

A district-based audit of the causes and circumstances of maternal deaths in South Kalimantan, Indonesia

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Abstract A district-based audit of maternal and perinatal mortality began during 1994 in three provinces of South Kalimantan, Indonesia. Both medical and non-medical factors were documented and an effort was made to progress from merely assessing substandard care to recommending improvements in access to care and the quality of care. Extensive discussions of cases of maternal death were held during regular meetings with providers, policy-makers and community members. The sources of information included verbal autopsies with family members and medical records. Between 1995 and 1999 the audit reviewed 130 maternal deaths. The leading causes of death were haemorrhage (41%) and hypertensive diseases (32%). Delays in decision-making and poor quality of care in health facilities were seen as contributory factors in 77% and 60% of the deaths, respectively. Economic constraints were believed to have contributed to 37% of the deaths. The distance between a patient's home and a health provider or facility did not appear to have a significant influence, nor did transport problems. The audit led to changes in the quality of obstetric care in the district. Its success was particularly attributable to the process of accountability of both health providers and policy-makers and to improved working relationships between health providers at different levels and between providers and the community. With a view to the continuation and further expansion of the audit it may be necessary to reconsider the role of the provincial team, the need of health providers for confidentiality, the added benefit of facility-based audits, the need to incorporate scientific evidence into the review process, and the possible consideration of severe complications as well as deaths. It may also be necessary to recognize that village midwives are not solely responsible for maternal deaths.

Keywords Maternal mortality; Infant mortality; Cause of death; Precipitating factors; Management audit; Quality of health care; Community health services; Indonesia (*source: MeSH, NLM*).

Mots clés Mortalité maternelle; Mortalité nourrisson; Cause décès; Facteurs déclenchants; Audit gestion; Qualité soins; Service public santé; Indonésie (*source: MeSH, INSERM*).

Palabras clave Mortalidad materna; Mortalidad infantil; Causa de muerte; Factores desencadenantes; Auditoría administrativa; Calidad de la atención de salud; Servicios de salud comunitaria; Indonesia (*fuentes: DeCS, BIREME*).

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Voir page 233 le résumé en français. En la página 234 figura un resumen en español.

Introduction

A large proportion of maternal and perinatal deaths may result from poorly managed deliveries, and many such deaths could be avoided if suitable care were given (1, 2). Audits carried out to improve the quality of health care compare the care given with an agreed standard (3). When deficiencies are identified, mechanisms for improvement are sought and actions are proposed. The methods of audit range from simple case descriptions to systematic investigations into the causes of substandard care in a large number of health outcomes. Although the effectiveness of audits in changing the practices of health care professionals remains a matter of debate, medical audits are now accepted in many Western countries (3, 4). However, little experience has been gained with audits of obstetric care in developing countries (5–9).

In 1994 a maternal and perinatal audit system was introduced in Indonesia as a tool for bringing both the continuous surveillance of maternal and perinatal mortality and

the quality assurance of obstetric services into the domain of the district health system. We describe below the maternal and perinatal audit system in three districts of South Kalimantan and draw lessons for its improvement.

Safe motherhood in South Kalimantan

The maternal mortality ratio in Indonesia is 390–472 deaths per 100 000 live births (10, 11). The fact that the majority of deliveries took place at home with a traditional birth attendant (TBA) led the Ministry of Health to launch a training programme for professional midwives to be deployed in villages. By 1999, more than 54 000 midwives had been trained and posted in Indonesian villages (12). These midwives, who are expected to live in their communities, are supervised by professionals in subdistrict health centres. They offer antenatal, delivery, and postpartum services to pregnant women during home visits or in clinics.

In 1995 the Ministry of Health, with the support of MotherCare, USA, introduced additional safe motherhood

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services in three districts of the rural province of South Kalimantan. These services comprised the following: training and continuing education for midwives in life-saving, communication and counselling skills; providing women and their families with information on how to make pregnancy safer; and initiating and supporting the maternal and perinatal audit process.

The population of 1 million in the three districts concerned is served by five government hospitals and 55 government community health centres. In 1997 the estimated 25 000 pregnant women in these districts were being served by 530 village midwives.

Maternal and perinatal audit system

The maternal and perinatal audit was developed in 1994 as one of many strategies for reducing maternal mortality. The Ministry of Health issued guidelines for piloting the audit in eight provinces, and model projects emerged in Central Java and West Nusa Tenggara. The safe motherhood initiative in South Kalimantan built on experience gained in these provinces. Although the audit focuses on both perinatal and maternal deaths, the present paper is mainly concerned with the latter.

