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IS SELF-USE OF MEDICAL ABORTION A VIABLE OPTION?

A systematic review of global evidence with a special focus on India

MARCH 2018

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IS SELF-USE OF MEDICAL ABORTION A VIABLE OPTION?

A systematic review of global evidence with a special focus on India

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Background and methodology

1.0 Context

The introduction of medical abortion (MA) changed the landscape of abortion care by providing a non-invasive, accessible alternative to surgical methods of terminating an unintended pregnancy. For over three decades, medical abortion, using a combination of mifepristone and misoprostol or misoprostol alone, has proven to be a safe, effective and acceptable method of terminating pregnancies. MA is an especially important option for women in contexts where access to safe abortion services is limited and morbidity and mortality associated with unsafe abortion procedures is high (Gynuity Medical Abortion Programme Brief, 2017).

Where and how women choose to obtain an abortion is no longer limited to health facilities; MA drugs are available from a wide variety of sources, ranging from officially registered pharmacies to informal medicine sellers. Even in countries where access to MA is restricted, women are obtaining the drugs through physicians, pharmacies, internet or on the black market (Kapp et al 2017, Erdman 2012, Powell Jackson et al 2015). Furthermore, women share information with each other on how to use the drugs, often bypassing the service provider and using this method themselves (Berer 2015).

Typically, the MA regimen includes a combination of mifepristone followed by misoprostol, with dosing guidelines set by the World Health Organization at 200mg mifepristone followed in 24-48 hours by an 800µg dose of misoprostol (if vaginal, buccal or sublingual) and 400µg dose if oral (WHO 2012). Some protocols also require that women take both mifepristone and misoprostol under clinical supervision and the use of ultrasound, thereby necessitating multiple visits to clinical facilities for pregnancy termination. However, varying dosages of mifepristone and misoprostol have been shown to be effective in clinical trials (Ngo et al 2011) and evidence suggests that women with regular menstrual cycles understand when their last menstrual period (LMP) and can date their pregnancy on their own without the need for an ultrasound (Shannon & Winikoff 2008, Clarke et al 2007, Shellenberg 2017).

Increasing evidence from both developed and developing countries suggests that home administration of misoprostol is a viable and feasible option (Ngo et al 2011). A simplified regimen of MA involves assessment of gestational age by a healthcare provider on the first visit and administration of mifepristone at the clinic, with the woman then taking misoprostol at home. This protocol improves the acceptability of MA as it offers greater privacy than in-facility abortion; gives women greater control over the timing of abortion; and makes it possible for the woman to get emotional support from her husband or partner or friend or family member (Akin A et al 2005, Mundle et al 2008, Kallner et al 2010, Blanchard et al 2015). Women also indicate that they prefer MA as it is "more natural,"avoids surgical intervention and anesthesia, and allows them to keep the process confidential (Mundle et al 2008, Ganatra et al 2010, Barge 2005).

Within this new landscape of abortion care, the definition of unsafe abortion is no longer considered simple and static, but rather a level of risk running along a continuum based on the circumstances each woman faces (Ipas 2015). In turn, making medical abortion pills available through pharmacists or medicine sellers may be an avenue for increasing access to safe abortion for women. However, there is limited documentation of successful interventions on the safe use of medical abortion outside the formal health system. There is even less published documentation on the role of informal medicine sellers and on interventions that aimed to change pharmacy policies related to pharmacists' prescribing or practicing medical abortion (MA).

This study aims to explore available global evidence on efficacy, safety and acceptability and operational challenges of self-use or self-administration of MA drugs with and without support of the formal health system. It aims to reiterate that self-administration of medical abortion is an acceptable option for women and has an acceptable success rate. Although this study intends to review global evidence, a special focus was given to document evidence from India separately to facilitate future implementation strategy and policy advocacy there.

1.1 Methodology

A systematic literature review was conducted to explore four broad dimensions:

1. Evidence of using misoprostol at home with clinical support and guidance
2. Evidence of using both mifepristone and misoprostol at home with clinical support and guidance
3. Evidence of accessing MA drugs for self-use through informal channels including, pharmacy, online, telemedicine and community-based organizations
4. Challenges and concerns of ensuring safe medical abortion services through informal channels

1.1.1 Search strategy and parameters

This report is based on a review of published literature, editorials, peer-reviewed journal articles, and grey literature including evidence, experiences, and concerns related to the self-administration of MA.

Databases and websites searched included PUBMED, MEDLINE,Open Access, WHO, Gynuity, Lancet, Elsevier Journal, Ipas Library, Population Council, Marie Stopes International, Women on Web, International Consortium for Medical Abortion, Reproductive Health Matters, IJOG, and Contraception. Sources were searched for relevant publications, from the earliest publication date to January 2018, using multiple subject headings and text words in combination (Table 1). Additional articles were identified through backward and forward reference searching. Published conference abstracts were also used to locate full text publications. Only full text publications and extended abstracts of studies on humans and published in English language were considered.

Table 1: Search terms used for the literature review

Medical abortion/MMA for India	Informal providers
Self-administration	Pharmacist
Home-use/self-use	Medicine shop
Mifepristone & misoprostol	Tele-medicine
Efficacy /outcome	Hotline / SMS
Regimen /protocol	Community-based organization
Adverse events	Acceptability
Approval	Satisfaction

1.1.2 Inclusion/exclusion criteria

Self-use of MA refers here to circumstances in which women seek to terminate their pregnancies on their own using either combination of MA drugs at home or misoprostol only. Self-administration refers here to any shift away from the traditional "three visits" model that includes taking any or both MA drugs (mifepristone and misoprostol) at home (or any location outside the health system) with or without clinical support and follow-up monitoring.

Articles of any study design (e.g. cross-sectional, prospective cohort, randomized controlled trial, etc) were included if they investigated or explored outcomes on self-administration of medical abortion with or without facility support. Studies which were not written in English were excluded from the review process.

1.1.3 Selection of studies and flow of analysis

Reviews were conducted in phases. In the first phase, 108 articles and reports were screened; in the second phase, 92 articles and reports were shortlisted based on the relevant content and literature. Published articles and research reports written in English were included in the review process if they presented the following dimensions:

- Study protocol or research design, respondents, MA regimen, protocol and gestation
- Efficacy of using MA drugs under different settings (success rate under clinical and home setting)
- Prevalence and types of unsuccessful abortion (incomplete or pregnancy continuation)
- Reported side effects and serious adverse events (if any)
- Clinical intervention and follow-up contacts
- Client satisfaction
- Accessing MA drugs and information though informal channels, including, web-portals
- Accessing MA drugs through pharmacies
- Barriers and concerns about accessing and providing MA through informal channels

Although reviews were not restricted to any geography, a special emphasis was given to studies conducted in India to facilitate future implementation strategy and policy advocacy relevant to India. To better understand changing and developing global views and discourse around medical abortion, we included reviews and editorials published in peer- reviewed journals. Identified studies were mapped and categorized into four domains, including a) use of misoprostol at home with clinical support and guidance, b) use of mifepristone and misoprostol both at home with clinical support and guidance, c) use of medical abortion outside of the formal health system, and d) challenges and concerns of ensuring safe medical abortion services outside of the formal health system. In the next phase, common variables- including sample respondents and size, drug regimen, successful abortion rate, follow-up contacts, postabortion complications-types and prevalence, adverse events, and client satisfaction were identified for summarizing results of each study in tabular form (sections a-c). Further, challenges and barriers of implementing any intervention on self-use of MA were reviewed and identified under different themes (section d).

Finally, to summarize the overall findings this study segmented the available evidences into four different levels of confidence or certainty: 'strong', 'moderate', 'low', and 'no'. The concept of these segmentations was adopted from the systematic review of literature on health worker roles in providing safe abortion care and post-abortion contraception (WHO 2015). The definitions of these four ranks are in Table 2 below:

Table 2: Ranks of evidence

Certainty	Logic behind categorization
Strong	Global evidence (studies conducted in multiple countries with different socio-cultural set up) with high likelihood of repeating similar results (e.g., rates of successful abortion) in future research. Available evidence does not pose much heterogeneity in outcome and interpretation.
Moderate	Available evidence comes from few (one or two) countries and there is some likelihood of repeating the same results.
Low	Minimum evidence, conducted sporadically in few countries without having strong methodological rigour.
No	No evidence available to answer the question of interest.

The study selection process is shown in Figure 1 below. A total of 108 studies were identified as potentially relevant for the subject and related context. However, following full text review, five studies were excluded in the second phase as they were written in French, and another 11 studies were excluded as they were duplicate. In sum, 92 studies were reviewed. Of these, 68 were peer-reviewed journal articles, 17 were reports or working papers, four were conference papers, and three others were blogs and fact-sheets (Table 3). Two different types of documents were reviewed: documents published operation research studies and other supporting documents that shared experiences, opinions and relevant issues on self-administration of MA.

