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Removal of user fees and system strengthening improves access to maternity care, maternal and neonatal mortality in a district hospital in Lesotho

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Abstract

Objective: Lesotho has one of the highest maternal mortality rates in the world. While at primary health care (PHC) level maternity care is free, at hospital level co-payments are required from patients. We describe service utilisation and delivery outcomes before and after removal of user fees and quality of delivery care, and associated costs, at St Joseph's Hospital (SJH) in Roma, Lesotho.

Methods: We compared utilisation of delivery services, stillbirths and maternal and neonatal mortality for the periods before (July 1, 2012 to December 31, 2013) and after (January 1, 2014 to June 30, 2015) user fee removal through a retrospective chart review and estimated additional costs attributed to user fee removal from provider (hospital) and patient perspectives.

Results: Out of 4,715 deliveries 3,855 were at SJH and 860 at PHC centres. Of women delivering at SJH 684 (18.5%) were ≤ 19 years and 894 (23.6%) were HIV positive. After user fee removal hospital deliveries increased by 49% - from 1,547 to 2,308 – and neonatal mortality decreased from 4.8 to 1.3 per 1,000 live births ($p=0.033$). Extrapolating costs to the entire country, 1 USD per capita per year would allow user fee removal at hospital level, the provision of free transport to/from and accommodation at hospital.

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Conclusion: Removing user fees for hospital delivery care in Lesotho is feasible and affordable, and has the potential to improve maternal and neonatal outcomes by removing financial barriers to skilled birth attendants and increasing coverage of institutional deliveries.

Keywords: user fee removal, Lesotho, neonatal mortality, obstetric care utilisation, retrospective study

Introduction

Global Context

Globally, more than 600 women die every day from complications of pregnancy and childbirth(1). Almost all maternal deaths (99%) occur in developing countries and half of these occur in sub-Saharan Africa(2). Maternal deaths can be greatly reduced by increasing the number of births attended by a skilled birth attendant, alongside timely access to secondary and tertiary care. There is a growing body of evidence to suggest removal or minimization of fees for antenatal and delivery services improves maternal and neonatal outcomes and increases facility-based deliveries(3–12). Lesotho could improve its maternal mortality – among the highest globally – by removing user fees for hospital delivery care.

Maternal mortality is difficult to measure and variations in methodology produce different results. Further, small population size, such as in Lesotho, contributes to additional uncertainty in estimates. Despite these challenges, the maternal mortality ratio (MMR) remains a valid measure of the risk associated with pregnancy and childbirth. The MMR represents the number of women who die while pregnant or within 42 days of pregnancy relative to the number of live births(13).

Estimates for MMR in Lesotho are consistently high relative to other countries in the region.

Estimates from the WHO suggest that Lesotho's MMR dropped from 720 deaths per 100 000 live births in 1990 to 490 deaths per 100 000 live births in 2013(2). While such decreases seem encouraging, this was well above the 2015 MDG target of 180 deaths per 100 000 live births and also above the average MMR among developing countries (230 per 100 000 live births)(14). The 2014 Lesotho Demographic Health Survey estimated the MMR at 1,024 deaths per 100,000 live births during the 7-year period prior to the survey (2007 – 2014)(15), suggesting that MMR may be even further from the target than estimated by WHO.

Among women aged 15-19 years living in Lesotho, 25% of all deaths are maternal(15) and the lifetime risk of maternal death is 1 in 61(2). The most common direct causes of maternal death are sepsis, abortion complications, obstructed labour, pre-eclampsia and haemorrhage(16), all conditions requiring treatment in hospital(17). In addition to these direct causes, human

immunodeficiency virus (HIV) carries a substantial burden of the maternal morbidity and mortality in Lesotho. In 2015, 13% of maternal deaths were attributed to indirect causes associated with HIV(18). This made Lesotho one of only five countries with an HIV attributable maternal mortality burden above 10%(18).

In Lesotho, alongside the implementation of sanctions against home delivery, there was an overall increase in facility-based deliveries from 59% in 2009 to 77% in 2014. However, home deliveries remain common in rural areas and among less educated and poorer women (15): 25% of rural women (2.5 times more than in urban areas) and 40% of women in the lowest wealth quintile deliver without a skilled birth attendant(15). Despite lower access among poor women, patient payments for delivery remain in place at hospital level.

