Perceived quality of and access to care among poor urban women in Kenya and their utilization of delivery care: harnessing the potential of private clinics?

Jean Christophe Fotso* and Carol Mukiira

African Population and Health Research Center (APHRC), Nairobi, Kenya

*Corresponding author. African Population and Health Research Center (APHRC), P.O. Box 10787, 00100 Nairobi, Kenya.
E-mail: jcfotso@aphrc.org. Fax: +254-20-400-1101.

This paper uses data from a maternal health study carried out in 2006 in two slums of Nairobi, Kenya, to: describe perceptions of access to and quality of care among women living in informal settlements of Nairobi, Kenya; quantify the effects of women's perceived quality of, and access to, care on the utilization of delivery services; and draw policy implications regarding the delivery of maternal health services to the urban poor. Based on the results of the facility survey, all health facilities were classified as 'appropriate' or 'inappropriate'. The research was based on the premise that despite the poor quality of these maternal health facilities, their responsiveness to the socio-cultural and economic sensitivities of women would result in good perceptions and higher utilization by women.

Our results show a pattern of women's good perceptions in terms of access to, and quality of, health care provided by the privately owned, sub-standard and often unlicensed clinics and maternity homes located within their communities. In the multivariate model, the association between women's perceptions of access to and quality of care, and delivery at these 'inappropriate' facilities remained strong, graded and in the expected direction.

Women from the study area are seldom able to reach not-for-profit private providers of maternal health care services like missionary and non-governmental organization (NGO) clinics and hospitals. Against the backdrop of challenges faced by the public sector in health care provision, we recommend that the government should harness the potential of private clinics operating in urban, resource-deprived settings. First, the government should regulate private health facilities operating in urban slum settlements to ensure that the services they offer meet the acceptable minimum standards of obstetric care. Second, 'good' facilities should be given technical support and supplied with drugs and equipment.

Keywords   Maternal health, urban poor, perceived access, perceived quality, public–private partnership

<div style="border:1px solid black; padding:1em;">

KEY MESSAGES

- In Nairobi's slums, women seek maternal health care from privately owned, sub-standard and often unlicensed clinics and maternity homes within their communities.

- While unable to offer many of the functions of basic emergency obstetric care, these facilities are well perceived both in terms of access and quality, presumably because they invest time in women, building trust and confidence.

- Kenya's public health sector is under-financed, perceived to be unfriendly to patients and does not reach the urban informal settlements though they are home to more than 50% of urban residents.

- Recognizing the weaknesses of the public health sector, the Kenyan government should regulate private health facilities in urban slum settlements, and provide technical support to the 'good' ones, with the goal of bringing quality health services closer to slum populations.

</div>

Introduction

Each year more than half a million women worldwide die as a result of complications arising from pregnancy and childbirth (WHO 2005; Ronsmans and Graham 2006). With less than 15% of the world's population, sub-Saharan Africa accounts for almost 47% of these deaths. Further, for every woman who dies, approximately 20 more suffer from pregnancy- or childbirth-related injuries that can have profound effects on their lives and their families' lives (WHO 2004). In Kenya, maternal mortality ratio has remained at over 400 per 100 000 live births and recent statistics from the 2008/09 Kenya Demographic and Health Survey (KDHS) show that only 44% of births in the country were assisted by a skilled attendant, exactly the same level as in 1998 (KNBS, 2010). While the roles of skilled birth attendants and emergency obstetric care in efforts to reduce maternal mortality have been demonstrated extensively (WHO 2005), functioning health systems that include trained and motivated health workers, equipped facilities and referral systems for complications are the key pre-conditions for their provision (Kruk *et al.* 2007).

The developing countries' rapid urbanization over the past half century has been accompanied by excessively high levels of concentration of the urban population, which have overstretched the available housing facilities resulting in the mushrooming of informal settlements (Henderson 2002; United Nations Population Division 2003). Kenya, for instance, has experienced rapid urbanization in the last few years, and although poverty was until recently a largely rural phenomenon, urban poverty has been rising. In 1992, the incidence of poverty in urban areas was estimated at 29% compared with 42% in rural areas; 5 years later, the figure had risen to 49%, compared with 52% in rural areas. In Kenya, the maternal mortality ratio is substantially higher among the urban poor (706 deaths per 100 000 live births) than the national average and indicators such as use of health services have been found to be lower among this population group (Magadi *et al.* 2001; African Population and Health Research Center 2002b).

A key dimension of urban poverty is inadequate access to appropriate health care services, with Nairobi slums being served mainly by privately owned, sub-standard, unlicensed and informal health facilities (African Population and Health Research Center and World Bank 2006). Providers from these private facilities, in addition, have been found to be often unfriendly and to fail not only to respond to queries from the women but also to counsel them during consultations for antenatal care (Izugbara *et al.* 2009). Young people in these informal settlements also face challenges such as high levels of unemployment, crime and substance abuse, poor schooling facilities, and early sexual debut resulting in unplanned childbearing, which accounts for a substantial proportion of births in Kenya (Zulu and Dodoo 2002).

Many studies have shed light on the influence on women's health-seeking behaviours of women's autonomy (Fotso *et al.* 2009); socio-economic position at the individual, household and community levels (Amooti-Kaguna and Nuwaha 2000; Magadi *et al.* 2001; Stephenson and Tsui 2002); and distance to health facility and other facility-level factors (Acharya and Cleland 2000; Chakraborty *et al.* 2003; Iftekher and Hoque 2005). While these perspectives have improved our understanding of the main drivers of poor maternal health in the context of developing countries, it is increasingly acknowledged that the way women perceive access to and quality of care is closely linked to their health-seeking behaviours (Babalola and Fatusi 2009; Bazant and Koenig 2009). Research on people's perceptions of the quality of care and access to health care has increased in the past decade (Sitzia 1999); yet few studies have investigated how these perceptions influence use of maternal health services in the context of poor urban settings. Further, previous studies have shown mixed results. A qualitative study in Uganda looking at community perceptions of quality of care showed that use of a facility was highly influenced by perceived quality, which was mainly determined by the competence of health workers and the relationship with the health workers, as well as the facility amenities (Kiguli *et al.* 2009). Another study in China revealed that physical accessibility was not an important factor in determining use of health care (Harris *et al.* 2010). Bhatia and Cleland (2001) reported similar findings in India.

