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## CLINICAL ARTICLE

## Client–pharmacy worker interactions regarding medical abortion in Zambia in 2009 and 2011

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## ABSTRACT

**Objective:** To examine sales practices, knowledge, and behavior of pharmacy workers regarding medical abortion in 2009 and 2011 in Zambia, where hostile and stigmatizing attitudes still result in high rates of unsafe abortion. **Methods:** Four mystery clients visited pharmacies during 2009 and 2011, and recorded their experiences following their interactions using a standardized form. Bivariate analysis examined pharmacy workers' attitudes, behavior, and medical abortion–dispensing practices. **Results:** Mystery clients visited 76 pharmacies in 2009 and 80 pharmacies in 2011. In 2011, mystery clients reported hostile interactions with pharmacy workers at 8 (10%) pharmacy visits, a relative decrease from 7 (22%) in 2009 ( $P = 0.0353$ ). In 2009, less than half (35 [46%]) of clients received information or had the opportunity to purchase medical abortion drugs in comparison with 53 (66%) in 2011 ( $P = 0.0110$ ). In 2011, more pharmacy workers mentioned a valid medical abortion drug in comparison with 2009 (42 [53%] vs 31 [41%], respectively); however, guidance for women on misoprostol use was minimal. **Conclusion:** Pharmacy workers exhibited increased awareness of misoprostol, less hostility, and a willingness to sell medical abortion drugs; however, they continued to provide inadequate information on misoprostol for medical abortion. Effective training of pharmacy employees is vital in increasing access to safe induced-abortion care.

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## 1. Introduction

Globally, the World Health Organization (WHO) estimates that 22 million unsafe abortions occur each year, resulting in the death of nearly 47 000 women [1]. In East Africa alone, the annual number of unsafe abortions was almost 2.5 million in 2008 [2], which were associated with almost 17% of the region's maternal deaths [3]. Even as countries continue to decrease legal restrictions that penalize women and providers [4], unsafe abortion remains a daunting problem, causing disproportionate suffering in the poorest countries and among the poorest families in the world [5].

Despite having one of the least restrictive induced abortion laws in Sub-Saharan Africa, regulations in Zambia's 1972 Termination of Pregnancy Act [6] still result in substantial barriers to safe induced abortion, especially in rural areas where access to safe termination providers are limited [7]. Maternal mortality, at 591 maternal deaths per 100 000 live births, remains high [8] and one study in Zambia estimated unsafe

abortion complications could account for 30% of maternal deaths [9]. The number of women admitted for post-abortion care to five major Zambian hospitals from 2003–2008 was almost 53 000; more than half of these complications were attributed to unsafe abortion [10].

Medical abortion, provided in health facilities or accessed by women themselves in pharmacies, has been shown to contribute to a decline in the number and severity of complications from unsafe abortions [11–13]. Medical abortion, using mifepristone and misoprostol, was introduced into Zambia in 25 public health facilities in 2009. Although 78% of eligible women seeking induced abortions chose medical abortion between January 2010 and September 2011 [14], roll-out to additional health facilities has been slow, being hindered by policy hurdles that continue to impede progress in expanding access to safe and legal induced abortions. In 2009, there were at least six products derived from the drugs mifepristone (two) or misoprostol (four) that were registered and permitted for sale in Zambia. Despite mifepristone's limited use in public health facilities in 2009, misoprostol variants and their abortifacient qualities were quite widely known by women, as well pharmacy and healthcare workers. However, these misoprostol products were registered for uses other than medical abortion (including other gynecological uses) so information related to their abortifacient

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properties was limited. Pharmacy workers in Zambia are only allowed to sell these products to women with a prescription; however, as the package inserts for these products do not contain information on the drug's abortifacient properties, it is unclear whether pharmacy workers know what advice to give women about using these products to terminate a pregnancy. This is in spite of scientific information about the efficacy and safety of these drugs, including endorsements from WHO, which continues to grow [15]. However, medical abortion with misoprostol alone is up to 85% effective until 10 weeks of pregnancy, and up to 85% effective at 9–13 weeks of pregnancy when the proper dosage and regimen is followed [16,17].

