

Accessing completeness of pregnancy, delivery, and death registration by Accredited Social Health Activists [ASHA] in an innovative mHealth project in the tribal areas of Gujarat: A cross-sectional study

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ABSTRACT

Background: The Innovative Mobile-phone Technology for Community Health Operation (ImTeCHO) is a mobile-phone application that helps Accredited Social Health Activists (ASHAs) in complete registration through the strategies employed during implementation that is linking ASHAs' incentives to digital records, regular feedback, onsite data entry, and demand generation among beneficiaries. **Objective:** To determine the proportion of pregnancies, deliveries, and infant deaths (events) being registered through the ImTeCHO application against actual number of events in a random sample of villages. **Materials and Methods:** Five representative villages were randomly selected from the ImTeCHO project area in the tribal areas of Gujarat, India to obtain the required sample of 98 recently delivered women. A household survey was done in the entire villages to enumerate each family and create a line-listing of events since January 2014; the line-listing was compared with list of women registered through the ImTeCHO application. The proportion of events being registered through the ImTeCHO application was compared against the actual number of events to find sensitivity of the ImTeCHO application. **Result:** A total of 844 families were found during household enumeration. Out of actual line-listing of pregnancies ($N = 39$), deliveries ($N = 102$), and infant deaths ($N = 5$) found during household enumeration, 38 (97.43%), 101 (99.01%), and 5 (100%) were registered by ASHAs through the ImTeCHO application. **Conclusion:** The use of mobile-phone technology and strategies applied during the ImTeCHO implementation should be upscaled to supplement efforts to improve the completeness of registration.

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KEY WORDS: Accredited Social Health Activist (ASHA), infant death, mobile health (mHealth), vital event registration

Background and Rationale

Web- and mobile-phone-based applications are now commonly used to improve coverage and quality of health services.^[1] In India, the mother and child tracking system (MCTS) is one such web-based applications that is used nation-wide to improve the coverage of maternal, newborn,

and child health (MNCH) services.^[2] Similarly, the use of mobile-phone application such as mobile health (mHealth) for improving health services is becoming popular in India.^[3] The first step of utilizing any e-health initiative is registration of eligible beneficiaries; however incomplete registration is a

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major concern.^[4] Only 35% of pregnant women were found to be registered through the MCTS in India in 2011.^[2]

The purpose of the current study was to assess an innovative mHealth intervention to ensure completeness of pregnancy, delivery, and death registration by the Accredited Social Health Activists (ASHAs) in the tribal areas of Gujarat.

Materials and Methods

This cross sectional study was undertaken by a local voluntary organization, Society for Education welfare and Action Rural (SEWA Rural) among randomly selected five predominant tribal villages of two primary health centers (PHCs) of Bharuch district for a period of 2 months (April-May 2015). SEWA Rural and the Department of Health and Family Welfare, Government of Gujarat, India implemented an innovative mHealth application called the Innovative Mobile-phone Technology for Community Health Operations (ImTeCHO) since 2013. The purpose of the ImTeCHO is to improve the coverage and quality of the MNCH services through improving support and supervision of ASHAs and PHC staff.^[5] Some of the strategies used in the ImTeCHO to ensure completeness of registration were as follows: Point of care registration using the ImTeCHO mobile-phone application, Linkage of ASHAs' performance-based incentives to electronic record in the ImTeCHO, Regular feedback to ASHAs regarding completeness of registration, and Demand generation among the community by the use of mobile-based videos.

To find the actual number of events (reference) in the sampled villages, trained and independent data collectors conducted house-to-house survey to enumerate every household. Using a pretested questionnaire, the members of each household were asked to identify current events after obtaining written informed consent from them. A detailed account of each event was collected including last menstrual period (LMP), date of delivery, native village, etc. Information was collected from a key informant as well such as ASHA and Anganwadi workers. After completing information collection in every village, ASHA's record was checked in her mobile to identify the women who were not registered through the ImTeCHO application; subsequently, ASHA was interviewed to identify reasons behind the nonregistration of the event through the ImTeCHO application. Every event found during household survey was compared with the ImTeCHO system to identify those events which were missed by ASHA using the ImTeCHO application.

To detect 10% difference in sensitivity between registration of deliveries in the ImTeCHO and reference, the required sample size calculation was 98 deliveries in both groups considering 90% power and 5% two-sided alpha error. Those villages were included where single ASHAs had been using the ImTeCHO application since January 1st 2014. Native currently pregnant women having LMP more than 3 months from the day of survey were included in the study. The data of native women who delivered between January 2014 and April 2015 and all infant who died between January 2014 and April 2015 were studied.

All the 35 eligible villages after meeting the inclusion/exclusion criteria were numbered. The villages were selected through stratified random sampling so that equal numbers of villages are chosen from two study PHCs.

The study was approved by the Scientific Committee of SEWA Rural and written informed consent was taken from participants after explaining the whole procedure of our study. All the participants were given a unique identification code to maintain anonymity. Descriptive statistics were used for analysis. Primary outcome of interest for the study was the proportion of pregnancies, deliveries, and infant deaths registered through the ImTeCHO application compared to actual number of events.