Health service delivery in the informal settlements of Nairobi, Kenya

There are limited public health facilities in the slums of Nairobi. A study conducted in 2002 showed that out of the 125 health facilities serving 4 slum settlements of Nairobi, only 4 were public; 15 were private not-for-profit, while the remaining 106 were private for-profit (African Population and Health Research Center 2002a). The study further revealed that only 47 (38%) of all facilities had licenses from the Kenyan Medical Practitioners

and Dentist Board, the authorized license-issuing body for health providers; a total of 25 (20%) facilities had obtained their licenses from the Clinical Officers Board and the Nursing Council; while 33 (27%) had business licenses from the City Council (which are not professional working licenses); and 20 (16%) were not licensed at all. Further, 90 (72%) of the health facilities did not have any working guidelines or standard protocols for their services—more than 75% of which were private for-profit—and about half of the private for-profit facilities reported that they had never been supervised by any agency.

A more recent survey conducted in 2009 showed that the situation has not improved noticeably. Out of a total of 503 health facilities used by residents of three slum communities—including Kibera, reported to be the largest slum in sub-Saharan Africa—only 6 (1%) were public, 79 (16%) were private not-for-profit, and the large majority (418 or 83%) were private for-profit. Many slum residents tended to use public and private not-for-profit facilities for treatment of childhood illnesses, while they tended to use private for-profit for delivery. Most of the providers serving slum residents operated at levels 2 or 3; four of the six public facilities were health centres while one was a dispensary. Of all the private providers, 81% were clinics, 9% dispensaries and 3% health centres (African Population and Health Research Center 2009)

Reproductive health policy in Kenya

Overall, the private sector is increasingly emerging as an important partner in providing health care in Kenya and in other developing countries (Berman and Rose 1996; Andaleeb 2000). With the aim of providing a comprehensive and integrated system of reproductive health care, the 1997–2010 Kenya National Reproductive Health Strategy (NRHS) was developed as a national response to the Programme of Action of the 1994 International Conference on Population and Development (Ministry of Health 2005). The 2009–2015 NRHS was later developed in order to address issues and challenges which were not included in the 1997–2010 strategy, and to provide guidance and alignment with the first ever National Reproductive Health Policy (NRHP), which was put in place in 2007 as a framework for equitable, efficient and effective delivery of quality reproductive health services.

The NRHP identified a number of key challenges to maternal health including poor access to skilled care by women throughout the pregnancy, delivery, post-partum and postnatal phases, especially among the urban poor and other hard-to-reach groups; and weaknesses in the health system pertaining to, among other factors, the inability of the public sector to provide efficient, effective and equitable services entirely on their own (Ministry of Health 2007). Based on these challenges, the policy outlined priority actions aimed at improving maternal health, such as ensuring that pregnant women have access to skilled care throughout pregnancy, removing barriers that hinder access to skilled care for poor and hard-to-reach women, and ensuring that the referral system across public and private facilities is strengthened. However, in spite of the various efforts put in place to improve maternal health, recent statistics from the KDHS show that there is still

an urgent need to heighten these efforts given the persistent poor maternal health indicators (KNBS, 2010).

Against this backdrop, this study was designed to: (1) describe the perceptions of access to and quality of care among women living in informal settlements of Nairobi, Kenya; (2) quantify the effects of women's perceived quality of and access to care on the utilization of delivery services; and (3) draw policy implications regarding the delivery of maternal health services to the urban poor.

Methods

Data

The data used in this paper are from a maternal health study carried out in 2006 in two slums of Nairobi, Kenya, namely Korogocho and Viwandani, which cover an area of about $0.97 \, \text{km}^2$ and have nearly 60 000 inhabitants in about 22 000 households. The two informal settlements are located about 3 km apart. In these two densely populated communities, the African Population and Health Research Center has been conducting health and demographic surveillance system (HDSS) since 2002. All households are visited three times a year to collect basic health and demographic information.

Using data from the HDSS, all women (a total of 1927) who had pregnancy outcomes in 2004–2005 were selected and interviewed. The questionnaire covered topics including antenatal, delivery and postnatal care; reproductive history; perceived access to and quality of care; obstetric complications; and antenatal, delivery and postnatal expenditures. Besides the household survey, the project also had a health facility component. The basis for inclusion of health facilities was the provision of delivery care to the study population as reported in the household survey. All health facilities (a total of 25) where women in the study area sought delivery care were audited and information collected on the number, training and competence of obstetric staff; services offered; physical infrastructure; and availability, adequacy and functional status of supplies and other essentials for safe delivery. While it was not possible to ascertain that an item of equipment reported was functioning, the interviewer requested whenever possible to see the items reported, as illustrated by the following questions (the instructions to the interviewer are in italics): (1) Is there a nurse/midwife/doctor available on call at all times after the official working hours? *If yes, ask to see duty schedule*. (2) Does your unit have guidelines on infection control? *If yes, ask to see the guidelines*. (3) *Ask to see the room where normal deliveries are conducted. For the following items, check to see if the item is in the room where the delivery is conducted or in an immediately adjacent room.*

Variables

Dependent variable

The outcome variable is the place of delivery. Based on the facility audit results, health facilities were classified as either 'appropriate' or 'inappropriate'. The first category comprised eight facilities that provide the following five signal functions of basic emergency obstetric care: parenteral antibiotics, parenteral oxytocics, parenteral anticonvulsants for pre-eclampsia/eclampsia, manual removal of placenta, and removal of retained

products. The sixth function (assisted vaginal delivery) was offered in two of the eight facilities. The eight facilities included four hospitals (a national referral and teaching hospital, an obstetric specialist hospital, a district hospital and a missionary hospital), three health centres and one private clinic. They were run or owned by the government, religious and missionary groups or faith-based organizations, and large non-governmental organizations, and were mostly located in the outskirts of the slums or other places in the city, often far from the study setting. The second group was made up of the remaining 17 facilities. They were small and often ramshackle, privately owned and often unlicensed clinics and maternity homes. They were typically run by traditional birth attendants, and were located within the two slum communities. Based on this grouping, the dependent variable is defined as follows;

$$Y = \begin{cases} 0 & \text{if respondent did not deliver at a health facility} \\ 1 & \text{if respondent delivered at an inappropriate health facility} \\ 2 & \text{if respondent delivered at an appropriate health facility} \end{cases}$$

We also include a binary specification of the variable to examine the patterns of health facility delivery, regardless of the status (appropriate or inappropriate) of the facility.

