Title: Pay for a free service, access to cesarean section in the slums of Dakar

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Abstract

Background In sub-Saharan Africa, equitable access to cesarean section still represents a major challenge for reducing maternal and neonatal mortality, particularly among disadvantaged populations where nearly 50% of maternal deaths are recorded. This situation is even more exacerbated in slums, where women experience enormous difficulties in financially accessing expensive health care such as cesarean section. It is in this context that this article fits, which aims to study access to cesarean section among women living in the slums of Dakar in the context of a policy of free cesarean section in Senegal.

Method Two quantitative surveys were carried out among 18 managers of public and private health facilities offering cesarean section and among 260 women living in the slums of Dakar and who underwent cesarean section between July and December 2022.

Results The results show that in Dakar there is no social or economic discrimination regarding access to cesarean section. Because the women who were surveyed live, for the most part, in poor households and do not have a high level of education. However, they paid financial amounts, sometimes substantial, to undergo the cesarean section when the medical indication required it. According to health facility managers, this payment is explained by the fact that the State often delays honoring its commitments regarding reimbursements for cesarean sections, which pushes them to charge women for cesarean sections.

Conclusion A more rigorous application of the policy of free cesarean section could further enable women living in the slums of Dakar to access this obstetric practice without becoming further impoverished.

Keywords: Caesarean section, Dakar, Slums, women

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Introduction

Caesarean section is a surgical procedure used to prevent maternal and neonatal mortality. Caesarean section rates have doubled since 2000 in several countries but remain below 10% in sub-Saharan Africa where the majority of poor women do not have access to this obstetric practice, which increases maternal and neonatal deaths [1]. According to WHO estimates, in 2020, 800 women died per day due to preventable causes linked to pregnancy and childbirth, 70% of these deaths were located in sub-Saharan Africa [2] where the risk of neonatal deaths is also the highest in the world [3]. In the majority of sub-Saharan African countries, women travel long distances to access health facilities and often cannot afford expensive surgical services [4].

Physical and financial barriers to accessing cesarean section that affect poor women more are the main factors explaining high rates of maternal and neonatal mortality in low-income countries [5]. In response to this, several countries in sub-Saharan Africa initiated free cesarean section policies in the early 2000s [6]. In Senegal, Mali and Niger, the policy of free cesarean section was introduced from 2005 and covers all costs within the hospital linked to a cesarean delivery, on the other hand in Burkina Faso a partial subsidy was adopted with 80% of the cost of the cesarean section borne by the State and the remaining 20% by the family [4]. In Senegal, this policy aimed to improve geographical accessibility to qualified care and to make childbirth and cesarean sections free [7]. It was gradually implemented in the poorest regions of the country before being extended to the Dakar region in 2013.
Several scientific publications have tried to provide evidence on cesarean section in Senegal, after the free policy. Some have shown how this policy pushed health facilities to increase the number of cesarean sections and bring financial resources to their hospitals thanks to State reimbursement [6]; [8]; [9]. Other studies focused more on the Dakar region and placed emphasis on the epidemiological-clinical aspect of cesarean section [10] or on the practice of cesarean section by hospitals [11]; [12] or even on the perception and experience of the cesarean section of women [13].

This present article aims to fuel the debate on cesarean section in Dakar, where 23% of the Senegalese population lives, by emphasizing the access of women living in the slums of the Senegalese capital to this obstetric practice. This aspect has been very little documented by the existing literature even though it allows us to understand poor women's access to cesarean section and to appreciate how they benefit from the free policy. The choice to focus solely on slums can be explained by several factors. It is clear that integrating women living in wealthy neighborhoods could offer us more opportunities to make comparisons. However, this comparison would essentially focus on the rate of practice of cesarean sections within health facilities and see between the rich and the poor who benefit more from the policy of free cesarean sections. This would have made it possible to contribute to reflections on the inequalities in the practice of cesarean section. But carrying out a study of this type would be less relevant in our eyes given the wealth of publications already done (see [5]; [1]. There are also numerous articles which have already shown that inequalities in recourse to cesarean section between rich and poor can be explained, in part, by the overuse of cesarean section services by the most well-off in contexts of free provision [4] and cases of abusive practice [14]. Caesarean section must be an exception and must be justified by a medical emergency, otherwise it is an unnecessary risk [15].

Therefore, the objective of this article is to study the financial access of women living in the slums of Dakar to cesarean section. The premise underlying the analysis is that women who live in the slums of Dakar have access to cesarean section but they continue to pay the financial costs despite the free policy, which further impoverishes them.

1. Methodology

1.1.Study type and area

The data used in this article come from a quantitative, cross-sectional and retrospective study. Data were collected from health establishments offering cesarean section and women who benefited from this practice between July and December 2022. The study area is limited to Dakar and seven of the 10 health districts in this region. The exclusion of the three other health districts is explained by the very low rate of cesarean sections noted there [16]. The study was carried out in public and private health establishments that offer cesarean section. Each health facility surveyed was geo-referenced with data on indicators allowing a comparative and spatial analysis to be carried out.

