

Strategies for Stakeholder Engagement and Uptake of New Intervention



Experience From State-Wide Implementation of mHealth Technology for NCD Care in Tripura, India

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ABSTRACT

Background: Appropriate strategies and key stakeholder engagement are the keys to successful implementation of new health care interventions.

Objectives: The study sought to articulate the key strategies used for scaling up a research-based intervention, mPower Heart electronic Clinical Decision Support System (e-CDSS), for state-wide implementation at health facilities in Tripura.

Methods: Multiple strategies were used for statewide implementation of mPower Heart e-CDSS at noncommunicable diseases clinics across the government health facilities in Tripura: formation of a technical coordination-cum-support unit, change management, enabling environment, adapting the intervention with user focus, and strengthening the Health Information System.

Results: The effective delivery of a new health system intervention requires engagement at multiple levels including political leadership, health administrators, and health professionals, which can be achieved by forming a technical coordination-cum-support unit. It is important to specify the role and responsibilities of existing manpower and provide a structured training program. Enabling environment at health facilities (providing essential equipment, space and time, etc.) is also crucial. Successful implementation also requires that patients, health care providers, the health system, and leadership recognize the immediate and long-term benefits of the new intervention and have a buy-in in the intervention. With constant encouragement and nudge from administrative authorities and by using multiple strategies, 40 government health facilities adopted the mPower Heart e-CDSS. From its launch in May 2017 until November 20, 2018, a total of 100,810 eligible individuals were screened and enrolled, with 35,884 treated for hypertension, 9,698 for diabetes, and 5,527 for both hypertension and diabetes.

Conclusions: Multiple strategies, based on implementation principles, are required for successful scaling up of research-based interventions.

Globally, deaths due to noncommunicable diseases (NCDs) rose by 14.3% from 2005 to 2015, and in 2015, NCDs contributed to 71.3% of total global deaths [1]. Among total deaths attributable to NCDs, three-quarters occur in low- and middle-income countries [2]. In India, the probability of premature death from the 4 NCDs (cardiovascular disease [CVD], cancer, chronic respiratory diseases, and diabetes) in individuals between 30 and 70 years of age is 26.2% [2]. The prevalence of hypertension and diabetes in adults (18 years of age and older) in India was 23% and 9.5%, respectively, in 2014 [2]. More than 50% of the individuals with diabetes who are on treatment do not achieve targets for glucose control [3]. Similarly, in

rural India, approximately three-quarters of adults with hypertension never receive treatment, and 90% of individuals receiving treatment for hypertension fail to achieve blood pressure control [4]. The current Indian public health care system is neither oriented nor equipped to process the total caseload of hypertension and diabetes. This is due in part to poor coordination across facilities at different levels of the health care system and lack of mechanisms to efficiently follow-up with or refer patients, resulting in a mismatch between patient needs and treatment availability as well as inefficient use of limited health care resources. In response to these challenges, the Government of India started the National Programme for

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Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) in 2010 [5]. The focus of the program is on health promotion, early detection, and management of NCDs: cancer, diabetes, CVD, and stroke. However, an insufficient number of adequately trained manpower is a major impediment to India's health system in implementing the NPCDCS. Hence, there is an urgent need for taking initiatives to train and equip medical professionals and providing them assistance through technology such as electronic Clinical Decision Support System (e-CDSS), thereby enabling them to practice evidence-based NCD interventions through the public health system [6]. In addition, the health information system also needs to be strengthened to use scarce resources efficiently.

With this premise, the State Government of Tripura, All India Institute of Medical Sciences (AIIMS), Public Health Foundation of India (PHFI), and Centre for Chronic Disease Control (CCDC) proposed and implemented NCD Initiative Tripura to build capacity for NCD prevention and control in the northeastern state of Tripura. The Government of Tripura recognized that investing in health results in valuable gains in human development. Health and Family Welfare Department, Government of Tripura, was committed to the objective of improving the scenario of the health status of the people of Tripura and provision of equitable access to good-quality health care. Health professionals from AIIMS, PHFI, and CCDC have implemented many large research projects in India on developing, implementing, and evaluating e-CDSS for hypertension, diabetes, and dyslipidemia for different levels of care [7-11]. The knowledge and experience from these research projects and commitment of Government of Tripura led to the development and implementation of NCD Initiative Tripura.