Key predictors: women's perceived access to and quality of care
Women interviewed in the household survey were asked seven questions to capture their perception of access to the nearest facility (see Appendix 1). An index variable was constructed from these items using principal components analysis (PCA). PCA is a statistical technique that linearly transforms an original set of observed variables into a substantially smaller and more coherent set of uncorrelated variables that capture most of the information through maximizing the variance accounted for in the original variables, thus solving the problem of weights (Dunteman 1989). The resulting women's overall perception of access to care was further recoded as tertiles with categories labelled as low, middle and high. Respondents were also asked 15 questions in relation to their perception of the quality of service at the nearest health facility. These questions cover the most important dimensions of quality from the client's perspective, namely technical competence, interpersonal relations, accessibility and amenities (Brawley 2000). More generally, the three aspects of quality of care—structure, process and outcome—are covered (Donabedian 1990). Similarly, women's overall perception of the quality of care was constructed from these 15 items using PCA and further recoded as tertiles with categories labelled low, middle and high.

Control variables
The control variables included in the analysis are women's education (coded as no education, primary, secondary or higher) and household wealth. The household survey collected information on household possessions (TV, radio, fridge, bicycle, motorcycle and car), presence of electricity, material of the dwelling floor, source of drinking water, type of toilet facility and type of cooking fuel. PCA was used to generate a household wealth index which was further recoded as tertiles with the categories labelled poor, middle and least poor. Other control variables include the following bio-demographic and health-related variables: wantedness of the last child; number of antenatal visits during the pregnancy of the last child;

whether the respondent was advised during antenatal care to deliver at a health facility; respondents' parity; age at birth of the last child; and slum residence (Korogocho, Viwandani).

Methods of analysis
Multinomial logistic regression was used to quantify the effects of the identified covariates on the three-category variable place of delivery. The analysis is carried out in two phases. First, we use bivariate models to explore the crude effect of women's perceived access to care and women's perceived quality of care on their choice of place of delivery. Second, multivariate model allows us to identify factors associated with place of delivery and quantify their effects when controlling for other variables. The STATA 10.0 commands *mlogit and logit are* used for the analysis.

Results
Sample description and use of delivery care services
As shown in Table 1, about two-thirds of respondents had primary level education and a quarter had secondary or higher education. Noticeably, over 30% of women reported that the pregnancy for their last child was either mistimed or unplanned. As reported elsewhere in the country, the coverage of antenatal care (ANC) is quite low, with only 52% of women reporting the recommended four antenatal care visits. The figure is comparable to the figure for Nairobi as a whole obtained from the 2008–09 KDHS (57%). Health care providers serving the study population seemed to have taken the opportunity of ANC visits to advise women to deliver at a health facility. Close to 77% of women reported having received such advice. The distribution of respondents by parity and age at first birth is typical to urban areas. Finally, there were more women from Korogocho (the locality with larger population) than from Viwandani.

Table 1 also shows that while it may be estimated that about 70% of respondents delivered at health facilities, a figure which may sound in line with that reported by the 2008–09 KDHS for Nairobi as a whole (about 89%), only about 48% delivered in facilities with at least the minimum standards (those referred to as 'appropriate'). These results indicate that it may be misleading if the two categories of facilities examined in this study are not treated separately.

Women's perceptions of access to and quality of care
Despite the 'inappropriateness' of the facilities located in the study area as indicated previously, with most of the 'appropriate' facilities being situated in the outskirts of, or far from, the study area, Table 2 shows a pattern of women's good perceptions in terms of access to care (Panel A) and quality of care (Panel B) at the nearest facility. Most respondents had favourable perceptions of the distance and travel time to, and the opening hours at, the nearest facility. Also, the transport and the transport cost did not seem to be a major problem to the respondents. Doctors and midwives at the nearest facility were reported available by 63% of respondents. Because the nearest

Table 1 Characteristics of study women from the slums of Nairobi, Kenya, who delivered in 2004–2005

Variables	%	N
Education		
None	8.6	166
Primary	66.0	1272
Secondary or higher	25.4	489
Wanted index pregnancy then		
No	30.6	590
Yes	69.4	1337
Antenatal care (ANC) visits		
0–1	12.0	231
2–3	36.0	694
4+	52.0	1002
Advised during ANC to deliver at a health facility		
No	23.2	448
Yes	76.8	1479
Parity		
1	25.0	481
2–3	45.8	883
4+	29.2	563
Age at delivery (years)		
<20	8.8	170
20–24	35.1	677
25–29	27.5	530
30+	28.5	550
Slum residence		
Korogocho	57.0	1098
Viwandani	43.0	829
Place of delivery		
Home/TBA/other non-health facility	30.0	578
Inappropriate health facility	21.5	415
Appropriate health facility	48.5	934
N		1927

Note: Women's perceived quality of and access to care and household wealth are not shown since they are defined as tertiles.
TBA = traditional birth attendants.

facilities were likely to be privately owned, only 12% of women found the fees charged to pregnant women affordable.

Panel B reveals that over 60% of women found the patient privacy during examination adequate, and 52–55% of them were happy with staff integrity, effectiveness of medicine supplied, doctors' and midwives' respectfulness towards pregnant women and their ability to examine their patients, and the recovery of pregnant women cared for. However, the endorsement was not as astounding for the access to care. Between 20% and 30% of respondents reported that the waiting, examination and delivery rooms were just more or less adequate; the equipment was just more or less adequate; patients' access to drugs were just relatively easy; doctors' and midwives' time devoted to patients was more or less adequate; and the doctors and midwives were just moderately capable.

