

The Impact of Delivery Fees Exemption Policy on Maternal Death Rates at Nakuru County Referral Hospital

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Abstract— Background- The reduction and elimination of pregnancy-related mortality remain a challenge in most low income countries. For this reason, many African countries have either reduced or eliminated delivery fees to promote health facility delivery service utilization. Healthcare seeking behavior is a central issue in service delivery. Cost has been highlighted as a major hindrance to utilization of medical services especially among the poor people. It has been shown that removal or reduction of user fees results to increased utilization of services. However, some studies have shown the opposite to be true. Following the free maternity services policy in Kenya, uninterrupted time series study was conducted in Nakuru County referral hospital to examine the effects of the policy on utilization of maternity services at the hospital and the effects on maternal and neonatal deaths. The impact of delivery fees exemption policy on maternal death rates at Nakuru County Referral Hospital. Data was collected from facility-based records using a predesigned standard data extraction form. The study used Interrupted Time Series Analysis (ITSA), a strong longitudinal quasi-experimental design with a single group to assess the effects of the Free Maternity Service Policy to maternal health. The three indicators were observed 24 months pre (June 2011–May 2013) and 24 months post (June 2013–May 2015) free maternity service policy implementation, giving 48 observations. There was a statistically significant increase in the number of skilled deliveries, significant reduction in neonatal mortality rates and a non-significant reduction in the maternal mortality ratio. These findings suggest that cost significantly limits access to skilled deliveries in Kenya thus the free maternity policy can successfully promote utilization of facility deliveries. However, free maternity alone cannot address maternal and neonatal mortalities thus there is needed to address other determinants of maternal and neonatal deaths such as the health service infrastructure and cultural practices.

Index Terms— Infant mortality rate, maternal mortality rate, maternal mortality ratio, Neonatal mortality rate, Obstetric complication, skilled delivery, User fee
Abbreviations. DHIS2, EmONC, IMR, ITSA, KEPH, KHSSP, MDG, MMR, MOH, NMR, SBA, SDG, TRA ANC, UNICEF, WHO

I. INTRODUCTION

According to Dzakupas S, *et.al* (2014), User fees are charges levied at the point of use of any aspect of health

services. User fees for health services were introduced or substantially increased in African countries following the 1987 joint World Health Organization/United Nations Children's Fund Bamako Initiative whose aim was to address severe problems in the financing of maternity care. User charges for essential drugs were also introduced to generate funds to improve the quality of health services and equity in access to these services. However, user fees have seldom produced these intended benefits Gilson L, *et.al.* (2000). Instead, they have been a significant barrier to access of maternal health care services in Kenya. Studies done between 2003 and 2006 in three African countries (Burkina Faso, Kenya and Tanzania) found that the mean cost of a normal or a complicated delivery in Kenya was US\$18.4 compared to US\$ 7.9 and US\$5.1 for Burkina Faso and Tanzania respectively Perkins M, *et.al* (2009). This has made user fees a prohibitive barrier to access to essential services even in Kenya El-Khoury M, *et.al* (2012)

Health is a fundamental commodity essential to people's well-being and for their active participation in development. Majority of Kenya population are uninsured, medical care is usually procured through out of pocket payments. This is common in many developing countries as a result of the health sector restructuring done in early 90s which led to abolishment of free medical care and introduction of user fee in all government health facilities. With 45.9% of Kenyans living below the poverty line, many often delay seeking medical care due to the associated financial burden. Oftentimes appropriate medical care is sought when all other options fail; sometimes this is too late especially for pregnant women. High rates of maternal and child mortality and morbidity are the leading contributors of disease burden in Kenya. Studies have shown that delays in seeking medical care are partly responsible for the high maternal and child mortality.

