

Maternal health in resource-poor urban settings: How does women's autonomy influence the utilization of obstetric care services?

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Short Abstract

This paper uses *ordered logit* models and data from a maternal health study carried out in two slums of Nairobi, to investigate the following questions: 1) How does women's autonomy influence the choice of place of delivery in urban poor resource settings? 2) Does its effect vary by household wealth? and 3) To what extent does it mediate the relationship between women's education and use of health facility for delivery. Preliminary results show that the influence of women's autonomy on the utilization of maternal health services among poor women in Nairobi is rather weak. Interactions between household wealth and autonomy further indicate that higher autonomy is associated with better use of maternity services among the middle- and least poor-wealth groups, and with poorer utilization among the poorest. Finally, women's autonomy does not emerge to be a mediator of the link between education and use of health services for delivery.

1. Background

Despite the various national and international initiatives to improve maternal health, more than half a million women from developing countries die each year as a result of complications related to pregnancy and child birth^{1,2}. With approximately 247,000 maternal deaths per year, sub-Saharan Africa shares nearly half of the toll³. Despite the wide recognition that one major factor contributing to high maternal mortality is the low use of maternal health services for delivery, the proportion of assisted deliveries in sub-Saharan Africa has remained very low and progressed only marginally from 42 percent in 1990 to 46 percent in 2004⁴. Focusing on the period around childbirth is appropriate since most maternal deaths cluster around labor and the postpartum period^{1,5}. In recognition of the central role of professional care at birth, skilled birth attendance was chosen as a process indicator for monitoring progress towards the maternal health Millennium Development Goal (MDG) that seeks to reduce maternal mortality by three-quarters by 2015.

In seeking to explain these low levels of health care use in developing countries, most studies have focused on the provision and geographic accessibility of services, and relatively very few have looked at how factors such as women's autonomy influence use of services^{6,7,8}. The 1994 International Conference on Population and Development Programme of Action noted that "improving the status of women also enhances their decision-making capacity at all levels in all spheres of life, especially in the area of sexuality and reproduction"⁹. Women's autonomy has been defined as a woman's ability to make and execute decisions regarding personal matters of importance to her on the basis of her power over others, access to information, control over material resources, and freedom from violence by her husband or other men^{10,11,12}. Others have conceptualized women's autonomy as their ability to determine events in their lives, even though men and other women may be opposed to their wishes^{13,14}. Items widely explored include women's freedom of movement, discretion over earned income, decision making related to economic matters, violence or intimidation by husbands, and decision making related to health care^{11,12,13,15,16}.

A number of studies have examined the effect of women's autonomy and their reproductive health outcomes in the context of the developing world. Unfortunately, this literature has been growing asymmetrically, the body of knowledge being built mainly on evidence from Asia and South Asia in particular^{13-17,18,19,20,21,22,23,24}, with very little empirical evidence from sub-Saharan Africa where the patterns of women's status and social position have been shown to differ from those observed in Asia and other parts of the developing world^{12,25}. These studies have shown that lower family size or desired fertility was observed among women with higher levels of

autonomy; higher rates of contraceptive prevalence were recorded among women with greater interpersonal control; and lower rates of child mortality were observed among women with more decision-making power. Comparatively much less research has focused on the relationship between women's status and the use of health services, a proximate determinant of maternal and child mortality.

Another research gap that can be identified from previous research is the construction of women's autonomy. While most researchers agree that the impact of women's autonomy on demographic and health outcomes should be investigated using measures reflecting women's degree of control in their lives with emphasis on control over financial resources, decision-making power, and the extent of freedom of movement^{8,13-17}, the context and reasons for using a single measure or a group of indicators reflecting different aspects of autonomy, has not been fully clarified. This paper agrees with Saleem & Bobak¹⁶ and argues that both approaches should be used simultaneously. Most of the previous studies on the extent to which women's autonomy influences their demographic and reproductive health outcomes have used models that failed to appropriately control for household income and wealth. For example Saleem & Bobak¹⁶ used four indicators of wealth: water supply, house construction, toilet facility, and husband work status. Not only are these indicators likely to be highly correlated, the absence in the model of more wealth-related indicators such as household possessions, may lead to misestimate of the effect of autonomy. Besides filling some of the substantive and methodological research gaps above-presented, this piece of work focuses on the urban poor.

