

Is Mother and Child Tracking System (MCTS) on the Right Track? An Experience from a Northern State of India

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Abstract

Background: Effective monitoring and supervision of health care programs depend on complete, accurate, and timely flow of data. Mother and Child Tracking System (MCTS) is a centralized information technology (IT)-based application launched in 2009 for improving the delivery of maternal and child health care services through name-based tracking. There is minimal evidence in the literature evaluating the operational aspects of such a name-based tracking system even after 5 years of its implementation. **Objective:** The present study was thus conducted to understand the opportunities and challenges in the operationalization of MCTS strategy in a district in Haryana and to understand the stakeholder's perspectives. **Materials and Methods:** Performance of Routine Information System Management (PRISM) framework was used. This cross-sectional study was conducted in Shahzadpur block of Ambala district, Haryana, India involving in-depth interviews of health care providers and clients in 12 subcenters (SCs) and two primary health centers (PHCs). **Results:** Lack of appropriate training, overburdened data entry operator (DEO) and auxiliary nurse midwife (ANM), poor Internet connectivity, slow server speed, and frequent power failures were revealed as major limitations for the effective implementation of MCTS. Nearly 18% of the clients reported receiving short message service (SMS) and only 6% could understand the SMS. **Conclusion:** MCTS has led to accountability and improved supervision of health workers, apart from empowering the community.

Keywords: Evaluation, health management information system, Mother and Child Tracking System (MCTS)

Introduction

Effective monitoring and supervision of health care programs depend on complete, accurate, and timely flow of data between different levels of health care facilities and a central information hub.¹ The necessity of effective information system was identified way back in the Bhole

Committee Report (1946) and has also been documented in subsequent committees.²

A computerized management information system can improve the health system through efficient mechanisms in data collection, storage, analysis, dissemination, and feedback of information. The Mother and Child Tracking System (MCTS) is a centralized web-based application launched by the Ministry of Health and Family Welfare in India in December 2009 to provide reliable data for effective decision-making through name-based tracking of each client.³ More than 4.06

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crore pregnant women and 3.3 crore children have been registered in the system since its inception.⁴ Few experiences of MCTS implementation have been documented in the states of Gujarat (e-Mamta),⁵ Tamil Nadu (Pregnancy and Infant Cohort Monitoring and Evaluation System — PICME),⁶ Rajasthan,⁷ and Chhattisgarh.

MCTS involves entry of huge volumes of data generated at the grassroot level, which is usually the subcentre. The data is then compiled at different levels and transmitted to the next higher level. It is very essential to identify the operational aspects of its implementation at each level, especially at the level where data are generated, i.e., at the subcenter (SC) and at the first point of data entry, i.e., primary health center (PHC). However, there is minimal evidence in the literature evaluating the operational aspects of such a name-based tracking system even after 5 years of its implementation by the Government of India. This study was conducted to understand the opportunities and challenges in the operationalization of MCTS strategy in Ambala district of Haryana, India and to understand the stakeholder's perspectives at the SC and PHC levels regarding MCTS, which will help policy makers and implementers increase the efficiency and effectiveness of the program.

Materials and Methods

Study design and area

A study using methods design was conducted in Shahzadpur block of Ambala district, Haryana, India from September 2013 to March 2014. Shahzadpur block has a population of around 0.2 million. The public health infrastructure in the block consists of a community health center (CHC), 4 PHCs, and 31 SCs.

Data collection

The evaluation methodology comprised a mix of quantitative and qualitative methods. Qualitative method included in-depth interviews with the health care providers. About one-third of the SCs (12 SCs) and half of the PHCs (2 PHCs) in the block were selected randomly for the study from a list of health facilities. In each selected facility, in-depth interviews were conducted with the auxiliary nurse midwife (ANM) at the SC level and data entry operator (DEO) at the PHC level to document their experiences with MCTS. A total of 14 ANMs and two DEOs were interviewed. The quantitative component included client interviews using

a structured questionnaire. Nearly 10 clients from each SC area (a total of 100 clients) were interviewed, which included pregnant and postnatal mothers of less than 6 months. These clients were selected consecutively at the selected health facility on the day of antenatal check-up or immunization.

