

## Waiting too long: low use of maternal health services in Kalabo, Zambia

J. Stekelenburg<sup>1,2</sup>, S. Kyanamina<sup>2</sup>, M. Mukelabai<sup>2\*</sup>, I. Wolffers<sup>3</sup> and J. van Roosmalen<sup>4</sup>

1 Department of Obstetrics and Gynaecology, University Hospital of Groningen, Groningen, The Netherlands

2 Kalabo District Health Board, Kalabo, Zambia

3 Section Health Care and Culture, Vrije Universiteit Medical Centre, Amsterdam, The Netherlands

4 Department of Obstetrics, Leiden University Medical Centre, Leiden, The Netherlands

### Summary

**OBJECTIVE** To determine the level of use of maternal health services and to identify and assess factors that influence women's choices where to deliver in Kalabo District, Zambia.

**METHODS** A cross-sectional descriptive study conducted between 1998 and 2000, with 332 women interviewed using semi-structured questionnaires. Focus group discussions were held and hospital data and registers were checked.

**RESULTS** Although 96% of respondents would prefer to deliver in a clinic, only 54% actually did, because of long distances, lack of transport, user fees, lack of adequate health education given during antenatal clinic attendances, poorly staffed and ill-equipped institutions with poorly skilled personnel.

**CONCLUSION** Unmarried women, women with higher education and women with formal employment, who are able to pay the user fees and live near a clinic are more likely to deliver in a clinic. This does not guarantee survival, however; maternal mortality is high in the district; health facilities are poorly staffed, poorly skilled and ill-equipped.

**keywords** use, maternity care, maternal mortality, maternity waiting home

### Introduction

Of the more than 515 000 maternal deaths annually, 99% occur in the developing world (Hill *et al.* 2001). Three quarters of these deaths result from direct causes, such as obstetric haemorrhage, sepsis, obstructed labour, hypertensive disorders of pregnancy and abortion. For many decades, the technical means to prevent the overwhelming majority of maternal deaths from these causes have been available. However, maternal mortality is the result of a combination of biological, medical and social factors, which are often inextricably interrelated. What is lacking in many parts of the world is the ability to bring the necessary technical skills to those in need of help. In many parts of the developing world, barriers to health care prevent women to benefit from life-saving interventions. Studies of maternal mortality in low income countries have shown that making pregnancy and childbirth safer first of all means to ensure that women have access to a continuum of care, including appropriate management of pregnancy, delivery and the post-partum period together with access to life-saving emergency obstetric care (EOC) when compli-

cations arise. Access to such care is the crucial component of safe motherhood.

Home births are often the only option for women in low income countries. A large proportion of these home deliveries take place without skilled attendants. The World Health Organization estimates that 60% of births in low income countries occur outside a health facility, with 47% assisted only by traditional birth attendants (TBAs), family members, or without any assistance at all (World Health Organization 1997). Over the last decade, many TBAs have been given midwifery training as part of the safe motherhood strategy. Training of TBAs started in Kalabo in the 1980s, as part of the Western Province Primary Health Care Programme, but the programme has almost collapsed. The programme had low priority, both at national and at district level, and little attention was given to it. If unsupervised, the TBAs tend to slide back into old ways and if unsupported, they are rendered helpless when a killer strikes during childbirth. The impact of trained TBAs (tTBAs) is intangible because of other factors such as accessibility of essential obstetric services (Kamal 1997).

Maternal mortality in Kalabo District is high. The most reliable data are from 1996, when a sisterhood method revealed a maternal mortality ratio (MMR) of 1238 per

\* Deceased.

J. Stekelenburg *et al.* **Low use of maternal health services in Zambia**

100 000 live births (Vork *et al.* 1997). Delay in seeking care, poor accessibility and substandard care factors in health institutions were identified as possible factors responsible for low use of health institutions and high maternal mortality.

In a period between 1998 and 2001, 20 maternal deaths occurred on a total of 1471 live births, corresponding with a MMR of 1359/100 000 live births. All maternal deaths in the hospital were analysed in review meetings since mid-1998, in order to formulate recommendations to prevent substandard care and to gain insight in reasons for delay of seeking care and delayed attendance (Stekelenburg & van Roosmalen 2002).