Why lay emphasis on the urban poor?

In sub-Saharan Africa, the unprecedented population growth that started in the second half of the 20th century has evolved into unparalleled urban growth. The region's urban population was 15 percent in 1950, 32 percent in 1990, and the United Nations projects that by 2020, a majority of sub-Saharan Africa's population will live in urban areas²⁶; the essential feature of current Africa urbanization is that cities have been growing despite poor macroeconomic performance; The pace of urbanization has outstripped economic growth, making it difficult for national and urban authorities to provide affordable housing, quality social services or sufficient employment to the growing population²⁷. These trends have resulted in unprecedented growth of slums and unplanned settlements on the periphery of most African cities^{28,29}.

Kenya's capital city typifies the current urban population boom and associated urban health and poverty problems. Its population increased from about 120,000 in 1980 to about 3 million in 2000, with over 60% of the population living in slums which cover only 5% of city's residential land area³⁰. It is estimated that while absolute poverty increased from 48 to 53% in rural areas

of Kenya between 1992 and 1997, it almost doubled from 27 to 50% over the same period in Nairobi city³¹. Key dimensions of poverty include inadequate access of urban dwellers to appropriate health care services, with Nairobi slums being served mainly by private-owned, sub-standard, unlicensed and informal health facilities³². Young people in these informal settlements 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^{33,34}.

The explosive growth of urban informal settlements in most countries of the developing world challenges the commonly-held assumption that the health and economic conditions of urban populations are superior to those of rural dwellers, and lends support to the concept of urban health penalty which posits that cities concentrate poor people in defined geographic areas and expose residents of these areas to unhealthy environments that result in a disproportionate burden of poor health³⁵. More generally, the advantage that urban areas previously had over rural areas on various health, social and economic indicators has narrowed over time, as economic and environmental conditions have sharply deteriorated in rapidly growing cities^{36,37}. Overall, it is increasingly evident that failing to appropriately target the growing sub-group of the urban poor and improve their living conditions and health status -which is an MDG target itself- may result in lack of improvement on national indicators of health and consequently, push countries away from meeting the MDG target.

The research presented in this paper was guided by the following questions: 1) How does women's autonomy influence the choice of place of delivery in urban poor resource settings? 2) Does its effect vary by household wealth? and 3) To what extent does it mediate the relationship between women's education and use of health facility for delivery.

2. Data and 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 Viwandani³². The two communities exhibit structural differences: Viwandani is home to many industrial workers; it attracts migrants with relatively higher education levels, and exhibits higher levels of economic activity; whereas the population in Korogocho is more stable. All women (a total of 1,927) who had pregnancy outcomes in 2004-2005 were selected and interviewed. Further, all health facilities serving the study population were assessed with regard to the number, training and competency of obstetric staff; services offered; physical infrastructure; and availability, adequacy and functional status of

supplies and other essentials for safe delivery, among others. A total of 25 facilities were surveyed.

Dependent variable

The outcome variable is the place of delivery. Building on our previous work³⁸, health facilities were classified as either appropriate or inappropriate. The first group, labeled as “*inappropriate*”, comprised 17 small and often ramshackle and unlicensed clinics and maternity homes that were deemed unable to offer many of the signal functions of Basic Emergency Obstetric Care (BEOC). They are located within the two slum communities. The second category comprised eight facilities that provide at least basic essential obstetric care. These facilities are run or owned by government, religious and missionary groups or Faith-Based Organizations (FBOs), and large Non-Governmental Organizations (NGOs), and are located in the outskirts of the slums or other places in the city, often far from the slums. Health facilities in this category were labeled as “*appropriate*”. Based on this grouping, the dependent variable is defined as follows:

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

Women’s autonomy

Most studies have documented the effects of four key aspects of women’s autonomy on various health-related outcomes. These include women's freedom of movement, discretion over earned income, decision making related to economic matters, violence or intimidation by husbands, and decision making related to health care¹¹⁻¹⁵. The data used for this paper only include variables that relate to women’s decision-making autonomy and freedom of movement (see Table 1). For the purpose of this study we define an overall women’s autonomy variable using all items described in Table 1, as well as decision-making autonomy (from the 10 variables in Table 1) and freedom of movement (based on seven item variables). All three autonomy variables are constructed using Principal Component Analysis (PCA) and recoded as tertiles with categories labeled Low autonomy, Middle and High autonomy.

Control variables

The socioeconomic variable of interest to this study is household wealth. PCA was used to generate household wealth tertiles from household characteristics, namely, the presence of electricity, type of cooking fuel, material of the dwelling floor, source of drinking water, type of

toilet facility, and possession of bed net, solar, radio, television, refrigerator, bicycle, motorcycle/scooter, car/truck and mobile phone. The categories of the constructed variable were labeled Poorest, Middle and Least poor. Women's education (coded as None; Primary; and Secondary or higher) was also included. Other control variables were parity, age at birth, pregnancy wantedness, number of antenatal visits, advice during antenatal care to deliver with a skilled health care provider, and slum residence (Korogocho, Viwandani).

[Table 1 about here]

Methods of analysis

To achieve its objectives the paper fitted ordered logistic regressions using partial proportional odds models³⁹. The analysis is carried out in three phases. First, multivariate models are used to identify factors associated with place of delivery and quantify their net effects. Second, interaction models are examined to test the extent to which the effects of the women's autonomy on the choice of place of delivery vary by household wealth. Third, we examined the potential mediating effect of women's autonomy on the link between education and place of delivery, by adjusting the effect of education for autonomy and assessing the change in the coefficients. At each stage, we run a model with women's overall autonomy and another with both women's decision-making and freedom of movement.

3. Results

Sample description

Table 2 depicts the description of the sample of 1,927 women who were interviewed in the household survey. About two-thirds of women had primary education, and only one-quarter reached or went beyond secondary education. Nearly 31% of women reported that their pregnancy was either mistimed or unwanted. Only 52% of women made the recommended four antenatal care (ANC) visits, and during the ANC visits, about 23% (of all women) were advised to deliver with the help of a health professional. For a quarter of women, it was their first pregnancy; about 46 percent had two or three children, while the remaining 29 percent had four or more children. Finally, 57 percent of women were from Korogocho and 43 percent from Viwandani.

Multivariate analysis: Main effects

As can be seen in Table 3, while the effect of household wealth on the choice of place of delivery appeared to be strong and in the expected direction ($p < 0.01$ in both Panel A and B), the effect of women's overall autonomy (see Panel A) was significant and counter-intuitive, with low autonomy women the least likely to deliver in appropriate health facilities. Panel B shows that

neither decision-making autonomy nor women's freedom of movement had any influence on place of delivery.

[Table 2 about here]

[Table 3 about here]

Women with at least secondary education were more likely to deliver in a health facility in general or in an appropriate health facility, compared to those with no education ($p < 0.01$). Pregnancies that were wanted were more likely to be delivered at health facilities ($p < 0.01$ in Panels A and B) or at appropriate facilities ($p < 0.01$ in Panel A), compared with those that were either mistimed or unwanted. The number of antenatal visits was associated with place of delivery, with women who made the recommended four visits more likely to deliver in a health facility delivery in general ($p < 0.01$) or in an "appropriate" facility ($p < 0.01$), compared with their counterparts who made at most one visit. Importantly, respondents who were advised during antenatal care to deliver at health facility were significantly more likely to use health facilities in general ($p < 0.01$ in both Panels) and the well-equipped ones in particular ($p < 0.01$ in both Panels), compared with those who were not advised. The likelihood of delivering at a health facility in general and in the well-equipped facilities in particular, significantly decreases as parity increases ($p < 0.01$ in both Panels).