Results

There were 844 household enumerations, 39 pregnancies, 102 deliveries and 15 infant deaths that were recorded. The median age of the study participants was 23 years (Range: 18 to 36 years). More than one-third of the women had one pregnancy in the past. About 87% of the deliveries have taken place within a hospital. There were 117 (80.13%) tribal women. Approximately 87% of deliveries took place in a hospital.

Table 1 tabulates data on pregnancies ($n = 39$), deliveries ($n = 102$) and infant deaths ($n = 5$) found during the household survey, 38 (97.43%), 101 (99.01%), and 5 (100%) were already registered by the ASHAs through the ImTeCHO application. The ASHA missed one case of pregnancy and delivery because she was under the impression that the women did not belong to the study village as they spent majority of time in another village. For the pregnancies, deliveries, and infant deaths found in household survey, the sensitivity of the ImTeCHO application with the household survey was 97% (95% CI 0.85-1.00), 99% (95% CI 0.93-0.99), and 100% (95% CI 0.46-1.00), respectively.

Discussion

The study found that the proportion of pregnant women registered through ImTeCHO was similar to the enumeration.

A survey done in India in 2011-2012 showed 95% of districts reporting data on pregnant women and 93% on children enrolled

Table 1: Number of pregnancies, deliveries, and infants deaths found during the household survey and in the ImTeCHO among sampled villages ($n = 5$ villages)

	Events recorded during household survey (reference)		
	Pregnancies ($n = 39$)	Deliveries ($n = 102$)	Infant deaths ($n = 5$)
Registered in the ImTeCHO	38 (97.43%)	101 (99.01%)	5 (100%)
Not registered in the ImTeCHO	1	1	0
Sensitivity	97%	99%	100%
95% CI*	0.85-1.00	0.93-0.99	0.46-1.00

*95% CIs for sensitivity was calculated using the Wilson method on VassarStats online statistics software.^[6]

under the MCTS, while in Gujarat, India only 51% of pregnant women among estimated were enrolled. Gujarat had 7.69% of data on pregnant women and 10.27% of data on children that were not reported appropriately by sub-centres under the MCTS.^[2] A similar study carried out in rural Ahmedabad^[7] shows only 79% of the women have a health card with 82.5% women having documentation of treatment and advice for the antenatal details and only 3.9% of women had been given advice regarding postnatal details.

A possible explanation for the difference in findings is the registration being made into this innovative mHealth application. Near-complete registration is ensured via numerous safeguards incorporated into the program that includes linking performance-based incentives with digital record, demand generation, regular feedback, and point of care registration. As documented in another publication, the ASHAs found the use of mobile application quite acceptable, feasible, and useful; therefore, they were more inclined to timely register pregnant women and deliveries.^[5]

One of the limitations of the study is its small sample size: Using a larger population sample would be helpful, as it would demonstrate the effects of the ImTeCHO application in a more appropriate manner. Also, SEWA Rural has been active in the study area for more than a decade, which might have positive influence on the results. However, similar findings were noticed in another new project area that is far from the reach of SEWA Rural.

To conclude, the strategies used to ensure complete registration in the ImTeCHO application could be applied in other e-health initiatives. Similar mHealth initiatives might be considered for scaling up in other tribal areas to improve the coverage and quality of the MNCH services.

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Conflicts of interest

The authors have no conflict of interest to declare.

References

1. Unites State Agency for International Development. mHealth Compendium. Vol. 3. Available from: https://www.msh.org/sites/msh.org/files/mhealth_compendium_volume_3_a4_small.pdf. [Last accessed on 2015 Apr 11].
2. Government of India. Mother and Child tracking System. Available from: http://www.nrhm-mcts.nic.in/MCH/Documents/MCTS_Imple_Status_17Nov2011.pdf. [Last accessed on 2015 May 2].
3. Datta SS, Ranganathan P, Sivakumar KS. A study to assess the feasibility of Text Messaging Service in delivering maternal and child healthcare messages in a rural area of Tamil Nadu, India. *Australas Med J* 2014;7:175-80.
4. Government of Gujarat. e-Mamta — Gujarat. Available from: <http://e-mamta.gujarat.gov.in/>. [Last accessed on 2015 May 20].
5. Modi D, Gopalan R, Shah S, Venkatraman S, Desai G, Desai S, *et al.* Development and formative evaluation of an innovative mHealth intervention for improving coverage of community-based maternal, newborn and child health services in rural areas of India. *Global Health Action* 2015;8:26769.
6. VassarStats: Website for statistical computation. Clinical Calculator 1. Available from: <http://www.vassarstats.net/clin1.html>. [Last accessed on 2015 May 7].
7. Govani KJ, Sheth JK, Bala DV. Utilization assessment of basic maternity health services through Mamta card in rural Ahmadabad. *Natl J Community Med* 2013;4:40-3.