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CLINICAL ARTICLE

Experiences with facility-based maternal death reviews in northern Nigeria

Jan J. Hofman [a,*], Hauwa Mohammed [b]

[a] Health Partners International, Lewes, UK
[b] Department of Obstetrics and Gynaecology, Federal Medical Centre, Nguru, Nigeria

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ABSTRACT

Objective: To evaluate the effectiveness of the maternal death review (MDR) system and process in improving quality of maternal and newborn health care in northern Nigeria. *Methods:* A combination of quantitative and qualitative methods was used, including review of MDR forms and of health management information system data on maternal deaths (MDs), as well as semi-structured interviews with members of 11 MDR committees. *Results:* Facility-based MDRs were initiated in 75 emergency obstetric and newborn care facilities in northern Nigeria and were initially conducted in the 33 hospitals; however, the process stopped after some time and had to be revitalized. Main reasons were transfer of key members of MDR committees, lack of supportive supervision, and shortage of staff. Ninety-three (12.1%) of 768 identified MDs were recorded on MDR forms and 52 (6.7%) had been reviewed. MDRs resulted in improved quality of care, including mobilization of additional resources. Challenges were fear of blame, shortage of staff, transfer of MDR team members, inadequate supportive supervision, and poor record keeping. *Conclusion:* MDR requires teamwork, commitment, and champions at health facility level to spearhead the process. MDR needs to be institutionalized in the Ministry of Health, which provides oversight, policy guidance, and support, including supportive supervision.

1. Introduction

Achievement of the Millennium Development Goal related to maternal health requires not only increasing coverage and access of key interventions but also improvement of quality of care (QoC) [1]. Review of maternal deaths (MDs) in health facilities, also sometimes called maternal death audit, assists in identifying important QoC problems. In addition to identifying obstetric causes, these maternal death reviews (MDRs) shed light on why women are dying by identifying contributing—and often avoidable—factors and help to discover important shortcomings in care and weaknesses in organization and provision of health services [2]. WHO recommends that health facilities providing obstetric care should review their maternal and perinatal deaths, and initiate action to address the identified problems. Facility-based MDR is defined as a "qualitative, in-depth investigation of the causes of and circumstances surrounding MDs occurring at health facilities" [3]. The main purposes of MDR are to answer the question "why did this woman die?," to initiate action to solve identified problems, to improve QoC, and to save lives in the future. For those taking part, it is a valuable learning experience and each death tells an important story of what went wrong and what could have been done better. Facility-based MDR usually does not provide information on what happened before the woman reached the health facility, unless relatives or carers at community level are interviewed. The main principles of MDR are to maintain anonymity, confidentiality, and a non-threatening environment without accusing or blaming people, and commitment to act. Its main purpose is identifying, analyzing, and solving problems, rather than punishing people. For the steps in initiating and conducting MDR, we refer to the WHO publication *Beyond the Numbers*: *Reviewing Maternal Deaths and Complications to Make Pregnancy Safer* [3]. Other methods used to improve quality of maternal and newborn health (MNH) are perinatal death review (PNDR) [4], near-miss review [5,6], criterion-based audit [7,8], and confidential enquiries into maternal and perinatal deaths [9,10].

Since 2010, the Partnership for Reviving Routine Immunization in Northern Nigeria – Maternal Newborn and Child Health (PRRINN-MNCH) program has initiated facility-based MDR in emergency obstetric and newborn care (EmONC) facilities in Katsina, Yobe, and Zamfara states in northern Nigeria as part of a wider continuous quality improvement (QI) initiative to improve quality of MNCH services. At each health facility, multidisciplinary QI teams review identified MDs after the chairperson—who is the champion of the MDR process—has collected all of the information, including patient records and additional data from interviews with health workers who were involved in the

* Corresponding author at: Health Partners International, Waterside Centre, North Street, Lewes, East Sussex BN7 2EG, UK. Tel.: +44 7979788729; fax: +44 1273478466.
E-mail address: hofmanjj@gmail.com (J.J. Hofman).