Pharmacists and more informal drug sellers have long been the primary sources of information and medication for the treatment and prevention of illness [18]. They are often a convenient, anonymous and inexpensive source of information, particularly when physicians are in short supply [18]. In one national study conducted in Cambodia, 37% of women seeking post-abortion care reported having attempted to terminate the pregnancy prior to visiting the clinic; 80% of these women sought advice or assistance from someone who sold drugs [19]. The role that pharmacy workers have in the provision of medical abortion drugs, and their contribution to either assist women in having a safe abortion, with adequate and correct information, or to perpetuate unsafe abortion with a lack of information or even misinformation, is largely unknown. In Zambia, pharmacists must study to become licensed pharmacists; they are degree holders and are able to own and manage a pharmacy. Additionally, they are able to supervise pharmacy assistants, or technologists, who do not have a degree. Pharmacists are required to request a prescription based on the schedule of the drug being sought. Misoprostol is a schedule II drug, which requires a prescription, regardless of desired use. The aim of the present study was to examine the sales practices, knowledge, and behavior of pharmacy workers around medical abortion in Zambia in 2009 and 2011, a dynamic environment for induced-abortion care. To our knowledge, the findings of the present study offer the first data regarding pharmacy practices related to the sale and use of drugs for medical abortion in Zambia, where hostile and stigmatizing attitudes about induced abortion still result in a high rate of unsafe abortions [20].

## 2. Materials and methods

The present study was part of a pilot study to improve abortion care and to introduce medical abortion services in 25 public health facilities in Zambia. A descriptive cross-sectional design was used to explore pharmacy worker knowledge and practices in 2009 and 2011. In both years, a complete listing of government-certified pharmacies in the intervention areas of Lusaka, Kafue, and Copperbelt provinces was provided by the Pharmaceutical Society of Zambia. These pharmacies were located in a variety of settings, from urban shops in Lusaka to small town pharmacies in the more rural areas of the Kafue and Copperbelt provinces. Informed consent was not obtained from the pharmacy workers because the mystery-client methodology requires non-disclosure to the service provider; however, strict confidentiality measures were put in place to protect the pharmacy workers. Ethical approval for this study was provided by The University of Zambia Biomedical Research Ethics Committee and the USA-based Allendale Investigational Review Board.

The study design incorporated two single-sample surveys of non-independent groups; some, but not all, of the pharmacy workers who interacted with mystery clients in 2009 may also have been in the 2011 group. Some of the pharmacists may also have been a part of a training or technical update meeting, but the methodology does not allow this determination to be made with certainty.

Four research assistants (two young male and two young female mystery clients) with experience in reproductive health attempted to visit all the pharmacies listed. Each mystery client asked the pharmacy worker if they sold anything to induce an abortion, either for themselves

or for a girlfriend. Mystery clients were trained to explain at the start that their (or their girlfriend's) period was late and that it was 6 weeks ago. The mystery clients had a list of possible probe questions to ask depending on the pharmacy workers' responses. Each mystery client recorded key information from the pharmacy worker–client interaction, including behavior, on a standardized form upon leaving the pharmacy. If the pharmacy worker offered to let them purchase something to induce an abortion, mystery clients were instructed to ask to see the product, to ask for information about its use and cost, and were told to then say that they needed to return to purchase the product.

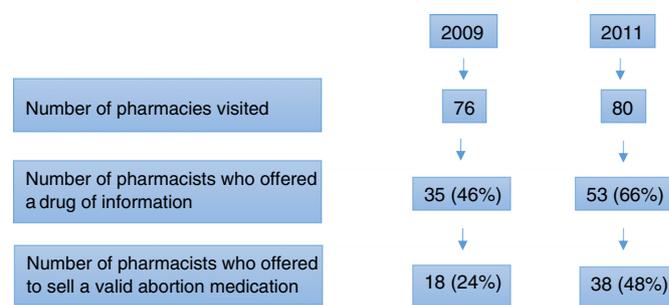
Data were entered in Epidata v3.1 (The EpiData Association, Odense, Denmark) and were analyzed with STATA v12 (Stata, College Station, TX, USA). A bivariate analysis was conducted to examine pharmacy workers' attitudes, behavior, and dispensing practices related to medical abortions and  $P < 0.05$  was considered statistically significant. This study analyzed these interactions, comparing results of 76 mystery client visits in 2009 and 80 visits in 2011 (Fig. 1).