1.2.Description of surveys

The study targeted women aged 18 and over, residing in the slums of Dakar and who received a cesarean section between July and December 2022, to understand the financial obstacles and elements facilitating the use of services related to cesarean section. However, it was difficult to find a sampling frame that only included women from the slums of Dakar who had performed a cesarean section during this interval. The choice of respondents was then made in three stages: (i) the identification of slums, (ii) the survey of health facilities which offer cesarean section and (iii) the survey of women who have undergone cesarean section between July and December 2022; The choice of this time interval, which is 6 months, is a reasoned choice which allowed us to take a representative sample of the targeted population while avoiding wasting too much time in analyzing registers which extend over a longer period.

1.2.1. Identification of slums

Regarding the identification of slums, the study was based on the classification given by [17] and the Dakar urban development strategy document [18]. This classification includes two categories. The first, which includes regular neighborhoods, is made up of residential neighborhoods and regular working-class neighborhoods. The second category which brings together slums is formed by irregular neighborhoods (Cité imbécile, Rebeuss, Niayes Thioker, etc.) and traditional neighborhoods (Ngor village, Yoff village, Ouakam village, etc.). We gave the supervisors who processed the registers the list of slums identified. It was this list that the survey supervisors, who were doctors recruited as part of this study, used to analyze the birth and operating room registers in order to list the women living in eligible neighborhoods. The work consisted first of drawing up the complete list of eligible women, then setting the quota to be surveyed, then doing a random draw without replacement to select the women to be surveyed, and finally arranging a meeting with them to do the interview if they agree to participate in the study.

1.2.2. Survey of health facilities

Our study targeted the 12 public health facilities in Dakar that have regularly practiced cesarean sections for years. These structures are distributed unevenly in the health districts of the said region and are affected by the free cesarean section policy. We conducted a survey of all these

public health establishments, which accommodate the majority of poor women who benefit from cesarean section. We also wanted to investigate as many private clinics offering cesarean sections, but only seven structures out of the 12 initially targeted were investigated because of cases of refusal. Among these seven structures, two did not have an operating block at the time of the survey. Therefore, the latter were not included in the data analysis. The reluctant private structures are found in the Dakar South, Dakar Center and Dakar West districts. These are the districts with the lowest proportions of population living in slums. On the other hand, in districts with a very high concentration of slums, we were able to investigate private facilities offering cesarean sections to find out if the populations living in slums gave birth by cesarean section. In short, we conducted interviews with 18 managers of public and private health facilities in Dakar offering cesarean sections. Its aim was to analyze the infrastructure and nursing staff available to these training courses to perform cesarean sections as well as the barriers that prevent them from carrying out their work properly.

Following each survey carried out with a health facility manager, we asked for their authorization to review operating room registers in order to identify women who lived in slums and who underwent a cesarean section in their structure between July and December 2022.We made a request for consent with a confidentiality commitment from each health facility surveyed. In addition, we asked the caregivers to first obtain the consent of the woman who had been cesareated in their structure before giving us her contact details, which allowed us to contact the person concerned to obtain her consent and carry out the investigation. .

1.2.3. ***Household survey of women who have undergone cesarean section***

After having analyzed the operating room registers and established the number of women eligible to be surveyed, we granted quotas to be surveyed for eligible women who had performed cesarean sections in the targeted health facilities.

We used the Cochran formula defined by:

$$n = \frac{z_{\alpha}^{2} p(1-p)}{d^{2}}$$

Where n denotes the total sample size of women to be surveyed in all slums, , z_{α}=1.96, is the 5% quantile of the normal distribution, $d = 0.05$ is the margin of error, p is the expected cesarean rate in the slums, it is unknown. However, this rate in the city of Dakar would be between 10-17%. So to ensure maximum variability, we take $p = 0.17$, taking into account a non-response rate of 15%. This approach allowed us to end up with a sample size of women from the slums to survey:

n= 250 with a margin of error of plus or minus 10%.

Adjusting the sample size to be investigated

Having obtained the base population which is of size N, made up of all women who underwent a cesarean section during the last six (6) months before the survey and who live in slums, an adjustment is made to take into account of this total number by the formula: $n' = \frac{n}{1+\frac{n}{N}}$

where

n'= sample size

N= base population size

Finally, the estimated sample size was distributed among all the slums and health facilities to be investigated in proportion to the number of cases recorded.

This methodology allowed us to survey a total number of 260 women who live in the slums of Dakar and who performed cesarean sections between July and December 2022. The objective of this survey was to see the characteristics of these women and their households, the geographical accessibility of the health facility where they underwent the cesarean section, the expenses they incurred as well as their satisfaction with this obstetric practice.

