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Out-of-pocket costs for facility-based maternity care in three African countries

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Objective To estimate out-of-pocket medical expenses to women and families for maternity care at all levels of the health system in Burkina Faso, Kenya and Tanzania.

Methods In a population-based survey in 2003, 6345 women who had given birth in the previous 24 months were interviewed about the costs incurred during childbirth. Three years later, in 2006, an additional 8302 women with recent deliveries were interviewed in the same districts to explore their maternity care-seeking experiences and associated costs.

Findings The majority of women interviewed reported paying out-of-pocket costs for facility-based deliveries. Out-of-pocket costs were highest in Kenya (a mean of US$18.4 for normal and complicated deliveries), where 98% of women who delivered in a health facility had to pay some fees. In Burkina Faso, 92% of women reported paying some fees (mean of US$7.9). Costs were lowest in Tanzania, where 91% of women reported paying some fees (mean of US$5.1). In all three countries, women in the poorest wealth quintile did not pay significantly less for maternity costs than the wealthiest women. Costs for complicated delivery were double those for normal delivery in Burkina Faso and Kenya, and represented more than 16% of mean monthly household income in Burkina Faso, and 35% in Kenya. In Tanzania and Burkina Faso most institutional births were at mid-level government health facilities (health centres or dispensaries). In contrast, in Kenya, 42% of births were at government hospitals, and 28% were at private or mission facilities, contributing to the overall higher costs in this country compared with Burkina Faso and Tanzania. However, among women delivering in government health facilities in Kenya, reported out-of-pocket costs were significantly lower in 2006 than in 2003, indicating that a 2004 national policy eliminating user fees at mid- and lower-level government health facilities was having some impact.

Keywords Maternal health care, costs, Kenya, Tanzania, Burkina Faso

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KEY MESSAGES

- Clients' estimates of out-of-pocket costs for maternity care show that they constitute a significant percentage of household income in three African countries.
- Costs at health centres and dispensaries are less than those paid at hospitals, but poorer women do not pay significantly less than the wealthiest women in any country.

Introduction

Increasing skilled attendance at birth is widely recognized as a priority strategy for reducing maternal mortality, and skilled attendance is being used as the target indicator to measure progress toward the fifth Millennium Development Goal of improving maternal health (MDG 5). In the developing world, however, only 57% of deliveries are attended by skilled attendants (United Nations 2007). In some regions, such as sub-Saharan Africa and South Asia, there has been little improvement in skilled attendance during the past two decades, and less than one-third of deliveries are attended by a doctor, nurse or midwife (Koblinsky *et al*. 2006). Indeed, at the midpoint to the target date for achieving the Millennium Development Goals, available data suggests that we are not on track to reach MDG 5 targets, particularly in sub-Saharan Africa (Hill *et al*. 2007). Accelerating progress will require intensified and sustained efforts to address both the critical under-supply of maternity care, particularly at primary care levels, and the barriers that limit women's use of these services before, during and after childbirth (Koblinsky *et al*. 2006; Bhutta *et al*. 2008).

Various studies (Leslie and Gupta 1989; Thaddeus and Maine 1994; Bloom *et al*. 2001; Hotchkiss *et al*. 2005; Haddad *et al*. 2006; Parkhurst *et al*. 2006; Gage 2007) have identified a range of social, economic and geographic factors that contribute to low use of skilled maternity care during childbirth. These factors include—among others—quality of care; distance; lack of transport to sites where skilled care is available; women's low social status, education levels, lack of autonomy, and decision-making power; and cultural norms that encourage home birth or discourage the use of facility-based care. Costs—both direct and indirect—have also been shown to be an important barrier to women's use of facility-based maternity care (Stanton and Clemens 1989; Nahar and Costello 1998; Gwatkin 2004; McIntyre *et al*. 2006; Koenig *et al*. 2007).

Direct out-of-pocket costs associated with maternity care include all formal, official fees charged for delivery care, bed stay, and required drugs and supplies. Official fees or user fees were introduced in many sub-Saharan African countries in the late 1980s and early 1990s as both an alternative to tax-based financing for government health services and as a means of generating increased accountability to communities and improving the quality of care (Gilson 1997; Ensor and Ronoh 2005). More recently, however, in view of the regressive nature of user fees in practice and the often negative impact of user fees on utilization of preventive health services, many countries in the region have begun to reduce or eliminate such user fees (Gilson 1997; Ensor and Ronoh 2005).

Direct costs may also include informal or unauthorized fees charged or required by the staff for care, drugs or supplies—both in settings where fees are officially charged, and in settings where maternal health services are nominally free of charge (Nahar and Costello 1998; Ensor and Ronoh 2005; McIntyre *et al*. 2006). These informal fees may be substantial; in one study in Bangladesh, unofficial fees were on average 12 times higher than official fees (McIntyre *et al*. 2006). Similarly, Sharma *et al*. (2005) found that in India, informal fees were five times formal fees, and represented 80% of total out-of-pocket expenses, whereas in Kenya, informal fees for maternal health services represented 59% of total out-of-pocket expenses paid by pregnant women. Direct costs of maternity care-seeking may also include various non-medical expenses, including the cost of transport to a health facility, the costs of food for the pregnant woman, and accommodation and upkeep for any family members who accompany her—costs that have been estimated to constitute as much as 50% or more of all direct costs (Ensor and Ronoh 2005; Borghi *et al*. 2006b; McIntyre *et al*. 2006).

