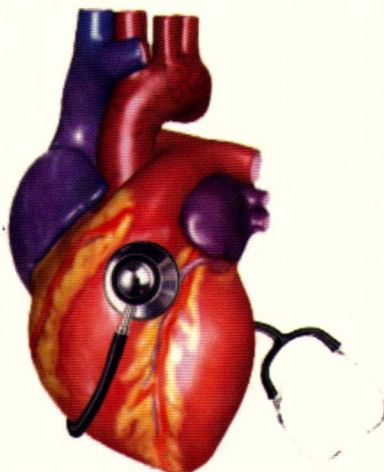




"DOCUMENTATION AND DISSEMINATION OF A BEST PRACTICE"

## **Cardio Vascular Diseases**

Prevention Screening and Treatment of Hypertension  
A Pilot Initiative of Tamil Nadu Health Systems Project



By  
Tamil Nadu Health Systems Project  
Department of Health and Family Welfare,  
Government of Tamil Nadu

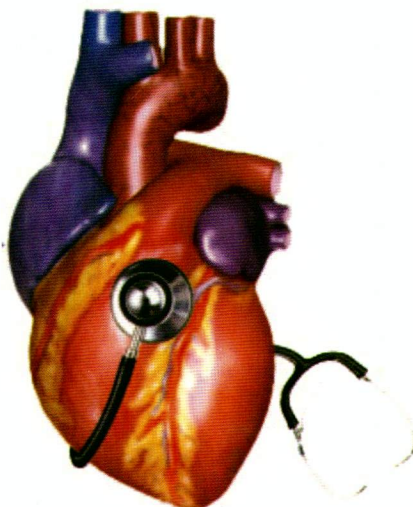
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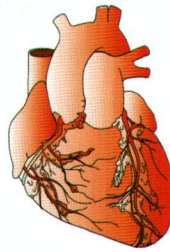
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# CHAPTER 1

## The Risk of Non-communicable Diseases

Non-communicable diseases (NCDs) or chronic diseases are those diseases that progress slowly and afflict the patient for a long duration. The four most common NCDs are Cardiovascular diseases (heart disease and stroke), Cancers (malignant tumours), Chronic respiratory diseases (chronic obstructive pulmonary disease and asthma) and Diabetes.

NCDs contribute to approximately 80 percent of the total mortality from NCDs. They are popularly called lifestyle diseases because their increasing occurrence is commonly attributed to the changing lifestyle in both urban and Rural India. Increased stress compounded by no physical activity along with unhealthy diet and substance abuse have led to the increased occurrence of such diseases that are reaching proportions.

Indeed, the occurrence of these NCDs is on the increase in developing countries like India. A World Health Organisation (WHO) estimate in 2005 shows that such countries would account for more than 70 percent of deaths due to chronic disease. Deaths from CVD will be more than from HIV/AIDS, Tuberculosis and Malaria. Middle-aged adults both men and women will be more affected by CVD than the elderly.

The most important myth is that only the urban rich are affected by it. But in reality, those in the middle and lower middle-income groups and in rural areas are also increasingly affected by NCD. Not only are 24 percent of deaths in India attributed to CVD and expected to increase further, but it is also responsible for high rates of disability.

## At a glance, in India

Cardiovascular diseases and cancer are at present the leading causes of death in developed countries accounting for 70 to 75 percent of total deaths.

A WHO study reports that India is fast emerging as the global capital of Diabetes and CVD. A State level study done in Tamil Nadu under IDSP (Integrated Disease Surveillance Project) in 2009 showed the prevalence of tobacco use, alcohol consumption, overweight, hypertension to be 22 percent, 15 percent, 23 percent and 20 percent, respectively. In Tamil Nadu, the crude mortality death rate due to CVD is highest in the country at about 360-430/100,000. By 2025, India is expected to have the highest incidence of Diabetes and Heart disease in the world and CVD will be the leading cause of death.

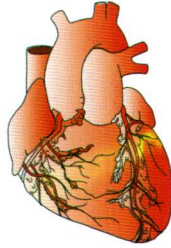


An Indian Council of Medical Research INDIAB study in Tamil Nadu shows the overall prevalence of diabetes is 10.4 percent and the prevalence of diabetes is 13.2 percent and 7.8 percent in urban and rural areas respectively in the state.

Apart from health burden to the individual, CVD also poses economic burden on the State. On one hand there is the prohibitive cost of treating a large population with Hypertension, Diabetes, and Cardiovascular diseases besides burdening the health system of the State. On the other, since such diseases

occur in adults during their most productive years, there is an indirect economic loss to the exchequer. A WHO study puts the loss to the national income due to CVD at USD 237 billion by 2015.

Treatment of NCD includes long-term drug intake to keep the diseases under control, and hospitalisation in case of emergencies. Cardio Vascular Diseases (CVD) could require sophisticated treatments like Angioplasty and Bypass Surgery, which are very costly. It is therefore desirable to prevent diseases like coronary heart disease, which is possible to a large extent through lifestyle modifications (LSM).



## CHAPTER 2

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### The Initiative for Spreading Awareness, Screening and Prevention

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The Department of Health and Family Welfare, Government of Tamil Nadu has a strong agenda for preventing the occurrence of NCDs among the individuals in the state as it believes prevention is better than cure.

The Tamil Nadu health policy of 2003 focused on the key issues of fighting Non-Communicable Diseases, improving management of health systems and improving the health status of disadvantaged communities. For this purpose, it proposed and started a project, the Tamil Nadu Health Systems Project (TNHSP), in January 2005 with support from World Bank. The aim was to achieve these goals by strengthening oversight of the public health facilities, increasing access to and utilization of Maternal and Neo-natal care services, effective implementation of Non-Communicable Disease interventions, and increasing effectiveness of service delivery in public sector hospitals at the district and sub-district levels.



During the project period, TNHSP also evolved an effective Health Management Information System that enables the project designers and implementers to track and measure project outcomes, health indicators and hospital indicators.

The first phase of TNHSP was successfully implemented from January 2005 to September 2010 and the project has been extended for another four years from October 2010 to September 2014.

### TNHSP – Designing the Pilot

Considering the gravity of situation with regard to Non-Communicable Diseases, especially cardiovascular diseases, Tamil Nadu Health Systems Project conducted baseline studies in four selected districts in 2007.

The districts were:

Intervention Districts	Sivagangai
	Virudhunagar
Control Districts	Theni
	Villupuram

According to the study, 26.7 percent of urban and 26.9 percent of rural populations were found to suffer from Hypertension, and 16.9 percent of the urban and 9.3 percent of rural populations from Diabetes Mellitus.

The findings of this study were used to design a pilot for spreading awareness initially in two of these districts about Non-Communicable Diseases especially cardiovascular diseases.