Framework of evaluation of Mother and Child Tracking System

The evaluation framework was adapted from the Performance of Routine Information System Management (PRISM) framework, which uses a systems framework of inputs, processes, outputs, outcomes, and impacts.⁸

Quantitative data analysis

Descriptive analysis such as proportions or percentages was done for quantitative variables using Statistical Package for the Social Sciences (SPSS) Version 19.0. Armonk, NY: IBM Corp.

Analysis of qualitative data

The author in this study (JPT) was the interviewer. He works as a Senior Resident of Community Medicine (credentials: MBBS, MD) in a premier tertiary medical college of the region and is trained in qualitative research. A relationship was established with the relevant stakeholders before commencement of the study and they were made aware of the purpose of the research. The interviewer conducted one-to-one interviews at the workplace of the participants. Apart from the participant and the researcher, nobody was present during the interview. An interview guide was used while conducting the interview and prompts were provided to the participant when she faced difficulty in understanding or was hesitant in answering. No audio or video recording was done as it was assumed that the participants would not open up. Interview was done in the local Hindi language. The author (JPT) took down the notes in English. The interview duration ranged from 10 min to about 0.5 h. The authors (JPT and PN) independently did verbatim transcription on the day of the interview in English. To validate the content of the interviews, the transcriptions were brought back and verified with the respondents if necessary. The transcripts were read and responses were listed. Commonly occurring codes were identified and organized into themes according to Berkowitz theory.⁹ Content from each coded group was then presented with direct quotes from the interviews. The analysis was

done manually and no software was used for analysis. The analysis was done by two researchers (JPT, PN) separately and these were compared. Any disagreement was resolved by the third author in this paper (SG).

Ethical approval for the study was obtained from the Institute Ethics Committee, Post Graduate Institute of Medical Education and Research (PGIMER). Informed consent was taken from the participants before interviewing.

Results

Based on the interviews with different stakeholders, the results are presented according to the evaluation framework.

Inputs

Technical support

The technical support for the program was provided by the National Informatics Centre, New Delhi, India. It works under the Ministry of Communications and Information Technology, which provides solutions for information management and decision support to the government.

Manpower

One DEO is stationed at each PHC for online data entry. However, there is no dedicated DEO under MCTS. DEOs have to handle data coming from several programs and other operations such as pharmacy and payment issues. Overburdened staff hampers timely data entry.

“Hamare paas to itna kam hota hai. Hamein HMIS, RNTCP, IDSP, Drug stores, ASHA payment aur bhi kei kaam dekhna hota hai.” — DEO (We have lots of work. We have to look at HMIS, RNTCP, IDSP, drug stores, ASHA payment, and many other activities.)

Hardware

There is one computer at each of the PHCs. However, there is poor logistic support in terms of electricity and Internet connectivity. During the working hours (10 AM-2 PM), several users log in simultaneously, which considerably slows down the server, thus delaying timely data entry. A web-based online portal should be supported by a strong server to reduce delays in data entry.

“Working hours mein server bahut slow rehtahai” — DEO (The server is slow during the office hours).

“Bijli ki bhi bahut samasya hai, din mein bijli rehti hi nahin hai.” — DEO (Electricity is a major issue, there is no power supply during daytime).

During the working hours, power cut was reported as a major worry, which leads to backlog in data entry. Uninterrupted supply of electricity is a major concern in rural remote villages.

Training

The DEOs have been trained in the use of computerized online portal, however, the ANMs did not receive formal training for the program. Operational manual has not been prepared.

Processes

Data flow

The health workers collect data at the SC level and enter it in the antenatal register as well as update the work plan. The work plan is then submitted at the PHC level every week for which they have to travel to the PHC. At the PHC, the DEO updates the database and generates work plan for the subsequent month, which is handed over to the health worker.

“Phir baar baar PHC bhi jana padta hai. Isse hamhare baki kaam nahi ho pate. Field visit ka target bhi poora nahi ho pata” — ANM (We have to go to the PHC several times, which hampers our work and therefore we are not able to meet our field visit targets).

Most of the ANMs reported that they have to travel to the PHC every week to submit registers or work plans, which not only puts a financial burden due to the transportation cost but also hampers routine work.

