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The barriers of maternal death review implementation in Sudan - a qualitative assessment

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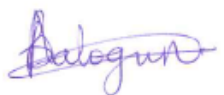

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Declaration

Author contributions: Halima Aramide Balogun and Solange Berleen Musoke have contributed to all parts of this thesis. Both authors contributed equally to the initiation and execution of all tasks related to this thesis, both in writing and editing of the different parts.

In addition, where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with guidelines.

We declare that the thesis "The barriers of maternal death review implementation in Sudan - a qualitative assessment" is the Authors' original work.

		
Signature:
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Date: May 13th 2014

“[...] How many women died and nobody heard? For example if there is one airplane carrying about say one hundred solders or officers that crashed [...] everybody will talk about this for several days, but how many women died because of [...] nobody will talk about this. Priorities [...]”

Abstract

Introduction: Maternal death review (MDR) is a cycle and involves identification of maternal death cases, data collection, analysis, recommendation, action and evaluation. The maternal mortality ratio is still high in Sudan. Maternal death reviews were established in 2009 as a qualitative improvement tool to support other strategies targeting maternal death reduction. The objective was to explore the implementation of the maternal death reviews in Sudan as a way of assessing the health system care response and changes in maternal health care from the national, state and facility level.

Method: This thesis is a qualitative primary analysis of secondary data. National level data and data from four states (including respective health care facilities from the states) were selected for assessment. Qualitative content analysis was utilised as the method of analysis. The software program Opencode 4.0 was utilised to analyse the manifest content to enable the creation of codes, categories, sub-categories and themes.

Results: Two main themes were derived; “Inadequate integrated design and desired systemic strengths” and “Muddling through unstructured and ineffective processes”. The first theme revealed the dependence on, and independence of the MDR from the health system and segregation from the health information system (HIS). The second theme revealed that the processes in the MDR were inconsistent and ineffective.

Conclusion: This study concludes that the design and the organisational structure of the MDR created systemic barriers that made MDR in Sudan ineffective to adequately improve quality of care.

Keywords: Sudan, Maternal Death Review, Obstetric Auditing, Health Policy and Systems Research,

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Abbreviations

FGD	Focus Group Discussion
FMoH	Federal Ministry of Health
HIS	Health Information System
HR	Human Resources
ICPD	International Conference on Population and Development
IDI	In-depth Interview
IT	Information Technology
MDG	Millennium Development Goal
MDR	Maternal Death Review
MDSR	Maternal Death Surveillance and Response
MDSR-TG	Maternal Death Surveillance and Response- Technical Guide
MMEIG	Maternal Mortality Estimation Inter-Agency Group
MMR	Maternal Mortality Ratio
PHC	Primary Health Care
RH	Reproductive Health
SHHS2	Sudan Household Survey 2 nd Round
SMoH	State Ministry of Health
SPSS	Statistical Package for the Social Sciences
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Introduction

Every maternal death is devastating, leaving behind families and orphans. According to the World Health Organization (WHO), “Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes” (1).

In 1990, an estimated 543,000 maternal deaths occurred worldwide and in 2010, that figure was down to 287,000 (2). The vast majority of maternal deaths (85%) occur in Sub-Saharan Africa and South Asia (2) and the bulk of maternal deaths have been deemed as preventable (3,4). Functioning, responsive health systems are a prerequisite to reduce maternal mortality and improve maternal health in a sustainable manner (5). Reduction of maternal mortality is one of the eight goals for development in the Millennium Declaration and the Millennium Development Goals (MDGs) MDG 5, (6,7) with the target of reducing the Maternal Mortality Ratio (MMR) by 75% between the years 1990-2015 (2). The MDG 5 is however unlikely to be achieved by 2015 (8) as mothers continue to die from preventable causes of death, before, during and after childbirth due to weak health systems (9). Since 1990 there has been a reduction of MMR by 47% (2) and a systematic analysis showed that 96 countries in the world will take more than 20 years beyond 2015 to reach the target of MDG 5 (9).

Maternal Death Review

Strong health systems are imperative to achieving the MDGs or any health outcome such as improving maternal health which are mostly attained through strategic intervention programmes (10). It is important that for successful implementation of policies, there is need for strong political will, partnership and participation of all relevant stakeholders in maternal health (5). A number of key strategies to improve maternal survival exist which include; increasing skilled birth attendance, ensuring timely access to emergency obstetric care when complications rise and increasing access to contraceptives (2). Among the aforementioned key strategies to improve

maternal health, WHO established the handbook *Beyond the numbers* in 2004 in order to achieve the MDG 5. Beyond the numbers is based on the principle that knowing the MMR is not enough, but it is highly important to understand the underlying factors that lead to deaths, which are rooted in the health care delivery system (4,11). Beyond the numbers explains that maternal deaths can be averted, even in resource-poor settings through establishing a **Maternal Death Review (MDR)** which is a qualitative analysis of the causes and conditions that lead to maternal deaths and how they can be averted at facility and community level (4,11). MDRs help to influence quality of clinical and public health care. Beyond the numbers mainly advocates for use of different approaches that address quality of maternal care through either using community based MDR (verbal autopsy), facility based MDR, confidential enquiries, near-miss reviews or clinical audit. All these approaches make use of a surveillance cycle and involve the continuous processes of identifying cases, collecting data, analysing, generating recommendations and refinement (4).

MDR is not a novel approach but is based on the foundations of public health surveillance. It uses the health information system (HIS) through systematic data collection and assessments, in order to take action in quality improvement processes (3,12). A functioning MDR amidst its systematic data collection and assessments additionally forms a foundation in civil registration and vital statistics, which further strengthens the HIS (13). In 2003, WHO, United Nations Population Fund (UNFPA) and United Nations Children's Fund (UNICEF) led operations (with Beyond the numbers as reference), with the aim to introduce MDR to all countries in Africa and to institutionalise MDR at the health system level. Between the years 2003-2007, representatives from 34 countries¹ participated in orientations and were introduced to MDR methods such as; verbal autopsy; facility-based MDR and near-miss reviews. Subsequently, national plans were drafted by the participating countries (14).

MDR highlights the factors behind maternal deaths, beyond MMRs, as previously established in the Beyond the numbers handbook (3), and is composed of three

¹ Sudan did not participate.

processes; *Notification*, *Review* and *Action* as shown in Figure 1, these processes are imperative to the functioning of a MDR system (3,11). According to WHO, MDR should involve identification and notification of suspected maternal deaths both at community through verbal autopsies, and facility level through patient record review.