The MMR in the more privileged regions of the world is 21/100 000 live births (Hill *et al.* 2001). A prospective population-based study in rural Zambia estimated the MMR at 889 per 100 000 live births (Mongu District Health Services 1995). A hospital-based study in a semi-urban area in Zambia showed MMR of 1088 and 2011 per 100 000 live births for 1998 and 1999, respectively (Crabtree 2000).

The cause of differences for MMR between the developing world and the industrialized world is poverty and the failure of health systems in low income countries to provide essential obstetric care for all.

Maternal health use indicators for Kalabo District from 1993 to 2000 are presented in Table 1. Services rendered by TBAs in the district are not included in these figures. The number of institutional deliveries almost doubled, from 1260 in 1994 to 2335 in 2000. The actual institutional deliveries as a percentage of the expected deliveries ranged from 21% in 1994 and 1995 to 39% in the year 2000. The actual number of institutional deliveries as a percentage of the total number of first antenatal attendances ranged from 29% in 1995 to 52% in the year 1997. Zambia's Central Board of Health national guidelines state a target for institutional deliveries of 40 to 50% of expected deliveries in rural districts like Kalabo. The

percentage of first antenatal clinic (ANC) attendance, as a percentage of total expected pregnancies, ranged from 67% to 74%. This was relatively stable, but below the national target of 80%. Use of the different health institutions varies greatly, from 10% in the lowest, staffed by a male clinical officer, to 76% in the highest, staffed by a male family health nurse.

The objectives of this study were to provide data to assist the District Health Management Team (DHMT) of Kalabo District to develop strategies for improving the maternal health services in the district, to gain insight into the level of use of maternal health services in Kalabo District and to assess factors that influence women's choices of delivery.

The theoretical framework of the three delays, as described by Thaddeus and Maine (1994), was used. Delay is assumed to be the key factor attributing to maternal death. If there is prompt and adequate treatment after the onset of an obstetric complication, the outcome will be satisfactory in most cases. The delays distinguished by Thaddeus and Maine are:

Phase 1 delay is in the decision-making process. Factors that can influence the decision to seek care include the woman herself, the husband and/or relatives, the availability and the skills of a tTBA, the ability to recognize high-risk pregnancies and to give the right advice, the status of the woman, illness characteristics (recognition and severity), distance from the health facility (accessibility), financial and opportunity costs (affordability), previous experiences and perceived quality of care.

Phase 2 delay occurs in reaching a health facility. Influencing factors are physical accessibility, travel time from home to facility, the availability and cost of transportation and the condition of roads.

Phase 3 delay occurs before receiving adequate care after arriving at the facility, but also includes substandard care. Influencing factors are the availability of supplies (blood transfusion, intravenous fluids and antibiotics), equipment

**Table 1** Institutional maternal health use in Kalabo District 1993–2000

Year	Number of first ANC attendances	%	Expected deliveries	Actual institutional deliveries	% of number of first ANC visits	% of number of estimated deliveries
1993	4071	67	5864	1262	31	22
1994	4173	68	5881	1260	30	21
1995	4342	71	5898	1267	29	21
1996	4368	71	5915	1471	34	25
1997	4247	69	5932	2195	52	37
1998	4349	70	5950	2142	49	36
1999	4604	74	5968	2268	49	38
2000	4610	74	5986	2335	51	39

Source: annual report Kalabo District Health Services 1993–2000. ANC, antenatal clinic.

and trained personnel, and staff competence (wrong diagnoses and/or action).

## Methods

### Study area and population

Kalabo District is one of the seven districts in Western Province of the Republic of Zambia, situated on the western side of the Zambezi River. The upland forest areas are sandy with a swampy type of vegetation along the Zambezi and its tributaries. The plains get flooded every year and some parts of the plains remain wet throughout the year. Communities living on either side of the flood plains are separated, which sometimes makes visiting health facilities difficult or impossible.

The population projection for 1996 was 114 996 (Central Statistical Office 1996). District growth rate is only 0.3%, because of high migration and mortality. Due to migration of men to sugar cane areas, there is a high percentage of female-headed households with a male to female ratio of 782 : 1000 (Central Statistical Office 1996). Most of the population is involved in subsistence farming or fishing, and is certainly living far below the current national poverty line. The district is virtually cut off from the rest of the country, as there are no roads. Transport by river is seasonal. Within the district there are also no roads, only sandy tracks. There is no formal public transport and there are almost no vehicles, apart from a few government vehicles, based in Kalabo town.