Globally, barriers to accessing care and reasons for inequitable access have remained more or less consistent over the last twenty-five years and can be broadly classified into: socio-cultural, perceived benefit/need of skilled attendance, and economic and physical accessibility(19,20). In Lesotho, 42% of women indicate that they face at least one barrier to accessing health care, with 27% reporting challenges with or inability to pay for treatment and 26% distance to the health facility(21). Barriers to care in the Roma-Semonkong catchment area were similar; women expressed themes related to cost of services and travel distance, perceived quality of services, and lack of knowledge and information related to the benefits associated with facility-based deliveries(22). In particular, women noted a reluctance to present at primary health care (PHC) due to fears of onward referral to a hospital at which they would be required to pay for services (22). This is in line with previous research which indicates that that user fees associated with delivery care are particularly problematic given that birth outcomes are unknown when women seek care, making the cost of delivery unknown and difficult to plan for(23).

Materials and Methods

Study design

Retrospective review of maternity registers at SJH before (July 1, 2012 – December 31, 2013) and after (January 1, 2014 – June 30, 2015) the removal of user fees and estimation of costs of removing user fees for maternal services from both patient and hospital perspectives.

Médecins Sans Frontières (MSF) intervention in Roma-Semonkong

In 2011 Médecins Sans Frontières (MSF) began a project designed to reduce maternal and infant morbidity and mortality in a hyper-epidemic HIV/Tuberculosis (TB) setting, in collaboration with the Ministry of Health (MOH) and the Christian Health Association of Lesotho (CHAL). Given evidence

that the majority of maternal and infant deaths in this high prevalence context were HIV-related, the project aimed to demonstrate that by integrating HIV/TB, mother and child health (MCH) and sexual and reproductive health (SRH) services, improving HIV care - particularly prevention of mother to child transmission of HIV (PMTCT) – and making modest improvements in MCH/SRH, a significant and rapid impact on maternal and infant mortality could be achieved and replicated.

Here we describe one component of this project: the provision of free maternal care at the district hospital of Roma-Semonkong, St. Joseph's Hospital (SJH), the only facility in the area providing basic emergency obstetric care. Initially, all maternal health services at SJH – including ambulance referral and stay at the mother waiting lodge (MWL) – required patients to pay fees. In January 2014, MSF started a pilot project through which user fees were removed by paying a forfeit sum to the hospital for each delivery, caesarean section (C-section) or ambulance referral. Similar schemes were already put in place by the Global Fund to ensure free hospital-based services for HIV, TB and malnutrition care, and for people living in indigent households.

MSF covered costs associated with delivery at the hospital for all referred women, including costs additional to health service provision costs. In order to overcome physical (e.g. long distances) and logistical barriers to timely hospital access (e.g. high cost of transportation and difficulties associated with travel once labour had started) we provided ambulance transportation to and from the PHC centres and room and board at a purpose-built, fully equipped maternal waiting lodge. MSF provided an ambulance, including maintenance and running costs by Riders for Health (R4H), who continued providing these services after the project was handed over to the Ministry of Health (MOH).

To assure that the maternity ward could deal adequately with expected increases in deliveries training courses, patient flow improvements and provision of additional medical materials and one additional nurse-midwife at SJH were organized. In 2014, MSF carried out training and mentoring for the nurse-midwives at SJH followed by training on ultrasound (USG) and caesarean section (C-Section) in the fourth quarter of 2014. In addition to this, 36 staff members from SJH and referral PHC centres received an Advanced Life Support in Obstetrics (ALSO) course, an evidence-based, multidisciplinary training program that prepares maternity health care providers to better manage obstetric emergencies (25,26). Lastly, referral from SJH to the tertiary hospital was strengthened.

