VOLUME 24 NO I PP 2-IO JANUARY 2019

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

Sarah Jane Steele¹, Hartini Sugianto¹, Quentin Baglione², Sandra Sedlimaier³, Aline Aurore Niyibizi¹, Kristal Duncan¹, Julia Hill¹, Jesper Brix³, Mit Philips⁴, Gilles Van Cutsem^{1,5} and Amir Shroufi¹

1 Médecins Sans Frontières South Africa and Lesotho, Cape Town, South Africa

2 Agence Européenne pour le Développement et la Santé, Brussels, Belgium

3 Médecins Sans Frontières South Africa and Lesotho, Roma, Lesotho

4 Médecins Sans Frontières Operational Centre Brussels, Brussels, Belgium

5 University of Cape Town, Cape Town, South Africa

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 (1 July 2012 to 31 December 2013) and after (1 January 2014 to 30 June 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 Of 4715 deliveries 3855 were at SJH and 860 at PHC centres. Of women delivering at SJH 684 (18.5%) were \leq 19 years and 894 (23.6%) were HIV positive. After user fee removal hospital deliveries increased by 49% — from 1547 to 2308 — and neonatal mortality decreased from 4.8 to 1.3 per 1000 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.

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 Lesotho, neonatal mortality, obstetric care utilisation, retrospective study, user fee removal, maternal health, maternal mortality, access to care

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 minimisation of fees for antenatal and delivery services improves maternal and neonatal outcomes and increases facilitybased 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. Furthermore, 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

© 2018 The Authors. *Tropical Medicine & International Health* Published by John Wiley & Sons Ltd. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

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 1024 deaths per 100 000 live births during the 7-year period prior to the survey (2007–2014)[15], suggesting that the 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 which require 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 25 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 because 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

A retrospective review of maternity registers at SJH before (1 July 2012–31 December 2013) and after (1 January 2014–30 June 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.

Médecins Sans Frontières covered costs associated with delivery at the hospital for all referred women, including costs additional to health service provision costs. 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. The ambulance was operated 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 nursemidwife at SJH were organised. 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 programme that prepares maternity health care providers to better manage obstetric emergencies [24, 25]. Last, 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 utilisation 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 (ANC) 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, foetal distress, hypertension/pre-eclampsia/eclampsia), were related to haemorrhage (placenta praevia, placenta abruption, ruptured uterus) or were related to labour dystocia (malpresentation, prolonged labour, pregnancyrelated 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, 26]. The maternal mortality ratio (MMR) was calculated as the number of maternal deaths in the period per 100 000 live births [26]. Macerated and fresh still birth ratios were calculated as the number of macerated and fresh still births per 1000 live births [26]. Neonatal mortality was calculated as the number of neonatal deaths per 1000 live births [26]. 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 were approved by the Ministry of Health of Lesotho.

Results

Between 1 July 2012 and 30 June 2015 there were 4715 deliveries: 3855 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 1987 to 2728) after the removal of user fees (Figure 1); hospital deliveries increased by 49.2% (from 1547 to 2308) while deliveries at the PHC centres remained stable (from 440 to 420).

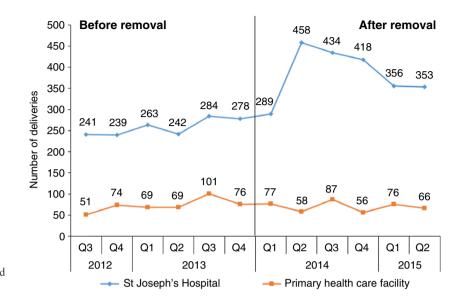


Figure I Number of deliveries at St. Joseph's hospital and referral facilities pre-and post-free maternal care by year and quarter. [Colour figure can be viewed at wileyonlinelibrary.com].

Detailed information on the mother, complications and outcomes were available for 3782 hospital deliveries (98.1%; pre user fee removal: 1484/1547, 95.9%; post removal of user fees: 2298/2308, 99.6%).

The Waiting Mother's Lodge (WML) opened in the third quarter of 2013 and was utilised 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 1 antenatal care (ANC) visit increased from 96.5% to 98.7% (P < 0.0001).

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).

Neonatal mortality, maternal mortality and stillbirth ratios

After removal of user fees there was a 72.9% decrease in neonatal mortality from 4.8 to 1.3 per 1000 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).

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 1575 Malotis for a C-section. Total cost (including patient transport and accommodation) therefore amounts to 780 Malotis for NVD and 1750 Malotis for a C-section (Table 4).