Figure 1: Selection of articles and steps for systamatic review

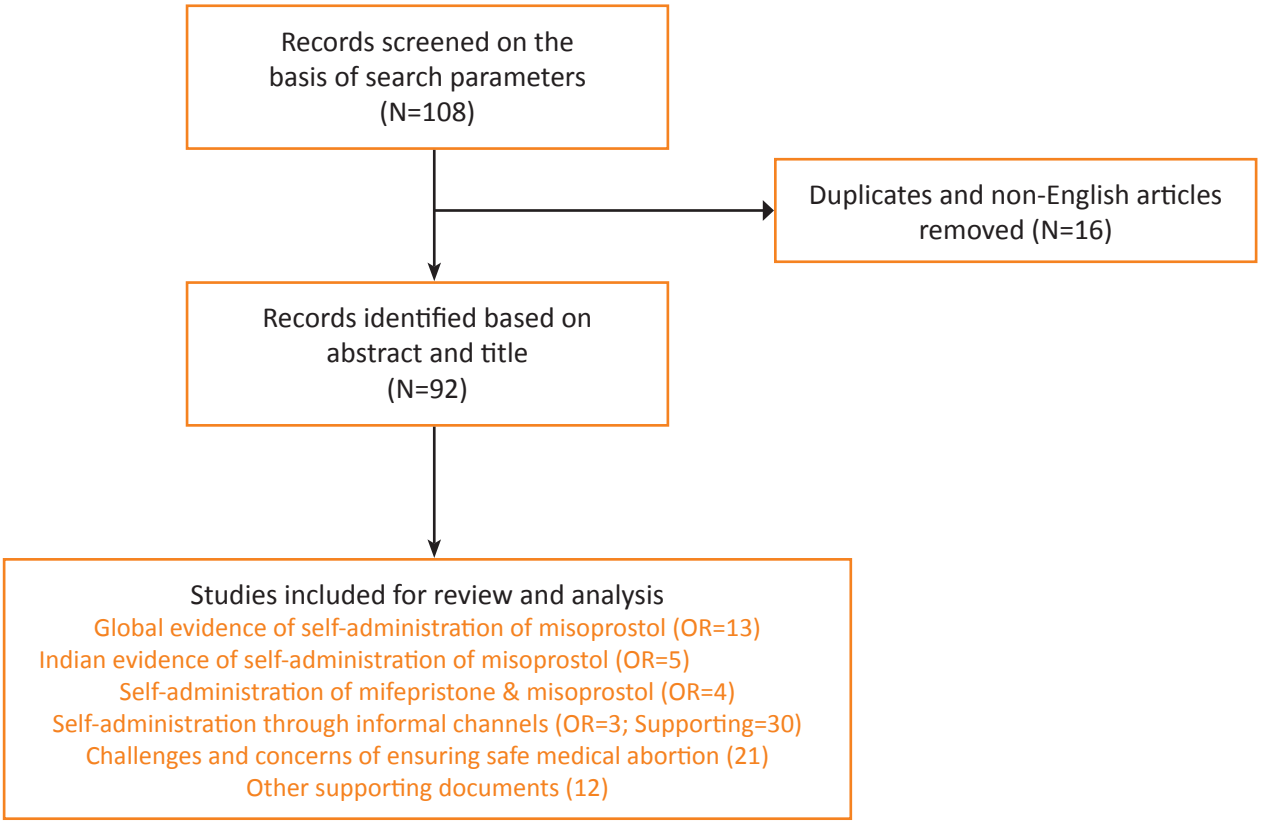

Table 3: Types of published and unpublished documents reviewed for this study

Document type	Number	(%)
Peer-reviewed journal	68	74
Report or working paper	17	18
Conference papers	4	4
Others (fact-sheet and blogs)	3	3
Total	92	100

Chapter 2

Safety and efficacy of MA among women who used mifepristone at clinic and misoprostol at home

2.0 Global Scenario

Medical abortion is a simple procedure with few serious complications (Shannon et al 2008, Kapp et al 2017). Evidence suggests that when given an option between clinic and home administration of MA, women opt for home-based medical abortion (Blum 2004, Akin 2005, Mundle et al, Bracken et al 2010, and Ngo et al 2011, Berer 2005).

- **80% of women prefer using MA at home when given a choice.**
- **Evidence suggests MA is a viable option and it helps eliminate the multiple visits to the facility.**

Protocols and regimens for MA are not uniformly applied and can vary from one country to another. Many countries using MA require three visits to the facility or provider: 1) to assess eligibility through gestational age dating; 2) to administer misoprostol 24-48 hours later; and 3) to confirm abortion completion status 1-2 two weeks after the procedure. WHO recommendations do not require routine follow-up after MA, so long as the woman has adequate knowledge and information about when to seek medical care for complications and how to meet her contraceptive needs (WHO 2012). Evidence suggests that home administration of misoprostol is a viable option and helps in eliminating the second visit for women. (Clark et al 2007).

This section examines evidence on the safety of administering misoprostol at home, managing the abortion process at home and seeking a service provider for treating complications. Reviews of available evidence also explored women's acceptability and satisfaction with self-use of MA at home. Two different sets of research studies were reviewed: The first examined efficacy and acceptability of home use of misoprostol versus clinic administration of misoprostol, while the second focused solely on efficacy of home use of misoprostol without comparing results with the clinical counterpart.

In addition, four qualitative papers were included to better understand women's perceptions of using the option of home administration of medical abortion. The qualitative research also described women's expectations and reasons for choosing home administration, and their experiences.

2.1.1 Efficacy and acceptability of home use and clinic use of misoprostol

Seven research studies- from Turkey (Akin et al 2004), Albania (Bracken et al 2006), Tunisia (Hajri et al 2004, Elul et al 2001), Nepal (Karki et al 2009), and Vietnam (Ngoc et al. 2004, Elul et al 2001)- measured the outcomes of

home and clinic administration of misoprostol, covering a total of 3,228 study participants. These studies were facility-based, at either medical and teaching colleges, maternity hospitals or family planning clinics, and were carried out between 2001-2009.

2.1.1.1 Intervention design

Women presenting for termination of an unintended pregnancy and eligible for medical abortion were given an option of surgical or medical abortion. Those who opted for medical abortion were enrolled in the study provided they fulfilled the inclusion criterion: residing in an area where follow-up was possible or they could reach the facility promptly in case of emergency; had no contraindications of medical abortion as per standard norms (WHO, 2003); and were willing to undergo surgical evacuation if medical abortion failed.

All seven studies followed the same protocol for determining a maximum gestational age of 56 days (Table A1). Gestational age was estimated by the provider based on women's recall of LMP and bimanual examination. Though not in the protocol, studies in Albania, Turkey, Tunisia and Vietnam indicate providers used their discretion to use ultrasound to estimate gestational age (Bracken et al 2006, Hajri et al 2004, Akin et al 2004, Elul et al 2001, Ngo et al 2004).

- **Overwhelming majority opted to take misoprostol at home.**
- **Home administration of misoprostol is a viable option.**
- **89-97% home users had complete abortion.**
- **Combined data shows a small no. of women experienced ongoing and incomplete pregnancy.**

The MA regimen was similar for all seven studies: 200mg mifepristone followed by 400µg misoprostol taken orally after 48 hours of taking mifepristone (Akin et al 2004, Bracken et al 2006, Elul et al 2001, Hajri et al 2004, Karki et al 2009, Ngoc et al. 2004) (Table A1). Women eligible for MA were given the first dose (mifepristone) on the first visit to the facility. All women were given an option of taking misoprostol 48 hours later either at the clinic or at home. An overwhelming majority of women (50% to 89%) opted to take misoprostol at home compared to 11% to 50% who opted for clinic use (Table A1). If they chose home administration they were given the choice of returning to the facility if they changed their mind. Follow-up visits to assess abortion completion status were scheduled on Day 14 in all studies.

Women were counseled and given detailed instructions on what to expect, levels and amount of bleeding, pain, nausea and cramps. They were told to contact the provider either by phone or to visit the facility if needed. All protocols provided painkillers which women were advised to take as needed.

2.1.1.2 Study outcomes

Data from these seven studies reinforce that home administration of misoprostol is a viable option with significant success rates. Women who had a complete abortion at home ranged from 89% (Ngo et al 2009 and Akin et al 2004) to 97% (Hajri et al 2004 and Bracken et al 2006), while women who returned to the clinic for misoprostol had successfully terminated their unintended pregnancy in 80% (Akin et al 2004, Elul et al 2001) to 97% (Bracken et al 2006) of cases (Table A1).

Four studies reveal that women who opted for home use had a higher success rate (Akin et al 2004, Elul et al 2001, Hajri et al 2004) while two studies (one each in Nepal and Albania) observed similar outcomes (Bracken et al 2006, Karki et al 2009). A study conducted by Ngo et al (2004) in Vietnam, however, observed clinic-based outcomes to be marginally more successful than the home-based outcomes– 94% and 88.6% respectively (Table A1).

Among those who did not complete their abortion, ongoing pregnancy was reported by 64 women (60 among women who used misoprostol at home and four who had taken misoprostol at the clinic), and incomplete abortion by 128 (105 who used misoprostol at home and 23 at clinic)[1]. All of these women underwent a surgical evacuation at the clinic either before or after the follow-up visit on Day 14 (Akin et al 2004, Bracken et al 2006, Elul et al 2001, Hajri et al 2004, Karki et al 2009, Ngo et al 2004). Surgical intervention was prevalent in the Ngo et al study – of the 51 women who received a surgical intervention, 18 were medically indicated, 20 were per the woman's request and 13 with an unspecified reason (Ngo et al 2004).