With regard to age, women aged less than 25 years were the least likely to deliver at health facilities or at the appropriate ones. Noticeably, there subsisted huge differentials in health facility deliveries by slum residence, with Korogocho women about twice more likely to deliver at health facility in general ($p < 0.01$), and more than five times more likely to do so in an appropriate facility ($p < 0.01$), compared to women living in Viwandani.

Multivariate analysis: Interaction effects

Results of the interactions between women's autonomy and household wealth are summarized in Figure 1, with focus on delivery at appropriate health facilities. Details are in Appendix 1. Noticeably, the effects of women's autonomy vary greatly by household wealth. In particular, the counter-intuitive result observed in the multivariate-main effects model is only true among the poorest. Graph 1-1 of Figure 1 indicates that in middle and least poor households, high overall autonomy women are more likely to deliver in appropriate health facilities, compared with their low or middle autonomy counterparts. Though middle autonomy women in least poor households tended to exhibit lower use of appropriate health facilities, the pattern of association between women's overall autonomy and place of delivery is in line with expectation among women residents in middle and least poor households. Similar patterns are observed in Graphs 1-2 and 1-3. Graded relationships between decision-making (Graph 1-2) or freedom of

autonomy (Graph 1-3) and place of delivery are observed among women from least poor households.

[Figure 1 about here]

Mediating effect of women's autonomy

In Table 4, we examined the extent to which women's autonomy mediates the association between women's education and choice of place of delivery. The changes in the coefficients between models without and with autonomy variables were modest, especially for secondary education. This minimal change suggests that autonomy is not a major mediator of the link between education and use of health services for delivery.

[Table 4 about here]

4. Discussion

This paper sought to investigate the influence of women's autonomy on utilization of obstetric care services among the urban poor women in Nairobi. A number of findings emerged from the study. Although various studies have found that women of higher autonomy were more likely to use health services, the results of this study found otherwise. The effect of autonomy, measured by overall autonomy, freedom of movement and decision making on the utilization of maternal health care services among poor women in Nairobi, is weak. These results vary with those of other studies⁴⁰, A study by, (Bloom&Wypij, Saleem& Bobak, Moursund& Kravidal) indicated that autonomy is a major determinant of maternal health care and contraception utilization. Another study conducted by (Bloom& Wypij) in India particularly indicated that freedom of movement had a strong effect on utilization of maternal health care.

In this study, autonomy was highly related to household structure and kinship relationships and the findings indicate that some dimensions of autonomy were more important to the outcome than others. One study done in Egypt indicates the importance of decision-making on use of contraception⁴¹. A study on women's autonomy and contraception use in Pakistan investigated decision and movement as autonomy measures (Saleem & Bobak). In their findings, decision autonomy was significantly associated with contraception use while movement autonomy was not consistently associated with contraception use; instead, women's education had the most prominent role. However, a study conducted by Moursund in India on the other hand indicates similar findings to those in this study. The individual-level index for decision-making autonomy had a positive but weak impact while there emerged an inconsistent pattern with the physical autonomy where women with high freedom of movement had a strong desire to stop child bearing but did not use contraception to a larger extent.

