Original Article

The impact of targeted subsidies for facility-based delivery on access to care and equity – Evidence from a population-based study in rural Burkina Faso

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Abstract We conducted the first population-based impact assessment of a financing policy introduced in Burkina Faso in 2007 on women's access to delivery services. The policy offers an 80 per cent subsidy for facility-based delivery. We collected information on delivery in five repeated cross-sectional surveys carried out from 2006 to 2010 on a representative sample of 1050 households in rural Nouna Health District. Over the 5 years, the proportion of facility-based deliveries increased from 49 to 84 per cent ($P<0.001$). The utilization gap across socio-economic quintiles, however, remained unchanged. The amount received for all services associated with births decreased by 67 per cent ($P<0.001$), but women continued to pay on average 1423 CFA (€1 = 655 CFA), about 500 CFA more than the set tariff of 900 CFA. Our findings indicate the operational effectiveness of the policy in increasing the use of facility-based delivery services for women. The potential to reduce maternal mortality substantially has not yet been assessed by health outcome measures of neonatal and maternal mortality.
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Introduction

In spite of recent progress, maternal mortality in Burkina Faso, as elsewhere in sub-Saharan Africa, remains unacceptably high.[1] As 80 per cent of maternal deaths could be avoided with available interventions,[2] many authors have urged countries to take action and implement policies to facilitate more equitable access to services.[3,4] This explains why human rights organizations have joined this debate.

Amnesty International titled its report on maternal mortality in Burkina Faso *Giving Life, Risking Death*.[5] For one of the first times, a human rights organization challenged decision makers on the right to equitable access to maternal health services. Before this report, Human Rights Watch had drawn attention to the costs of access to healthcare services in Burundi, denouncing detention of insolvent patients in hospitals.[6] The considerable media attention this report received contributed to the president's decision to abolish user fees for deliveries in 2006.

Uganda (2001), Ghana (2003/2004), and Senegal (2005/2006) all abolished user fees for delivery,[7] leading to an international consensus in favor of *free services for women at the point of use*.[8] Underlying user fee abolition is based on the assumption that improved access to skilled attendants at birth represents the single most effective means to reduce maternal and neonatal mortality as well as maternal morbidities.[9,10]

With an estimated 332 maternal deaths per 100 000 live births in Burkina Faso,[1] providing access to obstetric services represents a major challenge for the healthcare system. To increase access and reduce maternal mortality, the government introduced an 80 per cent subsidy for facility-based delivery. According to the new policy, women presenting with a normal delivery are asked to pay 900 West African CFA francs (CFA), 20 per cent of the total cost estimated at 4500 CFA (€1 = 655 CFA). Rates are proportionally higher for complicated deliveries (3600 CFA) and C-sections (11 000 CFA). The subsidy was implemented countrywide on 1 January 2007.

Following two process evaluations,[11,12] we report here on the first population-based study aimed at assessing the impact of the new financing policy – subsidy of facility-based deliveries – on service utilization and payments by households at point of use.

Methods

Study setting

We conducted our study between 2006 and 2010 in the Nouna Health District (NHD) in rural Burkina Faso. The district has a population of approximately 311 000 distributed in about 300 villages. At the time of the study, the health district had 25 first-line facilities, *Centres de Santé et de Promotion Sociale* (CSPS) – 24 located in rural areas and 1 in Nouna town. Nouna town also had a district hospital. All 25 CSPS were equipped and staffed as *Basic Emergency Obstetric Care* facilities, whereas only the district hospital was equipped and staffed as a *Comprehensive Emergency Obstetric Care* facility.

Study design and data collection

We carried out a 'before and after' study with multiple measurements, using a total of five repeated cross-sectional surveys performed from March 2006 to 2010 (Figure 1).

We collected data using a three-stage cluster sampling procedure described elsewhere.[13]

- In brief, we defined clusters according to the catchment area of each CSPS.