The principal component of the NCD Initiative Tripura is an Android-based e-CDSS, the mPower Heart e-CDSS, and some of its major capabilities are the ability to identify patients at high risk for diabetes, hypertension, or CVD; generate lifestyle intervention tailored to individual patients, generate customized prescription for diabetes, hypertension, dyslipidemia, and secondary prevention for CVD in accordance with the latest clinical management guidelines; store and integrate longitudinal health records of the patients both locally in the Android app and central server; and work in the off-line mode (without Internet connectivity). The mPower Heart e-CDSS is based on extensive research by the participating academic institutions and has shown benefits for the health system. During 2012 to 2014, this software was piloted, as part of the mPower Heart Project, in the Solan district of Himachal Pradesh in 5 government community health centers and the district hospital. It was found that patients with hypertension and diabetes achieved a significant reduction in systolic blood pressure and fasting glucose level, respectively, during the implementation period of the project [7]. This software was selected by Indian Council of Medical

Research as a showpiece for the Exhibition on Innovations in Medical Science and Biotechnology at the Presidential Palace of India in March 2015. We customized the mPower Heart e-CDSS as per the needs of health delivery system of Tripura by adding various features (e.g. customized printout for case data sharing, reminder folders [in which a health care provider can access the information of the patients who are missing follow-up visits], etc.). We implemented the intervention in 40 government health facilities of Tripura, which included primary health centers, community health centers, subdistrict hospitals, district hospitals, and a tertiary care hospital (Indira Gandhi Memorial Hospital) in the state capital. Also as part of this initiative, certificate courses on management of NCDs are being provided to state medical officers who are directly involved in providing care and management to NCD patients for capacity building.

The purpose of this paper is to articulate the key strategies used for scaling up a research-based intervention such as the mPower Heart e-CDSS to its implementation in the real-world health system in low- and middle-income countries. Subsequently, a detailed description of each step and the results achieved under these strategies are presented. Finally, the paper concludes by discussing the importance of and challenges in executing strategies used for T4 translation research.

METHODS

Project team (representatives from AIIMS, PHFI, and CCDC) along with Government of Tripura used multiple strategies for successful state-wide implementation of the NCD Initiative Tripura. The strategies used were the following.

Formation of a technical coordination-cum-support unit

A technical coordination-cum-support unit was formed for getting the support and guidance of state governments in the implementation of NCD Initiative Tripura. The purpose of this unit was to provide inputs to the state government on improving the quality of care at various levels of the multitiered health system, developing context-specific guidelines for NCDs, developing integrated care for chronic diseases (e.g., hypertension, diabetes, other CVDs, depression, alcoholism, chronic obstructive pulmonary disease), and developing outreach care and health data analytics. The structure of the unit was proposed jointly by the government of Tripura and implementation partners (AIIMS, PHFI, and CCDC). Table 1 shows the structure of the technical coordination-cum-support unit.

Before the implementation of the intervention, a 1-day orientation-cum-meeting on the components of intervention was conducted and it was decided that the project team would share a report on project activities every 3 months. Also, for any immediate help and support, state government-nominated NPCDCS state program officer (SPO) as the contact person.

TABLE 1. Structure of Technical Coordination-cum-Support Unit

Coordinator	Mission Director, National Health Mission, Tripura
Technical coordination-cum-support unit	Convener: Additional Director, Family Welfare, Government of Tripura Member: Joint Director, Directorate of Family Welfare and Preventive Medicines, Government of Tripura Member: Medical Superintendent, Regional Cancer Center, Agartala Member: State Program Officer, NPCDCS, National Health Mission, Government of Tripura Member: Nodal Officer, Information Technology, H & FW, Government of Tripura Member: 05 Representatives from AIIMS/PHFI/CCDC

AAIIMS, All India Institute of Medical Sciences; CCDC, Centre for Chronic Disease Control; H & FW, Health and Family Welfare Department; PHFI, Public Health Foundation of India.

Change management

It was important that health care providers who are actually going to deliver the new intervention at the health facilities should understand and accept this intervention. To bring the required changes, the following steps were taken.