Kalabo District has two first referral hospitals, located only 7 km from each other. There are 14 rural health centres (RHCs), which are unevenly distributed throughout the district. During the flood season, six RHCs are completely cut off from the rest of the district. There are about 150 community health workers and 81 rTBAs. As a result of the vast area, the scattered population and the complete lack of any means of transport, adequate access to health services is not available for all communities in the district. Furthermore, there is a critical shortage of trained staff of all cadres in all health institutions.

### Methodology

A cross-sectional comparative and descriptive study was conducted in Kalabo District between 1998 and 2000. A combination of both quantitative and qualitative methods, each complementing the other, was used in this health system research.

A total of 332 women in the catchment areas of five RHCs were interviewed, using semi-structured

questionnaires. The questionnaires served to obtain information about personal data, obstetric history, and preferences and barriers with regard to delivery services from the respondents. Not all questions were asked to all respondents. Nulliparous women could of course not be included in further statistics concerning the impact of different factors on use of maternal health services. Questions concerning the quality of ANC were only asked to those respondents who visited ANC during pregnancy, and the question about walking distance to the clinic was only put to those who did walk there.

The RHCs were sampled randomly from the 14 RHCs in the district. Within the catchment areas, three villages/ areas were selected, meeting the criteria that there should be an active neighbourhood health committee (NHC) and the village/area should be accessible. The interviewers approached women of reproductive age. Every third woman above the age of 16 years, at different locations in the selected villages, was included. There was not a systematic visiting of households, but interviewers tried to cover different areas in the villages. Whilst the mode of delivery concerned the complete obstetric history, the place of delivery was registered for the last delivery.

Four focus group discussions were held with community members and delegates from NHCs. Three discussions were held with women (only), who were found at the RHCs' premises at the time of the visit. The participants in the focus group discussions were not included in the interview group. The same criteria used for inclusion of respondents to the questionnaires were used. One focus group discussion was held among 10 NHC members, during their visit to Kalabo for a workshop. The focus group discussions served to discuss some of the findings from the questionnaires with mothers in a friendly, protected and traditional atmosphere, thus encouraging the participants to talk freely. Each focus group discussion consisted of 10 people. Prior to the focus group discussions, a chairperson was identified from the community. The discussions were prepared together with the principal investigator, who together with the chairperson identified the areas of discussion. Two members of the research team recorded all the meetings. After the meetings, the recordings were translated, transcribed and analysed by the complete research team.

SPSS was used for statistical analysis of the data. Crude odds ratios were calculated. Adjusted odds ratios and logistic regression was not performed.

Quarterly and annual reports, in-patient registers and delivery registers were used to find data that could give information about the use of services, including the data for use of the ANC. Institutional data were extracted from the Health Management Information System (HMIS) and

Hospital Management Information System (HosMIS), which have been operational in Zambia since 1996.

Checklists were used to assess the presence of equipment to deliver essential obstetric care in the health institutions. Annual reports were used to obtain information about the number of staff employed in the district.

### Definitions

Maternal death was defined as 'death of a woman while pregnant or within 42 days of termination of the pregnancy, irrespective of the duration or the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes', according to WHO's 10th version of the International Classification of Diseases (World Health Organization 1992). MMR is the number of maternal deaths per 100 000 live births.

Direct maternal deaths are those resulting from obstetric complications and indirect maternal deaths are those resulting from existing diseases, aggravated by the physiological effects of pregnancy. In Zambia's HMIS the expected number of deliveries per year is 52 per 1000 population (Central Board of Health 1998).

### Results

Age, parity and delivery mode of delivery in obstetric history were noted in the questionnaires (Table 2).

**Table 2** Background variables (age, parity and delivery methods)

	Frequency	Relative frequency (%)
Age ( <i>n</i> = 332)		
16–25	192	58
26–35	97	29
≥36	43	13
Total	332	100
Parity ( <i>n</i> = 332)		
Nullipara	9	3
1–3	87	26
4–6	126	38
>6	110	33
Total	332	100
Mode of delivery ( <i>n</i> = 323)		
Normal vaginal	267	83
Instrumental vaginal and C-section	56	17
Total	323	100
Total reported deliveries ( <i>n</i> = 1710)		
Normal vaginal deliveries	1636	96
Instrumental vaginal deliveries	26	1.5
Caesarean sections	48	2.8
Total	1710	100

Nullipara represented only 3% of all respondents; 87% of respondents were younger than 36 years (range 16–48); 71% had four or more children. Nullipara were excluded from further statistics. The remaining 323 respondents reported 1710 deliveries; 56 (17%) had once had an instrumental vaginal delivery or caesarean section; total reported instrumental vaginal deliveries and Caesarean section were 74 (48 caesarean sections and 26 instrumental vaginal deliveries), corresponding with a percentage of 4.3 of total reported deliveries (Table 2). Women who had had abortions were not excluded. Abortions were reported 99 times by 42 different respondents (one respondent reported 11 abortions).