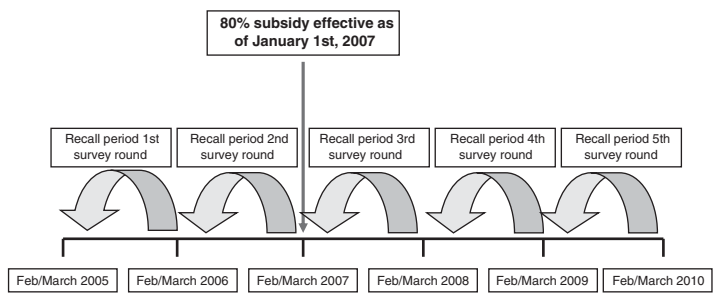

Figure 1: Information on timing of data collection and relevant recall period.
Note: The figure reports information on the five survey rounds (2006–2010) relating the timing of data collection with the relevant recall period and the implementation of the 80 per cent subsidy for facility-based delivery. The horizontal axis represents the timing of data collection. The wide arrows indicate the 12-month recall period, which applied to each survey round. The vertical arrow indicates when the 80 per cent subsidy was introduced in the NHD.

- We selected two villages within each cluster, the village where the CSPS is located and an additional one chosen at random among all the villages in the relevant catchment area.
- We randomly selected 20 households in each village, using modified EPI sampling procedures.[14] To take into account its larger population, we selected 70 households in Nouna town using the same procedure. We did not apply sampling proportional to village size.

In the sampled households, we collected information on the overall socio-economic status and interviewed all women who had completed a pregnancy in the 12 months before the interview date. We asked about the use of and spending on delivery services. We did not record information on travel costs, and thus our spending variable refers exclusively to direct medical costs.

Data analysis

We defined the primary study outcome as the number of deliveries in a formal health facility. To detect differences due to the policy introduction, we compared the proportion of facility-based deliveries over the 5 years. To assess impact on equity, we compared the proportion of facility-based deliveries across socio-economic groups and across women living at different distances from a health facility ($\leqslant 5$ km versus > 5 km). We used χ^2 tests to detect significance levels, set at $P < 0.05$.

Using a combination of housing infrastructure and durable assets, we applied standard procedures, relying on principal component analysis to estimate household socio-economic status.[15] As an additional measure of the impact of policy on equity, we used the Stata CONCINDC procedure to compute a concentration index to describe the distribution of facility-based deliveries across socio-economic groups.[16] The concentration index quantifies income-related inequality in a health variable, with values ranging between 1 and -1, with 0 representing perfectly equitable utilization across income groups. A positive value indicates that the variable of interest (in our case utilization of facility-based delivery) is higher among those with higher incomes. A negative value indicates higher utilization among those with lower incomes. For us, a negative value would suggest that poor women make greater use of

facility-based deliveries. The greater absolute values reflect greater inequality in use.

We defined the secondary study outcome as the amount of CFA women paid for delivery services. We limited our cost analysis to women who delivered in a CSPS, on the assumption that these were all uncomplicated deliveries and that the women should have been charged 900 CFA. The choice was justified by the fact that fewer than 3 per cent of all women delivered in the district hospital. To assess differences over time, we used the Kruskal–Wallis equality-of-populations rank test.

Results

Our study included 1934 women (Table 1). Across the 5 years, we observed no notable differences with regard to women's age, literacy, parity, and distance to health facility. Most of the women consistently belonged to the higher socio-economic quartiles. Women interviewed in 2006 were significantly less likely to have attended at least one antenatal care (ANC) visit compared with women interviewed in the later years.

