MDSR Action Network
Every maternal death counts

Connect | Inspire | Challenge | Learn | Act

Welcome

Dear Action Network members,

Welcome to the tenth edition of the MDSR Action Network's newsletter!

Thank you to those of you who responded to our questionnaire in the last edition. Your responses have given us a useful insight into what the network is doing for you and what more it could do. Here are some key findings:

- Members said that since joining the network they had learned from others working in similar or different settings and gained improved access to recent reports and publications.
- Members would like the network to do more to connect them to experts working in similar settings to share experiences. We will focus more attention on facilitating these connections.
- Members told us that an MDSR Action Network would be useful in their own country and ways to take this forward could be by establishing a network that meets face-to-face and developing a country-focused newsletter.

In this edition

This edition of the MDSR Action Network focuses on "eHealth": the use of information and communication technologies (ICT) for health. eHealth is increasingly being recognised as a key mechanism to advance women's and children's health. The Commission on Information and Accountability for Women's and Children's Health (CoIA) recommends the integration of ICTs into health information systems and health infrastructure in order to improve the flow of information to support the delivery and management of the health system.

This newsletter explores how ehealth could support MDSR. Be **inspired** by experiences from Ghana and Senegal in using mobile phones to support death notification and verbal autopsies at the community level. **Learn** key lessons on establishing an electronic MDR system in India, as well as the potential of ICTs to **improve** the quality of maternal and newborn health and accountability. You will also find updates from around the world, including from the MDSR Working Group who convened in early May.

Please read on, and we hope that you will find some useful eHealth-related insights to share with colleagues and consider in your own work.

USING MOBILE TECHNOLOGY TO SUPPORT VITAL REGISTRATION AND VERBAL AUTOPSY IN THE COMMUNITY: BONSAASO MILLENNIUM VILLAGES PROJECT, GHANA

Prior to the inception of the Ghana Bonsaaso Millennium Villages Project in 2006, maternal mortality was as high as 345 deaths per 100,000 live births, child mortality was 110 deaths per 1000 live births, and the institutional delivery rate was as low as 32%. The challenge of accessing healthcare was identified as the main cause of poor health indicators in the area at that time.

The Millennium Villages Project (MVP) in Ghana initiated vital registration and verbal autopsy (VRVA) in 2008 to support the improvement of maternal and child health services, and, in turn, to reduce infant, child and maternal deaths. Vital registration ensured that all community members were properly identified and included in the denominator of measures being tracked by MVP. In 2011, verbal autopsy was strengthened to ensure that any death in the village was recorded and analysed for medical and social causes so that future deaths could be prevented.

A CHW counselling a mother during a home visit

The vital registration and verbal autopsy system
At the community level, community health workers (CHWs) registered household members within their community, making sure to include pregnant women and children under five. They also collected data on the following vital statistics: birth registration (indicating date and place of birth), pregnancy outcomes, and all deaths.

Prior to 2008, a paper-based system was used to collect this data. Multiple challenges were experienced from the paper-based system, including a large volume of information being gathered making it difficult to manage and data analysis very time-consuming.

In late 2009, mobile communications were established throughout the area and, in 2010, the mobile-phone based system called ChildCount+ (CC+) was introduced by the project to address the problems of the paper-based system. The open-source system, CC+, enabled CHWs to send data via SMS text messages to a central server, collecting data in real-time. This system was later migrated to a smartphone-based system called CommCare[1] for general home visits.

A verbal autopsy specialist assists CHWs in conducting in-depth verbal investigations into the causes of each death in the community. This investigation gathers information from

A CHW collecting data at household level with mobile phone

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[1] A mobile and web platform for gathering and distributing healthcare-related information

the household and the health facilities of the catchment area where the death occurred to understand the circumstances behind the death.

This more extensive data collection by the verbal autopsy specialists required the use of a complementary electronic system known as Open Data Kit[2] (ODK), where verbal autopsy data is inputted into smartphones using mobile forms. Specialists visit homes, record the data on the phones and later return to an area with good coverage to send data to a central electronic medical record system - OpenMRS[3]. The OpenMRS system then automatically uses this verbal autopsy data to generate reports on the social and medical causes of each death, which were reported back to local and remote teams. The mobile phone-based system integrated with Open MRS was also eventually migrated to run on the CommCare system in 2014.