In this study 54% of respondents travelled to a health institution (hospital or RHC) for their last delivery, which is higher than the data mentioned in the introduction (from 21% in 1994 and 1995 to 39% in the year 2000; Table 1) and Zambia's Central Board of Health national target of 40–50%. ANC was visited during the last pregnancy by 72% of the respondents. This corresponds with the data mentioned in the introduction, ranging from 67% to 74% (Table 1), but is below the national target of 80%.

### Factors related to delay in obtaining adequate obstetric care

Almost all respondents (96%) had a preference of delivering in a clinic or hospital. Nevertheless, the actual percentage of institutional deliveries, for the last delivery, was 54%. An overview of factors related to delay in obtaining adequate obstetric care is given in Table 3 and 4.

#### *Distance, unavailability of transport and uneven distribution of health facilities*

These cause significant delay in deciding to go to a health institution (phase 1 delay), but also influence the delay caused by the travel time from home to the clinic (phase 2 delay). In many occasions, the decision is taken to stay at home to deliver, even when problems are already evident. While 76% of the respondents have to walk to the clinic, 50% have to walk for 2 h or more. This discourages women from seeking help at an institution and in some occasions they come too late. While 71% of those living within 2 h walking distance delivered in a health institution, only 35% of those living further away did. In focus group discussions participants mentioned that maternity waiting homes, (MWHs) which they knew to exist at district hospitals of other districts, could help to increase the number of women delivering in the health institutions.

**Table 3** Factors with possible impact on use of services (frequencies)

	Frequency (%)
Where to deliver ( <i>n</i> = 332)	
Hospital/clinic	319 (96%)
Home	13 (4%)
Mode of transport/travel time ( <i>n</i> = 323)	
Walking	245 (74%)
<2 h	84 (25%)
>2 h	161 (48%)
Other	87 (26%)
Opinion about user fees ( <i>n</i> = 323)	
Affordable	132 (41%)
Not affordable	191 (59%)
Perceived quality of (general) health care in institutions ( <i>n</i> = 303)	
Good/satisfactory	291 (96%)
Reasonable/poor	12 (4%)
Perceived quality of care in ANC ( <i>n</i> = 232)	
Good/satisfactory	202 (87%)
Reasonable/poor	30 (13%)
Sex preference for delivery care attendants ( <i>n</i> = 323)	
Do not mind	135 (42%)
Female	188 (58%)
ANC visits ( <i>n</i> = 323)	
Visited ANC during pregnancies	232 (72%)
Did not attend ANC during pregnancies	91 (28%)
Health education and knowledge about the EDD among those who attended ANC ( <i>n</i> = 232)	
Received health education	129 (56%)
Knowledge of risk factors and danger signs	35 (15%)
Knowledge about the EDD	105 (45%)
Status of women ( <i>n</i> = 323)	
Married	183 (57%)
Unmarried/divorced/etc.	140 (43%)
Higher education*	62 (19%)
Lower education†	261 (81%)
Formal employment	58 (18%)
No formal employment‡	265 (82%)

\* Secondary school and above.

† Primary school and below.

‡ Agriculture, fishing, beer brewing, business (market), etc. ANC, antenatal clinic; EDD, estimated date of delivery.

The charge of user fees for delivery services also plays a role in decision-making. In 2001 delivery fees were K 3000 (\$1) at hospital level and K 800 (\$0.27) at RHC level. For 59% of the respondents the delivery fees were not affordable. Among the 191 women who said that the fees were unaffordable 44% used the facilities, in the other group 68% delivered in the clinic (OR = 2.7; 95% CI 1.7–4.3).