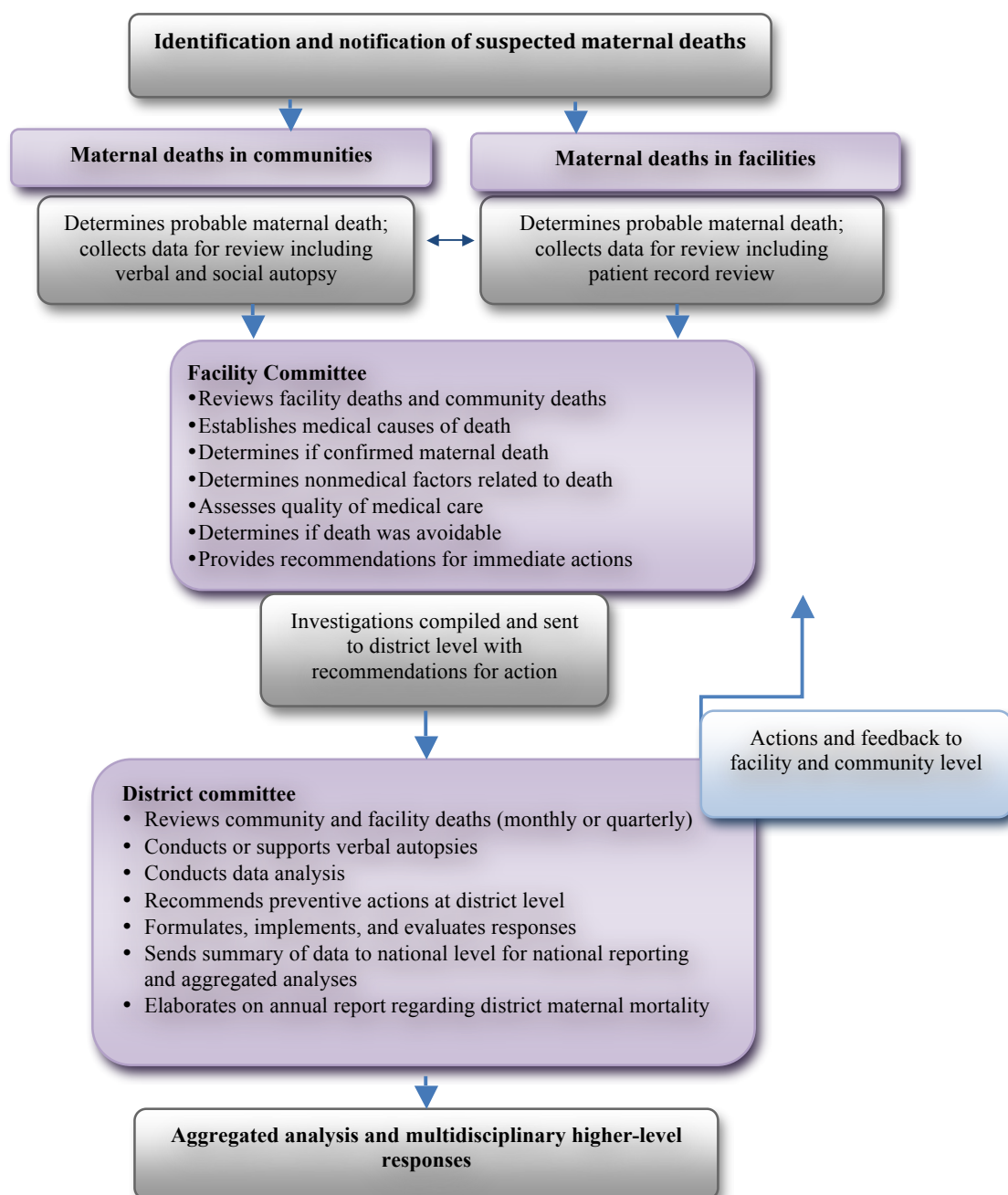


Figure 1: An overview of the MDR process within the MDSR process. Adapted from the MDSR technical guide (3).

A *facility committee* reviews the death records, establishes medical causes and confirms maternal deaths. In addition, the facility committee determines any non-medical factors related to the deaths, evaluates the quality of care, concludes if the death was avoidable and gives recommendations for future actions (3). The information from the facility committee is then forwarded to a district committee, which reviews the investigation at a monthly or quarterly basis. The *district committee* further conducts verification, gives feedback to facility and community level and submits summaries and recommendations to national level and other multidisciplinary higher-level institutions for reporting (3). WHO has since the initiative Beyond the numbers further developed MDR systems. One of the most significant and recent modus operandi developed by WHO in 2013 is the Maternal Death Surveillance and Response (MDSR) system where focus is on national surveillance of maternal deaths (3). Facility and community based MDR are essential components of the MDSR (3).

Maternal Health Policies and MDR in Sudan

The Republic of Sudan is a lower-middle-income country (15). Sudan has been affected by civil war and political instability and the health system suffers from deteriorated infrastructure, medical brain drain and limited allocation of government resources (16). According to unpublished material; 45% of Sudan's population of 37.2 million are under the age of 15 (17); a quarter of the total population are women in the reproductive age of 15-49 years (18) and two-thirds of the population live in rural areas (17). The Sudan household survey from 2010 revealed that; 74% of women aged 15-49 with a live birth in the two preceding years had received antenatal care at least once by skilled personnel; the total fertility rate was 5.6, the contraceptive prevalence rate was 9% and the birth rate among women aged 15-19 was 102 births per 1000 women (19).

In the health sector, the administration and management of health services is three-tiered: (i) the Federal Ministry of Health (FMoH) has the overall stewardship role and is responsible for policy making and formulation of guidelines; (ii) the State Ministries of Health (SMoHs) implement the health policies and programs are responsible for the organisation of health services at the state level; and (iii) the

Local level are responsible for the delivery of Primary Health Care (PHC) services (20).

Maternal mortality is an existing problem in Sudan. The MMR in Sudan was estimated to be 360 per 100,000 live births in 2013 in the Global Health Observatory Data Repository (21) and an MMR ≥ 300 per 100,000 live births is considered to be high (2). On the other hand, the Sudan Household Health Survey 2nd round (SHHS2-2010) from 2010 showed that the MMR was 216 per 100,000 live births (19) and the unpublished MDR report from 2012 indicated an MMR of 186 per 100,000 live births for 2011 (22). An accurate measurement of maternal mortality is difficult, especially where death registers that record causes of deaths are not comprehensive. In such cases, maternal mortality is estimated and a triangulation of data from census, surveys and model are included (1).

Being aware of the existing high MMR, a number of policies and strategies have been developed. The FMoH in Sudan developed the “*Road Map for Reducing Maternal and Newborn Mortality (2010–2015)*” to provide a strategic framework for accelerating progress towards the MDGs (16). It aimed to execute the following: (a) improve utilization of quality and equitable maternal and newborn services; (b) create accessibility (geographically, financially and culturally) to skilled health care delivery services with emphasis on the rural areas; (c) to address socio-economic issues by strengthening the capability of communities to promote and access maternal health care; and (d) to strengthen the capacity of health systems for planning and management, monitoring and evaluation of programmes related to maternal and newborn care (16).

For the practical execution of the policies for the improvement of maternal health, the FMoH in Sudan established the MDR System. An establishment proposal, which is unpublished material, came into existence in 2009 and aimed to contribute to the reduction of maternal mortality in Sudan by implementing MDR in referral facilities and in communities in order to improve the quality of care. The specific objectives of establishing MDRs in Sudan were: (a) identifying gaps in service delivery to promote efficient use of resources and improve best practice; (b) investigating community deaths; (c) improving the working environment to increase motivation

amongst health care staff; and (d) increasing knowledge on the determinants of maternal death and mobilising communities to improve maternal health. The proposal also contained the secondary objectives of counting every maternal death in facilities and communities and improving reporting on issues related to maternal health, and identifying the most common causes of maternal death including socio-cultural and socio-economic factors. Zero-reporting which entails reporting to the MDR system, even when no death has occurred, was also seen to be of equal importance (18). It is an indicator to indicate that active monitoring is taking place (3). A one-day orientation about MDR implementation in Sudan was held in 2008, whereby relevant stakeholders from all states were invited for endorsement and to help disseminate the proposal (18). The FMoH has since the establishment of the MDR in Sudan, produced three MDR reports from the years 2010-12, but these have not been published online (22).

Furthermore, a “*National Reproductive Health Policy*” with the aim to focus on accomplishing the MDG 5, and a priority to provide quality reproductive health care services beyond the absence of ill-health was also developed in 2010. The policy addressed the underlying factors facing reproductive health in Sudan targeting areas such as: (a) efforts to integrate the PHC facilities into the mainstream health system; (b) having a multidisciplinary approach by involving sectors beyond the reproductive health sector; and (c) involvement of the communities (17).

The rationale for this thesis was to explore and understand the implementation of MDR in Sudan through a qualitative assessment of secondary data by focusing on the MDR processes. There is evidence the MDR may influence quality of care which in turn can decrease the burden of maternal death (14) still few studies have discussed the challenges related to implementing MDRs (12). MDRs should indicate among other things, which part of service delivery needs strengthening in order to avert maternal deaths (23). This thesis has however made delimitation and will not focus on assessing the characteristics and causes of maternal deaths.

Aim

The aim of this thesis was to explore the implementation of MDR in Sudan from the perspective of the MDR stakeholders at the national, state and facility level.

Research Questions

1. How is the design of the MDR in Sudan supporting its processes?
2. How are the MDR processes (notification, review and action) in Sudan functioning in accordance with the MDR objectives?

