

# A PROGRAMMATIC EXPERIENCE ON IMPLEMENTATION OF MULTIPLE STRATEGIES TO IMPROVE SCREENING OF HYPERTENSION AND DIABETES IN 28 HEALTH UNIT DISTRICTS OF TAMIL NADU NOVEMBER 2022 – MARCH 2023

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## Abstract

**ABSTRACT:** In order to tackle NCDs, early detection and screening for the disease plays a vital role to initiate treatment at the earliest and ultimately reduce the premature mortality due to NCDs. In Tamil Nadu, a community-based NCD intervention program, Makkalai Thedi Maruthuvam (MTM) was launched in August 2021, an initiative taken to provide health care services at people's doorsteps, aimed to screening for NCDs as a measure of Population based screening and distributing medicines for patients suffering from NCDs in order to reduce their out-of-pocket expenditure. These services were delivered through Woman Health Volunteers (WHV), who were identified from the community with minimum qualification of higher secondary education. Even though the Tamil Nadu Public Health department has a broad base at field level, the screening coverage needs to be improved. So, as part of the Makkalai Thedi Maruthuvam program, the Department of Public Health & Preventive Medicine piloted multiple screening strategies on outreach mode to improve screening of HT & DM with focus to improve the coverage and quality of screening in selected districts. We proposed to do the secondary data analysis of the pilot data to analyse the effect of the strategies on coverage and quality and also to understand the feasibility of expanding the strategies on a wider scale. Proportions were calculated for screening coverage, positivity rate and detection rate. Our study resulted higher coverage among community-based strategy whereas higher positivity rate, follow-up confirmation and detection rate among screening strategies involving medical and para medical staff in the screening team. Conventional data collection tools were easier to implement whereas have challenges in follow-up monitoring. Newer digital tools which may be more effective than manual tools need additional resource mobilisation for implementation. In the 15 years of implementation of NCD intervention programme, MTM line list portal, the recent digital tool for the MTM program has created a better platform for tracking all the diagnosed NCD cases and ensuring their follow-up visits, compliance to drugs and adherence to treatment. The same platform can also be expanded to capture the screening details thus aiding in assuring higher detection rate and decreased dropout rate of screened positives of NCDs.

**KEYWORDS :** Mass screening, Screening on outreach mode, screening coverage

## INTRODUCTION

Noncommunicable diseases (NCDs) which are chronic in nature are due to a combination of genetic, physiological, environmental and behavioural factors. Most common NCDs are cardiovascular diseases, diabetes mellitus and cancers.<sup>1</sup> Currently there is an large estimate of around 50 % of population undiagnosed with Diabetes and Hypertension and of this population when diagnosed first nearly 20–30% already exhibit signs of microvascular and/or macrovascular complications.<sup>2</sup> According to WHO, NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur.<sup>1</sup> Modifiable risk factors such as Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets raises the risk of dying from an NCD. Also, Metabolic risk factors contribute to four key metabolic changes that increase the risk of NCDs such as raised blood pressure, overweight/obesity, hyperglycaemia and hyperlipidaemia.<sup>1</sup> The long latency period of type 2

diabetes mellitus often several years, when the individual is often asymptomatic and unaware of their condition resulting in many health problems affecting the oral cavity, eye, wound healing, complications in pregnancy, heart and kidney disease and may result in death in certain cases.<sup>3</sup>

The Alma Ata Declaration in 1978 insisted on the need for Primary Health Care for effective screening prevention and management of NCDS which has again brought into spotlight with the 40-year anniversary of the Alma Ata Declaration reasserting its principles in the Astana Declaration, reinforcing the importance of PHC in achieving universal health coverage and the sustainable development



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goals, and on the prevention and management of NCDs.<sup>4</sup>

In India, increasing longevity, unhealthy diets and sedentary lifestyles have led to an increase in non-communicable disease (NCDs) such as heart disease, diabetes and cancers, which accounts for 64% of the disease burden in the country.<sup>5</sup> In order to tackle NCDs, early detection and screening for the disease plays a vital role to initiate treatment at the earliest and ultimately reduce the premature mortality due to NCDs. To combat diabetes, hypertension and other NCDs, the Government of India has launched "Population-based screening (PBS) of common NCDs" at the community and primary health care level. PBS provides promotive, preventive, curative and referral services as part of comprehensive primary health care at Health Subcentre - Health and Wellness Centres (HWCs) across the country. It provides equitable access for NCDs screening and management at the community level by utilizing the services of the health care workers and frontline workers under the existing primary healthcare system.<sup>5</sup>

