


Online Abortion Drug Sales in Indonesia: A Quality of Care Assessment

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This study sought to understand the experience of buying misoprostol online for pregnancy termination in Indonesia. We conducted a mystery client study August through October, 2019. Interactions were analyzed quantitatively and qualitatively, along with the contents of the packages. One hundred ten sellers were contacted, from whom mystery clients made 76 purchases and received 64 drug packages. Almost all sellers sold “packets” containing multiple drugs; 73 percent of packets contained misoprostol, and 47 percent contained at least 800 mcg of misoprostol. Thirty-four packets contained insufficient drugs to complete an abortion. When compared to WHO standards, 87 percent of sellers imparted incomplete information about potential physical effects; no seller provided information about possible complications. Women buying misoprostol from informal online drugs sellers will be underprepared for understanding potential side effects and complications. Educational activities are needed to increase women’s access to information about safe use of misoprostol as a harm reduction strategy.

BACKGROUND

Abortion is permitted in Indonesia only in medical emergencies where the pregnancy poses a threat to the woman’s health and life, in cases of fetal impairment, or rape only up to 40 days gestation (Republic of Indonesia 2009). Nevertheless, every year millions of women in Indonesia seek an abortion, all of which occur outside of the formal healthcare system. A study in 2018 in Java, where close to 60 percent of Indonesia’s population of 268 million people

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live, estimated that 1.7 million abortions occurred that year. This translates to a rate of 42.5 abortions per 1,000 women of reproductive age (15–49) (Giorgio et al. 2020).

In recent years, misoprostol, a drug that can safely induce abortion 75–90 percent of the time (World Health Organization 2012) has become more available to women seeking to induce abortions. In legally restrictive settings, online access to misoprostol is one avenue for women to access the drugs. In Indonesia, misoprostol is only registered for treating gastric ulcers, and mifepristone is not registered. Little research exists on misoprostol in Indonesia, where misoprostol is sold under several different brand names. There is no evidence that mifepristone is accessible in the country. Imports of misoprostol-containing drugs have surged in the past three years, although no precise data exist (Pratima 2020). A study of callers to a safe abortion hotline in Indonesia in 2012 through 2014 found that 51 percent of callers from whom data was collected ($n = 1,829$) requested information on medical abortion, demonstrating widespread awareness of the pills and a clear demand for them (Gerdtts and Hudaya 2016).

So as to understand what women's experiences are like trying to use misoprostol, we attempted to purchase misoprostol from brick-and-mortar drug shops in 2018 in Yogyakarta and Indramayu, and we found almost none of these shops were willing to sell our mystery clients misoprostol (3/327). Police crackdowns on the illegal sale of nonnarcotic drugs through brick-and-mortar drug stores in Indonesia have made drug shops fearful of selling misoprostol. While online sellers also exist, they too are on the radar of law enforcement. BPOM (Indonesia's National Agency of Drug and Food Control) has engaged in various operations to shut down online sellers of illegal and counterfeit drugs including misoprostol.

Therefore, it will come as no surprise that the online misoprostol marketplace is a fluid universe with sites shutting down and reopening under different domain names, some sellers leaving the market, and new ones joining, as sellers play cat and mouse with regulators (Pratima 2020). Since 2015, the Ministry of Communications and Information blocked 300,000 sites selling illegal drugs "which were mostly used for abortion," following a report from BPOM (Pratima 2020). BPOM reported that in 2018 the Ministry of Communications and Information blocked or took down 2,217 websites selling drugs that require a prescription or are illegal in Indonesia, including sites that sold misoprostol for abortion purposes (Badan POM 2019), with another source citing that between 2017 and 2019 the Ministry of Communications and Information took down 96 sites advertising abortion drugs (Pratima 2020). With money to be made, it is likely that the sellers that are shut down will soon be replaced by others.

The purpose of this study was to understand the experiences of women who seek misoprostol online from informal sellers in Indonesia to terminate a pregnancy. We conducted a mystery client study with these sellers in 2019. Given the ever-changing landscape of informal online drugs sellers in Indonesia, the work described in this paper represents a snapshot of this universe at one point in time.