In addition to direct financial expenditures, there may be additional indirect costs of care-seeking, such as lost wages or earnings. Such costs are difficult to measure as they vary according to income and employment status, and may be subject to seasonal variation as well. However, some studies have suggested that indirect costs of care-seeking can exceed direct out-of-pocket costs (Ensor and Cooper 2004; McIntyre *et al*. 2006).

Assessing out-of-pocket costs of health services is challenging and potentially sensitive— especially when medical costs differ markedly from official service delivery policies and norms. Several recent studies on out-of-pocket costs of maternity care in low income countries in sub-Saharan Africa and Asia have consistently shown that out-of-pocket costs of maternity care vary considerably depending on the type of delivery (normal or complicated), as well as the type of health facility (public vs. private) and the level of the health system (Kowalewski *et al*. 2002; Borghi *et al*. 2003; Levin *et al*. 2003; Borghi *et al*. 2006a; Borghi *et al*. 2006b). In Uganda, Malawi and Ghana, for example, Levin *et al*. (2003) found that out-of-pocket costs for normal delivery (including user fees, travel costs and accommodation costs) ranged from US$2.30–22.80 in Uganda, US$0.40–7.90 in Malawi, and US$12.60–20.70 in Ghana. Fees for complicated deliveries were considerably higher, ranging from US$13–59 in Uganda to US$68–140 in Ghana.

These and other available data have been collected through relatively small studies and interviews with clients at health facilities. For the most part, they have not given a population-based overview of out-of-pocket expenses for maternity care, or of the extent to which actual expenditures differ from official policies—information that is important both in settings

where cost-sharing is in place, and in settings where maternity care is officially provided free of charge.

As part of a maternal health intervention[1] aimed at increasing women's use of facility-based maternity care in Burkina Faso, Kenya and Tanzania, population-based household surveys were conducted in 2003 and 2006 to measure changes in skilled attendance and related maternity care-seeking behaviours in six districts. The intervention package itself was focused on improving the quality and accessibility of maternity care, particularly at peripheral health facilities, rather than influencing the costs of maternal health services or the ability of users to pay for services through the introduction of prepayment or insurance schemes, community loan funds, waiver systems or cash transfers. However, the two surveys provided a unique opportunity to gather information on out-of-pocket medical costs paid by women for maternity care and to evaluate changes over time. By obtaining the costing data through a population-based survey, it was also possible to estimate the percentage of all women in a population who must pay these costs and the extent to which out-of-pocket medical costs vary across wealth quintiles. In addition, in Kenya, where user fees for maternal health services were eliminated by the government between the two surveys, the data provides a picture of the extent to which the policy change has affected women's expenditures on maternity care.

Methodology

Study area

Representative population-based surveys were conducted in two districts in each of the three countries: Ouargaye and Diapaga districts in south-eastern and eastern Burkina Faso; Homa Bay and Migori districts in western Kenya; and Igunga and Urambo districts in central-western Tanzania. All six districts are predominantly rural, and the majority of households surveyed engage in subsistence farming.

Poverty levels are high. In the two Kenya districts, between 47 and 71% of households are estimated to be living in poverty (Government of Kenya 2003). Similarly, it is estimated that 40% of households are below the basic needs poverty line in Tabora region, Tanzania (United Republic of Tanzania 2005). In Burkina Faso's Centre-East Region, approximately 51% of the population lives below the absolute poverty line (Government of Burkina Faso 2000).

The three countries have different health service financing mechanisms in place, and in one country these changed during the period studied. In Tanzania, while a cost-sharing policy is in place, maternity care (including both normal and complicated deliveries) is exempt at all levels of the public health system, and was nominally provided free of charge during the 6-year period studied. In both Burkina Faso and Kenya, cost-sharing policies were in place in 2003, when the initial study was carried out. In Burkina Faso, official fees for maternity care were approximately US$7.4 for normal deliveries, and US$29.6 for most complicated deliveries. In Kenya, the cost-sharing policy was ended in mid-2004. Therefore, during the period covered by the 2006 survey, all health services, including maternal health services, were officially free of charge at all government health centres and dispensaries, with the exception of a small registration fee for patient/client cards. These charges are 10 Kenya shillings (Ksh) at dispensaries (approximately US$0.13) and 20 Ksh (US$0.26) at health centres. According to the new policy in Kenya, government hospitals are permitted to charge a nominal fee for normal deliveries (approximately US$6.49 in 2006), and can set fees for other services, such as Caesarean section, in consultation with their boards.

Survey design and methodology

The surveys focused on women of reproductive age (15–49 years) residing in private households. Two-stage sampling was used. Enumeration areas (EAs) in each district were randomly selected with population proportional to size. Within each EA, a full household listing was conducted, and 25 households were selected for interview using a random number list. In each selected household, interviews were conducted with the household head (or any competent adult member of the household), as well as with all women of reproductive age and their co-resident husbands.

All individual respondents were asked about their education, occupation, ethnic group, religion and other background characteristics. Women of reproductive age who had had a live or still birth in the previous 24 months were asked a detailed series of close-ended questions about their recent pregnancy, delivery and postpartum experiences, including the costs of care-seeking. These women were also asked if they had experienced any of three complications during delivery—excessive bleeding (haemorrhage), fits or convulsions (eclampsia), and prolonged labour (obstructed labour)—as well as the costs of associated care-seeking. Only these three complications were considered because they are complications with relatively clear, recognizable symptoms, and are thus less subject to recall error or misdiagnosis.