## 3. Results

Mystery clients were able to visit 76 pharmacies in November 2009 and 80 in November 2011. It was not possible to obtain specific information regarding the pharmacy attendants, the mystery clients estimated the pharmacy workers' ages as being either older or younger than 30 years (Table 1). A similar distribution was found in both years, with most attendants (approximately 57%) estimated to be older than 30 years of age. In 2011, mystery clients had at least one other customer in the store at the time they approached the pharmacy worker more frequently than in 2009 (63 [79%] vs 33 [43%];  $P < 0.001$ ).

Despite there being other customers in the pharmacies more often in 2011, there was an increase in the number of pharmacy workers who were sympathetic and interested in helping the client (Table 1). In 2011, fewer mystery clients reported that they would describe their interactions with pharmacy workers discussing medical abortion as hostile, decreasing from 17 (22%) to only 8 (10%) ( $P = 0.0353$ ). Furthermore, in 2011 there was an observed increase in pharmacy workers' willingness to provide information about medical abortion. In 2009, 35 (46%) clients left pharmacies with more information or with the opportunity to purchase medical abortion drugs; however, in 2011, this proportion was higher with 53 (66%) mystery clients reporting this ( $P = 0.0110$ ). Additionally, more pharmacy workers mentioned or recommended a valid medical abortion drug (defined as a known misoprostol or mifepristone product) in 2011 compared with 2009 (42 [53%] vs 31 [41%], respectively).

Among the pharmacy workers who explicitly offered a medical abortion drug or information on a medical abortion drug, 3 (9%) referred mystery clients to a health facility for medical abortion in 2009, compared with 14 (26%) in 2011 (Table 2). In both years of the study, most pharmacy workers (31 [89%] in 2009 and 42 [79%] in 2011)



Denominator for proportions is the number of pharmacies visited

Fig. 1. Flow diagram showing number of pharmacies visited, those who offered a drug of information and those who offered to sell a valid abortion medication.

**Table 1**  
Demographics of pharmacy workers and summary of mystery-client interactions with pharmacy workers.<sup>a</sup>

Pharmacy interaction	2009 study visit (n = 76)	2011 study visit (n = 80)	P-value
Pharmacy worker age (as estimated by mystery client), y			0.9
30 or younger	33 (43)	34 (43)	
31 or older	43 (57)	46 (58)	
At least one other customer in the store at the time of interview	33 (43)	63 (79)	<0.001 <sup>b</sup>
Mystery client described interaction with pharmacy worker as hostile	17 (22)	8 (10)	0.0353 <sup>b</sup>
Pharmacy worker offered to sell, or provided information about, medical abortion drugs	35 (46)	53 (66)	0.0110 <sup>b</sup>
Pharmacy worker mentioned/recommended a valid medical abortion product	31 (41)	42 (53)	0.1

<sup>a</sup> Values given as number (percentage) unless otherwise noted.

<sup>b</sup> Indicates a statistically significant difference.

mentioned valid medical abortion products to the mystery clients; however, a far smaller number offered to sell mystery clients these medications. Among the pharmacy workers who offered to sell mystery clients a drug or offered information, 18 (51%) offered to sell the client a known and approved medical abortion drug in 2009, compared with 38 (72%) in 2011 ( $P = 0.0380$ ). Although the mystery clients in this study were trained to probe for any and all products that were recommended to them, all of the drugs that were mentioned or offered were either Cytotec (Pfizer, New York, NY, USA) or “the Chinese pill”, known to be a misoprostol drug imported from China. Despite the introduction of mifepristone in the study areas, none of the pharmacy workers mentioned, described, or offered to sell mifepristone. In both of the study years, a few pharmacy workers, 4 (11%) in 2009 and 11 (21%) in 2011, said they knew of something that would help a woman start a medical abortion but, despite the mystery clients probing on this issue, they did not state the names of these drugs. During both study years, among the pharmacy workers who did offer to help, approximately four in 10 mystery clients were asked for a prescription (14 [40%] in 2009 and 22 [42%] in 2011).