In focus group discussions participants mentioned that apart from the payment of medical fees, health personnel sometimes instruct women to come with certain

**Table 4** Factors studied and their impact on use (cross tables)\*

	Institutional delivery	Non-institutional delivery
Walking distance and where to deliver [ <i>n</i> = 245, OR = 4.7 (95% CI 2.6–8.3)]		
Walking distance		
<2 h	60	24
>2 h	56	105
Opinion about user fees and where to deliver [ <i>n</i> = 323, OR = 2.7 (95% CI 1.7–4.3)]		
Affordable	90	42
Non-affordable	84	107
Sex preference for delivery care attendants and where to deliver [ <i>n</i> = 323, OR = 3.5 (95% CI 2.2–5.6)]		
No preference	96	39
Preference for female attendant	78	110
Knowledge about risk factors and danger signs of pregnancy and where to deliver [ <i>n</i> = 232, OR = 2.5 (95% CI 1.2–5.4)]		
Adequate knowledge	24	11
Inadequate knowledge	91	106
Knowledge about estimated date of delivery and where to deliver [ <i>n</i> = 232, OR = 3.7 (95% CI 2.1–6.6)]		
Adequate knowledge	82	23
Inadequate knowledge	62	65
Marital status of women and where to deliver [ <i>n</i> = 323, OR = 5.6 (95% CI 3.4–9.1)]		
Unmarried/divorced/etc.	107	33
Married	67	116
Educational level and where to deliver [ <i>n</i> = 323, OR = 2.7 (95% CI 1.5–5.0)]		
Higher education	45	17
Lower education	129	132
Form of employment and where to deliver [ <i>n</i> = 323, OR = 6.1 (95% CI 2.9–13.0)]		
Formal employment	49	9
No formal employment	125	140

\* Different *n* are used in this table. When *n* = 323, all respondents minus the nulliparae (*n* = 9) are included; *n* = 232, those women who visited antenatal clinics are included; *n* = 245 in the crosstable about walking distance, as 245 respondents mentioned to walk to the clinic.

equipment, such as new baby gear, clothes, leather blades, candles, paraffin and maternity pads. Women who failed to produce these items often decided to deliver at home.

The perceived quality of care can influence the decision whether to travel to a clinic or not. The quality of delivery services is perceived as good or satisfactory by 96% of respondents; 87% perceived the quality of ANC as good. However, no significant associations were found between the perceived quality of services and the use of the services.

In Kalabo District, male workers run most clinics and sex preference is a widely discussed issue. A statistically significant association between the mothers' attitude

towards male attendants and the use of services that are exclusively manned by male health workers was found. Women who do not mind to be delivered by a male health worker more often deliver in a clinic (OR = 3.5; 95% CI 2.2–5.6).

Recognition of illness and/or risk factors can be influenced by health education. Only 56% of women who visited the ANC had received health education and 58% of them delivered in a clinic, compared with 48% of the group who did not receive any health education (OR = 1.5; 95% CI 0.8–2.8). Only 15% of women who visited the ANC had adequate knowledge about the risk factors and/or dangers signs of pregnancy. A statistically significant difference was found in the use of delivery services between the group of women who know the risk factors very well and the group of women who do not (OR = 2.5; 95% CI 1.2–5.4).

Women who visited ANC were asked about their estimated date of delivery (EDD), very important to know in order to make a timely decision to seek care. Only 45% knew their EDD and of this group 78% delivered in the clinic (OR = 3.7; 95% CI 2.1–6.6). During focus group discussions it emerged that health workers usually do not inform the expecting mothers about their EDD. Necessary information about the normal time span around the EDD that the delivery can take place is not shared with them. Of course, limited awareness of the date of the last menstrual period of some mothers also plays a role.

The status of women in society can also influence the decision where to deliver. Unmarried women (OR = 5.6; 95% CI 3.4–9.1), women with higher levels of education (OR = 2.7; 95% CI 1.5–5.0) and women with formal employment (OR = 6.1; 95% CI 2.9–13.0) have higher chances of using institutional delivery services. In 47% of cases women themselves decide where to deliver, in 14% the parents, in 11% the husband, in 9% relatives in general and in 3% the tTBA. No significant correlation was found with the percentage of institutional deliveries.

All facilities in Kalabo are poorly staffed. Two RHCs have only untrained staff. Of the 14 RHCs only two have clinical officers, only one has a trained midwife and only six have more than one trained staff. During holidays or annual leaves in eight RHCs no trained staff is therefore available. The two hospitals are also poorly staffed. This results in more than 50% of all deliveries in the two hospitals not being supervised by a trained midwife or doctor. Both hospitals only have one doctor with surgical skills. In one of the two hospitals no instrumental vaginal deliveries can be performed and only classical caesarean sections are performed. Occasionally, both doctors are out of the district at the same time. The inadequate number and the uneven distribution of tTBAs have led to a

situation where some communities, who live very far away from a clinic, do not even have access to a tTBA.

