c. The doctor is able to view the previous clinical history of the patient including last treatment given and the lab results and prescribe accordingly
d. Specialty OP- Doctors with a single click repeat the previous prescription.
e. In special cases the doctor can follow the Standard treatment guidelines, which would be made available in HMS shortly.
f. Saves a lot of time-need not write prescription, write on each drug token, write the lab investigations separately and also note down the OP number/diagnosis on the register
g. Drugs/lab investigations can be grouped into packages and more often a package may be prescribed.
h. The doctor is able to view the previous clinical history of the patient including last treatment given and the lab results and prescribe accordingly
i. Specialty OP- Doctors with a single click repeat the previous prescription.
j. In special cases the doctor can follow the Standard treatment guidelines, which would be made available in HMS shortly.

**Results of the implementation – whether achieved the objective**

a. Transition into digital record keeping HL 7compliant and now upgrading to SNOMED CT
b. Quick Retrieval of patient records
c. Online access to information across locations
d. Improved delivery of drugs and patient care through ICT
e. Single unified reporting platform across all health directorates
f. Collation/ consolidation of data – saving in time and effort
g. Uniformity and standardization of reporting forms and processes
h. Status dashboard for Equipments and Institutional performance indicators

**HMIS Project Inception**

Technology selection – for Application software (change in technology impacting Server and other parameters from using existing solution on standard technology to open source technology – ELCOT / State Government role etc.,)

**Application Solution Architecture**

1. Centralized web based solution
2. On open source platform

2.1 J2EE
2.2 Post grew SQL Database
2.3 Glassfish Application server
2.4 Solaris OS

**SUSE Linux OS at the end user level-user friendly screens**

The Solution was a centrally hosted web based application it follows industry standard three tier architecture via Presentation, Business Logic and Data Layer. The application is built on J2EE platform, the components used follow J2EE specifications. The access to the applications is user role based and privileges assigned as per the designated roles and requirements defined by the respective directorates. The applications also audited and certified as fully compliant with the Open Web Application Security Project (OWASP) requirements.

**Server Hardware – Open source environment support etc.**

This innovative project was initially started as pilot later up scaled to Phase-I, Phase-II and Phase-III covering 267 hospitals and 47 DME institutions and one Medical University. The scalability was monitored by World Bank clearance were given for the encouraging results during the process of upscale. Reliability and availability has been the key area of focus while drawing up the blueprint of infrastructural support for HMIS. Dynamic changes in technology and rapid growth of user needs are some universal changes. To counter the changing software scenario, TNHSP wisely chose an Open Source software stack to eliminate vendor lock-in, to create efficiencies, improve service delivery and maintain scalability.

**IT Infrastructure in Hospitals – Linux**

The hardware requirement for the hospitals including the UPS and electrical cabling, Local Area Network- number of nodes and positioning of switches, was carried out by a technically competent agency. This agency after a thorough field inspection prepared a scientific document detailing the exact requirements for each and every hospital including department wise breakup and cabling diagram for the hospital, based on which the procurement is being carried out. We have also established Automatic switch over from TNSWAN to VPNoBB (Virtual Private Network over Broadband) and vice versa at times when either one of them fails. VPNoBB has been provided to all hospitals to ensure uninterrupted running of the application. Power supply at all hospitals is backed by sufficient UPS Systems so that in the event of any power failure the application will run without interruption.

**Human Resource**

The project is being monitored by full time State HMIS coordinator along with a team from the respective directorates. The online reporting provides for status updates and helpdesk support. There are periodic reviews by the Project Director and respective Directorates on the online entry and usage status.

**Stakeholders:**

M/s TNMSC & ELCOT are the predominant procurement agency for the HMIS infrastructure adopting the World Bank procurement guidelines. The vendors for the IT infrastructure are as follows

| S.No | Elements | Pilot | Phase I | Phase II | Phase III |
|---|---|---|---|---|---|
| 1 | Software Application | TCS | TCS | TCS | TCS |
| 2 | Desktop Computers | HCL | Broad Line | HCL | Ricoh (Acer) |
| 3 | Dot Matrix Printers | HCL | Wipro | HCL | Ricoh (TVS) |
| 4 | LAN | HCL | HCL | Frontier | Ricoh (Plexonics) |
| 5 | UPS | Nutech | Frontline | RK Tech | Ricoh (JRC) |

| | | | | | |
|---|---|---|---|---|---|
| 6 | Furniture | Sastha Furniture | Archana Systems | Ergomax | SGS |
| 7 | Stationary | NA | NA | Mehra Forms | Vairam / |
| 8 | Printer Consumable | NA | NA | Sagar Computers | Antariksh |
| 9 | TNSWAN Connectivity | ELCOT / TCS / BSNL / HCL | ELCOT / TCS / BSNL / HCL | ELCOT / TCS / BSNL / HCL | ELCOT / TCS / BSNL / Wipro |
| 10 | Redundant Connectivity | BSNL | BSNL | BSNL | BSNL / Reliance |
| 11 | Network Monitoring | NA | NA | HCL | HCL |
| 12 | IT Coordinators / Server Admin | NA | ELCOT (Peri Soft) | ELCOT (Peri Soft) | ELCOT (Peri Soft) |
| 13 | Servers | NA | HCL | Accel Frontline | Interlace |
| 14 | Server Hosting | NA | TNEDC | TNSDC | TNSDC |

**SWOT analysis of the activity**

**Strengths**

- Policy in existence, governing HMIS.
- Good support from top officials.
- Planning and Statistics Department in place and functional.
- State and District Core Indicators defined.
- Existence of vital registration system.
- HMIS structure and reporting system in place.
- Technical personnel available.
- Existing Training curriculum for health records and information staff.
- Districts are proactive on HMIS activities.
- First state in India to implement HMIS.
- No Data Entry Operators used.

**Weaknesses**

- Parallel reporting systems.
- Untimely reporting by health facilities.
- Irregular / No feedback from district to facility level.
- Evidence-based decision making is constrained.
- Training material not in place.
- Lack of adequate M&E skills at all levels.
- Inadequate provision of data collection tools at facility levels.
- Inadequate supply of equipments such computers, printers, calculators at various levels.
- Weak feedback mechanism and poor dissemination at various levels.
- Many missed deadlines and pending works.

**Opportunities**

- Centralization provides opportunity for strengthening HMIS.
- Health Partners in place to support the HMIS.
- Strengthen integrated data processing and use at District level.
- Improve medical recording and reporting using ICD-10 codes.

- Integrated HMIS Software solution developed with central data repository and reporting facility, ready for implementation.
- Fully packaged Electronic Medical Record system developed for Outpatient Department.
- ICT infrastructure to computerise HMIS from district to central level in place.
- HMIS training materials distributed to districts / facilities.
- Good working collaboration with the divisions/departments.
- Collaboration and networking with other stakeholders.
- Capacities built on various vertical programmes would help to roll out a better HMIS.
- Recognition and support of HMIS by key stakeholders in the Health Sector.
- Development of a national ICT policy.
- Development of E- health policy and strategy.
- Implementation of the HMIS policy.

**Threats**

- Poor scheme of services leading to non-retention of qualified staff.
- Keeping pace with ICT development.

**IEC activities carried out**

HMIS have supplied IEC boards for OP counters in all secondary and tertiary care hospitals.

**State Health Data Resource Centre (SHDRC) :**

**Introduction**

State Health Data Resource Centre (SHDRC) was proposed by TNHSP to serve as a central repository for health data to enable conversion of raw data into useful information for making evidence based decisions, thereby promote quality health care delivery across the state. The repository shall involve the data of all the Directorates / Departments under the Health and Family Welfare Department. This programme was supported by World Bank, Indian Council of Medical Research (ICMR), National Health Mission (NHM) and Government of Tamil Nadu.

In order to establish this repository, TNHSP hired M/s Accenture Service Ltd. a software consultancy by following World Bank procurement procedures to accomplish the following tasks:

i. Integrate health data from different Directorates / Departments under Department of Health and Family Welfare.
ii. Digitalize health data from the year 2010 onwards from across all directorates and integrate them into SHDRC.
iii. Develop reporting modules/ screens for Directorates/ Departments that do not have a software application for reporting purpose.
iv. Develop and operationalize SHDRC Data Warehouse application along with SHDRC Web portal.
v. To provide assistance in operating SHDRC.
vi. Maintenance support of SHDRC Data Warehouse and SHDRC Web portal.
vii. Provide training to various levels of users of this software.

**Status as on 15.09.2015**

i. Production servers have been installed.
ii. Training of Health Care providers has been completed.
iii. SHDRC have launched the SHDRC application for the Directorates.
iv. STQC certification obtained for SHDRC web portal as per the norms of the State Data Center for hosting the SHDRC application.
v. Operationalisation of the SHDRC application has commenced.

The Consultant shall handover the SHDRC at the end of 24 Months but the consultant shall maintain and support the activities of SHDRC till March 2021.