It emerged that understanding the risk factors associated with CVD is the first step to prevention. Hence the pilot project focused on spreading awareness

about the risk factors, Preventing emergence of risk factors and recommending modifications to the lifestyle before the disease rears its head. The pilot was also aimed to encourage the targeted (30 years and above) population mostly from the rural and poor urban areas to regularly check their blood pressure and other required investigations to ensure timely intervention.

Based on the preliminary study, Tamil Nadu Health Systems Project designed a pilot to be initially implemented in two districts: Sivaganga and Virudhunagar.

These districts were selected because they have similar systems and customs but vary in their livelihood mainstay. While Virudhunagar is mostly an industrial district abounding in mills and match-stick factories with a better socio-economic status, Sivaganga is an agricultural district with fewer infrastructure developments. In both districts, a government funded NGO facilitated the implementation of Behaviour Change Communication (BCC) strategy to create awareness in the target population.

## The Objectives

- To create awareness about Cardiovascular diseases and their pre-disposing factors among the current and potential target groups
- Emphasis on lifestyle changes in high risk groups
- Reinforce the message to sustain such changes throughout their lives.
- Create awareness about the modifiable risk factors relating to CVD and an early detection and treatment of Hypertension, a major cause of CVD incidence.

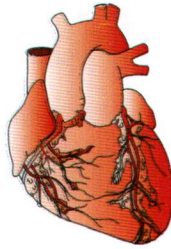
In addition to this, the pilot also aimed to:

- Identify the preparedness of the state's healthcare infrastructure to prevent CVD.

- Investigate whether CVD surveillance and risk reduction activities could be integrated with the existing infrastructure
- Evaluate the impact of a risk reduction program on the knowledge, attitudes and practices of the community, patients, healthcare providers, administrators and policy makers
- Estimate cost of undertaking such a programme at state level

The pilot was to be administered through four channels:

- 1) Community based activity: Create general awareness through information, education and communication (IEC) for the entire community in the pilot districts
- 2) School based activity: Catch them young by creating awareness among school children on the need and the importance of healthy lifestyle.
- 3) Workplace based activity: Create awareness among the vulnerable adult population in their places of work and encourage them to go for screening and health-seeking behaviour.
- 4) Clinical activity: Encourage the general population to visit the healthcare centres for screening for the diseases proactively.



# CHAPTER 3

## The Implementation

The aim of the pilot was to screen asymptomatic, target population and to create awareness among the general population in both rural and urban areas regarding the risks and the prevention of Cardio Vascular Diseases (CVD).

### Risk factors

#### a) Non Modifiable Risk Factors

- a. Age
- b. Sex
- c. Family History
- d. Genetic Factors

#### b) Modifiable Risk Factors

- i Smoking
- ii High Blood Pressure
- iii Diabetes
- iv Obesity
- v Sedentary lifestyle/Lack of physical exercise
- vi Unhealthy food habits like oil fried foods,etc
- vii Stress

The specific interventions were designed to address two levels:

1. Primordial Prevention and Primary Prevention
2. Secondary Prevention

## **Primordial Prevention and Primary Prevention**

The overall goal of Primordial Prevention was to prevent the emergence of the modifiable risk factors in the community. The primary prevention aimed at reduction of exposure to risk factors to enable behaviour change in the community by addressing the following goals:

### **Reduce tobacco and secondary smoke consumption**

- i. Publicize specific information on diseases related to smoking
- ii. Increase tobacco cessation and decrease tobacco initiation
- iii. Reduce secondary smoke inhalation
- iv. Implementation of COTPA Act in Public places.

### **Increase physical fitness with life style related activities**

- i. Increasing numbers in men and women who exercise for at least 30 minutes per day in given population
- ii. Increase physical activity for school children

### **Increase consumption of healthy diet**

- i. Increase information dissemination on healthy foods
- ii. Increase fruit and vegetable intake
- iii. Reduce caloric, fat and salt intake in target groups.

### **Reduce percentage of over-weight/obese individuals.**

- i. Increase awareness of benefits of ideal weight for height // life style issues.

- ii. Reduce sedentary / increase physical activity
- iii. Initiate activity to lead to behavior change in reducing risks of CVDs

## **Life style Modification (LSM)**

- i. Creating awareness in the community through various media like television, radio, bus boards
- ii. Providing counseling on LSM through Behavior Change Communication (BCC) / Inter Personal Communication (IPC) imparted by health staff at the level of clinics and in the field and also by Community Health Ambassadors

## **Secondary Prevention**

This aimed at early diagnosis and proper treatment with follow up.

**BCC (Behaviour Change Communication):** When planning the pilot, TNHSP kept in mind the fact that while clinical facilities for screening, diagnosis and treatment had to be made available, creating awareness and health-seeking behaviour was also critical. Therefore the aim was to discourage risk-enhancing behaviour patterns and modifying food habits, sedentary lifestyle and consumption of tobacco. Behaviour change communication (BCC) as part of its IEC activities became the key focus as the pilot project was implemented at schools, workplaces, in the community, and through clinics.

A four pronged intervention included approaching:

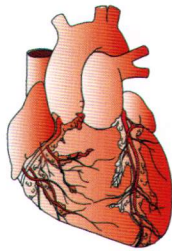
**Schools:** Twenty-five schools were selected in each district to target students in the 7th, 8th and 9th classes in these schools. Though not at risk for CVD, the aim was to create awareness early and encourage adoption of healthy lifestyle from a young age. They would also act as enablers for their family and community, spreading the messages of healthy living to the others around

them. School Heart Clubs were formed and activities were carried through these club with the help of Teachers (Physical Education & Science Teachers). Students from standards 8 and 9 were chosen as they would not have public exams and were also unlikely to shift schools at that stage.

**Workplaces:** Three workplaces, covering industry services (office) and bank were identified in each district. Awareness campaigns on CVD were conducted and heart clubs were formed. The observation made is that low-income groups are more vulnerable to CVD since industrial workers have very low levels of physical activity. Many of them smoke and consume food with high oil content from their work place canteens. As a result many are on regular medication for Diabetes and Hypertension and CHD.

**Community component:** For the community-based component, a range of IEC methods including extensive awareness campaign were deployed targeting the entire populations in the two districts. Within a year, it was recognized that the approach was ineffective and the focus of the campaign was shifted to cover a smaller population, i.e., two blocks in each districts in an intensive manner. However certain IEC activities through media were done across the district.

**Clinical component:** Eighty Primary Health Centres (PHCs) across both districts were selected as screening centres and 18 General Hospitals (GHs) as nodal centres. The PHCs were used for screening early diagnosis and treatment for the vulnerable. Counsellors were also appointed under the project at each centre to provide information, explain issues and advice patients.