Very few obstetric interventions can be performed at RHC level, because of the lack of trained personnel and/or equipment. No instrumental vaginal extractions, no blood transfusions, treatment of shock with intravenous fluids or antibiotics can be performed. The three main causes of maternal morbidity and mortality (haemorrhage, sepsis and obstructed labour) cannot be adequately treated at RHC level. Only two institutions have full delivery kits for their level. This means that basic EOC cannot be delivered at RHC level.

The two hospitals offer blood transfusion services but do not have a blood bank. This leads to unnecessary delays in adequate treatment. Intravenous fluids and parenteral antibiotics have always been available. Possibilities to diagnose and treat electrolyte and base/acid disorders in severely ill patients are still absent, which also contributes to mortality in some cases.

## Discussion

The use of both quantitative and qualitative methods, each complementing the other, in this health system research, allows the reader to draw some conclusions concerning the use of maternal health services in Kalabo District. Additionally, it gives an example of demand-driven research conducted by locally trained health managers, which was carried out with a very low budget and which led to results and recommendations, which could immediately be implemented at the same local level.

The most probable reason for the sharp increase in institutional deliveries between 1996 and 1997 is an improved data collection in the health institutions. A query still lies in the use of 5.2% of the total population for expected deliveries, as defined by HMIS in Zambia. It is generally felt that these percentages should be reviewed, bearing in mind current demographic and psychological changes in the population because of the HIV/AIDS epidemic. If the real percentage of expected deliveries were below 5.2%, maternal mortality would be higher, but the use of services better than reported. In this study 54% of respondents answered that their last delivery took place in a health institution, which is higher compared with HMIS data, which showed an increase of institutional deliveries from 21% in 1994 and 1995 to 39% in the year 2000.

Nevertheless, maternal health services are underutilized and the MMR is unacceptably high in Kalabo. Maternal mortality is far above 1000/100 000 live births, both with sisterhood method and with hospital data.

Data from tTBAs were not included in the study. Very few data from tTBAs were available from the HMIS. The

J. Stekelenburg *et al.* **Low use of maternal health services in Zambia**

tTBA programme is not running well in Kalabo District, just like the community health worker programme (Stekelenburg *et al.* 2003). The majority of tTBAs are inactive and the programme has low priority, both at district and at national level.

We think that the involvement of trained TBAs is still one of the most important strategies to be followed in rural districts like Kalabo. Despite increasing numbers of researchers and policy makers openly discussing and doubting the impact of tTBA programmes (Smith 2000), it remains one of the very few feasible and affordable options in sub-Saharan Africa, which suffers from economic malaise, a human resources crisis and the HIV/AIDS epidemic. Instead of criticizing the programme, inefficiently using the little available manpower and jumping from one intervention to the other, it would be better for the international health community to join efforts to improve community programmes (Kamal 1997; Walraven & Weeks 1999).

Despite efforts of many researchers to precisely define use and outcome indicators (Ronsmans *et al.* 1999) (major obstetric complications, major obstetric interventions, major obstetric interventions for absolute maternal indication and eclampsia), traditional indicators were used in this study: actual number of supervised deliveries as a percentage of expected number of deliveries, first ANC attendances as a percentage and supervised deliveries as a percentage of first ANC percentages. Populations were too small for the use of other indicators, measuring access to facilities providing basic and comprehensive EOC.

Distance is a significant factor of delay to decide to go to a health clinic (phase 1 delay), but also influences the delay caused by the travel time from home to the clinic (phase 2 delay). The geographical features of the district, the uneven distribution of facilities and the absence of any roads or transport systems were already mentioned. The study confirmed these findings. It is clear and straightforward that these factors do negatively influence the use of institutional delivery services. Confirmation could have been even stronger if even those who answered to use other forms of transport than walking had been asked about walking distance.

In a study in two districts in the Northern Province of Zambia the population attributable risk from poor accessibility was 29% and 65%, respectively (Le Bacq & Rietsema 1997). This confirms and quantifies findings also relevant for Kalabo District.

