

Skilled or Traditional Birth Attendant? Choices of Communities in Lukulu District, Rural Zambia

Jossy van den Boogaard, APRIORI (African Poverty Related Infection Oriented Research Initiative), Radboud University Nijmegen Medical Centre, the Netherlands, and Kilimanjaro Christian Medical Centre, Moshi, Tanzania

Bart Arntzen, General Practice Medicine, University Medical Centre Groningen, The Netherlands

Junist Chilwana, Lukulu District Health Office, Lukulu, Zambia

Martin Liyungu, Lukulu District Health Office, Lukulu, Zambia

Albert Mantingh, Department of Obstetrics and Gynaecology, University Medical Centre Groningen, The Netherlands

Jelle Stekelenburg, Department of Obstetrics and Gynaecology, Medisch Centrum Leeuwarden, The Netherlands

Jelle Stekelenburg, Henri Dunantweg 2, 8934 AD Leeuwarden, The Netherlands, Tel: +31 58 2866666, Email: jelle.stekelenburg@wanadoo.nl

Abstract

Objective: To analyse factors that contribute to the choice of either traditional birth attendants (TBAs) or skilled birth attendants (SBAs) by inhabitants of Zambia's Lukulu District.

Design: Cross-sectional descriptive survey.

Settings: Lukulu District, Western Province, Zambia.

Population: 1413 participants: parous women, their husbands, village headmen and elderly women.

Main outcome measures: Preferred and actual place of birth.

Methods: Questionnaires, structured interviews and focus group discussions

Results: 42% of women gave birth in a health facility, assisted by SBAs; 75% prefer to give birth in a health facility; many barriers are to be passed for women to reach a skilled attendant in time.

Conclusion: Skilled birth attendants are preferred to assist at childbirth in Lukulu District. Transportation problems, sociocultural reasons and unpreparedness still cause the majority of women to turn to traditional birth attendants. Traditional birth attendants should not yet be excluded from safe motherhood programs.

Introduction

By the year 2015, the number of women dying because of pregnancy-related complications should be reduced by 75% worldwide, as is stated in the United Nations Millennium Project (2006).

The current international policy on reducing the maternal mortality ratio (MMR) is to train more skilled birth attendants (SBAs), who should assist all pregnant women at childbirth. SBAs are people with midwifery skills (e.g., doctors, midwives, nurses) trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer complications (Starrs 1998). The definition excludes traditional birth attendants (TBAs), because they lack the resources to manage obstetric complications. Investing in the training of TBAs therefore no longer has priority (Kruske and Barclay 2004).

Like many African countries, Zambia is facing a human resource crisis in health. In rural areas, 60% of women are assisted by TBAs at childbirth (Central Statistical Office Lusaka 2001–2002). Increasing the number of SBAs so that every Zambian woman can be assisted by one at childbirth does not seem realistic in the short term. Besides, factors such as distance and transportation difficulties, socio-cultural ideas about childbirth and fear that SBAs could have a poor attitude may keep women from turning to them (Thaddeus and Maine 1994, Walraven et al. 2000, Kruske and Barclay 2004, Cham et al. 2005, Osubor et al. 2006).

Objectives

Our objectives in this paper are twofold: to analyse the factors that contribute to the choice of either TBAs or SBAs by inhabitants of Zambia's Lukulu District and to evaluate whether current international policy to exclude TBAs from safe motherhood programs is suitable for the district (and comparable poor rural districts).

Methodology

Study area and Population

Lukulu District is a rural district in the northern part of Zambia's Western Province. The total population is estimated at 78,737 and the district covers about 16,000 square kilometres (Lukulu District Health Office 2005). The majority of the population have no substantial source of income, and the district has no major industries that provide formal employment. Subsistence farming and small-scale fishing are the main ways of making a living. The western part of the district is flooded by the Zambezi River half of the year and is inaccessible during the rainy season. The district can only be crossed on dirt tracks.

Lukulu District Hospital is the only hospital in the district and meets the criteria for provision of comprehensive emergency obstetric care (EmOC) on most occasions. The distance from the 13 health centres to the hospital ranges from 12 to 127 kilometres. Health centre staff are supposed to provide basic EmOC.