## CHAPTER 4

### Manpower Planning, Staffing and Training

Even at the outset, the pilot was designed to integrate with the existing healthcare system in the state. The pilot districts had already established a District Project Management Unit (DPMU) with its staffing pattern to implement and supervise all TNHSP activities. The Joint Director of Medical Services who is the district level health official served as the nodal officer and the Non-Communicable Diseases (NCD) officer as the coordinating officer in the implementation of the CVD program at the GH / DDHS for PHC. The state PMU in coordination with the respective district units carried out the planning and preparatory work for the CVD program prior to the formal start of the program.

Two Non communicable diseases officers, staff nurses and Cardio-Vascular disease counsellors were appointed and the rest of the supporting staff being drawn from the existing system. In addition, for the workplace and community interventions, consultants to talk about and help implement lifestyle changes were brought in.

The World Bank (WB) provided technical and financial support. The Madurai Medical College and the Government Rajaji Hospital, Madurai, provided professional and technical inputs; the Gandhigram Institute for Rural Health

and Family Welfare Trust (GIRH-FWT), Gandhigram Rural University, Dindigul, designed, planned and organized awareness programs in the community for the pilot. GIRH also conducted awareness program for various target groups from the schools, workplaces and community components as well as counsellors for the clinics. National Institute of Epidemiology (NIE), Chennai, was responsible for concurrent evaluation of the project and Public Health Foundation of India (PHFI), New Delhi was involved in the cost analysis of the pilot project.



The standard treatment protocols for the pilot were developed by the concerned officials at the PMU. They were vetted and finalized in two Workshops at Chennai with the help of technical inputs from professors from city medical colleges and Madurai Medical College. The final screening, diagnostic and treatment protocols under the programme were submitted to the ethical committee at Madurai Medical College and clearance obtained.

The Madurai Medical College made a major contribution towards the training and refresher training of medical and paramedical staff from the nodal and screening centers. The institution also served as the tertiary care center for treating cases identified and referred after clinic-based intervention in the pilot districts.

## **The Different Components**

The focus of the school, workplace and community based components was through Behaviour Change Communication (BCC). Since BCC coverage of the entire population was impractical, two blocks in each district were chosen for intensive coverage. Between June and August 2007, sensitisation workshops were held for key persons of influence such as

school Headmasters, Block Development Officers and Block Extension Educators and Panchayat Officers in the two districts. They were introduced to the project background, causes of CVD, the risk factors, symptoms, prevention and treatment. This was expected to make reaching out to the target groups like schools and communities easier.

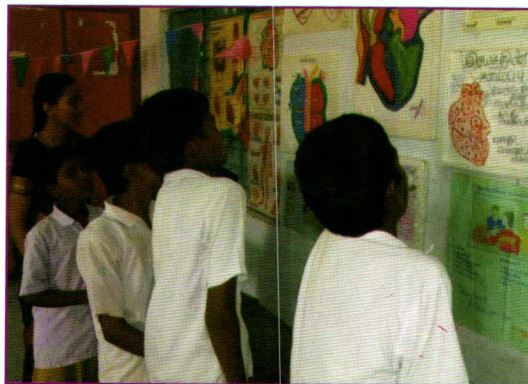
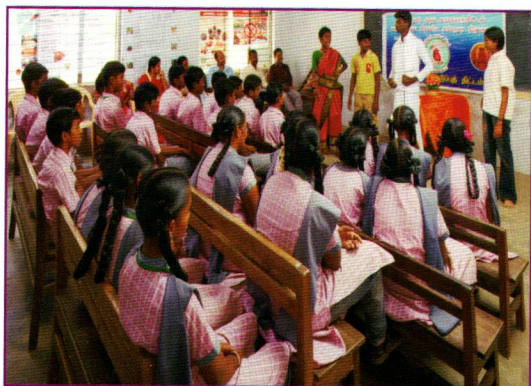
## The School

Twenty-five schools from each district were selected initially, and 25 more were selected as control schools for comparative assessment of impact of the school component of the project exclusively.



The target group in schools was identified as class 8th and 9th students for the first year, and in the second year, students moving up from class 7 to class 8 were to be included. In the first year, 5,196 students in Sivaganga and 12,234 in Virudhunagar were targeted.

Science or Physical Education teachers were to implement the school-based intervention by integrating knowledge through various activities and awareness related to CVD in the selected classes, encouraging games and



other physical activities, forming a Junior Heart Club in each school, helping students to organize exhibitions, rallies, etc.

During September-October 2007, a team of resource persons -- experts in Medicine, Health, Nutrition, Physical education, etc were brought in to design a Training of Trainers (ToT) module to train two selected teachers from each school. These teachers, in turn, would train students and instil in them knowledge and create awareness on risk factors of CVD. Teachers from the 50 intervention schools were trained in four batches during that period.

Some of the activities like allotting class time to provide more teaching about the heart, its functions and lifestyle related health issues, encouraging students to make charts, organizing exercise and sometimes yoga classes were initiated after the ToT was completed. These activities were continued in early 2008 after a break for term exams and holidays. In the new term, GIRH&FW project officers motivated the teachers to take up the formation of

Junior Heart Clubs. During summer holidays, short summer camps to continue CVD-related activity in the schools were planned. However, by the time school premises were made available after the Board exams, the students of classes 8 and 9 were already on holiday and could not be mobilized.

But soon after schools reopened in June 2008, a beginning was made with Junior Heart Clubs being formed in four schools.

During a visit to two schools by the WB representative in June, there was much energetic activity with children conducting an exhibition on CVD – charts, displays of healthy and unhealthy foods – performing yoga, and providing information on a CVD rally, quizzes and other competitions. Students showed some awareness of CVD risk factors during the event.



A timeframe was set for formation of Junior Heart Clubs in all 50 schools, and conduct activities such as a rally, an exhibition on nutrition, sports events and cultural competition periodically. A weekly session on CVD awareness was incorporated in the school curriculum. For teachers, refresher training once in four months was suggested. NIE suggested that five schools could be selected in each district (three rural and two urban) for testing which intervention had been most effective through pre and post tests for each intervention. Such testing of knowledge levels before and after training had been conducted during the first ToT for teachers and this was repeated during a second round of refresher training for teachers in August 2008. It was found that there was a significant increase in knowledge as a result of training; also, that those teachers who had been trained earlier had retained the knowledge acquired then. Formation of Junior Heart Clubs was completed in all

schools by October 2008. Students were encouraged to take home the CVD messages to their families and several of them reported that they had done so; a few cited positive results, such as a parent with symptoms of hypertension getting screened.

Activities related to the school-based component were completed by April 2009. With another summer holiday in the offing, this marked the end of two academic years under the project.