In total, the data used in the analysis of the following results concern two quantitative surveys, one carried out among 18 managers of health facilities offering cesarean sections and the other carried out among 260 women who underwent a cesarean section in these facilities between July and December 2022.

These health facilities are spread across 4 departments in the Dakar region. Given its demographic weight and the density of health facilities, the Dakar department has 11 health facilities surveyed compared to 2 for Pikine, 3 for Guédiawaye, and 2 for Rufisque. All these health facilities are located in different municipalities: 4 are in the Dakar Nord district, 3 in the Dakar Sud, Dakar Ouest and Guédiawaye districts, 2 in the Pikine and Rufisque districts and 1 in the Dakar Center district (figure 1).

The results show that the surveys concerned the main types of health facilities, which offer cesarean section in Senegal. The surveyed sample is made up of 33% by national hospitals, 17% by district hospitals, 22% by health centers and 28% by private clinics. In short, 72% of health facilities are public structures compared to 28%, which are private.

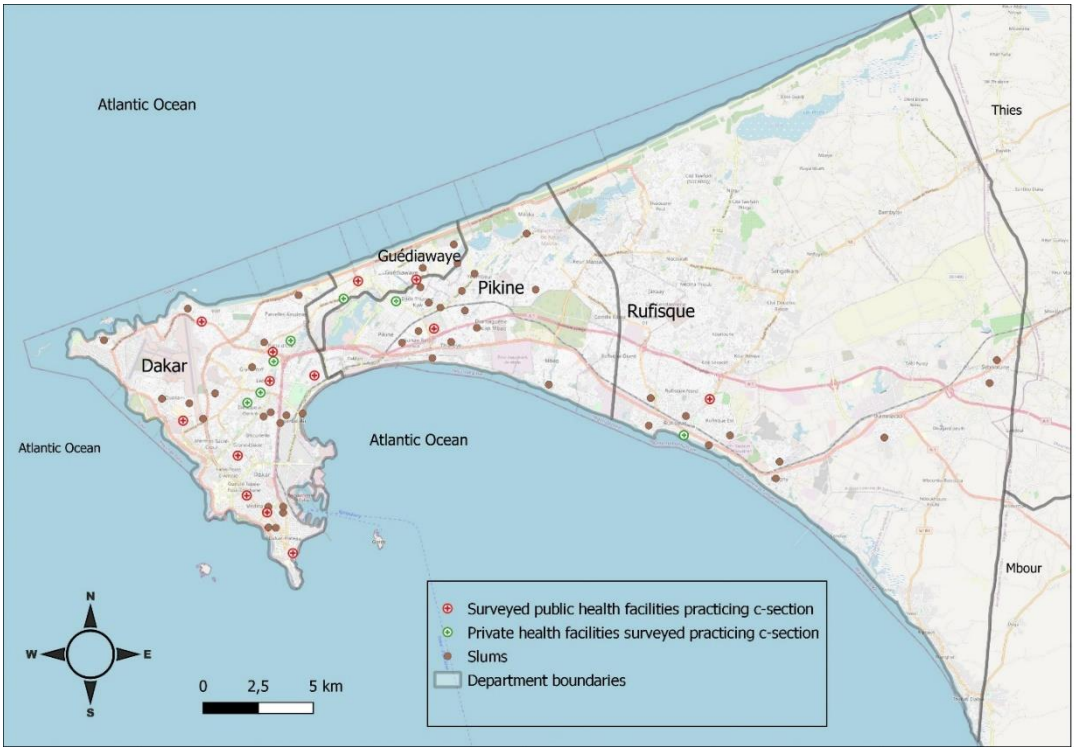

Figure1: Distribution of public and private health structures surveyed (source: authors)

1.3. Poverty calculation

Poverty was analyzed at two levels. The first level is the standard calculation used by the Demographic Health Surveys (DHS) and the Harmonized Survey on Household Living

Conditions (EHCVM). It is an objective measure. This involves seeing whether the household has adequate hygiene by looking at the source of water it uses for drinking, the connection of the toilet flush, the nature of the cesspool, the nature of the toilet composting and if he shares it with another household. Household assets reflecting access to certain amenities are also listed as, the materials that make up the house, access to electricity, possession of a radio, television, refrigerator, an air conditioner, a computer and means of transportation like a car, bicycle, cart, motorcycle, etc. A score is assigned to the household depending on whether or not it has these amenities. These scores are subsequently calculated using principal component analysis (PCA) with STATA software and converted into quintile or tertile of poverty.

The second level is a subjective measure of poverty. On the one hand, it consisted of asking households their perception of their economic situation, whether they considered themselves rich, poor or average. On the other hand, we asked households to estimate their monthly consumption expenditure and whether this allowed them to meet their vital needs. These different levels of analysis of poverty are relevant because the cross-interpretation of the resulting results allowed us to better distinguish poor households who live in slums.