Seventy-nine TBAs have been trained by the district's midwives and clinical officers. The training was based on a World Health Organization training program (Cabral et al. 1992), adjusted to national and local circumstances. Trained TBAs are supposed to assist women who choose to give birth in the village. The number of untrained TBAs in the district is not known, since they are not registered by the district's health board.

The exact number of maternal deaths in Lukulu District is also not known. The MMR in neighbouring Kalabo District, which has comparable features, was estimated at 1238 deaths per 100,000 live births (Vork et al. 1997), in a sisterhood method (a method to obtain information from a large population by interviewing respondents about the survival of all their adult sisters). Calculations using hospital-based data for Kalabo District showed an MMR of 1359 per 100,000 live births (Stekelenburg & van Roosmalen 2002).

Methods

Eight health centres and their catchment areas were selected for convenience. Data were collected by means of standardized, structured interviews from women who had given birth at least once in the past 5 years (abortions excluded, stillbirths included), husbands of parous women, and elderly women who had not given birth in the past 5 years. Village headmen of all selected villages were also interviewed.

Sample-size calculation was based on finding a significant difference of 60% in preference for either a TBA or an SBA (two-tailed, 95% confidence interval, 95% power). Sample sizes for parous women, husbands and elderly women had to be at least 369 each.

Motives for the choice of birth attendant were categorized (after interviewing). A *medical reason* was defined as a medical problem (in the respondent's view). Unexpected, fast progress of labour, making it impossible to reach the health centre in time, was called *fast delivery*. To *economic reasons* belonged financial and/or transportation problems. Motives such as expected witchcraft and gender of the birth attendant were grouped as *socio-cultural reasons*. When the respondent explicitly appreciated the fact that the chosen birth attendant was trained, the reason *trained staff* applied. Other reasons or unknown reasons were grouped as other.

Eight interviewers, all health centre staff members fluent in English and the two major local languages (Lozi and Luvale), were selected for data collection. The interviewers were trained in a 1-day session, during which questions and interviewing strategies were discussed.

The interviewers conducted their interviews in villages selected for convenience, divided in three categories:

Villages within a 30-minute walk from the health centre (category I)

Villages more than a 30-minute walk but less than a 2-hour walk from the health centre (category II)

Villages more than a 2-hour walk from the health centre (category III)

The included villages all consisted of at least three different households. Interviewing occurred in private to avoid getting copied answers. The anonymity of participants was guaranteed. Four focus group discussions (two with women only, two with men only) were done to obtain additional information.

Data were coded and recorded on data master sheets, using the software program Epi Info version 3.3.2 (Centres for Disease Control, Atlanta). Significant differences, bivariate odds ratios (OR) and 95% confidence intervals (95% CI) were calculated using ANOVA and chi-square tests. Results of the focus group discussions were used to complement interview data.

Three levels of obstetric care are distinguished in this survey: care by untrained TBAs, by trained TBAs and by health centre or hospital staff (SBAs).

Definitions

Skilled birth attendants are people with midwifery skills (e.g., doctors, midwives, nurses) trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer complications.

Traditional birth attendants are community-based providers of care during pregnancy and child-birth. TBAs are not trained to proficiency in the skills necessary to manage or refer obstetric complications. TBAs are not usually salaried, accredited members of the health system.

Limitations

Bias might have been introduced by the selection of interviewers, health centres and respondents. Interviewers were recruited from health centre personnel. Health centres and their catchment areas were selected for convenience, taking into account compromised accessibility during the study

period, which was the flood season. Only healthcare clients and their husbands were interviewed, not healthcare providers.

Results

Characteristics of the participants of 162 villages are summarized in Table 1. Overall, 444 parous women, 429 husbands, 378 elderly women and 162 village headmen were interviewed.

Age, parity, marital status and educational level of the women did not influence the choice of birth attendant. Trained TBAs were more present in category III than in category I and II villages ($p = .03$). Untrained TBAs were present in more category II and III than in category I villages ($p = .002$). Parous women from category I villages had a higher level of education than women from category II and III villages ($p < .001$). Husbands, elderly women and village headmen showed no differences in characteristics.

