

Current Per-Case and Annual Costs of Postabortion Care Provision in Malawian Public Health Facilities

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Introduction/Background: Unsafe abortion is not only a major contributor to pregnancy-related morbidity and mortality, but also contributes a significant and disproportionate amount of health system costs, especially in poorer countries where abortion laws are more restrictive (Vlassoff et al. 2008, Singh et al, 2005, Koontz 2003). Globally, about 8 million women each year experience short and long term disability resulting from complications of unsafe abortions (Singh et al 2009); about 47,000 of these women die from them and half of these deaths occur in Africa (WHO 2011). Sub-Saharan Africa has the highest maternal mortality ratio in the world (520 deaths per 100,000 live births, WHO 2011). In this region, an estimated 1.18 million women are admitted annually to health facilities for treatment of unsafe abortion complications such as incomplete abortion, hemorrhage, septicemia and uterine perforation (Singh 2006). A study using data primarily from Uganda used *Savings*, a cost modeling tool, and estimated that health system costs could be reduced by up to 86% through a combination of health service improvements and legal reform to liberalize abortion laws (Johnston et al 2007).

The latest estimate of maternal mortality for Malawi is 807 (range 696-918) maternal deaths per 100,000 live births (National Statistical Office and UNICEF 2008) with a lifetime risk of maternal death of 1 in 36 women, one of the highest globally (National Statistical Office and ORC Macro 2005). Abortion complications are the most common reason for admission to the gynecological wards of Malawi's major hospitals (Munthali 2004).

Since 2003, the Reproductive Health Unit (RHU) of the Malawi MOH has made a deliberate effort to increase the number of public facilities that provide postabortion care (PAC) through provider training and facility upgrades (JHPIEGO 2004). However, Malawi is currently not on track for meeting its goal for MDG 5 of a 75% reduction in maternal mortality by 2015 (MDG Monitor 2010). With a chronic labor shortage of health professionals, increased investment must be coupled with proper allocation and monitoring of resources. To operationalize Malawi's commitment to women's right to sexual and reproductive health, it will not only be necessary to improve and monitor quality of health services, but also to measure the costs of providing these services to ensure more efficient and effective distribution of resources and services.

Methods: Study objectives were to obtain a comprehensive description of different postabortion care treatment regimens currently used in Malawi and calculate their associated health facility costs. This study was designed using the *Savings* cost modeling tool, an Excel-based tool that estimates the current health system costs of treating complications from unsafe abortion (Johnston et al 2007).

Treatment regimen data were collected in May-July 2010 from a sample of 15 out of all 93 PAC-providing public health facilities in Malawi, purposively selected for high caseload and representation of

all service delivery levels, geographic regions, and urbanity. Respondents from facilities, primarily clinicians, provided a detailed description of each treatment regimen for a typical PAC case, including the type and amount of supplies used, the name and dosage of medications used, and the amount of time spent by each staff member during each stage of care. Data received from facility questionnaires were applied to the cost of supplies and medications listed in the essential drug list from the Central Medications Stores (CMS) Catalogue (2010-2011). Supplies and medications that were listed by respondents but for which costs could not be found in the CMS were drawn from the WHO Mother-Baby Package costing spreadsheet. Annual salary data per staff cadre were supplied by the Malawi RHU. All data were either collected in USD or converted from Malawian Kwacha to USD at an exchange rate of 1 USD to 150 Kwacha. Data were input into *Savings* and Stata/IC 11.2 to calculate median per-case costs, stratified by evacuation technology, types of complications, and inpatient/outpatient treatment.

An additional study objective was to estimate the annual cost of treating postabortion complications in the 15 study facilities as well as all 93 PAC-providing public health facilities in Malawi. To achieve this, calculated per-case costs were applied to estimated PAC caseloads and complication severity distribution as collected through a recently completed study of abortion incidence in Malawi (Malawi MOH, 2011).

No patient names, record numbers or other information that could be used to identify individual patients were collected. Overhead costs such as electricity, linens, water, food, beds, or administrative services were not included. Cost estimates also do not include fees paid by women or external supplies provided by women, the cost of contraceptives, the cost of referral, transportation costs, or social or economic costs such as loss of income or the cost of child care.

Results: Overall, the median cost of simple PAC (PAC requiring only a uterine evacuation) was estimated to be US \$16 per case, ranging between US \$19 for dilation and curettage (D&C) procedures, US \$13 for manual vacuum aspiration (MVA), and US \$11 for the use of misoprostol (Table 1). Cases requiring additional treatment of complications had corresponding increased per-case costs. PAC requiring treatment of sepsis or a blood transfusion cost US \$49 and US \$55 per case, respectively, and US \$87 if both interventions were required (Table 1). PAC that also required surgical repair of the cervix, vagina, or uterus cost between US \$119 and US \$158 per case, depending on the combination of treatments required (Table 1). Outpatient care (US \$48 per case) was estimated to be almost half the cost of inpatient care (US \$91 per case, table 1).