Objectives

The primary objectives of this analysis were to compare the uptake of delivery services at Roma-Semonkong primary health care centres and district hospital, and outcomes of deliveries at the hospital, before and after removal of user fees for maternal care at the district hospital (service

utilization and patient outcomes). The secondary objective was to estimate the cost from both provider (hospital) and patient perspectives of the removal of user fees

Outcomes and measurement

We documented the total number of deliveries at SJH and PHC centres in the catchment area. Age was collected as a categorical variable (19 years or less; 20-25; 25 years or more). Number of antenatal care visits attended was collected from the labour ward registers. Information on HIV status was determined at admission to SJH and post-partum. The proportion of deliveries done by caesarean section (C-section) was calculated. Complications were grouped according to whether they represented a pre-existing condition (Pre-term labour, fetal distress, hypertension/pre-eclampsia/eclampsia), were related to haemorrhage (placenta praevia, placenta abruption, ruptured uterus) or were related to labour dystocia (malpresentation, prolonged labor, pregnancy-related infections, post-partum haemorrhage, others). Referrals in from PHC centres and out to the tertiary hospital were also documented.

Standard definitions for maternal and neonatal mortality were used (13,24). The maternal mortality ratio (MMR) was calculated as the number of maternal deaths in the period per 100,000 live births(24). Macerated and fresh still birth ratios were calculated as the number of macerated and fresh still births per 1,000 live births (24). Neonatal mortality was calculated as the number of neonatal deaths per 1,000 live births(24). As data on the number of live births were not available for all time periods we calculated the number of live births as the number of deliveries minus the total number of stillbirths. This assumes that there were no multiple births and therefore may underestimate the total number of births.

Data sources, management and analysis

Information on patients, deliveries and delivery outcomes were collected from maternity registers at SJH and at PHCs. All data were aggregated by month and recorded in Microsoft Excel. Chi-square and Fisher's exact tests were used to compare binary outcomes. Ordinal variables were compared using a ranksum test.

Patient costs were estimated using actual reimbursements (of hospital bills and transportation) and "Standard Hospitalization" bills based on the fee schedule and patient profiles. Hospital costs were estimated using a combination of step-down cost allocation (i.e. cost accounting in which all costs are allocated to cost centres) and an activity-based approach (i.e. normative costs based on all drugs and medical supplies necessary for each maternal service). Costs in the currency of Lesotho

(Malotis) were converted to United States of America dollars (USD) using the average rate over the last quarter of 2015 based on the Infoeuro rating.

As analyses were conducted using aggregated, routine data. The intervention as well as the use of data was approved by the Ministry of Health of Lesotho.

Results

Between July 1, 2012 and June 30, 2015 there were 4,715 deliveries: 3,855 at SJH and 860 at the PHC centres. The number of deliveries attended by a skilled attendant in the district increased by 37.3% (from 1,987 to 2,728) after the removal of user fees (Figure 1); hospital deliveries increased by 49.2% (from 1,547 to 2,308) while deliveries at the PHC centres didn't change (from 440 to 420). Detailed information on the mother, complications and outcomes were available for 3,782 hospital deliveries (98.1%; user fee period: 1,484/1,547, 95.9%; after removal of user fees: 2,298/2,308, 99.6%).

The Waiting Mother's Lodge (WML) opened in the third quarter of 2013 and was utilized by 6 women by the end of that quarter, by 236 women in 2014 (Q1: 26; Q2: 62; Q3: 74; Q4: 74) and 101 women in the first half of 2015 (Q1: 45; Q2: 56); representing a total of 337 (14.6%) of women delivering at hospital after user fees removal.

Patient characteristics at time of admission to maternity

After removal of user fees, hospital deliveries increased in all age categories with the largest increase among women above 25 years (86.4% increase compared to 46.9% in women < 19 years and 41.3% in women 19-25 years) (Table 1). HIV prevalence was 23.6% across study periods. The proportion of patients with at least one antenatal care (ANC) visit increased from 96.5 to 98.7% ($p < 0.0001$).