Noticeably, more than 17% of women felt that the number of doctors and midwives was not adequate.

Women's perceptions of access to and quality of care, and utilization of delivery care

The bivariate results in Table 3 show a strong, graded association between women's perceived access to care and women's perceived quality of care on the one hand, and delivery at both 'appropriate' and 'inappropriate' health facilities ($P < 0.001$ for all coefficients except one which is significant at the level of 5%). While women with high perceived access to care were more than five times more likely to deliver in an 'inappropriate' health facility, compared with their counterparts with low perception of access to care, the odds ratio was only 1.67 with regard to delivery at an 'appropriate' facility. The same pattern is also observed with perceived quality of care.

As can be seen in Table 4, after including control variables, the association between women's perceived access to care and women's perceived quality of care, and delivery at an 'inappropriate' facility remained strong, graded and in the expected direction. For example, women with high perceived access to care were about 3.8 times as likely to deliver at an 'inappropriate' facility as those with low perceived access, and respondents with high perceived quality of care were about 2.9 times more likely to delivery in an 'inappropriate' facility, compared with those with low perceived quality of care. By contrast, the association of the two predictors of interest and delivery at an 'appropriate' health facility remained in the expected direction, but only one coefficient reached statistical significance at the level of 0.10. The effect of perceived quality of care on delivery at an 'appropriate' facility was substantially reduced from the bivariate to the multivariate models; however, women who perceived quality of care to be high were significantly more likely to deliver at an 'appropriate' facility, compared with women who perceived quality of care to be low ($P < 0.05$). The association of both predictors and delivery at a health facility regardless of its status remained strong.

Household wealth was strongly associated with delivery in a sub-standard facility, but more so with women's delivery at an 'appropriate' facility. While the effect of women's secondary education on delivery at 'inappropriate' facilities was in line with expectations but did not reach statistical significance, the association with delivery in an 'appropriate' facility was strong and statistically significant ($P < 0.001$). Considering both categories of health facilities together, the effect of women's secondary education was statistically significant ($P < 0.01$).

Pregnancy wantedness and women's parity were significantly related to delivery at both sub-standard and good facilities and in the expected direction. By contrast, the number of ANC visits, advice during ANC to deliver at a health facility, and respondents' age at birth of the index child were only associated with delivery at an 'appropriate' health facility or at a health facility regardless of the status. The effect of slum residence, though strong for both delivery at a sub-standard facility and delivery at a good facility, revealed a striking pattern. Women from Viwandani were more than three times as likely as their counterparts from Korogocho to deliver at 'inappropriate' health facilities ($P < 0.001$), and Korogocho women were about three

Table 2 Women's perceived access to and quality of the nearest health facility, Nairobi's informal settlements, Kenya

	1	2	3	n.a./don't know
A. Perceived access to care at the nearest health facility				
1. Distance to health facility (1 = Long; 2 = Quite long; 3 = Short)	1.2	12.4	61.2	25.2
2. Travel time to health facility (1 = Long; 2 = Quite long; 3 = Short)	0.9	10.6	57.5	31.1
3. Transport to health facility (1 = Difficult; 2 = Moderately difficult; 3 = Not at all difficult)	0.9	2.8	26.7	69.7
4. Cost of transport to health facility (1 = Not affordable; 2 = Moderately affordable; 3 = Affordable)	1.0	3.3	7.9	87.8
5. Fees charged to pregnant women (1 = Not affordable; 2 = Moderately affordable; 3 = Affordable)	18.1	40.1	12.0	29.8
6. Opening hours at health facility (1 = Not suitable; 2 = Moderately suitable; 3 = Suitable)	1.3	9.8	62.5	26.4
7. Doctors'/midwives' availability (1 = Not available; 2 = Moderately available; 3 = Available)	0.3	10.2	63.4	26.2
B. Perceived quality of care at the nearest health facility				
1. Staff integrity (1 = Not honest; 2 = Fairly honest; 3 = Honest)	3.3	11.3	55.1	30.3
2. Doctors'/midwives' competence (1 = Not capable; 2 = Fairly capable; 3 = Capable)	3.7	19.9	45.3	31.0
3. Patients' access to drugs (1 = With difficulty; 2 = With relative ease; 3 = Easily)	4.5	24.9	41.6	29.1
4. Effectiveness of medicine supplied (1 = Not good; 2 = Fair; 3 = Good)	2.1	14.0	53.9	30.0
5. Effectiveness of equipment (1 = Inadequate; 2 = More or less adequate; 3 = Adequate)	5.2	25.7	36.9	32.2
6. Waiting/examination/delivery rooms' conditions (1 = Inadequate; 2 = More or less adequate; 3 = Adequate)	5.6	29.6	37.2	27.6
7. Pregnant women recovery (1 = Do not recover well; 2 = Recover relatively well; 3 = Recover well)	2.5	14.8	50.9	31.7
8. Doctors'/midwives' ability to examine (1 = Not very well; 2 = Moderately well; 3 = Well)	3.0	17.1	52.0	28.0
9. Doctors'/midwives' openness with pregnant women (1 = Not very open; 2 = Fairly open; 3 = Open)	5.7	17.2	45.9	31.2
10. Doctors'/midwives' compassion (1 = Not compassionate; 2 = Fairly compassionate; 3 = Compassionate)	7.2	17.0	46.1	29.7
11. Doctors'/midwives' respect (1 = Not very respectful; 2 = Fairly respectful; 3 = Respectful)	3.0	14.7	54.1	28.3
12. Doctors'/midwives' time devoted to patients (1 = Inadequate; 2 = More or less adequate; 3 = Adequate)	3.6	22.8	44.9	28.7
13. Patient privacy during examination (1 = Inadequate; 2 = More or less adequate; 3 = Adequate)	2.2	11.1	60.3	26.5
14. Number of doctors/midwives (1 = Inadequate; 2 = More or less adequate; 3 = Adequate)	17.4	20.0	33.7	28.9
15. Doctors'/midwives' suitability to deliver (1 = Not well suited; 2 = Relatively well suited; 3 = Well suited)	2.4	14.9	45.5	37.2

times as likely as Viwandani respondents to deliver at 'appropriate' facilities ($P < 0.001$). Overall, women from Korogocho were 40% more likely to deliver at a health facility compared with their counterparts from Viwandani ($P < 0.005$).