Methodology

This thesis falls within the research field of Health Policy and Systems Research (HPSR) which is concerned with how policies are implemented and how policy actors influence policy outcomes (24). Within HPSR, personal, organizational and societal factors are taken into account to allow for a broad approach to understand the complexity and context-specificity of the phenomena at hand (24).

Methods

Study Design

An exploratory qualitative study was performed on secondary data from a national MDR situation analysis in Sudan where in-depth interviews (IDIs) and focus group discussions (FGDs) had been performed in 2013 (the full report from the national MDR situation analysis is unpublished). The data set from the national MDR situation analysis included transcripts from 50 in-depth interviews and 15 focus group discussions (FGD). Stakeholders at the national, state and facility level had been interviewed. The stakeholders at the state and facility level had medical and health information background. (see Appendix 1, a figure describing the data set from the national MDR situation analysis).

Study Setting

For the national MDR situation analysis, all 15 states² in Sudan were represented, and six states were studied more in-depth (see Appendix 2, a list of the six states

² 15 was the total number of states in Sudan in 2013

studied in-depth).

Study Sample and Selection Criteria

Study samples for this thesis were drawn from the large amount of available data in the national MDR situation analysis and this was based on convenience sampling. National level data and data from four out of the six states were selected for assessment in this thesis. The selection of states was based on two criteria: (a) states reporting the highest and lowest MMR in the SHHS2-2010; and (b) the states with the highest notification of MMR in the MDR reports (2010-12). These MDR reports are unpublished sources. There was an initial interest to see if there were differences in how the MDR processes were functioning in relation to the high or low MMR. There were differences in the reported MMR in the SHHS2-2010 (19) and the MDR reports from 2010-12. Based on the three annual reports, the average MMR for each state was calculated from the MDR reports 2010-12 and compared to the MMR presented in the SHHS2-2010 (see Appendix 3, quantitative analysis on average MMR). The selection of the states to focus on in this thesis was determined by having the highest and lowest average MMR according to the SHHS2-2010 and also on the MDR reports from 2010-12:

- Western Darfur had the highest average MMR according to the MDR reports;
- Southern Darfur had the highest MMR according to the SHHS2-2010;
- River Nile had the lowest average MMR according to the MDR reports; and
- Sennar had the lowest average MMR according to the SHHS2- 2010.

Data Collection

The data for the national MDR situation analysis was collected between April-May 2013. Prior to data collection, two national experts and an international researcher designed a questionnaire. The questionnaire was prepared in English, translated to Arabic and then rehearsed with the translator. The questionnaire was tested for completeness, sensitivity, and flow and the duration of the interview was adjusted through conducting role-plays. The questionnaire was then administered to 12 research assistants who worked in teams of two. Each team was subjected to two field tests whereby the questionnaire was revised prior to conducting the actual

interviews. The questionnaire was revised three times and it took five days of training to complete the final questionnaire. The interviews were semi-structured, with open-ended questions. The interviews were digitally recorded, transferred to three trained translators who transcribed the interviews verbatim in Arabic and then translated to English.

A total of 30 transcripts (12 IDIs and 18 FGDs) in English from the national level, the selected four states, and facilities of respective states, constituted the corpus of data included in the qualitative analysis for this thesis (see Appendix 4 for lists of transcripts at national, state and facility level).

Data Analysis

Qualitative content analysis as described by Graneheim and Lundman (25) was used as the method of analysis, as this method allows for the interpretation of the several meanings of a text (25). The analysis was also guided by the three phases of qualitative analysis; preparation, organising and reporting, as described by Elo and Kyngäs (26) (see Appendix 5, further description of phases of qualitative content analysis). Qualitative content analysis is a systematic process used to condense data and abstract codes, categories and themes (26). Condensation is the process of summarising data without losing the core of what is being said (25) and abstraction concerns the process of interpreting the data (25).

Preparation Phase

In this analysis 30 transcripts formed the unit of analysis. All transcripts were available in Microsoft word format, and entered as one whole document into the software OpenCode 4.0, a tool for coding qualitative data (27). The analysis was an iterative process whereby meaning units, which are shorter segments, such as words or sentences containing aspects related to each other (25) were coded.

Organising Phase

The coding was initially done together by the two researchers and then later the researchers took turns coding the data. Saturation was reached after all 30 transcripts were read and coded. A total of 842 codes were created, but 366 codes related to the aim and research questions were used for further analysis. Three

coding sheets were created which captured all of the codes related to the aim and research questions of this thesis. The coding sheets “process of notification,” “process of review” and “system” consisted of 40, 142 and 184 codes respectively. The two researchers then divided the coding sheets amongst themselves and set out to read the data by focusing on one coding sheet at a time. For example, the data was read by one researcher from the beginning to the end and all meaning units that had codes from the sheet “process of notification” were underlined with a blue pen, then the data was read once again and meaning units that had codes from the list “process of review” were underlined in orange. This facilitated mutually exclusive categorisation seeing that the meaning units were allocated through colouring. A second set of coding sheets were created on excel sheets which were further condensed since the amount of data was overwhelming to work with.

Reporting Phase

Following the qualitative content analysis, two key themes were identified that helped in the assessment of the effectiveness of the MDR. The themes unfold on how the design of the MDR was supporting its processes (notification, review and action) and how these processes were functioning in accordance with the objectives that the MDR set out to accomplish (See Table 1). The two themes were in turn supported by categories and sub-categories. In addition, the MDR processes induced from the analysis were presented in two visual process maps.

Ethical Considerations

Ethical approval was attained in 2013 for the national MDR situation analysis project from the Health research ethics committee of the Health research council of the FMoH in Sudan. This ethical approval also covers the use of these materials for educational purposes. During primary data collection the research participants were not subjected to any physical harm. It was assumed that some of the topics brought up during the interviews were sensitive to the research participants due to the nature of confidentiality in maternal death reviewing. Caution has been applied in the thesis in order to protect the participants. The secondary data used, in the form of transcripts actually enables tracing the participants because the state and role of the participant is stated, so the possibility of doing so has been minimised, as this information has been made confidential in this thesis.

Results

Analysis led to the formulation of two themes, “*Inadequate integrated design and desired systemic strengths*” and “*Muddling through unstructured and ineffective processes*” (see Table 1 below, Themes, categories and subcategories that emerged from the analysis of transcripts) which both indicated the barriers of the MDR in Sudan to adequately support its processes.

Inadequate Integrated Design and Desired Systemic Strengths

The first theme titled, “*Inadequate integrated design and desired systemic strengths*” revealed the limitations in the design of the MDR. Inadequate integration was found in the interactions that the MDR had with the health system, communities and private sector in Sudan as well as in its own organisational structure. This theme is supported by three categories, namely; vertical design, shared public sector resources and oversights, which highlight weaknesses in the system, but also point out needs that are desired in order to strengthen the system. Therefore, following each category enumerating the weaknesses; desired strengths emanated based on the fact that the research participants were asked for suggestions, and these suggestions are presented under each category.

Vertical Design

The FMoH established the MDR in 2009 as a vertical program. Technically, it falls under the Reproductive Health (RH) Unit at the Directorate of Primary Health Care (PHC). Along with the establishment, a National MDR Committee and State MDR committees were set up in Sudan. The external agencies UNFPA, UNICEF and WHO, provided technical assistance for MDR activities at the national and state level and also had representatives in the national MDR committee. Each state also had an appointed state registrar; acting as a link between the facilities, state MDR committees and the national registrar. The creation of facility MDR committees was not mandatory, some facilities appointed focal persons in charge of maternal death notification and review.