The study protocol included giving all women who opted for home use of misoprostol simple and clear instructions on when to ingest the misoprostol. Compliance is defined as women who took misoprostol at scheduled date and time and returned for the follow-up at scheduled date and time. A compliance rate was reported in studies conducted in Albania, Nepal, Vietnam and Tunisia (Bracken et al 2006, Karki et al 2009, Elul et al 2001). In all four studies, compliance rates were very high – women in both the home group and the clinic group took misoprostol on time and returned to the clinic for the follow up as per advice (data not shown).

None of the research studies recorded any serious adverse events during the intervention period. The Albania study reported two cases of excessive bleeding from the home-use group. They underwent a surgical procedure as a haemostatic measure (Bracken et al 2006). In Nepal, two women who returned to the clinic with heavy bleeding were found to have an incomplete abortion. They were referred to a tertiary level facility for blood transfusions and surgical evacuation (Karki et al 2009). The most commonly reported side effects included bleeding, abdominal pain, nausea and vomiting (Table A2).

2.1.2 Acceptability and satisfaction of self-administration of misoprostol

In all seven studies, women were asked the key reasons for choosing the home administration for misoprostol over clinical administration. Though each of the seven studies had different variables, some of the commonly reported reasons were: fewer visits; compatibility with household and work responsibilities; privacy and confidentiality; and feeling more comfortable being at home during the abortion process (Akin et al 2004, Bracken et al 2006, Elul 2000, Elul et al 2001, Hajri et al 2004, Karki et al 2009, Ngo et al 2004).

- **Women prefer home use over surgical interventions.**
- **Primary reasons for this preference are: Safety, non-invasive process, privacy and confidentiality, compatibility with household work, and presence of a family member/ friend.**
- **High level of satisfaction with home-use of MA.**

Satisfaction with home use of misoprostol was high: 84-97% of women reported that they were satisfied or highly satisfied with the procedure (Bracken et al 2006, Elul et al 2001, Hajri et al 2004, Karki et al 2009, Ngo et al 2004). Similarly, preference for home use of misoprostol for future termination of an unintended pregnancy was also high (92-96%)(table A3). Three studies which asked facility-based clients their preference for future terminations also

[1] The study conducted by Elul et al (2001) reported combined data for home and clinic users – ongoing pregnancy was reported by 4 and incomplete abortion by 12 women.

found a preference for taking misoprostol at home (Akin et al 2004, Bracken et al 2006, Elul et al 2001, Ngo et al 2004). Most women reported that they had someone present when terminating at home – husband or boyfriend or partner, mother, other family member or friend (Table A3).

Women were informed that they could contact the provider, either by visiting the facility or by phone, at any time during their abortion process. Calls were made mainly to check if their bleeding was as expected. However, there was no clear pattern of difference between provider contact for the two groups, as some studies suggested clinic users were more likely to call and make an unscheduled visit or phone call to providers (Akin et al 2004, Elul et al 2001 and Hajri et al 2004, Karki et al 2009, Elul et al 2001, Ngo et al 2004 (Table A1).

2.1.3 Efficacy of home use of misoprostol without a comparison group

This section examined six studies exploring the efficacy and feasibility of using misoprostol at home, without a control or comparison group. These studies were carried out between 2001 and 2011 in Curacao, the Kingdom of Netherlands (Boersma et al 2011), France (Clark et al 2005), South Africa (Blanchard et al 2015), Norway (Lokeland et al 2013), and Sweden (Fiala et al 2004, Kapp Kelner et al 2010) and covered a total of 2,739[2] women who were eligible and opted for home administration of misoprostol.

Mifepristone was registered in all study countries, except for Curacao in the Kingdom of Netherlands, which has very restrictive abortion laws. For the Netherland study, general practitioners were recruited as the first contact point for medical abortion and special permission was obtained from the government to import mifepristone for the research trial (Boersma et al 2011). The gestational age was determined by clinical history, woman's LMP and ultrasound based on providers' preference.

These studies did not have uniform drug regimens and protocols. Women's gestational ages ranged from 49 days in France and Sweden (Fiala et al 2004 and Clark et al 2005) to 70 days in Curacao (Boersma et al 2011). Five of the six studies dispensed 200mg mifepristone (Blanchard et al 2015, Boersma et al 2011, Clark et al 2005, Kopp Kallner et al 2010, Lokeland et al 2014), while one study in Sweden used 600mg mifepristone (Fiala et al 2004). However, all six studies used uniform doses of misoprostol 800µg with routes being oral, buccal or vaginal (Blanchard et al 2015, Boersma et al. 2011, Clark et al 2005, Fiala et al 2004, Kopp Kallner 2010, Lokeland et al 2014) (Table A4). The study conducted in Norway (Lokeland et al 2014) did not ask women to come for a second follow-up visit; instead women were asked to do a pregnancy test at home to assess their pregnancy status. Study participants were asked to return to the facility if the pregnancy test was positive or inconclusive.

2.1.3.1 Study Outcomes

These studies recorded high success rates of using mifepristone at clinic and misoprostol at home, with abortion completion rates ranging from 94% (Lokeland et al 2013)[3] to 98% (Boersma et al 2011, Fiala et al 2004, Kapp Kellner et al 2010) (Table A4). Out of 2,739 women who opted for home use of misoprostol, 196 (7%) were lost to follow-up.

- **94-98% women who used misoprostol at home had a complete abortion.**
- **Few women reported on-going and incomplete abortions.**
- **Side-effects and complications reported by a few women included: pain, nausea, vomiting, dizziness, weakness, fever and heavy bleeding.**

[2] Six studies conducted researches at different point of time and recruited a total of 2,739 women with varied sample size ranging from 30 in France to 1018 in Norway (Table A4)

[3] The study has measured the success rate based on all samples recruited for this research and not excluded samples who were lost to follow-up. If we adjust the calculation with reduced sample (excluding loss to follow-up) the success rate would go up to 98%. In that case, all the six studies would mark a success rate of 98% among women used misoprostol at home.

Ongoing pregnancy was reported by nine women and incomplete abortions by 32 women (Table A5).

Serious adverse events were reported in three studies- South Africa and Sweden (Table A5). In South Africa, women presented with a cluster of symptoms- weakness, dizziness, severe abdominal pain, severe bleeding and one case of ongoing pregnancy which was not successfully terminated through vacuum aspiration and was resolved by dilation and curettage (Blanchard et al 2015). The serious adverse event in Sweden was deep vein thrombosis, which was found to be unrelated to the abortion treatment (Fiala et al 2004). One woman in the Norway study needed a blood transfusion due to very low hemoglobin (Lokland et al 2013). Other side effects experienced by women included pain, nausea, fever and chills.

2.1.4 Acceptability of home use of misoprostol

None of the studies reviewed in this section asked women the reasons for choosing home administration of misoprostol. However, women almost uniformly reported being very satisfied with the procedure. Of the four studies which reported satisfaction rates, satisfaction levels ranged from 92% in France to 98% in South Africa (Blanchard 2015, Clark et al 2005). A large majority of women also reported their intention to choose MA at home again, if required.

Although women were uniformly instructed to contact the provider in case of any complications or questions, only 4%-6% reported making an unscheduled visit to the clinic (Clark et al 2005, Blanchard 2015, Fiala et al 2004, Kopp Kallner 2010) (Table A4).

- **Women reported being very satisfied with home use of misoprostol**
- **94-98% intend to use MA again at home in future, if required**
- **Evidence suggests women can manage abortion at home without follow-up contacts; only 4-6% women made an unscheduled visit to the facility**
- **Almost no evidence on postabortion contraception**

2.2 Use of misoprostol at home: Indian evidence

In India, induced abortion is legal under specific conditions under the Medical Termination of Pregnancy (MTP) Act, 1971. It permits a woman to terminate a pregnancy up to 20 weeks under a range of circumstances – to save a woman's life or preserve her physical or mental health; fetal impairment; pregnancy resulting from rape; and pregnancy resulting from contraceptive failure for married women (Government of India 1971, Government of India 2002). In 2003, rules and regulations were added to permit medical abortion by certified providers using mifepristone and misoprostol for pregnancies up to seven weeks (Government of India, 2003).

Continuing the process of increasing access to safe abortion, use of the "combination pack," containing 200mg mifepristone and 800µg misoprostol, was approved in 2008 (Government of India 2002; Government of India 2008). And in 2010, the National Comprehensive Training and Service Delivery Guidelines for providing comprehensive abortion care indicated that MA up to 63 days of gestation is safe[4] (Ministry of Health and Family Welfare. 2010a).

[4] The Comprehensive Abortion Care Training and Service Delivery Guidelines of 2010 suggest that medical abortion is safe and can be provided for a gestational age up to 63 days. The Ministry of Health and Family Welfare is in the process of modifying the MTP Rules in accordance with the approval of the drugs.

