

Maternal and New-born Mortality Surveillance – Case for Kwale, Kisumu, Vihiga and Siaya

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Background and Purpose: An analysis of DHIS2 data was done and a comparison of the number of deaths reported on the Integrated Disease Surveillance and Response (IDSR) and MoH 711, discovered that IDSR is under-utilized and inaccurate. This data analysis revealed that on average only 39% and 11% of maternal and neonatal deaths respectively, are reported as emergency events in the four counties. The aim of the study was to unearth the challenges hindering real-time submission of data and to understand the surveillance cycle in use.

Methods: A purposive sampling was used to select the research participants and regions to collect the data from. The staff directly involved in the reporting of maternal and new-born deaths were targeted. They included maternity ward-in-charges, surveillance focal persons, health records personnel, and the county health management teams. The awareness of the standard operating procedures and notification policies on zero-reporting was evaluated, as well as the preparedness of reporters, the availability of IDSR reporting tools, the reporting process, and the challenges hindering reporting to IDSR.

Results: The maternity staff were not aware that they were required to send death notifications to the IDSR office within 24 hours after the death occurs, only 3 (8%) respondents had seen a maternal and perinatal death standard operating procedure (SOP), the weekly reporting tool was not readily available in 15 (38%) facilities, only 8 (20%) facilities had a clear reporting cycle.

Conclusions: There is need for improving the reporting process of the maternal and new-born deaths in Kenya.

Keywords: Real-time data, Integrated Disease Surveillance and Response (IDSR), District Health Information System (DHIS2), Reporting Process Flow, Standard Operating Procedures (SOP)

1 Introduction

Kenya implemented the World Health Organisation technical guidelines to include maternal and neonatal deaths in the list of notifiable events through the Health Management Information System (HMIS) [13]. Orientation workshops and training were conducted for all healthcare workers at all levels. Studies conducted in the earlier years revealed that there was underreporting of these deaths, poor compliance with the Ministry of Health (MoH) circular on perinatal and maternal death notification, as well as lack of evidence of responding to the Maternal Death Review (MDR) recommendations at the national and facility levels [2]. The main recommendations from the reviews were to do capacity building for healthcare workers on forms completion and having a lead MDR person at each hospital.

In the technical guideline new amendments were also made to existing reporting tools. As part of these changes the reporting form MoH 505 which is one of the surveillance weekly reporting tools added maternal and neonatal deaths in the list of events on the form. There are other tools used in various ways at the health facilities: birth and death notification forms are used to register persons who were born or died, MoH 333 is used to collect data at the maternity and delivery ward, MoH 711 is an integrated summary tool for

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reproductive health, HIV/AIDS, malaria, TB and child nutrition. Maternal audit forms and D1 forms are used to register patients who have died.

A review by WHO in 2014 showed that the system appeared to be working well under partner sponsored programmes in selected counties but reporting and notification of the deaths have not improved [8]. The main focus by the partners is on malaria, HIV, TB, and outbreaks data. Furthermore, a study [3] revealed that despite the Maternal and Perinatal Death Surveillance and Response (MPDSR) notification and evaluation forms being incorporated into the DHIS2, the reporting still had gaps, and not all maternal deaths were adequately captured by the Civil Registration and Vital Statistics (CRVS) and DHIS2 systems.

In support of the MPDSR notification and evaluation forms being incorporated into DHIS2, technical guidelines and standard operating procedures (SOP) were developed to support the implementation of MPDSR in 2016. Some of the principles of the technical guidelines were: sending maternal and neonatal death notifications within 24 hours, conducting death reviews within 7 days, completing the weekly IDSR reports, and adopting zero reporting. Considering any maternal and perinatal death review as incomplete if no response from the audit team is provided was also added as a principle [6].

The German Development Cooperation through its Technical Agency in the Health Sector in Kenya (GIZ HSP), has as its mandate to ‘Improve Access to Quality Healthcare particularly for the poor and persons working in the informal sector’. GIZ HSP works in collaboration with four county governments, namely: Kwale, Kisumu, Vihiga and Siaya. GIZ HSP monitors the maternal and under-5 mortalities through the District Health Information Software (DHIS2) which is used in all facilities as a national reporting tool. During an analysis of this data covering January 2016 to December 2017, a comparison of the number of deaths reported on the Integrated Disease Surveillance and Response (IDSR) (as emergency events) and MoH 711 (a summary of the monthly statistics) was done (Figure 1) [14]. It was discovered that IDSR is under-utilized and inaccurate. On average only 39% of the maternal deaths and 11% of the neonatal deaths are reported as emergency events in the four counties.