Another finding from this study indicates that effect of autonomy on the use of maternal health services applies to the overall autonomy with neither decision making nor freedom of movement having an influence on the choice of place of delivery. This is in tandem with findings from other studies done in developing countries where autonomy in relation to use of maternal health services and contraception was found to be weak. A study by Furuta explored three dimensions of women's positions within their households; which were decision-making, employment and influence over earnings. In their findings, women's use of maternal health services may not be related to their positions in the household. Women's autonomy relating to decision-making was found to be weak, and a low percentage of educated women were involved in decision-making. A study done by Govindasamy P, & Malhotra A, 1996⁴² found education and employment as measures of autonomy only to partially mediate the use of reproductive health services among women in Egypt. Other studies have found an association between autonomy and the use of maternal health services although most of these associations were found to be weak. In a study done in Nepal, decision making was found to be weak in determining the use of maternal health services with women's household position not necessarily having a relationship with use of maternal health services. Employment of women on the other hand was not a guarantee to use maternal health services especially when women did not have control over their earnings (Furuta, Salway). Most of these studies have however been conducted in Asia and very few in sub-Saharan Africa. The different cultures between these regions for instance the strong kinship effect on women's position among Indian women may make it impossible to compare with studies done in sub-Saharan Africa.

The interaction between autonomy and household wealth revealed counter-intuitive results among the poorest women with high autonomy who were least likely to deliver in appropriate health facilities. Similar results by Furuta & Salway, 2006 found that, women's employment without control over their resources did not translate into use of maternal health services. This concurs with findings from a study in Cameroon whose main finding indicated that the burden of disease disproportionately rests on the economically disadvantaged⁴³. Indeed, the poor face pressure to raise money for survival and the poorest are likely to be most affected (Magadi Zulu). This finding shows that real wealth is important for utilization of maternal health care services and concurs with other studies^{44,45,46} which show that women who are poorer and with less education tend to have poor maternal health outcomes in poor settings. This important outcome indicating a positive relation between utilization of health services and wealth which seems to add to the evidence from several studies that the burden of disease rests on the economically disadvantaged and wealth significantly affects women's health (Magadi, Zulu)^{47,48}. At a general level, women are more likely to deliver in appropriate health facilities as their

autonomy level and economic status improve. These findings are in conflict with the common held view that high autonomy among women is a major contributing factor to utilization of maternal health services as indicated from various studies for instance a study by Saleem S & Bobak M, 2005 and Bloom SS, 2001 where decision making and freedom of movement as measures of autonomy were significantly associated with contraceptive use and the use of maternal care services respectively. Furthermore, very few studies on women's autonomy have focused on the urban poor (Bloom Wypij^{49,50}, more so the different categories among the urban poor like those outlined in this study (poorest, middle and least poor). This might be the reason that the counter-intuitive result does not concur with findings from most of the studies done on poor women's autonomy and access to maternal health services.

Another important finding of this study is that the association between autonomy and household wealth was strong in the expected direction for women is that women's autonomy in relation to access to maternal health services is not only weak, but poorest women have better autonomy than the least poor which may imply that they are more likely to seek health. It was expected that the least poor women because of their slight monetary advantage over the very poor ones would have more decision making power and freedom of movement which would give them greater influence over their health needs and this would translate into higher use of appropriate maternal health services. This could be explained by the fact that 57% of the women interviewed live in Korogocho which is better served with appropriate health facilities. Another reason advanced for high autonomy among the poorest women is that perhaps the poorest women are unmarried therefore do not face any obstacles from their spouses in decision making and movement like their married counterparts and can therefore easily access health care services. This is however a speculation that may require further studies to be conducted to ascertain.

More findings of this study indicate that age is significantly related to the use of maternal health services. Those women aged below 25 years of age experience poorer maternal health care and are less likely to deliver at a health facility or an appropriate health facility, a finding that is consistent with a study conducted in sub-Saharan Africa by Magadi Agwanda. This study which sought to compare the antenatal and delivery care services between teenager and older women found that teenagers in sub-Saharan Africa experience poorer maternal health care than older women with similar characteristics. These poor urban women therefore need maternal health services availed to them alongside health promotion in order to improve their health-seeking behaviour. These services would range from contraception, delivery and post-partum care. More results of this study indicate a strong association between the use of antenatal care