The audit aims to bring about a reduction in perinatal and maternal mortality through an improvement in the quality of maternal and child health services at the district level. More specifically, it aims to: identify substandard care factors for maternal and perinatal deaths; strengthen links between district health office, district hospital and health centres; make recommendations for the improvement of service organization and clinical care at the district level; and assess the main causes of maternal and perinatal deaths.

In addition to facility-based elements of care, the audit explores obstacles to obtaining care at the community level, e.g. delays in family decision-making and transportation problems.

Components of the system

Identification and reporting of deaths

The village midwives are responsible for reporting all maternal and perinatal deaths in their community to the health centre (Fig. 1). The midwives may learn about these deaths because they have cared for the women who have died or because they have received reports from village leaders or traditional birth attendants. In addition, maternal deaths occurring in hospital

are reported directly to the district health office, which passes the information to the village midwives.

Postmortem interview

When a village midwife is notified of a maternal or perinatal death in her community she visits the family of the deceased and conducts a home interview, usually within a week. The verbal autopsy, conducted with the help of a checklist, seeks to uncover clinical signs and symptoms and socioeconomic factors contributing to the death (13, 14). The interviewer is guided by a conceptual framework developed by MotherCare/John Snow Inc. (15). This pathway reconstructs the series of events that may lead to a perinatal or maternal death. Particular attention is paid to documenting the occurrence of and the reasons for delays in the following: family decision-making to refer a woman with a complication; reaching appropriate care; and receiving care from the health provider once the appropriate level of care has been reached (16).

For women who were in contact with the health services before death, the village midwife obtains further information from traditional birth attendants, midwives, and/or doctors. If a woman was hospitalized, the village midwife also consults the medical records, where available, and copies parts that are relevant to the case.

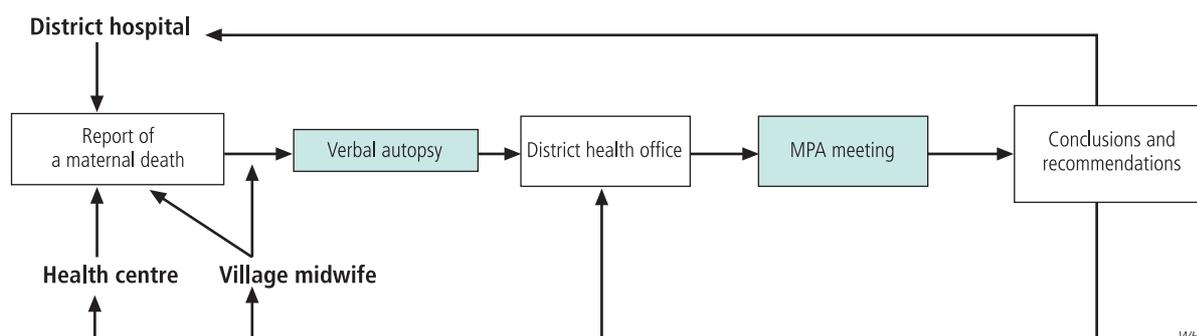
Finally, the village midwife assigns a cause of death and reports directly to a health centre, where a senior midwife or a doctor checks that the information collected is complete and consistent and verifies the accuracy of the cause of death. All interview forms are sent to the district health office.

District maternal and perinatal audit team

At intervals of 1–2 months, a meeting is attended by staff from the community health centre, midwives involved in the cases being discussed, and the district maternal and perinatal audit team (health administrators and hospital physicians) to discuss maternal and perinatal deaths that have occurred in the district. If community involvement is considered desirable, representatives of women's organizations or other community groups are invited to attend. The meeting is generally limited to 20–30 persons. Expenses for transport and food are reimbursed.

In order to facilitate full participatory discussion, the number of cases considered is limited to two or three, usually including one maternal and one perinatal death. The cases are selected on the basis of the nature of the problems identified and the frequency with which the medical causes of death occur.

Fig. 1. Schematic representation of the reporting system used in the maternal and perinatal audit (MPA), South Kalimantan, Indonesia



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At the district meetings the village midwife presents the background of the case and the chronology of events leading to death. The participants then consider the case, relying on the expertise of an obstetrician or paediatrician from the district hospital to guide discussion on clinical case management. The purpose of the meeting is not to assign blame but rather to uncover the root causes of death while engaging in constructive peer review. On the basis of the contributing factors identified during the meeting, the audit team at district level designs management initiatives, proposes additional training, and recommends changes in clinical protocol and policy. A formal record of the conclusions reached is kept by a rapporteur and is reviewed by the group at the end of each meeting. The findings and recommendations are discussed at the start of the next audit meeting in order to check on progress made in resolving the problems previously uncovered.