Role and responsibilities. With the help of the state government, the project team identified at least 1 nurse and 1 medical officer from each health facility who were responsible for delivering the intervention. This staff nurse was given a new designation of NCD nurse. The NCD nurse was responsible for maintenance of the equipment and reporting of any damage to the equipment to higher authorities. The medical officer was responsible for providing the necessary support to the NCD nurse (e.g., space, time to deliver the intervention). The project team also involved the chief medical officers (CMOs) of each district and the district NCD coordinator in the implementation of the new initiative with the support and recommendations of apex state health authorities.

Social media. A WhatsApp group was created for the NCD nurses and medical officers so that they can share their achievements, experiences, and challenges.

TABLE 2. Overview of Advanced Certificate Course in Prevention and Management of Diabetes and Cardiovascular Disease modules

Module I	The association between diabetes and CVD
Module II	Vascular complications and introductions to risk factor management
Module III	Management of glycemia with special reference to CVD
Module IV	Diabetic dyslipidemia, hypertension, and introduction to coronary artery disease
Module V	Coronary artery disease, stroke, and peripheral arterial disease in diabetes
Module VI	Special topics and summary

CVD, cardiovascular disease.

Capacity building. A certificate course (Advanced Certificate Course in Prevention and Management of Diabetes and Cardiovascular Disease [ACMDC]) and a structured refresher training program was provided to the health care providers to build their capacity to deliver high-quality care.

The ACMDC was designed for state medical officers who were directly involved in providing care and management to patients with NCD and it comprised modules, case studies, interactive videos, and group exercises (see Table 2). The total duration of the course was 6 months, with a once-a-month contact session, which was conducted on the designated weekend in Agartala, Tripura. The state government of Tripura nominated doctors (who were involved in providing care to patients with NCDs) and the course was conducted in 2 batches.

Also, a Structured Refresher Training Program was conducted for doctors and nurses in Agartala. Project team organized a 2-day central training for doctors on evidence-based diagnosis and management of hypertension and type 2 diabetes. Project team requested the state government to nominate at least 1 doctor from each health facility to attend the central training. Doctors were informed that algorithms being used in the mPower Heart e-CDSS were evidence based and had been developed by leading area experts from the relevant clinical fields. Similarly, the project team organized a 4-day training workshop for NCD nurses. During the training workshop, along with a detailed demonstration of the intervention (mPower Heart e-CDSS); various topics such as basic concepts about diabetes and hypertension; management of diabetes and hypertension; strategies for behavior modification; and counseling techniques for lifestyle modification, drug compliance, and follow-up care were covered. Group discussion and role-play activities were also done to make nurses comfortable in using mPower Heart e-CDSS. Along with central training, the project team provided on-site training and orientation at each health facility. Project staff visited all health facilities of the states and provided orientation about the new intervention to all the doctors, pharmacists, and nurses. The project staff provided the initial hand-holding and support to the NCD nurse to make her or him adept at the use of the e-CDSS.



FIGURE 1. Equipment being used in a noncommunicable diseases clinic.

Enabling environment for successful uptake of the intervention

The project team provided all the equipment (e.g., blood pressure monitors, stadiometers, weighing scale, measuring tapes, tablet computer loaded with mPower Heart e-CDSS app, printers) (Figure 1) necessary for the functioning of the mPower Heart e-CDSS with the help of the state government. The support of the CMO and medical officers was taken to ensure that the NCD nurse is provided proper space and time for setting up the equipment and use of the mPower Heart e-CDSS. To successfully implement the mPower Heart e-CDSS and benefit the maximum number of patients, the project team suggested a new workflow of the patient care in the health facility, which was accordingly implemented by the state government in the NCD clinics. Before the implementation of the intervention, the patient used to visit the doctor directly after the registration, but once the health facility initiated the project, the new workflow was implemented (Figure 2): 1) at the registration desk, patients 30