To address the situation, the government of Kenya introduced a policy exempting user fee for antenatal and maternity services in 2013. The policy requires all public health facilities to provide antenatal and maternity services without charging the clients. The bills are then submitted to the government for reimbursement. However, few studies have been conducted to assess the policy impact in Kenya, with mixed results. According to the World Health Organization, globally, approximately over 800 women lose their lives daily due to preventable causes related to pregnancy and childbirth (WHO, 2014). Over 99% of all

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deaths occur in developing countries. It is estimated that for every 100,000 live births about 360 women lose their lives due to pregnancy related complications in Kenya. This translates to over 5000 deaths every year, which is 2% of the global burden. Most of the deaths are due to preventable causes which can be prevented especially through skilled deliveries.

Realizing the undesirable effects of the user fee policy, many countries have either reduced or removed the user fees for maternity care. User fee on health care services was introduced in Kenya in 1989, where the fee was to support general operations and management of public health facilities. Introduction of these fees was criticized as a move that would advance social exclusion and inequity in accessing health care services leading to its suspension in the year 1990. Owing to the economic limits within the country, user fees on health care services was later re-introduced in 1991 with exemptions applicable to children under-five including immunization charges, treatment for malaria, tuberculosis and sexually transmitted diseases.. In 2004, the government adopted the 10/20 policy where a minimal fee of KES 10 and 20 for registration was charged at the public dispensaries and health centers respectively. In July 2013, Kenya introduced a health policy allowing more women to access free maternity services in government health facilities. It was anticipated this would increase facility-based deliveries and contribute to reduced infant and maternal mortality.

II. STATEMENT OF THE PROBLEM

The introduction of free maternity services by the government of Kenya in July 2013 meant that pregnant women delivering in health facilities were to be exempted from paying hospital user fees. Subsequently, health facilities are required to claim for reimbursement from the government for each delivery conducted. Every year, about 4 billion shillings are reimbursed for facility-based deliveries. However, it is not clear if introduction of free maternity services had had any impact on utilization of maternal health services and related health outcomes. Further it is not clear what the anticipated increment in deliveries in health facilities will have on the quality of care provided to women in labor. Quality of care can be reflected by changes in maternal and prenatal (newborn) death rates. Without knowledge of the impact, the government may continue spending on free maternity services while not making progress towards the **SDGs**. It is against this background that the study was undertaken to fill the missing knowledge gap by examining the effect of implementing free maternity services in Kenya: case of Nakuru county referral hospital

Study aims

The study aimed at assessing the impact of delivery fees exemption policy on maternal death rates at Nakuru County Referral Hospital.

III. LITERATURE REVIEW

Maternal mortality is an important indicator of a country's

development and its reduction is one of the Millennium Development Goals. Data from the 2008 KDHS indicated an increase in maternal mortality from 414 in 2003 to 488 in 2008. It is not possible to estimate levels of maternal mortality using data available from the HMIS. In fiscal year 2012/2013, 665 maternal deaths were reported in public health care facilities, representing 0.17 percent of total deliveries. Figure 3 shows the distribution of maternal deaths by month. The highest numbers of maternal deaths were reported in June 2012 (84) and February (69) and April 2013 (65).

According to Campbell OM (2006), the reduction and elimination of pregnancy-related mortality remain a challenge in most low income countries. According to the Kenya: Ministry of Health (2015), the maternal mortality ratio and the neonatal mortality rate in Kenya have been found to be 362/100,000 live births and 22/1000 live births, respectively. Given that only 61.2% of deliveries in the country are conducted in health facilities, pregnancy-related deaths have been attributed to delivery without skilled birth attendance Kenya: Ministry of Health (2015). Globally, high quality health facility delivery services have been recommended as a solution to preventable maternal and neonatal deaths McKinnon B *et.al* (2015), For this reason, many African countries have either reduced or eliminated delivery fees to promote health facility delivery service utilization De-Allegri M *et.al* (2015).