Within the group of pharmacy workers who did offer to sell mystery clients a known medical abortion drug, an increase was observed in 2011 in the number who provided important information on medical abortion; however, the provision of specific information was still low overall (Table 3). None of the pharmacy workers who offered to sell misoprostol in 2009 mentioned the correct number of tablets for initial dosage ( $4 \times 200 \mu\text{g}$ ) the patient would need to induce a medical

**Table 2**  
Behavior of pharmacy workers who offered to sell, or offered information about, a drug for medical abortion.<sup>a</sup>

Pharmacy interaction	2009 study visit (n = 35)	2011 study visit (n = 53)	P value
Pharmacy workers referred client to a health facility for medical abortion	3 (9)	14 (26)	0.0380 <sup>b</sup>
Pharmacy workers referred client to another pharmacy for medical abortion	8 (23)	7 (13)	0.2
Pharmacy worker mentioned/recommended a valid medical abortion product	31 (89)	42 (79)	0.3
Pharmacy worker offered to sell the client a valid medical abortion product	18 (51)	38 (72)	0.05 <sup>b</sup>
Pharmacy worker mentioned/recommended a drug but did not state the name	4 (11)	11 (21)	0.3
Pharmacy worker asked the client for a prescription	14 (40)	22 (42)	0.9
Pharmacy worker asked about last menses to assess gestational age	26 (74)	23 (43)	0.02 <sup>b</sup>

<sup>a</sup> Values given as number (percentage) unless otherwise noted.

<sup>b</sup> Indicates a statistically significant difference.

abortion; in 2011, 8 (21%) of the pharmacy workers included in the study did provide the correct dosage information ( $P = 0.0185$ ). In 2011, all of the pharmacy workers who offered to sell medication to the mystery clients also provided one or more pieces of correct information about medical abortions, including information about normal bleeding, pain, cramping, or when to seek care for emergency complications; this is in comparison with only 14 (78%) providers in 2009 that provided similar information ( $P < 0.001$ ). Although not statistically significant, a decrease in the proportion of pharmacy workers who clearly stated that misoprostol should not be taken if the woman is more than 10–12 weeks pregnant (7 [39%] in 2009 compared with 10 [26%] in 2011) was observed.

#### 4. Discussion

Between the two study years (2009 and 2011), pharmacy workers exhibited increased awareness of misoprostol, less hostility, and more willingness to provide information, sell medical abortion drugs and provide referrals for facility-based care. Approximately 80% of pharmacy workers who did not offer to provide drugs or information directly in 2011 still referred their clients to another health facility or pharmacy, indicating that there has been a shift toward better patient transfer at this level of the health system. However, pharmacy workers continue to provide inadequate information to patients who purchase misoprostol. Unsafe abortion-related morbidity is decreasing around the globe [1–3,21]. Several theories exist about the causes of these decreases but it is widely believed that greater evidence and information regarding safer methods of self induction are at least partly responsible [13,15,22,23]. The use of misoprostol, an inexpensive and widely available drug, provides a safe and reliable option to reduce morbidity arising from either self induction or from methods used by unskilled induced-abortion practitioners. In a country where knowledge of legal termination is still severely limited [24], pharmacy workers are important middlemen; they are accessible and close to the communities where they work.

Supported by similar studies, this research illustrates the limitations of pharmacy workers providing medical abortion medications for home use without providing the essential information and having the most recent scientific evidence available [25–27]. Effective training of pharmacy employees is important and can be a vital component of patient access to safe medical abortion care [25]. Training should be focused on critical areas, including the provision of basic information on medical abortion drugs (particularly misoprostol), referrals to safe induced-abortion providers, the provision of services such as screening to determine a client's eligibility for medical abortion, and informing clients about the possible side effects, length of action, and danger signs. Relaying essential information to patients, such as what “normal” and “unusual” symptoms are, or when to seek help, is particularly important in places like Zambia where internet connectivity is moderate to low and there are no written package inserts for this off-label use. Additionally, the use of phone lines as a method for pharmacists to access additional information on medical abortion should be explored. Without adequate access to information about safe medical abortion, including gestational limits, pharmacy workers may not provide the correct medication and dosage, potentially leading to delays in termination, which may move patients outside the limits of medical abortion.