Table 1. Themes, categories and subcategories that emerged from the analysis of transcripts

Theme	Inadequate integrated design and desired systemic strengths			Muddling through unstructured and ineffective processes		
Categories	Vertical Design	Shared Public Sector Resources	Oversights	Notification	Review	Action
Subcategories	Parallel independent system	Dependence on existing HR	Failure to capture community-based and private sector deaths.	Ambiguous interpretations on obligations to notify	Poor documentation practices	Limited feedback
	Lack of linkage to HIS	Dependence on existing communication system	Need for creation and strengthening of local level committees	Immediate notification of facility deaths	Lack of guidelines for review process	Distrust in that recommendations will be implemented
	Non-unified reporting system	Lack of funding for MDR processes, and capacity strengthening	Need for private sector awareness	Delayed notification of community deaths	Complicated review process	No guidelines for action process
	Lack of collaboration and integration	Limited flexibility to adapt to needs	Need for training about MDR	Inconsistent channels	Contradictory opinions on comprehensiveness of reporting forms	
	One man show		Lack of operational plan	Unclear roles and responsibilities	Lack of socioeconomic indicators in the reporting form	
				Lack of incentives	Monthly, quarterly and annual meetings	
				Fear of blame	Overburdened human resources	
					Incapable state registrars	

The MDR in Sudan has functioned as a parallel programme, an independent system that was not integrated with the National HIS making it to be a non-unified, vertically designed registry system. According to one research participant,

“It is a vertical programme and there are no linkages with it, data is transferred from the state to the national level and never gets linked to the national HIS”. (IDI)

There was a lack of collaboration between disease surveillance systems and it was suggested by most of the participants at the national level that the MDR should feed into an integrated comprehensive tool that captures health information across different disease areas. If the data collected through the MDR could be linked to the HIS in Sudan, the overall civil registry could be strengthened. An additional suggestion was that the RH unit should take over the MDR so that it did not have to exist as a separate vertical programme.

The organizational structure of the MDR was also designed vertically. The MDR was explicitly described as a “One-man Show” with the national registrar as the lead person. The national registrar, appointed by the undersecretary of the FMoH in 2009, was among other things, authorised to manage the state registrars, receive maternal death notifications from facility and state level, compile the quarterly MDR reports, organise and lead the national MDR committee meetings and finalise the annual MDR report to be distributed to all the states.

The MDR was reliant on the knowledge, dedication and time of the national registrar. Regarding this dependency, one respondent stated,

“[...] This gives some sort of weakness to the system because if we face any problem [...] It is a one man show, the date XX resigns, MDR will collapse”. (IDI)

Shared Public Sector Resources

Following the analysis that revealed the weaknesses of the MDR as an independent system and its vertical design, an important issue raised by most research participants was related to the dependency that the MDR had on public sector resources. In this second category *Shared public sector resources*, it was revealed that the MDR was dependent on the existing public sector resources in Sudan. The MDR system loaned its resources in terms of human resources, funding and communications systems (computers, transportation and phone services), from the health system in Sudan.

There was lack of resources especially set aside for the MDR and this affected among other things, capacity building i.e. the training of health care personnel involved in the MDR. The personnel and statisticians needed training on how to conduct the MDR processes, but there was no budget that could be allocated to train personnel on how to fill the reporting forms or for the health information staff to be informed on how to conduct statistical analysis for the MDR. When suggestions were made, the MDR was not flexible enough to adapt to its needs. Thus, the lack of funding limited the responsiveness of the MDR system. If an activity was not part of the annual plan, there was no budget to carry out additional necessary suggestions raised after the drafting of the annual plan.

Oversights

The third category *Oversights* was a significant aspect that emerged from the analysis. The oversights have been defined as important issues that were constantly ignored or left unaddressed. An important and apparent oversight perceived by most research participants was the failure of the MDR system to capture community-based deaths. Additionally, the deaths happening at the private sector facilities were not captured as well. In essence, the data on maternal mortality collected in Sudan was majorly facility-based. This reflected a major flaw of the system as it was stated by a research participant that approximately 80% of deliveries occurred in the communities.

“[...] There is no information in the community, we need to collect data about community, including death and birth records”. (IDI)

There were no effective efforts directed towards the community to encourage their involvement. Research participants mentioned a radio advertisement, encouraging community notification and a telephone number for community members to call in case of a maternal death, but the response from this initiative had given no results. The research participants had suggestions such as creating local community level committees to enable notification and review of community deaths or through involving existing community committees in MDR processes. It was apparent that research participants in private facilities were unaware of the MDR.

Another oversight was that many of the health care personnel involved in the MDR had not received training on how to perform activities of the MDR processes, such

as how to fill the reporting form, how to conduct reviews as well as how to write the MDR reports. There was no operational plan for most of the activities of the MDR processes. Respondents at all levels mentioned that they were not aware of any MDR related protocol with descriptions of detailed operations.

“[...] You are right there is no protocol for MDR system [...] no guidelines or protocol for the whole MDR system, only the 2009 proposal [...] no separate state operational plan for MDR”. (IDI)

In 2009, a one-day orientation had been held, but some research participants at the facility and state level mentioned that they had not taken part in the orientation. National level research participants explained that health care personnel that had not attended the orientation, had been informed and trained later by healthcare personnel that were present at the one-day orientation, but there was no follow up to confirm this.

“Sometimes we do not know whether they are all trained but they said to us that all are trained or are reminded how they can fill the form or how they can provide the information”. (IDI)

All the presented categories of the first theme have created weaknesses in the MDR system with inadequate integration, affecting the effectiveness of the system and its process, and have created the need for systemic strengthening.

Muddling through Unstructured and Ineffective Processes

The second theme, *“Muddling through unstructured and ineffective processes”* depicts the act by which the stakeholders of the MDR muddled through the complexities of the MDR processes. This theme consisted of three categories; notification, review and action. Within these MDR processes, unstructured activities were identified. The MDR processes notification, review and action were found to be ineffective due to the inconsistent channels of the processes and the fact that the MDR was not able to capture all deaths. In effect, the data produced was inconclusive and its effectiveness questionable. Feedback was also very limited.

Notification

Ideally, notification should occur from the communities, public and private sector hospitals. Succeeding the proposal for the establishment of the MDR in Sudan, a

decree was issued by the FMoH, making it obligatory to notify all maternal deaths since June 2009. Despite this, there were ambiguous interpretations of whether the stakeholders were obligated to zero-report, notify and report maternal deaths. This led to the neglect of these three activities, and in most cases solely reporting deaths to the civil registry and not to the MDR was perceived as enough. Unlike a number of other infectious diseases, it was inevident to the research participants whether it was mandatory to report maternal deaths, especially from the private sector facilities.

The following details were required for the notification process, (1) name of the deceased (2) date of death (3) place of death (4) name of notifier. The channels of notification via telephone to the state registrar, state MDR committee, the national registrar or the RH unit at the SMoH were inconsistent. In the facilities, the notifier could be an appointed MDR focal person, or whichever medical personnel present during the maternal death. In the communities, community midwives were responsible to notify. Most research participants agreed that notification must be and was, done immediately, between 24-72 hours after the maternal death, but there could be delays if the maternal death occurred outside office hours. If community notification occurred, it could take over a week and was thus delayed.

The notification and reporting process map (see Figure 2. Notification and reporting process map below) illustrates that the activities were not straightforward and that the channels of notification were inconsistent. This was partly due to the unclear roles and responsibilities of the stakeholders and MDR committees at the different levels. The roles and responsibilities of the state registrars were also unclear, and their capabilities were intensely criticized.