Kenya joined other African countries in the abolishment of delivery fees in all public health facilities through a presidential directive signed into effect on June 1, 2013 Ministry of Health Kenya (2013). Through this policy, public health facilities are reimbursed for costs incurred while providing delivery services through a capitation fund provided by the Ministry of Health. This policy provides equal reimbursement for both spontaneous vaginal deliveries and caesarean sections. The amounts reimbursed to health facilities are based on their capacity to manage pregnancy and delivery complications. As such, 2500 Kenya shillings (25 US dollars) are reimbursed for every delivery conducted in level 2 facilities (health centers) and level 3 health facilities (sub district hospitals); 5000 Kenya shillings (50 US dollars) are reimbursed for every delivery carried out in level 4 health facilities (district hospitals) and level 5 health facilities (provincial hospitals); and 17,500 Kenya shillings (175 US dollars) are reimbursed for every delivery performed in national referral health facilities Ministry of Health, Kenya (2015).

While eliminating delivery fees is a commendable intervention, pregnancy-related mortality due to the following “three delays” remains a concern: delays in deciding to seek skilled delivery services, delays in arriving at health facilities and delays in receiving adequate treatment and referral McCarthy J, *et.al* (1992). Cost is not the only factor hindering the utilization of health facility delivery services. In Kenya, maternal and neonatal deaths have been attributed to other factors, including lack of transport, long distances to health centers, poorly equipped health facilities, low quality of care in health facilities and traditional and cultural practices McCarthy J *et.al* (1992). Therefore, while

elimination of delivery fees in Kenyan public health facilities partially addresses economic barriers to maternal health care utilization, other economic barriers, health system gaps, quality of health facility delivery services and political, social, environmental and religious factors that may influence the utilization and outcomes of maternal health care in the country have not been addressed Watt S *et.al* (2005).

In addition, initial assessments of the implementation of this policy have identified various gaps, such as drug and supply shortages, insufficient funding, skilled health care worker shortages, lack of skills among health workers, stakeholder non-involvement in the policy design, delayed reimbursement of costs incurred while providing free maternal health care, heavy workloads, health worker demonization, healthcare worker attitudes, low privacy levels in public health facilities and unavailability of ambulances for emergencies occurring at community level Wamalwa EW 2015). In light of these contextual gaps, this study aimed to investigate the effects of the free maternal health care policy in Kenya on health facility delivery service utilization and maternal mortality ratio and neonatal mortality rate in public health facilities.

IV. THEORETICAL FRAMEWORK

This study was guided by the stages of change model were originally developed by Prochaska *et al.* in 1984 within a clinical context to describe the process of behavior change for addictive behaviors. In the latest formulation (Prochaska *et al.*, 1992), they suggested that individuals pass through five stages when attempting to change their behavior, the first

three are motivational and the remaining two are actionable stages. The first stage is referred to as the *precontemplation* stage, where the individual does not intend to change his or her behavior in the foreseeable future. It is suggested that many people at this stage are unaware, or under-aware, of their problems. Next is *contemplation* stage, where the individual is aware that a problem exists in relation to that behavior and is seriously thinking of overcoming it but has not yet taken action or made any preparations. The third stage is *preparation* stage, where individuals have decided to take action in the next month and have been unsuccessful in taking action in past year, then comes the *action* stage, where the individual actually changes his/her behavior.

The final and fifth stage is the *maintenance* stage, where the individual attempts to maintain the behavior change by working to prevent relapse. In addition, the action and maintenance stages have strict timeframes; people are described as being in the action stage if they have changed their behavior for a period of 1 day to 6 months and being in the maintenance stage if they have changed their behavior for more than 6 months. Suchman identifies five stages an individual undergoes in determining whether or not to seek medical care: Severity of the symptoms, assumption of a sick role as described in Parsons' sick role model (Parsons T, 1951), contacting medical care, acceptance of professional treatment (trusts and depends on the clinician), and recovery from illness (Suchman E, 1965). The five stages are illustrated in Figure 2 below.