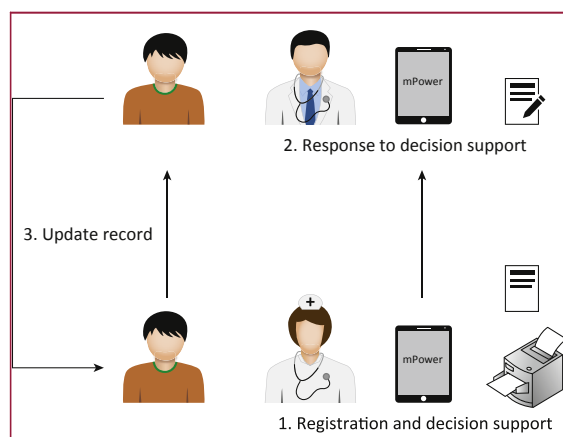


FIGURE 2. New workflow of patient care at a non-communicable diseases clinic.

years of age or older are directed to NCD clinics; 2) at the clinic, data entry into the mPower Heart e-CDSS app is done (medical and drug history, blood pressure measurement, glucose measurement, and anthropometric measurement) by the NCD nurse and an e-CDSS-generated printout of customized management plan for diabetes, hypertension, or dyslipidemia, as appropriate, is taken; 3) the patient, with this printout, visits the doctor in the health facility, who provides the final prescription based on recommendations given by mPower Heart e-CDSS and his or her own assessment; and 4) the patient returns to the NCD nurse, who updates the doctor's recommendations in the e-CDSS and provides the lifestyle advice to the patient.

Designing the intervention with user focus

Project team built certain functionality in the mPower Heart e-CDSS so that patients realize the benefits of the new intervention. Similarly, few functionalities in the mPower Heart e-CDSS were designed to reduce the workload of the health care providers and to make them believe more competent in delivering NCD care.

Strengthening the Health Information System

The project team implemented data analytic capability in the mPower Heart e-CDSS server and created a specific website to disseminate information and achievement of NCD Initiative. The mPower Heart e-CDSS server was capable of analyzing patient characteristics and outcomes of care to identify the most guideline-based and cost-effective treatments; proactively identifying individuals who would benefit from preventive care or lifestyle changes; correcting and publishing data on prevalence, incidence, complications, associations, patterns, and trends; assessing cost of NCD programs; workforce management; and planning logistics for NCD programs.

RESULTS

Formation of a technical coordination-cum-support unit

Formation of this unit helped in timely support from state health officials. Project team provided information to the state health officials about any major barriers such as nonavailability of manpower (nurse or doctor) and the requirement of additional space or funds. Immediate steps were taken by the health department of Tripura to overcome these barriers by, for example, arranging space in each health facility for NCD clinics, issuing an order to representatives of each health facility for availability of a nurse in the NCD clinics to deliver the intervention to the patients with NCDs, and also providing additional funds to each health facility for the procurement of required furniture and drugs for NCD clinics. Also, the NPCDCS SPO who was appointed as the first contact person for NCD Initiative Tripura visited each NCD clinic along with the project team and assured that the health care provides

for all the necessary support required for successful implementation. The NPCDCS SPO monitored the performance of all the NCD clinics daily and provided immediate solutions or suggestions when required. Through the support and guidance of members of the technical coordination-cum-support unit, the features and functionality of mPower Heart e-CDSS were further improved to meet the needs of health facilities. Various features such as customization of report functionality to send the report on the performance of health facilities, a daily report on the patient enrollment, and follow-up were suggested by members of the unit. Recently, a new feature of sending follow-up reminder to the patient from the mPower Heart e-CDSS app and integration of management algorithms for chronic obstructive pulmonary disease has been suggested by the unit, and the project team is in the process of implementing these features. Formation of a technical-cum-coordination unit helped in not only overcoming the barriers immediately, but also expanding the scope of intervention.

Change management

By defining the role and responsibilities of health care providers, creating a social media platform, and using capacity-building initiatives, the required changes were achieved for successful implementation of NCD Initiative Tripura.

Role and responsibilities. By involving all the concerned health care providers of health systems and defining their responsibilities, it became easier to implement the intervention, as everyone took ownership of his or her task. Nurses knew that the safety of equipment and using mPower Heart e-CDSS was their responsibility, so they asked for all the required help without any hesitation. For example, in a few NCD clinics, nurses asked for procurement of cabinet to store the equipment, and a few nurses asked to change their duty rosters so that they could spend sufficient time at NCD clinics. As the CMOs were responsible for the overall performance of each health facilities in their district and the district NCD coordinator was responsible for coordination with the administrative state health authorities, the project team was able to successfully build an ecosystem in which all the health care providers were helping each other for the use of the mPower Heart e-CDSS in the NCD clinics.