January 2016 to December 2017				
	Maternal Deaths 20+ years	IDSR Maternal deaths	Neonatal deaths	IDSR Neonatal deaths
Kwale County	46	15	240	66
Kisumu County	102	17	539	192
Vihiga County	13	2	139	29
Siaya County	34	70	378	4
Kenya	1,861	584	19,347	3,729

Table 1. Comparison between IDSR and monthly data

This study was conducted as a follow up research in the specific hospitals where GIZ gives direct support: Kwale (11), Kisumu (12), Vihiga (11), and Siaya (8). The health facilities are run by private institutions, the Ministry of Health, and faith-based organizations. From the definitions above, the following research questions were deduced: what workflow processes are followed when reporting neonatal and maternal deaths? What challenges are hindering emergency reporting of neonatal and maternal deaths to DHIS2?

1.1 Background

Despite the heightened attention and major global commitments along with significant funding, maternal health still remains a significant issue in low-income economies such as Kenya. Although maternal deaths have been reported as having reduced between 1990 and 2013, [12] found that approximately 830 mothers die on a daily basis due to pregnancy complication and childbirth. Whereas solutions to these problems are available, the implementation is constrained by lack of access to quality maternal care.

Mobile Health (mHealth) has been proved to have the potential to significantly reduce the inequality of maternal health care through various technological applications that aim at facilitating efficient communication between healthcare providers and patients. These applications can also assist in the

collection of data with the overarching objective of enhancing access to quality maternal health care. Other African countries like Tanzania show that having the necessary preconditions in a developing country can enhance surveillance of maternal and perinatal deaths by implementing legal and policy frameworks to support it [4].

The Ending Preventable Maternal Mortality (EPMM) working group composed of representatives from various national and international development partners is working towards ending preventable maternal mortality by ensuring universal health coverage (UHC), hospital accessibility to all without discrimination, addressing all maternal death causes, strengthening systems to collect high quality data, and finally ensuring accountability [11].

The GIZ Health Sector Programme in Kenya has also been working in four counties to strengthen the capacities of the health management teams to plan and manage the provision of health services. GIZ main aim is to enhance access to high-quality basic health services for the poor, workers in the informal sectors and their families. GIZ has supported the MPDSR process since 2015 and has had some gains in Kisumu County, for instance MPDSR meetings are now held on a monthly basis to discuss what went wrong, steps to ensure it doesn't happen again, and insights to learn from mistakes, at the county level; facilities and communities are now able to discuss the maternal death cases regularly, and clinicians give their input at each County MPDSR meeting [1].

In relation to the emergency reporting Kisumu is now able to notify the County Reproductive Health Coordinator immediately a death occurs in a facility, and the community conducts verbal autopsies within 7 days of any maternal death. Save the Children has also implemented emergency and developmental health programmes in some parts of the country since 2011 [7]. Their focus has been to provide support to the health systems and to endow communities to ask for health services. The quality of data has always been considered as an important matter because it has a huge impact on the government budget and is also used in stimulating high standards of patient care. Poor data quality has a negative impact on the quality of healthcare. This data is used at hospital level for assessing their service delivery, hence, make appropriate financial and administrative plans [9]. At the county and national levels, the statistics are used for planning of healthcare services and resource allocation in order of priority. Therefore, accurate, well-timed and accessible healthcare data play a critical role in the development, planning, and maintenance of healthcare services [9].

As the healthcare sector moves to progressive evidence-based healthcare systems, it has become critical for providers to embrace data for reasons such as making informed decisions to advance the quality of care, and by using data of good quality to enhance facility performance [9]. IT tools for data collection have been proved to help clinicians and patients access the latest evidence-based, lifesaving practices at their work stations.

Reporting structures in Kenya .

UNFPA and other partners introduced the maternal death surveillance and response (MDSR) as a new way of conducting maternal death reviews to Kenya in 2013. Since MDSR had well-established review processes, it was beneficial because it put more emphasis on the significance of timely reporting (surveillance) of the deaths and action implementation (response) to avert further deaths [13]. Implementation of MDSR entails the establishment of a system that links surveillance and review of maternal deaths at the facility and community levels so as to notify the national level with confidential investigation of the deaths. In 2016 the national guidelines incorporated perinatal deaths in MDSR to make it MPDSR and thus conduct surveillance and reporting for both maternal and perinatal deaths [8].

Kenya IDSR reporting .

Among the key components in the technical guideline, maternal and perinatal deaths were made notifiable events and thus incorporated in the notifiable disease reporting system IDSR. The technical guidelines directed that wherever the maternal mortalities were included as notifiable events, the IDSR platform must be strengthened during the MDSR implementation process [13]. The guidelines also instructed that zero reporting be done when no death occurs for every reporting period.