This study reviewed five studies of misoprostol home use in India (Table A6). Of these, three examined home administrations of misoprostol compared to the clinical setting (Iyengar et al 2016, Bracken et al 2010, Mundle et al 2008) while the other two examined the outcome of home use of misoprostol without any clinical comparison. All five studies adopted a prospective cohort study design. A total of 1,621 participants, from different regions of India, were studied (1,140 home administration, 481 clinic administration).

The trials were based in all levels of public and private health facilities, including in government medical colleges and hospitals, private medical colleges and hospitals, primary care centers, and, in four cities, clinics of the Family Planning Association of India.

Additionally, three qualitative studies (Ganatra et al 2010; Ramachander and Pelto 2005; Shah et al 2005) were accessed to understand experiences of women undergoing medical abortion, their preferences of place of administration of misoprostol, and the acceptability of home use of misoprostol. These studies included in-depth interviews with women who had undergone medical abortion either in a clinic or at home.

2.2.1 Implementation design

Women presenting for termination of pregnancy and eligible for medical abortion were given an option of choosing surgical or medical abortion. Those who opted for medical abortion were enrolled in the study provided they fulfilled the inclusion criterion: residing in an area where follow up was possible or they could reach the facility promptly in case of emergency; had no contraindications of medical abortion as per norms (WHO, 2003); and were willing to undergo surgical evacuation if medical method of abortion failed.

The gestational age for women eligible for inclusion in these studies varied between 7-9 weeks (Table A6). The gestational age was estimated by the provider based on women's recall of LMP and bimanual examination. Ultrasound was not used in any study to either estimate gestational age or completion of the abortion process. Eligible women were further given an option of clinic or home administration of misoprostol in all except two studies, where the paper does not indicate if women were given the option of choosing administration of misoprostol at clinic (Chunni et al 2009, Kalyankar et al 2014). In the study conducted in health centers in Rajasthan (Iyengar et al 2016), women seeking medical abortion up to nine gestational weeks received mifepristone in the clinic and, through a randomized selection process, providers allocated them either to home or clinic administration of misoprostol. In the other three Indian studies where women were given a choice, an overwhelming majority opted for home administration of misoprostol. For example, in the study conducted in Government Medical College Nagpur, with a total of 99 women enrolled, 87% (n=78) opted for home use and 21 for clinic administration of misoprostol. Bracken et al (2010) reported that out of 599 women recruited for the study, 530 women (88%) opted for home use over clinic administration.

In all five studies, women were counseled on what to expect after the administration of MA drugs, levels and amount of bleeding, pain, nausea and cramps. All protocols followed pain management guidelines and women were told to contact the provider if needed.

The MA protocol followed for mifepristone was similar in all five studies: administered mifepristone 200mg orally on the first visit to the clinic, followed by misoprostol after 48 hours to be ingested at home or the clinic, depending on choice of place of administration. However, there were differences in dosages and routes of administration of misoprostol. Four out of five studies used 400µg misoprostol (Mundle et al 2008, Bracken et al 2010, Chunni et al 2010, Kalyankar et al 2014). The exception was noted in the Rajasthan study, which used 800µg

misoprostol at clinic or at home (Iyengar et al 2016). Routes of administration of misoprostol also varied between the studies. Study by Iyengar et al (2016) in Rajasthan followed all three routes (sublingual 55%, vaginal 17%, oral 28%). Mundle et al used only sublingual, while the other three studies (Chunni et al 2009, Bracken et al 2010 and Kalyankar et al 2014) administered misoprostol orally.

All women who opted for medical abortion were asked to return to the facility on Day 14 to assess the completion of abortion. In the study by Iyengar et al, women were also included via another study arm to assess completion of abortion status at home using a low-sensitivity urine pregnancy test. These women were randomly assigned (1:1) with a computer-generated randomized sequence to clinic follow-up or self-assessment at home. Thus, of 731 women enrolled in the study, 365 were assigned home assessment and 366 clinic assessment of abortion completion, irrespective of the place of administration of misoprostol. Women enrolled in home assessment were provided a low-sensitivity urine pregnancy test to be done 14-15 days after ingesting mifepristone. They were followed up by phone or home visit 12-15 days after mifepristone to assess continuing pregnancies or complications (Iyengar et al 2015)[5].

2.2.2 Study Outcomes

Data from the Indian studies mirror global evidence indicating home administration of misoprostol is a viable option. There were no significant differences in outcomes between home and clinic use of misoprostol. For example, Iyengar et al (2016), reported a difference of just 0.2% between the outcome of abortion status between the home users (94.2%) and clinic users (94.4%). Similarly, Mundle et al (2008), reported a difference of 0.9% between the outcome of abortion status between home-users (94.7%) and clinic-users (95.6%). The difference between the two groups was slightly larger in the Bracken et al (2010)study, which reported a gap of 3.4% (home users 89% and clinic users 92.4%). (Table A7).

In addition to the overall success rate, two studies also provided abortion success rate by gestational age. Chunni et al (2009) provided abortion success rate for three gestational age segments. The success rates were 92.8% for ≤49 days, 83% for 50-56 days, and 80% for 57-63 days, while the overall success rate was 86%. Similar variations were also recorded by Kalyankar et al (2014), which presented data on 80 women enrolled in the study and further divided that into two groups based on gestation age. This study observed a success rate of 100% for gestational age ≤49 days and 95.4% for 50-63 days, while the overall success rate was 97.5%.

- **Studies in India have found efficacy rates similar to other global studies.**
- **Success rates in India range from 86% to 97.5% and are comparable to the expected range of efficacy of MA observed globally (84-97%).**
- **Method failure is reported in terms of incomplete abortion, ongoing pregnancy by a limited number of women- with more among home users.**

Among those who did not complete their abortion and for whom data was available, method failure was reported by 163 out of 1,561 women (10.4%). This included ongoing pregnancy (home use n=12, clinic use n=6), incomplete abortion (home use n=61, clinic use n=19) or intervention if medically indicated or suggested by provider and/or requested by the woman (home use n=44, clinic use n=22). All of these women underwent a surgical evacuation at the clinic either before or after the scheduled follow up visit on Day 14. (Table A8).

5 Iyengar et al 2015 and Iyengar et al 2016 studies are based on the same data set of 731 women who received MA drugs at home and clinic. However, for the comparative analysis (table A7), this study included the Iyengar et al 2016 study, since this article exhibited the findings separately for home users and clinic users and helped in comparing the results with other four studies conducted in India.

Data on adherence was collected by three studies (Bracken, et al 2010, Iyengar, et al 2016 and Mundle, et al 2008). Compliance was defined as women who took misoprostol and returned for follow up at the scheduled date and time. Compliance was high in all three studies. Mundle et al (2008) observed compliance of 98.7% for home use and 95.6% for clinic users of misoprostol. Iyengar et al (2016) reported compliance for almost all participants (home use 99.4%, clinic use 96.4%). In that same study, there was no difference in Day 14 follow-up visits between women who took misoprostol at home (87.8%) and those who were administered MA in a clinic (85.6%). In Bracken et al (2010) loss to follow-up for both the groups was recorded in the range of 4% (home users 4% and clinic users 4.3%).

- **Compliance was higher among home users in comparison to clinic users.**
- **Home and clinic users have same probability to return for the follow-up visit.**
- **Self-reported side effects and complications are: bleeding, abdominal pain, nausea and vomiting.**

One study mentioned an adverse event (Iyengar et al 2016). However, the nature and follow-up treatment of this adverse event was not specificed in detail. Bracken et al 2010 mentioned three events for which women were treated but it was unclear whether these women ingested misoprostol at home or in the clinic (Bracken et al, 2010). All other studies reported common signs and symptoms of side effects and had no significant variations between women using misoprostol at home or in clinic.

2.2.3 Acceptability of home use of misoprostol:

The most frequently mentioned reasons for choosing home administration of misoprostol were: fewer visits - 20.8% (Bracken et al 2010) to 65.3% (Mundle et al 2008); continuation of household duties– 20% (Mundle et al 2008) to 28.1% (Bracken et al 2010); and convenience - 3.8% (Mundle et al 2008) to 47.5% (Kalyankar et al 2014).

High satisfaction was indicated by women with home use of misoprostol, ranging as high as – 80% - 97.5%. As in the global findings, 81.9% to 96.2% women said they would prefer using misoprostol at home in the future to terminate an unintended pregnancy (Mundle et al 2008, Bracken et al 2010, Kalyankar et al 2014, Iyengar et al 2016)(Table A9).

For home administration of misoprostol, the presence of someone else at the time of ingesting the tablets was reported as an important factor. Most women said their husband/ partner, husbands' family member or natal family members were present when they ingested misoprostol (Iyengar et al 2016, Bracken et al 2010, Mundle et al 2008).

- **Studies in India reported an important determinant of self-administration of MA is of presence of someone at home at the time of ingestion of misoprostol.**
- **Reported reasons for choosing home use of misoprostol: fewer visits, can manage routine activities, convenience and comfort.**

Women made unscheduled visits and telephone contacts with the providers because they were concerned about their abortion status and/or bleeding. However, when compared to those who took misoprostol in the clinic, there were no significant differences in the Rajasthan study (Iyengar et al 2016). Mundle et al reported that 13% of home users versus 4% of clinic users made unscheduled visits, and that 28% of home users made substantially more telephone calls to the hotline than clinic users (10%) (Mundle et al 2008). As per Bracken et al (2010) study, 37.7% of clinic users were more likely to require a phone call for missing a follow up visit vis-a-vis 15.3% of home users.