METHODS

Sampling

Between August and October 2019, we conducted a mystery client study in which three fieldworkers posing as women seeking medical abortion purchased drugs from informal

online sellers in Indonesia. This required first doing a listing exercise to establish the universe of informal online sellers visible from stand-alone websites, marketplace sites (similar to Amazon), and Instagram.

The listing exercise used four search terms on these three platforms to identify misoprostol sellers:

- 1 [Jual [Sell]] Misoprostol
- 2 [Jual [Sell]] Cytotec
- 3 [Jual [Sell]] obat aborsi [abortion pills]
- 4 [Jual [Sell]] obat telat datang bulan [bring back a missed period]

The word “jual” [sell] was added to Google searches to target informal sellers and exclude scientific information, medical guidance, and pharmaceutical company websites. Web searches were conducted on Google Indonesia (google.co.id), using the internet browser Chrome’s incognito mode in order to avoid algorithmically influencing subsequent search results. Marketplace searches additionally used deliberate misspellings (e.g., mis0prostol) to account for many sellers’ strategy of using such misspellings to avoid detection by both government agencies and the sites’ own oversight mechanisms. While we could not identify sellers’ locations, conducting all searches in Bahasa and using Google Indonesia and Indonesian marketplace sites limited results to sellers advertising to clients in Indonesia. Some sellers advertised that they sold to other countries in addition to Indonesia.

The listing took place August 9 through 28 by six fieldworkers who completed a one-day training. For each site or seller page, listers filled out a form to capture essential information on the seller listing, including their WhatsApp number. This resulted in identifying a universe of 727 pages or social media profiles advertising abortion drugs: 441 websites, 153 marketplace sites, and 133 Instagram sites. International sales sites did come up, and we excluded them from the sample because our mystery clients were not prepared to communicate in English with the sellers. Furthermore, they are more “formal” than “informal,” as they provide medically accurate information backed up by international guidelines.

Before sampling, we identified duplicate sellers within and across platforms according to WhatsApp numbers; we assumed that different profiles linked to the same WhatsApp number were the same seller. There was great variability in the number of different sales sites connected to one seller; some advertised on all three platforms (websites, marketplaces, and Instagram). While 166 sellers only had one site on which they advertised abortion drugs, 11 sellers had more than 10 sites. The largest number of sites on which a single seller advertised was 51. Identifying and removing duplicates based on their contact information resulted in a final universe of 281 sellers: 147 websites, 85 marketplace sites, and 49 Instagram accounts (Table 1). We selected five sellers (two websites, two marketplaces, and one Instagram seller) for a pilot test prior to data collection, which left an eligible sample frame of 276 sellers. Among sellers who advertised on more than one platform, the distribution of platforms was similar to sellers who used only one platform; therefore, we did not take platform type into account when selecting which site would capture these sellers in the sample frame.

To make sure we contacted the sellers with the largest online presence, the eight sellers with the largest number of sites were sampled with certainty. The remaining sellers with

TABLE 1 Sample of online misoprostol sellers and outcome of interactions with mystery clients, 2019

	Websites	Marketplace	Instagram	Total
Universe of sellers identified in web listing	441	153	133	727
De-duplicated universe	147	85	49	281
Sample	73	39	20	132
<i>Unable to reach: number inactive or website down</i>	10	7	5	22
Sent initial message to seller	63	32	15	110
<i>Seller did not respond to initial message</i>	7	7	2	16
Established text exchange with seller	56	25	13	94
<i>No purchase-seller stopped responding</i>	1	1	0	2
<i>No purchase-identified as duplicate prior to sale</i>	7	3	2	12
<i>No purchase-other reasons^a</i>	2	1	1	4
Purchased pills from seller	46	20	10	76
<i>Purchased and did not receive pills</i>	5	3	4	12
Purchased and received pills	41	17	6	64
Percentage of sample that resulted in purchasing and receiving pills	56	44	30	48

^aOther reasons include too expensive, seller required a prescription, seller made mystery client feel unsafe, seller requested an in-person meeting for cash payment.

SOURCE: Online purchase of abortion drugs in Indonesia, 2019.

smaller online presences were randomly sampled proportional to their distribution in the sample universe using the Stata command *gsample*. Our target was 100 contacts with online sellers. With no prior information to inform how likely it would be that sellers would no longer exist when we attempted to contact them, we oversampled by 25 percent. This resulted in an initial sample of 128 unique sellers: 73 websites, 36 marketplace pages, and 19 Instagram profiles. The proportion of sellers immediately identified as duplicates was slightly higher than anticipated, so we randomly selected an additional four sellers, resulting in a total sample of 132 online misoprostol sellers.