Discussion

This paper was based on the premise that despite the poor quality of maternal health facilities located in the slums of Nairobi, the responsiveness of their services to the socio-cultural and economic sensitivities of women would result in good perceptions and higher utilization by women. This assumption was reasonably supported by the study. The results show high endorsement of perceived good access in terms of distance, travel time, opening hours and availability of doctors and midwives. Given that these facilities are within reach, the respondents are not usually faced with transport and cost of transport challenges.

Our results also indicate women's good perceptions of quality of care for most of the indicators used in the study. Not surprisingly, women seem to worry about the number of nurses and midwives, the effectiveness of equipment, the conditions of the waiting, examination and delivery rooms, and access to drugs; and to a lesser degree, about the time devoted to patients, and doctors' and midwives' competence and suitability

to perform deliveries. A service provision assessment conducted in the study area reported that emergency obstetric services offered at the health facilities assessed were not optimum, with assisted vaginal delivery the predominantly missing procedure, and the majority of the skilled attendants lacking the requisite skills to perform other critical emergency obstetric procedures such as removal of retained placenta, a major cause of postpartum haemorrhage (Ziraba *et al*. 2009).

Women's high endorsement of quality of care in terms of patient privacy during examination (60.3%), staff integrity (55.1%) and doctors' and midwives' respect for the patients (54.1%), deserves attention. Other studies have shown that public providers of maternal health services in urban Kenya are not only frequently unfriendly to women, but also regularly fail to answer their questions, to ask them for important routine information, and tend to display behaviours of harassment and mistreatment of women (National Coordinating Agency for Population and Development 2005; National Coordinating Agency for Population and Development (NCAPD) and ORC Macro 2006). By contrast, traditional birth attendants and other informal providers located in the slums invest time in women, building trust and confidence, which ultimately contributes to fostering a strong relationship between these providers and the women who seek maternity services (Izugbara *et al*. 2009).

The multivariate analysis reveals that high perceptions of access to and quality of care provided by the 'inappropriate'

Table 3 Odds ratios (OR) of bivariate multinomial logistic regression models on the effects of women's perceived quality of and access to care on health facility (HF) delivery in the slums of Nairobi, Kenya

	Delivery at inappropriate HF vs Delivery at home/TBA/other non-HF		Delivery at appropriate HF vs Delivery at home/TBA/other non-HF		Delivery at appropriate or inappropriate HF vs Delivery at home/TBA/other non-HF	
	OR	*P* value	OR	*P* value	OR	*P* value
Perceived access to care (Ref: Low)						
Medium	2.78	0.000 ***	1.50	0.001**	1.74	0.000***
High	5.17	0.000 ***	1.67	0.000***	2.33	0.000***
Perceived quality of care (Ref: Low)						
Medium	2.40	0.000***	1.32	0.027*	1.54	0.000***
High	4.35	0.000***	1.93	0.000***	2.44	0.000***

*P < 0.05; **P < 0.01; ***P < 0.001.
TBA = traditional birth attendants.

Table 4 Odds ratios (OR) of multivariate multinomial logistic regression models on the effects of women's perceived quality of and access to care on health facility (HF) delivery in the slums of Nairobi, Kenya

	Delivery at inappropriate HF vs Delivery at home/TBA/other non-HF		Delivery at appropriate HF vs Delivery at home/TBA/other non-HF		Delivery at appropriate or inappropriate HF vs Delivery at home/TBA/other non-HF	
	OR	*P* value	OR	*P* value	OR	*P* value
Perceived access to care (Ref: Low)						
Medium	2.07	0.002**	1.22	0.221	1.41	0.027*
High	3.79	0.000***	1.31	0.159	1.82	0.001**
Perceived quality of care (Ref: Low)						
Medium	1.78	0.014*	0.92	0.611	1.12	0.478
High	2.93	0.000***	1.50	0.026*	1.85	0.000***
Household wealth (Ref: Poorest)						
Middle	1.15	0.424	1.42	0.010*	1.31	0.033*
Least poor	2.15	0.000***	2.23	0.000***	2.22	0.000***
Education (Ref: Primary)						
None	0.64	0.196	1.35	0.120	1.20	0.329
Secondary or higher	1.31	0.128	1.77	0.000***	1.61	0.001**
Wanted index pregnancy then						
Yes	1.44	0.027*	1.29	0.042*	1.33	0.014*
Antenatal care (ANC) visits						
2–3	1.41	0.138	1.58	0.014*	1.48	0.021*
4+	1.29	0.250	1.94	0.000***	6.67	0.002**
Advised during ANC to deliver at a health facility						
Yes	1.14	0.427	1.39	0.014*	1.33	0.023*
Parity						
2–3	0.55	0.003**	0.39	0.000***	0.43	0.000***
4+	0.29	0.000***	0.22	0.000***	0.25	0.000***
Age at delivery (years)						
<20	0.83	0.528	0.98	0.943	0.93	0.750
25–29	1.15	0.457	1.45	0.019*	1.33	0.055†
30+	0.91	0.689	1.44	0.036*	1.24	0.185
Slum residence						
Viwandani	3.34	0.000***	0.37	0.000***	0.73	0.010*

†P < 0.10; *P < 0.05; **P < 0.01; ***P < 0.001.
TBA = traditional birth attendants.

health facilities located in the study area have a positive influence on women's utilization of these facilities for delivery. Given that women in the slums of Nairobi are seldom able to reach not-for-profit private providers of maternal health care services like missionary and NGO clinics and hospitals (Agwanda 2006), and given the weaknesses of Kenya's public health sector (National Coordinating Agency for Population and Development 2005), this finding, coupled with women's perceptions of facilities located in the slums, calls for the design and implementation of a public–private partnership in the delivery of maternity services among the urban poor.