2.3 Conclusions from global and Indian evidence

Available evidence suggests that giving women an option of ingesting misoprostol at home is a viable option and does not have an impact on the levels of efficacy or successful abortion. Studies also show that women can handle their abortion procedure effectively. The option of reducing the number of visits to the facility is influencing the choice and acceptability of self-administration of misoprostol at home.

Women uniformly show a high level of satisfaction with, and accepted the option of, self-use of misoprostol as it enabled them to undergo the abortion process with privacy and confidentiality and to have the further comfort of having family member present at the time of the abortion.

Providers' age-old reluctance to suggest self-administration of misoprostol to rural and less-educated women was not so evident. A few studies recruited more rural and less-educated women for self-administration and observed no significant variations in the success rate of abortion through self-administration of misoprostol (Iyengar et al 2016, Mundle et al 2008).

Global and Indian studies have clearly shown that when women have accurate information on the possibility of heavy bleeding and other side effects that need medical attention, they can manage their abortion process at home, thereby eliminating a visit to the facility. There were no significant differences in the efficacy and outcome of medical abortion, whether misoprostol was ingested at home or in the clinic.

Training for providers on how to counsel women is as important as providing them training on assessing the gestational age or abortion completion status. In India, the Comprehensive Abortion Care Guidelines developed by the Ministry of Health and Family Welfare indicate that a provider can select women to give misoprostol for home administration (Ministry of Health & Family Welfare 2010). If this option is to be provided to women in future, simple, low-literacy materials need to be developed to inform women on what to expect, how to manage their bleeding and what to do in case of an adverse event.

- **Global and India evidence suggest giving women a choice for home use of misoprostol is a viable option and does not have any impact on the outcome and efficacy level.**
- **No significant difference is found in the outcomes of MA among home and clinic users.**
- **Women are capable of managing the abortion procedure if counseled and informed effectively.**
- **Providers are not reluctant to suggest home-administration of misoprostol to rural and less- educated women.**
- **Training providers on how to counsel women is as important as providing them training on assessing the gestational age or abortion completion status.**

Chapter 3

Self-administration of mifepristone and misoprostol with clinical guidance

3.0 Context

- **Evidence suggests no difference between self-administration and clinical administration of MA.**
- **About half to three-fourths of women chose to administer mifepristone at home.**
- **92-99% would intend to use the same method and place of administration in the future.**

When women opt for MA, they have many factors to consider. For example, they may assume incorrectly that the abortion will occur on the day of their appointment, when they are given the first dose of medical abortion (mifepristone). Their visit to the facility, therefore, may have been planned according to their work or home care schedule. However, in most cases, bleeding usually occurs one to three days after the appointment when the woman ingests the prostaglandin analogue (misoprostol). Hence, the initiation of bleeding may happen at an inconvenient time. Secondly, appointments may not be available at a suitable time and date (Swica et al 2013). This may disrupt her daily schedule. In addition, a woman may want to have her partner or friend or family member with her at the time of starting the medical abortion process and this may not be possible if she needs to return to the facility to take MA drugs.

Evidence on the efficacy and acceptability of home-use of misoprostol has been available for decades, indicating that women prefer taking a prostaglandin analogue at home and that it is as effective as taking it in a facility setting (Ngo TD et al 2011). Clinical trials were conducted to adjust the dose of mifepristone and misoprostol. However, research on efficacy and acceptability of self-administration of mifepristone is still nascent. Researchers and clinicians only recently have started exploring if women can be given the option of taking both mifepristone and misoprostol at home.

This section explores evidence substantiating the efficacy and acceptability of self-administration of both mifepristone and misoprostol with clinical support, including counseling and follow-up. Four studies reviewed for this section were conducted during 2009 (Conkling et al 2015) and 2013 (Chong et al 2015). Two of these studies were conducted in USA (Chong et al 2015 and Swica et al 2013), and one each in Nepal (Conkling et al 2015) and Kazakhstan (Platais et al 2016).These studies were selected purposively, primarily because they presented comparative data on the efficacy of using the full MA regimen at home and clinic. The only exception was the Kazakhstan study (Platais et al 2016), that assessed the overall efficacy of MA without segmenting it by home and clinic users of mifepristone, though other variables were presented separately for the two groups.

Medical abortion was permitted in all three study countries albeit with some variations on the gestational age. Kazakhstan national guidelines for MA using mifepristone (200mg) and misoprostol (600µg) are permitted as an outpatient service for terminations up to seven weeks of LMP (≤49 days) and as an in-patient service for those

between 8-22 weeks (Platais 2016). Nepal allows MA using mifepristone (200mg) and misoprostol (400µg) up to nine weeks of gestation (≤63 days). The USA also allows MA upto 70 days of gestation using combination of mifepristone and misoprostol.

All four studies were non-randomized and prospective, aiming to assess the efficacy and acceptability of home-use of mifepristone and misoprostol given an option to choose. These studies also aimed to assess reasons for choosing the place of administration of MA. The studies were facility-based and included six clinics of Planned Parenthood in Vermont, New York City, and Washington State (Chong et al 2015); and four urban demographically diverse clinical sites in New York City, Philadelphia and Atlanta (Swica et al 2013). The three sites in Kazakhstan included two sites in the Consultation and Diagnostics Department of the Perinatal Centers in Astana, and a Polyclinic in Almaty (Platais 2016). The sites in Nepal were at two medical college hospitals in Kathmandu (Conkling et al 2015). A total of 1,191 participants (n=596 for home use and n=595 for clinic administration) were included in these four studies.

3.1.1 Intervention design:

Women presenting themselves for termination of an unintended pregnancy and eligible for medical abortion were given an option of choosing surgical or medical abortion. Those who opted for medical abortion were enrolled in the study if they met the inclusion criteria, which included: residing in an area where follow up was possible or if they could reach the facility promptly in case of emergency; no contraindications of medical abortion as per norms (WHO 2003); were willing to undergo surgical evacuation if MA failed. These women were given a choice of administration of MA drugs either at home or in the clinic.

Three studies provided MA up to a gestational age of nine weeks (Swica et al 2013, Chong et al, and Conkling et al 2016), while the study of Kazakhstan provided MA up to 10 weeks of gestation (Platais et al 2016). The estimation of gestational age was described in two studies – Swica et al determined the gestational age based on existing clinic protocol, either transvaginal ultrasound or LMP and bimanual examination (Swica et al 2013). Providers in Kzakhstan assessed the gestational age by women's menstrual histories and a pelvic examination (Platais et al 2016).

The number of women opting for home administration was not high in the two US-based studies. In the Chong et al study, only 128 women (32%) opted for home administration and in the Swica et al study, less than half (46%, n=139) opted for home use. On the contrary, in Kazakhstan and Nepal, the majority of women opted for home-administration of MA; 64% (n=185) and 72% (n=144), respectively (Table A10).

Those who opted for home use were given 200mg mifepristone, and the provider helped them choose a date and time for administering it at home, so long as it fell within the gestational limit of the study. Dosages of misoprostol for the studies ranged from 400µg (Conkling et al 2015) to 800µg (Swica et al 2013 and Erica et al 2015). Routes of administration of misoprostol included buccal in studies conducted in USA and sublingually in Nepal and Kazakhstan.

Variations were noted in the timing of administration of misoprostol. Two studies asked women to take misoprostol within 24-48 hours (Chong et al 2015, Platais et al 2016) of taking mifepristone and one study within 24-72 hours (Conkling et al 2015). Another study suggested a range of 6-48 hours (Swica et al 2013).Women were given home cards to record the time and date of mifepristone and misoprostol administration and were asked to return to the clinic for a follow-up visit on day 14 of mifepristone ingestion. Women who opted for clinic use were given mifepristone on the day of the first visit and were asked to return on day three for misoprostol administration.

3.1.2 Study Outcome

Data from these studies demonstrate that self-administration of mifepristone and misoprostol is a viable option. There was no difference in abortion outcomes between self-administration and clinic use of MA. In three studies where abortion completion rates were given separately for self-use and clinic-use, the success rate for self-use of MA ranged between 96% (Chong et al 2015, Conkling et al 2016) to 97% (Swica et al 2013). The difference in outcomes between self-use and clinic-use was insignificant and net variations were within the range of one percentage point (Table A10). Although the study conducted by Platais et al (2016) in Kazakhstan didn't report abortion outcomes separately for home and clinic, the overall success rate was marked as 99% (n=286/289).

Further, home and clinic use of MA had no significant difference in ongoing pregnancy and incomplete abortions. Two studies that provided segmented data by home and clinic (Erica et al 2015; Conkling et al 2015) observed three ongoing pregnancies (Home: 3 and Clinic: 3) and six incomplete abortions (Home: 6 and Clinic: 6) each for home and clinic (Table A10). These women underwent a surgical evacuation at the clinic either before or after the follow-up visit on Day 14.