Table 1. Characteristics of women admitted for obstetric care at St. Joseph’s Hospital before and after removal of user fees for hospital delivery care (July 2012 – June 2015)

	User Fees		User fees removed		p-value	Overall	
	(N = 1484 Deliveries)		(N=2298 Deliveries)			(N=3782 Deliveries)	
	%	N	%	n		%	n
Age							
19 years or less	19.5	(277/1417)	17.8	(407/2289)	0.0003	18.5	(684/3706)
20-24 years	38	(538/1417)	33.2	(760/2289)	0.003	35	(1298/3706)
25 years or more	42.5	(602/1417)	49	(1122/2289)	0.0001	46.5	(1724/3706)
Attended at least one ANC							
	96.5	(1351/1400)	98.7	(2037/2063)	<0.0001	97.8	(3388/3463)
HIV positivity							
	23.2	(345/1484)	23.9	(549/2298)	0.666	23.6	(894/3782)
HIV Positive - Known at admission	22.2	(329/1484)	23.2	(534/2298)	0.451	22.8	(863/3782)
HIV Positive - Maternity	1.2	(15/1155)	0.79	(12/1764)	0.11	1.0	(27/2907)
HIV Positive - Post partum	0.09	(1/1140)	0.17	(3/1752)	1.0	0.14	(4/2892)

Delivery characteristics

The proportion of deliveries referred from PHC centres remained small with no change between periods; the proportion of deliveries referred out to the tertiary hospital in Maseru increased from 0.3% to 1.2% (Table 2). C-sections decreased from 9.6% to 7.0% (p=0.007) while the proportion of deliveries with at least one diagnosed complication increased from 9.6% to 15.8% (p <0.0001). This was primarily driven by complications related to hypertension as the proportion of deliveries diagnosed with hypertension, pre-eclampsia or eclampsia more than doubled from 10.6% to 23.1% (p=0.001).

Table 2. Type of birth, birth complications and referral patterns before and after the implementation of free delivery care at St. Joseph's hospital, Lesotho

	User fees (N = 1484 Deliveries)		User fees removed (N=2298 Deliveries)		p-value	Overall (N=3782 Deliveries)	
	%	N	%	n		%	n
Referred in from Health Centers	2.6	(38/1484)	3.4	(79/2298)	0.128	3.1	(117/3782)
Type of Delivery							
Vaginal	90.5	(1343/1484)	93	(2136/2298)	0.007	92	(3479/3782)
C/Section	9.5	(141/1484)	7.0	(162/2298)		8	(303/3782)
At least one complication	9.6	(142/1484)	15.8	(363/2298)	<0.0001	13.4	(505/3782)
Pre-existing pathology							
Hypertension/Pre-Eclampsia or Eclampsia	10.6	(15/142)	23.1	(84/363)	0.001	19.6	(99/505)
Pre-term labor	3.5	(5/142)	6.3	(23/363)	0.281	5.5	(28/505)
Fetal distress	7	(10/142)	8.3	(30/363)	0.255	7.9	(40/505)
Pre- and intra-partum haemorrhage							
Placenta Praevia	0	(0/142)	0	(0/363)	--	0	(0/505)
Placenta abruption	4.9	(7/142)	0	(0/363)	<0.0001	1.4	(7/505)
Ruptured uterus	0.7	(1/142)	0	(0/363)	0.281	0.2	(1/505)
Labor dystocia							
Malpresentation	7.7	(11/142)	4.7	(17/363)	0.196	5.5	(28/505)
Prolonged labor	19.7	(28/142)	16.5	(60/363)	0.396	17.4	(88/505)
Pregnancy related infections	0.7	(1/142)	0.6	(2/363)	1	0.6	(3/505)
Retention of placenta	3.5	(5/142)	3	(11/363)	0.484	3.2	(16/505)
Post-partum hemorrhage	10.6	(15/142)	11.6	(42/363)	0.64	11.3	(57/505)
Others	31.0	(44/142)	25.9	(94/363)	0.248	27.3	(138/505)
Referred out to a tertiary hospital	0.3	(5/1484)	1.2	(27/2298)	0.006	0.8	(32/3782)

Neonatal mortality, maternal mortality and stillbirth ratios

After removal of user fees there was 72.9% decrease in neonatal mortality from 4.8 to 1.3 per 1,000 live births ($p=0.033$); maternal mortality decreased from 138.1 to 88.0 per 100,000 live births and stillbirth ratios from 24.9 to 19.8 per 1000 live births, but differences were not statistically significant (Table 3).