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cases. The three-delays model developed by Thaddeus and Maine is used as an analytic framework for analyzing the contributing factors [11]. Mentoring support is given to the QI teams through supportive supervision, which the program supports and tries to strengthen in the states. At additional quarterly meetings at local government area (LGA) level (the Nigerian equivalent of a district), QI teams present and discuss some of their MDs and share experiences with MDR. To build capacity in the states to establish QI initiatives, including MDR and PNDR, selected doctors and midwives with experience in QI and MDR have been trained as trainers and supportive supervisors. In an interstate workshop, tools for MDR recording and reporting have been developed. These include a recording form, a notification form, a follow-up form, and a staff interview guide. A guideline was developed on how to complete the forms. The forms were approved by the State Ministries of Health. (Interested readers can request electronic copies of the forms via E-mail to the corresponding author.)

Between July 2010 and early 2013, MDR had been initiated in 75 EmONC facilities (25 in each state), of which 31 are general hospitals, two are secondary specialist referral hospitals (federal medical centers), and 42 are primary healthcare (PHC) centers, which had been upgraded to basic EmONC (BEmONC) facilities. In July 2011, a preliminary rapid assessment of the MDR process was conducted in Zamfara and Katsina states. Because of the precarious security situation, this was not possible in Yobe state. Two years later, the present more in-depth evaluation of the MDR process was carried out. The aim of the present study was to review the MDR system and process in EmONC health facilities and to evaluate its effectiveness in improving quality of MNH care. The analysis of the causes and contributing factors of the reviewed MD cases, which was part of the evaluation, will be reported in another paper.

2. Materials and methods

The present evaluation, which was conducted by a national consultant in obstetrics between March 19 and April 30, 2013, used a combination of quantitative and qualitative research methods. Quantitative methods included review of available forms for MDR recording and reporting, and data of reported MDs through the health management information system (HMIS). Qualitative evaluation methods included semi-structured interviews with members of the MDR teams, who provided informed consent for the interviews. Three PRRINN-MNCH-supported LGAs were randomly selected from each state, and one BEmONC and one comprehensive EmONC (CEmONC) facility were randomly selected from the list of EmONC facilities in each selected LGA. A total of 18 facilities were visited and interviews were conducted with 11 MDR teams from nine CEmONC and two BEmONC facilities. The other seven BEmONC facilities were PHC centers that had not experienced any MDs. Ethics approval was not required for the present study, which was requested by the PRRINN-MNCH program.

Quantitative information was entered into a data extraction form and analyzed using SPSS version 18 (IBM, Armonk, NY, USA). In-depth interviews were tape-recorded, transcribed, and analyzed using a thematic framework.

3. Results

All available forms for MDR recording and reporting since the introduction of MDR were retrieved from all 75 EmONC facilities by program staff. The numbers of available forms are presented in Table 1. Ninety-three cases of MD had been reviewed. Table 2 shows the distribution of cases per state. For 10 cases, all three forms were available; for 31 cases, only the copy of the notification form was available, which meant that no MDR had been conducted because there were no recording forms. Twenty-nine of the 52 recording forms were fully completed and so were all 41 notification forms and 10 follow-up forms. Eleven recording forms had no written action plan; of the 41 action plans, only 10 follow-up forms were available. For the same period, 768 MDs had been reported from the same facilities through the state HMIS. Thus, only 93 (12.1%) HMIS-reported MDs had been recorded on MDR forms and only 52 (6.7%) MDs had actually been reviewed.

Table 1
Availability of MDR forms for analysis.[a]

Forms for MD recording	Forms for MD notification	Forms for MD follow-up	Total
54[b] (51.5)	41 (39.0)	10 (9.5)	105 (100.0)

Abbreviations: MD, maternal death; MDR, maternal death review.
[a] Values are given as number (percentage).
[b] Two of the 54 recording forms were excluded from the analysis because they were used as referral forms.

In-depth interviews were conducted with members of the MDR teams in 11 hospitals (four hospitals in Katsina, four in Yobe, and three in Zamfara). Seven PHC centers designated as BEmONC facilities were visited but had not experienced any MDs.