### **At a Glance:**

- 25 schools in each district were earmarked to carry out the activity and the students studying in 7th and 8th standards were the targeted stakeholders of this program
- Sensitisation and re-orientation sessions were conducted for Education Dept. Officials
- In schools, teachers especially those handling Science subject were sensitized about the risk factors related to CVD
- New Junior Heart clubs were started: 30 students, i.e. 10 from each class were chosen to form Junior Heart clubs (JHC), which would discuss the activities performed for CVD prevention to make the effort sustainable
- Summer camps were conducted in five selected schools in Virudhunagar and three in Sivaganga district
- Programmes such as rallies and human chains carried out by students to increase awareness on risk factors of CVD.
- Created awareness among 19000 students on CVD risk factors.

## In The Workplace

The second non-clinic based component was the raising of awareness among people in their workplaces – industry, service (office) and bank were decided upon during preparatory planning. There were initial hurdles to finding interested participants, but this was overcome as two factories, two banks and the collector's office in each district were finalized as target institutions.



As planned, the GIRH&FW field team made an introductory power point presentation in each workplace. This consisted of a short description of the cardiovascular system, the heart's functions, the forms of disease that could affect the heart, risk factors, causes and symptoms, other related conditions, who could be at risk, and the need for a healthy and active lifestyle including stress management. A questionnaire to test knowledge levels was applied to the target group in each workplace, before and after the first sensitisation session. Subsequent programmes included talks by specialists – Cardiologist, Nutritionist, Yoga teacher, etc – yoga camp, exhibition on the premises, visit to some of the employees' families by the field team and group meetings with smaller numbers of employees. It was also planned that regular participants in each workplace would be motivated to form heart clubs.

For workplaces, the first phase of sensitisation was carried out between October 2007 and June 2008 and, in some places, the second phase of specialist's lectures and training had begun. This was a more intensive phase and expected outcomes included: change in canteen food menu and in quality of food; display of no smoking boards; implementation of COTPA Act; increase



in number of persons who go for regular walks and /or cycle to work. At the next level, the number of heart clubs formed would be considered a measure of effective outcome.

The responses varied for the different groups targeted in the sensitisation programmes. Workers in industry were from a lower socio-economic and

educational level. Much of the information in the introductory sensitisation was new to them and so caught their attention and interest, resulting in questions and discussion. As a result, the pre and post test indicated significant increase in knowledge levels for both of them. The other successful programme in the factories was the exhibition. For the workers it was an occasion to give their families an outing, to go round the exhibition together and share their new knowledge. The GIRH&FW field team was able to hold a few discussion meetings with smaller groups of employees and visit some of their families.

However, most workers were not interested in the specialist lectures or in yoga practice as they felt these were beyond their understanding. Some canteens had cut down on fried foods to serve more nutritious items and the workers welcomed the move. The field team initiated formation of heart clubs in a couple of factories.

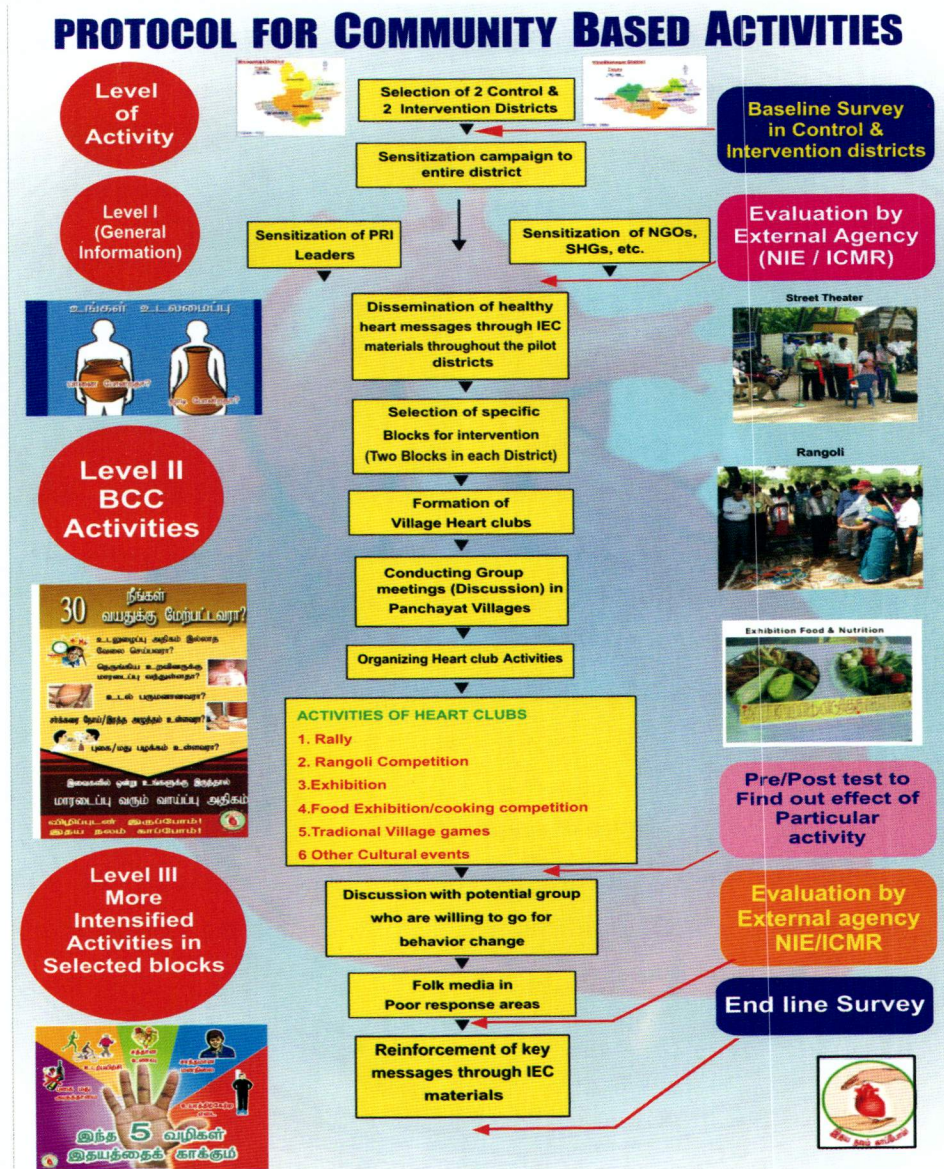
Bank employees were from a comparatively higher economic level with more education. Therefore, the initial sensitisation offered very little new information. Exhibition or formation of a heart club did not meet with much enthusiasm in this group. However, they were more interested in the specialist lectures and yoga and many followed up on these.

Employees at the Collectorate were of similar background as that of the bank employees. But as the numbers were large and there were many divisions, most employees did not attend more than one programme. However, exhibitions conducted at the collectorates were successful in drawing large numbers of interested visitors. This achieved the purpose of creating awareness.