Table 3. Maternal, neonatal and still birth ratios among women delivering in MSF-supported facilities in Roma-Semonkong before and after the implementation of free maternal care services

	PRE-user fee removal		POST-user fee removal		p-value	Total	
	Ratio	n	Ratio	n		Ratio	n
Maternal mortality ratio*	138.1	(2/1448)	88.0	(2/2272)	0.645	118.7	(4/3370)
Neonatal mortality ratio**	4.8	(7/1448)	1.3	(3/2272)	0.033	3.0	(10/3370)
Stillbirth ratio**	24.9	(36/1448)	19.8	(45/2272)	0.302	24.0	(81/3370)
Macerated stillbirth ratio**	11.0	(16/1448)	10.1	(23/2272)	0.346	11.6	(39/3370)
Fresh stillbirth ratio**	13.8	(20/1448)	9.2	(21/2272)	0.201	12.2	(41/3370)

*Per 100,000 live births

**Per 1,000 live births

Costs of free delivery care

Prior to removal of user fees, women paid 341 Malotis for a normal vaginal delivery (NVD) and 586 Malotis for a C-section, including transport and accommodation at the WML. Actual costs incurred by SJH were 605 Malotis (excluding salaries) for NVD and 1,575 Malotis for a C-section. Total cost (including patient transport and accommodation) therefore amount to 780 Malotis for NVD and 1,750 Malotis for a C-section (Table 4).

Assuming that 50% of expected births¹ nationally occur in a hospital, and including the costs of other maternal hospitalizations, a national policy of user fee removal for delivery services in hospitals will cost 26,775,205 Malotis (1,912,514 USD²) per annum (excluding Government of Lesotho salaries). This translates to 1 USD extra per capita per year, as compared to the 105³ USD spending per capita for health in 2014.

¹ Expected births were calculated by applying the crude birth rate to the female population of child-bearing age.

² 1 USD = 14 Malotis

³ Spending on Health, 2014 USD

Table 4. Total costs (Malotis) of free maternal care at SJH and national level extrapolations

	Normal vaginal delivery	C-section	Other maternal hospitalizations
Costs incurred by patients attending SJH			
Average hospital fees paid per patient	165	411	91
Transport costs per patient	51	51	51
Accommodation costs per patient	124	124	0
Average Total cost per patient	341	586	142
Costs incurred by SJH			
Costs excluding GoL salaries & excluding drugs and medical supplies	335	744	432
Drugs and medical supplies	160	721	N/A
Drugs and medical supplies for Postnatal services	110	110	N/A
Total costs incurred by SJH	605	1,575	432
Costs extrapolated~ to national level			
Cost incurred by hospital*	605	1575	432
Costs incurred by patient**	175	175	51
Total costs per patient	780	1750	483
Number of patients at National level***	26,365	2,035	5,485
Total cost for National level***	20,564,700	3,561,250	2,649,255
*Excluding Government of Lesotho (GoL) salaries			
**Transport and accommodation			
***Assuming that 50% of expected births occur in hospital			

Discussion

Removal of user fees for hospital delivery care resulted in a large increase in facility-based deliveries and lower neonatal and maternal mortality. The cost was very low and would amount to an increase of 1 USD per capita per year in health expenditure if Lesotho implemented this policy.

After removal of user fees for hospital delivery care, ambulance transportation and use of a waiting mother lodge (WML), hospital-based deliveries increased by 49% at the district hospital, while deliveries at primary care centres in the area remained stable. This represents an overall

increase of 37% in facility-based deliveries attended by a skilled birth attendant in the district, an increase from 42% to 57% of the 4,788 expected pregnancies in the catchment area (25).

The lack of strong evidence around the association between user fees and use of maternal services, particularly emergency obstetrical care, has been highlighted(23). This lack of evidence results from both the number and quality of existing studies(23). Despite this, there is consistency in the direction of effect, particularly when assessing the impact of fees on facility (primary health care- and hospital- level) deliveries(3–12). Our findings are in line with this trend and importantly are able to assess not only access to care but also delivery outcomes and the presentation of complications during delivery. The latter have often not been reported(23).