Most MDR committees included representatives of relevant departments (e.g. maternity, laboratory/blood bank, pharmacy, operating theater, prenatal clinic), as well as the chief nursing officer, the hospital secretary, the medical records officer, a midwife, and a doctor (usually the chairperson). The usual frequency of MDR meetings was monthly; two hospitals had quarterly meetings. In all visited hospitals, MDRs stopped at some point and most restarted in October 2012, after revitalization of the process by PRRINN-MNCH staff. Transfer of key members of the MDR committees was the main reason given for the discontinuation of MDR, together with lack of supportive supervision and shortage of professional staff for the high workload. All hospitals had received supportive supervision by staff from the PRRINN-MNCH program once or twice, but not from the State Ministry of Health.

All of the people interviewed could recall some actions undertaken and completed, based on the MDRs. These included organizing on-the-job training related to identified problems such as poor use of the partograph; requesting necessary resources from hospital management or the State Ministry of Health (e.g. more skilled staff or equipment); establishment of cupboards with emergency drugs in the labor ward and mechanisms to ensure availability; redistribution of staff such as midwives from other wards to the labor ward; conducting voluntary blood donation campaigns to improve availability of blood in the blood bank; health education in the community on danger signs of pregnancy to improve health-seeking behavior and reduce late presentation; and strengthening the emergency referral system by involving local drivers and having their phone numbers.

When asked about successes and achievements, all respondents were enthusiastic about the MDR process and provided much positive feedback. Maternal death review has initiated improvements in QoC. The most frequently mentioned success was better management of patients. Another achievement was mobilization of resources through hospital management, the community, or the State Ministry of Health. Examples included obtaining a generator for the labor ward (Katsina General Hospital); a bag-valve mask and oxygen (Family Support

Table 2
Distribution of reported MDs per state through routine HMIS and the MDR system.

	Through routine HMIS	Through MDR system[a]
Katsina	475	53 (11.2)
Yobe	82	14 (17)
Zamfara	211	26 (12.3)
Total:	768	93 (12.1)

Abbreviations: HMIS, health management information system; MDR, maternal death review.
[a] Values are given as number (percentage) of HMIS-reported MDs reported through the MDR system.

Hospital Damaturu), and a solar refrigerator for the blood bank (Kaura Namoda and Bungudu General Hospitals). In Yobe and Katsina states, retired midwives had been recruited and deployed to hospitals, and a doctor was posted to the maternity unit of Buniyadi General Hospital. Some action plans in Yobe and Katsina resulted in collaboration with community members to educate women and their families on the danger signs of pregnancy and the importance of prompt referral to hospital. In Kaura Namoda General Hospital, a community health team was constituted for this, with the support of the Emir. This team also mobilized resources, renovated an old hospital store, and bought drugs to establish a revolving emergency drugs fund.

Interviewees reported challenges when initiating the MDR process, which were related to the fear of health workers regarding blame or repercussions. Shortage of human resources and high workload were also mentioned and made it difficult to get all committee members together, leading to cancellation or postponement of meetings. The security situation in Yobe state with regard to the threat of terrorism further aggravated the human resources situation because health workers left or were unwilling to be posted there. Transfer out of staff affected the MDR process, particularly when the chairperson or key members of the MDR committee left. This was the main reason for discontinuation of the MDRs. Another challenge was poor record keeping, including incomplete or missing patient records. This indicates the importance of collecting additional information through interviews with health workers who were involved in the cases. Hospitals with many MDs were unable to review all of them. Availability of MDR forms was sometimes a challenge and distribution of forms depended mainly on the PRRINN-MNCH program.

4. Discussion

Most of the publications on MDR in low-income countries are accounts of the number of MDs and their causes and contributing factors, and sometimes of actions undertaken [12–16]; some papers describe the trend of hospital-based maternal mortality since the introduction of MDR [17,18]. Few studies report experiences with the process of initiating and conducting MDR [19,20]. In the present paper, we describe experiences in the challenging environment of northern Nigeria.