Questions related to the costs of care-seeking explored the direct medical expenses women incurred for delivery care, including formal user fees and informal fees. All costs were reported in local currencies. For those who had delivered at a health facility, two separate questions explored how much they paid for consumables (drugs and supplies) and for services (e.g. delivery charges, bed stay, laboratory fees, professional fees and bribes). A third question asked how much they had paid in total for direct medical expenses related to delivery. Costs of transport to the health facility were also explored. However, other direct costs (e.g. expenses for food and upkeep of any accompanying relatives), and indirect costs (e.g. opportunity costs of time spent at the facility) were not explored. Women were also asked about the source of funds used to pay fees and other costs.

To measure socio-economic status and wealth index, household asset quintiles were computed using principal components analysis (Filmer and Pritchett 2001). The household questionnaire collected information on household assets (e.g. radio, television, bicycle, car, etc.), as well as dwelling characteristics (e.g. flooring and roofing materials, type of drinking water source and toilet facilities). This type of analysis is routinely used to measure household wealth because of difficulties in collecting accurate information on household income and expenditure. The principal components analysis assigns weights to each household asset according to the relative importance

Table 1 Study sample size

	Number of women interviewed		Number of women with recent live/still birth (within 24 months)	
	2003	2006	2003	2006
Tanzania	4262	5585	1733	2547
Burkina Faso	4267	7569	2502	3534
Kenya	5332	5371	2110	2221
Total	13 861	18 525	6345	8302

of each asset in terms of representing the overall assets in the household. Each household was assigned a standardized score for each asset, where the score differed depending on whether or not the household owned that asset. Scores were summed for each household, and individuals were ranked according to the total wealth index score from 1 to 5 for the household in which they resided. For each survey, the pooled (two-district) sample was then divided into population quintiles—five groups with the same number of individuals in each. The quintiles thus represent the poorest 20% of the population, second poorest 20%, middle 20%, fourth poorest 20%, and least poor 20% of the population, respectively. Education, income and consumption patterns were not included in the household wealth index.

Survey sample

A total of 13 861 women were interviewed in the 2003 survey and 18 525 in the 2006 survey. Response rates ranged from 93–97%. Of all the women interviewed, a total of 6345 in the 2003 survey and 8302 in the 2006 survey had had a live or still birth within the preceding 2 years (see Table 1). About 42% of deliveries in the 2003 survey and 45% in the 2006 survey took place in health facilities.

Data analysis

Data from the household surveys were entered in CSPro and converted to SPSS for analysis. Data for the two study districts in each country were combined.

As noted above, three separate questions explored total out-of-pocket medical expenses for delivery care, including a question on the costs of drugs and supplies, a question on fees (bed, lab, professional fees, etc.) and a question on the total amount. Some women answered the third question on the total expenses incurred, but could not or did not provide information on the costs of drugs/supplies or fees. Therefore, data on total costs were used, except when specified otherwise. Costs presented are mean costs (with 95% confidence limits) for all women who were able to report on costs.

To compare the costs reported in the two surveys, 2003 costs were adjusted upward to account for inflation, using annual Consumer Price Index increases from 2003 to 2004, 2004 to 2005 and 2005 to 2006. The compounded inflation rates were 17% for Tanzania, 9% for Burkina Faso and 40% for Kenya (International Monetary Fund 2007). Inflation-adjusted costs for 2003 and unadjusted costs for 2006 were then converted to US dollars using the average exchange rate for the 6-year period under study (OANDA undated).

National budget survey data were used to determine mean monthly household income or mean monthly household expenditure for the geographic regions where the survey districts were located. Based on available data, mean monthly household expenditure/income for the study districts were estimated as follows: US$76 for Tabora Region, Tanzania (United Republic of Tanzania 2002); US$81 for Centre-East Health Region, Burkina Faso (Yago and Savadogo 2003); and US$86 for Nyanza Province, Kenya (Government of Kenya 2001).

Study limitations

There are several potential limitations of this study that should be noted. For both surveys, interviews with women about their recent delivery experiences covered the previous 24-month period, and recall about costs over this period may be inaccurate, particularly in settings where male family members control health care decision-making and resources. However, the large number of women interviewed about recent deliveries (14 647 in the two surveys combined) would minimize the effect of unreliable recall by a few women. It is noteworthy that the costs reported by women for different types of delivery are consistent within and between the two surveys, and they are comparable to those reported in other studies for the same countries (Sharma *et al*. 2005) and other countries in sub-Saharan Africa (Levin *et al*. 2003).

A second limitation is the difficulty of obtaining current data on mean monthly household income or expenditure for the particular geographic areas studied, or the extent to which household income keeps pace with inflation. We used government survey data for each country published from 2001–03. More recent independent studies on household income and expenditure in the three countries (Mujinja *et al*. 2004; Su *et al*. 2006; Opiyo *et al*. 2007) have suggested that government figures may overestimate household income or expenditure in rural areas that engage primarily in subsistence agriculture (Mujinja *et al*. 2004; Su *et al*. 2006; Opiyo *et al*. 2007). However, as there were no recent data available on the specific districts covered in this study, it was necessary to use the government data from 2001–03.

Results

In the 2006 survey, the majority of births in Tanzania (56%) took place in health facilities, whereas in both Burkina Faso and Kenya, 45% and 33% of births, respectively, took place in health facilities. Among women who delivered outside the health system, the primary reason given for delivering at home was lack of time to reach a health facility.