**Component III : Sub Component 2 : Improving Quality of Care**

Tamil Nadu Health Systems Project aimed to improve the Quality of Care in the hospitals through (a) mainstreaming of continuous quality improvement by developing and implementing a set of quality indicators (b) establishing quality improvement circles in the health facilities to track progress on the agreed indicators (c) protocol development for improved management of clinical conditions. The Project had implemented the following during the project period

**(i) Quality of Care Indicators**

The Project had after detailed discussions with the stakeholders and World Bank had arrived at a set of quality care indicators and trained the health care providers on their usage. The list of quality care indicators is given below

- Bed Occupancy rate
- Average Length of stay
- Surgical productivity index
- Diagnostic services index
- Night time Caesarean Rate
- Equipment Utilisation index
- OT Swab Positivity Rate
- Post Operative Infection Rate
- Bio Medical Waste Generation Rate
- Equipment down time index
- Hospital gross Death Rate
- Hospital Inpatient referral out rate
- Condemnation rate
- Condemned article disposal rate

Monthly reports were collected online from each of the hospitals and after analysis feedback to the hospitals done. This has resulted in the marked improvement in the performance and quality of activities in the hospitals

**(ii) Quality improvement circles**

TNHSP had established Quality Circles in all Government Secondary Care Hospitals in Tamil Nadu during the year 2008. Operation of Quality Circle (consisting of various categories of staff in the hospital) is the driving force to improve the quality of care within the secondary care hospitals. Quality Circle meetings are conducted once a month or more frequently in the hospitals. Reports are collected through HMIS online. Regular trainings and review meetings were conducted. The training was given to the Hospital Superintendents / Chief Medical Officer, Nursing Staff and Para-Medical Staff in the hospitals.

**(iii) Protocol development**

**(a) Standard Treatment Guidelines**

TNHSP had developed and published a standard book on ' Standard Treatment Guidelines' authored by 25 eminent professors in the concerned specialties in the medical colleges. Sufficient copies of this book have been supplied to all health institution in the state so that the health care providers can refer to this book and provide quality treatment

**(b) Treatment Guidelines for Snake bite and scorpion Sting**

As more Snake bite cases are accessing the Government hospitals, a book & charts on the above subject have been published for the use of health care providers in the hospitals

**(iv) Poison Treatment Centers**

Tamil Nadu Health Systems Project had established poison treatment centers in 66 secondary care hospitals. These Poison Treatment Centers are dedicated service units, where all type of poison cases are being treated and their lifes saved, with adequate equipment, intensive care facilities and specially trained doctors and staff. TNHSP has supported all the PTCs with the provision of intensive care unit cots, ventilator,ECG machine, pulse- oximeter, cardiac monitor, multi-parameter monitor, defibrillator, emergency crash cart, resuscitation tray, essential drugs, and computer with internet facilities. Moreover, these centers are also provided with well established protocols for the treatment of common cases of acute poisoning. Special training on poison treatment were given continuously to the untrained doctors and staff nurses covering all the secondary care hospitals irrespective of Poision Treatment Centres. The Death rate of the poisoning cases had come down from 4% to less than 1%, from the second year of starting of poison treatment centers.

**(v) Training on Rational Use of Medicines**

Training on Rational Use of Medicines was provided for all the Medical Officers of Govt. Hospitals including Primary Health Centers, so that, the patients get medications appropriate to their clinical needs, in correct doses, for an enough period of time and free of cost. without any adverse drug reactions. A manual was printed and supplied to all trainees and hospitals. Both the World Bank fund and NRHM fund have been utilized and 2200 persons were trained on Rational Use of Medicines.

**(vi) Accreditation of Government Hospitals**

The Tamil Nadu Health Systems Project improved the quality of care in all project hospitals. Some of the hospitals were prepared for getting accreditation by National Accreditation Board for Hospitals (NABH) & Health Care Providers. A total of 11 hospitals have been accredited by NABH till the end of the project and many hospitals were in various stages of preparation. The hospitals accredited are (i) Government District Head Quarters Hospital, Namakkal (ii) Government Non Taluk Hospital, Sholingar (iii) Government District Head Quarters Hospital, Padmanabhuram (iv) Government District Head Quarters Hospital, Manapparai (v) Government Taluk Hospital, Arupukkottai (vi) Government Taluk Hospital, Tambaram (vii) Government District Head Quarters Hospital, Cuddalore (viii) Government District Head Quarters Hospital, Erode (ix) Government Taluk Hospital, Hosur (x) Government Taluk Hospital, Harur (xi) Government Taluk Hospital, Rasipuram. Final assessment completed and awaiting accreditation in the following Government District Head Quarters Hospitals (i) Tiruppur (ii) Pudukottai (iii) Usilampatti (iv) Periyakulam & (v) Srirangam

**(vii) Other Activities to Improve Quality of Care**

TNHSP had implemented the following activities to improve the Quality of Clinical Care in the project hospitals

(a) Establishment of 'Hospital Clinical Society' and conducting 'Continuing Medical Education' (CME) programs in major hospitals.
(b) Conducting 'Hospital Annual Day' in all hospitals each year to improve inter personal communication and to inform the community about the facilities available and good work done by the hospitals
(c) Conducting 'Discharge Parade' in the hospitals by the hospital superintendent daily to get the feedback from the discharged patients.
(d) Conducting 'All Staff Meeting' every month in the hospitals.

**Training Modules prepared**

- "Training Manual on Quality Care Indicator", Tamil Nadu Health Systems Project, India.
- "Training Manual on Rational Use of Medicines", Tamil Nadu Health Systems Project, India.

**Component III : Sub Component 3 : Strengthening Health Care Waste Management**

**Scope of Activity**

Government of Tamil Nadu developed an integrated infection control and waste management plan with operational procedures, standardized protocols and training modules to institutionalize a comprehensive Infection Control and Waste Management system in all Government Health Institutions in Tamil Nadu.

**Evolution of the Activity**

Bio Medical Waste Management Activity plan included:

- Pilot implementation of Bio Medical Waste Management in 11 Hospitals in two districts of Tamil Nadu – Dharmapuri and Krishnagiri since 14.01.06.
- To upscale the same to all Government Health Care institutions based on the success of the pilot
- To establish common treatment facilities in 5 regions of Tamil Nadu to cover all Government Hospitals.

A major component of the activity was professional training of all stake holders to understand the proper disposal of Bio Medical Waste, safety of health personnel and people. A sustainable model had been proposed for the health institutions including a stringent system of monitoring and supervision right from the state level up to the hospitals.

**Pilot implementation:**

- Piloting of Bio Medical Waste Management started in 11 Hospitals in 2 districts of Dharmapuri and Krishnagiri since 14.01.06.
- Initially, it was planned to establish common treatment facility under the project. Meanwhile, Tamil Nadu Pollution Control Board (TNPCB) had approved 11 Common Treatment Facilities (CTF) to be run by the private agencies. It was decided to pilot BMWM in the above mentioned 2 districts by utilising the already established CTF in the private sector approved by TNPCB.
- Common treatment facility hired at Edapadi at Rs.3 per bed basis.
- Requirement of consumables and equipments for all the hospitals in the two pilot Districts was arrived based on the performance and the number of beds. TNMSC purchased and distributed the consumables to the hospitals before started the training.
- After the success of the pilot, upscaling to all Government hospitals planned SEC proposals to the Government based on the proposals and G.O. issued on 28.09.2007.

- Stake Holders meeting convened on 11.04.2007 by PMU & World Bank (Audio Conference) with representatives of TNPCB, DME, DMS, DPH and ESI. Private CTFs, TANSACS and Toxic links to discuss the issue on upscaling the implementation.
- Finalisation of colour coding: In the first Stakeholders meeting on 11.04.07 it was decided to continue the same colour coding pattern as it was in the pilot project. But in the second meeting held on 20.08.07 there was an objection from TNPCB with regard to colour coding epically black.
- Revised colour coding pattern has been worked out and was accepted by TNPCB, TANSACS, RNTCP all Health Directorates and Toxics link.
- Preparation of IEC materials based on the new colour coding pattern was done in house on 18.10.2007 by the experts from Chengelpet Medical College, Toxics link, TANSACS, RNTCP, PMU.

**Up scaling to all hospitals based on the success of the pilot:**

- 270 secondary care hospitals, 41 tertiary care hospitals,
  130 thirty bedded primary health centres and 8 ESI hospitals.
- Implemented from September 2008 onwards.
- Unified protocol on color coding in coordination TNPCB, TANSACS, RNTCP, DMS, DME, DPH and toxics link on 23.10.07.
- Equipment such as colour coded bins, colour bags, trolleys, needle destroyer, protective gears like aprons, gloves, shoes etc and equipments such as colour bins, trolley, needle destroyer etc., supplied through TNMSC to all individual hospitals.
- Consumables like Hypochlorite solution, Bleaching powder through TNMSC to all Government hospitals.
- A total of 44,000 training modules on bio medical waste management prepared and supplied to all Government project hospitals.
- IEC activity with 6 posters and 7 stickers both in English and Tamil supplied to all hospitals through TNMSC.
- Further supply of consumable entrusted through State Health Society.
- Training modules (both in English and Tamil (local language)) on Bio Medical Waste Management prepared in house and supplied to all government hospitals.
- Posters and stickers both in English and Tamil (local language) supplied to all hospitals through TNMSC.
- Consultant firm, hired for providing regional level training. They trained the trainers and master trainers and they monitored the district level training along with the trainers. Monitoring and Evaluation formats I & II designed and incorporated in the training module.
- Training in Bio Medical Waste Management implemented from 2008 onwards

**Hiring of Common Treatment Facilities (CTF) for End disposal**

- ✓ 9 out of 11 common treatment facilities approved by TNPCB had been hired through TNMSC for transportation and end disposal of bio medical waste generated in Government Hospitals for each district on per kilogram basis. Contract with the CTF operators extended up to 31.03.2011 with the same cost approved earlier. Common Treatment Facility Operator is selected through a tender by Tamil Nadu Medical Services Corporation Limited. Nine different CTF operators have been contracted to operate in 9 different regions in the state. The CTF operator is paid on the basis of per kilogram of waste lifted by him. Initially CTF operators were paid on per bed/day to basis. As the bed occupancy varied they paid on per kilogram basis. It is a recurring expenditure. The cost of collection of Bio Medical Waste varied from Rs.26 to Rs.49 (average Rs.27) Contract extended with same cost approved earlier
- ✓ A new comprehensive tender finalized by the TNHSP for the collection transport and end disposal of bio medical waste. The revised CTF rate is effective from 01.07.2013. This "Agreement of service" is for a minimum period of 3 years from the date (27.06.2013) of agreement. The revised rate being Rs.43 per kg in plain regions and Rs.140 per kg in hilly regions.