Assuming that 50% of expected births.¹ nationally occur in a hospital, and including the costs of other maternal hospitalisations, a national policy of user fee removal for delivery services in hospitals will cost

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

| Table I 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) |

| | $\frac{\text{User fees}}{(N = 1484 \text{ deliveries})}$ | | User fees removed $(N = 2298 \text{ deliveries})$ | | | $\frac{\text{Overall}}{(N = 3782 \text{ deliveries})}$ | |
|-----------------------------------|--|-------------|---|-------------|----------|--|-------------|
| | | | | | | | |
| | % | N | % | п | P-value | % | п |
| 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) |

Bolded figures indicate P > 0.05.

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) | | | Overall (<i>N</i> = 3782 deliveries) | |
|---|------------------------------------|-------------|--|-------------|----------|---------------------------------------|-------------|
| | % | N | % | п | P-value | % | п |
| Referred in from health centres | 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 labour | 3.5 | (5/142) | 6.3 | (23/363) | 0.281 | 5.5 | (28/505) |
| Foetal 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) |
| Labour dystocia | | | | | | | |
| Malpresentation | 7.7 | (11/142) | 4.7 | (17/363) | 0.196 | 5.5 | (28/505) |
| Prolonged labour | 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 haemorrhage | 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) |

26 775 205 Malotis (1 912 514 USD^2) 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.

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.

 $[\]overline{^{2}1 \text{ USD}} = 14 \text{ Malotis}$

³Spending on Health, 2014 USD

| | PRE-user fee removal | | POST-use removal | er fee | | Total | |
|---------------------------------------|----------------------|-----------|---------------------|-----------|---------|-------|-----------|
| | Ratio | п | Ratio | п | P-value | Ratio | п |
| 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) |

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

†Per 100 000 live births.

‡Per 1000 live births.

Table 4 Total costs (Malotis) of free maternal care at St Joseph's Hospital (SJH) and national level extrapolations

| | Normal vaginal delivery | C-section | Other maternal hospitalisations |
|---|----------------------------|-----------|---------------------------------|
| 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 | 335 | 744 | 432 |
| drugs and medical supplies | | | |
| 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 | 1575 | 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 | 2035 | 5485 |
| 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.

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 4788 expected pregnancies in the catchment area [24].

The lack of strong evidence around the association between user fees and the 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 consistent 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 was 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, 23, 26] 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 h of onset) [25]. 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 preeclampsia. 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 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, 25, 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 utilisation (i.e. there was insufficient time for word-of-mouth increases).

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 programme 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 recognise 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 were 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 programme to remove user fees in a public sector hospital and that adequate monitoring could be maintained in similar settings. Furthermore, 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 programme 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.

References

- Naghavi M, Abajobir AA, Abbafati C *et al.* Global, regional, and national age-sex specifc mortality for 264 causes of death, 1980-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet* 2017: 390: 1151–1210.
- WHO, Unicef, UNFPA, Group WB, WHO, UNPD. Trends in maternal mortality: to 2015: estimates by WHO, UNI-CEF, UNFPA, World Bank Group and the United Nations Population Division. *Organization* 1990: 2015: 1–38.
- Nguyen HT, Zombré D, Ridde V, De Allegri M. The impact of reducing and eliminating user fees on facility-based delivery: a controlled interrupted time series in Burkina Faso. *Health Policy Plan* 2018: 33: 948–956.
- Chama-chiliba CM, Koch SF. Assessing regional variations in the effect of the removal of user fees on institutional deliveries in rural Zambia. *African Health Sciences* 2014: 17: 29.
- Dossou J-P, Cresswell JA, Makoutodé P *et al.* 'Rowing against the current': the policy process and effects of removing user fees for caesarean sections in Benin. *BMJ Glob Health* 2018: 3: e000537.
- Ravit M, Audibert M, Ridde V, de Loenzien M, Schantz C, Dumont A. Removing user fees to improve access to caesarean delivery: a quasi-experimental evaluation in western Africa. *BMJ Glob Health* 2018: 3: e000558.
- Calhoun LM, Speizer IS, Guilkey D, Bukusi E. The effect of the removal of user fees for delivery at public health facilities on institutional delivery in Urban Kenya. *Matern Child Health J* 2017: 22: 409–418.
- De Allegri M, Ridde V, Louis VR *et al.* Determinants of utilisation of maternal care services after the reduction of user fees: a case study from rural Burkina Faso. *Health Policy* 2011: 99: 210–218.
- 9. Witter S, Arhinful DK, Kusi A, Zakariah-Akoto S. The experience of Ghana in implementing a user fee exemption policy to provide free delivery care. *Reprod Health Matters* 2007: **15**: 61–71.
- Manthalu G, Yi D, Farrar S, Nkhoma D. The effect of user fee exemption on the utilization of maternal health care at mission health facilities in Malawi. *Health Policy Plan* 2016: 31(9): 1–9.
- 11. Hotchkiss DR, Krasovec K, El-Idrissi MDZE, Eckert E, Karim AM. The role of user charges and structural

attributes of quality on the use of maternal health services in Morocco. *Int J Health Plann Manage* 2005: 20: 113–135.

