

Obstetric emergencies and maternal deaths in the Solomon Islands

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Abstract

This study verified reported maternal deaths in Malaita Province, Solomon Islands, in 1994 and 1995. Circumstances surrounding maternal deaths resulting from an obstetric emergency were investigated through interviews with health workers and communities. Reported deaths were found to over-estimate the true level of maternal mortality. Enhanced communication facilities and increased availability of appropriate drugs and equipment would reduce deaths by improving the health clinics and health centres capacity to manage obstetric emergencies. Improved supervision and targeted training of traditional midwives will contribute to improved pregnancy outcomes. Contrary to expectation, traditional customs were not a barrier to effective maternal health care.

Introduction

As in other developing countries, maternal mortality in Solomon Islands is a serious problem but little is known about the exact level of mortality, the causes of death, or what should be done to prevent them. In 1995 when the Ministry of Health and Medical Services (MHMS) asked for a study of maternal mortality, there were only three sources of information. The first and most often quoted source was a maternal mortality ratio of 549 deaths per 100,000 live births derived from a national survey of over 2000 women. The survey used a technique known as the Sisterhood Method in which adults

are asked about how many sisters they had and how many died in childbirth. An estimated maternal mortality ratio can be calculated using those retrospective reports. The estimate will refer to the mortality experiences in the past, approximately representing the situation of about 15 years earlier. The second source of data were records from the labour wards of hospitals. This had the weakness in common with all hospital-based statistics: it does not represent the events occurring outside of the hospital. The third source was the newly computerised health information system (HIS). Based on reports from rural clinics as well as hospitals, this system suggested that the province of Malaita had the highest number of maternal deaths in the country. Eleven deaths were reported for 1994, suggesting a maternal mortality ratio in the order of 350 per 100,000 live births. Therefore Malaita was made the focus of the study.

The study reports findings of a post-graduate students' project which sheds light on some of the circumstances surrounding maternal mortality in Melanesia and some interventions which may be successful in preventing deaths³. Perhaps more importantly, it is a model of a simple, rapid approach to investigating maternal mortality which identifies major problems and practical recommendations to rectify those problems. We hope that this article will encourage similar investigations in other Pacific countries.

Maternal mortality

The reduction of maternal mortality requires that health services can respond to unanticipated emergencies. This means that health services need to be able to provide oxytocic and antibiotic drugs, treat hypertensive disorders and to perform manual removal of placenta and assist in obstructed labour. Maternal health programs which concentrate only on improving the general health of women, providing family planning and screening high risk pregnancies will not have a substantial effect on maternal deaths. This is because obstetric emergencies can occur to healthy women with no risk factors. Of course, education and community based programs may be necessary to encourage women and their families to seek appropriate health care when an emergency occurs.

The International Classification of Diseases (ICD-9) defines a maternal death as: 'The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of duration and the site of pregnancy, from any cause related to

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or aggravated by the pregnancy or its management, but not from accidental or incidental causes'⁴. Conventionally a distinction is made between 'direct' and 'indirect' maternal deaths⁵. Indirect obstetric deaths are those due to pre-existing medical conditions such as malaria, hepatitis or anaemia, which are aggravated by pregnancy. In developing countries these usually account for 25 % of all maternal deaths. The remainder are direct obstetric deaths due to complications of pregnancy, delivery or the post-partum period, of which the most important are post-partum haemorrhage (PPH), induced abortion, hypertension, infection and obstructed labour.

'Obstetric emergencies', the focus of the study, were defined as unpredicted, life-threatening complications of pregnancy, delivery and the post-partum period. It excludes 'predictable' emergencies such as those involving twin or breech deliveries. These are the events which require prompt referral to health facilities equipped to manage the condition.

Method

Malaita is home to 25% of the nation's people. Most of its population live on a narrow coastal strip. The interior is mountainous and rugged. Along the coast transport is by regular shipping lines and canoes and, along the northern half, a road. Except for one road, the transport in the interior is entirely by foot.

The province has one government hospital which serves as a referral hospital and another hospital operated by the Seventh Day Adventists. Within the government system there are three area health centres with in-patient facilities. These are the referral centres for the 21 rural health clinics, 5 of which are operated by church organisations. There are also 23 nurse aid posts in the province. The facilities of the aid posts in particular vary enormously; some have a larger client load than some of the smaller rural health clinics.

In Malaita the students used the HIS to identify all maternal deaths which occurred in 1994 and 1995. Obstetric emergencies which occurred outside of the hospital but were later referred to the hospital were also noted. The team followed up each case by talking to the hospital, health centre and health clinic staff involved in treating the woman and by visiting her village. In addition, all other rural health clinics and nurse aid posts attending at least fifty births in 1994 were also visited. At each health facility staff were interviewed and checks made on records, drugs and equipment. This enabled the team to assess the capacity of each health facility to manage an obstetric emergency. The Manual of Obstetrics and Gynaecology for Health Workers⁶ was the reference for preparing the interview schedule and clinic checklist.