The study received approval from the Institutional Review Board of the Guttmacher Institute (USA) and the Institutional Review Board of the University of Indonesia Faculty of Public Health.

Data Collection

Three of the listers stayed on and acted as mystery clients. Two are midwives and one had participated in previous health survey research. In addition, a supervisor who is a midwife with experience in public health field coordination was hired. All mystery clients and the supervisor participated in a one-day training on the survey tool developed to capture their interaction with the online seller, contributed to revisions to the tool after pilot testing, and completed a half-day refresher training on the final, revised tool. Each mystery client was provided two electronic tablets, each equipped with a SIM card, so that they could simultaneously contact two sellers throughout the study period. Data collection took place September 2 through September 24.

We set the maximum allowable purchase amount for abortion drugs from a unique seller at 1.5 million rupiah, or roughly 106 US dollars. We chose this maximum based on the named price for abortion drugs observed online during the listing exercise. That is equivalent to almost one month's minimum wage in most districts in Indonesia ("Minimum Wage – Indonesia" n.d.). There were often multiple drug packets for sale from any given seller, some of which cost more than 1.5 million rupiah. The mystery client purchased the packet

recommended by the seller if it was within the maximum allowable purchase amount. Sellers sometimes modified their recommendation based on whether the mystery client said she had previously given birth, specifying that this affected the amount of drugs she needed. Mystery clients were allowed one attempt to negotiate the asking price.

After contact was initiated, more duplicates were detected. We presumed the seller was a duplicate if a seller had the same bank account number and at least one of the following was also observed: the same price was quoted, the seller provided near-identical responses in texts, or there was nonsimultaneous texting from the two phone numbers (i.e., consistently having text exchanges with only one mystery client at a time).

All contact between sellers and mystery clients took place over WhatsApp or directly through the marketplace chat function. Mystery clients contacted all drug sellers using a script depicting a woman whose period was late by two weeks, meaning that she was 4 to 6 weeks pregnant. Other details we had created (age, marital status, parity) were only meant to be used if the seller asked; no seller asked for information on age or marital status. The mystery clients completed a self-administered quantitative survey based on the interaction. Variables captured in the quantitative survey included whether the seller responded, questions the seller asked and information provided, the amount paid, and the contents of packages received.

In addition to the self-administered survey that mystery clients filled out for each seller, all conversations were preserved as text transcripts. We consulted those transcripts during analysis when we came across certain frequently reported, unanticipated experiences. Themes of these experiences included (a) instructions on what to physically do before or during the use of the pills which were not captured in our close-ended responses and (b) deflection tactics to avoid answering questions on side effects and complications. These qualitative data were systematically analyzed to identify common types of answers which we summarize here and provide textual examples of dominant themes.

Drug Identification and Analysis

We hired a pharmacist based in Jakarta to identify all pills that arrived and were not immediately identifiable, as well as to assess whether any packages contained drugs that were contraindicated. The mystery client supervisor and the pharmacist identified drugs visually (comparing shape and color) using pharmaceutical drug lists such as MIMS (a drug index used throughout Asia), Medscape (a widely used online tool for clinical drug identification), and the online database maintained by PT IFARS Pharmaceutical Laboratories, an Indonesian pharmaceutical company. When the pharmacist was unsure of what the pill was based solely on visual identification, but suspected what the drug might be, she would purchase the actual drug to confirm. This step was only possible for drugs available for purchase in Jakarta. The pharmacist classified all identified nonabortive drugs into subclasses and major classes based on their intended use and their impact on the body. If the pharmacist was not able to determine what they were, she marked them as nonidentifiable. Following identification, the pharmacist assessed each package for combinations of drugs whose interactions could potentially cause physical effects other than an abortion.