In the case for Kenya, the IDSR platform on DHIS2 is where all maternal related deaths should be reported within a week and notifications sent within 24 and 48 hours if it happens in a facility or in the

community respectively, through the fastest means available. The IDSR guidelines advise that after the death of a pregnant woman has been determined, a health facility must contact the district authority and give information (notify) about the case. They should then follow the notification with a written case-based report and a weekly report on the IDSR Weekly Reporting Tool (MoH 505) filled in triplicate.

Surveillance concept .

Surveillance data is information for action which must be transmitted to bodies that can take action to prevent or control further damage to communities and individuals. These bodies may not only include the MoH but also other sectors, industries, non-governmental organizations, community groups and many others. Health surveillance is a cycle of ongoing public health activities and actions that involve public health agencies, health workers, and the public. The first stage of the cycle starts when a health event occurs and is reported by a health worker to the public health office; this does not stop until the information about the case has been collected, integrated, analysed, interpreted, surveillance products produced and disseminated to the users (in this case those who will act on it)[10].

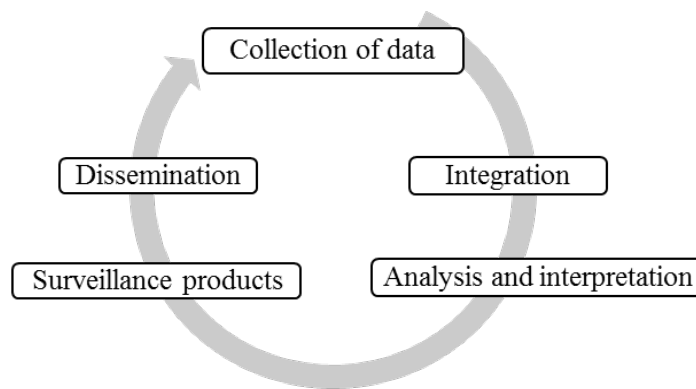


Figure 1. Surveillance cycle model “(adapted from [10])”

2 Materials and methods

In this research a purposive sampling procedure was used to select the research participants and regions to collect the data from. The staff that are involved directly in the maternal and perinatal deaths reporting were targeted. They included maternity ward in-charges, facility surveillance focal persons, health records personnel, and the county health management teams.

2.1 Data collection tools

The semi-structured interview format was used where an interview guide containing a set of questions was prepared prior to the interview sessions and additional questions asked in no particular order for further clarification and as a trigger to an open discussion.

Focus group discussions were done with preformatted questions focusing on the main area of interest were prepared and tabled before the participants for discussion in a group. The discussions triggered further questions within the participants which they were able to answer. They were also able to share their experiences and views on the MPDSR reporting process and challenges faced at the higher levels.

2.2 Data collection

There were 41 facilities selected to participate in the study. The data necessary for this research was obtained from 39 healthcare facilities which were accessible. Two facilities were inaccessible due to the bad road conditions. The participants were interviewed through a one on one interview. Where the facility

in-charge was not available the records person together with the surveillance focal person were interviewed. A few members of the County Health Management Team (CHMT) were also engaged in group discussions. Completeness of data recorded on registers was also checked by reviewing the maternity registers.

2.3 Data preparation and processing

The data obtained was prepared and processed by the following steps:

- The recorded interview sessions were transcribed for each participant and written on a notebook then later input to the SPSS data editor. Since the data collected was mainly qualitative it had to be coded in order for it to be in a format that could be tabulated into the SPSS analysis tool.
- The open-ended questions were coded to create multiple responses and to develop meaningful relationships. This was dependent on the question asked and the number of responses given. The original data is still available for further reference.
- The data was then filtered to analyse the awareness of zero reporting since this represents the direct cause of non-reporting. This was also helpful in checking the reporting frequency.

2.4 Ethical issues

The research process was conducted within the stipulated clinical rules and ethics. According to the guidelines for ethical conduct of biomedical research involving human subjects in Kenya, a high level of privacy was observed while looking at the maternity registers which had patient's data recorded [3]. The data was handled confidentially exclusively by the researcher. Before this activity begun a written consent was sought from the interviewees and signed for the protected information and all procedures abided by.

3 Results

From the targeted 42 facilities, 39 were visited and interviewed in the various counties as follows: Kwale (9), Kisumu (12), Vihiga (11) and Siaya (7). Ownership of the health facilities was as follows: faith-based 10%, private hospitals 18% and governmental hospitals 72%.