How the data is used
The data is discussed during weekly MVP health team meetings comprising selected senior doctors, nurses and heads of public health programmes in the district. During these weekly meetings, vital statistics and verbal autopsy data is reviewed and analysed in order to identify solutions to the circumstances that led to the death and/or morbidity, and to prevent future occurrences.

On a monthly basis, a meeting with a larger stakeholder group takes place where issues on all deaths and morbidity trends are discussed. During these larger stakeholder meetings the verbal autopsy specialist presents on all cases of deaths that have been investigated. Participants of this monthly meeting comprise the MVP health team and multiple representatives from where the death occurred, including from the district referral hospital, from local facilities, from communities, and CHWs. The meeting discusses the issues presented, finds solutions, and sets timelines for their implementation.

Examples of solutions implemented as a result of the verbal autopsy data include community health information sharing sessions and staff in-service training. These would be based on recommendations from the larger, monthly stakeholder meeting.

Achievements
The transition towards using these electronic data collection systems saw a greater volume of data reporting (see tables 1 and 2), which was in real-time and more accurate. This data collection has become an important monitoring and managerial tool, providing vital information in real-time, so that resources and staff performance gaps can be quickly identified and action taken immediately. The programme has seen improvements in health staff performance, logistics provision and management. This implies that an effective data collection system provides the edge to improve performance for better results.

Table 1: Birth Records	
Period (year)	Proportion (%)
2006	29.7
2007	32.2
2008	63.0
2009	81.0
2010	81.7
2011	81.2
2012	82.5
2013	83.7
2014	85.8

Table 2: deaths recorded by different verbal autopsy data collection methods				
Period (year)	Death category			Data collection method
	Under 5yrs	Maternal	Others	
2010	5	0	12	Manual, paper-based system used
2011	44	0	125	Data collection through ODK/OpenMRS
2012	22	0	110	Data collection through ODK/OpenMRS
2013	15	0	93	Data collection through ODK/OpenMRS
2014	20	1	48	Data collection through CommCare

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[2] An open source platform that enables data collection on mobile phones and data submissions to a central server
[3] A web-based, open source electronic medical record platform that can be used to collect person-level health information from several different technologies.

Challenges and lessons learned

MVP has been successful in using effective data systems to improve performance and health outcomes. However, this was not achieved without challenges. Key challenges and lessons learned include:

- Although the paper-based system cost less compared to the CommCare system, it was not cost-effective due to the limitations faced in using it: time consuming to collect, numerous errors, risk of data loss, large costs for data entry, and lack of real-time data collection limiting rapid decision-making. Key costs to consider for the CommCare system include the smartphone and data bundle.
- While the CC+ mobile phone-based system introduced in 2010 reduced data bulkiness, there were a number of challenges in using it, including CHWs having to type a lot of information into basic-feature phones, which led to significant errors, and CC+ requiring mobile service at the point of sending SMS text messages. Transferring to the CommCare system using smart phones in 2012 helped to address these problems. CommCare enabled CHWs to enter data on the smart phone anytime, anywhere with or without a mobile network service since data can be synchronized as soon as the CHW enters a network zone. Also, CommCare can be designed to limit the amount of typing, and therefore reducing errors, by using drop down selection boxes and multiple choice selection options.
- Training on using the technology takes time. It takes about three days to train someone in the technology and one to two months to become skilful in using it. Allocating time for this is important.
- There will always be the challenge of the equipment, namely the phones getting lost, broken, or faulty. To address this challenge, the programme provides supervisors with back-up phones ready to be used until a permanent replacement is found.
- We have not experienced families being concerned about using the mobile phones to collect the verbal autopsy data. Nevertheless, it is important to be culturally sensitive on when you conduct the interview (e.g. in our case, conduct the interview one week after the death) and explain to the family how the data is to be collected before the interview and that it will not be used for any wrong motive.

Future plans and the way forward

The success of the system has meant that the Ministry of Health and the Ghana Health Service have expressed interest in scaling up. MVP is currently working with the Ghana Government to look for both domestic and foreign support to scale-up the interventions.