Outputs

Data quality

Computerization ensures that data entry is more accurate and timely. It improves record keeping, integrity, and validity of data through better supervision. The ANMs were of the view that due to MCTS, their work was being closely monitored. They felt that the data they enter are closely scrutinized and any discrepancy may be easily detected at the higher level. Thus, MCTS has resulted in the effective supervision of health care workers and has ensured better data quality.

“Ab workplan mein bharne se pehle do bar sochna padta hai kahin galat to nahin hai, hamare upar danda rakh diya hai” — ANM (Now we have to think twice before

filling anything in the work plan, there is a constant eye on us every time).

Outcome

Benefits to the end-users

A total of 100 clients were interviewed. The mean age of the respondents was 24.5 years (20-35 years). Around 46% of them belonged to Scheduled Castes (SC)/ Scheduled Tribes (ST) and 39% were Other Backward Class (OBC). The mean income of the clients was ₹6,330. All of them got their pregnancy registered and most of them (96%) received a Mother and Child Health (MCH) card at the time of registration.

Nearly 80 (80%) clients gave a contact number. Among them, two-thirds (48) gave their husband's phone number, whereas only 13 (16%) of them gave their own number to be fed into the MCH register. Among those who gave any contact number, only 18 (22%) of them reported having received any short message service (SMS) regarding the services. Out of those who received an SMS, only one-third could understand the message. The most common reason for not being able to understand the message was reported to be the technical language of the message and not being able to operate the mobile phone. Among the clients who did not give a contact number, some cited the lack of mobile connection (44%) as the major reason behind this while some (28%) did not know their mobile number [Figure 1].

“Hum to message nahin padhte, han kabhi phone aaya to utha liya. Waise bhi message hamein samajh mein nahin aata” — Client (We do not read messages, we receive voice calls only. Again, we cannot understand messages as well).

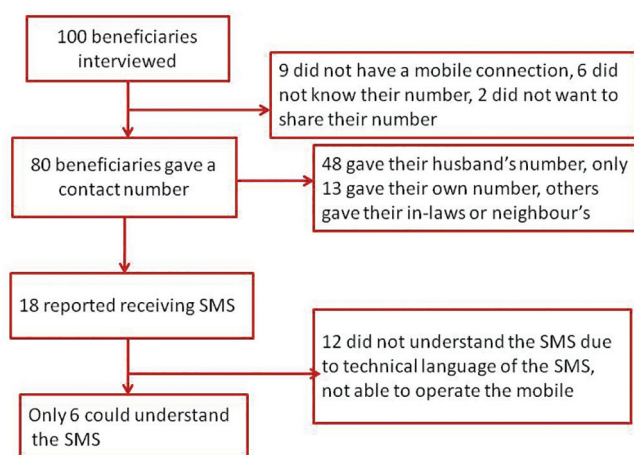


Figure 1: Flowchart showing the number of clients receiving SMS under MCTS

Most of the clients said that they rarely used to seeing messages but were used to attend calls only. Thus, the true benefits of the MCTS did not reach the clients. Mobile phones are widely used and considered to be an effective medium to reach the masses. However, they are still out of reach of the clients in remote rural locations. Most of the mobile phone users in remote areas have less knowledge about other operations of the mobile phone except for calling somebody or receiving calls. Some even reported that the language of the messages is beyond their comprehension.

Improved service delivery

“Isse maa aur bachhe ko track karne mein aasani bhi hoti hai, pata lag jata hai ki kisko services due hai” — ANM (With this, it is easy to track the mother and the child; we can easily find out whose services are due).

Most of the ANMs were of the view that autogenerated work plans help them track the services due to the clients (antenatal mothers and children). Earlier, there was no mechanism in place to track the services; rather they had to be done by going through the registers manually. The work plan also helps in planning daily field activity and thereby improving service delivery.

In-depth interviews of 14 ANMs (one from each health facility visited) were conducted regarding their experience with MCTS and the barriers associated with it. None of the ANMs had a written job description. About 85% of them reported supervision by higher officials. The ANMs reported that they had to spend an average of 6 h every week toward MCTS, which put additional burden on their routine activities. Although they were briefed regarding their role in MCTS, none received any formal training. Nearly all of them received work plans from the PHC. A total of 85% of the ANMs reported an increase in workload due to MCTS although 71% were of the opinion that it has benefited the clients by generating an increased demand for services. At the same time, they were wary of the fact that because of the autogenerated work plans their work was closely monitored.