Household wealth also emerged as an important factor in the utilization of maternal health facilities, with the least poor being more likely to deliver at a health facility and more so in an appropriate one. This finding lends support to results from other studies that have shown the influence of clients' financial capability as a major barrier to the utilization of health services (Mugisha et al. 2004; Prata et al. 2004). Several studies conducted in urban slums have shown similar results (for example, Navaneetham and Dharmalingam 2002; Bazant and Koenig 2009). It is therefore imperative to direct efforts into health care financing by designing and implementing measures such as fee waivers on delivery services to improve utilization of maternity services by poor women (Amooti-Kaguna and Nuwaha 2000; Onah et al. 2006).

The results further show that the number of ANC visits during the course of the pregnancy, though not associated with delivery at an 'inappropriate' health facility, was significantly related to delivery at an 'appropriate' facility, a finding which is in accord with a large number of other studies. Bloom et al. (1999) noted that the frequency of ANC visits has a positive association with safe delivery, and argued that more emphasis should be laid on the content of ANC visits. This argument is supported by this study, with women who received advice during ANC being more likely to deliver at health facilities, compared with those who did not receive advice. A similar study conducted in an urban slum of Dhaka city also showed a strong association between use of ANC and delivery in a health facility (Iftekher and Hoque 2005). This finding confirms that ANC is an important factor for inducing women to deliver in health facilities and that strategies aimed at encouraging women's ANC attendance could greatly increase use of maternal services (WHO and UNICEF 2003).

Our results on the influence of women's education on their choice of place of delivery are in line with previous research on the education–health link (Becker et al. 1993; Chakraborty et al. 2003; Iftekher and Hoque 2005). It has been shown that education helps women to overcome various misconceptions about institutional delivery, and serves as a proxy for cognitive skills, information and values as they relate to health-seeking behaviours (Raghupathy 1996; Celik and Hotchkiss 2000; Iftekher and Hoque 2005). Unexpectedly, women with no education had higher likelihood of delivering at an 'appropriate' health facility compared with women with primary education ($P < 0.10$). This counter-intuitive finding may be due to the small proportion of women with no education in the sample (less than 9%).

In line with expectations, pregnancy wantedness was found to be associated with place of delivery, as shown by other studies (Altfeld et al. 1998). Our finding regarding parity is also in line with other studies that show a higher likelihood of delivery at a health facility among those with a lower parity. Mothers with a higher number of children may not have the time or financial resources to seek health facility delivery (Elo 1992; Stephenson and Tsui 2002). In addition, mothers who have had previous successful deliveries may not see the need to deliver at a health facility (Fotso et al. 2008a; Gabrysch and Campbell 2009).

The pattern of association between place (slum) of residence and place of delivery may be explained by the fact that Korogocho is served by two 'appropriate' health facilities run by NGOs, and by a public referral maternity hospital that is located not too far away. These three facilities accounted for 56% of the deliveries among women in Korogocho community (Fotso et al. 2008).

Harnessing the potential of private clinics in urban, resource-deprived settings

The National Reproductive Health Policy, like the Second National Health Sector Strategic Plan (NHSSSP II), acknowledges the potential of public–private partnership for increasing the provision of health services. It further recognizes the fostering of strong public–private partnerships as the main vehicle for effective implementation of the policy (Ministry of Health 2007). Despite the recognition that the public sector alone will not be able to provide the required services (Ministry of Health 2005), efforts to promote public–private partnership have been largely ineffective, partly due to limited training opportunities and incentives for private providers to support national health plans. The government has also remained the major source of funding to the health sector regardless of the decline and stall of the real financial allocation to the public sector over the past decade (Ministry of Health 2009).

The quality of emergency obstetric care services in Nairobi's slums is unacceptably poor, with inadequate essential equipment, supplies, trained personnel, skills and other support services. Importantly, there is little supervision to ensure adherence to standards (Ziraba et al. 2009). Well-equipped private facilities are usually accessed on a 'pay-before-service' basis, whereby patients have to make a cash deposit before treatment can commence. Cases of women being refused admission by private hospitals and clinics for not being able to make deposits, or for lack of evidence of a capacity to pay, are not uncommon (Izugbara et al. 2009). The public health sector is under-financed, characterized by shortages of most basic essentials, and is perceived as being unfriendly to patients (National Coordinating Agency for Population and Development 2005). The public sector also faces the challenges of a shortage of skilled health workers, poor procurement and supply systems, and poor monitoring systems, among other things (Ministry of Health 2007; Fotso et al. 2008b). Not-for-profit private providers of maternal health care services, such as missionary and NGO clinics and hospitals, are seldom within the reach of women living in informal settlements. Given their respective strengths and weaknesses, neither the private nor the public sector alone can best deliver quality, accessible and affordable health care services (Ministry of Health 2007; Fotso et al. 2008b).

Against the backdrop of challenges that the public sector continues to face in health care provision, we recommend that the Kenyan government design and implement a strategic partnership with the private sector with the goal of bringing quality health services closer to slum populations. While the 'cost' barrier faced by the slum dwellers may be alleviated through initiatives such as the recent waiver of fees on delivery services at government dispensaries and health centres, the 'distance' barrier remains a source of concern.

The partnership should revolve around two key components. First, the government should regulate private health facilities operating in urban slum settlements to ensure that the services they offer meet the acceptable minimum standards of obstetric care. The standards for the provision of maternal care set by the Ministry of Health describe the quality of services that midwives, nurses, clinical officers and doctors should provide to women and their babies (National Joint Steering Committee for Maternal Health Kenya 2002; Ministry of Health 2006). Secondly, 'good' facilities should be given technical support and supplied with drugs and equipment. For instance, the continuous training opportunities offered to medical personnel working in the public sector should be extended to staff from private facilities in the slums. The Ministry of Health could also extend its emergency back-up referral services to private health facilities operating in slums to ensure quick transfers in emergency cases (Fotso *et al.* 2008a).

Limitations of the study

One of the limitations of this study may be recall bias, which might have affected responses as the data from the study were based mainly on self-reporting. However, as Babalola and Fatusi surmised, recall bias is less likely in studies which are pregnancy-related as compared with more sensitive subjects such as sexual behaviour or drug abuse (Babalola and Fatusi 2009).