3.1 Awareness of zero reporting

The awareness for the timelines to send maternal and perinatal death notifications was assessed with the following findings:

- No maternity staff was aware that they were required to notify the surveillance focal person
- No maternity staff was aware that they were required to send zero reports to the surveillance person if no death occurred.

A section on the manual maternity register for the registration of the total number of deaths per day was incomplete and the registers had cases of lacking data in the following fields: diagnosis, blood loss, feeding options, delivery conducted by, and birth notification number.

3.2 Preparedness of the reporter

Only 3 (8%) respondents were aware or had seen standard operating procedures (SOP) on maternal and perinatal deaths guideline. The only available SOP was the maternal deaths audit form and none on the general reporting guideline from the MPDSR. A further 8% (3 respondents) were not aware of any SOP and 84% (33 respondents) had no form of policy or guideline. 19 (49%) respondents had not received any form of training on how to report maternal and perinatal deaths while 20 (51%) respondents had been trained more than three years ago.

3.3 Availability of reporting tools

The standard reporting booklet called MoH 505 IDSR Weekly Reporting Tool was not readily available in 38% of the health facilities visited. A good number of the facilities had photocopied pages of the booklet which was only used for outbreak cases and not for maternal or neonatal deaths. The tools in use at the maternity and records department in all the facilities visited were distributed as shown in the graph below:

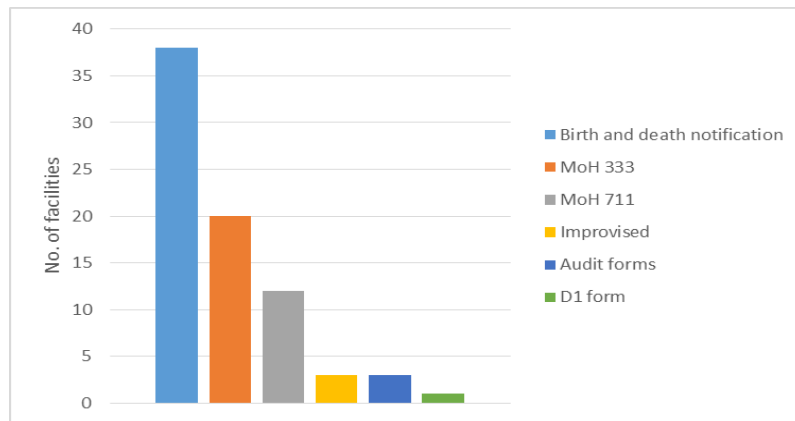


Figure 2. Reporting tools in use at facility level

3.4 Reporting process

Only one facility out of the 39 had a well-defined MPDSR flowchart pinned on the wall at the maternity ward; it was developed with the help of a development partner. 97% of the facilities were issued with MoH tools and in case of a maternal or perinatal death, the hospitals were able to send the written reports to the sub-county offices. There are only 8 (20%) facilities that have a clear reporting cycle in place and are able to complete the process by submitting their data in DHIS2 at the end of the month.

There was no single register in all the 38 facilities which was properly and completely filled as is required. Completeness of the registers was not checked in one facility because it had an improvised general register used in all the departments of the hospital. The registers had numerous misfiling with the wrong content or words instead of codes in some fields.

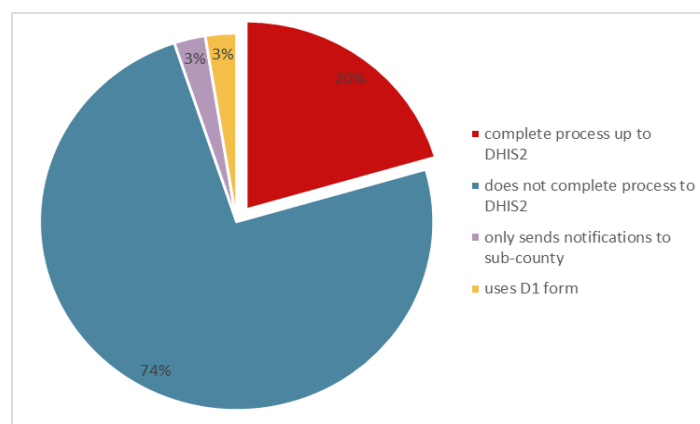


Figure 3. Complete reporting to DHIS2

3.5 Feedback mechanisms in place

Proper feedback mechanisms are lacking and only 26% of the facilities reported to have received feedback from the county management team. None of the respondents has received feedback from the surveillance teams placed at the sub-county or county level.

3.6 Challenges hindering reporting

There were 27 challenges cited to be hindering timely and complete reports within the recommended timelines. The challenge that topped the list was the lack of awareness for immediate notification and zero reporting scoring 69% among others as displayed in the graph.