In order to understand the extent to which drug sellers followed international standards for medical abortion provision, we used World Health Organization (WHO) and International Federation of Gynecology and Obstetrics (FIGO) guidelines to assess whether the misoprostol that mystery clients received met minimum standards for packaging, dosage, and instructions on administration routes (Morris et al. 2017; World Health Organization 2018). For a gestational age of maximum six weeks, sellers should provide at least 800 mcg of misoprostol and should instruct the mystery clients to use either the vaginal, sublingual, or buccal route of administration. The WHO recommends providers consider repeat dosing to achieve a complete abortion on a case-by-case basis (World Health Organization 2018). Therefore, in line with the most recent WHO safe abortion guidelines, while selling multiple doses would allow the seller to recommend repeat dosing if needed, we assumed that a recommendation for repeat dosing was not a requirement to meet the minimum standard of abortion provision, and there was no maximum dosing. We also evaluated whether the misoprostol came in the original sealed aluminum blister pack as removal from the pack can compromise drug quality (World Health Organization 2018).

Using WHO guidelines and Pfizer's Cytotec patient information leaflet, we determined that users of misoprostol for pregnancy termination should be informed of physical effects (abdominal cramping and menstrual-like bleeding), potential side effects (nausea/vomiting and diarrhea), and signs of possible complications (increased intensity/prolonged abdominal cramping, excessive bleeding, and prolonged fever or chills) ("CYTOTEC® (Misoprostol)" n.d.; World Health Organization 2012, 2014, 2018). We created dichotomous benchmarks for the two physical effects, two side effects, and three complication symptoms to measure whether sellers provided the minimum essential information.

RESULTS

Mystery clients were able to initiate contact with 110 of the 132 sampled sellers; the remaining 22 sellers could not be reached because the contact number was no longer active or the website was down even though the duration between listing and contact was at most 7 weeks and usually less. Of the 110 sellers that could be contacted, 16 did not respond to the mystery client's initial message, and an additional two stopped responding after several exchanges with the mystery client. Mystery clients declined to purchase from 16 sellers for various reasons: one seller insisted on meeting in person, 12 were suspected to be duplicates before buying pills, one asked for a prescription, one made the mystery client feel unsafe, and one asked for a price that was higher than our maximum allowed purchase price. This left 76 sellers from which our mystery clients purchased drugs. Of these, 12 sellers were paid but never delivered the package, and in some cases blocked the mystery client immediately after receiving money. The mean price paid, including shipping, was equivalent to \$64.53 (with a range of \$35.71–107.86). We received 64 packages, of which 10 were determined to have come from a seller we already bought from based on the return address, handwriting, and/or package contents; the contents and prices of what was sold by these potential duplicates were not identical. Overall, 48 percent of our original sample resulted in purchasing and receiving drugs: 56 percent of websites, 44 percent of marketplace sellers, and 30 percent of Instagram accounts (Table 1).

TABLE 2 Medications contained in packages purchased by mystery clients, 2019

	N (packages) = 64	
	Percentage ^a	<i>n</i>
Any misoprostol	73	47
Gastrointestinal medication	38	24
Herbal menstrual regulator	25	16
Pain medication	22	14
Antibiotic	22	14
Steroid hormones	20	13
Vitamin	13	8
Allergy medication (antihistamines)	8	5
Other drug ^b	6	4
Unidentifiable drug	64	41

^aPercentages do not sum to 100 because multiple drugs received in each package.

^bOther drug includes antifungals, cold/cough medication, and drugs for postpartum hemorrhage (Methylergometrine).

SOURCE: Online purchase of abortion drugs in Indonesia, 2019.

Drugs Received

Pills were often sent in bulky material such as batik scarves, diapers, and menstrual pads to disguise the contents of the package. Mystery clients were most commonly sold packets containing three or more types of pills ($n = 59$, 92 percent).

Although mystery clients reported the same gestational age in every interaction, there was a great deal of variation in the combinations of drugs and number of misoprostol pills sold. Seventy-six unique types of pills were shipped in the 64 packages. The pharmacist identified 43 different types of pills; it was not possible to identify the remaining 33 types of pills. Seventy-three percent of the packages included any misoprostol (Table 2). In all of these packages, the brand of misoprostol was Cytotec (manufactured by Pfizer). Sixty-four percent of packages ($n = 41$) contained one or more drugs that our pharmacist could not identify. In addition to misoprostol, the drugs received included gastrointestinal medications, herbal menstrual regulators, pain medication (some of which are nonsteroidal anti-inflammatory drugs (NSAIDs)), antibiotics, steroid hormones, vitamin supplements, antihistamines, antifungals, cold/cough medication, and drugs for postpartum hemorrhage (Table 2). In many cases, sellers advertised packages containing, in addition to misoprostol, a “fetal expulser,” “fetal boosters,” and/or “cleansers.” However, these labels were not associated with any one type of medication. Only one package contained drugs that had an identifiable contraindication. This package contained a contraindicated antibiotic and an NSAID that have potential for minor interaction effects.