In Tamil Nadu, a community-based NCD intervention program, Makkalai Thedi Maruthuvam (MTM) was launched in August 2021, an initiative taken to provide health care services at people's doorsteps, aimed to screening for NCDs as a measure of Population based screening and distributing medicines for patients suffering from NCDs in order to reduce their out-of-pocket expenditure. These services were delivered through Woman Health Volunteers (WHV), who were identified from the community with minimum qualification of higher secondary education. Even though the Tamil Nadu Public Health department has a broad base at field level, the screening coverage needs to be improved. A recent article on implementation of MTM program, various challenges were reported which included poor screening coverage by involving only a community-based health worker in screening of NCDs.<sup>6</sup> So, as part of the Makkalai Thedi Maruthuvam program, the Department of Public Health & Preventive Medicine piloted multiple screening strategies on outreach mode to improve screening of HT & DM with focus to improve the coverage and quality of screening in selected districts. We proposed to do the secondary data analysis of the pilot data to analyse the effect of the strategies on coverage and quality and also to understand the feasibility of expanding the strategies on a wider scale.

## METHODS

The implementation of the screening strategies on outreach mode had been proposed in all the 46 HUDs in the state, randomly selecting one block in each of the HUDs for

a period of five months from November 2022 to March 2023. In each of the selected block, the target beneficiaries of the Makkalai Thedi Maruthuvam program aged 18 years above were included in the study.

Nine screening strategies were planned which includes the routine Population based screening by community level health care worker – Women Health Volunteers (WHVs). The other strategies include camp mode by the Primary Health Care team, camp by private hospitals, screening by Mid-level Health care Providers (MLHPs) at the Health Sub-centre level, screening by Mobile Medical Unit team, screening by NGOs with the support of Resident Welfare Association, screening at workplaces, all combined with the routine PBS by WHVs. Six ways of data collecting tools were proposed in the pilot. Based on the readiness and difficulties in establishing the data collection tool, only four strategies out of nine were piloted which covered 28 HUDs. The data from the piloted four strategies were analysed and the experiences in implementing were reported. The challenges and difficulties faced in establishing the data collection tools were also described.

Data were collected in an Excel sheet and analysed using epi info 7.2. Proportions were calculated based on the numbers screened, number followed up with further evaluation by medical and paramedical staff for confirmation of diseases and hypertension cases detected.

## RESULTS

The nine strategies with the implemented four strategies denoted in alphabets, and with the data collection tool used were described in Table 1. The proposed six different data collection tools for the pilot study by the state were – NCD program Registers (manual), ODK tool with ABHA ID, existing Tamil Nadu Population Health Registry app, customized State NCD app called DPH THANKS app, CPHC-NCD app by Government of India, and a local district app. Of these six, ODK tool and the GoI CPHC-NCD app were could not be established. Hence four strategies proposed with ODK and one strategy with GoI NCD application as data collection tool couldn't be conducted and hence only four strategies were implemented for the pilot.

Four strategies - screening only by WHVs, screening by WHVs and special NCD camps, screening by WHVs and MLHPs and, screening by WHVs and camps in coordination with private empanelled hospitals were denoted as A, B, C, D respectively.

In 28 HUDs where four strategies had been implemented, the total target population is 34,21,126 and the population



screened were 7,27,057 with 21% as screening coverage. The routine PBS by WHVs had the highest screening coverage of 32.9% whereas the strategies involving special NCD camps had the least screening coverage of 10.4% and is shown in Table 2.

The screening positivity rate among the screened by the four strategies are given in Figure 1. Strategy by routine PBS by WHVs plus camps conducted by state insurance – Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS) private empanelled hospitals showed the highest positivity rate and the conventional WHV screening strategy had the least positivity rate.