Table 1. Characteristics of the study population in total and per category of villages

Parameter	All villages together	Per village category*			p-value
		I	II	III	
Villages (n)	162	49	54	59	
Inhabitants per village (mean)	66	60	53	82	> .05
% of villages in which t-TBA† present	40	33	34	50	.043
% of villages in which TBA‡ present	68	51	77	75	.002
Parous women (n)	444	136	148	160	
Age (mean, years)	29.4	29.8	28.7	29.5	> .05
Parity (mean)	4.3	4.5	4.0	4.3	> .05
Number of children (mean)	3.5	3.7	3.3	3.4	> .05
% married	74	71	77	75	> .05
Education:% not educated	16	15	14	20	> .05
% grade 1–4	32	18	42	34	< .001
% grade 5–8	47	56	43	41	.007
% grade 9–12	5	11	1	5	.001
Husbands of parous women (n)	429	136	155	138	
Age (mean, years)	35.6	35.8	35.6	35.3	> .05
Number of children (mean)	4.5	4.5	4.1	4.8	> .05
Number of women married to (mean)	1.1	1.1	1.1	1.1	> .05
Education:% not educated	12	9	11	15	> .05
% grade 1–4	23	22	26	19	> .05

Table 1. Continued

% grade 5–8	47	53	45	45	> .05
% grade 9–12	18	16	18	21	> .05
Elderly women (n)	378	107	135	136	> .05
Age (mean, years)	56.6	58.4	56.8	54.9	> .05
Parity (mean)	7.2	7.4	7.4	6.8	> .05
% married	54	49	56	56	> .05
Education: % not educated	43	45	39	45	> .05
% grade 1–4	34	36	37	29	> .05
% grade 5–8	20	18	20	23	> .05
% grade 9–12	3	1	4	3	> .05
Village headmen (n)	162	49	54	59	
Age (mean, years)	63.5	62.6	65.6	62.3	> .05
% married	88	89	89	86	> .05
Education: % not educated	21	20	22	20	> .05
% grade 1–4	38	35	35	42	> .05
% grade 5–8	28	27	35	22	> .05
% grade 9–12	13	18	8	16	> .05

*Category I: villages within a 30-minute walk from the health centre; category II: villages more than a 30-minute walk but less than a 2-hour walk from the health centre; category III: villages more than a 2-hour walk from the health centre.

† t-TBA = trained traditional birth attendant.

‡ TBA = untrained traditional birth attendant.

Table 2 shows that the latest delivery of parous women between 2000 and 2005 was assisted by SBAs in 42%, trained TBAs in 28% and untrained TBAs in 29% of cases. Three women (1%) gave birth without any help. Distance influenced the choice of birth attendant: more women from category I villages gave birth in the health centre than women from more remote villages ($p < .001$, $OR=2.06$, 95% CI 1.34–3.16). Fewer women from category I villages were assisted by untrained TBAs than women from category II and III villages ($p < .001$, $OR=0.31$, 95% CI 0.17–0.53). The educational level of parous women did not influence the choice of birth attendant (data not shown).

A multivariable logistic regression analysis (binominal, i.e., SBAs versus trained and untrained TBAs) was performed to investigate whether age, marital status and education of women, and the distance from their village to the health centre, were independently affecting the choice of birth attendant. Only distance to the health centre was significantly associated with the choice of birth attendant ($p = .003$).

Table 2. Birth attendant at previous childbirth per category of villages

	All villages	Cat I	Cat II	Cat III	p-value (2)
SBA	42%	54%	38%	34%	.002
Trained TBA	28%	30%	24%	31%	> .05
Untrained TBA	29%	15%	38%	34%	< .001
No one	1%	1%	0%	1%	> .05
Total	100% (n = 444)	100% (n = 136)	100% (n = 148)	100% (n = 160)	

Table 3 shows the motives for the choice of birth attendant at the previous birth: 44% of women who gave birth in the health centre or hospital mentioned confidence in the skills of birth attendants in these facilities, and 54% of women who were assisted by a trained TBA had the same motive. When labour progressed fast, untrained TBAs were called for help (38%). TBAs, both trained and untrained, were chosen for socio-cultural reasons (24% and 31%, respectively).

Economic reasons were more often mentioned as a motive for choosing an untrained TBA, and socio-cultural reasons were more often mentioned to explain the choice of a TBA. Fast delivery was mainly a motive of women who were assisted by untrained TBAs.