The drugs that arrived were not always what was advertised. When one mystery client asked why the drugs that arrived differed from the drug photographs that the seller had sent to the mystery client, the drug seller responded that the drugs were, in fact, the same and the function of the drug was the same. Others simply failed to respond.

Misoprostol Received: Dosage, Packaging, and Directions for Use

For packets that included misoprostol, we classified the packaging, amount of pills, and advised mode of administration according to WHO standards (Table 3) (World Health Organization 2018). In 87 percent ($n = 41$) of the packets that included misoprostol, the drug arrived in its original aluminum blister packet with no signs of tampering or damage. Expiration dates

TABLE 3 Misoprostol received by mystery clients and instructions given about how to take the medication, 2019

	N (packages) = 47	
	Percentage	n
Misoprostol packaging		
Received misoprostol in an aluminum blister pack with no signs of tampering/damage	87	41
Misoprostol dosage		
Received at least the minimum dose of misoprostol recommended for an abortion at 6 weeks (800 mcg)	64	30
Misoprostol Instructions		
Directions included optimal ^a administration routes	72	34
Directions included suboptimal ^b administration routes	28	13
Received at least the minimum dosage of misoprostol in recommended packaging and directions included only optimal administration routes	45	21
Pain management		
Received pain medication	22	14

^aOptimal administration routes for misoprostol include buccal, vaginal, or sublingual, per WHO guidelines.

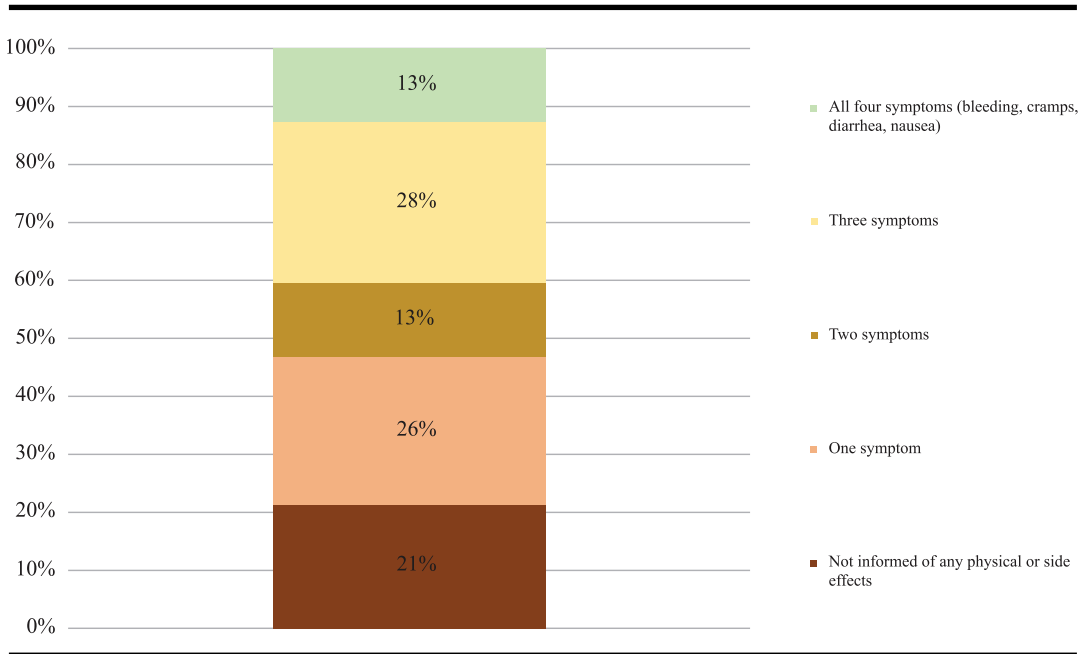
^bSuboptimal administration routes include cases where the drug seller didn't give an administration route, mentioned the option to take the misoprostol orally, or instructed the mystery client to insert misoprostol vaginally with additional guidelines such as using a penis for insertion, or inserting directly into the uterus.