*Table 1: Nine screening strategies and data collection tools to improve screening of Hypertension and Diabetes in 46 Health Unit Districts of Tamil Nadu, November 2022 – March 2023*

| S.No. | Denoted as | Screening Strategy  | No. of HUDs selected | Data collection tool at community level for screening data  |
|-------|------------|---|----------------------|---|
| 1     | A          | Routine Population Based Screening (PBS) by WHV only  | 8                    | Manual Registers:<br>1. Family Folder<br>2. Master Register<br>3. Referral slips<br>4. Line list Register |
| 2     | B          | Routine Population Based Screening (PBS) by WHV and screening by Camp mode - Special NCD camps and VKT camps by PHC team  | 7                    | TNPHR app   |
| 3     |            | Routine Population Based Screening (PBS) by WHV and screening by MMU (modifying their FTP)  | 7                    | Creating ABHA ID & ODK  |
| 4     |            | Routine Population Based Screening (PBS) by WHV and screening by PHC team with the support of Resident Welfare Association (RWA) and NGOs                               | 2                    |   |
| 5     |            | Routine Population Based Screening (PBS) by WHV and screening by PHC team at identified workplaces (Workplace based intervention) with the support of labour department | 3                    |   |
| 6     |            | Routine Population Based Screening (PBS) by WHV, screening by Mid-level Health Provider (MLHP) and by Camps - special NCD camps and VKT camps                           | 3                    |   |
| 7     |            | Routine Population Based Screening (PBS) by WHV, screening by Mid-level Health Provider (MLHP) and by MMU by modifying their FTP  | 3                    | GoI NCD app   |
| 8     | C          | Routine Population Based Screening (PBS) by WHV and screening by Mid-level Health Provider (MLHP)   | 8                    | Google forms for screening data entry & DPH-THANKS app  |
| 9     | D          | Routine Population Based Screening (PBS) by WHV and screening by camps by CMCHIS empanelled private Hospitals in coordination with the PHC team                         | 5                    | Customized NCD app  |

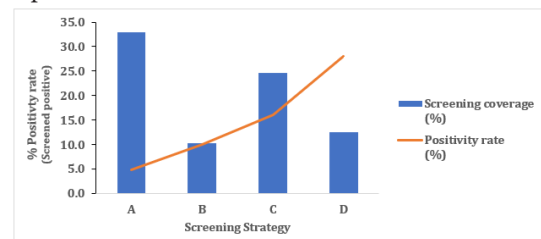
*Table 2: Screening coverage by the four screening strategies for Hypertension and diabetes in 28 Health Unit Districts of Tamil Nadu, November 2022 – March 2023*

| Screening Strategy & Data collection tool                                      | Total Population in selected HUDs | No. Screened    | Screening coverage (%) |
|--|-----------------------------------|-----------------|------------------------|
| A. Routine PBS by WHVs   | 11,32,752                         | 3,73,140        | 32.9                   |
| B. Routine PBS by WHVs + VKT camps + Spl. NCD camps                            | 10,95,173                         | 1,13,490        | 10.4                   |
| C. Routine PBS by WHVs + Screening by MLHPs                                    | 7,17,115                          | 1,77,250        | 24.7                   |
| D. Routine PBS by WHVs + camps by state insurance empanelled private hospitals | 5,06,086                          | 63,177          | 12.5                   |
| <b>Overall</b>   | <b>34,51,126</b>                  | <b>7,27,057</b> | <b>21</b>              |

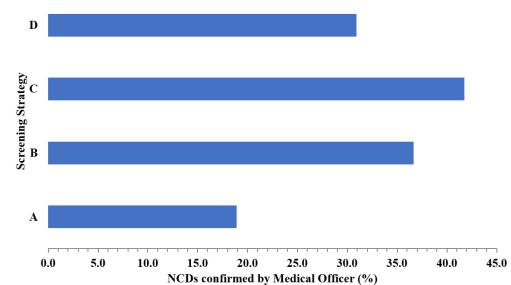
Of those screened positive, the proportion confirmed by Medical Officer for hypertension and diabetes is 18.9% for routine PBS by WHVs (A), 36.7% for routine PBS by WHVs, VKT camps and Spl. NCD camps (B), 41.8% for routine PBS by WHVs and screening by MLHPs (C), and 30.9% for routine PBS by WHVs and camps by state insurance empanelled private hospitals (D) as shown in figure 3. Similarly, the detection rate for hypertension is found to be

0.9%, 3.7%, 6.7%, and 8.6% respectively for A, B, C and D as shown in figure 4. The highest detection rate was found with the strategy D involving routine PBS by WHVs and camps by state insurance empanelled private hospitals.