The percentage of women delivering in a health facility increased significantly from 49 to 84 per cent ($P < 0.001$) between 2006 and 2010

Table 1: Study sample descriptive characteristics

	2006	*2007*	*2008*	*2009*	*2010*
Surveyed households	1050	1050	1050	1035	1028
Completed pregnancies	366	316	432	435	385
Mean women's age in years	27	27	27	26	26
Mean parity	4.3	4.2	4	3.8	4
Women's literacy	37 (10)	33 (10)	58 (13)	50 (11)	57 (15)
Attended at least one ANC visit	327 (89)	299 (95)	419 (97)	422 (97)	377 (98)
Socio-economic status					
1st quartile (lowest socio-economic status)	51 (14)	66 (21)	71 (16)	60 (14)	66 (17)
2nd quartile	93 (26)	68 (22)	112 (26)	87 (20)	77 (20)
3rd quartile	104 (28)	78 (25)	116 (27)	140 (32)	90 (24)
4th quartile (highest socio-economic status)	118 (32)	104 (33)	133 (31)	148 (34)	152 (39)
Distance to health facility					
$\leqslant 5$ km	206 (56)	193 (61)	253 (59)	252 (58)	211 (55)
> 5 km	160 (44)	123 (39)	179 (41)	183 (42)	174 (45)

Note: Values indicate numbers (percentage).

Table 2: Facility-based deliveries, facility-based deliveries by socio-economic quartile, and facility-based deliveries by distance

	Pre-intervention				*Post-intervention*					
	2006		*2007*		*2008*		*2009*		*2010*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Completed pregnancies	366	—	316	—	432	—	435	—	385	—
Facility-based deliveries	179	49	182	58	293	68	315	72	325	84
χ^2 *P*-value					< 0.001					
Facility-based deliveries by										
1st quartile (lowest SES)	23	45	32	49	39	55	43	72	49	74
2nd quartile	40	43	32	47	68	61	56	64	57	74
3rd quartile	46	44	41	53	78	67	95	68	75	83
4th quartile (highest SES)	70	59	77	74	108	81	121	82	144	95
χ^2 *P*-value	0.05		0.001		<0.001		0.01		<0.001	
Concentration index (SE)[a]	0.0682 (0.0296)		0.1016 (0.0266)		0.0791 (0.0184)		0.0419 (0.0159)		0.0577 (0.0124)	
Facility-based deliveries by										
⩽5 km	153	74	154	80	221	87	233	92	207	98
>5 km	23	16	28	23	72	40	82	45	118	68
χ^2 *P*-value	<0.001		<0.001		<0.001		<0.001		<0.001	

[a]SE stands for Standard Error.

(Table 2). The increase in utilization rates ranged from 30 to 35 per cent across all socio-economic groups, leaving existing inequities in access unchanged, as demonstrated by stable significant differences in access (Table 2). The CI indicates that the increase in utilization detected before the policy was implemented (2006–2007) favored higher income (as demonstrated by a significantly larger index value), whereas the increase in utilization detected after the policy was implemented (2008 onwards) found inequities in access close to the ones observed in 2006 (as demonstrated by a series of index values not significantly different from 2006). Over time, the gap in access due to distance became smaller, but remained significant.

The mean amount paid for a facility-based delivery decreased by 67 per cent from 4329 CFA in 2006 to 1423 CFA in 2010 ($P<0.001$), whereas the median decreased from 4050 CFA in 2006 to a constant 900 CFA in 2008, 2009, and 2010 (Table 3).

Discussion

Except for Ghana, which implemented an extensive evaluation program,[17] most African countries that abolished or reduced user fees for facility-based delivery neglected to monitor and assess the impact of their policies at the population level. In Burkina Faso, our population-based evaluation was possible thanks to an existing and repeated representative cross-sectional household survey in the NHD. Previous assessments of the impact of policy in Burkina Faso, including national statistics, had been limited to facility-based records.[11,18]

Data from our study in the NHD showed a significant increase over the 5-year period in the use of facility-based delivery, from 49 per cent in

Table 3: Price paid for facility-based delivery

	2006	*2007*	*2008*	*2009*	*2010*
Facility-based deliveries	179	182	293	315	325
Women who paid something for their facility-based delivery	173	175	287	256	287
Median price paid	4050	3500	900	900	900
Mean price paid	4329	3702	1402	1456	1423
Kruskal–Wallis χ^2 *P*-value			<0.001		

Note: All prices are expressed in CFA (€1=655 CFA).