Acknowledgments

This case study was written by Eric Akosah and Seth Ohemeng Dapaah from Millennium Villages Project, Bonsaaso-Ghana and reviewed by Dr Andrew S. Kanter, Columbia University.

Further information

Read more about this mHealth solution in the article 'Combining vital events registration, verbal autopsy and electronic medical records in rural Ghana for improved health services delivery' published by *Studies in health technology and informatics* and written by contributors to this case study and their colleagues - S., Ohemeng-Dapaah, P., Pronyk, Akosa, E., Nemser, B., & Kanter, A.

Learn | Resources and Journal articles

EVERY DEATH COUNTS: ELECTRONIC TRACKING SYSTEMS FOR MATERNAL DEATH REVIEW IN INDIA

This article by Chittaranjan Purandare and colleagues in the *International Journal of Gynecology and Obstetrics* describes the process that led to the development of an electronic MDR system in India. Users were positive about the software, finding it simple to use, secure, and useful to generate reports for planning. Key lessons learned include:

- Ensure alignment of the country's objectives and strategies into software development plans
- Have a clear implementation road map and project management system to ensure that timelines are followed
- Have an action plan for both intended and unintended problems that arise
- Involve programme "champions" who will see implementation to its end
- Establish public-private partnerships for guidance and support from key stakeholders
- Share regular updates on progress to ensure help is provided when needed and that team-members are motivated to provide high-quality work

EARLY DETECTION OF MATERNAL DEATH IN SENEGAL THROUGH HOUSEHOLD-BASED DEATH NOTIFICATION INTEGRATING VERBAL AND SOCIAL AUTOPSY: A COMMUNITY-LEVEL CASE STUDY

The article by Mosa Moshabela and colleagues in the *BMC Health Services Research* presents a case study of community-level surveillance in Senegal as part of the Millennium Villages Project (MVP). The mobile technology based (mHealth) platform Childcare+ was used to identify pregnancies, births and deaths. Once this information is entered into the surveillance system, this then prompts a verbal and social autopsy to be conducted. Verbal Autopsy and Social Autopsy (VASA) data was collected using a standardised tool based on the WHO's Verbal Autopsy questionnaire but with some modifications on questions related to social contributors to mortality (e.g. accessing transport). The VASA data was collected either by hand or using a mobile device and then uploaded to a central database where a pre-set algorithm was used to calculate the likely cause of death and any contributory social factors.

The case study highlights how the routine community-based surveillance system identified inefficiencies at a tertiary level of care as the main contributor to the five maternal deaths in the area. The study concludes that mHealth data collection tools are able to detect small changes in community-level mortality in real-time, can help facilitate rapid-cycle quality improvement interventions when linked with accountability structures such as mortality reviews.

HOW INFORMATION AND COMMUNICATION TECHNOLOGIES CAN IMPROVE THE QUALITY OF MATERNAL AND NEWBORN CARE IN LOW AND MIDDLE INCOME COUNTRIES: A STRUCTURED LITERATURE REVIEW

The Evidence for Action MamaYe programme has developed a structured literature review of how ICT/mobile technology have been used in low and middle income countries for monitoring and improving the quality of maternal and newborn healthcare in general, as well as in the context of vital event registration and/or maternal death reviews.

The review identified a total of 24 projects covering four thematic areas:

- **data management** including collection, transmission, and analysis of information
- **point of care support** by assisting decision-making and diagnosis
- **training and disseminating** knowledge to healthcare workers (e.g. latest research and guidelines)
- improving **communication and networking** between healthcare workers and health facilities, patients or other healthcare workers

The review found that these technologies could have greater potential in improving and monitoring quality of maternal and newborn care if the following factors are considered:
- ensuring the deployment of technology that can be installed and maintained locally
- deploying devices and infrastructure that is low cost and can be integrated within the health system
- ensure the buy-in and commitment of key stakeholders

The paper concludes that the future for ICT for contributing to quality of care improvements is promising; however it must be complemented by other inputs such as adequate infrastructure and human resources to maximize its potential.