## **For the Community**

Originally, the community-based intervention targeted the total population of the two pilot districts. Widespread IEC campaigns were conducted to enable linking up the clinic-based intervention by increasing voluntary screening

among asymptomatic vulnerable groups. The emphasis was on motivating for screening those identified as vulnerable because of possible combination of factors – age, unhealthy habits , etc. The aim was to motivate a change in lifestyle to avoid risk factors.



Hoardings, posters, stickers, bus boards, slides flex banners, scroll messages for local cable channels were part of the promotional activities.

Panchayat leaders, members of NGOs and SHGs were identified as persons of influence and sensitised and trained as they would spread the CVD message in their communities and also help GIRH&FW field teams in their subsequent attempts to set up programmes within communities for intensive BCC. In Sivaganga district alone, 445 panchayats were targeted and workshops organized for five batches. In Virudhunagar district also such workshops were held.



Between October 2008 and October 2009, significant ground was covered in the communities of the four targeted blocks. But the extent of behaviour change (food habits, physical exercise, avoidance of tobacco, alcohol, etc) was difficult to assess, considering the short time span.

### At a Glance:

- 2 blocks were chosen in each district
- Sensitization training given to Block Development Officers, Panchayat office holders, NGO staff, Self Help Group (SHG) and youth group leaders
- Cycling club, Walkers' club, Village Heart Clubs and other such activities initiated
- Group meetings held to discuss CVD risk factors
- Rallies and Heart day celebrations conducted to improve awareness
- Village Heart Melas conducted in villages of the 2 pilot districts – 50 Heart Melas conducted so far
- Sensitized and created awareness among 4,55,145 people

## The Clinical Component

The clinical component, the most concrete aspect of the pilot project, started with preparations for:

- Appointment of support staff at State and District levels
- Identification of 80 screening centres (44 Primary Health Centres in Sivaganga district and 36 in Virudhunagar district) and 18 nodal centres (9 GHs in each district)
- Preliminary visits to all the selected PHCs to observe availability of equipment like Semi-Auto Analysers, lab facilities and staff strength
- Planning for adequate and continuing supply of reagents and drugs through the Tamil Nadu Medical Services Corporation (TNMSC)



The Madurai Medical College provided ethical clearance for the programme. The standard treatment procedures were developed in two Workshops conducted in Chennai for professors from city Medical Colleges and Madurai Medical College. The Colleges contributed substantially in the training (both initial and ongoing) of medical and paramedical staff of the nodal and screening centres. It was also the designated tertiary care centre for treating cases identified and referred after clinic-based intervention in the pilot districts.

### Briefly

- CVD clinics established in 80 PHCs and 18 GHs
- 44 PHCs in Sivaganga, 36 PHCs in Virudhunagar
- Special IEC material developed and used for counselling

## TAMIL NADU HEALTH SYSTEMS PROJECT – CVD PILOT PROJECT

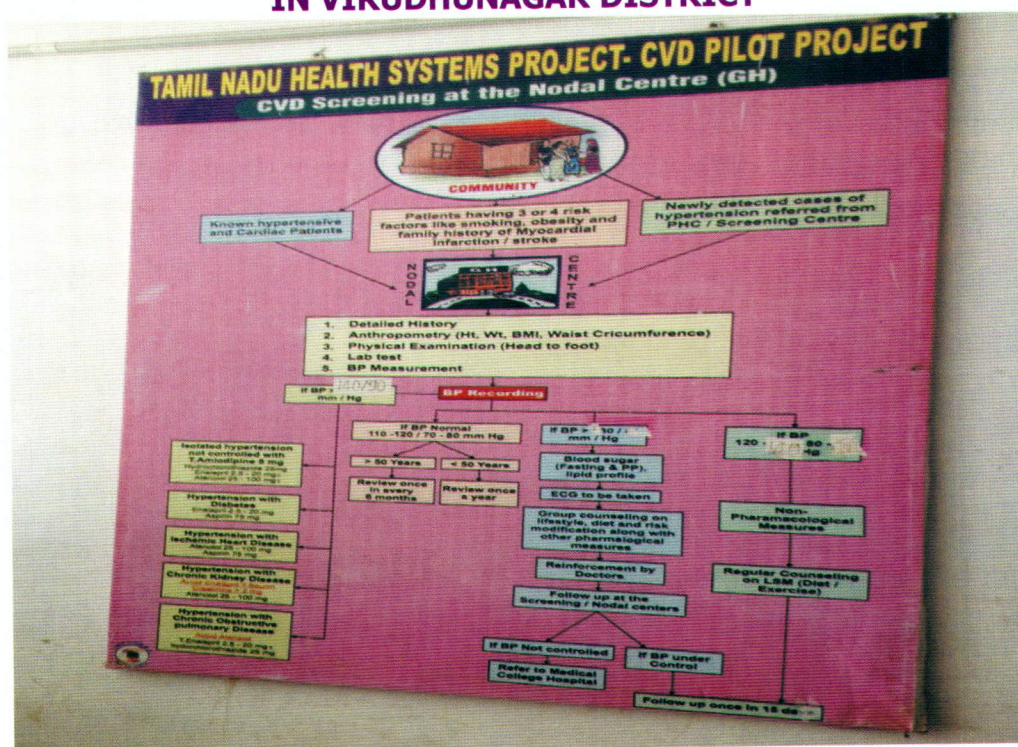


- Special staff nurses are trained and employed as CVD staff nurses by trained counsellor.
- Special Registers for the purpose of Screening, Treatment & follow up.
- People below the age of 30 counselled on CVD risk factors by trained counsellor.
- All people more than 30 yrs of age were screened for CVD
- Screened 12,31,259 patients
- 77,757 newly detected hypertension patients treated and were followed-up with strict adherence to Protocol.
- Further follow-up done for all patients detected with hypertension
- Graduates appointed as counsellors in the health care centres

The counselling, screening and the follow-up transformed the approach of the community as a whole and they willingly participated in the intervention programs.



## PILOT PROTOCOL USED IN A DISTRICT HEADQUARTERS HOSPITAL IN VIRUDHUNAGAR DISTRICT



## Training

Training, a major activity within the clinical component began on July 7, 2007, a day after the inauguration of the project, and began with a sensitisation workshop conducted by project personnel from TNHSP in Madurai Medical College for about 30 specialists from the Medicine and Cardiology

departments. Sensitisation of these specialists about the CVD intervention programme and determining the logistics in conducting training for district staff associated with its implementation were the two focus areas. This was where details like numbers to be trained, duration of training, venue etc, were finalised; a training module was framed by the Department of Cardiology. In the first half of August 2007, 300 doctors and nearly 500 health care providers (men and women) in Virudhunagar and Sivaganga were trained.