**Establishment of Regional Training Centers:**

TNHSP established an integrated and sustainable plan of "**9 Regional Training Centers** (including 7 Government and 2 Private medical college institutions)" through "**PROJECT PUSH**" in coordination with APAC –VHS, TANSACS and with different stakeholders from Tamil Nadu Pollution Control Board, State Health Society and private medical college institutions which aim in enhancing the quality of infection control in all Government hospitals in Tamil Nadu. Hence, Tamil Nadu Health Systems Project established 9 Regional Training Centers (7 Government Medical Colleges and 2 Private Medical Colleges)

**Government Medical Colleges and Hospitals**

1. Madras Medical College and Rajiv Gandhi Government General Hospital.
2. Madurai Medical College and Government Rajaji Hospital, Madurai.
3. Government Mohan Kumaramangalam Medical College Hospital, Salem.
4. Coimbatore Medical College and Hospital, Coimbatore.
5. Thanjavur Medical College and Raja Mirasudhar Hospital, Thanjavur.
6. Tirunelveli Medical College and Hospital, Tirunelveli.
7. KAPV Government Medical College and Hospital, Trichy.

**Private Medical College and Hospital**

1. Sir Ramachandra Medical College and Research Institute, Chennai
2. P.S.G Institute of Medical Sciences and Research, Coimbatore.

**Project conducted in two phases:**

Phase –I (Jan 2011 – March 2012) supported by APAC –VHS

- Facility assessment of 11 Regional Training Centers
- Training of TOT in ICWM in 11 Regional Training Centers. TOT's in turn to train other health staffs in that particular regional training centers
  - Training of 250 master trainers
  - In house training for 10,000 health care workers
- End line assessment of 11 Regional Training Centers.

Accomplishment (January 2011 – March 2012)

**1.** Development for tools for baseline assessments
**2.** Development of training curriculum & Modules
**3.** Review meetings with Core Monitoring Committee & providing strategic directions
**4.** Training completed for 264 health care providers (TOTs) in 11 Regional Training Centers and In house training completed for 12,216 staff.
**5.**

**Phase - II** (April 2012 onwards)

- Training of Health Care providers from all health institutions at the Regional training centers.
- Funds for 250 training programmes sanctioned by TANSACS through APAC – VHS till December2012.
- Training of Health Care providers through project (World Bank) funds.
  G.O. obtained – G.O. (2D) No. 99 H & FW Dept. Dated: 15.10.2012 sanction accorded for Rs. 2,40,00,000 for incurring expenditure towards training of Health Care providers.
- Certification of all health care providers who undergone training in Regional training centers.

**Workshops conducted**

1. Workshop on sensitization of service providers on Health care waste management was conducted in Dharmapuri on 16.09.2005. **Objective** of the workshop was to sensitize all stake holders

about the integrated Health Care Waste Management plan (Pilot) in Dharmapuri and Krishnagiri districts.

2. Workshop on implementation of integrated biomedical waste management was conducted in Chennai on14.12.2005. Objective of the workshop to evolve a uniform set of guidelines for all those who are involved in the implementation of bio medical waste management in the state viz Tamil Nadu Health Systems Project, Reproductive and Child Health Project, Tamil Nadu Sate AIDS Control Society, Directorate of Medical and Rural Health Services, Primary Health Centres , TB control programme and, leprosy programme.

**Training** of all health care providers in all Government health institution and all stake holders in Infection control and Bio Medical Waste Management. It is an **ongoing** activity.

Training is conducted for

- Doctors
- Nurses & Lab Technicians
- Nursing attendants, Hospital workers & sanitary workers.

**Brief Summary of the Surveys studies conducted**

Consultancy firm M/s.Mott Mac Donald Pvt. Ltd. was appointed in the year 2014 for assessing the impact evaluation of training and practices in ICWM in the firm completed their evaluation and submitted their reports.

**Books Published**

- About 44,000 copies of training modules (25,928 English modules and 18,072 Tamil modules) were printed through TNMSC in the year 2008 and supplied to all JDHS officer, all the TOT participants.

- All doctors, nurses and paramedical staffs were supplied with English modules and sanitary and hospital workers were supplied with Tamil modules.

- Again, 30,000 copies of Hand Book on Infection Control and Bio Medical Waste Management (15,000 copies in English and 15,000 copies in Tamil (local language) printed in 2014 and supplied to all Regional Training centers, in turn to be distributed to trainees of Infection Control Waste Management.

**Equipment & Consumables Purchased**

Colour coded bins, Colour bags to be placed in respective bins needle destroyers / Hub Cutters puncture proof containers, trolleys, protective gears like aprons, gloves, mask shoes etc., and consumables like Sodium Hypochlorite solution, bleaching powder supplied by TNMSC after floating tender.

**Building Constructed**

Bio Medical Waste Management storage rooms within the hospital premises were constructed along with the civil work construction planned for the hospital.

**Results of Implementation**

World Bank fixed up a target of 44,000 Health Care Providers to be trained from Project funds. Till May 2015 48,111 Health Care Providers one being trained.

**Ongoing Activity**

Infection Control Waste Management activity is an ongoing activity. Activity will be continued by the respective Directorates (DME, DMS & DPH).

**Synergy with NRHM**

- Common Treatment Facility operators and for Equipments and Consumables funds are being provided by NRHM.
- Common Treatment Facility operators are paid through TNHSP for Secondary Care Hospital and through D.D. Health to PHCs.

**Assets Created**

Storage room for Bio Medical Waste within the hospital campus and Training Centers in 7 Government Medical College and 2 Private Medical Colleges.

**Achievements:**

Health care providers are trained from April 2012 to May 2015.

| | | |
|---|---|---|
| No. of Health Care Providers – in house training | : | 12,480 |
| No. of Health Care Provider trained from April 2012 to June | : | 36,718 |
| **Total no trained** | **:** | **49,198** |

**Component III : Sub Component 4 : Building Capacity for Strategy Development and Implementation**

(i) Establishing a Strategic Planning Unit.
(ii) Establishing Public-Private Partnership (PPP) wing.
(iii) Conducting a Health Insurance Pilot.
(iv) Strengthening Project Management.

**(i) Establishing a Strategic Planning Unit.**

The Strategic Planning Cell was established within the Project Management Unit to function as a think tank for the project and to undertake various studies and policy research work for improving the efficiency and effectiveness of the Health Systems in the State. The Strategic Planning Cell was consisted of Expert Advisors in Hospital Reforms and Management, Specialist in HRD & HMIS, Specialist in Health System Research and Economics and Expert Advisor in Public Private Partnership.

(a) The Strategic Planning Cell had prepared 446 proposals and placed before the State Empowered Committee and obtained Government orders.
(b) Prepared Status Report books on Project activities every 6 months at the time of the World Bank Missions and so far 21 such books have been prepared.

(c) Prepared the strategies for implementation of project activities like Comprehensive Emergency Obstetric and Newborn Care (CEmONC) Services, Tribal Health Development activities, Non Communicable Diseases prevention, screening treatment and follow up programme, Web based Health Management Information System (HMIS), Quality of Care activities including Accreditation, Bio Medical Waste Management, Outsourcing of Housekeeping Services, Equipment Maintenance etc.,

(d) Provided expertise for the studies & surveys, workshops and training programmes conducted by the various programmes undertaken by the project.

**(ii) Establishing Public-Private Partnership (PPP) wing.**

The Public-Private Partnership (PPP) Cell was established within the Project Management Unit, to bring in a fruitful partnership between the Government and all stakeholders in Health. The cell was responsible for finding areas where partnership could enhance and complement efforts of the Government in providing services to people especially in remote and interior areas. The PPP cell was staffed with a Chief Executive Officer (CEO) for PPPs and support staff.