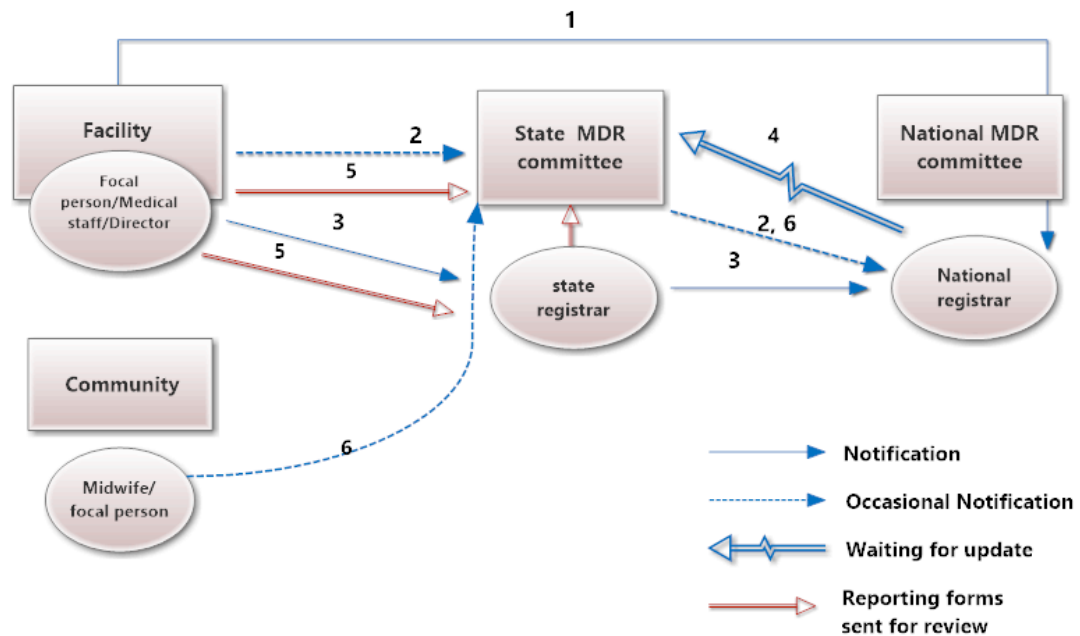


Figure 2. Notification and reporting process map: (1) Notification was done from the facilities to the national registrar. (2) Occasionally, notifications would arrive straight to the state MDR committee, who would forward information to the national registrar. (3-4) Facilities would notify the state registrar, who would notify the national registrar, bypassing the state MDR committee who would have to wait for updates from the national registrar before reviewing and investigating maternal deaths. (5) Facilities would send reporting forms (review process) either at the same time of notification or within a month. (6) Occasionally, notifications would arrive from the community midwives or focal persons.

Several times, the lack of funding specifically directed towards the MDR was mentioned as a barrier to notification, especially, in the communities. There were no clear financial incentives as stated below by one research participant.

“[...] Ideally they should be paid at least, if not motivated [...] be given telephone price, be given per diem when he goes to review and to be motivated by attending workshops and conferences”.(IDI)

Midwives working in the communities were not guaranteed a cell phone or remuneration for their personal calling fees, necessary for community notification. Not only were community midwives not incentivized to partake in notification, research participants in the facilities also suspected that community midwives feared being blamed and therefore did not notify deaths in the communities.

Recommendations to disseminate cell phones to community midwives arose several times during MDR meetings and reports. Other recommendations were to raise awareness among the midwives that the aim of the MDR was to identify systemic

issues causing maternal deaths in the communities, and not to create accusation and litigation.

Review

The review process was three-fold, taking place at the facilities, at the state and national MDR committees (see Figure 3. Reporting and review process map below). The activities in the review process at the facilities included investigating the cause of death, conducting facility committee meetings where maternal deaths were discussed, filling in the reporting form and sending the reporting form electronically or in hard copy to the state registrar, state MDR committee, national registrar or the RH unit at the SMoH.

The facilities were supposed to submit the reporting forms within a month following a maternal death. The overall documentation practices (not only the MDRs) taking place at facilities in Sudan was said to be poor. The research participants described the activity of “reporting” as complicated. Firstly, there were no guidelines that explained how the review should be done and secondly, review occurred at a later time than notification and was not done through the same channels. One research participant from the state level admitted that the number of notifications and reporting forms that they received did not match. Once, 21 notifications, but only 19 reporting forms came through. Another research participant explained the complicated process of reporting,

“[...] In the FMoH there are two bodies. One for the registration, [...] XX has a registrar in every state, who we consider as state registrar. State registrar report to the national registrar, this is one body. I think usually he report at the same time of the event [...] But at our level (the SMoH, the other body) reporting doesn't have to take place at the same time, we focus on the other details like "results, investigations and reports" more than reporting process, which usually happens every three months during our committee meetings”.(IDI)

The activities in the notification and review processes were occurring both in parallel and separately since these activities occurred to different stakeholders at different points in time.

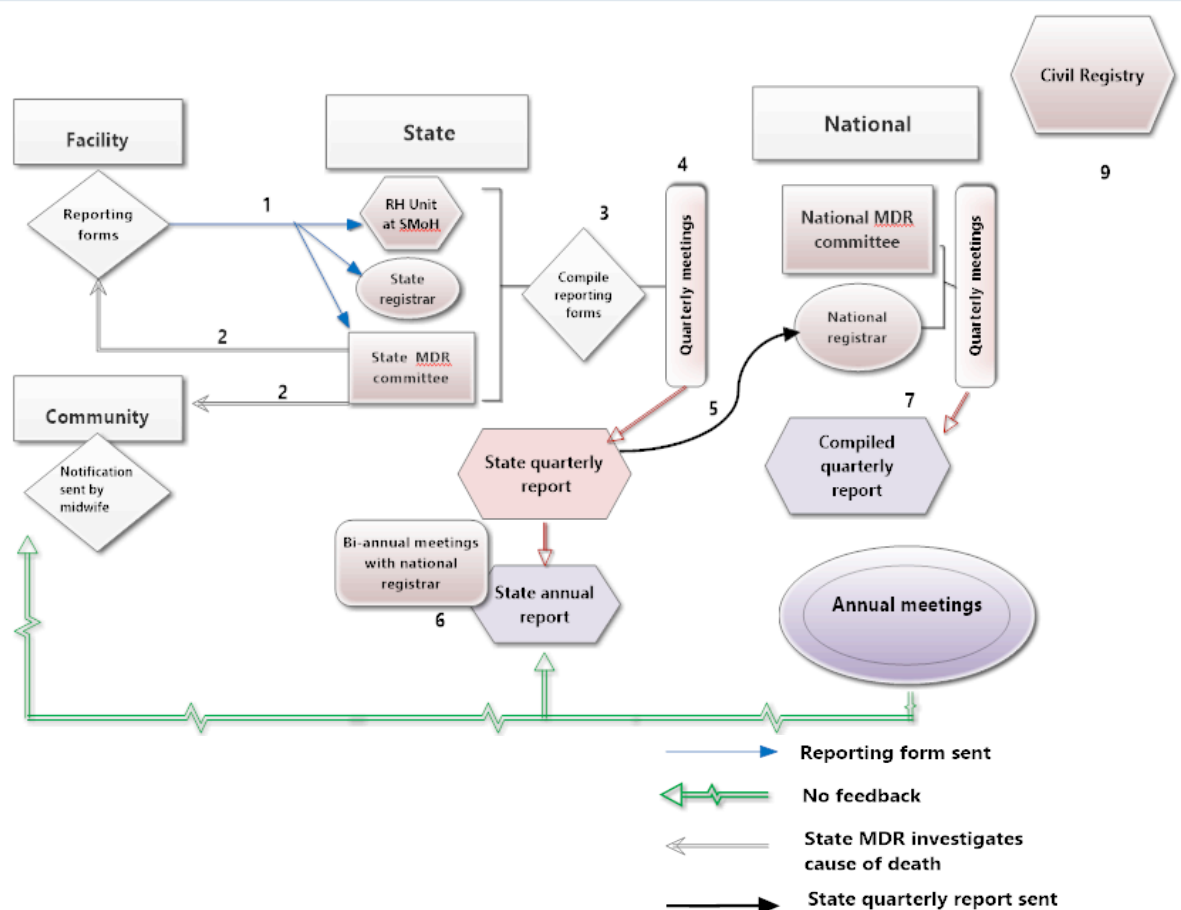


Figure 3. Reporting and review process map: (1) Reporting forms were sent from the facility to different stakeholders at the state level. (2) The state level reviewed maternal deaths through investigations at the facility and community level. (3) The state level compiled reporting forms from the whole state (facility and community-based deaths) (4) State MDR committee held quarterly meetings which resulted in a state quarterly report (5) which was sent to the national registrar. (6) State MDR committee had bi-annual meetings with the national registrar. (7) National MDR committee compiled these state reports and summarised the year with an annual meeting and report. (8) National MDR committee should have sent feedback to the states and facilities but this did not occur. (9) Civil registry received no information from the MDR.