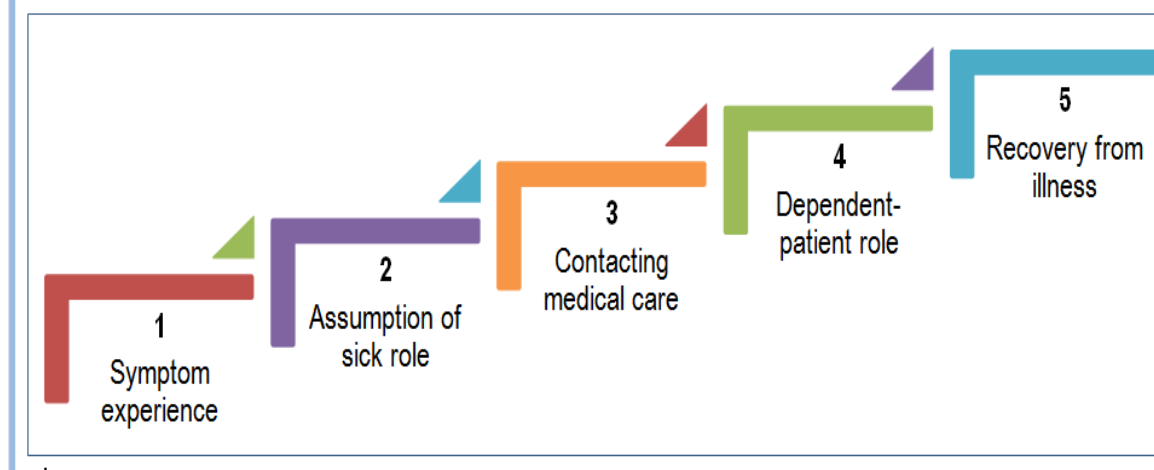


Figure 1: Suchman's stages of illness and medical care

V. METHODOLOGY

The study was conducted in Nakuru County, one of the forty-seven counties in Kenya. With a population of 2.2 million persons according to the 2019 housing and population census, Nakuru is the fourth most populous county in Kenya after Nairobi, Kakamega and Kiambu. Nakuru County was selected for the study because of its maternal health indicators, particularly uptake of maternal health services and maternal mortality. In 2013, Nakuru County had a maternal mortality rate of 374 per 100,000 live births and skilled delivery of 51%. It was ranked among the top four counties in

Kenya with high maternal death burden by UNFPA in 2014 despite being one of the counties with the best infrastructure, high number of health workers and with 35% of its budget being allocated to health (County Budget Paper, 2014).

VI. LOCATION

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VII. SAMPLE AND RECRUITMENT

The study targeted all patient files at maternity between June 2011 and May 2015 which had a minimum of two data points collected pre-intervention and one post-intervention. There was no restriction on participants, language of study, or type of outcome. Data were summarized using appropriate summary statistics. Thus, the study had 48 monthly data sets: 24 months before the policy and 24 months after the policy. To assess the utilization of maternity services in the pre and post program period, the study used 30% of total data from the period one and a half years prior to the implementation of the program (December 2011-May 2013) and the period one and a half years after the implementation of the program (June 2013-November 2014) (Mugenda & Mugenda, 2003). Basing on the 30% of the total data as recommended by Mugenda, a total of 3600 files, 1800 from each period were reviewed.