Table 3. Motives for choice of birth attendant at previous childbirth per chosen birth attendant

	SBA (1)	Trained TBA (2)	Untrained TBA (3)	Pair-wise analysis of:	p-value of pair-wise analysis	OR of pair-wise analysis	95% CI of pair-wise analysis
Medical reason	11%	0%	1%	1 versus 2+3	< .001	31	5–1281*
Fast delivery	4%	7%	38%	1+2 versus 3	< .001	0.09	0.05–0.17
Economic reason	7%	10%	16%	1 versus 2+3	.045	0.51	0.25–1.04
				1+2 versus 3	.01	0.46	0.23–0.89
Socio-cultural reason	14%	24%	31%	1 versus 2+3	< .001	0.43	0.25–0.73
Trained staff	44%	54%	1%	1+2 versus 3	< .001	119	20–4783*
Other	20%	5%	13%	1+3 versus 2	< .001	4.1	1.7–12.0*
Total	100% (n = 185)	100% (n = 125)	100% (n = 130)				

* Exact confidence limits, because of small numbers in some cells.

OR = odds ratio; 95% CI = 95% confidence interval.

Table 4 shows the preference of birth attendant for the next childbirth. Ninety percent of women who gave birth in a health facility prefer to give birth in this facility again. Forty-seven percent of women assisted by a trained TBA wish to be assisted by the trained TBA again, and 9% of women again prefer the help of the untrained TBA.

Table 4. Birth attendant preferred at next childbirth compared to birth attendant at previous childbirth

Previous delivery Next delivery	SBA	Trained TBA	Untrained TBA
SBA	90%	52%	74%
Trained TBA	10%	47%	17%
Untrained TBA	0%	1%	9%
Total	100% (n = 185)	100% (n = 125)	100% (n = 130)

Table 5 shows that the majority of women prefer an SBA to assist their next delivery. No significant difference was found in preferences between the different groups of participants.

Table 5. Preferred birth attendant at next childbirth

	Survey population (total group)	Parous women	Husbands	Elderly women	Village headmen
SBA	75%	74%	76%	77%	70%
Trained TBA	22%	23%	22%	20%	23%
Untrained TBA	3%	3%	2%	3%	7%
Total	100% (n = 1413)	100% (n = 444)	100% (n = 429)	100% (n = 378)	100% (n = 162)

Table 6 shows that 69% of parous women prefer to give birth in the health centre or hospital, because of the presence of trained staff; 75% of women who prefer an untrained TBA have socio-cultural reasons for doing so.

Table 6. Motives of parous women for preferred birth attendant

	SBA	Trained TBA	Untrained TBA
Economic reason	1%	15%	8%
Socio-cultural reason	23%	32%	75%
Trained staff	69%	46%	0%
Other	7%	7%	17%
Total	100% (n = 328)	100% (n = 102)	100% (n = 13)

Discussion

Whereas 75% of study participants would prefer to give birth in a health facility, only 42% of women actually did so for their previous delivery. Although 29% of women were assisted by untrained TBAs at the last delivery, only 3% prefer assistance of an untrained TBA at their next delivery. In other words, there is a difference between preference and actual choice. This was also found by Voorhoeve et al. (1982) and Stekelenburg et al. (2004). All villagers participating in the focus group discussions explained the difference by referring to the lack of transportation from their village to the health centre.

The distance from village to health centre contributes to phase-one and phase-two delay in receiving adequate obstetric care (Thaddeus and Maine 1994). Distance may delay or postpone the decision to go to the health facility (phase one), and it determines travel time from village to health centre (phase two). During the rainy season, some health centres are not accessible at all due to heavy floods.

To overcome transportation problems and reach a health centre when labour has already started, mothers' shelters (maternity waiting homes), places where women can wait for labour during the last few weeks of pregnancy, were constructed near some health centres. Although practical problems such as the provision of food and care for other children need to be solved (Figa'-Talamanca 1996), maternity waiting homes can function well, as long as basic elements are provided (Stekelenburg et al. 2006).