In Burkina Faso and Tanzania, the majority of institutional deliveries took place at government health facilities; relatively few births took place in private or mission health facilities (16% and 11%, respectively). However, in Kenya, 28% of institutional deliveries were at private or mission facilities.

In all three countries in both surveys, almost all women who delivered at a facility reported that they had to pay some costs,

Table 2 Out-of-pocket costs paid for normal delivery at different types of facilities (2006)

		Mean costs		Confidence interval (US$)	
	N[a]	Local currency	US$	Lower	Upper
Tanzania (Tsh)					
Government hospital	190	5456	5.2	3.9	6.5
Government health centre	238	3163	3.0	2.6	3.4
Government dispensary	456	2566	2.5	2.2	2.7
Pvt. hospital	64	22 004	21.0	15.8	26.3
Pvt. health centre	38	5040	4.8	3.2	6.4
Pvt. dispensary	63	5582	5.3	4.4	6.2
All facilities 2006	1049	4682	4.5	4.0	5.0
Non-facility birth	1127	1082	1.0	0.9	1.2
Burkina Faso (CFA)					
Government hospital	46	8113	13.3	9.8	16.8
Government health centre	685	4009	6.6	6.1	7.0
Pvt./mission health centre	94	1905	3.1	2.0	4.3
All facilities 2006	826	4029	6.6	6.1	7.1
Non-facility birth	1848	266	0.4	0.4	0.6
Kenya (Ksh)					
Government hospital	206	1049	13.5	11.2	15.8
Government health centre	123	575	7.4	6.7	8.1
Government dispensary	22	331	4.3	2.9	5.6
Pvt. hospital	40	3327	42.8	24.2	61.4
Pvt. maternity/nursing home	13	1221	15.7	6.4	25.0
Pvt./mission health centre	34	1046	13.5	10.7	16.2
Pvt. dispensary	36	1145	14.7	11.9	17.5
Other private	11	1643	21.1	8.1	34.2
All facilities 2006	485	1106	14.2	12.2	16.2
Non-facility birth	1457	278	3.6	3.4	3.8

[a]The percentage of women who delivered at facility (normal and complicated) who reported on costs was 91% in Kenya, 91% in Tanzania and 65% in Burkina Faso.

Pvt: Private, non-government.

N: number of women.

and the majority were able to report on the out-of-pocket expenses they incurred for delivery care. In Kenya, 98% of women reported in the 2006 survey that they had to pay costs at the facility, and 91% were able to report an amount. In Tanzania, 91% of women reported an amount. In contrast, in Burkina Faso, 92% of women said they paid fees, but only 65% could cite the amount—a difference that may be related to high levels of husband involvement in care-seeking in this context (Family Care International 2007).

Out-of-pocket costs of maternity care

Normal delivery

Overall, mean out-of-pocket medical costs related to delivery were lowest in Tanzania (US$4.5), moderate in Burkina Faso (US$6.6), and highest in Kenya (US$14.2) (Table 2). Established patterns of using the health system differed across the three countries and overall mean out-of-pocket costs reflect these differences. In Burkina Faso, for example, 89% of institutional deliveries took place at health centres. Similarly, in Tanzania, the majority of institutional deliveries took place at government health centres and dispensaries. In contrast, in Kenya, 42% of institutional deliveries took place in government hospitals, as opposed to health centres and dispensaries.

Consistent with the findings from other studies (Levin *et al*. 2003; Borghi *et al*. 2006a), in all three countries, out-of-pocket costs for normal delivery were uniformly higher at government hospitals than at government health centres and dispensaries (Table 2). In Tanzania, for example, mean out-of-pocket medical expenses for normal delivery were US$3.0 at health centres and US$2.5 at dispensaries, compared with US$5.2 at hospitals. Similarly, in Burkina Faso, out-of-pocket expenses for delivery care at government health centres were US$6.6, compared with US$13.3 at government hospitals. In Kenya, mean out-of-pocket expenses for delivery care at health centres (US$7.4) and dispensaries (US$4.3) were comparable to those reported in Burkina Faso, but overall mean costs were

Table 3 Out-of-pocket costs for complicated delivery (2006)

		Mean costs		Confidence interval (US$)	
	N	Local currency	US$	Lower	Upper
Tanzania (Tsh)					
Government hospital	54	8998	8.6	5.4	11.8
Government health centre	70	4414	4.2	2.5	6.0
Government dispensary	78	3541	3.4	2.5	4.2
Pvt. hospital	23	29 805	28.5	19.4	37.5
Pvt. health centre	6	16 927	16.2	1.1	31.3
Pvt. dispensary	10	7242	6.9	3.5	10.3
All facilities 2006	241	8062	7.7	6.2	9.3
Burkina Faso (CFA)					
Government hospital	30	18 499	30.4	17.9	42.9
Government health centre	151	6579	10.8	8.4	13.2
Pvt./mission health centre	22	2642	4.3	1.7	7.0
All facilities 2006	203	8029	13.2	10.5	15.8
Kenya (Ksh)					
Government hospital	64	2023	26.0	14.1	38.0
Government health centre	34	518	6.7	5.0	8.3
Government dispensary	14	621	8.0	5.2	10.2
Pvt. hospital	12	4128	53.1	5.0	101.2
Pvt. maternity/nursing home	8	15 732	202.4	68.4	336.4
Mission health centre	17	1197	15.4	9.1	21.7
Private dispensary	16	1236	15.9	7.8	24.0
All facilities 2006	165	2363	30.4	20.5	40.3

Pvt: Private, non-government.
N = number of women.

considerably higher because few women deliver at mid- and lower-level government health facilities in Kenya. In one of the Kenya districts, for example, more than half of all institutional deliveries took place in the district hospital.