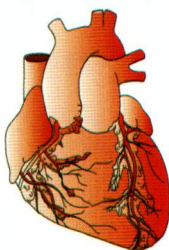
Doctors, nurses at nodal centres, health care providers and lab technicians at the screening centres were given technical training to hone their skills in diagnosis and treatment; and to treat patients with understanding. They were also trained in the standard treatment protocol and investigation guidelines, which included criteria for early detection and treatment, step-by-step procedures in methods of primary and secondary treatment, investigation procedures and referral protocols, registers and forms to be used at each level – HSC and PHC, GH and tertiary care centres.

Counsellors were made available at each of the 98 designated clinics and they were trained in batches over the following two months. In addition, two staff nurses called CVD Staff Nurse were posted in each of the 18 hospitals (total of 36 staff nurses). Counselling is needed before and after diagnosis and so all those who deal with the patient –



doctors, nurses and technicians – were also made aware of the need to provide some counselling along with medical services.

School teachers, Block Extension Educators and Inspectors of factories were also made part of these sensitisation efforts. Also, they were made aware of the role of Gandhigram Institute for Rural Health and Family Welfare (GIRH-FW) in IEC, BCC and training activities.



## CHAPTER 5

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### Impact

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As a result of training and sensitisation, most of the counsellors were well-informed, sympathetic and good communicators. Lab facilities and staffing were initially inadequate, but the situation had been addressed subsequently.

The field team recruited for community work in the four blocks, though late entrants in the system, established a well-organised communication system. Field supervisors were able to get in touch with their Community Program Assistants (CPAs) very quickly and this helped as sometimes adhering to the planned monthly timetable was sometimes a challenge.

The awareness campaigns have had a positive impact on diet, and the target addressed by the CPAs had better knowledge of risk behaviour and the need to change food habits. Interestingly, the importance of exercising is yet to sink in. However, to counter stress, visiting their place of worship was encouraged instead of yoga as this is something poor village communities can relate to better.

At the end of two years in the schools in the two pilot districts, awareness about the impact of tobacco products was high, as revealed by a 2010 survey of standard 10 students from 25 schools in each district. It showed that the children were aware that smoking affected the lungs. While the awareness was

70.5 per cent in Sivaganga, it was higher at 86.7 percent, in Villupuram. More than 90 percent of students in both districts also were aware of the carcinogenic properties of tobacco. The survey revealed that communication through television was the most effective followed by cinema.

To assess whether there had been an impact on diet, a detailed survey would be required.

An end line evaluation by the National Institute of Epidemiology in March 2011 on four parameters: assessment of clinic based hypertension- screening and treatment; surveying the people surveyed in 2006 to assess increase in awareness about risk factors; a follow up of the people surveyed in all four districts to assess change in risk behaviours; and lastly a survey in Theni and Virudhunagar to compare the prevalence of risk factors and awareness about them.

While assessing the intervention to be adequate, the survey revealed that women and the elderly above 50 years of age were the main users of the clinic-based intervention and diabetics was the most commonly identified co-morbid condition among the patients. Following counselling on diet modification 75 percent of the patients reduced salt and fried food intake and nearly half of them started regular walking.

There was also a reduction in smoking and alcohol use in all groups except in the Virudhunagar rural group. The evaluation showed an increase in the blood pressure of all rural groups but not in the urban groups. There was an increase in awareness about the connection between diet / exercise / drugs and Hypertension and Diabetes in all groups. Other ongoing awareness activities in the control district also contributed to an increased awareness in control groups. However there was no increase in awareness regarding the role of physical activity in preventing Hypertension except among the urban group in Theni.

## Briefly

- Behavioural changes have been observed on the targeted areas where the pilot study was undertaken
- Schools: Risk factors of CVD is being introduced into the regular curriculum and published to create awareness among children
- The success of the awareness programs has lead to the Labour department permitting intervention programs in workplaces.

## Impact at a Glance

- Created awareness among 19000 students on CVD risk factors
- 3441 persons have been sensitized so far among the working group.
- Sensitized and created awareness among 4,55,145 people.
- 12,31,259 patients have been screened and 77,757 newly detected hypertension patients are being treated and followed-up.

The clinic-based intervention has been implemented through 18 Government Hospitals and 80 Primary Health Centres. Staff nurses were exclusively trained and employed as CVD prevention staff nurses. Counsellors were appointed in all these centres and specially developed IEC material were used for creating awareness on risk factors.

The third evaluation component of the end line survey was a comparison between Virudhunagar and Theni districts on awareness of risk factors.

A cross-sectional survey in Virudhunagar and Theni districts revealed that the socio-demographic profile of the targeted population was similar in both districts, the average age at around 40, and mostly covered manual workers.

Smoking and alcohol use prevalence was higher in urban Virudhunagar as compared to Theni. Smoking prevalence was higher in rural Theni as compared to Virudhunagar but the opposite was true for alcohol use.

Fruit and vegetable intake was very low in all areas with an average fruit consumption of less than half a serving and an average vegetable consumption of less than one serving per day.

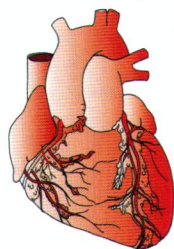
Prevalence of overweight/obesity was higher in males than females in both districts, and higher in Theni than in Virudhunagar district as was also the prevalence of Diabetes. Radio was the most common source of disseminating information on risk factors in all areas. Messages regarding smoking and alcohol were more commonly heard as compared to messages on obesity and diet.

## **Cost Analysis**

The Public Health Foundation of India (PHFI) assessment of the economic impact of the clinical component of the CVD program showed that the pilot project for prevention of Hypertension was relatively inexpensive in terms of cost per person screened. The project spent Rs.32 per person screened and Rs.656 per patient coming in for treatment. For each patient who was controlled for Hypertension, the pilot project spent Rs.992. The pilot project reported a recurring cost of Rs.28 per person screened and Rs.17 per encounter and Rs.883 per patient controlled for Hypertension.

But as the coverage of treatment was low, the project was expensive in terms of cost per case treated. The case detection and treatment figures would have to improve for the project to achieve better unit cost ratios. The unit cost ratios are important for making allocation decisions and a minimum coverage has to be ensured for the project to be efficient. The efficiency rate for the project is 23 per cent.

However, these ratios are not indicative of the effectiveness of the project as PHFI did not attempt to measure the burden of disease or the future cases of CVD averted due to the project.



## CHAPTER 6

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### Monitoring, Evaluation and Learnings

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Any pilot is an experiment and the challenges and the lessons learnt from the experience enable one to tweak and modify the design so that it can be improved on when implemented across larger areas.

The pilot for prevention of cardio-vascular diseases also had its own set of challenges but constant evaluation and timely intervention enabled some of the hurdles to be overcome through redesign and modifying the strategy.

One of the challenges was the slow response to the initiatives. Overambitious coverage in a short time made IEC ineffective. By the same token, BCC-based efforts were also slow to show results, needed long-term effort with patience and their inclusion in a 2-year pilot project was but a beginning.