2006 to 84 per cent in 2010. Our findings confirmed estimates from national statistics, which identified an increase from 36 per cent in 2000 to 73 per cent in 2010,[19] and from a prior facility-based analysis,[11] suggesting that the increase in utilization began before the subsidy was introduced.

Considering that access to skilled attendance at birth by ensuring quicker access to emergency obstetric services represents the single most effective means to reduce maternal and neonatal mortality and maternal morbidity,[10] the observed increases in access suggest important benefits for population health. The magnitude of the impact, however, depends largely on health workers' ability to manage obstetric complications.[20] Therefore, reaching firm conclusions about the impact of user fee abolition on population health entails two further steps: first, estimating the impact on the quality of basic and emergency obstetric services; second, estimating the impact on morbidity and mortality indicators.

The political decision to implement subsidies at one time everywhere in the country limited our methodological options, forcing us to adopt a 'before and after' study design. In the absence of a control group, it is difficult to determine the precise size of the new policy's effect on the utilization of maternal care services.[21] In the same time period, however, general consultations for acute illness episodes remained rather constant, except for individuals enrolled in a mutual health organization,[22] suggesting that something specific occurred after 2007 to promote facility-based delivery beyond what would have been the expected increase due exclusively to secular trends. Similarly, the size of the observed increase also suggested that something beyond mere secular trends intervened to produce changes in the use of facility-based delivery. Absent any other major maternal care intervention, one can safely conclude that the policy was responsible for much of the observed increase. Capturing five time points, rather than limiting ourselves to the observation of utilization rates the year before and the year after the implementation of the policy, further increased the internal validity of our study results.[23] A parallel analysis from another district confirmed our findings, as it suggested that the increase attributable to the introduction of the policy ranged from 15 to 30 per cent.[18]

One potential threat to the validity of the study emerged from the sampling strategy. Including in the sample all villages where the CSPS were located might have led us to estimate utilization rates higher than the real ones. Our analysis, however, displays a pattern that is confirmed

by the national estimates and is purposely stratified by distance in order to differentiate between those living near and those living far from a health facility. Similarly, one should consider possible threats to validity due to recall bias, especially when assessing amounts spent on health care when those are reported several months later.

In addition, our findings suggested that all socio-economic groups, including those with fewest resources, benefitted from the policy and increased their utilization. This observation challenged the view that the poorest often fail to benefit from new universal public policies,[24] while it confirmed evidence from another district in Burkina Faso,[25] from the free delivery policy in Ghana,[26] and from demand-side interventions (delivery vouchers) in Bangladesh.[27] The new financing policy, however, still fell short of reducing inequities in access due to socio-economic status, as indicated by a CI that did not fall significantly closer to zero in 2010 as compared with 2006. This is not surprising because the policy included no special provisions to favor access by women in the lower socio-economic quartiles, either by exemption targeting or by reimbursing travel costs. Similarly, differences in utilization for women living at different distances from the health facilities persisted over time, suggesting barriers to access beyond financial ones.[21]

Appraising findings from this study in comparison with findings from other settings suggested that the 80 per cent subsidy in Burkina resulted in an increase in utilization not very different than complete abolition of user fees in neighboring countries. Household survey data from Ghana, Senegal, and Uganda showed that, following abolition of user fees for maternal care, facility-based deliveries increased, respectively, by 5–12 per cent, 12 per cent, and 28 per cent.[28–30] One might speculate that had the subsidy in Burkina Faso covered 100 per cent and not only 80 per cent of the charge for facility-based delivery, the increase in utilization would have been even higher than the observed 30 per cent. Evidence from two pilot districts in the country, where donor support allowed complete abolition of user fees, seems to confirm this view.[18]

Our study also revealed a significant reduction in the price paid for delivery at point of use. In line with findings from another district,[25] the price reduction reported by women in our study averaged 67 per cent. This was considerably larger than the reduction of 30 per cent reported in Ghana. In Ghana, despite a policy that would, in principle, completely abolish user fees for maternal care, women continued to pay US$13,[31] or 10 times more than in Burkina Faso. Understanding the difference

between user payments in the two countries is beyond the scope of our study and requires further qualitative inquiry.