The monthly caseload estimate determined from the Malawi Abortion Magnitude Study for the 15 study facilities included 501 total PAC cases, 86% of whom were treated for simple PAC. Fourteen percent of women were treated with a uterine evacuation as well as treatment for sepsis, a blood transfusion, surgical repair, or some combination of the three. While all 15 study facilities reported using MVA for PAC and only 9 reported the use of D&C, over half of all PAC cases were treated with D&C and 44% with the WHO-recommended method of MVA. Just two health facilities reported using misoprostol. Far more D&C cases were performed on an inpatient basis (71%) than MVA cases (36%) (Data not shown).

Table 1. Estimated median per-case costs of current PAC provision

	Percent of total caseload	Median per-case cost
Simple PAC ¹	86%	US \$16
MVA	44%	US \$13
D&C	55%	US \$19
Misoprostol	<1%	US \$11
PAC requiring a blood transfusion	3%	US \$54
PAC requiring both surgical repair ² and a blood transfusion	<1%	US \$125
PAC requiring treatment of sepsis	9%	US \$48
PAC requiring both surgical repair ² and treatment of sepsis	<1%	US \$119
PAC requiring both treatment of sepsis and a blood transfusion	2%	US \$87
PAC requiring surgical repair ² , treatment of sepsis, and a blood transfusion	<1%	US \$158
Outpatient Care	44%	US \$ 48
Inpatient Care	56%	US \$ 91
Overall PAC (inclusive of all procedures/complication types)	-	US \$ 88

¹ PAC requiring only a uterine evacuation.

² PAC requiring a uterine evacuation as well as surgical repair of the vagina, cervix, uterus, or intestines.

When the per-cases costs determined through the *Savings* model were applied to estimated annual caseloads for these 15 study facilities, it is estimated that approximately US \$156,735 is spent per year on treatment of postabortion complications (data not shown). All 93 PAC-providing public health facilities in Malawi spend an estimated US \$408,464 on treatment annually, with 38% of that cost being used to treat cases requiring treatment of additional complications (Table 2).

Table 2. Estimated annual cost of current PAC provision, by complication type

	Annual caseload among all PAC-providing public health facilities ¹	Estimated annual cost among all PAC-providing public health facilities ¹
Simple PAC ²	15,882	US \$254,119
PAC requiring a blood transfusion	518	US \$28,507
PAC requiring both a blood transfusion and surgical repair ³	37	US \$4,628
PAC requiring treatment of sepsis	1,666	US \$81,634
PAC requiring both treatment of sepsis and surgical repair ³	37	US \$4,406
PAC requiring both treatment of sepsis and a blood transfusion	333	US \$29,321
PAC requiring treatment of sepsis, a blood transfusion, and surgical repair ³	37	US \$5,849
All PAC cases	18,511	US \$408,464

¹ N=93 public health facilities, as determined by the Malawi Abortion Magnitude Study (Malawi MOH, 2011)

² PAC requiring only a uterine evacuation.

³ PAC requiring a uterine evacuation as well as surgical repair of the vagina, cervix, uterus, or intestines.

Discussion/Conclusion: Over half of cases at the 15 study facilities were performed with D&C, the most expensive procedure method for simple PAC. Inpatient cases also proved to be considerably more expensive than outpatient cases, although 71% of inpatient cases were also performed with D&C. Among inpatient cases, 80% did not require additional treatment of sepsis, blood transfusions, or surgical repair, and it can be assumed that these were simple PAC cases that could have been treated as outpatients and/or released more quickly from the facility, thereby reducing costs.

The Malawi Abortion Magnitude Study calculated an annual estimate of the number of women served with postabortion care in Malawi, based on the number of women presenting to postabortion care providing health facilities for postabortion care in one month. Temporal variation of pregnancy, underreporting at the facility level, and exclusion of facilities that could have provided postabortion care are a few of the factors impacting these estimates, leading to a likely underestimation of the annual number of women receiving postabortion care in Malawi. As annual total costs of postabortion care were applied to these estimates, it is probable that our cost estimate calculated here is far lower than what it would be if all of the women requiring care made it to a public health facility. Additionally, we calculated only the cost to the public health system, although private health facilities in Malawi also provide this care and bear additional costs of treating postabortion complications.

These findings indicate that the treatment of additional medical and/or surgical complications can cost between three to ten times more than providing simple PAC (depending on the complication). Women with the most serious and expensive complications are likely the women who experience the longest delay before being treated at a health facility. Community interventions to educate women on sexual and reproductive health and availability of services or sources of nearest facility care, improved referral systems, and decentralization of PAC to health centers can help eliminate these delays and reduce health system costs.

Nationally, current estimated annual health facility costs of providing postabortion care amount to US \$408,464. The World Bank (2009) calculates a per capita health expenditure cost in Malawi of US \$19, with almost 60% of total health expenditures borne by the public sector (World Bank 2009). Our estimates here show that even simple PAC consumes US \$16 per case, with additional complications substantially increasing costs. These statistics indicate that the current scenario of PAC provision places undue stress on the public health system budget. The provision of postabortion care with outpatient MVA or misoprostol at lower levels of the health system (such as health centers) could greatly reduce health system costs, while at the same time making significant funds available for redistribution to competing obstetric and gynecologic needs. However, while additional staff training and service delivery improvements can result in significant cost reductions, expanding the legal indications for abortion could reduce costs even further.

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