Subdistrict meetings

The districts have faced difficulty in trying to strike a balance between maintaining a small meeting size, so as to allow a good forum for active discussion, and including a significant number of midwives. In order to allow more midwives to participate, the districts have held smaller subdistrict meetings at three-monthly intervals. Each subdistrict meeting generally involves four or five community health centres. These meetings have a similar format and are additional to the district meetings. On average, there is a bimonthly meeting in each district and a smaller subdistrict meeting every one to two months, rotating between the subdistricts.

Data from the maternal and perinatal audit system

Maternal deaths

Between 1995 and 1999 the village midwives conducted 130 postmortem interviews. There were large variations between years and between districts (Table 1). The district of Hulu Sangai Selatan seemed to have the most comprehensive reporting of maternal deaths, since the expected number of live births was lower than in the other two districts.^a The leading causes of death were haemorrhage (41%), followed by hypertensive diseases (32%) (Table 2). The three districts had similar patterns of reported causes of death. The highest level of birth attendant seen by mothers prior to death is shown in Table 3. Only 41.5% of the women were seen by a midwife or a doctor before death, and 69.2% of deaths occurred elsewhere than in a health facility.

Contributing factors

Aggregate information on contributing factors was available for 30 maternal deaths audited in 1998 and 1999 (Table 4). Delays in decision-making and poor quality of care at the health facility were seen as contributing factors in 77% and 60% of the deaths, respectively. Among the most prevalent aspects of poor quality of care cited were delays in seeing a health provider, inadequate care, and care that did not conform to protocols. Economic constraints were believed to have contributed to 37% of deaths. Problems of distance or

Table 1. Numbers of maternal deaths reported through maternal and perinatal audit system, South Kalimantan, 1995–99

Year	District			Total
	Banjar (n)	Barito Kuala (n)	Hulu Sangai Selatan (n)	
1995	6	–	10	16
1996	6	8	14	28
1997	18	7	10	35
1998	10	6	15	31
1999	10	4	6	20
Total	50	25	55	130

Table 2. Numbers and causes of maternal deaths reported through maternal and perinatal audit system, South Kalimantan, 1995–99

Cause of death	District			Total
	Banjar (n)	Barito Kuala (n)	Hulu Sangai Selatan (n)	
Direct obstetric				
Early pregnancy deaths ^a	1 (2.0) ^b	–	2 (3.6)	3 (2.3)
Haemorrhage	24 (48.0)	11 (44.0)	18 (32.7)	53 (40.8)
Antepartum	–	2	–	2
Postpartum				
Retained placenta	9	5	11	25
Uterine atony	6	1	2	9
Unspecified	9	3	5	17
Hypertensive diseases	13	10 (40.0)	19 (34.5)	42 (32.3)
Eclampsia	11	9	14	34
Pre-eclampsia	2	1	5	8
Sepsis	3 (6.0)	–	4 (7.3)	7 (5.4)
Dystocia	–	–	1 (1.8)	1 (0.8)
Other ^c	1 (2.0)	–	1 (1.8)	2 (1.5)
Indirect obstetric^d	3 (6.0)	3 (12.0)	9 (16.4)	15 (11.5)
Unknown	5 (10.0)	1 (4.0)	1 (1.8)	7 (5.4)
Total	50 (100.0)	25 (100.0)	55 (100.0)	130 (100.0)

^a Including two abortion deaths and one death from ectopic pregnancy.

^b Figures in parentheses are percentages.

^c Including one death after a Caesarean section and one death from a lung embolus.

^d Including deaths associated with asthma, cardiac diseases, typhoid fever, tuberculosis and hepatitis.

^a Based on official statistics for 1996, the expected number of live births per year is 11 977 in Banjar, 7097 in Barito Kuala, and 4718 in Hulu Sangai Selatan (26).

Table 3. Highest level of birth attendant seen by women who died, reported through maternal and perinatal audit system, South Kalimantan, 1995–99

Birth attendant	District			Total
	Banjar (n)	Barito Kuala (n)	Hulu Sungai Selatan (n)	
Family member	2 (4.0) ^a	–	2 (3.6)	4 (3.1)
Traditional birth attendant	17 (34.0)	5 (20.0)	24 (43.6)	46 (35.4)
Midwife	14 (28.0)	9 (36.0)	9 (16.4)	32 (24.6)
Doctor	7 (14.0)	5 (20.0)	10 (18.2)	22 (16.9)
Unknown	10 (20.0)	6 (24.0)	10 (18.2)	26 (20.0)
Total	50 (100.0)	25 (100.0)	55 (100.0)	130 (100.0)

^a Figures in parentheses are percentages.