VIII. DATA COLLECTION

Data was abstracted using a pre-tested data abstraction form (Appendix 2). Data was limited to a period of 24 months prior to the introduction of free maternity services policy and 24 months after the introduction of the policy. A Survey Data Abstraction Form was used to collect information about women who delivered at Nakuru County Referral Hospital between January 2011 and December 2014. The information was collected from hospital Anti-Natal clinic register and Maternity/Delivery register to collect the required information for all the mothers who were recorded in the two

registers during this period

IX. DATA ANALYSIS

The study used Interrupted Time Series Analysis (ITSA), a strong longitudinal quasi-experimental design with a single group to assess the effects of the Free Maternity Service Policy to maternal health. The three indicators were observed 24 months pre (June 2011–May 2013) and 24 months post (June 2013–May 2015) free maternity service policy implementation, giving a total of 48 observations. Visual inspection of the data was done to check for any outliers, linear trends, and data quality issues. Interrupted time series analysis of quarterly performance for the 3 indicators was performed using autoregressive integrated moving average models setting significance level at $p < 0.05$. All analysis was done in SPSS with data consisting of monthly values for the three variables. Ordinary least squares (OLS) regression model with a time series specification (an intercept term, a trend term, a level change, and a trend change) was used to check for serially correlated errors by plotting the graphs of the residuals from the OLS regression as well as generating the autocorrelation and partial autocorrelation (ACF/PACF) plots. Significant and easily identifiable peaks at certain lags on the ACF/PACF plots were observed in 2 of the three variables.

X. FINDINGS

A total of 29,312 pregnant women attended Nakuru Level 5 Country referral hospital between June 2011 and November 2014. Majority were aged between 30 and 49 years (41%), had 2 to 3 children (38%), had primary or no education (53%) and were not working (36%). Most respondents were Christians (72%) predominantly residing in rural areas (55%). Overall, there were 75% more women who received care at the referral hospital 24 months post the policy period compared to similar period before the policy was instituted. The increase in service uptake was highest among elderly women with 2-3 children, low education, rural residents and the unemployed. (**Error! Reference source not found.**)

Table 1: Women attending maternity services at Nakuru County referral hospital

Indicator	Pre-Policy (Jun 2011 – May 2013)	Post-Policy (Jun 2013 – May 2015)	Change
Hospital deliveries	10,253	14,392	40%
Live births	9,760	13,999	43%
Maternal deaths	67	80	19%
Neonatal deaths	270	169	-37%
Maternal mortality ratio (/10 ⁵)	686.5	571.5	-17%
Neonatal mortality rate (/1000)	27.7	12.1	-56%

There was a statistically significant increase in the number of skilled deliveries from 10,253 before policy implementation to 14,392 representing a 40% (95% CI: 39, 41%) increase (**Error! Reference source not found.**). Analysis of deliveries indicated a declining trend prior to the policy (slope -14.52, $p = 0.16$) and a significant increase after policy implementation (slope = 49.16, $p < 0.05$) as shown in **Error! Reference source not found.**. Stationary R^2 yielded a value of 0.65 implying that 65% of the model was explained by the policy intervention. The mean absolute percentage error was 7.3 indicating that the values predicted by the model were on average, within 7.3% of the actual values.

Table 1: Social Demographic Characteristics of study respondents

Demographic characteristic	Pre-intervention		Post-intervention		Overall	
	Jun 2011 – May 2013		Jun 2013 – Nov 2014		June 2011 – Nov 2014	
	No.	%	No	%	No	%
Age of respondent						
Less than 20	2,345	22	4,850	26	7,195	25
20 – 29	4,584	43	5,409	29	9,993	34
30 - 49	3,731	35	8,393	45	12,124	41
Parity						
1 Child	3,624	34	4,850	26	8,474	29
2 – 3 Children	3,945	37	7,088	38	11,033	38
4+ Children	3,091	29	6,714	36	9,805	33
Highest level of education						
None or Primary	5,970	56	9,699	52	15,669	53
Secondary or Higher	4,690	44	8,953	48	13,643	47
Self-declared employment status						
Employed	4,051	38	4,476	24	8,527	29
Self employed	3,411	32	6,715	36	10,126	35
Not working	3,198	30	7,461	40	10,659	36
Residence						
Urban	5,863	55	7,461	40	13,324	45
Rural	4,797	45	11,191	60	15,988	55
Religion						
Muslim	2,132	20	3,917	21	6,049	21
Christian	7,462	70	13,616	73	21,078	72
Other	1,066	10	1,119	6	2,185	7
Total	10,660	100	18,652	100	29,312	75