The team also tried to identify direct maternal deaths which had not been reported. They did this by asking at all of the clinics and in the surrounding communities. They also attended a provincial meeting of nursing officers and asked

nongovernment organisations such as church women's groups to use their contacts to uncover deaths which may have escaped the attention of the health service. All of these reports were followed up in the same way as the officially reported deaths.

Interviews were held with men, women and custom midwives in villages in order to assess their knowledge of obstetric emergencies and the decision making process involved in an obstetric emergency. Most but not all of the villages visited had experienced an obstetric emergency in the past two years.

In total 3 nurse aid posts, 11 rural health clinics, 3 area health centres and 19 villages covering each of the four regions in the province were visited. Readers who know the transport difficulties in Malaita will appreciate that this is no mean feat! Thirty-nine health workers were interviewed. Group and individual interviews were held with men and women in each of the communities visited. In most cases men and women were interviewed separately. Six women identified by villagers as custom midwives were also interviewed.

Results

Validating reported deaths proved much more complex than had been expected. As mentioned above the HIS reported 11 maternal deaths in Malaita in 1994. Yet the 1994 Annual Health Report produced by the province recorded only two maternal deaths, one of which was an indirect death. Closer examination of the HIS reports made it clear that some of the explanation of the high numbers was mistakes in completing the forms. One clinic had reported six maternal deaths in one month! Following investigation, and using a triangulated approach of provincial HIS, staff interviews and community discussions, the team was able to confirm one indirect and three direct maternal deaths for 1994, two of which were not recorded in either the HIS or provincial report. The three direct maternal deaths in that year were from PPH.

The reporting improved considerably in 1995. In that year the HIS reports were routed to the Provincial Health Service prior to being forwarded to Honiara. The province required that a report describing the circumstances of the death accompany each mention of a maternal death. Furthermore, someone at the provincial level followed up late returns and encouraged clinics to report maternal deaths by radio. Four maternal deaths appeared in the HIS for that year and all of them were confirmed by the team. No unreported maternal deaths were uncovered. All four deaths were due to PPH.

Although the HIS is much better now that control is closer to the actual occurrence of the event, the team found that there was still potential for errors. There was still confusion about how to complete forms. Universally, health workers incorrectly believed that maternal deaths due to indirect causes would be reported only once on the form - although

opinions differed as to whether it should be reported as a maternal death or, for example, a death caused by malaria. Delays in sending the reports from the clinic to the provincial headquarters in the hospital also remain common. Furthermore, staff at the province work on HIS when they can grab a moment between other duties. Reported maternal deaths may not be noticed or followed up promptly.

Factors involved in deaths

All but one of the maternal deaths and obstetric emergencies investigated were handled by nurses at the rural health clinics. This was either because the woman had planned to deliver at the clinic or because problems arose during a village delivery and the woman had been taken to the clinic. At the clinic nurses faced a number of problems in trying to deal with a post partum haemorrhage, which was the cause of all of the emergencies investigated.

The first problem to be encountered would be drugs and equipment. All clinics visited had a complete delivery set (2 forceps, 1 pair of scissors, 1 sponge holder) but many were rusty and in a poor condition. All but one clinic had a good stock of suture material. Only three clinics had a stock of urinary catheters but the nurses spontaneously mentioned that they could use infant feeding tubes instead. The most serious deficiency was in the lack of essential drugs. Syntometrine (ergometrine/oxytocin) injection, vital in the prevention and management of PPH, was supposed to be available to all clinics, but three did not have any in stock when the team visited and most nurses said that they frequently had difficulties in getting sufficient supplies. In addition, there were grave misunderstandings about the cold chain requirements for syntometrine which needs to be stored between 2°C and 8°C. Injectable syntometrine loses 50% of its potency after only 4-5 days when kept at 25°C. Yet the team found that sometimes syntometrine was delivered to the clinics outside of a cold box. Furthermore, two clinics had run out of kerosene for their refrigerator and another was about to. Two more clinics did not store their syntometrine in the refrigerator and the clinics that had run out of kerosene had kept their syntometrine (although thrown out their vaccines) in the belief that 'anything is better than nothing.'

The second problem encountered by clinic staff facing an obstetric emergency would be communication. All health facilities visited had functioning radios or access to a community radio. In early 1996 the health service was renting a Telecom frequency for a half hour period each day. In the case of an obstetric emergency a nurse could contact a doctor at the provincial hospital through the 24-hour Telecom frequency. Nevertheless, in two of the maternal deaths investigated, staff were unable to make radio contact with the doctors for further advice.