1.4. Cartographic analysis

The analysis of the results through mapping was essential to show the spatial disparities concerning the costs of cesarean section stated by the heads of health facilities and the women having cesarean section. The production of the maps was not easy mainly because of the case of Keur Massar which was established as a department in 2021 (decree 2021-687) on the flanks of the Pikine department but whose official boundaries remain unclear. To remedy this problem we preferred to keep the shapefiles of the former department of Pikine (including Keur Massar) when creating the maps. The data collected concerning women living in Pikine and Keur Massar were thus combined in figures 2.a and 2.b. and are represented by the department of Pikine. All the maps contained in this paper were produced using the Quantum Gis 3.28.3 software and show the spatial distribution of data collected through our own field surveys. The Open Street Map (OSM) platform was used as the base layer of Figure 1.

2. Results

2.1.1. Characteristics of the Caesarean women surveyed

The analysis of the characteristics of Caesarized women takes into account their age, their level of education, their religion, their ethnicity, their marital status, their profession and their situation in their household. It allows us to know who are the women living in slums who have undergone cesarean section for possible comparisons with women living in other contexts.
Table 1 shows that the average age of the women surveyed is 31 years old. Their level of education is low, the majority of respondents are not educated (21%) or have not gone beyond primary school (39%). They are predominantly Muslim (95%) compared to 5% Christian. These women are mostly in monogamous households (79%), compared to 19% who have one or more co-wives. Regarding ethnicity, 40% of the women surveyed are Wolof, 24% are Poular and 18% are Serer. Other ethnic groups (Diola, Socé, Soninké, etc.) represent 18% of the sample (table 1). The majority of respondents (45%) do not carry out any economic activity, they are housewives. Around 28% exercise an independent profession, often informal trade, and 5% are pupils/students. Finally, 9.6% are employees in the private sector and 3% work for the State.
Our results show that 75% of the women surveyed have their husband who is the head of the household compared to 2% who are themselves the head of the household. They are either widows or single mothers. The majority of heads of households are active in commerce (43%). Tertiary sector employees are low with 7.7% civil servants and 15% private sector employees.

A small proportion of household heads are transporters (5.4%) or unemployed/housewives (4.6%). Households have an average of 10 members.

Table 1: Characteristics of the Caesarean women surveyed

Characteristic	**Dakar**,N=118	**Guédiawaye**, N = 29	**Keur Massar**,N= 24	**Pikine**, N = 62	**Rufisque**, N = 27	**All**, N = 260
Middle age	31 (6)	30 (4)	30 (5)	31 (6)	31 (7)	31 (6)
Educational level						
Unschooled	20	21	17	21	30	21
Primary	33	48	50	40	41	39
Secondary	27	17	17	26	15	23
University	19	14	17	13	15	17
Religion						
Islam	94	97	100	92	100	95
Christianity	5.9	3.4	0	8.1	0	5.0
Ethnic group						
Wolof	35	34	50	40	63	40
Serere	24	0	8.3	19	15	18
Poular	24	34	25	24	15	24
Others	18	31	17	16	7.4	18
Marital status						
Monogamous bride	76	76	79	84	85	79
Married with co-wife(s)	20	24	21	16	15	19
Bachelor	3.4	0	0	0	0	1.5
Occupation						
Household	39	38	54	52	59	45
State worker	1.7	0	4.2	3.2	11	3.1
Employed in the private sector	11	6.9	17	9.7	0	9.6
Independent	25	45	25	29	26	28
Pupil/Student	9.3	3.4	0	0	3.7	5.0
Other	14	6.9	0	6.5	0	8.8
Relationship to the head of household (CM)						
I am the head of the household	3.4	0	0	1.6	0	1.9
It is my husband	81	76	88	65	59	75
He is a close relative	11	14	8.3	27	33	17
Others	4.2	10	4.2	6.5	7.4	5.8
Profession of the CM						
Official	7.6	6.9	4.2	9.7	7.4	7.7
Breeder/Fisherman/Trader	39	45	58	47	41	43
Others	30	21	8.3	15	33	23
Private sector employee	15	10	25	18	7.4	15
Carrier	7.6	14	4.2	0	0	5.4
Unemployed/Housewife	0.8	3.4	0	11	11	4.6
Average household size	9	12	11	10	12	10

2.1.2. Economic situation of the households of the Caesarean women surveyed

The analysis of the economic situation of the households of Caesarized women living in the slums of Dakar aims to verify whether these households really belong to poor households. Table 2 gives an indication of their level of wealth.

Poverty tertiles reflect a certain homogeneity of households according to their economic situation. In fact, 33% of households are poor, 33% are rich and 34% are middle categories.