The research participants had contradicting opinions on the reporting forms used to establish the cause of death in the facilities. The reporting form included questions about the deceased woman's history of admission, cause of current admission, mode of delivery, received treatment and who was present during the death. The ICD-10 coding procedure was not used to establish the cause of death and autopsies were not performed.

“[...] The information technology (IT) departments always face difficulties with its analysis via Statistical Package for the Social Sciences (SPSS), which proves their

absence during the formulation process. [...] we have a very good IT personnel who are well trained and highly educated...[...] they find it difficult to analyse the form, sometimes I sit with them to show them how I wanted them to do it "I became an IT personnel". [...] They should be involved because at the end they will put the percentages and participate in writing the reports [...]". (IDI)

Some research participants argued that the reporting form was comprehensive enough, covering all the relevant causes of death, whilst others questioned the fact that it did not contain any socioeconomic indicators. Albeit the absence of socioeconomic indicators and other possible causes of death in the reporting form, their underlying relevance was discussed during the committee meetings. The research participants explained that pregnant women arrived too late at the facility and blamed community midwives and family members for that mismanagement. The reasons for late presentation and maternal deaths were sometimes speculated during committee meetings, since the MDR did not capture data to make evident conclusions. One research participant, sceptically mentioned,

"The only thing that has reduced maternal mortality was when health care, treatment and surgery were free". (FGD)

There were factors outside the health system that affected maternal health which the review process could not adequately take into account. There was also discouragement among research participants that the MDR could reduce maternal mortality.

Facilities asserted to having monthly meetings where they reviewed maternal deaths. This review could occur in conjunction with the review of other deaths as well. One research participant however claimed that a committee had been set up at a facility in 2009, but no activities, such as meetings, had ever taken place. Taking part in the review process was perceived as carrying out an extra task. The research participants mentioned that the MDR related assignments were carried out voluntarily since they were not remunerated financially.

“If you asked somebody to do some job you have to offer him/her in return. [...] my list of duties does not contain any responsibility of reporting or any reviewing or anything of these. I don’t have any incentive for phone call, reporting or revision. Not only regarding the maternal mortality, other many things; you just find yourself asked to do some jobs, the midwife as well, she does not have any sources of income other than the delivery procedures that she does. She borrows money depending on a delivery case she knows that will happen soon”. (FGD)

There were no financial incentives for the health personnel to engage at the facility level, but at the state level, the ministry of health sometimes provided incentives for attending state MDR committee meetings.

“[...] but sometimes when there is no financial support people come to the meeting very frustrated and leave early”. (IDI)

Health care personnel participating in the review process claimed that lack of time affected their commitment and that they were overburdened. Engaging in MDR activities was actually a disincentive due to the shared responsibilities that the MDR created. One state MDR committee member, an obstetrician, worried that they would miss treating critical cases while they were busy investigating maternal deaths for the review process.

Review activities by the state MDR committee members and the state registrar included reviewing the reporting forms from the facilities, making investigations surrounding community deaths (through verbal autopsies), and making further investigations in case of unclarities, which could include visiting the facilities or communities where the deaths occurred. In addition they conducted quarterly meetings, compiled data from the facilities through statistical analysis and sent quarterly reports to the national MDR committee with the results and recommendations. The national MDR committee met quarterly and produced reports based on the compilation of results and recommendations received from the different state MDR committees, and the final annual report was to be disseminated to the states and facilities.

Challenges faced at the state level were the frequent turnover of state registrars and their lack of training and knowledge about MDRs. One research participant that had

previously been appointed state registrar expressed frustration towards the new state registrar,

“Here our registrar can't even use the calculator, he wasn't selected in a proper way and never received any kind of training. I developed the report formula by myself [...] I didn't attend or received any training it's just personal efforts. [...] I have to formulate the final report to be discussed at the meeting; you will detect the dissimilarity of the reports components, presentation and points. That reflects [...] that they don't have a unified systematic guide, because each one develops the report according to their experiences, knowledge and qualifications, in states they chose the registrars regardless of their qualifications, if they can create a single power point presentation they will employ them”. (IDI)

The citation above indicates the professional commitment that was required of the research participants while muddling through the MDR processes.

Action

The last step in the MDR process was action, which should include feedback and implementation. This step was by many research participants viewed as the most important step since they saw it as the main objective of the MDR. They also saw that this was the step of the MDR that was essentially lacking. The visible feedback seen was only when annual reports were sent from the national MDR committee. Some research participants however claimed that they did not receive the annual reports or any feedback relevant to the suggestions that they proposed to the national MDR committee. One state level research participant that had given recommendations to improve training, supply blood banks and invest in more qualified medical personnel, stated,

“[...] But is this going to be implemented or not, we know nothing about it. We just go back to our hospital after meeting and work”. (FGD)

The citation above reflects the distrust that one research participant had regarding implementation of recommendations. Although some research participants hoped that their recommendations would turn into actions, there was no clear indication on

the proportion of recommendations that had been implemented based on the MDR. Respondents had distinct opinions on how to give and implement recommendations. There were no guidelines on how recommendations from the state level to the national level were to be formulated. Stakeholders at the national level complained that the State MDR committee should think of solutions before submitting recommendations to the national level and that the state should be more involved in problem solving. On the other hand, the state MDR committee complained that the national level disregarded their suggestions. Most research participants believed that the national MDR committee was responsible to take action.

Discussion

The findings from the analysis revealed that the systemic inadequacies affected the MDR processes. The two themes “Inadequate integrated design and desired systemic strengths” and “Muddling through unstructured and ineffective processes” were interlinked in the manner that the unstructured activities identified in the second theme, partly stemmed from the systemic weaknesses identified in the first theme.

The MDR in Sudan has contributed to the existence of a registry system of maternal deaths, quarterly and annual reports, and the MDR committee meetings at state and national level, despite its limited funding, vulnerabilities and the muddling through. Therefore, the strength of the MDR is that it has created an avenue for discussion and analysis. The effect and impact of its existence on maternal health was however elusive. The MDR in Sudan existed in a void detached from its essential components that were supposed to facilitate its operations. The non-existing links to the health system especially the HIS were found to segregate the MDR and impede its operations. In an evaluation of MDRs in fifteen countries in Africa by Pearson, it was found that vertically designed MDRs were less sustainable than MDRs that were integrated into maternal and reproductive health units since maternal health was dependent on the quality of services that fell under these units (14). The MDR in Sudan had difficulties functioning as a system since it was dependent on the professional commitments of individuals (one-man show), the health system, but at the same time independent from the system due to its vertical nature. The reasons

for the vertical design were unknown, but Freedman points out that it is typical of programmes introduced in conjunction with external development agencies to focus on disease specific areas, and ignore health systems (5). Health systems should be seen as the systems they are, and not as their aggregated building blocks (5), since the building blocks function in synergy. Although the focus of thesis emphasizes the relationship between MDR and the HIS building block, other building blocks of WHO Health systems frame work (Service delivery, Health workforce, Medical products, Financing, and Governance) are seen as equally important, because they all impact the responsiveness and delivery of quality health care when implementing MDR. For example this thesis shed light on the limited MDR notifications arriving from the communities which may depend on inadequate service delivery in the communities.

Shared public sector resources do not necessarily have to be a problem, there are opportunities for improvement of MDR activities if the sharing is planned for and activities carried out in a structured manner. The lack of protocol and guidelines which was seen as a systemic inadequacy, led to inconsistent notification channels, no operational plans for the research participants to follow during the review process and discordances between the state and national level regarding the action process - all these resulted in the ineffective MDR system. This was also evident in Pearson's study where coordinating MDR processes, particularly those occurring simultaneously and in parallel, were found to be difficult in the African countries (14). In Pearson's evaluation, it was also found that developing national MDRs was susceptible to several challenges which were rooted in the system that they were being introduced to (14). Many of the challenges identified in this thesis had been outlined by policy makers in Sudan in 2010, but still persisted. It was explained that Sudan's health system struggled to achieve maternal health goals due to unclear policies concerning practice regulation, inadequate funding and lack of co-ordination amongst partners (17).