Social media. Initially, the WhatsApp group only had the NCD nurses, but subsequently, medical officers, district NCD coordinators, SPO, and Mission Director, National Health Mission Tripura adjoined the group. This group provided a platform for notifying all the issues related to NCD activities to senior health officials who provided support to rectify these issues at the earliest. This was a unique experience on connectivity for the entire community.

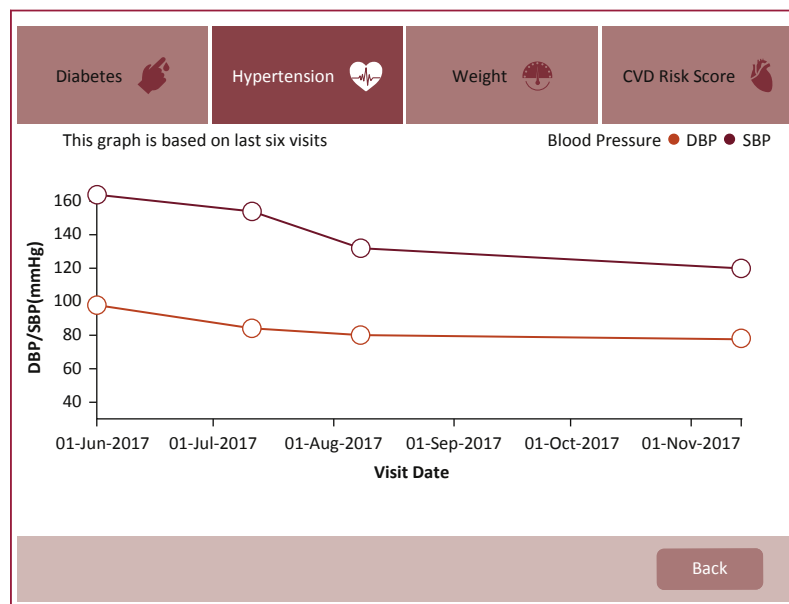


FIGURE 3. Screenshot of the graphical display of the patient's clinical parameters on the mPower Heart electronic Clinical Decision Support System app.

Capacity building. In year 1 of the NCD Initiative Tripura, a total of 46 medical officers have successfully completed the ACMDC certificate course. After the successful conduction of the first batch in which 17 medical officers completed all the 6 modules of the ACMDC, more medical officers from health facilities showed their interest in this course. In the second batch, 29 medical officers joined and completed the ACMDC certificate course. In addition to the ACMDC, the NCD initiative provided central training and on-site training to the health care providers. During the training of the doctors, many case studies were discussed through demonstration of mPower Heart e-CDSS. Also, it was informed and discussed that nurses would use the m-Power Heart e-CDSS to enter the clinical parameters of the patients and the mPower Heart e-CDSS system will generate a brief profile of the patient (a printout) along with suggestions for therapy. Doctors liked the idea of a nurse using the mPower Heart e-CDSS and supporting them in providing care at NCD clinics. Doctors also agreed that mPower Heart e-CDSS has been designed to support them in providing evidence-based care to patients with NCDs. As the nurses were the primary users of the mPower Heart e-CDSS, content and duration of the training was developed to meet the needs of the nurses. Of 40 nurses who attended the training, 16 nurses were using the tablet computer for the first time. The project team anticipated such challenges and included a session and hand-holding on how to use the tablet computer. Group discussion and role-play further helped the nurses in understanding all the functionalities of the mPower Heart e-CDSS. All the nurses found the training helpful for



FIGURE 4. Noncommunicable diseases nurse using the mPower Heart electronic Clinical Decision Support System in the government health facility.

performing their duties effectively at NCD clinics. On-site visits to provide the orientation on mPower Heart e-CDSS to each important stakeholder (all doctors, pharmacist, staff nurses, and receptionists) in the health facility helped in early adoption of the intervention. Through refresher and on-site training, the project team built the confidence of the health care providers in the new intervention. This training ensured that NCD nurses were confident in using the technology and were aware that they would get support from project staff and administrative health authorities when required.