The third problem would be transport, recognised around the developing world as a major constraint to reducing maternal deaths. While over 70% of clinics have their own

canoe and outboard motor (OBM), all of the nurses said that at times they did not have fuel or money to purchase it locally. In the case of an obstetric emergency, the woman's family may be asked to pay for the fuel if there are no clinic funds available. The OBMs seemed to be well maintained and only one nurse reported a broken motor. Those clinics with road access rely on private trucks to transport patients to the hospital. This system may be cheap and reasonably reliable in normal circumstances but the trucks, like canoes, do not run at night. A nurse cannot always secure private transport in an emergency situation and may waste valuable time trying to find a truck to carry a dying woman to hospital. Failure to obtain transport was the main factor in one of the maternal deaths.

If the clinic cannot manage the obstetric emergency the practice is to refer the case to the area health centre partly because it is a policy but also because the centres are en route and have access to the best form of transport to a hospital. The team found that the area health centres were unable to play an adequate role as a referral facility. Compared to the rural health clinics, area health centres offer more facilities such as in-patient beds and a microscopist. But they were unable to offer any further management for an obstetric emergency than is available from the clinics. When the team visited, only one of the three area health centres had syntocinon, used for the treatment of post partum haemorrhage, or haemocel for management of shock. The other two centres do not routinely stock these drugs. One centre was even out of syntometrine. None of the centres had facilities for minor surgery nor anaesthetic drugs such as Ketamin used in the manual removal of retained products. The team found that in two cases investigated, the women were referred to an area health centre but could not be provided with life saving treatment while they were there. In one case a woman was transferred to the area health centre with a retained placenta and was bleeding. By the time she reached the area health centre her condition had deteriorated and she was in shock. The clinic nurse had already commenced an intravenous infusion and repeated syntometrine. The area health centre staff could do no more than refer her to the hospital. She died before arrival at the hospital. In another case a woman who had obstructed labour with full dilatation was referred, on a perilous road trip in the back of a truck, from a centre to the hospital in an effort to save the lives of both the mother and baby. A Ventouse extraction was performed at the hospital. The staff at the area health centre are not trained to perform Ventouse extractions although the equipment is available.

Factors not involved in deaths

At the beginning of the study the team commonly heard four explanations for the large number of maternal deaths in Solomon Islands. These were that the staff were not sufficiently skilled to manage emergencies, that women would not use the health facilities because of concerns about being seen by a male worker, that various customs would prohibit the appropriate use of maternal health services and that home deliveries were a major contributing factor to maternal

deaths. The team found little evidence to support these claims.

Only eight of the thirty-nine nurses interviewed had less than five years experience. All of them routinely delivered between twenty-six and fifty babies a year. Using a score sheet developed for this study, all of the nurses surveyed demonstrated a good knowledge of the management of a number of obstetric emergencies. All nurses interviewed scored more than 80% on the score sheet with 85% of nurses achieving 100%. The majority of nurses had managed a PPH, defined as blood loss of 500 ml. within 24 hours of delivery, or retained placenta in the past five years.

Examination of ante-natal records showed that nurses had a good record of referring women with risk factors to the hospital. They were able to anticipate problematic deliveries and actively encouraged women to attend hospital. The nurses said that very few women refused to attend hospital once they had been referred though unfortunately this was not possible to verify.

The Provincial Health Service endeavours to place a male and female health worker in all rural clinics and most clinics do have male and female staff. Nurse aide posts, however, are only staffed by one worker, who can be either male or female. While the female health staff attend most deliveries, male nurses assist in cases of obstetric emergencies and will attend normal deliveries when no female staff is available. Staff also try to be sensitive to community concerns. One male nurse working alone encouraged women to attend antenatal sessions at another clinic. Another male temporarily without a female nurse to accompany him, brought in a retired female nurse living in the community to perform the deliveries. Many of the male health workers, including all the doctors at the hospital, claimed that they had never been refused permission to examine a woman.

In Malaita events that occurred in the past are referred to as 'time before'. The team quickly learned that this time period can range from more than thirty years ago to last week. and it is essential to ascertain when the events described occurred. Stories told of women dying and going through difficult labours without support because of custom and blood taboos are told as though they happened recently. However, when pressed for more details it soon becomes clear that these are stories of historical events that occurred, in most cases, more than twenty years before.

In 'time before' it was the custom for women in Malaita to have their babies in a hut in the bush, either by themselves or with an untrained attendant. A relative or friend could bring them food and call out instructions from outside the hut, but the women were usually on their own during the delivery. Belief in pollution was widespread with restrictions placed on women during menstruation and childbirth. Women had to deliver away from the village and not return to their homes for

ten days. They then had to stay inside their homes for another ten days. If other women were with them during this seclusion period they would also become polluted and the same restrictions applied. There were no traditional birth attendants, however 'women who knew' would sometimes help. These experienced women used custom medicines and practices to assist with prolonged labour and complications after delivery.