**Public Private Partnership (PPP) activities**

The following PPP activities have been initiated by TNHSP

a. Emergency Ambulance Services
b. Free Mortuary Van Services
c. Outsourcing of Housekeeping Services
d. Outsourcing of Laboratory Services
e. Tribal Health Development activities involving mobile outreach health services, Bed grant scheme, sickle cell anaemia package, tribal counselors scheme. (already described)
f. Patient counseling services in CEmONC hospitals and hospitals in Tsunami affected districts. (already described)
g. NCD pilot programme for undertaking school based, community based and work place based activities and for NCD counselors at health institutions in the pilot districts & Village link volunteers for propagation cervical cancer screening programme in the households. (already described)
h. Health Care waste Management with CTF operators

**(a) Emergency Ambulance Services**

The Government of Tamil Nadu is keen to improve the access and utilization of health services by the poor especially the rural poor and pregnant women. With this aim two ambulances were provided to an NGO Seva Nilayam Trust in Theni district with budget to run emergency ambulance services to transport pregnant women and emergency cases including road traffic accidents in the year 2000. This is the first such scheme in India, in partnership with private for emergency ambulance services in rural areas. As this scheme was successful TNHSP had proposed in the PIP that in order to make available ambulance transport services to the needy mothers and other emergencies it was proposed to provide one ambulance for every block to be operated by NGO through public private partnership. It was proposed to have a central control; room in the district head quarters hospital in each district to regulate the ambulance services. This was an innovative scheme which was to be implemented in 15 districts in phase I of the project and if found successful to be scaled up throughout the state. Initially 187 ambulances were procured and handed over to NGOs selected by the district project monitoring

committee @ 1 NGO per block in 16 districts. District Control rooms were established in the District Head Quarters Hospitals and a toll free number 1056 was obtained. This scheme was running fairly successfully from January 2007. The remaining blocks were to be covered with 198 ambulances in 16 districts which were under procurement. During the time in A.P state, Emergency Management Research Services (EMRI) started their ambulance services with a central control room. As it was found by TNHSP that instead of managing hundreds of NGOs it would be better that a single partner with a central control room can manage the programme efficiently. EMRI was contracted to run the services on all expenses met and no profit basis for a period of five years from June 2008 and the partnership contract was extended in May 2013 for a further period of five years. 108 Service became operational with 20 ambulances in Sept 2008. Ramped up to a level of 385 by March 2010 and 688 by January 2014. Currently 751 ambulances are in use. All districts covered with an average population cover of 1.15 Lakhs per ambulance. Inter Facility transfers were offered as part of EMS for the first time since Oct 2010. Neo-Natal services launched in June 2011, for the first time in the country as part of EMS. During the original project 385 were provided by the project followed by 200 additional ambulances provided during the additional financing period. As regards recurring cost it met out of NRHM funds and Government of Tamil Nadu fund.

**Different type of Ambulance Services**

- Advanced Life support ambulance (ALS)
- Basic Life Support ambulances (BLS)
- Neonatal ambulances – Specially designed for Neonates less than 28 days
- Four Wheel Drive ambulances – Mainly for Hilly/Tribal and difficult terrain locations

**Emergency Care Centre**

Helps in stabilizing the patient enroute to the hospital during long distance travel.

**Morbidity Analysis - Emergency Type**

The morbidity of the cases transported were analyzed and found that pregnant mothers have utilized more followed by trauma, acute abdomen, Cardio Vascular, Trauma (non Vehicular) and others

**Special Focus**

Tribal area – Special focus is given to tribal areas for the benefit of the tribal people. The increase in utilization is evident from the following graph.

30 Four wheel drive ambulances funded by World Bank, were inducted in the month of July'14 to cover the hilly terrain, unreached and difficult to reach areas, 48 four wheel drive ambulances funded by NRHM inducted in Jan 2015.

**Inter Facility Transfer**

Inter Facility Transfer service is being provided to patients requiring higher level care from Secondary care / Primary level institution to Tertiary institution.

**Neo natal Emergency Care**

To provide emergency care to the sick newborn babies, a specially designed ambulance with equipments is being provided to transport to the NICU centers and higher centers of Excellence, to provide immediate care. Currently 57 vehicles are in operation in 32 Districts.

**Number of ambulances**

| S.No | Type of Ambulance | Number of Ambulances |
|---|---|---|
| 1 | Basic life support ambulances | 550 |
| 2 | Acute life support ambulances | 58 |
| 3 | Neo natal ambulances | 66 |
| 4 | Four wheel drive ambulances | 77 |
| | Total | 751 |

*(Source: TN-EMRI data)*

**Monitoring & Evaluation**

The activities of TN-EMRI is being continuously monitored at the district level by District Monitoring Committee under the chairmanship of the District Collector and at the State level the Project Director, Tamil Nadu Health Systems Project is reviewing the performance of TN-EMRI. Further, the Chief Secretary, Government of Tamil Nadu is also reviewing the performance at Government level every six months.

**Performance of Emergency Ambulance Services (From September 2008 to December 2015)**

| S.No | Category | Performance |
|---|---|---|
| 1 | Total Beneficiaries | 3021752 |
| | Total Non IFT Cases | 2261235 |
| | Total IFT Cases | 760517 |
| | | |
| 2 | Road Traffic Accidents | *721622* |
| | RTA Non IFT Cases | 648864 |
| | RTA IFT Cases | 72758 |
| | | |
| 3 | Pregnancy cases | 793677 |
| | Preg Non IFT Cases | 435122 |
| | Preg IFT Cases | 358555 |
| | | |
| 4 | Other Emergency cases | 1506453 |
| | Other Non IFT Cases | 1177249 |
| | Other IFT Cases | 329204 |
| | | |

*(Source: TN-EMRI data)*

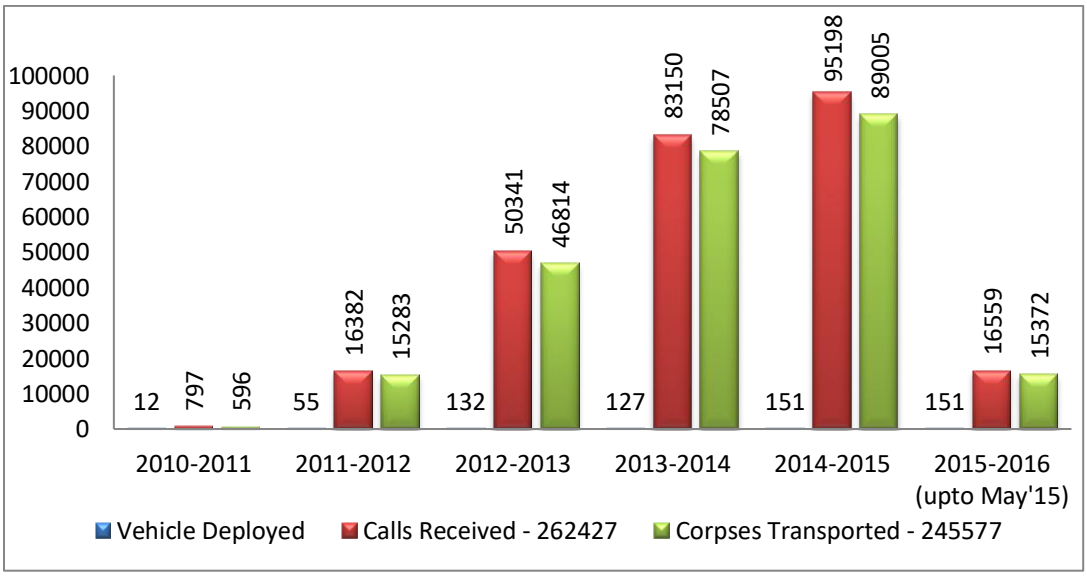
**(b) Free Mortuary Van Services**

As the Government of Tamil Nadu is keen to improve the services to the patients accessing the Government Hospitals for treatment it had also proposed free mortuary van services for transportation of dead patients in the unfortunate event of death happening. Originally it was planned to procure 42 vehicles and to operate them through the NGOs in PPP mode. The Project had selected the NGOs and handed over the mortuary vans to be operated from the hospitals during the year 2007. The NGOs were permitted to collect a small fee from the relatives of the deceased for the transportation of the body from the hospital to the burial ground or residence anywhere within the state. This scheme was well received by the people since they

have been relived from the clutches of the private operators who charge exorbitantly. During the additional financing this has been added with 21 more mortuary vans provided by the project and in addition NRHM & GoTN., provided more vehicles. This service was handed over to a single NGO Tamil Nadu State Branch of Indian Red Cross Society.

The programme is being operated 24X7 through the telephone number 155377 by the IRCS, Tamil Nadu branch, through the 24X7 call center maintained at KGH. The request for Free Hearse Service (FHS) will be made either by the individual or through Government Hospital or Police authorities. On receipt of the request the Communication cum Dispatch Officer (CDO) at Central Response Centre (CRC) will enter all the details in the computer and direct the FHS driver to pick up and transport the deceased to the desired destination. To transport the cases beyond 300 KMs and to avoid downtime of the vehicle, manpower loss, etc., transportation by Railways is implemented, and utilized for covering all the States of India.

**Performance of the activity**




**Results of the implementation – whether achieved the objective**

- 85% of the hospital deaths are transported in this service.
- However 94 % of the call requests received are serviced.

**(c) Outsourcing of Housekeeping Services**

**Pilot scheme of Outsourcing of Housekeeping Services**

- Base line studies had shown that performance of Sanitation Services in Government Hospitals was poor due to various factors such as (i) lack of Man power (ii) lack of Training (iii) lack of supplies (iv) lack of Monitoring
- Piloting of Outsourcing of Housekeeping Services was included in the Project Implementation Plan (PIP) of TNHSP under Component III
- Four hospitals namely District Head Quarters Hospitals Cuddalore, Pudhukottai, Tiruppur and Taluk Hospital Tambaram were selected for Piloting Outsourcing of Housekeeping and Security services.
- Bid documents prepared by TNHSP and handed over to DM & RHS.