Further systemic weaknesses that created the unstructured activities that resulted in the ineffectiveness of the MDR were the combination of shared public sector resources and the lack of funding which led to that the health care personnel were "loaned" from the public health sector but not remunerated. The lack of incentives also impacted the commitment of the health care personnel. Pearson's evaluation of African countries recommended that MDRs should have their own budget lines in

the health sector budget so that they do not have to compete with other priorities. Sufficient financial support from federal governments and external development agencies could help with this and contribute to the sustainability of MDRs (14).

The MDR in Sudan failed to capture community and private sector deaths. The magnitude of this oversight could not be verified, but this omission pointed out that the MDR was not achieving its objectives. According to the establishment proposal, the general objective of introducing MDRs was to improve quality of care in facilities and communities and reduce maternal mortality (18). Without the community and private sector MDRs, the data produced by the system was not a reliable indication of maternal mortality reduction in Sudan. Investigating community deaths was actually a specific objective in the establishment proposal, as well as improving motivation amongst health care personnel, which the MDR actually counteracted. The MDR did not appear to improve the working environment of health care personnel but rather overburdened them. The MDR also contained the secondary objective of identifying socio-cultural and socio-economic factors – objectives that it did not fulfill. Zero-reporting, an indicator that active surveillance was taking place was stated as equally important as reporting maternal deaths in the establishment proposal, but analysis made it apparent that this was not either being fulfilled. Any targeted efforts to capture community deaths would need support from the state and national level. Regarding private sector deaths, raising awareness that maternal death is a notifiable event was needed.

It was found that the implementation of the MDR in Sudan diverged from its recommendations and objectives. In essence, the MDR in Sudan did not function as a qualitative analytical tool of maternal deaths in facilities and communities as recommended by the WHO and struggled to achieve these benefits. In practice, the MDR in Sudan has involved the national level in the notification, review and action process, but these processes were supposed to be community and facility-based (3). The MDR in Sudan derailed from the activities of MDRs as recommended by the WHO and its own objectives set in the established 2009 proposal (3,18). This resulted in inadequate integration, unstructured activities and its ineffectiveness. The most recent MDR guidelines which were outlined in the MDSR from 2013 contained in-depth information for action to prevent maternal death (3). The MDSR is a surveillance action cycle whereof a functioning MDR is an essential component

(3). The MDSR goes farther than the MDR. It consists of two other components which are; analysis and interpretation of aggregated findings and recommendations from the MDR which are prioritized at the national level and; the response of national level to implement the prioritized recommendations and monitoring actions taken (3).

Although MDSR is an important surveillance action cycle and a functioning MDR is an essential component, one Lancet correspondence from May 2013, criticized the emphasis on MDSR as a strategy to improve maternal health arguing that it is important for health systems implementing MDR to remain focused on improving the facility based reviews of maternal deaths and not to aim for MDSR from the onset which is a national approach, as the focus of MDR will be undermined (28). This critique can be likened towards the MDR in Sudan, whereby a top-down approach had been taken rather than strengthening the lower levels. For health system strengthening to improve maternal health, the United Nations (UN) task force on child health and maternal health, recommend that focus should be on sustaining an integrated primary health care (PHC) especially at the district level, working from the communities to the first level of referral (5).

Research has been carried out on MDRs in Africa, and reached similar conclusions. Policy makers in Sudan are also aware of their challenges on the relatively new MDR in Sudan. However, the added value of this thesis is that it has systematically analysed statements by the research participants and this will serve as evidence base for improvement of effective execution of operations related to maternal death reviews in Sudan. The major findings in this thesis were that the MDR was both a dependent and independent system, the systemic inadequacies affected the MDR processes and lastly, the MDR digressed from its objectives and recommendations which made the impact that the MDR had on maternal health, questionable since it was evident that the MDR did not capture community and private sector deaths.

Methodological Considerations

This section includes reflections on the trustworthiness, transferability, and triangulation of this thesis. One limitation of analysis of secondary data is the lack

of influence in the generation of the data set (29). Selection of states for this thesis was limited to the study design of the national MDR situation analysis, which had its own criteria to select six states for in-depth. The analysis of the MDR system in Sudan is based on data collected during the period April to May 2013 and may therefore not reflect the present situation of the system in Sudan. Unpublished sources, such as the Sudan MDR establishment proposal and the MDR reports 2010-12 were available to the authors. The use of these documents may limit transparency for the reader, but wherever these sources have been used, it has been stated in the text.

The inductive approach of analysis was used to avert preconceptions related to the MDR in Sudan, and also to avoid misconceptions about policy initiatives in low- and middle-income countries. The selected samples were able to capture views from the different levels of the MDR system, but not from the community. Evaluations of MDRs are highly context-specific and in light of this, transferring the findings and conclusions from this thesis, must be carefully addressed.

Decisions and agreements between the two authors were reached mutually through discussions. When disagreements arose, compromises and re-formulation of concepts and sentences in order to satisfy both authors were done. During the process of familiarizing with the data, there were initial misunderstandings of statements from respondents from the transcripts, however these were clarified through iterative discussions and consultations with the supervisor. Establishing communication between the researchers involved in generating the primary data and the researchers involved in the secondary study can limit bias (29). In this case, the original researcher supervised this secondary study, and could offer explanations. During the duration of this study, researcher triangulation (30) was used during analysis between the two researchers and also through external seminars, in order to get constructive criticisms. In some cases, quotes from the respondents have been used, this is to reflect the views of some of the respondents. Both researchers were involved in the analysis throughout the process, largely 90% of meetings were physical and 10% online.

Conclusion and Recommendations

In addition to the reports written since the establishment of MDR in 2009 and the national MDR situation analysis through which secondary data was accessed for this study, this thesis has analytically assessed the design, effectiveness and the functioning of the MDR process at the facility, state and national level in Sudan.

- This assessment concludes that the design and the organisational structure of the MDR were not adequately supporting its processes.
- The barriers of the MDR were that the MDR was not integrated into the health system, suffered insufficient funding and did not have an operational plan or health care staff that had been exposed to the MDR processes in capacity building or incentivising purposes.
- The MDR processes were ineffective and could not fulfill its objectives.

A number of recommendations emerged from this assessment, although one of them is elaborated below:

- Developing a national guideline; Re-developing reporting form to include socioeconomic indicators; Proper integration of MDR into the RH unit to ascertain sustainability; Enabling collaboration with other disease surveillance programmes in the HIS; and Adequate resource allocation.
- Amidst all bottlenecks mentioned perhaps a narrower approach would have been more beneficial and effective. Less attention at the top i.e. less reliance on the national registrar to be involved in the MDR processes and on the national MDR committee to take action and more focus on a bottom-up approach; improving community and facility-based reviewing and creating a district committee (a locality in the case of Sudan) who succeeds the activities at facilities and communities. Facilities and communities should not have to wait for feedback from the national level. There were however no research participants from the community, so their reasons for not taking part in MDR processes could depend on a number of reasons, and the way to include them in the future could be creating awareness, planning for community MDR processes and financing them. The findings from this study imply that further research is needed and focus should be to employ

qualitative studies in order to understand the perception of the communities and how to involve them in the MDR activities.