It was generally felt that the absence of a suitable waiting shelter designed for expecting mothers with high-risk pregnancies could be contributing to the low use of delivery services. Many respondents suggested that separate waiting shelters should be constructed for waiting

mothers. The construction of MWHs is an internationally accepted tool to increase the accessibility and the use of maternal health services and to improve pregnancy outcome (Tumwine & Dungare 1996; World Health Organization 1996; Spaans *et al.* 1998). A further study was conducted to investigate the need and feasibility for an MWH.

A strong correlation was found between the perceived affordability of user fees and attendance. During the focus group discussion, health authorities were requested to reconsider the issue of charging a fee for delivery services. The practice of asking women to bring requirements for the delivery is not part of the cost-sharing scheme, which is accepted at district level.

The large difference between the reasonably high ANC attendance and the lower supervised delivery percentage is still not fully understood. ANC attendance did not influence the decision where to deliver and most women did not receive health education during their ANC attendance. It indicates poor quality of ANC, further substantiated by the finding that only 45% of pregnant women are aware of their EED. This finding stands in direct contradiction with 87% of respondents appreciating the quality of ANC as good. Some respondents might have given wished answers. It could also show that pregnant women's expectations are already met by taking blood pressure and distributing medicines (ferrous sulphate and chloroquine). Women who had a high level of knowledge about risk factors of pregnancy more often delivered in a health institution, which shows the possible positive impact of education.

All assumptions concerning women's status and the decision where to deliver were confirmed. Women with higher education, women with formal employment and unmarried women, in other words women who make their own decisions, have a higher chance to deliver in a clinic. Both economic and social dimensions of the distribution of power between spouses influence the use of services (Beegle *et al.* 2001).

Health facilities in the district are ill staffed and ill equipped. Health workers are not very skilled in obstetrics. RHCs are supposed to act as centres where basic EOC can be given (UNICEF, WHO, UNFPA 1997). This was never the case in Kalabo. Very few complications referred from the communities can be treated and the risk of increased delay is high, because of visiting the RHC. With the recent introduction of radio equipment and the improvement of ambulance services, the most important function for RHCs is to facilitate referrals to the hospital. The District Hospital is able to deal with all obstetric emergencies, but substandard care contributes to maternal morbidity and mortality, as in all hospitals in the world (Stekelenburg & van Roosmalen 2002). Substandard care may also

influence women's decisions where to deliver, which closes the vicious circle of unsafe motherhood. Recommendations were formulated for the District Health Management Team and led to policy changes in many occasions: radio equipment was installed at all RHCs and three ambulances were brought to the district. The maintenance of the communication and transport system was once again emphasized.

With regard to the finding that RHC staff asked women to bring additional requirements to the labour room, DHMT members added this issue to the supportive supervision check list. The charging of user fees for delivery services is part of a national policy and could not be stopped. The RHC staff came to the District Hospital to discuss the results of the study. They received maternal health refresher courses and took notice of findings of the maternal mortality reviews. Together with staff from the District Health Office, they developed programmes to improve the quality of the ANC. Much emphasis was put on the need of proper communication with the clients about where to deliver, the EED, risk factors and fears and expectations about the clinic.

The responsible officers from the DHMT shared findings about staff shortages and poor equipment with the provincial and national authorities. In meetings of the District Development Coordinating Committee representatives from the DHMT shared findings about the correlation between educational level and the distribution of power between spouses and the use of services with representatives from other departments, like education, agriculture and social development.

The hospital was advised to intensify efforts to implement full blood bank services. Problems to attract potential donors could not easily be solved. The HIV/AIDS epidemic and traditional beliefs still stand in the way. The DHMT has written project proposals to attract donors to contribute to improving structures at the mother's shelter, so that an MWH can be opened.

Preferably, after a period of about 5 years, research should be carried to study the impact and the sustainability of the policy changes. An improvement of maternal health indicators could add to the conviction of the authors that this kind of health system research can lead to increasing knowledge of local health managers about their own district health system and facilitate appropriate programme-writing.

#### Acknowledgements

We want to thank Mr H.L. Imasiku, Ms Patricia Ndopu, Ms Jennifer Kabuyana and Ms Elisabeth Kashumba for their contributions in the phase of data collection;

Mr L. Lubilo for his assistance to organise the data and Mrs Nel van Beelen for editing the final draft of this manuscript. The 'Stimuleringsfonds' of the Dutch Society for Tropical Medicine and International Health provided financial support.