Older women have vivid memories of the women who did not come back to the village after giving birth. It is difficult to prove, but the team came away with the impression that younger women, having heard these stories all their lives, are determined that they will not go through such an experience and are demanding the safer alternative of an attended clinic birth. Importantly, their husbands and other men in the village are supporting them.

None of the villages visited were continuing the practice of birthing huts. The team visited two villages which were known to be custom villages, but even there it is now common practice for women to attempt to deliver in a health clinic. Births in the bush are now births to women visiting their gardens and caught by surprise at the onset of delivery. Births in the village are largely births that occurred during the night when travel to the clinic is hazardous or impossible. Nurses, village women and village men were unanimous in the opinion that it was not 'right' for a husband to refuse to allow a woman to follow the advice of health personnel. Furthermore, village women had a good idea of what constituted danger signs during delivery. Although disharmony in marital relations was widely regarded as the cause of difficult deliveries this did not affect the response to emergencies.

Despite the often stated absence of traditional birth attendants, the team found that a woman termed 'custom midwife' was known to every village. In virtually every case this woman had received some formal training. In a number of cases they were retired nurses or nurse aids. Here the village was directly benefiting from years of human resource development by MHMS and churches. All of these custom midwives used their influence to encourage women to attend antenatal care and to have their deliveries at a clinic.

Recommendations and outcomes

Based on the findings above the team made a number of recommendations. They were intended to be feasible and directly related to saving lives. First, the three area health centres should be strengthened. Second, syntocinon should be available in rural clinics and a protocol for its use in the management of PPH should be established. It is a more effective and more stable drug than syntometrine. Third, the system of supervision and quality assurance should be given higher priority and appropriately resourced. Fourth, a study should be undertaken to identify villages where home births make up the majority of births. Custom midwives in these

villages should be offered training and support by the provincial health service. The team knew that the province would be getting their own radio frequency that would improve communication and did not include it as one of the recommendations.

A year later the director of the provincial health service informed the team that they had instituted most of the recommendations (K. Carroll, *personal communication*, 1996). In particular, health clinics were now stocked with syntocinon. The radio frequency was functioning extremely well and providing some of the support needed for effective supervision. The director reported that there were only two maternal deaths in 1996 and that two had been prevented as a direct result of the changes introduced.

Conclusion

The starting point of this project was the justifiable concern of the MHMS regarding the high number of maternal deaths in Malaita reflected in the national estimates from the recent retrospective sisterhood study. The project came up with the unanticipated finding that, at least in Malaita, maternal mortality was not as frequent as feared. With four direct maternal deaths in both 1994 and 1995, an estimated mortality would be somewhere between 155 per 100,000 based on the number of registered births and 103 per 100,000 based on the projected number of births derived from trends measured in the 1986 census. These estimates exclude indirect maternal deaths and are therefore not directly comparable with the estimates derived from the sisterhood method. However, it does suggest that the current level of maternal mortality in Malaita is well below that prevailing a couple of decades ago. Maternal mortality remains a serious problem in Solomon Islands, but this study was able to put the concern in perspective; the country does not have one of the highest rates in the world.

The simple methodology consisted of four parts: investigation of all reported deaths; identification and investigation of unreported deaths; a survey of health facilities and staff; and interviews with villagers and custom midwives. This work could easily be taken on by other national or provincial health departments in the Pacific.

The systematic study of reported and unreported deaths revealed the unexpected finding that, unlike the findings from studies in the international literature, all of the direct maternal deaths and virtually all of the nonfatal obstetric emergencies were due to PPH. Although other deaths may have gone undetected, this finding focused attention on problems and

solutions which addressed PPH and not causes of death which were not seen in health facilities in Malaita. Another finding of this study is to confirm that a decentralised HIS is better than one which is centralised. In 1995 the reporting of maternal deaths improved because the provincial health service was involved in collecting the data and investigating the deaths. We also learned that in a decentralised system recommendations can be implemented more rapidly at the

provincial level. At the national level there are many additional procedures to follow before a policy can be changed. Finally, by talking to grassroots people in clinics and villages the team were able to go beyond the stereotypes of what local people will and will not do and find out what they are doing. As a consequence, it became ap-

parent that for most of Malaita it was not necessary to encourage women to come to the clinic for antenatal services and delivery - they were already doing that!

“ ... by talking to grassroots people in clinics and villages the team were able to go beyond the stereotypes of what local people will and will not do and find out what they are doing. ”

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