- **Abortion outcome marks no significant variations between home or clinic use of MA**
- **Success rates range from 96% to 97%**
- **Self-users prefer to take misoprostol on weekend, indicating their desire to manage their bleeding when at home**
- **No differences reported between home and clinic users in terms of the number of unscheduled calls and visits**

Adherence to protocol was reported at length by all studies and was found to be high for both self-use and clinic use of MA (Table A11). Among self-users of mifepristone, the range of taking mifepristone at the scheduled date and time was 74% (Swica et al 2013) to 100% (Platais 2016), while average (median) interval was around 25-26 hours. Adherence to time protocol (within 24-48 hours of mifepristone) was even better for misoprostol, and particularly among home-users. They took misoprostol on time ranged from 94% (Swica et al 2013) to 100% (Platais 2016), while at clinic the same proportion ranged from 91% (Swica et al 2013) to 100% (Platais 2016). The median gap between mifepristone and misoprostol was around 24 hours both at home and in clinic for all four studies. Although, segregated data by home and clinic was not available in Kazakhstan study, the study reported that all women took both mifepristone and misoprostol on scheduled date and time (Platais et al 2016) (Table A11). Interestingly, women who planned taking misoprostol on weekend was higher among self-administration, indicating their desire to manage their bleeding when at home – 33% (Conkling et al 2015) to 50% (Chong et al 2015). (Table A11).

Serious adverse events were not reported by any of the studies included in the review. Side effects were reported in Kazakhstan; however, results were not reported separately for home and clinic users. The most commonly reported side effects included chills (59.6%), diarrhea (30.9%), nausea (21.1%) and vomiting (15.4%). In all four studies under review, no differences were reported between home and clinic users in the number of unscheduled calls and visits (Chong et al 2015, Swica et al 2013, Conkling et al 2015, Platais et al 2016) (Table A10).

3.1.3 Acceptability of home use of mifepristone and misoprostol

One of the key objectives of all four studies was to assess acceptability of home-use of MA. All four studies asked women their reasons for choosing the place of administration of MA, the best and worst features of MA, and whether they would choose the same place for MA if the need were to arise in future.

The most commonly mentioned reasons for home-use of MA were 'allows more flexibility in schedule' (62-31%), 'can save days for work/school' (21-32%), and 'can manage everything along with household duties' (13-31%) (Chong et al 2015, Swica et al 2013, Platais et al 2016, Conkling et al 2015).

Reasons for opting for clinic administration included 'desire to start the process immediately' (27-59%), 'presence of provider' (14-85%), 'less anxiety' (16-56%), and 'comfort of being at clinic' (35-45%) (Swica et al 2013, Platais et al 2016, Conkling et al 2015).

These studies also asked women about the best and worst features of their experience of using MA at home and clinic. The responses were similar across the studies (see table below).

Table 4: The best and worst features of using MA at home and in clinic as reported by women

Experience of using mifepristone & misoprostol at home				*Experience of using mifepristone & misoprostol at clinic*			
Best	**Range**	**Worst**	**Range**	**Best**	**Range**	**Worst**	**Range**
Can choose the time of bleeding	30-70%	No worst feature	74-88%	Presence of provider	31-87%	No worst feature	82-93%
Can balance work and abortion	50-56%	Anxiousness	24%	Comfort	43-52%	Lack of privacy	45%
Privacy	61%			Privacy	5-16%		

Acceptability was assessed by measuring women's preference to use the same clinic or method and recommend it to others, if required. An overwhelming majority of home users (around 92-99%) indicated that they would opt for home use again to terminate a pregnancy if need were to arise in future (Chong et al 2015, Swica et al 2013, Conkling et al 2015, Platais et al 2016). Around 96-98% women stated they were also confident in suggesting MA to friends and relatives. (Table A12)

- **Best feature of self-administration is the planning of their bleeding process**
- **However, one-fourth of home users were anxious**
- **The best feature reported by the clinic users is the presence of a provider during abortion, while lack of privacy has been reported as the worst feature**
- **Majority (92-99%) intended to use MA at home in future if need arose**
- **Women took MA drugs on scheduled dates and time both at home and clinic**

3.2 Conclusion

Findings from these four studies show that providing women an option to take both mifepristone and misoprostol at home has immense potential to make medical abortion an acceptable and accessible option. Given the proven safety of mifepristone and that most women do not face any severe side effects following use, self-administering MA drugs is a viable choice. This option enables women to plan their bleeding process with preferred dates and times, ensures complete privacy, and allows management of abortion with the support of husband or other family members.

Chapter 4

Self-use of MA through pharmacy, online, telemedicine and other informal channels

4.0 Evidence of using MA through pharmacists: Global

Pharmacies almost universally serve as a first source of health care to people, particularly to low-income populations (Beitz, 2004; Bista et al 2002). Pharmacies are visited because of their convenience and geographic accessibility; consumers can access MA drugs, information and advice; waiting times are short and the cost of services can be less than in the formal sector (Banerjee et al 2017, Beitz 2004, Mayhew S 2001, Ramos et al, 2004). These advantages of pharmacies seem to be crucial for women seeking health care that is often socially stigmatized, such as abortion and contraception.

Even where abortion is available in the health system under a liberal abortion law and for a range of indications, pharmacies have an important role to play, especially in low-resource settings. A recent study conducted in India to estimate the incidence of abortion and unintended pregnancy (Singh et al 2018) revealed that an overwhelming majority of abortions in India (73%) are being carried out using MA obtained outside the health system, primarily through pharmacies. The scenario is similar in the other parts of the world, more so in the developing world (Tamang et al 2015).

However, there is limited documentation and evidence of outcome (successful and unsuccessful abortion, and complication) of using MA obtained directly through pharmacies. There is even less published documentation on successful interventions to improve knowledge, attitudes, practices and behaviors of pharmacy staff to ensure safe abortion services using MA.

4.1 Operation research to assess the efficacy of self-use of MA through pharmacies:

In this section we reviewed four recent studies conducted in Nepal (Tamang et al 2015, Tamang et al 2017) and Bangladesh (Footman et al 2016 and Footman et at 2017). Unlike in the previous chapters, these studies are presented separately because the primary purpose and outcome variables were not similar.

4.1.1 Operation Research study in Nepal: 2015

The first operation research (OR) in Nepal examined whether trained pharmacy workers can correctly provide information on safe use of mifepristone and misoprostol for early first-trimester medical abortion. The intervention group was given orientation and training using a harm-reduction approach, and compared with a non-equivalent comparison group. A total of 202 pharmacies participated in the intervention group and 212 in the comparison group. The intervention aimed to improve knowledge on correct use of MA for early pregnancy termination

among women and trained pharmacists on the eligibility criteria for safe MA use up to 9 weeks gestation, the recommended regimen and protocol, effective routes of administration, assessment of completeness abortion by woman, conditions and symptoms requiring immediate referrals to facilities and importance of a follow-up visit to a trained provider where possible for assessing completeness of abortion (Tamang et al 2015).

The trained pharmacy workers' knowledge increased substantially; however, no such improvement was found in the comparison cohort. Compared to the baseline (65%), 97% of trained pharmacy workers knew up to what stage of pregnancy and how women should use mifepristone and misoprostol. A higher percentage of pharmacy workers in the intervention group (77%), compared to the comparison group (49%), were knowledgeable at follow-up about determining whether an abortion was successful.

Of the total 11,480 women who sought advice from 207 intervention pharmacy shops during the study period, 5,594 (80%) were provided MA tablets for self-use by pharmacy workers. Of these, an overwhelming majority (5,576 or 99.7%) experienced complete abortion (Table A13) and only 0.3% (18 women) reported symptoms of incomplete abortion to a pharmacy worker, who then advised the woman to visit the nearest health facility for treatment of postabortion complications. (Tamang et al 2015).

4.1.2 Operation Research study in Nepal: 2017

The second OR study conducted in Nepal (Tamang et al 2017) examined the outcome of self-use of MA through pharmacists. The study compared the outcomes in terms of complete abortion, safety and satisfaction among women who were administered MA drugs by two groups of pharmacy workers trained at different time intervals.

This study showed no significant difference in complete abortions among women who accessed MA from pharmacy workers trained during 2015 (96.9%) and trained during 2010 (98.9%) (Tamang et al. 2017).

Pharmacy workers, if oriented adequately, can effectively provide safe MA drugs and information to women.

Further, women who accessed MA drugs from these pharmacists for self-use reported no serious complications and there was little difference in their satisfaction levels (Tamang et.al. 2017). The rate of complete abortions and the level of satisfaction reported in the study were comparable to the other global studies conducted under the guidance of health facilities or hospitals. Thus, these two studies conclude that pharmacy workers if adequately trained can safely and effectively provide MA drugs and information to women, without prescription.

4.1.3 Research Study in Bangladesh: 2016

In Bangladesh, where abortion is legal only to save a woman's life, menstrual regulation is officially recognized as an interim method for establishing non-pregnancy and the law permits the use of a combination of mifepristone and misoprostol for a missed period. A prospective cohort study in Bangladesh undertaken in 2015-2016 followed up women who purchased and self-administered either misoprostol alone or a combination of mifepristone and misoprostol and assessed clinical outcomes of these women (Footman et al 2017).