- Wilkinson D, Gouws E, Sach M, Karim SSA. Effect of removing user fees on attendance for curative and preventive primary health care services in rural South Africa. *Bull World Health Organ* 9(7): 79: 665–671.
- 13. The World Health Organization. Health Statistics and Information Systems: Maternal mortality ratio (per 100 000 live births).
- World Health Organization. Maternal Mortality Fact Sheet 2014. World Health Organization: Fact Sheet, 2014.
- Lesotho Ministry of Health. Lesotho 2014 Demographic and Health Survey. 2016.
- 16. Lesotho Ministry of Health, United Nations. MDG Acceleration framework, improving maternal health. 2013.
- Harrison M, Griffin J, McClure E, Jones B, Moran K, Goldenberg R. Maternal mortality from obstructed labor: a MANDATE analysis of the ability of technology to save lives in Sub-Saharan Africa. *Am J Perinatol* 2016: 33: 873– 881.
- The World Health Organization, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Trends in maternal mortality 1990 to 2015. 2015.
- Gabrysch S, Campbell OMR. Still too far to walk: literature review of the determinants of delivery service use. *BMC Pregnancy Childbirth* 2009: 9: 34.
- Thaddeus S. Too far to walk: maternal mortality in context. Soc Sci Med 38(8): 1091–1110.
- National Institute of Statistics, Directorate General for Health and II. Demographic and health survey 2014. 2016. 1–457.
- 22. Medecins sans Frontieres. MSF Roma Policy Brief. 2015.
- Dzakpasu S, Powell-Jackson T, Campbell OMR. Impact of user fees on maternal health service utilization and related health outcomes: a systematic review. *Health Policy Plan* 2014: 29: 137–150.
- 24. World Health Organization. Maternal Health and Safe Motherhood Programme & UNICEF. Indicators to monitor maternal health goals: report of a technical working group, Geneva, 8-12 November 1993. Geneva: World Health Organization. 1994.
- 25. Vermeiden T, Stekelenburg J. Maternity waiting homes as part of an integrated program for maternal and neonatal health improvements: women's lives are worth saving. J Midwifery Womens Health 2017: 62: 151–154.
- 26. The World Health Organization. 29 Stillbirth rate Definition and Calculation. 2015.
- Owa JA, Osinaike AI, Makinde OO. Trends in utilization of obstetric care at Wesley Guild Hospital, Ilesa, Nigeria. Effects of a depressed economy. *Trop Geogr Med* 1995: 47: 86–88.
- Ekwempu CC, Maine D, Olorukoba MB, Essien ES, Kisseka MN. Structural adjustment and health in Africa. *Lancet* 1990: 336: 56–57.
- Witter S, Khadka S, Nath H, Tiwari S. The national free delivery policy in Nepal: early evidence of its effects on health facilities. *Health Policy Plan* 2011: 26(Suppl.2): ii84– ii91.

^{© 2018} The Authors. Tropical Medicine & International Health Published by John Wiley & Sons Ltd.

- 30. Yates R, Fleisher L, Gottret P *et al.* Universal health care and the removal of user fees. *Lancet* 2009: 373: 2078–2081.
- 31. Askew I, Weinberger M, Dasgupta A *et al.* Harmonizing Methods for Estimating the Impact of Contraceptive Use on Unintended Pregnancy, Abortion, and Maternal Health.
- 32. Abajobir A, Alati R, Kisely S, Najman JM. Antecedents and maternal health outcomes of unintended pregnancy: a systematic review. *Ethiop Med J* 2017: 55(4): 325–354.

Corresponding Author Sarah Jane Steele, Médecins Sans Frontières South Africa and Lesotho, 4th Floor Deneb House, 368 Main Rd., Observatory, Cape Town, South Africa 7925. E-mails: sarahtaleski@gmail.com; sarahjane.steele@joburg.msf.org