In both Kenya and Tanzania, costs of normal delivery were significantly higher ($P < 0.001$) at private facilities than at government facilities. In Kenya, costs at private/mission facilities were twice as high as those incurred at government facilities, and in Tanzania these costs were almost four times as high (Table 2). In contrast, mean costs at mission health centres in Burkina Faso (US$3.1) were lower than those incurred at government health centres because such sites subsidize the costs of drugs and supplies. However, the difference was not significant.

Complicated delivery

The proportion of women reporting that they had experienced any of the three obstetric complications during delivery (haemorrhage, eclampsia or obstructed labour) varied across the three countries. In both surveys, a higher proportion of women in Kenya (25% in 2006) reported experiencing such complications, compared with women in Burkina Faso (20%) and in Tanzania (19%).

Across all three countries, mean costs incurred by women who had experienced complicated deliveries were significantly higher than those reported by women who had normal deliveries (Table 3). In Tanzania, the mean cost of complicated delivery was about 70% higher than that of normal deliveries in 2006 (US$7.7 versus US$4.5, $P < 0.001$), but still low relative to the other two countries. In Burkina Faso, out-of-pocket expenditures for complicated delivery were twice as high as those for normal delivery (US$13.2 versus US$6.6, $P < 0.001$). However, they were considerably lower than the official fees for most complications. In Kenya, the mean cost of complicated deliveries in 2006 was more than twice the cost of normal delivery (US$30.4 versus US$14.2, $P < 0.001$).

As with normal delivery care, costs related to complicated delivery care were much higher at hospitals than at health centres and dispensaries, particularly in Kenya and Burkina Faso. In Tanzania, costs at health centres and dispensaries—which handle two-thirds of complicated deliveries—were higher than for normal delivery but still relatively low (US$4.2 and US$3.4, respectively). In Burkina Faso, out-of-pocket costs for complicated deliveries were US$10.8 at health centres, compared with US$30.4 at hospitals. As with normal deliveries, out-of-pocket expenditures for complicated delivery at private facilities in Burkina Faso (US$4.3) were much lower than the government facilities.

In Kenya, the costs at government hospitals (US$26.0) and private facilities (US$68.7) were very high, whereas costs at health centres and dispensaries were comparatively low (US$6.7 and US$8.0), and only moderately higher than the

costs of normal delivery care at these sites. As discussed above, a key contributing factor to the high overall mean costs is the high cost of care in government hospitals and private facilities, and the high percentage of institutional deliveries that occur in these facilities.

Costs of complicated delivery care did not vary significantly according to the type of complication experienced. Haemorrhage and prolonged labour were the most common complications reported in each country, and accounted for over 90% of cases (data not shown).

Non-facility or home births

The proportion of births taking place outside the formal health system, and the associated costs, varied widely across the three countries. As noted earlier, the majority of births in Tanzania took place in health facilities, whereas 55% of births in Burkina Faso and 67% in Kenya took place outside the health system.

The majority of non-facility births occurred at home or at the home of a traditional birth attendant (TBA). In 2006, women who delivered at home reported mean out-of-pocket expenses for delivery of US$0.4 in Burkina Faso and US$1.0 in Tanzania. In Kenya, the mean cost of non-facility deliveries was much higher at US$3.6, but still low compared with costs related to institutional deliveries (Table 2).

Women who delivered at a home were significantly poorer than those who delivered at a facility in all three countries in 2006, based on comparison of the mean wealth index scores of both groups. In Tanzania, the mean wealth index of women who delivered at a facility was 3.1 compared with 2.9 for those who delivered at home ($P < 0.01$). In Burkina Faso the index was 3.2 and 2.7, respectively ($P < 0.001$). In Kenya, the difference in the mean wealth index between these groups was the greatest—3.5 and 2.7, respectively ($P < 0.001$). Similar patterns were found in 2003 for Burkina Faso and Tanzania, but in Kenya in 2003 there was no significant difference in the mean wealth index scores of women who delivered at health facilities compared with those delivering at home (2.5 and 2.4, respectively, $P =$ not significant, or ns).

Comparison of out-of-pocket costs incurred by women in 2003 and 2006

The inflation-adjusted out-of-pocket expenditures for maternity care allow comparison of changes in costs over the period studied (2003 to 2006). For the purposes of comparison, data on costs related to normal delivery were analysed separately from those related to serious obstetric complications (Table 4).

Out-of-pocket medical costs for normal delivery increased at all types of facilities in Tanzania, but decreased overall in Burkina Faso and Kenya. Adjusting for inflation, there was a 20% increase in out-of-pocket costs for maternity care in Tanzania, from US$3.7 to US$4.5. However, this increase was not statistically significant. In Burkina Faso, there was an 8% decrease in out-of-pocket costs for normal delivery care from US$7.2 in 2003 to US$6.6 in 2006 ($P =$ ns).

In Kenya, where there was a change in health system financing between the two surveys and cost-sharing officially ended, mean costs for normal delivery decreased by 25%, from US$19.0 to US$14.20 ($P = 0.015$). Out-of-pocket costs for maternity care decreased at government health facilities while they increased at private facilities.