SOURCE: Online purchase of abortion drugs in Indonesia, 2019.

were only visible for misoprostol on 15 untampered blister packets, all of which expired after conclusion of fieldwork (2020 or later). Of all packages containing misoprostol, 64 percent ($n = 30$) contained at least 800 mcg, the minimum amount of misoprostol recommended for an abortion at 6 weeks. This represents 47 percent of all packages received. Six percent of all packages received contained two doses of misoprostol (1600 mcg or more); no packages contained sufficient misoprostol for a third dose (2400 mcg or more).

When mystery clients asked the drug sellers how to take the drugs before the purchase happened, sellers commonly responded that they would send instructions after the pills arrived. The seller provided all instructions over text; none of the packages contained written instructions. Sellers often requested pictures of the pills that had arrived in the mail before engaging with the client about how to take the pills. In 72 percent of the interactions, sellers advised mystery clients to use optimal administration routes for misoprostol (vaginal, sublingual, or buccal), while the rest were told to use suboptimal routes of administration. Suboptimal administration routes included cases where the drug seller did not give an administration route, mentioned the option to take the misoprostol orally, or instructed the mystery client to insert misoprostol vaginally with additional guidelines such as using a penis for insertion, or inserting directly into the uterus. Two drug sellers asked the mystery client to take a picture when she inserted the Cytotec into her vagina; our mystery clients did not respond to that request, and the drug sellers did not follow up. In sum, 45 percent of the interactions resulting in a sale containing misoprostol ($n = 21$) met WHO standards for dosage, packaging, and optimal administration routes. However, these interactions comprise only 21 percent of *all* interactions which resulted in a sale. Only 22 percent of packages with misoprostol included some kind of pain management medication (WHO 2018).

Sellers provided a wide variety of additional instructions, which were widely divergent. Common instructions included advising when to take the pills (at night, first thing in the morning), to fast, not to drink, to eat/drink certain items (Sprite, pineapples), and to avoid certain foods (one seller explained that cold beverages can strengthen the womb). Less

FIGURE 1 Number of physical effects provided to mystery clients of online misoprostol sellers, 2019

common instructions included not to urinate or defecate before the fetus is expelled, not to vomit, to exercise (squat jumps, running in place), to rest when using the drug, not to sleep on her stomach or sit down, to squat for an hour, to put her legs up for one hour, to have sex after using the pills. Sellers gave various reasons for these instructions: sleeping on her stomach would strengthen the womb, exercise would make her body tired and the womb weaker thus hastening the abortion process, and sperm would act as lubricants in the abortion process. Sometimes when mystery clients queried the reasons for certain instructions, the drug seller ignored the question.

Guidance on What to Expect from Sellers Who Sold Misoprostol

Among the 73 percent of interactions that resulted in a misoprostol sale, sellers gave varying amounts of information about the expected physical effects or side effects of the drug. Over one fifth (21 percent, $n = 10$) of sellers did not mention any physical effects. The most commonly mentioned physical effect was menstrual-like bleeding (64 percent, $n = 30$) followed by abdominal cramping (53 percent, $n = 25$). The most commonly mentioned side effect was nausea or vomiting (45 percent, $n = 21$). Diarrhea was mentioned in 23 percent of interactions ($n = 11$). Twenty-six percent ($n = 12$) only mentioned one effect (either bleeding or cramping), while 13 percent of sellers ($n = 6$) mentioned all four potential physical effects of taking misoprostol (bleeding, cramping, nausea/vomiting, and diarrhea) (Figure 1). Even when probed, no seller informed mystery clients of any potential complications.