In addition to the removal of user fees, we provided free access to a WML and obstetric training of health staff at primary care and hospital level. There found a statistically significant 73% decrease in neonatal mortality and non-significant decreases in maternal mortality by 36% and stillbirths by 20%. While the increase in hospital deliveries is most likely related to the removal of user fees, the improvements in neonatal mortality, maternal mortality and stillbirths may result from a combination of factors including improved quality of care at the hospital, earlier referral associated with free ambulance and skill improvement at primary care, improved referral to tertiary care, and an increase in self-referrals compared to referral of complications by primary care.

Free access to the WML was taken up by 14.6% of women delivering at SJH, suggesting that provision of accommodation at the WML facilitated uptake of delivery care at SJH hospital. There is evidence showing the positive effect of maternal waiting lodges (22–24) on increasing the number of deliveries at facilities and in decreasing time to emergency obstetric care when needed. This is particularly important in preventing deaths related to haemorrhage, ruptured uterus and eclampsia, all of which can lead to rapid maternal death (i.e. within 48 hours of onset)(26). We also saw an increase in the number of women diagnosed with complications of pregnancy at the hospital, mostly due to an increase in diagnosis of pre-eclampsia. This may be due to improved referral from PHC, improvement in diagnostic skills at the hospital and use of WML prior to delivery. There is limited evidence to suggest that the user fees increase complicated deliveries at facility level(27,28). This has been attributed to delayed health seeking behaviour among women who cannot afford the fees(27,28). However, more recent evidence shows that both removal of user fees and improvement in screening and referral, alongside availability of WMLs, increase the proportion of deliveries with complication(5,9,26,29).

As has been seen in other settings (9) we anticipated an increased workload at SJH through increased service utilisation subsequent to the removal of user fees. Therefore, integral components of the pilot were to ensure adequate training of PHC and hospital staff and to improve

overall patient flow within SJH and referral pathways (i.e. from primary to secondary to tertiary care as needed). While essential to ensuring the provision of quality services, given the short nature of this pilot, it is unlikely that improved quality of care and/or improved patient experience contributed meaningfully to the increase in service utilization (i.e. there was insufficient time for word-of-mouth).

An additional 1 USD per capita per year expenditure for health would allow Lesotho to remove maternal fees at hospital level. This includes adequate funding for maternal care services in hospitals, a minimum quality of care (availability of drugs and supplies), as well as additional direct costs which would otherwise be incurred by the patient, including transportation to and from hospitals and accommodation in a waiting mother lodge.

Experience at SJH suggests that other resource requirements (staff, equipment etc.) associated with implementing a programme of free maternal care are also relatively low. Scaling-up removal of fees at national level seems affordable and given the positive outcomes seen in this study would result in value for money spent. A mechanism similar to that of HIV, TB, malnutrition and indigent schemes could be implemented for delivery services. Existing schemes provide services for free, with hospitals being reimbursed by the funder based on forms submitted.

It has been suggested that provision of free maternal and child services can be used as a feasible first step towards the provision of universal free health care (30). Expanding this program can allow government and other funders a chance to build towards universal health care. It is important to prevent significant expenditures often associated with HIV and TB care but it is also important to recognize that fees can prevent health seeking behaviour.

This study has some limitations. Retrospective review of routine data did not allow us to measure potentially relevant indicators related to women's socio-economic status and other factors which might impact access (i.e. distance of house from hospital; parity; education level, etc.). Data from before implementation was of lower quality, with more missing information than data collected after implementation. Due to the aggregate nature of the data we are not able to directly assess associations between exposures, for example attending the waiting mother lodge, and delivery outcomes. We are also missing important information on cases presenting specifically for complications related to termination of pregnancy. Termination of pregnancy is illegal in Lesotho; however, due to a lack of availability of family planning women resort to unsafe/backstreet abortions to end unwanted pregnancies. Unwanted pregnancies often result in complications and contribute to the burden of maternal morbidity(31,32) and obstetric cases treated at hospital level. Complications from abortions account for more than one quarter of maternal deaths, however, due to limitations in data we were not able to include a full costing of the complications of abortions in

this study. The routine nature of implementation may also be considered a strength of this study as it demonstrates that it is feasible to implement a program to remove user fees in a public sector hospital and that adequate monitoring could be maintained in similar settings. Further, it adds to the limited body of evidence related to the impact of user fees specifically on access to maternal care(4,23), in particular hospital and emergency delivery care.