Within a year, it was recognized that the approach was ineffective and the focus of the campaign was shifted to cover a smaller population, ie, two blocks in each districts. However certain IEC activities utilising media were done across the district.

During training of doctors, it was clear that they were familiar with much of the content relating to Hypertension and its treatment. The training was a useful

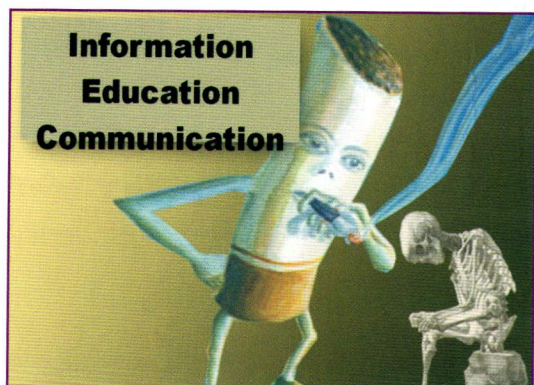
refresher, reinforcing the protocol and providing information based on recent research in diagnosis and treatment methods.

Some doctors expressed concern that certain reporting forms were too long and cumbersome. Based on this feedback, it was agreed to revise the reporting form. This was also the beginning of a continuous monitoring of project documentation procedures.

Major aspects of these components took time to get off the ground. But process monitoring and review resulted in at least one major change in approach halfway through the project period.

Many of the activities organized in the schools were not sustained or continuous. The shortness of the project period, further limited and interrupted by exams and holidays, was a major constraint in the school-based component.

However, knowledge levels among teachers and students increased, suggesting that the next generation will be more aware and more healthy.



In the community component, by June 2008, it was evident that the IEC component was yet to get off the ground and the sensitisation campaign was spread too thin. For example, during the World Bank representative's field trip that month, a visit to a community brought forth a warm welcome, the guest was asked to hoist a CVD flag, start a rally, and judge a rangoli competition on

the CVD theme. However, as in the case of a school exhibition on the same occasion, it was clear that much of the activity was organised for the moment and was obviously not sustained or continuous. Community members – including those who drew the rangolis – had little knowledge or awareness of CVD risk factors.

## **Areas of Improvement Identified**

A review meeting in October 2008, where representatives of TNHSP, the World Bank, NIE and GIRH&FW were present, critically analysed the problems of BCC targeting the community. It was agreed that the major problem with the original BCC plan was that too ambitious and wide a coverage (all the population of two districts) for dissemination of information and awareness had been planned. A more focused approach could be expected to yield better results. The revised plan defined three levels of activity:

- Level I activity would be widespread, aimed at the larger community through posters, stickers and bus boards.
- Level II interventions would consist of short video clips to be played in all PHCs.
- Level III interventions would focus on two selected blocks in each district – street plays would be staged and health melas conducted. Components of the latter would be rally, rangoli and cooking competitions, exhibition and exercise.

Based on the advice of the NIE, the blocks selected for intensive focus were Devakottai and Manamadurai in Sivaganga; Sivakasi and Rajapalayam in Virudhunagar.

Of the field staff trained and appointed by GIRH-FW in November 2007, to cover the entire project area, those who remained needed refresher training and some fresh recruitment was also necessary. GIRH-FW appointed and trained one Community Program Officer (CPO) and nine Community Program

Assistants (CPA) for each district, to cover the two selected blocks. By March 2009, the appointed field staff initiated interventions in the targeted communities. These interventions consisted of sensitisation training for various community leaders such as Block Development Officers, Panchayat Office holders, NGO staff, Self Help Group (SHG) and youth group leaders; formation of Village Heart Clubs with representatives from the above groups as well as grassroot health service providers; holding of Heart Melas and Heart Day celebrations; group meetings and follow-up meetings of field-staff with village people. Detailed planning, rigorous M&E and a flexible mindset allowing for change when needed are major contributors to the success of a pilot project. Some of the other lessons learnt and incorporated during up scaling of the initiative are given below;

<b>Lessons learnt</b>	<b>Addressed in scale up</b>
Dedicated human resources necessary	Staff nurses appointed in all health facilities exclusive for this program
Uninterrupted Supply of drugs / reagents needed	Separate budget for the same is approved
Ensure timely supply, maintenance and replacement of equipments	Central procurement
Periodic reorientation of doctors	Will be done
Protocols need to be simplified and PHC doctors to have decision making powers	Number of conditions requiring referrals is reduced
Follow up of patients with Hypertension and Diabetes in clinics	VHNs are assigned the task of follow up
Data quality needs improvement	Dedicated nurse responsible for maintaining data. Random checks by statistical assistant
Analysis/corrections of reports at district level to be ensured	Dedicated Statistical Assistants (SAs) were appointed.

In addition, a need was felt for continuous improvement and refinement of protocols for technical aspects and so the project was periodically reviewed and suggestions made to improve incorporated. This helped identify several problems at different levels and address them effectively.

Record keeping and documentation was found to be poor and faulty with staff nurses in the districts finding the formats difficult. The primary output of the clinic-based intervention – numbers screened and numbers diagnosed – was well short of targeted levels. The impact of IEC and other community activities was negligible. Almost all the patients screened had come, not out of awareness of Hypertension / CVD risk, but for other reasons. This raised the question of effectiveness of voluntary screening based on different IEC approaches. In many clinics, there was a shortage of reagents and drugs; some lacked the BP apparatus and other equipment required for the program.

Changes were introduced following a Review / Workshop in May 2008. Counsellors were re-trained properly and all PHCs and hospitals were equipped with essential medical equipment, two computers and a television. Adequate stock of medical supplies was ensured, and documentation had improved. The monthly reporting formats, in their final revised form, were user-friendly. This resulted in an increase in the overall number of patients visiting the GHs and PHCs.

In the second year, the performance of the clinical component was better as there was greater familiarity and confidence among the staff. Some GHs and several PHCs could be identified as models in the performance of different crucial tasks. Counsellors were in place, trained and performing well in all the clinics. Most of the medical staff were also trained and newly-appointed staff were being trained for the CVD program periodically. Supply and maintenance of essential equipment and availability of drugs had improved.

## Improving reporting formats

There were some challenges – such as the mix-up of old and new patients in screening records, with the same patients swelling the list of those screened through multiple entries. In some places this was the result of a conscious effort to show higher numbers; in others, it was because of poor knowledge of recording and failure on patients' part to bring their CVD clinic card on repeat visits. NIE reports in both October 2008 and March 2009 pointed out that pressure to increase numbers screened was counter-productive. This was so especially with regard to PHCs, because most had reached saturation level as far as opportunistic screening of visiting patients was concerned. The alternative suggested was to take screening to the community.

The Standard Treatment Protocol and the use of various drugs for treatment, as well as how to measure the waist circumference to determine obesity were explained and demonstrated.