Enabling environment for successful uptake of the intervention. It is very important that the environment where the intervention is going to be delivered should be apt and ready for its uptake. Project team faced many challenges while providing an enabling environment, for example, resistance from the registration desk and doctors while implementing new workflow recommended for the mPower Heart e-CDSS and also arranging space for the NCD clinics. However, using change management strategies and support from administrative health authorities helped in overcoming the challenges faced by the project team. Eventually, workflow change and availability of all the necessary equipment helped in achieving the maximum impact of the intervention.

Designing the intervention with user focus. The mPower Heart e-CDSS follows a structured pattern of delivering NCD care and made sure that patients get sufficient time and proper lifestyle advice in the health facility. Also, features such as the graphical display of the patient's clinical parameters not only helped the doctor in making an informed decision about the patient's management, but was also appreciated by patients (Figure 3). Nurses felt more confident while providing care to the patients after they started using the technology. Features such as searching patient's previous records and reminder folder helped the nurses in performing their duties more efficiently. After the implementation of the mPower Heart e-CDSS, medical

officers got more support from the NCD nurse because of task shifting, as nurses were supposed to do the initial patient assessment by using the mPower Heart e-CDSS. Medical officers reported that the implementation of the mPower Heart e-CDSS was useful, as it has provided them quick access to the brief profile of the patients on a printout with evidence-based recommendations, thus improving quality of care for the patients with hypertension, diabetes, and dyslipidemia.

Strengthening the Health Information System. The use of the mPower Heart e-CDSS to enroll the patients in 40 government health facilities led to generation of a large dataset on the central server. The mPower Heart e-CDSS server provided real-time access to all the concerned stakeholders (medical officers, CMOs, district NCD coordinators, nurses, and administrative health care officers) about the performance of each NCD clinic. This server also provided password-protected access to different types of customizable reports (e.g., gender distribution, status on screening and enrollment of patients with hypertension/diabetes, number of patients who have been tested for blood glucose level) to the designated users. The mPower Heart e-CDSS server also had other important features such as a graphical representation of changes in the clinical parameters, tracking the activity of users (login details, time spent). Also, project team daily sent an e-mail on the performance of each NCD clinic to the CMOs, district NCD coordinators, and administrative health authorities. Both mPower Heart e-CDSS server and daily reporting helped the apex administrative authorities to mobilize resources to help the underperforming health facilities. Establishing the server with data analytics is a stepping stone in achieving the goals of improving the health status of the people of Tripura and equitable access to good quality health care.

DISCUSSION

The project team used multiple strategies for translating our research-based intervention to state-wide implementation to achieve population-level outcomes and to impact health policy. The strong support of the political and administrative leadership was key to its rollout and helped iron out several barriers that were encountered. The project team faced many challenges while implementing these strategies, for example, ensuring the willingness of health care providers to use new intervention in their routine practice was not an easy task. At the beginning of the implementation of NCD Initiative Tripura, almost one-half of 40 health facilities ($n = 18$) did not use the mPower Heart e-CDSS. The nurses who were trained were either shifted to another health facility or busy performing inpatient duties. However, with the constant push from administrative authorities and on-site support, all the 40 health facilities adopted the mPower Heart e-CDSS (Figure 4). Initially, only 5 facilities were providing NCD care facilities to the patients 6 days a week, but within a few months, all 40 health facilities started providing NCD care

TABLE 3. Challenges or barriers and solutions in the implementation of the mPower Heart e-CDSS