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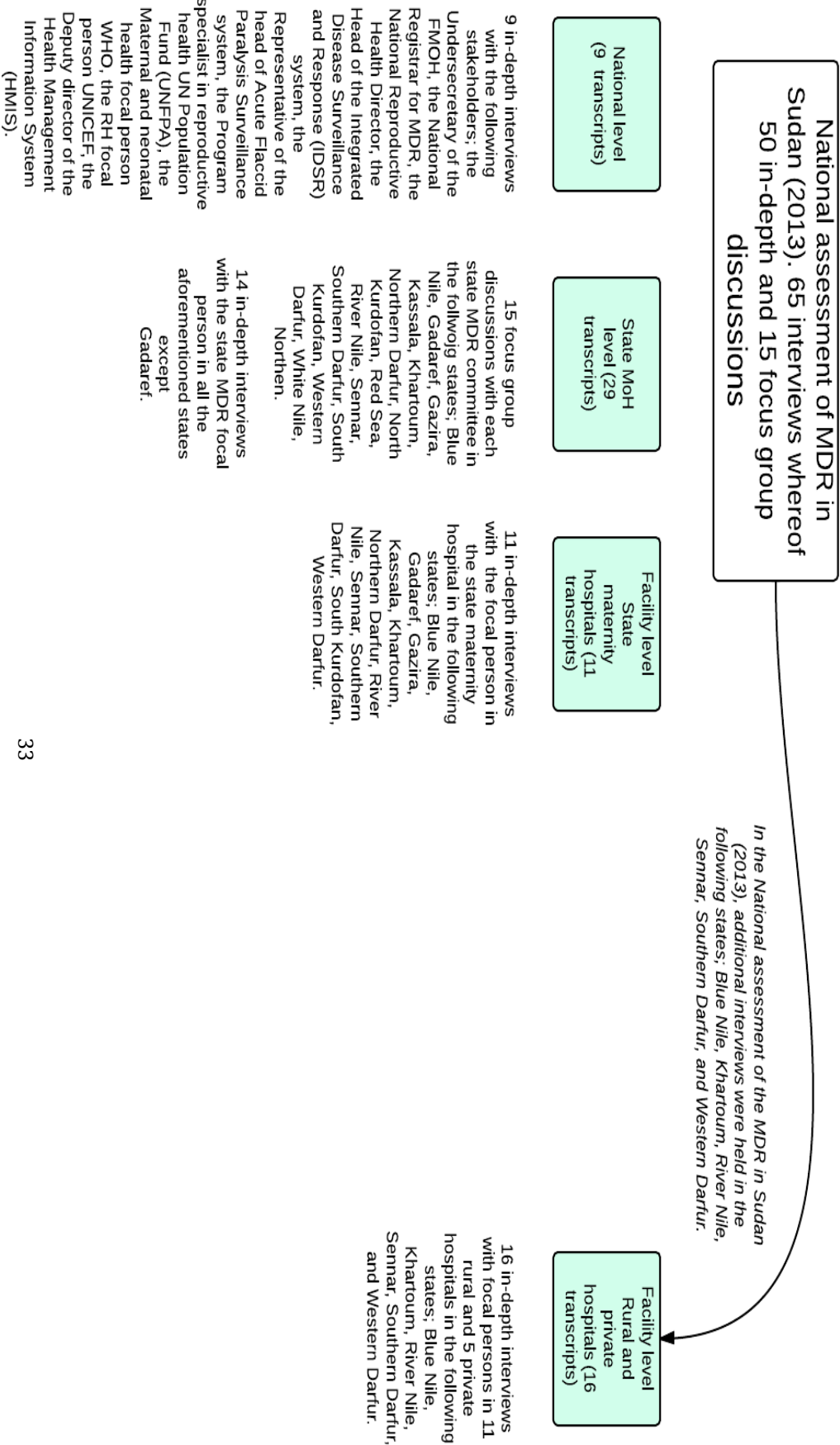
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Appendices

Appendix 1. Description of the Secondary Data Set

The 2013 national MDR situation analysis



Appendix 2. In-depth Study of Six States of the Secondary Data Set

(The 2013 national MDR situation analysis)

Of the 15 states in Sudan, 6 states were selected and studied more in-depth.

- Southern Darfur was chosen because it had the highest average MMR according to the SHHS2-2010.
- Sennar state had the lowest average MMR according to the SHHS2-2010,
- Khartoum state was chosen because it had the highest number of notified deaths in the MDR report from 2012.
- Blue Nile state was chosen because it had received funding from the Decentralized Health Services Development Project and had been judged to have a well-functioning MDR system for maternal deaths that occurred in both health facilities and communities.
- River Nile state was chosen because it was the first state to establish MDR and Western Darfur, because it was the last state to establish MDR.

Appendix 3. Quantitative Analysis on MMR

MMR calculated from the SHHS2-2010

State	Average MMR from the SHHS2- 2010
Khartoum	175
River Nile	147
Gadaref	267
Gazira	185
Northern State	127
Sennar	106
Kasala	245
White Nile	169
Blue Nile	258
Southern Darfur	335
Red sea	280
Northern Kurdofoan	208
Northern Darfur	178
Southern Kurdofoan	112
Western Darfur	322

MMR calculated from MDR reports 2010-12

State	MMR 2010	MMR 2011	MMR 2012	Average MMR
Khartoum	107	90	96	97.8
River Nile	89	94	96	93.1
Gadaref	121	75	118	104.1
Gazira	196	163	126	158.7
Northern State	245	85	154	155.3
Sennar	214	263	214	225.9
Kasala	370	271	215	267.4
West Nile	219	194	225	213.1
Blue Nile	841	355	235	406.5
Southern Darfur	380	437	239	348.7
Red sea	634	290	280	370.6
Northern Kurdofoan	206	537	392	375.4
Northern Darfur	437	440	410	424.8
Southern Kurdofoan	367	524	415	416.2
Western Darfur	626	432	501	508.7

Appendix 4. List of Transcripts

List of transcripts at national level

National level stakeholders from:
<ol style="list-style-type: none"> 1. Federal Ministry of Health (FMOH) 2. National MDR Focal Person 3. FMOH Reproductive Health Unit 4. Integrated Disease Response Surveillance System (IDRSS) 5. United Nations Population Fund (UNFPA) 6. WHO 7. United Nations Children's Fund (UNICEF) 8. Director Health Information System

Transcripts are based on In-depth interviews.

List of transcripts at state and facility level

State level stakeholders	Facility level stakeholders:
River Nile state <ol style="list-style-type: none"> 1. SMoH (In-depth) 2. State MDR committee 	<ol style="list-style-type: none"> 1. State hospital 2. Rural hospital with the lowest MMR? 3. Private hospital
Western Darfur state <ol style="list-style-type: none"> 1. SMoH 2. State MDR committee 	<ol style="list-style-type: none"> 1. State hospital 2. Rural hospital (In-depth) 3. Private clinic (In-depth)
South Darfur state <ol style="list-style-type: none"> 1. SMoH (In-depth) 2. State MDR committee 	<ol style="list-style-type: none"> 1. Hospital 2. Rural hospital 3. Hospital 4. Private clinic
Sennar state <ol style="list-style-type: none"> 1. State MDR committee 	<ol style="list-style-type: none"> 1. State hospital 2. State maternity hospital 3. Rural hospital with highest MMR 4. Rural hospital with lowest MMR 5. Private hospital

Transcripts, except those denoted as In-depth are based on Focus group discussions (FGD).

Appendix 5. Further Description of Phases of Qualitative Content Analysis

Further description of phases of qualitative content analysis, adapted from Elo

Phases	
Preparation phase	In accordance with qualitative content analysis, decisions on what data to analyse (the unit of analysis and meaning units) and how to do, so have to be made (25,26). Units of analysis can be whole interviews or smaller amounts of data that form an understandable context (25).
Organising phase	Coding is the process whereby descriptive notes are written while reading the text to describe the content, and then the codes are transferred onto lists of coding sheets(26). Some meaning units were given one code, whilst others were given 2-5. Throughout the coding process, meaning units were sought for, condensed, and abstracted. Condensation is the process of summarising data without losing the core of what is being said (25) and abstraction is about the process of interpretation the data which takes place when codes, sub-categories, categories, and themes are created (25).
Reporting phase	In qualitative content analysis, sub-categories that represent similar events are grouped under a category (26), and categories are grouped under a theme. The themes are to describe the content of the categories, and the sub-categories are to describe the content of the categories (26). Categories should be grounded in the empirical data (26) and were generated inductively, through interpretation and abstraction.