- The Joint Directors floated the bids and finalized the successful bidder which was approved by DMS.
- Tamil Nadu Transparency of tenders act was followed
- Funds for Outsourcing services for the Pilot provided by NRHM
- The Pilot was carried out for 2 years
- Assessment of the Pilot was carried out by APAC – VHS – US AID

**Pilot scheme Assessment Report**

**Strengths**

- Clear contractual obligations
- Dedicated manpower available
- Supervision structure available
- Reporting system available
- Provision of Chemical and consumables
- Importance of hygiene & cleanliness of hospital established

**Outcome**

- Remarkable improvement in the physical cleanliness of the hospitals.
- Assured housekeeping services round the clock especially during night time.
- Improved safety & better crowd regulation.
- Good coordination with the hospital & HK agency staff.
- Increase in satisfaction among Health Care Providers and Patients.
- Cost effective model (Outsourcing) has provided more manpower at the same cost)

**Gaps**

- % Compliance varies across the four centres 49% to 75% (ideal > 85%)
- Outsourcing agency functions as a manpower agency and doses not bring in technical expertise.
- Knowledge of functional areas – hence proper allocation of human resource and frequency of cleaning could not be planned.
- Knowledge of hazardous chemicals, Dilution, Measurements by the HK agency very poor.
- Sewage cleaning & chlorination not done scientifically.
- Improper placement of security staff.

**Scaling up of Housekeeping Services to 48 hospitals**

- During Additional Financing period, Proposal was placed before the State Empowered Committee for up scaling outsourcing of House Keeping services to 48 Major Hospitals having more than 200 bed strength
- Based on the assessment of the Pilot scheme, the Govt. permitted TNHSP to scale up this scheme to 48 hospitals -
- TNMSC floated the bid by following World Bank procurement procedures.
- The successful bidder M/s.Krystal Integrated Services, Mumbai was selected and started the services from March 2014

- This scheme after being implemented by the Project with World Bank funds was handed over to DM & RHS for further implementation from 01.10.2014
-

**Monitoring of Housekeeping Services in 48 hospitals**

- An outsourcing cell was established in TNHSP in the Project Management Unit.
- Daily Electronic Report obtained from each hospital and from the vendor regarding availability of Manpower and Consumables.
- Bio Metric system of attendance was introduced for the House keeping persons in the Hospitals.
- A Nodal Officer was nominated in each hospital to monitor the House keeping services.
- Detailed training modules developed for training of the House Keeping personnel and their Supervisors and trained.
- Protocols were developed as per the contract agreement and bidding documents as to the number of times the toilets are to be cleaned, floors to be cleaned etc.,
- Monitoring cards were fixed in the toilets and wards to be entered as soon as they are cleaned to be countersigned by Supervisors and Staff nurses.
- A store room has been provided to stock the equipment and chemicals which is inspected by the Nodal Officer every day.
- Weekly review of the Vendor in the PMU with the reports and any complaints were sorted out.
- Monthly Review of the Nodal Officers of 48 Hospitals along with the vendor at the PMU.
- Frequent inspections by the District & State level Officers.
- An online monitoring system was developed to monitor the activities online by the hospital authorities, JDHS and at the State level by the PMU. However, this could not be installed due to connectivity issues.

**Additional Services Provided**

The outsourcing agency was providing the following services

a. Cleaning
b. Security
c. Plumbing
d. Electrical
e. Laundering
f. Gardening
g. Cook Assistant – Diet Distribution
h. Carpentry

**Results of Outsourcing of House Keeping Services**

- The feedback from the Health Care Providers, Patients, and visitors to the hospitals is generally satisfactory to very good.
- The Hospitals are clean, surroundings are kept neat and clean the garbage has been removed.
- The toilets are very clean, cleaned 6 times a day.
- The Biomedical Waste Management system is properly managed.
- The vehicles are parked properly.
- The visitors are monitored and theft of hospital goods has been almost nil.
- Gardens have been developed in almost all hospitals giving an esthetic appearance of the Hospitals.

**Remarks of World Bank Mission regarding Outsourcing of House Keeping Services**

"The mission reviewed the Quality of Services provided by the contracted agency during its field visit and expresses satisfaction with the same. It is understood that the contracted agency is facing staff turnover in a few districts, however in consultation with the hospital authorities and TNHSP, the issues are being collaboratively resolved. Post September 2014, GoTN will financially sustain the outsourced services from its domestic budget".
*(World Bank Mission–July 17 – 24, 2014 Aide Memoire – Page 5)*

**Issues in Outsourcing of House Keeping Services**

- Frequent Attrition of Housekeeping personnel.
- Tendency to carry out the personal work of Health Care providers at the expense of hospital work.
- Insufficient use of Chemicals.
- Lesser use of modern equipment and trolleys.
- Could not install online monitoring system
- Wages are paid as per Collectors rate & there is variation of wages among the districts.

**(d) Outsourcing of Laboratory Services**

**Outsourcing Laboratory Services**

This activity, Outsourcing of Laboratory services programme, was approved by the World Bank and comes under the Component I. Sub component C. The objective of this activity is to strengthen the clinical laboratories in secondary care hospitals and medical college hospitals by (1) implementing outsourcing of Laboratory services, as a pilot project in 5 District Head Quarters Hospitals and 2 Medical college Hospitals initially through a Public Private Partnership mode and (2) strengthening the Laboratories of all secondary care hospitals in the State by supplying the equipments, which are not available as per requirement of hospitals based on the services provided.

In this connection, a GO for outsourcing of laboratories services was issued and tender called for following hospitals by Tamil Nadu Medical Service Corporation (TNMSC) as per the norms of World Bank.

As a pilot project, Seven Regional Diagnostic Laboratories that were operated by the Tamil Nadu Medical Services Corporation at (i) Tiruvannamalai (ii) Villupuram (iii)Namakkal (iv) Tiruppur (v) Virudhunagar (vi) Ramanathapuram (vii) Pudhukkottai were proposed to strengthen through the Private Partner, along with the District Laboratories in the same districts to be managed by the private partner. Out of 7 hospitals, only 5 District Head Quarters Hospitals (viz) Namakkal, Tiruppur, Virudhunagar, Ramanathapuram and Pudukkottai have been taken for the above activity as the rest of two Government District Head Quarters Hospitals, Tiruvannamalai and Villupuram have been handed over to Director of Medical Education. The selected private agency has to provide the services which are already available in the respective hospital laboratories i.e. Clinical Biochemistry, Clinical Pathology, Cytopathology, Hematology, Histopathology, Immunology and Microbiology including Serology.

The detailed work order issued by the TNMSC on 06.01.20145 for the World Bank Procurement - Package No: AG70 - AS70: "National Competitive Bidding for Operating District Laboratory and Regional Diagnostic Laboratory at District Head Quarters in Namakkal, Tiruppur, Virudhunagar, Ramanathapuram and Pudhukottai districts and Medical College Hospitals in Thiruvanamalai and Villupuram districts through Public Private Partnership mode". Based on the work order, the contract was signed between the five hospitals [i.e. the five respective Joint Director of Health Services (Ramnad, Namakkal, Tiruppur,

Virudhunagar & Pudhukottai) and M/s Dr. Ganesan's Hi-tech Diagnostic Centre Pvt Ltd., at TNHSP office on 04.02.2014.

**Contract implementation of Outsourcing Hospital Services (both Housekeeping and Laboratory services)**

At TNHSP office, as per the instruction of the Project Director, the Expert Advisor (SPC) was in-charge for all outsourcing services and the Programme Officer (QC/OS) was managing the execution of the contract for implementation of outsourcing of hospital services i.e. Housekeeping services and Laboratory services.

After the execution of contract for outsourcing the housekeeping services and laboratory services, under the guidance of the Expert Advisor (SPC), the Chief Executive Officer (PPP), TNHSP was responsible for overall programme on outsourcing hospitals services. Later, the Government orders issued for establishing exclusive Outsource Source Cell at TNHSP in order to monitor the outsourcing activities effectively. Based on this Government orders, the following set of regular officials from the DMS side and contract staff directly selected by TNHSP have joined Outsource Cell at TNHSP. The objective of this Outsource Cell was continuous monitoring and improving of housekeeping system as per the contract agreement between TNHSP and the Contract Agency.

The implementation of Housekeeping and Lab services were carried out by TNHSP with the support of Outsource Cell Staff for a period of one year. Regular monthly meetings were convened by the Project Director, TNHSP with the hospitals officials in order to strengthen the outsourcing of housekeeping and lab services.

**Handing over the Outsourcing Hospital Services to Regular Directorate**

TNHSP has obtained Government order for mainstreaming the outsourcing of housekeeping and lab service activities to the regular directorate for sustainability of the programme beyond the project period. Accordingly after probation period of one year of services by the contract agencies, both the activities were transferred to the Directorate of Medical and Rural Health Services with all necessary contract particulars and documents. Later, the above regular officials and staff, who have worked in TNHSP and monitored the outsourcing services for one year initially, have been transferred to the respective Directorate (DME & DMS) to continue the implementation process for both the lab services and housekeeping services in the hospitals.

**(iii) Conducting a Health Insurance Pilot**

In the Project Implementation Plan it was proposed to conduct a pilot on community based Health insurance scheme. However the Government of Tamil Nadu in the year 2008 felt that it would implement 'Comprehensive Health Insurance Scheme' throughout Tamil Nadu by making certain changes in the A.P Government sponsored 'Rajiv Gandhi Arogya Sri Scheme' implemented in their state. Thus Government of Tamil Nadu implemented a Health insurance scheme with their own budget from the year 2009. Later in the year 2011 this scheme was further improved and the present 'Chief Minister's Comprehensive Health Insurance Scheme' being implemented. Hence this activity is dropped from the project.