ICT FOR IMPROVING INFORMATION AND ACCOUNTABILITY FOR WOMEN'S AND CHILDREN'S HEALTH
This report by the International Telecommunication Union provides practical information on the variety of ICT solutions available that could help support countries in improving information and accountability for maternal and child health, as advocated by COiA. The report firstly provides an overview of the status of different ICT services available in CoIA focus countries before presenting examples of the role that ICTs can have in implementing COiA's 10 recommendations. The report also highlights key governance, policy, and human resources considerations for the successful implementation of ICT projects at national scale.

USING EHEALTH TO SUPPORT MPDR: EXPERIENCES FROM BANGLADESH
Dr Animesh Biswas and colleagues have written a case study on their experiences in integrating the information system - DHIS 2 - into the Maternal and Perinatal Death Review (MPDR) programme in Bangladesh. To date, the DHIS2 system has been piloted as part of the MPDR programme in three districts - Bandarban, Cox's Bazar and Netrokona – and used to upload maternal and newborn death notifications into the central health management information system.

Act | Updates from around the world

MDSR working group
The MDSR working group met "virtually" on 11 May. The meeting was chaired by Dr Matthews Mathai of the World Health Organization and attended by representatives from multiple organisations, including UNFPA, Center for Disease Control and Prevention, Evidence for Action, USAID, and FIGO.

Key updates from the meeting include:
- Preparations are underway for the first global MDSR implementation progress report, which will be launched in October 2015 at the FIGO conference in Vancouver. As we mentioned in the last issue, the WHO, with support from UNFPA, have been collecting data on MDSR implementation since April 2015. The Global report will include this data on MDSR implementation together with case studies highlighting country level experiences on strengthening MDSRs. .
- Planning is underway for a pre-congress MDSR workshop in Vancouver to provide learning opportunities through sharing of experiences. This will be led by the WHO and UNFPA in collaboration with FIGO. Look out for more information on this in our next issue and on our events calendar.

NIGERIA
The National MDR Steering Committee was launched by the Honourable Minister of Health in March 2015. Since its launch The Federal Ministry of Health is planning a meeting of the Steering Committee where they hope to draw up a work plan for the implementation and direction of Maternal and Perinatal Death Surveillance and Response in Nigeria. At sub-national level, an MDR scorecard has been developed in Jigawa State to track the strengthening of the MDR system and identify where improvements can be made, particularly on the implementation of recommendations.

MALAWI
The National Committee on Confidential Enquiry into Maternal Deaths (NCCEMD) met in April with a new team taking over its leadership. In June, the NCCEMD will be finalizing the 2014 annual national MDSR report.

In April 2015, the findings of a pilot study in rural Malawi assessing the value of involving communities in investigating and responding to local maternal deaths was released. Read a summary here.

ETHIOPIA
Ethiopia is now seeing increasing numbers of maternal deaths being reported to the national database as the surveillance system becomes established.

Maternal deaths are incorporated into weekly reporting from the community to the national level. Following the report of a death, a verbal autopsy should be carried out, which provides an opportunity to better understand why the death occurred and how such deaths can be prevented in the future.   The verbal autopsy should be done at an appropriate time following the death, usually 2-4 weeks.

At a national level some patterns are beginning to emerge – haemorrhage is the main cause of death in all regions. This gives the planning teams useful data to coordinate a response, which will include improving the capacity to prevent and manage haemorrhage at all levels.

To read more, take a look at Ethiopia's May MDSR Newsletter here, where you'll find updates on integrating MDSR into the undergraduate curriculum at St Pauls Millennium Medical College, inspiring stories of change, and a case study from Addis Hospital demonstrating "gold standard" MDSR practice.

SIERRA LEONE
Attempts are being made to revitalise MDR committees in Sierra Leone since the outbreak of the Ebola Virus. An MDR committee meeting took place in Kabala hospital in April 2015, which reviewed all nine maternal deaths that took place in the hospital. Recommendations based on the MDR findings were identified. For more information, please read this blog.

And finally…

In this issue we've learnt from others about their experiences in tapping into eHealth to advance MDSR systems. We'd really like to hear back from you on your own experiences and views about eHealth – the positive and the negative. You can do so:
- Online here
- Through this word document and sending it back to the Action Network.
- Send me an email

Please keep sharing your stories and publications. We look forward to them!

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Evidence for Action hosts the Maternal Death Surveillance and Response Action Network on behalf of the World Health Organization's Maternal Death Surveillance and Response Working Group