Table 4. Factors contributing to 30 maternal deaths reported through maternal and perinatal audit system, South Kalimantan, 1998–99

Contributing factor	n
Delay in decision-making	23 (76.7) ^a
Lack of knowledge of danger signs	7 (23.3)
Economic constraints	11 (36.7)
Refusal to seek care	16 (53.3)
Delay in reaching health provider or facility	10 (33.3)
Long distance to medical facility	7 (23.3)
Lack of transportation	4 (13.3)
Difficult road conditions	2 (6.7)
No health provider near case	2 (6.7)
Poor quality of care by health provider and/or at health facility	18 (60.0)
Equipment shortage	4 (13.3)
Drug shortage	2 (6.7)
Delay in seeing health provider	11 (36.7)
Inadequate care	8 (26.7)
Care not in accordance with protocols	7 (23.3)

^a Figures in parentheses are percentages.

transport did not appear to be prominent. Refusal to seek care might have contributed to half the deaths.

However, the listing of contributing factors does not reveal the depth of information that can be obtained by verbal autopsy. Many factors may contribute to a death. It is not easy to pinpoint a single factor that might have prevented death. This is illustrated by the case of a woman with a retained placenta who bled to death (see Annex 1 on World Wide Web version at URL: www.who.int/bulletin). There were several delays in decision-making. The woman suffered three hours with a retained placenta before skilled medical help was sought. This suggested that a delay occurred before the traditional birth attendant recognized the emergency. Once the village midwife had been called there was a delay of half an hour before the family decided to take the woman to hospital. A further delay occurred because transportation arrangements took 45 min, and the time taken to reach the health facility contributed to the maternal death. Family decision-making and attitudes towards

the health sector also had a bearing on the case, since a trained health professional was not asked to be present at the delivery.

Finally, issues related to the quality of care were identified. The patient's antenatal care did not include an assessment of haemoglobin levels, which might have indicated a need for treatment other than routine iron supplementation. The equipment in the village midwife's health post for performing a haemoglobin test was in a state of disrepair and the patient did not want to go to the health centre. The obstetrician guiding the audit meeting noted that the village midwife should have given an infusion to the patient in shock, pressing the infusion bag if necessary. He suggested that further training of village midwives in emergency care was needed. It was also noted that village midwives should have kits with more flexible needles and a more rapid flow for infusion.

Actions taken and solutions proposed

The audit has resulted in concrete improvements in some aspects of the district health systems. The recommendations arising from the audit cover additional training for midwives, the need for a blood bank and specific drugs, the need for standard treatment guidelines, and various other matters (see Box 1). For example, in Hulu Sungai Selatan district the audit revealed that the unavailability of appropriate medication at the community level might have contributed to a number of maternal deaths caused by eclampsia. In response, magnesium sulfate was supplied to village midwives. In another instance, inconsistencies in case management between midwives in the community health centres and villages led to the development and distribution of a standard protocol for handling obstetric emergencies. This is being used as an interim measure until a national standard essential obstetric protocol for midwives, now being developed by the Ministry of Health, becomes available.

Box 1. Recommendations for the health and other sectors, based on the maternal and perinatal audit

Recommendations involving the health sector

- Provide village midwives with better equipment and drugs for management of emergency cases.
- Develop standard protocols for the management of emergency cases at village level.
- Supply magnesium sulfate to all village midwives.
- Increase supervision of health centres and village midwives by an obstetrician.
- Provide training to village midwives for manual removal of placenta.
- Provide training to village midwives for management of shock.
- Supply mechanical ventilators to all hospitals.
- Sanction midwives who are absent from the villages for which they are responsible when deliveries occur (e.g. delay salary payments).
- Strengthen the national safe motherhood movement.
- Encourage village midwives and health centres to conduct verbal autopsies soon after death.
- Train village midwives in the concepts of maternal and perinatal audit so as to reduce their inhibitions about participating in audits.

Recommendations involving other sectors

- Organize village referral teams with the involvement of community members.
- Establish community funds to pay for emergency referrals.
- Identify a means of transport in each community (e.g. car, boat) that could be made available in an emergency.
- Encourage village midwives to approach religious leaders when mothers or their families refuse referral.
- Encourage the use of the health certificate for poor families.