Women who were assisted by SBAs or trained TBAs value highly that these birth attendants are trained to conduct "a clean and safe delivery." The presence of a radio system to communicate with the hospital in case of complications was important to women who gave birth in a health centre. Most inhabitants of Lukulu District seem to be aware of some of the dangers of pregnancy and delivery. They express overwhelming confidence in the capacity of health centre staff. Trained TBAs belong to the same category as trained, qualified staff according to many villagers. They are seen as "the eyes of the health centre."

This comparison of the skills of trained TBAs with those of health centre staff is realistic. At least half of the deliveries in health centres are attended by classified daily employees (CDEs) who, like trained TBAs, have no formal medical education. Only female CDEs were trained in obstetrics, during a 3-week course comparable to the training given to TBAs. So, whereas all health centre staff were referred to as SBAs in this survey, the term applies to half of them at most. This illustrates the current worldwide discussion about the definition of a skilled attendant. Some attendants who are supposed to be skilled are not (Harvey et al. 2007), and trained TBAs might be more skilled than expected.

A remarkably high number of women described an emergency situation (fast delivery) to explain why an untrained TBA conducted the delivery. Apparently untrained TBAs are rescuers for those who cannot reach the health facility in time. They are present in most villages.

The socio-cultural role of trained and untrained TBAs should not be underestimated. Their practices often stem from deeply rooted cultural ideas (Lefèber 1994), and they are highly respected in rural communities for socio-cultural reasons (Kruske and Barclay 2004). Trained TBAs could therefore play an influential role in linking communities to health facilities, for example, by educating communities about risks of pregnancy and delivery, informing women about their estimated date of delivery, assisting them in being well prepared and providing them with continuous emotional support (van Roosmalen et al. 2004).

While national and regional programs should focus on increasing the numbers of properly trained midwives, in certain districts where serious shortages of trained health workers exist and investments have been made in the past to empower and train TBAs, continuation of TBA-support programs should be considered. A short-term additive value can be expected. This strategy will succeed only if both TBAs and health workers are willing to co-operate. Regular training should be organized for TBAs, and they should be compensated for the work they do. Providing them with a regularly replenished delivery kit and a mode of transportation (e.g., a bicycle), or a small salary, is worth

considering. On these conditions, TBAs could be of great value at improving pregnancy outcome in developing countries. Indicators to evaluate the effect of such programs should be developed, for example, the number of referrals or percentage of skilled attendants (including trained TBAs) present during delivery. Maternal mortality ratios are not appropriate indicators to evaluate the effect of TBA support programs at the district level.

Conclusion

Although TBAs conduct more deliveries than SBAs in Lukulu District, the majority of women prefer SBAs to TBAs. The closer women live to a health facility, the more likely they are to choose to give birth there. Whereas trained TBAs and SBAs are preferred because of their skills acquired by training, untrained TBAs assist when lack of time, transportation or money keep women in labour from reaching the health centre. As long as there is no improvement in the district's poverty level and infrastructure, women will continue to give birth in the village without the assistance of SBAs. Socio-cultural reasons for assistance from TBAs will not be easy to overcome. Besides, the current number of SBAs in Zambia is too small to assist all women in labour. Therefore, TBAs cannot yet be excluded from safe motherhood programs.

Authors' Contributions

Josy van den Boogaard, MD, former research officer Lukulu District. Initiated and carried out the survey. Drafted first version of the manuscript.

Bart Arntzen, MD, former MD Lukulu District Hospital. Initiated the survey. Revised the manuscript critically for substantial intellectual content.

Junist Chilwana, health worker Lukulu District, participated in the survey.

Martin Liyungu, health worker Lukulu District, participated in the survey.

Albert Mantingh, MD, PhD, consultant obstetrician. Supervised the survey and revised the manuscript critically for substantial intellectual content.

Jelle Stekelenburg, MD, PhD, consultant obs & gyn. Initiated and supervised the survey, revised the first manuscript critically for substantial intellectual content and drafted the manuscript for *Journal of World Health and Population*.