CONCLUSIONS

Removal of user fees at a district hospital in Lesotho was associated with an increase in utilisation, without compromising service quality. At 1 USD per capita per year this program is affordable at a national level. As part of its efforts to achieve the Sustainable Development Goals, the Government of Lesotho should consider the nationwide introduction of free delivery care at all levels of the healthcare system.

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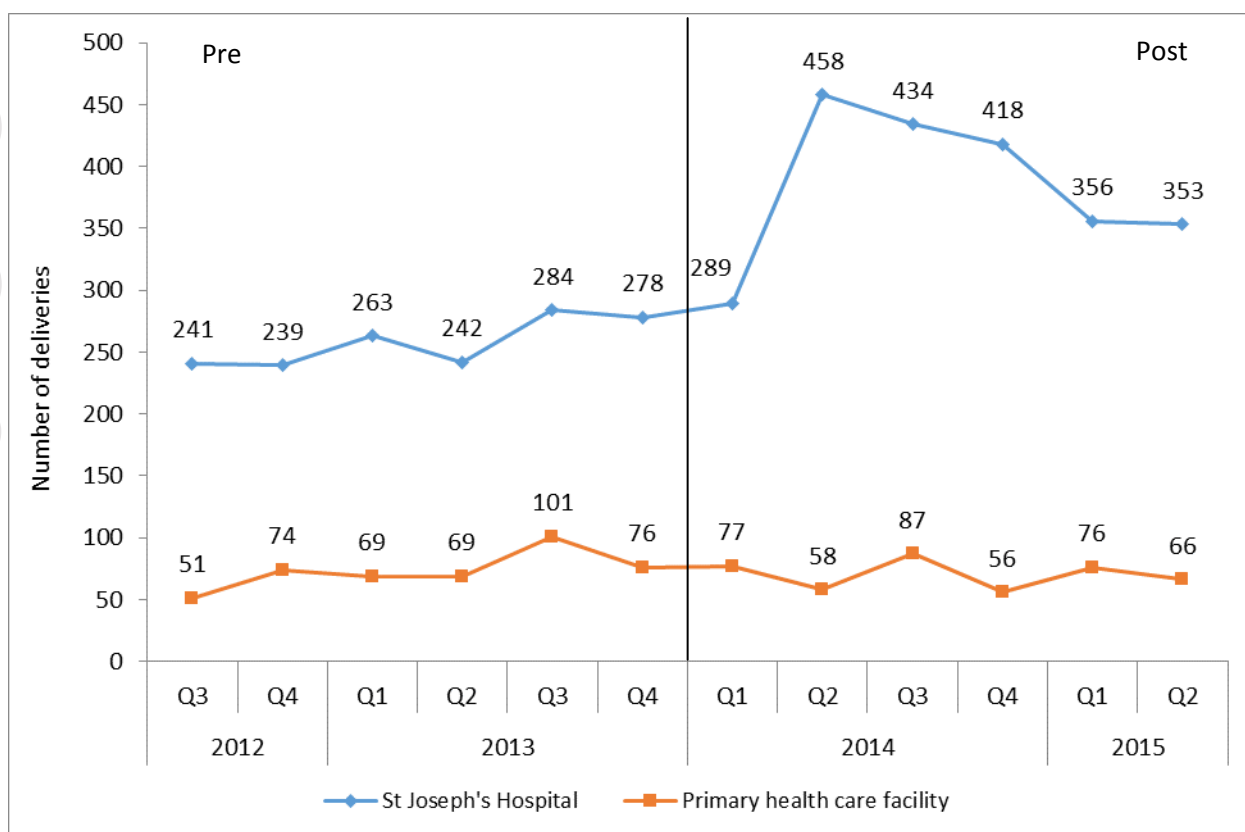


Figure 1. Number of deliveries at St. Joseph's hospital and referral facilities pre-and post- free maternal care by year and quarter