Lessons learnt

The audit is not solely a means of researching and documenting maternal deaths. It is also a tool used by the district health offices to bring about action for removing obstacles to high-quality care. Many studies have documented the medical and non-medical causes of maternal mortality, but few have offered a systemic means of monitoring and changing these factors (17–20). The maternal and perinatal audit, with its active involvement of key persons in the health sector, not only ensures ownership of the findings but also encourages implementation of the proposed changes. The process is difficult and time-consuming but the accountability of both health providers and policy-makers dictated by this approach may well be one of the most critical factors in improving the health sector's responsiveness to the high levels of maternal mortality.

The audit fosters a closer working relationship between the different levels of health care providers by bringing together those who are facility based and those who are community based to analyse and deal with the causes of mortality in their areas. By improving communication between the district health office, the district hospital, community health centre staff and village midwives, the audit seeks to increase appropriate referrals for obstetric emergencies, a critical element in avoiding maternal deaths. In turn, the enhanced understanding among district health officials of the factors at community level that contribute to each maternal or perinatal death allows them to make improved recommendations to the community health centres and village midwives under their supervision.

However, the audit could benefit from a greater involvement and clearer definition of the role and responsibilities of the provincial team. This team not only provides the resource person or persons for the districts that do not have an obstetrician and/or paediatrician but is also uniquely positioned to transfer information and lessons from the audit meetings between districts and make broader province-wide policy changes catalysed by audit findings. Improved guidelines for the audit should include suggestions on who should be included in its teams at each level and should clearly define the responsibilities of the teams.

The inclusion of village leaders, religious officials and other policy-makers in audit discussions promotes an inter-sectoral problem-solving approach to safe motherhood. By including community leaders in the audit meetings it was expected that issues that were not solely the domain of the health sector would receive greater attention. However, this proved not to be easy in practice. The participation of individuals or groups with no direct expertise in medical matters was felt to be potentially threatening to health providers, particularly when deficiencies in clinical management were discussed. The audit may have to temporarily abandon the involvement of community members if open self-criticism among medical providers is to be encouraged. The possibility of a broader membership could be explored at a later stage.

Although the audit does not intend to apportion blame, there are a number of inherent features in the current system which tend to put most of the responsibility and potential blame on the actions of village midwives, largely ignoring the role of underlying systems. The village midwives are the key rapporteurs, whether or not they have provided care to the

deceased women. The fact that a midwife may be sanctioned if she fails to provide care to a woman living in her target area illustrates the enormous responsibility placed on her for preventing deaths. The obstetrician, on the other hand, represents the highest level of authority. Because only one obstetrician is usually present, his or her actions or knowledge are rarely challenged. The final conclusions, therefore, may tend to represent the obstetrician's opinion rather than agreement among all those present at the meeting. Given that obstetric care of poor quality at the facility level is a critical element in maternal mortality, the audit has to ensure that the village midwife does not become the scapegoat for flaws in the health system.

Confidentiality for both patients and carers is generally seen as the cornerstone of audit, although it has been argued that non-confidential straightforwardness and open-mindedness is vital for a successful audit strategy (3, 6, 8). Audit is only of value when the professionals involved are confident that the findings cannot be used for legal or other actions. The lack of confidentiality in the current system may already have resulted in resistance to the reporting of cases for audit (12). Clearly, the development of a true process of accountability without apportioning blame is not easy, and rules and regulations on running and reporting audit meetings have to be developed. Explicit recognition of the need for confidentiality may lessen the concerns of some people about the audit process.

Auditing cases of severe obstetric morbidity might be a useful alternative or complement to the auditing of maternal deaths (21, 22), because morbidity is more common than deaths and the compilation of evidence from such cases would yield more powerful statistical results (23). Discussing the circumstances that have led to a life-threatening complication in a woman who survives may be less threatening to providers than discussing maternal deaths. In the event of survival, positive elements of care may emerge and staff may be congratulated for saving life. In addition, the possibility of speaking to the surviving woman offers the opportunity to obtain her opinion on the care given.

By using the village midwife as the central vehicle for reporting, the audit tends to focus on factors contributing to maternal deaths in the community rather than on those in health facilities. While this approach encourages communication and collaboration between the village midwife and higher levels of the health care system, it does not necessarily foster accountability by doctors and midwives in health facilities. The lack of authority and expertise of the village midwife in matters of hospital care puts her in an awkward position when consulting hospital records and reporting findings. Since the quality of facility-based care is equally critical in the prevention of maternal deaths, facility-based audits may have to complement community-based inquiries. Promising approaches to audit are being tested in certain developing countries (9, 24).

An audit is only effective if the care given is compared with explicit standards (3). However, the development of treatment guidelines is difficult. Although it is necessary to place greater reliance on scientific evidence and less on ideology or expert opinion (25), it is not always easy to challenge local opinion. The Ministry of Health has produced treatment guidelines for the management of severe obstetric complications but they have not always been adopted.