To be successful, MDR requires teamwork and commitment. Health facilities need someone committed (a champion) to spearhead the process. Transfer of staff trained in conducting MDR, particularly the chairperson of the MDR team, can negatively affect the MDR process. In 2012, the inactive MDR committees had to be reconstituted and revitalized by the PRRINN-MNCH program. Team building is needed so that MDR meetings do not depend solely on the chairpersons, and should continue when they are not around or have been transferred. We recommend that each MDR committee has a deputy chairperson or more than one champion to sustain the process. Providing incentives such as refreshments during MDR meetings may motivate participants.

Supportive supervision of MDR teams is very important, particularly in the initiation stage. The review teams need technical, team-building, and moral support. It also helps to develop their analytical skills when they are guided by experienced doctors or obstetric consultants. In northern Nigeria, however, supportive supervision was sporadic, difficult to organize, and largely dependent on donor funding—reflecting the weak health systems in the states.

In addition to regular review meetings at facility level, quarterly MDR meetings organized at LGA (district) level or at the local referral hospital—attended by representatives from EmONC facilities in the area—facilitate sharing of experiences and capacity building. It is important that a senior doctor or obstetric consultant with experience in MDR attends these meetings—supporting the process, building capacity, and developing analytical skills. In Malawi, the absence of senior staff such as doctors or consultant obstetricians during MDR was regarded as a weakness of the MDR process, and where reviews were conducted exclusively by junior staff some provider-related factors were missed [19]. However, such meetings in northern Nigeria depended on donor funding, which might jeopardize sustainability.

Although the aim was to review all MDs, this happened for only a small proportion. However, even if only some MDs are reviewed but the process is carried out regularly, important and useful lessons can still be learned for improvement of QoC.

The MDR process has not been institutionalized in the Ministry of Health so far. Maternal death reviews need guidance, coordination, and support from the national and State Ministries of Health. We recommend that the Nigerian Ministry of Health establishes a committee or unit at state and national (federal) level to oversee MDRs and PNDRs, to provide guidance and support (including supportive supervision of MDR committees), to coordinate and monitor the process, and to ensure that resources are allocated in the annual health budgets. Policy guidance and written guidelines are also needed. Involving Ministry of Health staff in MDR training during the QI workshops did not result in the Ministry taking on a leadership role or supporting the MDR process. The barriers need to be identified and addressed, and more intensive advocacy and follow-up are needed to institutionalize MDR and PNDR; identifying champions at national or state level is also important. In Malawi, support from the district health management team was considered crucial because it motivates staff and facilitates the implementation of recommendations [19]. Therefore, the PRRINN-MNCH program has developed a QI orientation package and is planning to conduct QI orientation workshops for senior health policy makers, as well as for health planners and managers at state and district level.

Record keeping was poor and incomplete with regard to both patient records and MDR forms. Formulation of and follow-up on action plans need more support. Supportive supervision can help to improve these areas. Obtaining additional information on cases of MD through interviews and during discussion at MDR meetings is important for putting together the full detailed story of what happened and what went wrong, and the MDR champion(s) at facility level must take this responsibility or delegate it.

The MDR process has not led to better reporting of MDs compared with the routine HMIS. Prompt notification of MDs did not usually happen. The perceived need and demand for MD reporting are low while MD is not a notifiable condition in Nigeria, as it is in some other African countries [20]; in these countries, the fact that MD is a notifiable condition helps to accord high priority to maternal mortality and may increase reporting of MDs. Thus, MD notification forms were not useful and can be omitted unless Nigeria makes MD a notifiable event and introduces a system of maternal death surveillance and response [21]. The forms for MDR recording and reporting were approved by the State Ministries of Health but were not integrated into the HMIS. The production and distribution of these forms depended largely on the PRRINN-MNCH project. For the Ministry of Health to play this role requires well-functioning health systems and sufficient funding for the HMIS. After institutionalization of the MDR process, the committee in the Ministry of Health responsible for MDR should exert pressure for this to happen or mobilize funds. Alternatively, MDR policies could state that health facilities are expected to print or photocopy their own forms; this could be reinforced and encouraged during supportive supervision visits to hospitals.

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Conflict of interest

The authors have no conflicts of interest.

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