Of 109 women who provided information, the majority had used a mifepristone and misoprostol combination pack (80%) and 71% reported correct use (mifepristone followed 24 hours later by 800µg misoprostol). A majority (96%) of women who used combination pack reported that they were no longer pregnant, but some women did report symptoms that suggested need for medical care including fever, heavy bleeding and cramping and pain. Only 2% of these women sought care (Footman, 2016).

4.1.4 Outcome of a study conducted in Bangladesh: 2017

Another unpublished study in Bangladesh highlighted the same subject. In this study, pharmacists were asked to enroll women who agreed to be followed up for the purpose of the study (Footman et al 2017).

Findings of this study were encouraging. Most women who were sold a combination of the two drugs took the correct regimen. The abortion completion rates were comparable to clinic use of medical abortion drugs. An overwhelming majority (94.3%) reported that they were not pregnant at the time of follow-up contact (Table A13). This abortion rate was comparable to the rate observed under clinic use (95-98%). However, among women who took only misoprostol, the completion rate was reported as 75%, significantly lower than the rate observed for the combination drug (Footman Katharine et al 2017).

4.2 Evidence of using MA through informal channels: India

Although there have been no studies on outcomes of self-use of MA in India, there were several research studies indicating the substantial use of MA drugs, including mifepristone and misoprostol, by women who access them without prescription. In the absence of direct evidence on self-use of MA in India, we reviewed nine studies that contacted women who visited facilities after using MA at home.

No studies were found exploring at length what happens to women who access MA drugs outside of the formal health facility and do not return for follow-up at a facility.

With growing acceptance of medical abortion in India, availability of medical abortion drugs through pharmacists is widespread and has been well documented (Banerjee et al 2017; Singh et al 2018). A recent study measuring the incidence of abortion in India estimated that 11.5 million medical abortions were done outside of health facilities in 2015 (Singh et al 2018). Evidence also revealed that when faced with an unintended pregnancy, the first attempt by women was to terminate it on their own, often using drugs purchased from the pharmacist without a prescription (Kumar et al 2013, Banerjee et al 2012a, Zavier et al 2012, and Elul et al 2004).

Women in one study indicated that they often delayed seeking care for an unintended pregnancy and used "oral medicines" or injections perceived to be abortifacients as a first line of action (Ganatra et al 2005).

Another study analyzed combined data from 14 cross-sectional household surveys conducted in the last ten years (2007-2016) in four major states of India and interviewed 18,820 currently married women to assess their reproductive behavior and knowledge, attitudes, and practices towards accessing abortion services. A sub-sample of 1,187 women who experienced abortion in the last three years preceding the survey were also interviewed (Banerjee et al 2017). The study revealed that the use of traditional abortion methods (e.g., herbs, oil massage) declined from 9% in 2004 to 0% in 2015, while the use of MA increased from 27% to 65% and surgical abortion declined from 64% to 35% in the same time. Along with abortion methods, a similar transition has also been reported for use of abortion providers. Women's use of a private doctor or private clinic declined from 60% to 30%, while use of informal providers, primarily pharmacists, increased from 13% to 43% between 2004 and 2015. This study also indicated a complication rate of 30% among women self-administered MA and other methods at home during 2004 and 2015.

A facility-based study conducted during August and December 2007 in Madhya Pradesh interviewed 381 women who received treatment for postabortion complications (Banerjee et al 2012a) at 10 secondary and tertiary level public facilities. More than half of these women (53%) originally attempted to induce abortion at home. Among those who reported complications, 47% visited a medicine shop and 79% used MA drugs. Although this study identified self-use as the primary method of termination it did not record the specific types of medicines women used for pregnancy termination. Women uniformly failed to report the name of the drugs provided by the pharmacists and reported different protocols of drug administration. Around 65% women reported heavy bleeding followed by 60% abdominal pain as the major outcome of postabortion complications. Half of these women (54%) were hospitalized and 15% required blood transfusion.

Another study conducted in Bihar and Jharkhand echoed the results of the Madhya Pradesh study. Women presenting themselves to NGO-run facilities for terminating a pregnancy between 2008-2010 reported at least one attempt to terminate the current pregnancy at home by ingesting allopathic or Ayurvedic drugs prior to presenting at the facility (Kumar et al 2013). Of the 1,065 women who reported making an unsuccessful attempt to terminate their pregnancy, 43% reported using an allopathic drug (combination of mifepristone-misoprostol, misoprostol alone, mifepristone alone, and emergency contraception or oral contraceptive pills). About 35% women reported using Ayurvedic or homeopathic drugs and 23% could not identify the drugs they had taken (Kumar et al 2013).

In a study undertaken in Bihar and Jharkhand in 2004, women indicated that they often delayed seeking care for an unintended pregnancy and used "oral medicines" or injections perceived to be abortifacients as a first line of action (Ganatra et al 2005).

In a study with chemists and providers in Gujarat, five of 13 chemists reported that customers who approached them for MA drugs came to the chemist shop without a prescription, knew the names of the abortion medicines and asked for them either by their brand names or by the generic names, while eight reported that customers sought their help in suggesting what medicines to take for terminating pregnancy (Visaria et al 2006). Recommendation of drugs included Ayurvedic medicines as they didn't have any side effects, while some reported recommending abortion drugs.

In addition to WHO recommended medical abortion drugs (mifepristone and misoprostol), a range of other drugs are also available and used by women to abort an unintended pregnancy. These drugs have no proven efficacy at terminating a pregnancy. Data from a few studies undertaken over the last decade indicate that between 11-53% of women received abortion services at a health facility reported at least one prior attempt at terminating the pregnancy; a majority reported using home remedies, Ayurveda drugs or allopathic tablets obtained from the pharmacists without prescription (Stillman et al 2014).

As per the law, pharmacists in India cannot dispense medical abortion drugs without a prescription. However, available evidence suggests otherwise. For example, a study in Bihar and Jharkhand, in 2005, found that pharmacists sell medical abortion drugs and other Ayurvedic and Homeopathic drugs without prescription. Additionally, chemists interviewed had inadequate knowledge about drug doses, gestation age limits and side effects and they did not inform their clients about the need to get this information (Ganatra et al 2005). The scenario has not changed much in India in the last decade. A recent study undertaken in Madhya Pradesh in 2013 reported a similar trend (Powell Jackson T et al 2015) and observed poor knowledge and quality of MA service provision, counselling, and information by the pharmacists.

4.3 Off-label use of misoprostol alone

Misoprostol was originally marketed for gastric ulcer prevention and treatment causes, uterine contraction, and cervical ripening. Use of misoprostol for a range of obstetric and gynaecological applications is well known, including for first- and second-trimester abortion, induction of labour, prevention and management of postpartum hemorrhage, and treatment of miscarriage (Sherris et al 2005).

In countries where abortion is restricted and mifepristone is not registered, women use misoprostol alone to terminate an unintended pregnancy or to induce menstruation or uterine bleeding. Misoprostol use has been documented widely in Brazil, as has the practice of using misoprostol for termination of pregnancy and treatment of incomplete abortion in Latin America, the Caribbean, Sub Saharan Africa, and South Asia (Dzuba et al 2013).

Information on what to expect was missing as most women reported that though the pharmacist had told them about some of the symptoms, they were unable to determine whether the symptoms were normal or whether complete abortion had taken place (Sherris et al 2008)

Evidence tells us that women are accessing misoprostol through physicians, pharmacists over the counter, the black market, and street vendors. Findings from a multi-country study undertaken from 2001-2002 to better understand the availability and use of misoprostol alone to induce abortion indicate that in some developing countries women access misoprostol through pharmacies and self-medicate to induce abortion. Women who reported self-administering misoprostol said that their source of information about the drug was their male partners, family or friends, or drugstores (Sheris et al 2008). Information on what to expect was missing as most women reported that though the pharmacist had told them about some of the symptoms, they were unable to determine whether the symptoms were normal or whether complete abortion had taken place (Sherris et al 2008).

In Latin America and the Caribbean (LAC), only Cuba, French Guiana, Guyana, Mexico City and Puerto Rico have liberal laws that permit women to terminate pregnancies (with varying gestational limits) (Dzuba et al 2013). Misoprostol is available over the counter in pharmacies in many LAC countries, generally at low cost. In the absence of accurate abortion statistics, it is not easy to assess the impact of misoprostol on abortion and morbidity in LAC. But evidence suggests that it is safer for clandestine use than alternative unsafe methods and that it reduces morbidity and mortality (Dzuba et al 2013).

In low- and middle-income countries where abortion is restricted, women access medical abortion pills from pharmacists without prescription. Pharmacists are a common source of consultation about abortion and women sometimes prefer going to pharmacists for information and for medical abortion because of convenience, anonymity and cost (WHO 2015).

4.4 Evidence of using MA online: Hotlines, SMS and Telemedicine

While there is evidence on the efficacy and acceptability of self-administration of MA, with both mifepristone and misoprostol being administered at home, there is scant evidence on the efficacy and acceptability of using hotlines or online support to access MA.