However, the results obtained from the estimation of monthly household consumption expenditure indicate that there are strong disparities between them. In fact, 41% of households have consumption expenditures of less than 200,000 FCFA (327 USD) compared to only 1.5% who spend more than 600,000 FCFA (982 USD) per month. The majority of households (52%) spend between 200,000 FCFA (327 USD) and 400,000 FCFA (654 USD) per month. For 75% of households, their resources are not sufficient to cover their vital needs, of which 38% maintain that they barely cover them compared to 35% who affirm that they are insufficient. This situation could justify why with the measurement of subjective poverty only 8.5% of households consider themselves rich. The majority of households (53%) consider themselves to be middle class compared to 38% who say they are poor.

Table 2: Economic situation of the households of Caesarean women in the slums of Dakar

Features	**Dakar**,N= 118	**Guédiawaye**, N = 29	**Keur Massar**,N= 24	**Pikine**, N = 62	**Rufisque**, N = 27	**All**, N = 260
Estimated monthly expenses						
Less than 200,000 (FCFA)	48	21	29	37	48	41
Between 200,000 and 400,000 (FCFA)	48	69	58	52	48	52
Between 400,000 and 600,000 (FCFA)	2.5	10	8.3	8.1	3.7	5.4
600,000 and more (FCFA)	0.8	0	4.2	3.2	0	1.5
Average monthly health spending	90,397	69,282	28,898	33,618	38,781	63,465
Satisfaction with vital needs						
Yes it is enough	27	34	8.3	31	3.7	25
Yes but barely	38	31	29	40	48	38
No it's not enough	35	34	62	29	48	37
Wealth status perception						
Poor	42	28	33	48	19	38
Average	53	55	62	40	74	53
Rich	5.9	17	4.2	11	7.4	8.5
Household socio-economic status (wealth tertile)						
Poor	39	38	21	27	26	33
Average	32	31	25	40	30	33
Rich	28	31	54	32	44	34

These results concerning the socio-demographic characteristics of women and their households reveal a high incidence of poverty in the slums of Dakar. However, we see that even though it is an area of poverty, there are niches of wealth in the slums of Dakar. These niches can be explained by civil servants from the state and the private sector who live in slums to find more affordable housing costs.

3.2. Financial accessibility of cesarean section

3.2.1. Cost of cesarean section according to health facility managers (public/private)

Caesarean section is not completely free in any of the health facilities surveyed, even in hospitals and public health centers which are affected by the policy of free cesarean section. When it exists, free of charge concerns the costs of the operation and/or the cesarean section kit. The patient therefore pays the consultation ticket, the prescription, the hospitalization and sometimes even other costs.

The average cost of cesarean section varies considerably depending on the types of health facilities. It is lower at the level of health centers (65,000 FCFA/106 USD) and district hospitals (95,833 FCFA/157 USD). However, at the level of national hospitals this cost is still high and

calculated at 191,250 FCFA (313 USD). On the other hand, at the level of private clinics the cost of cesarean section is very high with an average of 630,000 FCA (1,031 USD). For each type of health facility, we see very different standard deviations in the average costs of cesarean section, which demonstrates a large difference within each type of health facility (table 3).

Table 3: Average cost of cesarean section by type of health facility

Variables	Mean	Std. Err.
Overall average cost of cesarean section (FCFA)		
National hospital/maternity	191250	55942.79
District Hospital	95833	48311.78
Health center	65000	21350.25
Private clinic	630000	93005.38
Ticket cost (FCFA)		
National hospital/maternity	5250	1282.9
District Hospital	3667	1333.33
Health center	2000	577.35
Private clinic	13200	1319.21
Cost of the kit (FCFA)		
National hospital/maternity	24683	7954.99
District Hospital	18333	18333.33
Health center	17125	9785.99
Private clinic	162399	159410.5
Cost of prescriptions (FCFA)		
National hospital/maternity	38850	12073.6
District Hospital	33333	4409.59
Health center	16250	1652.02
Private clinic	2399	1912.99
Hospitalization cost (FCFA)		
National hospital/maternity	23467	10599.58
District Hospital	10000	10000
Health center	5875	3642.201
Private clinic	49200	31955.42
Other costs (FCFA)		
National hospital/maternity	61700	45656.76
District Hospital	29833	18952.43
Health center	23750	8984.94
Private clinic	2399	1912.99
Together (FCFA)	**Mean**	**Std. Dev.**
Overall average cost of cesarean section	269167	269057
Ticket cost	6472	5074
Cost of the kit	60200	185626
Cost of prescriptions	22783	22657
Hospitalization cost	24461	41747
Other costs	31483	66725

The results show that the items which increase the cost of cesarean section are mainly the cost of the kit estimated on average at 60,200 FCFA (98 USD) and that of hospitalization which is on average 24,461 FCFA (40 USD) per day. These costs are very high at the level of private clinics where the kit costs 162,399 FCFA (266 USD) and hospitalization 49,200 FCFA (80 USD) per day. The women surveyed spend on average 3 days in health facilities after the cesarean section before returning home. The cost of hospitalization becomes heavy for women

who have spent several days in the health facility, especially for those who have had post-cesarean complications. For the latter, hospitalization can even constitute more than 70% of the overall cost of the cesarean section.