The mystery-client methodology provides a rare opportunity to elicit information about behaviors related to a stigmatized procedure. However, this means that each individual pharmacy worker's position, education, and previous exposure to medical abortion information are unknown to the mystery client, and therefore, the researchers. As part of the pilot study, many pharmacy workers in these pharmacies had participated in a 1-day training program (held in May–August 2009 and May 2010) on compassionate treatment for people seeking information about induced abortion, evidence-based regimens for medical abortion, and the provision of referrals to facility-based induced-abortion services

**Table 3**  
Behavior of pharmacy workers who offered to sell a valid medical abortion medication.<sup>a</sup>

Pharmacy interaction	2009 study visit (n = 18)	2011 study visit (n = 38)	P value
Pharmacy worker offered to sell misoprostol	18 (100)	31 (82)	0.05 <sup>b</sup>
Pharmacy worker offered to sell the correct number of misoprostol pills (4 × 200 µg)	0	8 (21)	0.02 <sup>b</sup>
Pharmacy worker stated that:			
Length of pregnancy should be no longer than 10–12 wk <sup>c</sup>	7 (39)	10 (26)	0.3
There would be cramping for a few days, which would then stop	5 (28)	8 (21)	0.6
The patient would bleed for a few days, which would then stop	NR <sup>d</sup>	31 (82)	–
The patient should seek help only with a complication (bleeding being considered normal)	NR <sup>d</sup>	8 (21)	–
Pharmacy worker gave the mystery client one or more important pieces of information about medical abortion <sup>e</sup>	14 (78)	38 (100)	<0.001 <sup>b</sup>

Abbreviation: NR, not reported.

<sup>a</sup> Values given as number (percentage) unless otherwise noted.<sup>b</sup> Indicates a statistically significant difference.<sup>c</sup> The question asked in 2009 was whether the patient was at or beyond 12 weeks of pregnancy. The question asked in 2011 was whether the patient was at or beyond 10 weeks of pregnancy.<sup>d</sup> Some questions were added to the 2011 questionnaire; as such, they do not have an equivalent response for 2009.<sup>e</sup> Important pieces of information included warning signs for complications as well as gestational limits for use of medical abortion drugs.

[22]. Between 2009 and 2011, during the time period of this study, in an effort to create an environment where international technical knowledge was disseminated, many pharmacy workers were exposed to short technical presentations on medical abortion drugs for gynecological indications at professional association meetings and at the annual workshops of the Pharmaceutical Society of Zambia, with a focus on induced abortion. Some of the pharmacy workers who interacted with mystery clients in 2011 likely attended a presentation or participated in an intervention on mifepristone or misoprostol for gynecological indications; however, it is impossible to know if the clients spoke to these same participants or if information from that training event had been relayed to other staff in the workplace. The results of the present study may also be documenting a changing environment where information on scientific advances is becoming available more rapidly. In the present study, it is not possible to disentangle the effects of multiple variables such as increased internet connectivity in Zambia, new global clinical evidence, or participation in technical updates. The causal relationship may be cumulative.

Additionally, Zambian pharmacy workers and their pharmacies are highly mobile, as demonstrated by numerous changes in shops and staffing in the 2 years between interviews. As such, listings conducted in the two study years resulted in different records of functional shops and changes in the locations of staff. Despite these challenges, this study provides useful information on the attitudes and behaviors of pharmacy workers in Zambia, showing decreased hostility towards individuals seeking information and medication for inducing an abortion, and increased willingness to provide information to patients. Using mystery clients to explore the role of pharmacy workers' practices in the prevention, as well as the possible perpetuation, of unsafe abortion, allows observations, and therefore recommendations, to be made regarding improving access to safe termination care and medications. With the introduction of medical abortion in Zambia, information about, and access to, safe abortion is increasing [14]. The national environment is changing, and information about medical abortion and access to legal medical abortion is increasing among healthcare providers and the wider public. The combination of policy changes allowing pharmacists to sell medical abortion drugs, as well as adequate training and access to information, could result in pharmacists being safe and reliable access points for medical abortion.

Pharmacy workers are an increasingly important cadre of first-line healthcare providers for abortion care, provided that they are armed with appropriate knowledge and are allowed to use it. Simple, straight forward updates on scientific advances in induced-abortion care could help these frontline health workers dissuade women from resorting to unsafe methods for self-induced termination and encourage the uptake of safer options to reduce morbidity and mortality from unsafe abortions.

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## Conflict of interest

The authors have no conflicts of interest

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