Similar changes were observed in the costs of complicated deliveries, though they were not statistically significant in any country. In Kenya, there was an overall 6% decrease in out-of-pocket costs for complicated delivery care, from US$32.5 in 2003 to US$30.4 in 2006. The decrease was entirely due to decreases in costs incurred at government facilities, which decreased by 33%, from US$27.2 to US$18.1. Costs for complicated delivery care at health centres in Kenya decreased from US$13.8 in 2003 to US$10.8 in 2006; however, only 21% of women with complications delivered at these mid-level health facilities. In contrast to the trends in the public sector, mean out-of-pocket costs for complicated delivery care at private health facilities in Kenya increased dramatically from US$40.5 in 2003 to US$68.7 in 2006. Approximately one-third of complicated deliveries in the study districts in Kenya were in private facilities.

In Tanzania, mean costs related to complicated deliveries increased from US$6.8 in 2003 to US$7.7 in 2006, a 14% increase ($P =$ ns). In Burkina Faso, out-of-pocket costs for complicated deliveries increased by 3% ($P =$ ns).

Contribution of service charges and supply items to direct costs

In addition to being asked about the total out-of-pocket medical costs for maternity care, women who had delivered in a health facility were asked how much they paid in service fees (i.e. bed stay, lab fees, and delivery or registration fees) and for supplies, drugs or other materials. As noted earlier, fewer women provided information on the specific costs of itemized services and supplies than on the total out-of-pocket costs of care. Because of the lower number of women responding, the itemized costs do not agree in absolute terms with the amounts given in Tables 2 and 3, but the trends are generally in agreement with total costs reported. This data provide a picture of the relative contribution of consumables and service charges to total out-of-pocket expenditures during the period studied.

For normal deliveries in Tanzania, service fees (bed and delivery fees) represented about two-thirds of total costs during both surveys, whereas in Burkina Faso, the cost of drugs and supplies was consistently higher than service fees. In Kenya, the service fees and drug/supply costs both decreased between the two surveys, but despite the end of cost-sharing, service fees represented more than two-thirds of total costs related to normal deliveries in both 2003 and in 2006. It is noteworthy that at all levels of the health system, women in Kenya reported paying for both supplies and service fees, although officially government health centres and dispensaries should not have charged for such items during the period covered by the 2006 survey.

In Tanzania, the costs of supplies and service fees for complicated delivery were equivalent to those for normal delivery (Table 5). An encouraging finding was the change in Kenya from 2003 to 2006; whereas in 2003 costs for supplies and services for complicated delivery were considerably higher than for normal delivery, by 2006 costs for complicated delivery decreased to the extent that they were almost the same as those

Table 4 Changes in costs for delivery (2003–06)

		Mean cost		95% CI	
	N	Local currency	US$	Lower	Upper
Tanzania (Tsh)					
Normal delivery					
2003[a]	756	3900	3.7	3.1	4.3
2006	1049	4682	4.5	4.0	5.0
Percentage increase/decrease			*+20.0%*		
Complicated delivery					
2003	5	7077	6.8	4.3	9.2
2006	243	8061	7.7	6.2	9.3
Percentage increase/decrease			*+14.0%*		
Burkina Faso (CFA)					
Normal delivery					
2003	260	4383	7.2	6.5	7.9
2006	826	4029	6.6	6.1	7.1
Percentage increase/decrease			*−8.0%*		
Complicated delivery					
2003	90	7813	12.8	8.6	17.0
2006	208	8029	13.2	10.5	15.8
Percentage increase/decrease			*+3%*		
Kenya (Ksh)					
Normal delivery					
2003	324	1479	19.0	15.7	22.4
2006	485	1106	14.2	12.2	16.2
Percentage increase/decrease			*−25.0%*[b]		
Complicated delivery					
2003	182	2525	32.5	24.1	40.9
2006	169	2363	30.4	20.5	40.3
Percentage increase/decrease			*−6%*		

[a]Inflation adjusted to 2006 cost levels.
[b]Difference between 2003 and 2006, $P = 0.015$.

for normal delivery. Interestingly, itemized costs for complicated delivery were not twice those for normal deliveries as was reported for total costs for all countries (Tables 2 and 3). The difference could possibly be attributable to other costs, such as informal fees, which were not captured in the answers for itemized costs.

For women who reported on service fees, a further breakdown shows more clearly the differences in each country. In Tanzania in 2006, 67% reported paying a delivery fee and 25% a fee for bed stay (Table 6). In Burkina Faso, 92% paid for bed stay, but only 12% paid a delivery fee. In Kenya, the burden of cost was high in both categories; women reported paying both bed fees (59%) and delivery fees (74%). Overall, however, the proportion of women in Kenya reporting that they paid these fees was lower in 2006 than it was in 2003.

Affordability

Out-of-pocket expenditures on maternity care were calculated as a percentage of mean monthly household income or expenditures based on available household-budget survey data for the geographic regions/provinces of the study districts. Mean out-of-pocket costs for medical expenses related to normal delivery care represented about 6% of monthly household income in Tanzania, 8% in Burkina Faso and 17% in Kenya (Table 7). The mean out-of-pocket costs of complicated delivery care represented about 10% of monthly income in Tanzania, 16% in Burkina Faso and 35% in Kenya. It should be kept in mind that the out-of-pocket costs only include medical costs for delivery; studies have shown that for many families other direct costs (e.g. transport costs and accommodation costs) and indirect costs (lost earnings, opportunity costs, etc.) may be considerably higher than the medical costs (Xu *et al*. 2003; McIntyre *et al*. 2005; Khan 2006).