3.2.2 Cost of cesarean section according to women having cesarean section (public/private)

Women paid different amounts to access a cesarean section depending on their department of residence. The results show that the average cost of cesarean section expressed by our respondents is 215,882 FCFA (353 USD) (Table 4). This cost is different from that found with the heads of health facilities which is 269,167 FCFA (440 USD).

Table 4: Financial accessibility of cesarean section for cesarean women in the slums of Dakar

Features	Dakar. N = 118	Guédiawaye. N = 29	Keur Massar. N = 24	Pikine. N = 62	Rufisque. N = 27	Together. N = 260
How much do you estimate the overall cost of cesarean section?	177564	238502	193952	330093	116277	215882
How do you judge these costs?						
High	65	79	79	81	78	73
Average	32	14	17	16	22	24
Low	2.5	6.9	4.2	3.2	0	3.1
Who paid this cost						
Person/structure who paid						
Myself	14	6.9	8.3	9.7	3.7	11
My husband	95	93	75	95	100	93
Health Insurance	2.5	14	17	11	7.4	7.7
By a third party	3.4	21	25	4.8	3.7	7.7
Others	5.1	10	8.3	6.5	3.7	6.2
Payment sources						
Sale of property	0	7.1	0	3.2	0	1.6
Loan	14	29	43	21	15	20
Own money	96	89	95	95	96	95
Hospital support	8.5	0	0	4.8	0	5.1
Insurance support	1.7	18	9.5	11	3.7	6.6
Others	3.4	7.1	0	3.2	11	4.3

We note that this cost is higher for women who live in the departments of Pikine (330,093 FCFA / 540 USD) and Guédiawaye (238,502 FCFA / 390 USD). These are departments where the majority of cesarean sections are carried out in national hospitals. It is also in Pikine where we recorded the highest proportion of women (81%) who maintain that the cost of cesarean section is high. On the other hand, in the department of Dakar where there are several health centers and district hospitals that practice cesarean section, the cost of this obstetric practice is low (177,564 FCFA/290USD), as well as in Rufisque (116,277 FCFA/190 USD). According to 73% of respondents this cost is high, compared to only 3% who think it is low. 24% of our respondents say that the cost of cesarean section is average.

3.2.3. Cost of cesarean section appreciated by the public where the free cesarean section policy applies

To verify the differences observed in the costs of cesarean sections mentioned by those in charge of health facilities and women having cesarean sections, we made a spatial distribution

of these costs, focusing only on public health facilities where the free policy applies. cesarean section and women who have had it (figure 2). On the one hand, we see in Figure 2.a that according to health facility managers, cesarean sections are higher in the Dakar department (109,722 FCFA/179 USD) and lower in the Pikine department (63,000 FCFA/ 103 USD). The opposite is however observed with figure 2.b which relates that according to the women surveyed, cesarean section is more expensive in the most populated departments of the suburbs of Dakar, namely Guédiawaye (216,000 FCFA/353 USD) and Pikine (Keur Massar including) (214,220 FCFA/350 USD). These costs incurred by women to access a cesarean section are worrying because the policy of free cesarean sections is still in force in Senegal. We also note that these costs are underestimated by those in charge of health facilities who, apart from the cost of the services they offer to women, ignore the other additional costs incurred by the latter and their husbands.

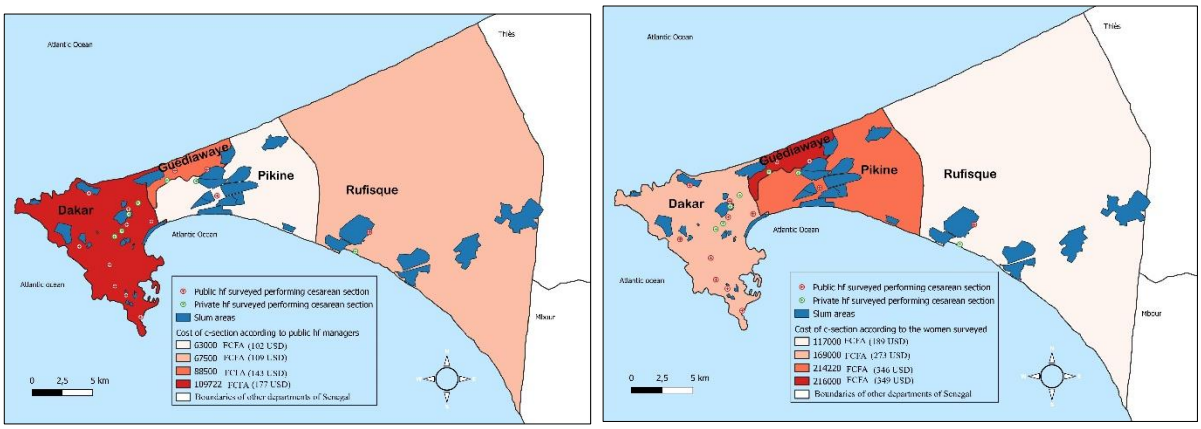

Figure2: Cost of cesarean section assessed at different levels: a cost underestimated by health facility managers? (source: authors)