services and delivery at a health facility with about 77% of women interviewed having been advised during ANC to deliver at a health facility. This finding relates to that of a study done in the same slums (Fotso, Ezeh, Oranje) where a strong linkage between use of antenatal care and place of delivery was found and further correlates with those from WHO/UNICEF⁵¹. Parity on the other hand, is likely to determine the choice of place of delivery. Women with higher parity have higher autonomy with regard to delivery at all types of health facilities or not delivering in a health facility. Furthermore, with about 30% of the women reporting the unintendedness of the pregnancy, this is an indication of unmet need for contraception which requires important consideration in order to limit pregnancies that are unintended because they contribute to other risks like unsafe abortions. Targeting women for messages that promote health is an avenue that can be exploited if improvement in maternal health is to be observed among the urban poor. Other messages to be reinforced during these sessions include emphasis on the importance of accessing maternal health services from the time they are pregnant, to delivery and post-partum as well as educating these women about the various symptoms for complications in order to promptly access health services when needed.

The data also suggested no evidence of autonomy being a mediator between education and health service utilization. Very few studies have investigated the mediation of autonomy on the influence of education with varying results. A study among Bangladesh women found that autonomy had a major mediating effect on education²² while that conducted in Egypt indicated that education and employment only partially mediated the use or non-use of reproductive health services (Govindasamy). Another conducted in India indicates that autonomy did not mediate the link between education and contraception (Moursund Kravdal) and concurs with a study among Pakistani women (Saleem, Bobak). Results from our study indicated very modest changes in coefficients between models with and without autonomy variables implying very weak mediation of autonomy on education and the use of maternal health services hence there is an impact of education on maternal health care but it is dependent on decision and movement as forms of autonomy.

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Table I. Variables used to define women's autonomy

A. Decision making

1. Who decides how the money you earn is spent?^a

Who in your household usually has the final say on the following decisions^a

2. Your own health care?
3. Making large household purchases?
4. Making household purchases for daily needs?
5. Visits to family or relatives?
6. What food should be cooked each day?
7. You should do work to earn money?
8. What to do if a child falls sick?
9. Having another child?

B. Freedom of movement

1. If you are ill and need to see a doctor, do you first have to ask someone's permission?^b

Are you usually allowed to go to the following places^a:

2. Just outside your house or compound?
3. Local market to buy things?
4. Local health center or doctor?
5. In the neighborhood for recreation?
6. Home of relatives or friends in the neighborhood?

^aCoded: 1=Respondent alone or with somebody else; 0=Other(s)

^bCoded: 1=Yes; 0=No

Table 2. Characteristics of women from the slums of Nairobi, Kenya who delivered in 2004-2005

Variables	%	N
Education		
None	8.6	166
Primary	66.0	1,272
Secondary or higher	25.4	489
Wanted index pregnancy then		
No	30.6	590
Yes	69.4	1,337
Antenatal care visits		
0-1	12.0	231
2-3	36.0	694
4+	52.0	1,002
Advised during ANC to deliver at a health facility		
No	23.2	448
Yes	76.8	1,479
Parity		
1	25.0	481
2-3	45.8	883
4+	29.2	563
Age at birth		
<20	8.8	170
20-24	35.1	677
25-29	27.5	530
30+	28.5	550
Slum residence		
Korogocho	57.0	1,098
Viwandani	43.0	829
N		1,927

Note: Women's autonomy and Household wealth are not shown since they are defined as tertiles.

Table 3. Coefficients of ordered logistic regression models on the effects of women's autonomy on health facility delivery in the slums of Nairobi, Kenya