Interestingly, while the costs of normal delivery represented only 6% of mean monthly household income in Tanzania, 48% of women in Tanzania described the costs as 'higher than expected', compared with 20% of women in Burkina Faso, and 31% in Kenya. This may reflect the fact that household income is lowest in Tanzania and there would be proportionally less

Table 5 Costs to women for service fees and supplies

		2003[a]			2006		
Type of delivery	**Type of expense**	Local currency	US$	*N*	Local currency	US$	*N*
Tanzania (Tsh)							
Normal	Supplies	2098	2.0	271	2321	2.2	496
	Service fees	4042	3.9	374	4201	4.0	518
Complicated	Supplies	2863	2.7	40	2350	2.2	116
	Service fees	3901	3.7	57	4276	4.1	130
Burkina Faso (CFA)							
Normal	Supplies	4103	6.7	175	3064	5.0	415
	Service fees	2098	3.4	194	2058	3.4	558
Complicated	Supplies	4732	7.8	56	3601	5.9	91
	Service fees	2825	4.6	51	2294	3.8	121
Kenya (Ksh)							
Normal	Supplies	422	5.4	135	326	4.2	170
	Service fees	1114	14.3	307	834	10.7	460
Complicated	Supplies	691	8.9	68	346	4.5	46
	Service fees	1593	20.5	165	918	11.8	145

[a]Inflation adjusted to 2006 cost levels.

Supplies include drugs and consumable supplies.

Service fees include charges for bed, delivery care, lab fees, and other fees.

Table 6 Percentage of women who deliver at a facility who pay for bed stay and delivery fees[a]

	Percentage of women paying	
Type of fee	2003	2006
Tanzania		
Bed stay	24.2	25.1
Delivery fee (registration)	63.7	67.3
Burkina Faso		
Bed stay	93.0	91.9
Delivery fee (registration)	7.8	12.2
Kenya		
Bed stay	69.3	59.1
Delivery fee (registration)	83.1	74.4

[a]Percentage of all women who reported on fees paid.

Table 7 Cost of delivery as a percentage of monthly household income[a]

	Normal delivery	Complicated delivery
Tanzania	6%	10%
Burkina Faso	8%	16%
Kenya	17%	35%

[a]Household monthly income was estimated as US$76 for Tanzania, US$81 for Burkina Faso and US$86 for Kenya.

available for health care after essential expenditures, such as those for food, are made.

Out-of-pocket costs to women of different wealth status

Analysis of the mean fees paid for all deliveries (normal and complicated) by women in each wealth quintile showed that out-of-pocket costs for maternity care are regressive in all three countries; the costs incurred by the poorest women were not significantly different from those paid by the wealthiest women (Table 8). In Tanzania, the mean cost paid by the poorest women for all types of deliveries was US$4.6, compared with US$5.1 for all women. In Burkina Faso, the costs paid by women in the poorest quintile were US$7.6 compared with US$7.9 for all women. In Kenya, women in the poorest quintile paid US$20.3—more than the mean amount paid by all women (US$18.4).

Transport costs

Transport costs—along with costs for other family members—are usually considered direct costs of care-seeking, and can be very high for women who live long distances from a facility. Among women who had to pay for transport to a facility, the costs were relatively similar (see Table 9). However, a much greater proportion of women in Kenya reported having paid for transport to the facility compared with the other two countries. In Tanzania, the majority of women (89%) travelled to the facility by bicycle or foot, and only 7% paid for transport. Similarly, in Burkina Faso, more than three-quarters of women travelled by foot or bicycle to the facility and less than 10% paid for transport. In Kenya, however, two-thirds of women reported that they paid for transport in 2006. Transport costs are not included in the out-of-pocket medical costs shown in Tables 2–4.

Discussion

Cost data presented here were collected through population-based household surveys as part of a larger intervention study

Table 8 Out-of-pocket costs for delivery by women of different wealth quintiles[a]

	Tanzania		Burkina Faso		Kenya	
Wealth index quintiles	Cost (US$)	*N*	Cost (US$)	*N*	Cost (US$)	*N*
Poorest	4.6	220	7.6	164	20.3	65
Second	5.6	248	7.5	214	11.5	109
Middle	4.0	275	9.0	193	15.1	105
Fourth	5.4	278	7.1	221	19.8	155
Richest	5.8	275	8.4	244	21.9	222
Total	5.1	1296	7.9	1037	18.4	656

[a]Cost for normal and complicated delivery are combined (2006).

Table 9 Mean costs of transport

	Percentage of women paying for transport		Mean cost of transport (US$)	
	2003	2006	2003	2006
Tanzania	7	7	1.2	2.5
Burkina Faso	5	2	1.4	3.2
Kenya	30	68	1.7	1.8

that was testing strategies to increase the use of skilled maternity care in three regions of Kenya, Burkina Faso and Tanzania. Women reported how much they had paid for various medical expenses related to delivery care, including formal and informal fees, drugs, and consumable supplies. Women were asked about all the medical expenses they incurred during delivery, regardless of whether expenditures occurred at the health facility itself or at outside pharmacies or kiosks. The surveys collected information on delivery at public and private facilities at all levels of the health system, and the large number of women interviewed for this study (6345 women in 2003 and 8302 in 2006) provides a robust overview of out-of-pocket costs for maternity care at two points in time in three low-income countries in sub-Saharan Africa.