As with all cross-sectional studies, the direction of the observed association may not be clear. For example, we argue that women who perceived quality of care to be high were significantly more likely to deliver at an 'appropriate' facility compared with their counterparts with low perceived quality of care. It may be that it is because they delivered at an appropriate facility that their perception of quality is higher. Despite this inherent limitation, the paper sheds light on the use of delivery services among the urban poor, and provides recommendations to improve maternal health in resource-deprived urban settings of Kenya.

Acknowledgements

Funding

Conflict of interest

None declared.

References

Acharya LB, Cleland J. 2000. Maternal and child health services in rural Nepal: does access or quality matter more? *Health Policy and Planning* **15**: 223–9.

African Population and Health Research Center. 2002a. Health and livelihood needs of residents of informal settlements in Nairobi City. Nairobi: African Population and Health Research Center.

African Population and Health Research Center. 2002b. Population and health dynamics in Nairobi's informal settlements. Nairobi: African Population and Health Research Center.

African Population and Health Research Center. 2009. Strengthening information systems, knowledge sharing, and partnerships for addressing urban health vulnerabilities in the slums of Nairobi, Kenya. Nairobi: African Population and Health Research Center.

African Population and Health Research Center and World Bank. 2006. Averting preventable maternal mortality: delays and barriers to the utilization of emergency obstetric care in Nairobi's informal settlements. Nairobi: African Population and Health Research Center & World Bank.

Agwanda A. 2006. Reproductive health in Kenya: an examination of Safe Motherhood Initiative in light of the Millennium Development Goals. In: Mba CJ, Ngwe E (eds). *Reproductive, Maternal and Child Health in Africa: Current Developments and Future Directions*. Dakar: UEPA/UAPS, pp. 149–75.

Altfeld S, Handler A, Burton D, Berman L. 1998. Wantedness of pregnancy and prenatal health behaviors. *Women and Health* **26**: 29–43.

Amooti-Kaguna B, Nuwaha F. 2000. Factors influencing choice of delivery sites in Rakai district of Uganda. *Social Science & Medicine* **50**: 203–13.

Andaleeb SS. 2000. Service quality in public and private hospitals in urban Bangladesh: a comparative study. *Health Policy* **53**: 25–37.

Babalola S, Fatusi A. 2009. Determinants of use of maternal health services in Nigeria – looking beyond individual and household factors. *BMC Pregnancy and Childbirth* **9**: 43.

Bazant ES, Koenig MA. 2009. Women's satisfaction with delivery care in Nairobi's informal settlements. *International Journal for Quality in Health Care* **21**: 79–86.

Becker S, Peters DH, Gray RH *et al.* 1993. The determinants of use of maternal and child health services in Metro Cebu, the Philippines. *Health Transition Review* **3**: 77–89.

Berman P, Rose L. 1996. The role of private providers in maternal and child health and family planning services in developing countries. *Health Policy and Planning* **11**: 142–55.

Bhatia JC, Cleland J. 2001. Health-care seeking and expenditure by young Indian mothers in the public and private sectors. *Health Policy and Planning* **16**: 55–61.

Bloom SS, Lippeveld T, Wypij D. 1999. Does antenatal care make a difference to safe delivery? A study in urban Uttar Pradesh, India. *Health Policy and Planning* **14**: 38–48.

Brawley M. 2000. The client perspective: what is quality health care service? A literature review. Kampala. Uganda: Delivery of Improved Services for Health/USAID.

Celik Y, Hotchkiss D. 2000. The socioeconomic determinants of maternal health care utilization in Turkey. *Social Science and Medicine* **50**: 1797–806.

Chakraborty N, Islam MA, Chowdhury RI *et al.* 2003. Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International* **18**: 327–37(311).

Donabedian A. 1990. The seven pillars of quality. *Archives of Pathology & Laboratory Medicine* **114**: 1115–8.

Dunteman GH. 1989. *Principal Components Analysis*. Newbury Park, CA: Sage Publications.

Elo IT. 1992. Utilisation of maternal health-care services in Peru: the role of women's education. *Health Transition Review* **2**: 49–69.

Fotso JC, Ezeh A, Madise N *et al.* 2008a. What does access to maternal care mean among the urban poor? Factors associated with use of appropriate maternal health services in the slum settlements of Nairobi, Kenya. *Maternal and Child Health Journal* **13**: 130–7.

Fotso JC, Ezeh A, Oronje R. 2008b. Provision and use of maternal health services among urban poor women in Kenya: what do we know and what can we do? *Journal of Urban Health* **85**: 428–42.

Fotso JC, Ezeh AC, Essendi H. 2009. Maternal health in resource-poor urban settings: how does women's autonomy influence the utilization of obstetric care services? *Reproductive Health* **6**: 9.

Gabrysch S, Campbell OM. 2009. Still too far to walk: literature review of the determinants of delivery service use. *BMC Pregnancy and Childbirth* **9**: 34.

Harris A, Zhou Y, Liao H *et al.* 2010. Challenges to maternal health care utilization among ethnic minority women in a resource-poor region of Sichuan Province, China. *Health Policy and Planning* **25**: 311–8.

Henderson V. 2002. Urbanization in developing countries. *The World Bank Research Observer* **17**: 89–112.

Iftekher H, Hoque MM. 2005. Determinant of choices of delivery in some urban slums of Dhaka city. *Pakistan Journal of Social Sciences* **3**: 469–75.

Izugbara C, Ezeh A, Fotso JC. 2009. The persistence and challenges of homebirths: perspectives of traditional birth attendants in urban Kenya. *Health Policy and Planning* **24**: 1–10.

Kenya National Bureau of Statistics (KNBS) and ICF Macro. 2010. Kenya Demographic and Health Survey 2008-09. Calverton, Maryland: KNBS and ICF Macro.

Kiguli J, Ekirapa-Kiracho E, Okui O *et al.* 2009. Increasing access to quality health care for the poor: Community perceptions on quality care in Uganda. *Patient Preference and Adherence* **3**: 77–85.

Kruk ME, Galea S, Prescott M, Freedman LP. 2007. Health care financing and utilization of maternal health services in developing countries. *Health Policy and Planning* **22**: 303–10.