**(iv) Strengthening Project Management**

**Project Management**

A four tier management structure was created with (a) State Empowered Committee headed by the Chief Secretary (b) Project Steering Committee headed by the Health Secretary (c) Project Management Unit headed by the Project Director and (d) District Project Management Unit headed by the Joint Director of Health Services of the district, to be monitored by the District Project Monitoring Committee headed by the District Collector. The State Project Management Unit consists of (i) Strategic Planning Cell (ii) The Systems and Quality improvement cell (iii) The Engineering Cell (iv) The Equipment (Procurement) Cell (v) Financial Management Cell (vi) Human Resource Development Cell (vii) Public Private Partnership Cell (viii) Health Promotion Cell and (ix) Administration Cell.

The State Empowered Committee approves the annual plans, various activities of the Project, sanctions funds and reviews the progress of the Project activities. Till now the State Empowered Committee had met 17 times and approved 446 proposals amounting to an expenditure of Rs.1430 crores.

The Project Steering Committee headed by the Health Secretary was convened regular review meetings along with the monthly meeting of Heads of the Directorates during the time the inter directorate issues were sorted out and the progress of the Project activities was reviewed. The Project Management Unit headed by the Project Director is the nerve centre of all activities of the Project.

**The Strategic Planning Cell**

The Strategic Planning Cell is the think tank for the project and undertakes various study and policy research work.

**The Systems and Quality improvement cell**

Though this cell was to cover topics like CEmONC, Tribal Health, NCDs, HMIS, Health Care Waste Management (HCWM) and Quality Care activities initially when the programmes got bigger they started functioning separately as distinctive cells. Their performance is given under the respective sub-components.

**The Engineering Cell**

The Engineering Cell had through the state Public Works Department (PWD) constructed additional buildings for the Project Hospitals.

**The Equipment (Procurement) Cell**

The Equipment Cell prepared the list of Equipment to be procured under the Project and also manages Equipment maintenance system.

**Financial Management Cell**

This cell is headed by the officials from Treasury Department of Government of Tamil Nadu (GoTN). The cell manages budgeting, distribution of funds, raising reimbursement claims, maintaining accounts and assisting the audits.

**Human Resource Development Cell**

This cell deals with the training of the health care providers.

**Public Private Partnership Cell**

This cell looks after all partnership activities.

**Health Promotion Cell**

This cell deals with the behavior change communication activities.

**Administration Cell**

This cell handles the routine day to day administration of the Project activities including the administration of Tamil Nadu Health Systems Society. The District Project Management Units are also administered by this cell.

**District Project Management Unit**

A District Project Management Unit (DPMU) was set up in each district to implement all activities of the project in the districts. This office was headed by the Joint Director of the Health Services in the districts. He is assisted by the District HSP Officer who was a Medical Officer posted exclusively for the project and an Assistant cum Accountant. The Project activities in the District are monitored by a committee known as district Project Monitoring Committee headed by the District Collector.

**Financial Management**

Initially the Project was started on the departmental mode of financial management involving the treasury. After two years that is in 2007 it was felt that the treasury mode of functioning was delaying the progress of project activities. Hence Tamil Nadu Health Systems Society was created and the project started functioning under society mode since the year 2008 onwards. The Project, except during the first two years of implementations has been prompt in getting the funds reimbursed and has been able to absorb the funds within the due dates. A detailed Financial Management Rules (FMR) manual was prepared during the beginning the project. The quarterly Interim Unaudited Financial Reports (IUFR) statements were prepared and sent regularly to World Bank for reimbursement of the Government funds spent.

**Component IV: Maximizing the Efficiency of the Public Sector to deliver essential services.**

**Sub-Component 1 : Rationalization of Secondary Care facilities.**

The Project had undertaken mapping of health facilities, a detailed facility survey of infrastructure and the project team had visited the hospitals during the project planning stage and identified the interventions to be carried out by the project. The criteria adopted to provide additional buildings, up gradation and renovation were (i) health indicators such as infant mortality rate, maternal mortality ratio, below poverty line (BPL) population, tribal area, SC/ST population (ii) performance of the hospitals such as inpatient and outpatient census, deliveries and surgeries performed (iii) geographical location (access) (iv) non availability of private sector in the area (v) current status of the infrastructure and (vi) chronic backlog of investment. Based on the above the civil works were undertaken as follows.

| Period | Civil Works | No. of Hospitals | Cost (Rs. in Crores) |
|---|---|---|---|
| Phase I | Hospital buildings | 35 Hospitals in 5 districts | 49.50 |
| Phase II | Hospital Buildings | 190 Hospitals in 25 districts | 234.40 |
| | DMS Annex building | One | 10.10 |
| Additional financing | Construction of maternity blocks | 8 Medical college hospitals | 55.23 |
| Additional financing | DMS Annex Building | 4th Floor and 5th Floor over DMS Annex Building | 4.36 |

All the civil works were completed well within the project period and were put into use for the patients. The Engineering Cell had through the state Public Works Department (PWD) constructed additional buildings for the Project Hospitals. The World Bank consultant Architect had approved the drawings for these buildings. The tendering, selection of the vendors and supervision of the construction were looked after by the PWD. The World Bank Procurement procedures have been followed for the selection of the contractors. The hospital buildings constructed included comprehensive maternity blocks, outpatient blocks, operation theater complexes, inpatient ward complexes etc. which are of very high utility value and enhanced the satisfaction levels of patients and health providers alike.

**Sub-Component 2 : Rationalizing of equipment.**

The Equipment Cell prepared the list of Equipment to be procured under the Project based on the facility and equipment survey conducted during the project planning stage and as per need, prepared technical specifications by getting the assistance from the concerned specialists in the hospitals and the Procurement of these equipment was done by Tamil Nadu Medical Services Corporation Limited by following World Bank Procurement procedures. The Equipment Cell also manages Equipment maintenance system and the project has recruited 49 Bio – Medical Engineers (BME) on contract for this purpose and out of them 35 Bio – Medical Engineers BMEs are funded by the project and remaining 14 BMEs working in the institutions under the administrative control of Director of Medical Education (DME) in the medical College Hospitals are funded by the Government of Tamil Nadu. The project has introduced the cadre of Bio Medical Engineers into the system for the first time and this has vastly improved the Equipment Maintenance system and greatly reduced the equipment down time and improved the equipment utilisation.

The budget spent for procuring equipment for various programs of TNHSP such as Non-Communicable diseases Intervention Program, Emergency Ambulance Services, Mortuary Van Services, Tribal Development Initiatives, Strengthening of Intensive Care Services, CEmONC Services and Poison Treatment Centers. The equipment were procured through, i) Tamil Nadu Medical Services Corporation (TNMSC) and ii) Project Management Unit of TNHSP for small procurements such as printing of modules by following World Bank procurement procedures and the cost works out to the tune of INR 27407.80 Lakhs as presented below :

| Sl No. | Phase | Estimate (Rs. in lakhs) | Contarct value (Rs. in lakhs) |
|---|---|---|---|
| 1 | I | 4719 | 4080 |
| 2 | II | 4114 | 3444 |
| 3 | III | 4209 | 3867 |
| 4 | Additional Financing | 16886.89 | 16016.8 |
| | Total | 29928.89 | 27407.8 |

All goods and equipment provided by the project were put into use, which had enhanced the provision of services by the hospitals to the patients which has reduced the patient referral outs and resulted in improved patient satisfaction

**Sub-Component 3 : Human Resource Planning & Development**.

Tamil Nadu Health Systems Project had included training as one of the core activities of the project and conducted training programmes to improve the technical and managerial skills of health care providers to enhance health service delivery at the facility level. Certain training programmes were conducted to improve the quality of care by positive communication, to build team sprit among the health

care providers and to build friendly relationship with the community. The programme related trainings are given by the respective programme officers. They were

| | |
|---|---|
| 1. | **CEmONC Programme** : (a) Partograph training, (b) Labour ward skill development (c) Newborn Resuscitation training (d) Ultra Sonogram training (e) Referral System training (f) Emergency Obstetrics Management for Medical Officers. |
| 2. | **Tribal Health** : (a) Tribal Counselors training on counseling. |
| 3. | **Non Communicable Diseases Intervention** : (a) Training on VIA/VILI for Medical Officers & Staff Nurses (b) Colposcopy Training for Medical Officers (c) NCD Programme training for Medical Officers, Nurses & other categories (d) Training on online screens, (e) training of village link volunteers (f) Training of Patient counselors. (g) Training of Self help group members. |
| 4. | **Health Management Information System** : (a) Basic Computer Training (b) Training on HMS/MIS Software application. |
| 5. | **Bio Medical Waste Management** : (a) Bio Medical Waste Management training for all Persons working in the hospitals |
| 6. | **Quality of care** : (a) Quality of care improvement training (b) Quality of care indicators training (c) Training on quality circles (d) Training on standard treatment guidelines (e) Rational Use of Medicine (f) Training on Snake Bite treatment (g) Training on Basic life support and Advanced Life Support (ALS) (h) Accreditation Training |
| 7. | **Equipment** : (a) Equipment Maintenance Training |
| 8. | **Human Resource Development** : (a) Hospital Administration Training (b) Poison Treatment Training (c) Ministerial Staff Training Programme (d) Nursing Superintendents Training (e) Post Graduate Training in M.P.H at Tata Institute of Social Sciences, Mumbai (f) Ventilator training (g) ECHO cardiogram Training (h) Dialysis Training (i) Motivation and Leadership Training. |

The training programmes were conducted from the first year of the project till the end of the project implementation period. All training programmes were properly planned, training modules were developed and feedback obtained from the trainees on the quality and usefulness of the programme. This was the first time in the history of Health Department that such a massive training programme on diverse subjects to improve health care service delivery has happened in the secondary care sector. This had definitely improved the performance of the health care providers.