Moreover, the protocols in question do not always agree with internationally agreed standards. For example, the use of vaginal tampons to stop vaginal bleeding was encouraged at audit meetings, although there is little evidence in support of this intervention. Integrating evidence-based medicine into clinical practice takes time, but efforts have to be made to incorporate scientific evidence into the review process.

Although the primary objective of the audit is not quantitative, the system nevertheless aids the reporting of maternal deaths. The leading causes of maternal death reported through the audit are haemorrhage and hypertensive diseases, but how far they represent the pattern of mortality in the community is uncertain because the degree of completeness of reporting is unknown. In the seven hospitals covering the three districts the patterns of causes of death differed from that in the community. Hypertensive diseases accounted for 64% of hospital maternal deaths, followed by dystocia (16%) and haemorrhage (12%) (26). It was not possible to establish how many hospital deaths were included in the audit but the results indicate that, for certain causes, particularly haemorrhage, further efforts to help women reach life-saving medical care in time are warranted. Mortality attributable to sepsis, on the other hand, appears to be equally low in hospital and audit data, confirming the suggestion that sepsis has declined in importance as a cause of death in Indonesia (26).

Conclusions

The maternal and perinatal audit system adopted in Indonesia is unique in that the active involvement of carers, policy-

makers and community members fosters the accountability needed to improve the responsiveness of the health sector to the high levels of maternal mortality. The findings of the South Kalimantan audit yielded important clues on the factors contributing to maternal death in the community. Insights on the quality of care in facilities and on economic constraints that affect care-seeking deserve further exploration. Little work has been reported on such approaches in developing countries. Indonesia may be setting an example from which useful lessons can be learnt. However, the country's audit system needs to be continually re-examined, with view to optimizing the process and making whatever changes are required in the health care system. ■

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Résumé

Audit au niveau du district sur les causes et les circonstances des décès maternels dans le Kalimantan du Sud (Indonésie)

Un audit au niveau du district sur la mortalité maternelle et périnatale a été lancé en 1994 dans trois provinces du Kalimantan du Sud en Indonésie. Les facteurs médicaux et non médicaux ont été répertoriés et on s'est efforcé d'aller au-delà d'une simple évaluation des pratiques insuffisantes pour recommander des améliorations en matière d'accès aux soins et de qualité des soins. L'audit ne se limitait pas aux établissements de soins : il cherchait à rattacher les antécédents familiaux et communautaires aux décès maternels, essentiellement par des techniques qualitatives. Les cas de décès maternels ont été examinés de façon approfondie au cours de réunions périodiques avec les prestataires de soins, les décideurs et les membres de la communauté. Les sources d'information consistaient, outre les dossiers médicaux, en autopsies verbales réalisées avec les membres de la famille. Entre 1995 et 1999, 130 décès maternels ont ainsi été passés en revue. Ils avaient pour causes principales les hémorragies (41 %) et les troubles hypertensifs (32 %). Une prise de décision tardive et une qualité insuffisante des soins ont été considérées comme ayant contribué au décès dans 77 % et

60 % des cas respectivement. On a estimé que les contraintes économiques ont contribué au décès dans 37 % des cas. La distance entre le domicile et le prestataire ou l'établissement de soins ne semblait pas avoir d'influence significative, non plus que les problèmes de transport. L'audit a conduit à une amélioration de la qualité des soins obstétricaux dans le district, résultat qui a pu être en partie attribué au processus de responsabilisation des prestataires de soins comme des décideurs et à l'amélioration des relations de travail entre les prestataires des différents niveaux et entre ceux-ci et la communauté. Pour poursuivre cet audit et en étendre la portée, il pourra être nécessaire de réexaminer le rôle de l'équipe provinciale, la nécessité de respecter la confidentialité de la part des prestataires de soins, l'avantage supplémentaire que constituent les audits réalisés dans les établissements de soins, la nécessité d'intégrer les données scientifiques au processus d'examen, et la prise en compte éventuelle des complications graves en plus des décès. Il pourra aussi être nécessaire de reconnaître le fait que les sages-femmes de village ne sont pas les seules responsables des décès maternels.