The study showed that the vast majority of women incur out-of-pocket expenses for maternity care in all three settings. It is noteworthy that in both surveys, women were no less likely to report paying out-of-pocket medical costs in settings where maternal health care is nominally provided free of charge than in settings where cost-sharing policies were in place. However, costs were lowest in Tanzania where maternal health services are officially exempt. In all three countries, there was no difference in the out-of-pocket costs reported by the poorest women compared with women in the wealthiest quintiles, indicating that both user fee and nominally free services appeared to be equally regressive, and that waiver or exemptions to support the very poor are absent or ineffective.

Mean out-of-pocket medical costs related to normal delivery were substantial, representing a considerable portion of mean monthly household income—from 6% in Tanzania to 8% in Burkina Faso and 17% in Kenya. Mean costs of complicated delivery represented about 10% of mean monthly household income in Tanzania, 16% in Burkina Faso, and 35% in Kenya. These high costs related to household income are of concern, particularly in light of other research that has shown that unexpected health care costs that exceed 10% of monthly household income can be catastrophic and constitute an extreme burden that may push a household into poverty or into deeper poverty (Xu *et al*. 2003; McIntyre *et al*. 2005; Khan 2006). Most obstetric complications cannot be reliably predicted, and therefore the high costs of complicated delivery care are difficult for households to forecast or plan for, which contributes to hardships in covering such costs when they do occur. It was noteworthy that almost one-third of women in Burkina Faso reported that they had sold assets to pay for delivery costs, indicating that the costs of maternity care are a significant burden on households. Similarly, in Tanzania, 31% of women reported selling crops or assets, while a slightly higher proportion (40%) reported that money came from the immediate family. Interestingly, in Kenya, the majority of women (79%) reported that the funds needed for delivery care came from the immediate family.

An examination of the inflation-adjusted costs over time shows that costs increased substantially in Tanzania, decreased slightly in Burkina Faso, and decreased significantly in Kenya. The Kenya decrease in out-of-pocket costs coincides with the end of the cost-sharing policy that was in place until mid-2004. However, it is important to note that even when the cost-sharing policy was no longer in effect in Kenya, there was no decrease in the percentage of women who reported paying some out-of-pocket medical costs for delivery care. These fees remained high at hospitals and private health facilities. However, they did decrease considerably at mid- and lower-level government health facilities, and were more comparable in 2006 to the out-of-pocket costs reported in the other two countries. Despite the termination of cost-sharing in Kenya in 2004 and the reported reduction in out-of-pocket costs at government facilities, there was only a small increase overall in the percentage of women who delivered at facilities during this study period, from 29% in 2003 to 33% in 2006.

It is noteworthy that the end of the cost-sharing policy and significant decrease in mean out-of-pocket costs in Kenya was not accompanied by an increase in skilled care-seeking in this context; there was almost no change in use of skilled maternity care in the two Kenya districts. A number of studies have shown that the costs of care-seeking can be a major obstacle to utilization of maternal health services and that service utilization—particularly among the poor—falls when user fees are introduced (Nanda 2002; Nganda 2003; Ensor and Ronoh 2005; Richard *et al*. 2005; Borghi *et al*. 2006c; Haddad *et al*. 2006). However, as others have observed, the elimination of user fees does not always trigger an immediate increase in use of

professional maternity care. The elimination of user fees can result in gaps in the availability of drugs and supplies, overworked and demoralized staff, and poorer overall quality of care (Gilson and McIntyre 2005; Ensor and Ronoh 2005).

Achieving MDG 5 requires increased efforts to address barriers to woman's use of maternal health care, and particularly skilled maternity care during delivery. Although there are a range of complex social issues and health system factors that influence women's use of maternity care, direct costs of care-seeking—as well as uncertainty about these costs—remain an important and well-documented barrier, both in settings where services are nominally free and in services where cost-sharing policies are in place. Addressing these costs is critical, but requires context-specific data on the main sources or drivers of women's out-of-pocket costs (i.e. formal or informal fees, drugs, supplies, transport, accommodation and meals, etc.) and carefully planned strategies to ensure that the quality of health care can be maintained throughout the modification of financing schemes.

Globally, there is consensus that primary health care facilities, such as health centres, can play a central role in maternal survival strategies. An important finding from this study is that in the two countries where rates of skilled care were the highest, Burkina Faso and Tanzania, the majority of births occurred in health centres and dispensaries and not hospitals. When staffed by fully qualified, skilled attendants and supported with the essential equipment, drugs, supplies and a functioning emergency referral system, these sites could handle the majority of deliveries, and in so doing prevent many complications and ensure that complications that do arise are detected promptly and managed or referred, as appropriate. A health centre strategy can potentially reduce maternal mortality to less than 200 maternal deaths per 100 000 live births (Campbell and Graham 2006). Available evidence confirms that costs of maternity care—both to users and to health systems—are lowest at such health facilities. Thus, from the perspective of intervention effectiveness, efficiency and equity, it is critical to invest in primary care heath facilities, ensuring that they have the skilled staff, equipment, supplies and support they need to provide accessible, affordable and quality care to pregnant women.

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Endnote

[1] The intervention package itself was aimed at improving the quality, availability and utilization of skilled maternity care. However, it was not aimed at influencing the costs of maternal health services or increasing the ability of pregnant women to pay through the introduction of prepayment or insurance schemes, community loan funds or waiver systems.

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