**Sub-Component 4 : Enhancing Management of Public facilities :**

The project had attempted with good results to improve the management of project hospitals through (a) provision of hospital management training to doctors, ministerial staff and nurses (b) enhanced the financial powers of the chief medical officers for condemnation (c) obtaining monthly performance reports of the hospitals through HMIS (d) grading of hospitals into A,B,C & D categories and reviewing the C & D categories for improving their performance (e) conducting periodical monthly review meetings (f) conducting of monthly all staff meetings in the hospitals (g) periodical inspections of the hospitals (h) conducting hospital annual day (i) conducted medical audit and prescription audit (j) computerised inventory control of stores (k) regular training programmes.

## 6. Project Costing

The Project cost and the Expenditure are given below :

**Statement of Actual Expenditure (Categories wise)**

**I. Original Project (27.01.2005 to 30.06.2010) Rs.in Crores**

| Category | Allocated Project Cost (PAD Value) | Actual Expenditure |
|---|---|---|
| Goods (TNMSC&ELCOT) | 149.9809 | 110.4356 |
| Civil Works | 209.4287 | 262.9374 |
| Consulting services | 10.3920 | 7.5079 |
| Non Consulting services | 156.8333 | 86.5333 |
| Recurrent Cost (Incremental operating cost) | 44.9716 | 7.8632 |
| Unallocated Contingencies | 25.5489 | |
| NGO/Private services | | 18.9380 |
| Training | | 6.1639 |
| IEC | | 1.7996 |
| TOTAL | 597.1554* | 502.1789 |

*Funds deducted for ETRP has not been deducted

**II. Additional Financing (01.07.2010 to 15.09.2015) Rs.in Crores**

| Category | Allocated Project Cost (PAD Value) | Actual Expenditure |
|---|---|---|
| Goods (TNMSC&ELCOT) | 238.9662 | 312.1402 |
| Civil Works | 54.4200 | 60.5183 |
| Consulting services | 14.1810 | 31.1050 |
| Non Consulting services | 60.3330400 | 166.6930 |
| Recurrent Cost (Incremental operating cost) | 241.5911754 | 12.1484 |
| NGO/Private services | | 79.3699 |
| Training | 18.2564180 | 42.5123 |
| IEC | | 15.5429 |
| TOTAL | 627.7478334 | 720.03* |

*Excess expenditure made due to accrual of funds due to dollar rupee exchange value fluctuation.

## 7. Workshops conducted

The following is the list of workshops conducted

| S.No. | Name of the Workshops |
|---|---|
| 1. | Project Inception Workshop |
| 2. | Sensitisation Workshop on TNHSP activities |
| 3. | Tribal Health Workshop in collaboration with NGOs |

| | |
|---|---|
| 4. | Workshop on Cervical Cancer Screening Pilot, for Stakeholders |
| 5. | Sensitisation Workshop for service providers on Health care waste management |
| 6. | Workshop on World Bank procurement procedures for Core Officers and staff of TNHSP, TNMSC & PWD |
| 7. | Four regional CEmONC Sensitisation Workshop for Stakeholders in each of the four regions in the state |
| 8. | Workshop on Baseline Data on utilization of CEmONC centres |
| 9. | Workshop on Accreditation of hospitals |
| 10. | Sensitisation Workshop on DPMU procedures for Stakeholders |
| 11. | Workshop for development of Quality of care indicators |
| 12. | Workshop on developing standards for accreditation of hospitals by the state |
| 13. | Workshop on validation of Institutional Services Monitoring Report (ISMR) |
| 14. | Workshop on Analysis of Social Assessment Data for BPL & SC/ST Beneficiaries of CEmONC Hospitals |
| 15. | Road Traffic Accidents Prevention and Trauma Care Workshop |
| 16. | Tobacco Control Workshop |
| 17. | Snake bite Poisoning Treatment Protocol Developing Workshop (2 Workshops) |
| 18. | Anti Tobacco Initiatives Workshop |
| 19. | Workshop on Up scaling the Base line Data collection from the Medical Institutions |
| 20. | Workshop on NGO Management |
| 21. | Workshop on Standard Treatment Protocol Development Workshop |
| 22. | Workshop on Tribal Outreach Health Services with NGOs and other Stakeholders |
| 23. | Workshop on Advocacy program for health administrators of Tamil Nadu on Non Communicable Diseases with focus on diabetes |
| 24. | Workshop on Development of design and protocol for piloting Cardio Vascular Diseases |
| 25. | Workshop on Patient counseling centers for Chief medical Officers |
| 26. | Workshop on Cervical Cancer Screening Pilot |
| 27. | Workshop on Development of Training plan |
| 28. | Workshop on Diabetes prevention |
| 29. | Workshop on Tobacco Control |
| 30. | Workshop on Tribal Health activities with Stakeholders in different regions periodically |
| 31. | Regional Workshops on Maternal Health in six regions periodically |
| 32. | Video Conferences on Maternal Death Review every month on 4$^{th}$ Thursdays |
| 33. | Regional Review meetings on tribal health conducted with NGOs and district level administrators |
| 34. | Sensitisation Workshops conducted for web based HMIS region wise |

## 8. Implementation Completion Review Workshop

As the Project was completing its implementation, an Implementation Completion Review Workshop with the stake holders was organized on 28.08.2015 & 29.08.2015. The objectives of the workshop are (i) to have a comprehensive and systematic account of Project's performance (ii) to capture and disseminate experiences (iii) for self-introspection and evaluation (iv) for evaluation of the World Bank's Performance (v) to study the innovative and successful operations (vi) to discuss the major findings from the surveys and the impact of the project (vii) to recognize and apprise on the role played by various stakeholders of the Project (viii) to discuss about the challenges encountered and their resolutions (xi) to discuss about way forward. The participants of the workshop included the officials from (i) World Bank (ii) Government of India (iii) National Health Systems Resource Centre (iv) Indian Council of Medical Research (v) Uttar Pradesh Health Systems Project (vi) National Institute for Smart

Government (vii) Indian Institute of Technology (viii) Institute of Public Health India, Bengaluru (ix) Government of Kerala (x) Government of Tamil Nadu (xi) Former Project Directors, TNHSP (xii) Civil Society (xiii) Other Stakeholders which included state and district level health administrators, NGOs, Consultants, Vendors, Training Institutions, etc., In the workshop all the programmes implemented by TNHSP were discussed and the benefits accrued to the society were spelt out. Many recommendations have come out of the workshop which the Government is examining to include them in the further implementation of the programmes by the department.

## 9. Closure of the Project and Handing over of the programmes

The Project went in for a smooth closure on 15.09.2015. All major activities like CEmONC services, Tribal Health, NCD programme, HMIS programme, Quality of care activities, Equipment maintenance, Bio-medical waste management & Training have been handed over to the directorates for further implementation as regular departmental activities. All contract staff like female NCD staff nurses, Bio-medical engineers, IT coordinators and other staff sanctioned for the programmes have been transferred to the directorates along with the programmes. Government of Tamil Nadu and National Health Mission will be funding these activities. Certain programmes like State Health Data Resource Centre, 108 Emergency Ambulance Services, Free Mortuary Van Services are retained by TNHSP to be implemented by TNHS Society with Government funding. Most of the assets have been handed over to the directorates and the DMS annex is housing the programmes being implemented by TNHS Society. All contract staff taken for the programmes are retained as such they are working for the programmes.