Resumen

Auditoría distrital de las causas y circunstancias de las defunciones maternas en el Kalimantan meridional (Indonesia)

En 1994 dio comienzo una auditoría de distrito de la mortalidad materna y perinatal en tres provincias del sur de Kalimantan, Indonesia. Se documentaron factores médicos y de otro tipo, y se hizo un esfuerzo para pasar de la mera identificación de la atención de baja calidad a la formulación de recomendaciones destinadas a mejorar el acceso a la asistencia y la calidad de la misma. La auditoría no se basó sólo en los servicios, pues procuró además documentar los antecedentes familiares y comunitarios de las defunciones maternas, principalmente mediante técnicas cualitativas. Los casos de defunción materna eran analizados exhaustivamente en reuniones regulares de los proveedores, los formuladores de políticas y los miembros de la comunidad. Como fuentes de información se emplearon autopsias verbales obtenidas a partir de los familiares e historias clínicas. Entre 1995 y 1999 la auditoría examinó 130 defunciones maternas. Las causas más importantes de defunción fueron las hemorragias (41%) y los problemas de hipertensión (32%). Las demoras en la adopción de decisiones y la escasa calidad de la asistencia dispensada en los centros de salud se consideraron factores contribuyentes en el 77%

y el 60% de los fallecimientos, respectivamente. Se estimó asimismo que las dificultades económicas habían sido un factor concurrente en un 37% de las defunciones. La distancia entre la vivienda de la paciente y el centro o el dispensador de salud no parecía influir demasiado, así como tampoco los problemas de transporte. La auditoría hizo que cambiara la calidad de la atención obstétrica en el distrito. Ese éxito cabe atribuirlo en particular al proceso de responsabilización tanto de los dispensadores de salud como de los formuladores de políticas, así como a unas mejores relaciones de trabajo entre los dispensadores de salud a distintos niveles y entre los dispensadores y la comunidad. Con miras a proseguir y ampliar la auditoría, convendría quizá volver a analizar la función del equipo provincial, la necesidad de confidencialidad por parte de los dispensadores de salud, el beneficio añadido de las auditorías de servicios, la necesidad de incorporar datos científicos en el proceso de examen, y la posible inclusión de las complicaciones graves además de las defunciones. Es posible también que haya que reconocer que las parteras de aldea no son las únicas responsables de las defunciones maternas.

References

1. *Mother/baby package: implementing safe motherhood in countries*. Geneva: World Health Organization; 1994. Unpublished document WHO/FHE/MSM/94.11.
2. Costello AM de L. Perinatal health in developing countries. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 1993;87:1-2.
3. Crombie IK, Davies HTO, Abraham SCS, Florey CduV. *The audit handbook. Improving health care through clinical audit*. Chichester: John Wiley & Sons; 1993.
4. O'Brien T, Oxman AD, Davis DA, Haynes RB, Freemantle N, Harvey EL. *Audit and feedback: effects on professional practice and health care outcomes*. Oxford: Cochrane Library; 1997.
5. Ronsmans C. What is the evidence for the role of audits to improve the quality of obstetric care? *Studies in Health Services Organisation and Policy* 2001; 17:207-8.
6. Bugalho A, Bergstrom S. The value of perinatal audit in obstetric care in the developing world: a ten-year experience of the Maputo model. *Gynaecological Obstetric Investigation* 1993;36:239-43.
7. Mancey-Jones M, Brugha RF. Using perinatal audit to promote change: a review. *Health Policy and Planning* 1997;12:183-92.
8. Suleiman AB, Mathews A, Jegasothy R, Roslinah A, Kandia N. A strategy for reducing maternal mortality. *Bulletin of the World Health Organization* 1999;77:190-3.
9. Graham W, Wagaarachchi P, Penney G, McCaw-Binns A, Yeboah Antwi K, Hall MH. Criteria for clinical audit of the quality of hospital-based obstetric care in developing countries. *Bulletin of the World Health Organization* 2000; 78:614-20.
10. *Indonesia demographic and health survey 1994*. Calverton (MD): Indonesian Central Bureau of Statistics and Macro International Inc; 1995.
11. Hill K, AbouZahr C, Wardlaw T. Estimates of maternal mortality for 1995. *Bulletin of the World Health Organization* 2001;79:182-93.
12. Geefhuysen CJ. Safe motherhood in Indonesia: a task for the next century. In: Berer M, Ravindran TKS, editors. *Safe motherhood initiatives: critical issues. Reproductive health matters*. London: Blackwell Science; 1999. pp.62-72.
13. Ronsmans C, Campbell O. *Verbal autopsies for maternal deaths. Report of a WHO workshop*. Geneva: World Health Organization; 1995. Unpublished document WHO/FHE/MSM/95.15.
14. Ronsmans C, Walraven G, Etard JF. Verbal autopsies. In: *Qualitative approaches for investigating maternal deaths*. Geneva: World Health Organization (in press).
15. Koblinsky M. On the pathway to maternal health – results from Indonesia. *MotherCare Matters* 1995;5:1-2.
16. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Social Science and Medicine* 1994;38 (8):1091-110.
17. Fawcus S, Mbizvo M, Lindmark G, Nystrom L. A community-based investigation of avoidable factors for maternal mortality in Zimbabwe. *Studies in Family Planning* 1996;27:319-27.
18. Kwast BE, Bekele M, Yoseph S, Gossa A, Mehardi L, Frost O. Confidential enquiries into maternal deaths in Addis Ababa, Ethiopia, 1981–1983. *Journal of Obstetrics and Gynaecology in East and Central Africa* 1989;8:75-82.
19. Langer A, Hernandez B, Garcia-Barrios C, Saldana-Uranga GL, National Safe Motherhood Committee of Mexico. Identifying interventions to prevent maternal mortality in Mexico: a verbal autopsy study. In: Berer M, Ravindran TKS, editors. *Safe motherhood initiatives: critical issues. Reproductive health matters*. London: Blackwell Science; 1999.
20. Walraven G, Telfer M, Rowley J, Ronsmans C. Levels of maternal mortality, its causes and contributing factors in rural Gambia. *Bulletin of the World Health Organization* 2000;78:603-13.
21. Filippi V, Alihonou E, Mukataganda S, Graham WJ, Ronsmans C. Near misses: maternal morbidity and mortality. *Lancet* 1998;351:145-6.
22. Mantel GD, Buchmann E, Rees H, Pattison RC. Severe acute maternal morbidity: a pilot study of a definition of a near miss. *British Journal of Obstetrics and Gynaecology* 1998;105:985-90.
23. Ronsmans C, Filippi V. Severe obstetric morbidity. In: *Qualitative approaches for investigating maternal deaths*. Geneva: World Health Organization (in press).
24. Ronsmans C, Filippi V. Improving obstetric care through near-miss audit. *Child Health Dialogue* 2000;18:9.
25. Lohr KN, Eleazar K, Mauskopf J. Health policy issues and applications for evidence-based medicine and clinical practice guidelines. *Health Policy* 1998;46:1-19.
26. Ronsmans C, Achadi E, Sutratikto G, Zazri A, McDermott J. Use of hospital data for safe motherhood programmes in South Kalimantan, Indonesia. *Tropical Medicine and International Health* 1999;4:514-21.