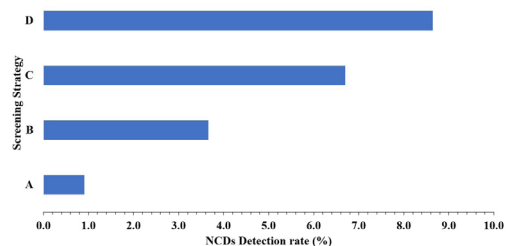
With regard to the establishment of data collection tools, it was easier to adopt the existing manual reporting system and the TN Population Health Registry app (TNPHR). With regard to the data collection tool – Google forms and DPH THANKS application, the google forms were piloted in the selected 8 HUDs whereas, the subsequent data collection tool proposed at facility level for capturing the follow-up data in a state customized app, the THANKS app, a new application was reported as could not developed due to time and resource constraints. A local customized application which was already in implementation was included for the pilot in Madurai HUD. The rest two tools – GoI CPHC NCD app and an ODK tool with ABHA ID which could not be implemented were reported as due to the technical difficulties.



*Figure 1: Positivity rate among multiple strategies to improve screening of Hypertension and Diabetes in 28 Health Unit Districts of Tamil Nadu November 2022 – March 2023*



*Figure 2 : Proportion of those screened positive confirmed by Medical Officer for NCDs in 28 Health Unit Districts of Tamil Nadu November 2022 – March 2023*



*Figure 3 : Detection rate of NCDs among screened by strategies in 28 Health Unit Districts of Tamil Nadu November 2022 – March 2023*



## DISCUSSION

Piloting of the different screening strategies on Outreach mode is an appreciable attempt and need of the hour. Since NCDs are in the rising trend, awareness of the diseases alone can help to manage the burden. Screening of all target individuals are required. Tamil Nadu Public Health department have initiated this pilot to understand the impact and challenges in the implementation of the identified screening strategies on outreach mode.

High screening rate was found among the conventional PBS by WHVs during their house-house visit which is the active mode of screening and easily helps to reach the target beneficiaries at their household itself. Similarly, the screening coverage were higher among the screening by WHVs and MLHPs at Health subcentre level. Whereas the low screening rate found among screening by camp mode both by PHC team alone and by PHC team in co-ordination with state insurance empanelled private hospitals. Camp mode screening also requires comparatively mobilisation of existing resources and also additional resources at the community-level.

Positivity rate was found highest among those screened by WHVs and private empanelled hospitals and higher among those screened by WHVs and MLHPs, which shows screening by medical and paramedical showed higher positivity rate. The lowest positivity rate among WHVs again suggests that even though the field staff are trained and screening being carried out without at most care the quality of screening improves with a involvement of a medical and paramedical staff in the team. Similarly, the proportion of those screened positive confirmed to have hypertension or diabetes or both were higher in screening by camps and screening by WHVs and MLHPs and lowest among those screened by WHVs. This shows the difficulty in mobilising the beneficiaries from community to facility for conformation of diseases which is dependent on the awareness level of the community and also on the IEC, interpersonal communication with the beneficiaries by the health care staff.

Higher detection rate also found among those screened by WHVs and private hospitals and, by WHVs and MLHPs which again reiterates the importance of a medical or a paramedical staff in the team. Strategy by a community-level health care worker visiting house-house have shown higher screening coverage with lower detection rate. Whereas, the strategies involving medical and paramedical staff at camp mode and facility level have shown higher follow-up evaluation and detection rate. Hence this study emphasises that the health system should adopt all the screening strategies proposed in the pilot, as per the local needs and also

involve the private hospitals and communities to improve the coverage and quality of screening and management of NCDs. This study also paves a way forward to assess the various data collection methodologies used by the Health Care Workers in improving the screening and management of NCDs.

The recent digital tool for capturing the details of the beneficiaries of the community-based Makkalai Thedi Maruthuvam Programme-MTM line list portal is found to be more effective in tracking the follow-up of all diagnosed hypertensive, diabetic and cancer patients under the programme. In the 15 years of implementation of NCD intervention programme, MTM line list portal has created a better platform for tracking all the diagnosed NCD cases and ensuring their follow-up visits, compliance to drugs and adherence to treatment. The same platform can also be expanded to capture the screening details thus aiding in assuring higher detection rate and decreased dropout rate of screened positives of NCDs.

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