#### References

- Beegle K, Frankenberg E & Thomas D (2001) Bargaining power within couples and use of prenatal and delivery care in Indonesia. *Studies in Family Planning* 32, 130–146.
- Central Board of Health (1998) *Health Management Information System; Indicators Manual*. Central Board of Health, Zambia.
- Central Statistical Office (1996) *Zambia Demographic Health Survey*. Central Statistical Office, Zambia.
- Crabtree K (2000) Maternal mortality at Kabwe General Hospital 1998–1999. *Presented at the Annual Netherlands Health Workers and Counterparts Meeting*, Lusaka.
- Hill K, AbouZahr C & Wardlaw T (2001) Estimates of maternal mortality for 1995. *Bulletin of the World Health Organization* 79, 182–193.
- Kamal IT (1997) The traditional birth attendant: a reality and a challenge. *International Journal of Gynaecology and Obstetrics* 63, 43–52.
- Le Bacq F & Rietsema A (1997) High maternal mortality levels and additional risk from poor accessibility in two districts of northern province, Zambia. *International Journal of Epidemiology* 26, 357–363.
- Mongu District Health Services (1995) A study of factors contributing to maternal mortality in Mongu District, Western Province, Zambia. Mongu District Health Services, Mongu (unpublished).
- Ronsmans C, Achadi E, Sutratikto G, Zazri A & McDermott J (1999) Use of hospital data for safe motherhood programmes in South Kalimantan, Indonesia. *Tropical Medicine and International Health* 4, 514–521.
- Smith JB (2000) The impact of traditional birth attendant training on delivery complications in Ghana. *Health Policy and Planning* 15, 326–331.
- Spaans WA, van Roosmalen J & van Wiecken CMAG (1998) A maternity waiting home experience in Zimbabwe. *International Journal of Gynaecology and Obstetrics* 61, 179–180.
- Stekelenburg J & van Roosmalen J (2002) The maternal mortality review meeting; experiences from Kalabo District Hospital, Zambia. *Tropical Doctor* 32, 219–223.
- Stekelenburg J, Kyanamina SS & Wolffers IN (2003) Poor performance of Community Health Workers in Kalabo District, Zambia. *Health Policy* 65, 109–118.
- Thaddeus S & Maine D (1994) Too far to walk: maternal mortality in context. *Social Science and Medicine* 38, 1091–1110.
- Tumwine JK & Dungare PS (1996) Maternity waiting shelters and pregnancy outcome: experience from a rural area in Zimbabwe. *Annual of Tropical Paediatrics* 1, 55–59.



J. Stekelenburg *et al.* **Low use of maternal health services in Zambia**

UNICEF, WHO, UNFPA (1997) *Guidelines for Monitoring the Availability and Use of Obstetric Services*. UNICEF, New York.

Vork FC, Kyanamina SS & van Roosmalen J (1997) Maternal mortality in rural Zambia. *Acta Obstetrica Gynecologica Scandinavica* 76, 646–650.

Walraven G & Weeks A (1999) The role of (traditional) births attendants with midwifery skills in the reduction of maternal mortality. *Tropical Medicine and International Health* 4, 527–529.

World Health Organization (1992) *ICD-10: International Statistical Classification of Diseases and Health Related problems*. WHO, Geneva.

World Health Organization (1996) *Maternity Waiting Homes: A Review of Experiences*. WHO, Geneva.

World Health Organization (1997) *Coverage of Maternity Care. A Listing of Available Information*. WHO/RHT/MSM/96.28. WHO, Geneva.

**Authors**

**J. Stekelenburg**, Halligenweg 13, 9063 DX Molenend, The Netherlands. Tel./Fax: +31 58 2561439;

E-mail: jelle.stekelenburg@wanadoo.nl (corresponding author).

**S. Kyanamina**, Kalabo District Health Board, PO Box 888, Kalabo, Zambia. E-mail: seshekedho@zamtel.zm

**I. Wolffers**, Section Health Care and Culture, Vrije Universiteit Medical Centre, van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands. E-mail: wolffers@cs.com

**J. van Roosmalen**, Department of Obstetrics, Leiden University Medical Centre, Albinusdreef 2, 2333 ZA Leiden, The Netherlands. E-mail: j.j.m.van\_roosmalen@lumc.nl

**M. Mukelabai** (deceased).