As documentation was critical to understand the level of success of the project and areas of improvement in reaching the NCD program to the target group, the formats were revised and the participants were taken through them step by step.

Since the target figures were not achieved in the first year, ways to improve the reach were discussed and worked out.

Through interactions and discussions, it emerged that some of the problems were:

- Inadequate drugs and lab facilities
- Inadequate training of counsellors
- Inadequate Physicians with MD (General Medicine) qualifications at GH to manage referred cases
- No previously trained doctor in some PHCs
- One fourth PHC/GH had only one BP apparatus

- Doctors practicing screening as per protocol except for poor focus on life style modification advice and not including waist circumference in anthropometry
- Dose increase to achieve BP control and cut offs for control, not practiced as per protocol by nearly one third of doctors
- Majority of PHC doctors referred for uncontrolled hypertension and only half referred for complications
- Only 10 percent refer for lab investigations as most patients are not willing to go to GH
- Doctors prescribing first drug as per protocol; however lack of drugs at PHC/GH major constraint for prescribing second line drugs (like Hydrochlorothiacide HCTZ)
- Improvement of reporting for month of May (except for extreme values)
- Inconsistencies for a few indicators (related to follow up or BP under control)
- Only Few PHC / GH able to carry out lab tests

The analysis was followed by the following recommendations:

- Improve drug and reagent availability in PHC/GH
- Arrange for availability of HCTZ in TNMSC warehouse
- BP apparatus, preferably electronic, to be made available
- Lab technician at every PHC/GH
- Patient cards/registers inadequate in some PHCs; supply to be ensured
- Periodical reorientation required as trained doctors may not remain in the same PHC; preferably, all doctors in PHC should be trained
- ECG training for PHC/GH doctors
- Protocol modification
- Referral criteria
- Addition of second drug at PHC itself

- Video shows on counselling for CVD risk factors to be made available at PHC level to facilitate group counselling
- Counsellors need to be retrained by Doctors using simplified tamil language module
- Reporting format has been improved but there is scope for further improvement
- Direct communication with PHC/GH doctors for report clarifications / feedback to be established.

Such detailed analysis and implementation of the recommendations arising from it, contributed hugely to improved performance in the clinical sector. Thus a key aspect of the CVD program was flexibility – a readiness to evaluate, identify lapses and ways to set them right, and adopt new approaches when old ones proved unsatisfactory. Some of the areas in which this marked change in approach was evident were:

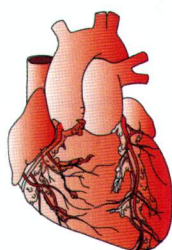
## **BCC strategies**

Initially, the non-clinical components did not produce the desired results. But, based on this feedback and an analysis of the problems, the aims were revised and a better focus arrived at.

Initially it was believed that the IEC activities would encourage the targeted group to voluntarily opt for screening. But as the desired result seemed unlikely to be achieved, the IEC/BCC strategy was fine-tuned in a 3-level approach of increasing intensity.

As mid-course correction, it was decided to opt for opportunistic screening and CVD counsellors were trained to check BP. The rest of the staff was advised that everyone who came into contact with patients should be able to provide counselling if necessary.

Midline evaluation of the various components helped in identifying shortcomings and introduce suitable changes to address these issues.



## CHAPTER 7

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### Scaling and Sustaining the Initiative

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As validated by officials of the World Bank, the pilot project conducted by TNHSP for spreading awareness and encouraging health-seeking behaviour regarding prevention of cardiovascular diseases is first of its kind. A huge population of 13 lakhs was covered through various components of the pilot project.

It is also probably the first such pilot to be undertaken with discrete school based, workplace based, community based and clinical components. Several initiatives were taken wherein each of the components was piloted individually but the whole program was unique in its comprehensive design.

Based on the pilot – its success and the lessons learnt from the exercise – TNHSP is now in the process of implementing an expanded, sustainable, long-term intervention for the prevention and control of CVD in the entire state, implementing Program for Prevention, Screening and Treatment of Non-Communicable Diseases (NCD). The Program also includes interventions focusing Diabetes Mellitus in addition to Hypertension. While the clinical component is being given importance, partners will be identified to carry out NCD related activities to target other social groups such as school children,

working population and general community. Involvement of government departments of Education, Labour, Rural Development, Municipal administration and ESI helps to ensure that respective target populations get covered in a holistic manner.

<b>Phase I (16 Districts)</b>	<b>Phase II (16 Districts)</b>
Thanjavur	Thiruvallur
Virudhunagar	Thiruvannamalai
Sivagangai	Vellore
Theni	Salem
Chennai	Namakkal
Cuddalore	Krishnagiri
Kancheepuram	Dharmapuri
Villupuram	Karur
Trichy	Coimbatore
Perambalur	Tirupur
Ariyalur	Nilgris
Dindigul	Erode
Nagapattinam	Tirunelveli
Madurai	Thoothukudi
Thiruvarur	Kanniyakumari
Pudukottai	Ramanathapuram

The partnerships would leverage on the strengths of the respective departments in the implementation services of the NCD intervention programme such as incorporating NCD related information and messages in the curriculum for standards 6 to 9 or advocacy with trade unions to enable employees to benefit from NCD interventions using available government and health facilities.

There is a proposal to integrate the data on to the existing HMIS by online entry of patient data and also link the records of patients requiring critical treatment to the Government Insurance Scheme, which would result in a seamless

integration. It would also reduce the number of patients lost due to waiting and give access to good quality treatment.

Based on the experience of the pilot project and its positive impact, the CVD prevention programme was scaled up to all the 32 districts in Tamil Nadu in a phased manner by covering 16 Phase I districts in 2012 and the balance 16 Phase II districts in 2013.

In the upscaling of the program during 2012 & 2013, Govt. of TN has inducted this program in the regular stream of health care. Role of respective departments and details of activities to be initiated at various levels were spelt out in the Government Orders issued in this regard.

## **Conclusion**

Tamil Nadu Health System Project's Pilot initiative for addressing the rising incidence of Non-Communicable Diseases aimed to create awareness about the diseases, especially cardiovascular diseases in the first phase and encourage screening and initiate lifestyle changes to prevent future occurrence of the diseases. For this, it created focused activities targeting school going children, the workplaces, at the clinics and the community as a whole.

With constant monitoring and mid-course correction, the programs were fine-tuned to suit the realities on the ground and made relevant for the target groups. As a result, at the end of the pilot phase, there was more awareness about the causes of diseases such as CVD and how to prevent them through proper diet and exercise. There was also greater awareness on the need for periodic screening to keep the diseases at bay.

Encouraged by the results of the pilot, the program is being implemented across the state in a phased manner. The pilot also helped understand the hurdles and the solutions helped with successful implementation of the Pilot program and paved way for planning the up scaling activities.

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