## 10. Achievement of Project Development Objectives

The project had achieved all project development as seen from the results monitoring indicators during the additional financing period. TNHSP. The results are given below

**Revised Results Monitoring Framework (updated as of September 15, 2015)**

| SNo | Objectives | Project Indicators | Calculated as | Achievement Year 5 (Oct. 2014 – Sept. 15, 2015) |
|---|---|---|---|---|
| 1. | Increased access to and utilization of maternal and neonatal care services, particularly by poor, disadvantaged and tribal groups | Proportion of C-sec deliveries amongst SC/ST mothers at secondary level CEmONCs | [Total no. of c-sec deliveries amongst SC/ST in a year at project certified secondary level CEmONCs**/**Total no. of c-sec deliveries at certified secondary level CEmONCs] X 100 | 40.0<br>(35,099/87,646) |

| SNo | Objectives | Project Indicators | Calculated as | Achievement Year 5 (Oct. 2014 – Sept. 15, 2015) |
|---|---|---|---|---|
| 2. | Effective non-communicable disease interventions scaled-up throughout the state | Cancer cervix screening and cardio-vascular disease prevention and treatment pilot scaled up based on comprehensive assessments | | Screening, treatment and follow-up of CaCx, CaB, HTN and DM scaled up to all 32 districts of state.<br><br>Preventive interventions: school based interventions ongoing through SSA in 16,369 govt. and aided schools.<br><br>Workplace based interventions completed in 400 worksites<br><br>Community based interventions targeting 250,476 (97%) of the planned 258,255 women's self-help groups completed through TNCDW |
| 3. | improved health outcomes, access and quality of service delivery through strengthened oversight of the public sector health systems and greater engagement of the non-government sector; | Improved access to health care, as measured by inpatient utilization of services by the poorest 40% of the population. | [No. of people who reported ailment in last 15 days/no. of people surveyed] X 1000 | (i)Proportion of population reporting ailment in last 15 days (13.2 per 1,000) and percentage of these who accessed any form of care (97.5%);<br><br>(ii) Number of hospitalization cases (41.9 per 1,000) |
| 4. | | Patient satisfaction (perceived quality of care) as measured by patient satisfaction survey due in May 2010, December 2011 and endline survey | | Overall inpatient satisfaction score: satisfaction score: 3.92<br><br>Overall outpatient satisfaction score: 3.87<br><br>Data from patient satisfaction survey indicates:<br><br>- 84% of the patients were satisfied with the wait period of 4 minutes to access outpatient care;<br>- 75% of surveyed inpatients found 10 minutes of registration time acceptable and 88% of inpatients perceived 16 minutes for securing a bed acceptable;<br>- 98% of the respondents reported that the OPD and waiting area was clean and hygienic,<br>- 97% of inpatients found the facilities such as labor and ward |

| SNo | Objectives | Project Indicators | Calculated as | Achievement Year 5 (Oct. 2014 – Sept. 15, 2015) |
|---|---|---|---|---|
| | | | | rooms to be clean and hygienic;<br>- 86% of patients were aware of availability of continuous water at health facilities and 79% of patients were satisfied with the facility |
| 5. | Increased effectiveness of public sector hospital services, primarily at district and sub-district levels. | No: of public hospitals accredited by the National Board of Accreditation of Hospitals | | 11 accredited (3 full accreditation; 1 entry level accreditation; 7progressive level accreditation) |
| | **Intermediate Results Indicators** | | | |
| 6. | | (core) Number of health personnel receiving training: | cumulative | 480,586<br>(Yr 5 achievement: 156,684) |
| 7. | | (core) Number of health facilities constructed, renovated and/or equipped | | 2,330<br>PHC-1,889<br>GH-274<br>Municipal dispensaries-100<br>MCH-67 |
| 8. | Reducing maternal/neonatal mortality | Total no: of complicated SC/ST maternal admissions at certified CEmONCs*<br>(* where CEmONCs are certified to have at least 2 OBGYNs/2 pediatricians and 1 anesthetist) | | 74,373 |
| 9. | Improving Tribal Health | No: of tribal patients provided outpatient care through Mobile Outreach Vans | | 244,003 |

| SNo | Objectives | Project Indicators | Calculated as | Achievement Year 5 (Oct. 2014 – Sept. 15, 2015) |
|---|---|---|---|---|
| 10. | Facilitate use of hospitals by the poor and the disadvantaged | - Percentage of calls made by pregnant women attended to by 108 services | - [total number of calls made by pregnant women serviced by 108 services in a year /total no: of calls made by pregnant women in a year X 100] | 99.3 |
| | | - percentage of calls made for Road Traffic Accident victims attended by 108 services | - [total number of calls made for RTA serviced by 108 services in a year /total no: of calls made for RTA in a year X 100] | 87.0 |
| 11. | Facilitate use of hospitals by the poor and the disadvantaged | Number of performance based contracts delivering health care services through TNHSP in Tamil Nadu | | 37<br>(five contracts with Regional Diagnostic Labs, 2 Housekeeping contracts and 30 CTF contracts) |
| 12. | Health promotion | Number of schools where health promotion activities for prevention of cardiovascular diseases is undertaken | | 16,369 |
| 13. | Strengthening M&E capacity | Number of health facilities where HMIS is used to submit monthly reports | | 2,300<br>PHC-1,889<br>GH-274<br>Municipal dispensaries-70<br>MCH-67 |
| 14. | Strengtheing Health Care Waste Management | Number of public health facilities implementing integrated health care waste management plan | | 450 |

**11. TNHSP, HMIS - Awards**

| S.No. | Year | Awards Received |
|---|---|---|
| 1 | 2009 | Winner of the e-India jury award for " e – Health best Government Initiative/policy" |
| 2 | 2011-12 | Finalist CSI – Nihilent e-governance award |
| 3 | 2011-13 | Winner of 15th National e-Government award under category of " Exemplary reuse of ICT based solution " |
| 4 | 2013 | South Asia Pacific Manthan Juror's award |
| 5 | 2013-14 | e-India Award |
| 6 | 2014 | South Asia Pacific Manthan Special Mention award |

**12. Books Published**

The following books have been published by the project.

| S.No. | Name of the Book |
|---|---|
| 1 | Standard Treatment Guidelines |
| 2 | Handbook on Treatment Guidelines for Snake bite and Scorpion Sting |
| 3 | Tribal counselor guide |
| 4 | Handbook on Infection control & Bio-medical waste management |
| 5 | Documentation and dissemination of a best practice - HMIS |
| 6 | Cervical Cancer – Prevention Screening & Treatment, a pilot imitative of TNHSP - NCD |
| 7 | Programme for Prevention and Treatment of Non Communicable Diseases – Manual for Programme Managers |
| 8 | Programme for Prevention Screening and Treatment of Non Communicable Diseases – Manual for Programme Managers |
| 9 | Cardio Vascular Diseases - Prevention Screening and Treatment of Hypertension - a pilot imitative of TNHSP |
| 10 | Field Workers Training Manual - NCD |
| 11 | Auxiliary Nursing Midwifery (ANM) Training Manual - NCD |
| 12 | Guidelines for Special NCD Camps |
| 13 | Patient follow up path way - NCD |
| 14 | Clinical manual on NCD Interventions for medical paramedical staff - NCD |
| 15 | An overview of obstetric ultrasound - NCD |
| 16 | Causes of referral out of female clients admitted in comprehensive emergency obstetrics and neonatal care (CEmONC) centre and maternal and foetal outcomes : A cross sectional study (2012 – 13) |
| 17 | Guidelines and protocol for high risk pregnancies |
| 18 | Mechanical ventilation training module |
| 19 | Facility Based Newborn Care training – Module III (B) Medical Officer of the CEmONG Centres |
| 20 | Training module for OG specialists on labour Skill |
| 21 | Guideline for blood transfusion in obstetric practice |
| 22 | Training Programme on office administration for ministerial staff of health department – Training manual |
| 23 | Intensive Medical Care, Poison Management & Basic Life Support – Training manual |
| 24 | Training Programme on Principles of modern Nursing and Ward Management for Nursing Superintendents |

**13. TNHSP initiatives**

| | |
|---|---|
| 1. | Strengthened CEmONC centres with additional specialist doctors, nurses and buildings. Developed |

| | |
|---|---|
| | protocols – Introduced high risk mother screening programme. Contributed for the reduction of MMR and IMR |
| 2. | Introduced Tribal health activities namely mobile outreach health services in tribal areas, sickle cell anemia package, bed grant scheme and tribal counselors scheme |
| 3. | Introduced '108' Emergency ambulance services |
| 4. | Introduced free mortuary van services |
| 5. | Introduced Non Communicable Diseases prevention, screening treatment and follow up programme for hyper tension, diabetes mellitus, cervical cancer and breast cancer through a successful multi departmental programme |
| 6. | Carried out large scale IEC programmes |
| 7. | Web based real time health management information system established in all hospitals |
| 8. | Established viable bio-medical waste management system in all health care institutions in the state |
| 9. | Established Regional Training centres for training on Bio-Medical Waste Management in Nine medical college Hospitals both in public and private sector |
| 10. | Standard treatment guidelines book published |
| 11. | Snake bite and scorpion sting treatment protocol book published |
| 12. | Quality circles established in all secondary care hospitals |
| 13. | Quality care indicators introduced in the hospitals |
| 14. | Accreditation of hospitals by NABH obtained in 17 hospitals |
| 15. | Initiated continuous medical education programme |
| 16. | Provided hi –tech equipment like digital X-ray machine, Colour Doppler etc to hospitals |
| 17. | Established Equipment maintenance system for the hospitals and a cadre of bio medical engineers introduced into the system |
| 18. | Out sourcing of hospital sanitation and security services established in 80 major hospitals |
| 19. | State of the art buildings constructed in 233 hospitals (225 secondary care hospitals and 8 tertiary care hospitals) |
| 20. | Brought in systemic changes like enhancement of financial powers of medical officers, rationalization of services and introduced medical audit & prescription audit |
| 21. | Introduced a regular monitoring system by way of getting institutional services monitoring report monthly and A,B,C,D grading of hospitals and review system |
| 22. | Established poison treatment centres in 66 major hospitals which brought down the death rate due to poisoning |
| 23. | Established 'State Health Data Resource Centre' with collaboration with ICMR & NRHM |
| 24. | Massive training programmes carried out for technical and managerial skill development of health care personnel |
| 25. | Established sustainable public private partnership models in the health department |
| 26. | Revised Tamil Nadu Medical Code book |
| 27. | Introduced online reporting system in the Health Department |
| 28. | Introduced dialysis and echocardiography services in all district head quarters hospitals |

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