	Panel A		Panel B	
	Model with Overall autonomy		Model with Decision-making and Freedom of movement	
	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)
Overall autonomy (Ref: Low)				
Medium	-0.037	-0.240 *		
High	0.125	-0.170		
Decision making (Ref: Low)				
Medium			-0.107	--
High			0.046	--
Freedom of movement (Ref: Low)				
Medium			-0.075	--
High			-0.075	--
Household wealth (Ref: Poorest)				
Middle	0.290 **	0.290 **	0.287 *	--
Least poor	0.785 **	0.438 **	0.772 **	0.438 **
Education (Ref: Primary)				
None	0.090	0.334 †	0.090	0.324 †
Secondary or higher	0.434 **	--	0.430 **	--
Wanted index pregnancy then				
Yes	0.200 *	--	0.306 **	0.141
Antenatal care visits				
2-3	0.496 **	0.185	0.344 *	--
4+	0.665 **	0.403 *	0.538 **	--
Advised during ANC to deliver at a health facility				
Yes	0.328 **	--	0.328 **	--
Parity				
2-3	-0.704 **	--	-0.693 **	--
4+	-1.136 **	--	-1.116 **	--
Age at birth				
<20	0.042	--	0.055	--
25-29	0.321 **	--	0.318 **	--
30+	0.146	0.428 **	0.164	0.392 **
Slum residence				
Viwandani	-0.365 **	-1.469 **	-0.413 **	-1.413 **

†p<.10; *p<.05; **p<.01

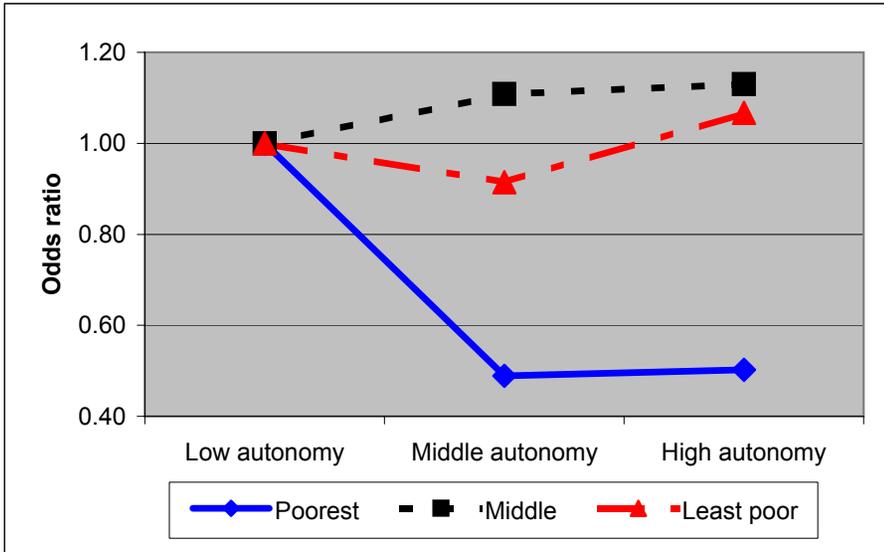
Table 4. Changed in the coefficients of place of delivery by education after controlling for women's autonomy

	Panel A		Panel B	
	Model with Overall autonomy		Model with Decision-making and Freedom of movement	
	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)
1. Crude model (no control)				
Education (Ref: Primary)				
None	0.102	0.354 *	0.102	0.354 *
Secondary or higher	0.433 **	0.433 **	0.433 **	0.433 **
2. Full model (with all variables)				
Education (Ref: Primary)				
None	0.090	0.334 †	0.090	0.324 †
Secondary or higher	0.434 **	0.434 **	0.430 **	0.430 **
3. Variation (%)				
None	-11.8	-5.7	-11.4	-8.4
Secondary or higher	0.3	0.3	-0.7	-0.7