Annex 1. Case study of Mrs A

A maternal death in South Kalimantan was followed up with a verbal autopsy and a full audit at the district level attended by all the community health centre staff and an obstetrician.

Background and history of antenatal care

Mrs A was 30 years old when she died. She had three previous children and was completing her fourth pregnancy. There was no reported history of complications in the previous pregnancies or deliveries. During the first and second trimesters of her pregnancy she visited a health post where she received a tetanus toxoid injection. During the third trimester she visited the village midwife twice. She received 90 iron tablets during her pregnancy as per Ministry of Health guidelines but her haemoglobin level was not checked.

Timeline of events on 25 June 1996

At 05:00 Mrs A delivered a healthy baby with the assistance of a traditional birth attendant but the placenta was not delivered. After a delay of approximately three hours, during which she bled considerably and became increasingly weak, her husband and family called the village midwife from the next village. She reported to her superior at the health centre and then set out for Mrs A's house. This journey took 45 minutes by canoe.

At 09:50 the village midwife arrived at Mrs A's house. The placenta was still undelivered and Mrs A was bleeding. The

umbilical cord had not been cut. Mrs A was losing consciousness, her pulse rate was 72 per minute and her respiration rate was 24 per minute. The baby was in good condition. The midwife cut the cord, wrapped the baby in cloth, removed the placenta manually using an aseptic technique and gave an infusion of 500 ml Ringer lactate, allowing free flow. The manual removal was successful. Mrs A was given intramuscularly one ampoule of methylethylgometrine maleate. The midwife washed Mrs A, sutured a tear in the perineum, massaged the uterus and applied a *gurita* (a girdle to help the abdomen to return to its original shape). The midwife washed the baby and checked it for deformities. The baby was weighed (3300 g). The umbilical cord was compressed with betadine.

At 10:10 the infusion was still flowing freely but the blood pressure was low. The midwife suggested that the family take Mrs A to the district hospital. At 10:25, after much discussion, the family began preparing to go to the hospital. Mrs A continued to be infused during the journey and her blood pressure dropped. The bleeding had stopped. At 10:55, Mrs A was still restless and her blood pressure had dropped even further. At 11:25, about six hours after delivery, she died en route to the hospital.

Cause of death according to village midwife: shock attributable to haemorrhage as a result of retained placenta. ■