When mystery clients asked about the physical effects of taking the pills, particularly any serious complications, common tactics employed by the drug seller were deflection, downplaying the physical effects, chiding the woman for being concerned about something “so

minor,” or simply ceasing to respond. For example, when one mystery client asked if she would receive medicine to treat shivering side effects, the drug seller responded, “OMG, that is just the reaction of the drugs, so let it be and it will disappear by itself.” Another responded to a query: “Sis, don’t chat too much.” When another mystery client asked about potential side effects, the drug seller replied, “It is just a drug reaction.” When mystery clients probed drug sellers about serious effects and the potential for specific complications such as pain or excessive bleeding, drug sellers commonly ignored the questions, told them that the effects would be similar to menstruation, or reiterated that the drugs are very safe and do not have serious side effects.

DISCUSSION

To the best of our knowledge, this is the first study that systematically purchased misoprostol for abortion online in a country with restrictive abortion laws. These experiences show that the quality of medication and instructions provided by informal online sellers are commonly inadequate to facilitate a safe and complete abortion. Only 47 percent of packages contained an adequate dosage of misoprostol to terminate an early pregnancy, meaning that some women who seek abortions through these sellers will receive drugs that will either not result in a termination or will cause a potentially dangerous incomplete termination of pregnancy. Very few packages (3/47) contained adequate misoprostol for repeat dosing (two or three doses of 800 mcg). In addition to (and in some cases instead of) misoprostol, the packets of drugs sold included a variety of medications that were not easily identified and were not necessary.

In 12 cases, 16 percent of our interactions that resulted in a purchase, the mystery client paid for the drugs, and nothing arrived, demonstrating the high risk of attempting to purchase misoprostol online. We have every indication that these are scams, since drug sellers either blocked the mystery client’s number immediately after payment or stopped responding when asked where the package was. Some women may have enough resources to try again with another seller and many may not.

When misoprostol was included in the packages, most sellers did advise an optimal mode of administration, and the majority of misoprostol arrived in its original aluminum blister packet. However, many sellers provided instructions that are not only unnecessary, but may be quite burdensome and uncomfortable. Accompanying dos and don’ts provided by some sellers, if followed, would make the experience of using misoprostol much more uncomfortable, if not painful.

While some information was provided to the mystery clients on what physical symptoms or side effects she should expect, it is important to highlight that none of the sellers from whom we made purchases provided information on how to identify complications. This may be because sellers worried that telling women about potential complications could result in losing a sale or it may be a result of the sellers’ limited knowledge about misoprostol. Lacking complete information about the physical effects, many women who purchase from these sellers are likely unprepared for what to expect and may not be able to determine whether the abortion is complete and/or whether they should seek additional care.

Quality of care provided, however, extends beyond the medications and information offered by a provider. According to the WHO guiding principles for medical abortion, providers should refrain from imposing their personal beliefs/judgement on women seeking abortions, communicate information in simple terms, and address women's concerns and follow-up questions (World Health Organization 2018). Our findings suggest that online sellers succeed in two of these areas: we saw no evidence of judgement, and all information was communicated using colloquial language. However, it is important to emphasize the degree to which sellers deflected concerns about potential serious side effects and refused to accurately respond to these concerns.

Our findings on the quality of service from informal online sellers are consistent with the body of evidence on medical abortion provision from in-person drug shops or pharmacies in other low- and middle-income settings in which abortion is legally restricted, where, in general, the information provided is incomplete. A systematic review of 22 studies from 16 countries found that when pharmacists and unlicensed drug sellers sold misoprostol, few sellers advised an effective regimen or shared adequate information on how to recognize or manage complications (Footman et al. 2018). In addition, it is common for incomplete information to be imparted across other reproductive health commodities as well. The 2017 Indonesian Demographic and Health Survey found that incomplete information was imparted about contraception (National Population and Family Planning Board et al. 2018). Therefore, while suboptimal provision by pharmacists and drug sellers is not unique to abortion drugs, the legal restrictions on abortion may prevent women from seeking additional information or care from qualified providers when they have questions or experience problems. This could mean that provision of incomplete information on misoprostol use for abortion carries greater risk than provision of incomplete information on other drugs for which there are fewer barriers to seeking additional information and care.