Magadi M, Diamond I, Madise N. 2001. Analysis of factors associated with maternal mortality in Kenyan hospitals. *Journal of Biosocial Science* **33**: 375–89.

Ministry of Health. 2005. Reversing Trends: The Second National Health Sector Strategic Plan of Kenya, NHSSP II – 2005–2010. Nairobi: Ministry of Health.

Ministry of Health. 2006. Norms and Standards for Health Service Delivery. Nairobi: Ministry of Health.

Ministry of Health. 2007. The National Reproductive Health Policy: Enhancing Reproductive Health for all Kenyans. Nairobi: Ministry of Health.

Ministry of Health. 2009. The National Reproductive Health Strategy 2009–2015. Nairobi: Ministry of Health.

Mugisha F, Bocar K, Dong H *et al.* 2004. The two faces of enhancing utilization of health-care services: determinants of patient initiation and retention in rural Burkina Faso. *Bulletin of the World Health Organization* **1**: 572–9.

National Coordinating Agency for Population and Development (NCAPD). 2005. Kenya Service Provision Assessment Survey 2004. *Maternal and Child Health, Family Planning and STIs*. Nairobi: NCAPD.

National Coordinating Agency for Population and Development (NCAPD), ORC Macro. 2006. Kenya Service Provision Assessment Survey 2005. *Maternal and Child Health, Family Planning and STIs*. Nairobi: Ministry of Health, Central Bureau of Statistics, and ORC Macro.

National Joint Steering Committee for Maternal Health Kenya. 2002. Standards for Maternal Care in Kenya. Nairobi: Ministry of Health.

Navaneetham K, Dharmalingam A. 2002. Utilisation of maternal health care services in southern India. *Social Science & Medicine* **55**: 1849–69.

Onah HE, Ikeako LC, Iloabachie GC. 2006. Factors associated with the use of maternity services in Enugu, southeastern Nigeria. *Social Science & Medicine* **63**: 1870–8.

Prata N, Greig F, Walsh J, West A. 2004. Ability to pay for maternal health services: what will it take to meet WHO standards? *Health Policy* **70**: 163–74.

Raghupathy S. 1996. Education and the use of maternal health care in Thailand. *Social Science & Medicine* **43**: 459–71.

Ronsmans C, Graham WJ. 2006. Lancet Maternal Survival Series steering group. 2006. Maternal mortality: who, when, where and why. *The Lancet* **368**: 1189–200.

Sitzia J. 1999. How valid and reliable are patient satisfaction data? An analysis of 195 studies. *International Journal for Quality in Health Care* **11**: 319–328.

Stephenson R, Tsui AO. 2002. Contextual influences on reproductive health services use in Uttar Pradesh, India. *Studies in Family Planning* **33**: 309–20.

United Nations Population Division. 2003. *World Urbanization Prospects: The 2003 Revision*. New York: United Nations.

World Health Organisation, United Nations Children's Fund. 2003. *Antenatal Care in Developing Countries. Promises, achievements and missed opportunities: an analysis of trends, levels and differentials, 1990–2001*. Geneva: World Health Organization.

World Health Organization. 2004. *Maternal Mortality in 2000: Estimates Developed by WHO, UNICEF and UNFPA*. Geneva: World Health Organization.

World Health Organization. 2005. *World Health Report 2005: Making Every Mother and Child Count*. Geneva: World Health Organization.

Ziraba AK, Mills S, Madise N *et al.* 2009. The state of emergency obstetric care services in Nairobi informal settlements and environs: results from a maternity health facility survey. *BMC Health Services Research* **9**: 46.

Zulu E, Dodoo F. 2002. Sexual risk-taking in the slums of Nairobi, Kenya 1993–98. *Population Studies* **56**: 311–23.

Appendix 1 Variables used to define perceived access to and quality of care

A. Perceived access to care

In your opinion:

(1) The distance from your home to the nearest health facility is: *Long; Quite long; Short*

(2) The travel time from your home to the nearest health facility is: *Long; Quite long; Short*

(3) To get transport from your home to the nearest health facility is*: Difficult; Moderately difficult; Not at all difficult*

(4) The cost of transportation from your home to the nearest health facility is: *Affordable; Moderately affordable; Not at all affordable*

(5) The fees pregnant women are charged at the nearest health facility are: *Affordable; Moderately affordable; Not at all affordable*

(6) The opening hours at the nearest health facility are: *Suitable; Moderately suitable; Not at all suitable*

(7) The doctors and midwives at the nearest health facility are: *Available; Moderately available; Not at all available*

B. Perceived quality of care

In your opinion:

(1) The people who work in the nearest health facility are: *Honest; Fairly honest; Not very honest*

(2) The doctors and midwives are *Capable; Fairly capable; Not capable* of finding out the problem with a pregnancy

(3) Patients can obtain drugs: *Easily; With relative ease; With difficulty*

(4) The effectiveness of the medicine supplied by hospitals/clinics is: *Good; Fair; Not good*

(5) The equipment is *Adequate; More or less adequate; Inadequate* for detecting diseases related to pregnancy

(6) The waiting rooms, examination rooms and delivery rooms are: *Adequate; More or less adequate; Inadequate*

(7) The pregnant women cared for: *Recover well; Recover relatively well; Do not recover well*

(8) The doctors and midwives examine their patients: *Well; Moderately well; Not very well*

(9) The doctors and midwives are *Open; Fairly open; Not very open* with the pregnant women

(10) The doctors and midwives are *Compassionate; Fairly compassionate; Not very compassionate* towards pregnant women

(11) The doctors and midwives are *Respectful; Fairly respectful; Not at all respectful* towards pregnant women

(12) The time that the doctors and midwives devote to their patients is: *Adequate; More or less adequate; Inadequate*

(13) The patients are given *Adequate privacy; More or less adequate privacy; Inadequate privacy* during examination by the nurse/doctor

(14) The number of doctors and midwives is: *Adequate; More or less adequate; Inadequate*

(15) The doctors and midwives are *Well suited; Relatively well suited; Not well suited* to deliver pregnant women