2.a. Cost of cesarean section according to public financial

2.b. Cost of cesarean section according to the women surveyed

Moreover, the results showed that women use several means to pay the cost of the cesarean section (table 4). In 95% of the cases referenced, women pay the cost with their own household money, either by mobilizing their own funds (11%) or those of their husbands (93%), others benefit from the support of a third party (7.7%) or their company's health insurance (7.7%) or hospital care (5.1%). On the other hand, there are some women who borrow from their loved ones (20%) or sell their assets (1.6%) to pay or supplement the costs related to the cesarean section.

Discussion

The study confirms that the poor mainly inhabit slums. While the incidence of poverty is at 9% in the Dakar region [19], our results show that at the slum level, it is at 34%. Consumption expenditure does not exceed 400,000 FCFA (654 USD) for 93% of households, which have an average of 10 members. This is why, moreover, only 8.5% of households perceive themselves as rich among the entire population surveyed and it is practically the same proportion of households (7%) which have a monthly consumption expenditure greater than 400,000 FCFA (654 USD). It is generally the women who live in these pockets of wealth within the slums who go to private clinics to perform cesarean sections and are either private sector or state civil servants. They benefit from their insurance coverage.

On the other hand, the majority of women are poor and do not carry out any income-generating activity except small informal trade. They accessed the cesarean section at the level of public health facilities. The results underline that there is no economic (wealth level) and social (education level) discrimination in access to cesarean section because the sociodemographic characteristics of women who have had cesarean section show that the latter are predominantly poor. These women are aged, on average, 31 years old and 60% of them have not gone beyond primary education, including 21% who have never been to school. These results, while confirming those of the ECPSS 2019 [20] with regard to the age of women who have performed cesarean section which is over 30 years, allow them to be put into perspective on the aspects which show that cesarean section is mainly carried out by women with a higher standard of living and education. They also put into perspective the ANSD conclusions on the fact that it is often women who are in the two wealth quintiles who benefit more from cesarean section [20]. This reduction in discrimination in access to cesarean section was one of the objectives of the free policy. According to the study by the Ministry of Health and Medical Prevention [7], poor women experienced enormous difficulties in paying the costs related to childbirth and especially cesarean section, pushing some to prefer to resign themselves to the risks of death, failing to be able to sell their property or mortgage it (oxen, livestock, land, etc.).

Regarding the inequalities in recourse to cesarean section already documented by [5] in low and middle income countries reporting that the lowest cesarean section rates are found in the fifth poorest quintile (median of 3.7%) and the highest are located in the fifth richest quintile (median 18.4%), our study shows that with regard to Dakar, the poor have no problem accessing cesarean section. With the free policy, health facilities benefit from cesarean sections [9] and perform the obstetric practice when the woman's situation requires it, regardless of her socio-economic status.

Added to this is the fact that despite the policy, cesarean section is not entirely free in Senegal. Poor women and their husbands continue to bear many costs related to cesarean section. These costs vary depending on the health facilities as reported by our results and can sometimes be exorbitant even in eligible public hospitals, which are supposed to apply the free policy. It should be remembered that one of the major objectives of this policy was to reduce financial barriers to the use of obstetric services in order to better combat maternal and perinatal mortality [7]. The gratuity therefore consisted of paying regional hospitals 55,000 CFA Francs (US$110) per cesarean section (with 50,000 FCFA (82 USD) for the surgical procedure and 5000 FCFA (8 USD) for the 5 days of hospitalization). For district hospitals, there was no money transfer; the subsidy was in the form of kits. The results of Mbaye et al. [9] reported that in health facilities where there was a shortage of kits, it was the patients who bought their own medicines, which did not prevent the hospital from charging 55,000 FCFA (110 USD) for the price of the cesarean section to the State. According to these authors, the policy of free cesarean section is an opportunity for hospitals to make money because the reimbursement they receive from the State is much higher than what the cesarean actually costs them. According to Witter et al. [6] this surplus amounts to US$61 (approximately 40,000 FCFA) while several costs linked to the cesarean section are covered by the patient.
Even if in our study we did not note cases of kit shortages because in all the structures visited the cesarean section and delivery kits were permanently available at the IB pharmacy, it is clear that in several sites the kit was not free, it was prescribed to the patient and had to be purchased before admission to the operating room. If the patient cannot afford to purchase it, there are kits stored in the delivery room which are used for emergencies but which the patient must reimburse after the cesarean section. This strategy could also explain why poverty is not a limiting factor in access to cesarean section in Senegal compared to poor and less urbanized countries in Latin America [15].