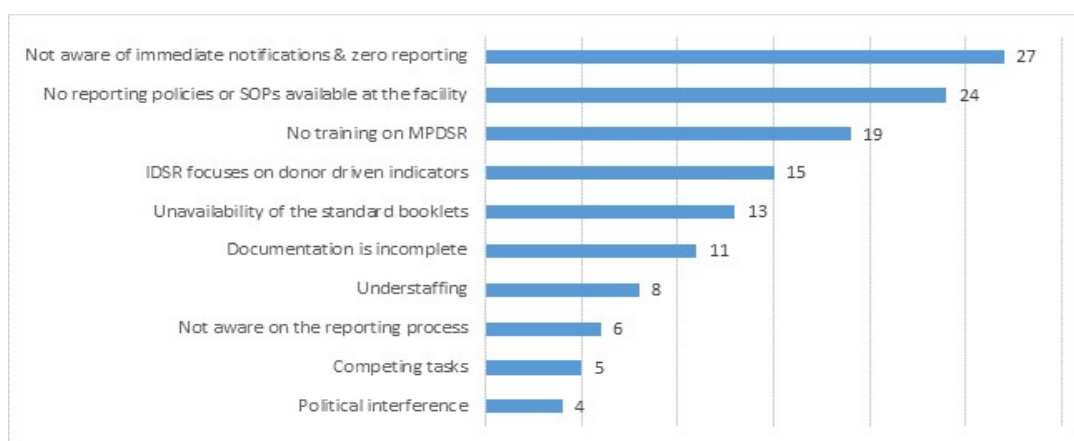


Figure 4. Challenges hindering reporting

The respondents also stated that due to understaffing and other competing tasks the registers had many gaps, were incorrectly filled and incomplete. They also suggested what they needed to support the reporting process and enhance the quality of the IDSR data as listed in table 2:

Needs	Frequency
Capacity building on filling the tools	15
Resources to be availed by the facility	15
Mobile-based system	11
Access to DHIS2 at the maternity	9
EMR	8
Availability of tools	6
More staff	6
Records person	3

Table 2. Participants needs for better reporting

4 Discussion

The study established that the present MPDSR reporting cycle is very inefficient because the flow charts have not been circulated to the facilities and are not in use. This lack of use has led to the delays or lack of death reports. For the reporting cycle to be complete it is expected that feedback is given to the facilities by the surveillance focal persons at higher levels to enhance the data quality.

At the health facilities, the quality of IDSR data was found to be poorer than the analysis done on the monthly DHIS2 data, because there was an alarming lack of awareness of the national reporting procedures

and policies. These national reporting policies and procedures were also missing from more than two-thirds of the facilities. Collection of the IDSR data was also found not be a priority to the facilities based on the DHIS2 data analysis as well as the awareness of the same on the ground. 15 (38%) respondents stated that the focus is mainly on partner-driven data needs which is a hindrance to effective reporting of maternal and neonatal deaths. Facility staff who have been delegated to send the IDSR data in facilities are untrained. In private hospitals surveillance is treated as an external body, therefore, no staff is assigned for this.

It was also established that the health workers were inadequately trained on the job of reporting maternal and perinatal deaths to the surveillance team. 19 (49%) respondents had not received formal training on events and disease surveillance within the last three years. There have been IDSR focal persons deployed to the sub-county and county levels and the facility in-charges act as the focal persons in small facilities. In spite of this effort, no impact has been felt since the IDSR numbers have remained low.

The study also established shortcomings with regard to the IDSR reporting tools: they were either not available at the facility or underutilized due to a lack of perceived ownership as the tools were seen as being donor driven. This underutilization of tools was also seen in the maternity registers which were highly incomplete.

In conclusion, the underreporting of maternal and new-born deaths as reported in previous studies still exists. Poor compliance with the Ministry of Health circular on perinatal and maternal death notification within 24 hours has also not improved as seen in the research results. In addition, the notification and reporting of the maternal and neonatal deaths have also not improved over the years as shown by the DHIS2 data. Despite the Maternal and Perinatal Death Surveillance and Response (MPDSR) notification and evaluation forms being incorporated into the DHIS2, the system still has gaps, and not all maternal deaths are adequately captured by the DHIS2 system. The reporting process for neonatal and maternal deaths has not been circulated to health facilities. There exist numerous challenges that are hindering emergency reporting of the neonatal and maternal deaths to DHIS2; whereas some can be resolved by building the capacity of facility staff, others need a technological solution.

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Statement on conflicts of interest

The author declares that there is no conflict of interest.

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