The 900 CFA charged for an uncomplicated delivery may appear to be a small amount, but it corresponded to about three times the daily household expenditure of 46 per cent of the country's population.[32] This may explain why more than 25 per cent of women in the lowest socio-economic quartile continued to deliver outside a facility. The decision to opt for an egalitarian contribution (20 per cent of the actual cost of delivery) rather than an equitable fee schedule (based on ability to pay) inevitably meant that current policy turned out to be regressive, causing the poor to pay a greater proportion of their income for delivery services.

Our study detected a remarkable difference, at the CSPS level, between what women were officially supposed to pay (900 CFA) and what they reported to be paying, on average, at point of use (1400 CFA). In a context of extreme poverty, this difference of 55 per cent is notable. Three hypotheses could explain this difference and merit further qualitative inquiry. Our quantitative data are insufficient to explain the reason behind the observed difference, because the prescribed 900 CFA is meant to cover all costs associated with a normal delivery, independent of what obstetrical procedures are used.

- Direct informal payments by patients to providers persist in Burkina Faso,[5] just as they do in Tanzania, Senegal, and Uganda in context of fee exemption.[29,33,34]
- Two other studies showed that both providers and women, especially in rural areas, did not always understand the technical aspects of this policy.[11,12] Providers might have asked women to pay for products or services for which they were not supposed to be charged, without this being necessarily ill-intentioned.
- As is often the case in fee exemption policies,[35] this difference may be due to the fact that women had to buy elsewhere products missing from the CSPS, but essential for the delivery, such as gloves or related medications.

The relative success of the new policy in increasing service utilization across socio-economic groups and in reducing the price paid at point of use should be taken in the current context of discussions in Burkina Faso to organize a national health insurance scheme aimed at achieving universal coverage. This is especially important in the light of considerations about financial sustainability. The current policy is funded through the

national budget, with no direct vertical donor support, but such funding is up for reconsideration in 2015. In neighboring Ghana, user fee abolition for facility-based deliveries preceded the development and was later incorporated into the national health insurance scheme. This has proven to be an effective strategy to ensure continuous funding and to advance universal health coverage, while counteracting potential disparities in access frequently observed when national insurance schemes are quickly implemented.[36]

Tackling interventions aimed at increasing access to safe delivery, however, only represents one of many strategies needed to reduce maternal mortality. Additional parallel efforts should be channeled toward addressing the unmet need for family planning, which in Burkina Faso still stands at 29 per cent, one of the highest levels in the world.[37] Considering the recent evidence having accrued on the positive relationship between family planning and reduction in maternal mortality,[38] Burkina Faso may wish to consider investing in targeted programs fostering access to modern family planning as an additional means to save women's lives.[39]

Conclusions

United Nations agencies, the African Union, and many heads of state have recently called for the alleviation of financial barriers at the point of use for deliveries. The present study, carried out in one rural district of Burkina Faso, confirmed the usefulness of such a policy for increasing the utilization of obstetric services across socio-economic groups. Because decision makers opted to charge the same amount to everyone regardless of their ability to pay, the policy inevitably remains inequitable and regressive. A more progressive policy would be one that entirely abolishes user fees, and to the extent possible removes all other barriers for obstetric care – as the President of Burkina Faso committed to do in February 2010. This would further reduce the financial burden and send a clearer message to the population and to health workers that the policy's implementation is likely to result in overall higher utilization rates.

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