Just like Mbaye et al. [9] and Witter et al. [8] the results of this study showed that patients bear several costs linked to cesarean section such as hospitalization, consultation ticket, medications and even sometimes the kit and where the surgical procedure. However, the Universal Health Coverage Agency, which is the structure in charge of the free cesarean section policy in Senegal, still indicates in its platform (https://www.agencecmu.sn/cesarienne) that any Senegalese woman in a state of pregnancy whose state of health or that of the fetus requires the use of a cesarean section is eligible for this policy and indicates that it is in force in all public health facilities capable of performing a cesarean section. She covers : the operative act; the pre-operative assessment; the kit of medicines and consumable products accompanying the said act; hospital stay not exceeding five days; the products and medications necessary for possible resuscitation and the related assessment.
However, our results reveal that often it is the act which is free (the State considers that the participants are its agents), the patient pays all the other costs linked to the cesarean section. This result has already been mentioned by several authors. In 2007, an evaluation made by the Ministry of Health on the free policy had already shown the imbroglio surrounding its application [7]. Among the actors they interviewed some affirmed that they had not benefited from any gratuity, others said they had paid for the medications administered during childbirth and the post-partum prescription but not for the cesarean section, while a minority affirmed have benefited from complete free access. In our study, the rare women who obtained full free coverage were only those who were fully covered by their health insurance, all the other women had to pay more or less to undergo the cesarean section.

Witter et al. [6] who compared the policy of free cesarean section in Ghana and Senegal showed how in Senegal the real cost of cesarean section did not decrease significantly for the majority of patients who claimed to have paid for many items which should normally be included in the free treatment (gloves, medicines, accommodation, ticket) as well as for the costs known to be excluded (transport and treatment of complications). According to the heads of the public health facilities surveyed, this problem is explained by the delay in reimbursement of cesarean section procedures by the State of Senegal. As certain resources used during cesarean section are exhaustible (kit for example), health facilities cannot wait for the subsidy granted by the State which is delayed, at the risk of being confronted with the problems of shortage of kits and demotivation of staff. To deal with these eventualities, they charge women for certain items to permanently renew the stock used for cesarean section and ensure the continuity of the practice of this obstetric act in their services.

Apart from Senegal, the policy of free caesarean sections introduced at virtually the same time (2005) in West Africa is posing implementation problems in many countries. [21]. For example in Benin, cesarean section became more expensive after the adoption of the free policy [22]. In Mali, it was accompanied by a decline in the quality of care for parturients [23] while in Burkina Faso, it led to an increase in abusive cesarean sections [24].

Conclusion

The women who live in the slums of Dakar are predominantly poor. Most have had a cesarean section in public hospitals. In the latter, the State has implemented a policy of free cesarean sections. However, this policy is not rigorously applied due to the delay in reimbursement that the State owes to health facilities for cesarean sections.

In Senegal, free cesarean section looks more like a policy of subsidizing cesarean section as is the case in Burkina Faso. This can be explained by two factors. First, eligible health facilities continue to receive reimbursement from the State (even late) for all cases of cesarean section performed; then majority of households, even poor ones, managed to pay the cost of the cesarean section without mobilizing external funds or going into debt, which means that the cost is probably affordable for them. However, we do not know whether this money spent by the household did not come at the expense of other essential expenses such as food or payment of rent, for example. In the context of the households studied, the majority of whom believe that their resources are not sufficient to meet their vital needs, the costs linked to cesarean section constitute a burden which further contributes to their impoverishment. The results of Dumont [4] have also demonstrated how certain expenses linked to cesarean sections have pushed families into a situation of extreme poverty in Mali, leading to children dropping out of school and chronic undernourishment. Before him, Ensor et Ronoh (2005) also reported the precariousness and risky adaptation strategies faced by households who have paid for expensive maternal care.

In Dakar, the financial obstacles to access to cesarean section are reduced by the free policy and the avant-garde system put in place by public hospitals to compensate for State delays and guarantee the renewal of stocks of consumables. However, apart from socio-economic factors, other factors could constitute barriers: these are cultural factors (refusal of the woman or her family to have a cesarean section) or spatial factors (distance from health facilities which offer cesarean section in relation to at the women's place of residence). A more in-depth analysis on these two aspects could provide additional evidence on access to cesarean section among women residing in the slums of Dakar.

Ethical Approval

All procedures performed in studies involving human clinical data were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The Senegal's National Health Research Ethics Committee (CNERS) approved the study.

Informed consent was obtained from all individual participants included in the study.

Data availability

The study doesn't require a data availability statement.

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