References

- Cabral, M., I. Kamal, V. Kumar and L. Mehra. 1992. *Training of traditional birth attendants (TBAs). A guide for TBA trainers*. Geneva: World Health Organization.
- Central Statistical Office, Lusaka, Zambia. Central Board of Health, Lusaka, Zambia. 2001–2002. "Chapter 1. Introduction"; "Chapter 9. Maternal and Child Health." *In Zambia, Demographic and Health Survey*, pp. 1–11; 127–53. Calverton, Maryland: ORC Macro.
- Cham, N., J. Sundby and S. Vangen. 2005. "Maternal Mortality in the Rural Gambia, a Qualitative Study on Access to Emergency Obstetric Care." *Reproductive Health* 2(1):3.
- Figa'-Talamanca, I. 1996. "Maternal Mortality and the Problem of Accessibility of Obstetric Care; the Strategy of Maternity Waiting Homes." *Social Science & Medicine* 42(10): 1381–90.
- Harvey, S.A., Y.C.W Bland n, A. McCaw-Binns, I. Sandino, L. Urbina, C. Rodríguez, I. G mez, P. Ayabaca, S. Djibrina and the Nicaraguan maternal and neonatal health quality improvement group. 2007. "Are Skilled Birth Attendants Really Skilled? a Measurement Method, Some Disturbing Results and a Potential Way Forward." *Bulletin of the World Health Organization* 85(10): 783–90.
- Kruske, S. and L. Barclay. 2004. "Effect of Shifting Policies on Traditional Birth Attendant Training." *Journal of Midwifery & Women's Health* 49(4): 306–11.
- Lefèber, Y. 1994. *Midwives Without Training. Practices and Beliefs of Traditional Birth Attendants in Africa, Asia and Latin America*. Assen, The Netherlands: Van Gorcum & Comp.
- Lukulu District Health Office. 2005. "Annual Reports Lukulu District Hospital." Zambia.
- Osubor, K.M., A.O. Fatusi and J.C. Chiwuzie. 2006. "Maternal Health-Seeking Behaviour and Associated Factors in a Rural Nigerian Community." *Maternal and Child Health Journal* 10(2): 159–69.

- van Roosmalen, J., G. Walraven, J. Stekelenburg and S. Massawe. 2004. "Integrating Continuous Support of the Traditional Birth Attendant into Emergency Obstetric Care by Skilled Midwives and Doctors: a Cost-Effective Strategy to Reduce Perinatal Mortality and Unnecessary Interventions." *Tropical Medicine & International Health* 10(5): 393–4
- Starrs, A. 1998. *The Safe Motherhood Action Agenda. Priorities for the Next Decade, Report on the Safe Motherhood Technical Consultation*, 18–23 October 1997, Colombo, Sri Lanka. New York, NY: Family Care International.
- Stekelenburg, J. and J. van Roosmalen. 2002. "The Maternal Mortality Review Meeting: Experiences from Kalabo District Hospital, Zambia." *Tropical Doctor* 32(4): 219–23.
- Stekelenburg, J., S. Kyanamina, M. Mukelabai, I. Wolffers and J. van Roosmalen. 2004. Waiting too long: low use of maternal health services in Kalabo, Zambia. *Tropical Medicine & International Health* 9(3): 390–8.
- Stekelenburg, J., L. van Lonkhuijzen, W.A. Spaans and J. van Roosmalen. 2006. "Maternity Waiting Homes in Rural Districts in Africa; a Cornerstone of Safe Motherhood?" *Current Women's Health Reviews* 2: 235–8.
- Thaddeus, S. and D. Maine. 1994. "Too Far to Walk: Maternal Mortality in Context." *Social Science & Medicine* 38(8): 1091–110.
- United Nations Millennium Project. 2006. "Millennium development goals." Retrieved: April 17, 2008. <<http://www.unmillenniumproject.org/who/who07.htm>>
- Voorhoeve, A.M., C. Kars and J.K. van Ginneken. 1982. "Machakos Project Studies. Agents Affecting Health of Mother and Child in a Rural Area of Kenya. XXI Antenatal and Delivery Care." *Tropical and Geographical Medicine* 34: 91–101.
- Vork, F.C., S. Kyanamina and J. van Roosmalen. 1997. "Maternal Mortality in Rural Zambia." *Acta Obstetricia et Gynecologica Scandinavica* 76: 646–50.
- Walraven, G., M. Telfer, J. Rowley and C. Ronsmans. 2000. "Maternal Mortality on Rural Gambia: Levels, Causes and Contributing Factors." *Bulletin of the World Health Organization* 78(5): 603–13