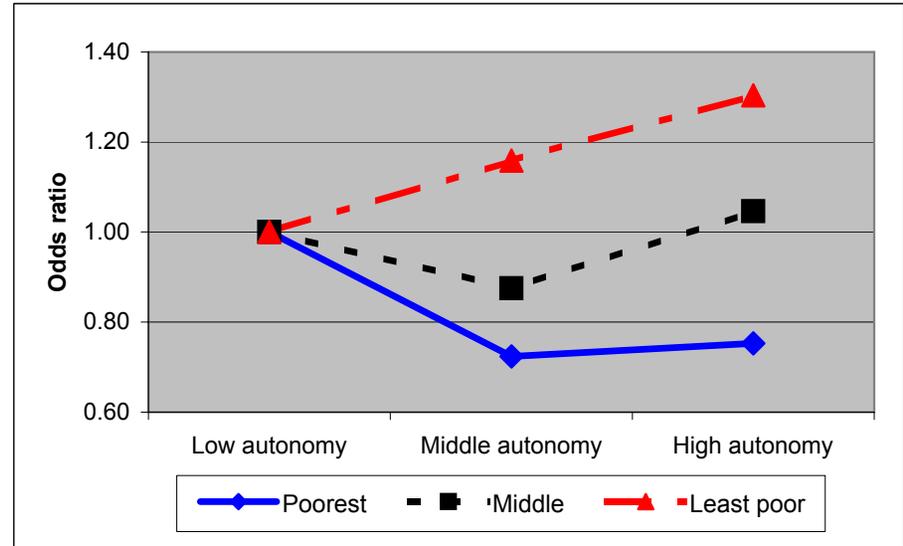
†p<.10; *p<.05; **p<.01

Figure 1. Interactions between women's autonomy and household wealth as determinants of health facility delivery

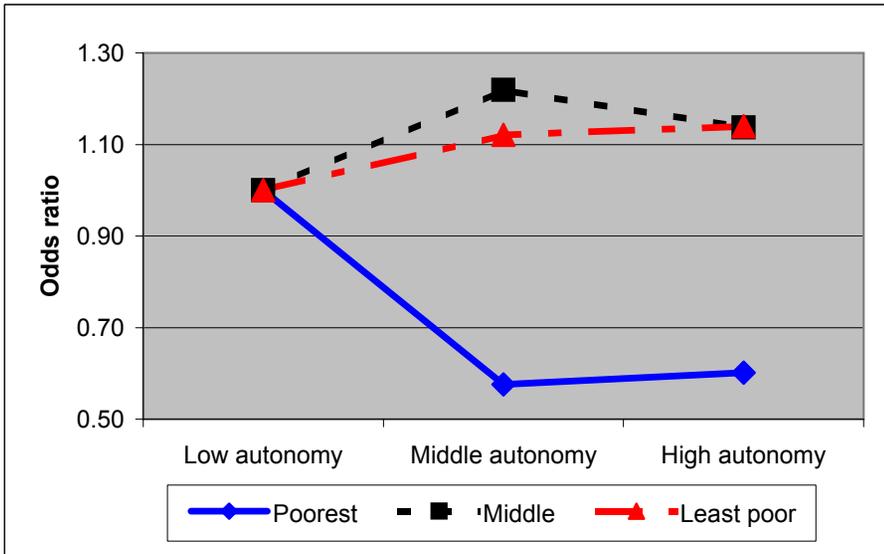
Graph 1.1. Overall autonomy and household wealth Interaction



Graph 1.2. Decision-making autonomy and household wealth Interaction



Graph 1.3. Freedom of movement autonomy and household wealth Interaction



Appendix 1. Coefficients of ordered logistic regression models on the interactions between women's autonomy and household wealth as determinants of health facility delivery in the slums of Nairobi, Kenya

	Overall autonomy		Decision making		Freedom of movement	
	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)	All types of HF vs Not HF	Appropriate HF vs (Inappropriate or not HF)
Overall autonomy (Ref: Low)						
Medium	-0.529 **	-0.715 **				
High	-0.400 *	-0.689 **				
Decision making (Ref: Low)						
Medium			-0.323 †	--		
High			-0.073	-0.284		
Freedom of movement (Ref: Low)						
Medium					-0.551 **	--
High					-0.509 **	--
Household wealth-Autonomy interactions						
Middle-Medium	0.818 **	--	0.190	--	0.750 **	--
Middle-High	0.811 **	--	0.329	--	0.637 *	--
Least poor-Medium	0.626 *	--	0.470 †	--	0.666 *	--
Least poor-High	0.754 **	--	0.150	0.549 †	0.640 *	--

†p<.10; *p<.05; **p<.01