Challenges for Stakeholder Engagement	Structural Barriers	Overcoming Challenges for Stakeholder Engagement	Overcoming Structural Barriers With Facilitators
<ul style="list-style-type: none"> • Support of CMOs and district NCD coordinators in the initial phases of the implementation • Doctors' apprehensions and initial resistance to trust the outcomes of the mPower Heart e-CDSS • Nurses' familiarity/acceptability of using the smart device (tablet computer) for delivery of the intervention • Difficulties faced by NCD nurses in administrating the intervention in the NCD clinics • Involvement of NCD nurses in the ward duties 	<ul style="list-style-type: none"> • Lack of systematic assessment of patients with NCDs and availability of longitudinal health records • Lack of integrated and evidence-based care for NCDs • Lack of referral system to higher health facilities • Frequent change in the doctor's roster • Inadequate availability of nurses in the NCD clinics • Resistance to implementing the new workflow for mPower Heart e-CDSS • Lack of systematic reporting on the enrollment status of patients with NCDs in government hospitals 	<ul style="list-style-type: none"> • Defining the role and responsibilities of apex authorities at the district level and support from state administrative health authorities helped in the active involvement of the CMOs and district NCD coordinators for implementation of the mPower Heart e-CDSS • Explaining the algorithms and discussing case studies through demonstration of the mPower Heart e-CDSS during the structured refresher training program of the doctors built the confidence of doctors on mPower Heart e-CDSS • Duration (4 days) and content of the training program was designed in such a way that nurses who were not familiar with the tablet computers could use them to deliver the intervention. A lot of emphasis was given on the basics of using the tablet computer and explaining all the functionalities of the mPower Heart e-CDSS • On-site support provided by the project team and support from administrative health authorities in providing the enabling environment helped the NCD nurses to effectively deliver the intervention in the NCD clinics • Regular meetings of project staff with CMOs, district NCD coordinators, and medical officers helped the NCD nurses in performing the duties required for NCD clinics 	<ul style="list-style-type: none"> • Implementation of the mPower Heart e-CDSS helped the health facilities in providing structured and systematic care. In the mPower Heart e-CDSS, it was necessary for the NCD nurse to follow the structured questionnaire, which was designed as per the NPCDCS requirement. Also, the mPower Heart e-CDSS provides access to the longitudinal health records of the patients. • The mPower Heart e-CDSS has in-built evidence-based clinical algorithms for multiple diseases, which helped in providing integrated care and also provides prompts to health officials for referral to higher health facilities, based on patient's clinical parameters • On-site training and orientation of all the doctors in the health facility helped in overcoming the challenges due to change in doctor's roster. Also, the doctor who went through a structured refresher training program acted as the change agent • Mobilizing assurance from administrative health authorities to ensure the availability of NCD nurses and the acceptance of new workflow for the intervention at health facilities • Provided access to the health care officials to view the performance of each NCD clinic on the central server. Also, project staff shares the daily status report of each health facilities with concerned health care officials through e-mails

CMO, chief medical officer; e-CDSS, electronic Clinical Decision Support System; NC, noncommunicable disease; NPCDCS, National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke.

facilities to the patients 6 days a week (Table 3 provides the overview of challenges/barriers faced during the implementation of the mPower Heart e-CDSS and solutions to overcome those challenges/barriers). From its launch in May 2017 to November 20, 2018, a total of 100,810 eligible individuals had been screened and enrolled, with 35,884 treated for hypertension, 9,698 for diabetes, and 5,527 for both hypertension and diabetes. The mPower Heart e-CDSS has enabled uniform evidence-based treatment of these patients. The program has introduced task shifting with greater involvement of nurses in care delivery of NCDs. Data from the e-CDSS server are a reliable source for health administrators to monitor real-time process or health outcomes in the individual health facility and overall in the state. Medical officers who attended the capacity-building initiatives on the management of NCDs are implementing the learning and experience of the training programs in their routine practice and act as change agents. The political leadership of the state of Tripura, including the Chief Minister and Health Minister, also showed keen interest in implementing the technology-based intervention for the betterment of the health status of people of Tripura and attended the demonstration of the mPower Heart e-CDSS in the state capital (Agartala). In July 2017, the mPower Heart model for NCD was selected for oral presentation at Fourth National Summit on Good, Replicable Practices and Innovations in Public Health Care Systems in India, by National Health System Resource Centre, Government of India. Executing multiple strategies helped us in engaging and getting support of key stakeholders to achieve impact at the population level. However, more T4 translational research in low- and middle-income countries is needed to ascertain the potential impacts of these strategies and find more strategies that can be adapted easily by other states or countries.

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