Report generation

The utility of the data for program review is limited because the huge volume of data fed into the MCTS database is not being used to generate reports at various levels. Reports are still prepared by compiling data from various registers, which takes a lot of time and is prone to errors.

Use of information

Data are sparingly used for decision-making at the facility level. Lack of feedback from higher centers and lack of autogeneration of reports were found to be the major limiting factors for use of information.

“Hamhe to pata hi nahi chalta ki hum kahan par galti kar rahen hain. Jo report hum banate hain, uske bare main humein kabhi nahi bataya jata” — ANM (We never come to know about our mistakes. We never get any feedback on the reports we submit).

Discussion

The MCTS is an important information technology (IT) initiative by the Government of India with the prime objective of continuous monitoring of clients through the preparation of a computer-based list of target clients and due services at subdistrict level health facilities. Few states such as Gujarat (E-Mamta),⁵ Tamil Nadu [(Pregnancy and Infant Cohort Monitoring and Evaluation (PICME)],⁶ Rajasthan,⁷ and Chhattisgarh have successfully tried similar tracking systems. The Government of Gujarat introduced a name-based tracking information management system called “E-Mamta” for the first time in India. This system generates facility-wise reports and provides real-time information.⁵ Tamil Nadu also launched PICME to closely track pregnant women till their delivery and the children up to 1 year of age.⁶

Despite the limitations, the present study reported improved service delivery because of close monitoring of the services through monthly work plans in MCTS. Similar computerized information systems in India also have demonstrated an improvement in delivery of MCH services (ANC and immunization) following the implementation of a computer-based informationsystem.^{10,11}

Another gap leading to underutilization of MCTS portal is the unavailability of standard recording registers with the frontline health functionaries. The data columns in MCH registers — the basic tool available with health care workers to maintain the records of clients for MCH services — do not match with the information required to be filled in the MCTS portal. Health care workers have to fill work plans and registers separately for entry into the MCTS portal, which increases the work burden.

Poor feedback and poor use of information were identified as major gaps. In implementation of MCTS allows the creation of reports although they are grossly underutilized. Apart from this, MCTS should have a mechanism for the autogeneration of graphs and pictorial representation of data, coverages, and other indicators at the SC, PHC, and CHC levels for real-time performance monitoring and immediate corrective action. E-mails and SMS may be used frequently for feedback.

Although mobile phone usage has grown manifold over the past few years, it was found that females have relatively poor access to mobile phones and those who have them lack the skill to operate and read messages. Only 16% of the clients gave their own mobile number to be fed into the system. However, mobiles have been used (especially text messaging) successfully to send reminders^{12,13} and educational content.^{14,15}

Interrupted supply of electricity and slow server speed are the two major challenges in remote rural locations. A dedicated computer assistant with high-speed Internet connectivity is the basic requirement for regular entry and update of the database. Currently, the MCTS portal is an absolute online version and it cannot operate if there is no or poor Internet connectivity. Adding a feature for offline data entry process followed by online uploading to the server would be useful. Distribution and collection of the immunization work plans (due list of clients) must be tagged with alternate vaccine delivery mechanism for ensuring timely availability of the same at session sites. Regular mechanism for review, feedback, and feedforward of MCTS status and use need to be established at PHC, district as well as higher levels. Poor interpretation and poor use of data have been demonstrated in the evaluations of information systems of different countries.¹⁶⁻¹⁸

A limitation of the study was the small sample size. However, this was a qualitative enquiry meant to explore the perceptions of various stakeholders. Also, the tracking system is a nationwide program with minimal inter- or intrastate variations.

Conclusion

Maintaining a good health management information system (HMIS) is essential for an effective health system in any country. Lack of appropriate training, overburdened DEO and ANM, poor Internet connectivity, slow server speed, and frequent power failures were revealed as

major limitations for the ineffective implementation of MCTS. Utility of the data for program review is limited. However, MCTS has led to accountability and improved supervision of health care workers, apart from empowering the community by providing access to their information.

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Conflicts of interest

There are no conflicts of interest.

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