This study has several limitations. First, while the mystery client design of this study shed light on the instructions and information provided before taking the pills in an effort to induce an abortion, we are not able to determine whether sellers would be willing to reengage with a client if she later asked further questions about physical symptoms or complications. Second, the anonymity of online contact meant that we had to make assumptions about who might be a duplicate seller, and it is possible that we were interacting with the same seller on some occasions or that some identified duplicates were in fact unique sellers. Third, this study only captured the experiences of women who seek misoprostol online using the same keywords and platforms as we did. It remains unknown what proportion of misoprostol use in Indonesia is from drugs acquired online from informal sellers, or what the universe would have been had we searched in other languages or with other search terms. A journalist interviewed a seller who said he labeled the Cytotec he sold as an herbal medicine to evade detection, and said other sellers describe Cytotec as a diet drug (Pratima 2020); it remains a mystery how women seeking to buy an abortifacient would know that the herbal or diet medicine advertised was really an abortifacient. Therefore, it may be that those vendors don't make up a great deal of total sales. Fourth, many packages (64 percent) contained unidentifiable drugs for which we could not identify the purpose nor the consequences of combining with misoprostol and other (identified) medications. Fifth, we were not able to assess the efficacy of the drugs in terms of abortion outcome, including any

complications. Though the packaging and expiration dates lead us to believe the condition of misoprostol received was generally good, we were unable to verify drug quality by testing the misoprostol.

CONCLUSIONS

More research is needed to fully understand how women acquire misoprostol in Indonesia, and the screening, information, and support received from the various sources. Future research efforts should include women who have attempted to abort with drugs purchased online, as well as online drug sellers themselves to better understand seller knowledge about use of misoprostol for abortion.

Direct educational outreach activities are needed to increase women's access to information about safe use of misoprostol for self-managed abortion. These educational activities could be carried out by local, women-led, grassroots entities including nonprofit organizations focused on harm-reduction, health organizations promoting self-care, or feminist organizations. Educational materials should be produced and made accessible to individuals of reproductive age so that they are able to critically evaluate any information about how to induce an abortion with medication. This could be done through educational information meant to be included with the pills that is made available by these educational entities. Direct outreach from established abortion hotlines and access organizations could also provide an opportunity for individuals of reproductive age to learn directly from educators and raise questions. This is part of a harm reduction strategy.

The spread of COVID-19 in 2020 has resulted in people bypassing health facilities for all types of healthcare services, including abortion. These individuals are avoiding facilities either because they fear they will contract COVID-19 there, or because they are unable to access providers who have been reassigned to combat COVID-19. Instead, there is preliminary, anecdotal evidence that people are going directly to pharmacies and other informal healthcare sources for family planning, if they are even able to maintain the use of family planning at all (Paddock and Sijabat 2020). To the extent that they cannot, there will be more unintended pregnancies. Further, with restrictions on outside movement and recommendations to minimize physical contact, people may prefer online sources of care to brick-and-mortar pharmacies or drug shops. Capacitation of pharmacies is a strategy that international nongovernmental organizations are considering to help women access medical abortion in the time of COVID-19. While COVID-19 elevates the importance of informal sources of drugs and information during the outbreak, it remains to be seen whether an increased reliance on informal and web-based sources will remain after the pandemic. This may be influenced by how quickly the formal health care sector is able to resume its previous level of service provision after the pandemic recedes. Either way, the present and possible future importance of informal, digital sources demands greater attention now.

Informal online sales of misoprostol have opened the door to greater access to safe drugs, which is in line with public health principles to avoid unnecessary high maternal deaths in Indonesia. And yet in an effort to curb misoprostol use for induced abortion, the production and distribution in Indonesia of two common brands of misoprostol, Cytotec and Gastrul,

have been halted (Pratima 2020). BPOM stated that Cytotec was allowed to circulate until July, 2020. It remains to be seen how this will affect access to these drugs in the country. While informal online sales offer some degree of private access to misoprostol for self-managed abortion, there are some challenges associated with this method of procurement. Online transactions for purchasing misoprostol from these informal sources fall short of international standards for safe use as they impart incomplete information on correct use of misoprostol, physical effects, side effects, and complications. Postabortion care services may be in high demand when sellers impart insufficient information. In addition, rates of incomplete abortions and complications may be greater for women seeking misoprostol from informal online vendors due to a lack of eligibility screening and incorrect administration of the drugs. Nevertheless, online access to misoprostol through these vendors is likely a safer option for many women than more invasive procedures that pose an even greater risk to their health and lives.

DATA AVAILABILITY STATEMENT

Research data are highly sensitive and are therefore not shared.

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