There was a 19% increase in maternal deaths at the referral hospital from 67 deaths in the pre-policy period to 80 deaths after the policy implementation. Despite this increase, there was a 17% reduction in maternal mortality ratio (MMR) from 686/100,000 live births to 571/100,000 deaths (**Error! Reference source not found.**). Pre-intervention slope showed a non-significant decrease in maternal mortality prior to the policy (slope -4.64, $p = 0.07$) and a non-significant increase after policy implementation (slope = 2.74, $p = 0.15$). The Ljung-Box test statistics was significant ($p=0.05$) as shown in **Error! Reference source not found.**. Stationary R^2 yielded a value of 0.21 implying that 21% of the model was explained by the policy intervention. The mean absolute percentage error was 32.83 indicating that the values predicted by the model were within 33% of the actual values.

XI. NEONATAL MORTALITY RATE

There was 37% reduction in the absolute number of neonatal deaths at the health facility from 270 to 169 before and after the policy respectively. There was a significant decline in neonatal mortality rates (NMR) from 27.7/1000 live births to 12.1/1000 live births translating to 56% reduction in neonatal mortality rate (**Error! Reference source not found.**). The ARIMA model parameters for the pre-intervention slope showed a non-significant increase in the rate of quarterly maternal mortality (slope= 0.19, $p = 0.52$) during the 24 months preceding the policy. During the 24 months after free maternity healthcare policy, a significant

decline in neonatal mortality rate was observed (slope = -0.24, $p < 0.05$) as shown in **Error! Reference source not found.**. Stationary R^2 yielded a value of 0.08 implying that only 8% of the variance observed in the neonatal mortality rates could be explained by the policy intervention. The mean absolute percentage error was 17.31 indicating that the values predicted by the model were within 17% of the actual values.

XII. DISCUSSION AND CONCLUSIONS

The study design allowed measurement of the effects of the policy in a real-world setting. However, being non-experimental, the strength of evidence and thus causality is limited owing to lack of a controlled environment. Nonetheless, the analytical approach enabled us to elicit compelling evidence on the effects of the policy. Further analysis should be done with the data disaggregated according to the various demographic dimensions. This may help the policy makers better understand the factors that may influence the performance of the policy. The results reported supported the hypothesis that user fee exemption lead to increased utilization of maternal health care. They also corroborate findings of the majority of evaluations that have shown increased utilization of health care after user fee removal ([Dzakpasu et al. 2014](#)). They underscored the importance of user fee exemption as a strategy for universal health coverage. An important implication of the results is that user fee exemption may not have the same importance for

different types of maternal health services. This is inferred from the lack of significant effects for some variables and the significant positive effects for the other variables. The fact that the signs and statistical significance of the SLA coefficients were the same for corresponding utilization variables in the two sets of results shows the robustness of the primary set of results.

The percentage of pregnant women who make at least one ANC visit during pregnancy has been high in Kenya. The Demographic and Health Survey (MDHS) (2004) showed that it was 95% nationally while the MDHS (2010) showed that it rose to 99%. The data used in this study showed that, for CHAM health facilities with user fee exemption, it was 73% between 2003 and 2005 (before user fee exemption was introduced) and increased to 84% due to user fee exemption. However, despite the effect of user fee exemption it still fell below the national average. For average ANC visits, the increase due to user fee exemption means that pregnant women were modestly better followed up at CHAM health facilities with SLAs, holding other factors constant. Nevertheless, even after user fee exemption, the average number of ANC visits was lower than the four visits recommended in the FANC approach. This could partially be attributed to what has been referred to as confidence selection where women who have had previous uneventful pregnancies consider themselves to be at low risk of complications and make fewer visits despite removal of the financial barrier ([Grossman and Joyce 1990](#)).

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