According to the study '*Exploring the feasibility of obtaining Mifepristone and Misoprostol from the Internet,*' obtaining MA drugs online through pharmaceutical websites is feasible in the USA (Murtagh et.al. 2017). Of 18 combination

products and two misoprostol products received from 16 different sites, no site required a prescription or any relevant medical information. The time between online order and receipt of the 20 MA drugs ranged from 3-21 business days (median waiting time was 9.5 days). The price for the 18 combination products ranged between $110 (INR 7,500) to $360 (INR 23,400), including shipping and fees. However, the cost of misoprostol without mifepristone was less than the combination product.

Chemical assays observed that 18 tablets labelled 200mg mifepristone contained between 184.3mg and 204.1mg mifepristone, while 20 tablets labelled 200mcg misoprostol contained between 34.1mcg and 201.4mcg of the active ingredient. Thus, given the findings, we expect that women for whom clinic-based abortion is not easily available or acceptable may consider self-sourcing pills from the internet to be a rational option (Murtagh et.al. 2017).

New finding suggests that women for whom clinic-based abortion is not available or acceptable may consider self-sourcing pills from internet as a rational option.

To bridge the digital divide and complement online work, Women on Web (WoW) has been working with local partners and international networks using different strategies, such as mobile phones, SMS and word-of-mouth campaigns to build awareness about MA drugs available locally. The Republic of Ireland (usually referred to as Ireland) and Northern Ireland have some of the most restrictive abortion laws in the world. Abortion is allowed in Ireland only to save a woman's life (note: this law was overturned by voters in May of 2018; the studies reviewed here were conducted before that referendum). In Northern Ireland, abortion is allowed only to save the woman's permanent physical and mental health. Analysis of outcome data from 1,000 women who received MA drugs from WoW services in Ireland between January 2010 to December 2012 revealed that 94.7% had complete abortion without any surgical intervention. Post-abortion complications were reported by a small number of women and required interventions like blood transfusion (n=7) and use of antibiotics (n=26). Medical advice was suggested to 92 women and of these 87 sought some medical care (Aiken et al 2017).

The WoW website went on line in April 2006 and the helpdesk answered an average of 10,000 emails in 16 languages every month. WoW provided data on women who accessed their services, indicating that the outcome of the procedure has been comparable with the results where abortion services were provided as outpatient services. Thus, women can safely self-administer MA drugs at home, provided they have full and correct information with additional online interactive consultations (Aiken et al 2017, Gomperts R et al 2008).

Women can safely self-use MA drugs at home, provided they have full and correct information with additional online interactive consultations.

In Argentina, Chile, Ecuador, Peru and Venezuela, women's groups have established free hotlines as a risk reduction strategy to mitigate the harm of clandestine abortions (Dzuba et al 2013). Women Help Women and Women on Web are two web sites that provided women with accurate information based on WHO Guidance, send them mifepristone and misoprostol with directions for use, provided advice if required. From these two internet based interventions the complete abortion rate using both mifepristone and misoprostol was around 96-98% —or higher if used in early pregnancy termination (Berer 2015).

Women on Web (WoW) captured data on clinical outcomes for women who self-used MA drugs for terminating pregnancies. Data revealed ongoing pregnancy of 1.6-1.9% for women with pregnancies of less than 13 weeks, while surgical intervention was undertaken for 12.4-20.9% for various complications. This indicates that women do seek in person care from a provider when faced with complications or an adverse outcome of MA (Gomperts et al 2014, Gomperts et al 2012, Gomperts et al 2008).

Limited evidence is available on the outcome of women who accessed MA drugs through telemedicine. The available evidence reiterates that women do access mifepristone and misoprostol, or misoprostol alone to terminate unintended pregnancies. Hotlines and the web/internet have expanded the choices for women by giving them access to medical abortion drugs, thus preventing them from undergoing clandestine unsafe procedures.

Hotlines and the internet have expanded the choices for women, providing access to MA drugs and preventing clandestine unsafe abortions.

Gynuity started a pilot project in 2016 to evaluate the feasibility and acceptability of a model to provide medical abortion by telemedicine in four U.S. states: New York, Hawaii, Oregon and Washington. Women were provided counseling via video conference, obtained screening tests at facilities close to them, and if eligible were sent mifepristone and misoprostol by mail (Gynuity Program Brief).

The efficacy of telemedicine for MA provision has been documented. An independent, multi-year evaluation of Planned Parenthood of the Heartland's telemedicine abortion program in Iowa demonstrated that provision of medical abortion through telemedicine enhanced access, resulted in earlier abortions, was safe and effective, and was highly acceptable to the women who utilized it (Reproductive Health Technologies Project 2017). Results of this evaluation indicated that MA through telemedicine had comparable clinical outcomes to face-to-face provision. For example, an evaluation report by Reproductive Health Technologies Project (2017) stated that 99% of telemedicine users had complete abortions and less than one percent reported serious complications such as visiting emergency room or requiring blood transfusion (Grossman et al 2011 and 2013). The same evaluation reported that 94% of women who chose telemedicine were very satisfied with the process, compared to 88% of face-to-face clients, and were more likely to recommend this to others (Reproductive Health Technologies Project 2017).

4.5 Community-based interventions

Involving community-based organizations to encourage MA use is an innovation that has been explored in Kenya and Tanzania. An operations research study undertaken by the Public Health Institute and Ipas in Kenya and Tanzania in 2012 aimed to explore the feasibility of involving community-based organizations (CBOs) to educate communities about correct uses of misoprostol for abortion and postpartum haemorrhage. These organizations developed innovative ways of informing women and ensuring access to misoprostol by connecting CBOs with the pharmacists selling misoprostol. The results prove that even when abortion is restricted by law and socially stigmatized, CBOs can openly share information about misoprostol and refer it to women without political backlash (Coeytaux F et al 2014).

Community-based organizations can openly share information about misoprostol and refer it to women without political backlash (Coeytaux F et al 2014).

- **Hotlines, the internet, women's groups, and community level mobilizations are responding to women's need for information on self- use of MA drugs.**
- **Hotlines are used in countries where abortion is legally restricted; for example, in Latin America, sub Saharan Africa, Asia, and Eastern Europe.**
- **Hotlines provide information but not pills.**
- **Studies suggest provision of MA through telemedicine has enhanced women's access, resulted in early abortions, is safe and effective and acceptable.**
- **Results indicate that MA through telemedicine has comparable clinical outcomes to face-to-face provision.**

4.6 Challenges and concerns of ensuring safe-abortion through pharmacists and other informal channels

Even with some evidence of successful implementation of self-use of MA through pharmacists (Tamang et al 2015, Tamang et al 2017) and other informal channels (Aiken et al 2017, Gomperts R et al 2008), concerns have often been raised about women's ability to accurately assess their gestation age to be eligible for MA; their ability to identify completeness of abortion or complications; or their need to seek medical care or their ability to self-administer MA drugs as per instructions. Concerns have also been raised on the scope, ability, intention and attitude of pharmacists and other informal providers to manage the unintended pregnancy by ensuring correct information and products, as well as post-abortion contraception to prevent repeated unintended pregnancy. This section explores concerns and challenges of ensuring safe use of MA drugs through pharmacists and other informal channels. Although these studies do not necessarily focus on the population using MA through informal channels, they still provide general evidence of women's capacity to handle issues that may arise through the use of MA from pharmacies, hotlines and telemedicine.

More than 90% women can calculate their gestational age with a small margin of error which is of no consequence to efficacy of MA (Shannon et al 2008)

4.6.1 Women's ability to assess gestation age

One concern in provision of MA is the assessment of gestational age for eligibility of MA. Clinically, gestational age can be assessed by taking a woman's history of last menstrual period (LMP) and examination by a trained provider. Ultrasound can be used in cases where there is a need to confirm the gestational age or pregnancy location or viability (Kapp et al 2017). However, evidence suggests that women can recall their LMP and determine the duration of their pregnancy regardless of education and whether they routinely record the dates of their LMP. Kapp et al (2017) presented data from a systematic review evaluating the accuracy of using LMP to determine eligibility for first- trimester abortion. Findings from 7,500 women revealed that between 3 to12% women failed to assess their gestational age based on their LMP to be eligible for first trimester abortion (Schonberg D 2014). Clark et al (2007) suggested that women are likely to be conservative in assessing their eligibility for medical abortion and since small underestimates of gestational age are not likely to lead to any adverse reactions to medical abortion, it is safe to rely on information provided by women with knowledge of their LMP. Shannon and Winnikof (2008) also suggest that more than 90% women can calculate their gestational age with a small margin of error which is of no consequence to efficacy of MA.

New technology such as mobile phone applications and an online gestational age calculator to assess gestational age has been piloted in Ghana and South Africa (Kapp et al 2017). In the pilot in Ghana, while a majority of women (94%) agreed with the providers' assessment of their gestational age, 72% needed verbal instructions to use the application's pregnancy wheel calculator to complete the assessment. In the study in South Africa, 71 out of 78 participants found the gestational age calculator easy to use and only 3 out of 78 participants miscalculated their eligibility for MMA (Kapp et al 2017).

4.6.2 Ability of women to self-administer MA drugs as per instructions

As discussed in chapter 3, there is ample evidence that women can take both mifepristone and misoprostol according to a set of explicit instructions (Erica et al 2015, Swica et al 2013, Conkling et al 2015, Platais et al 2016).Though many of these studies focus on guidance from formal providers, studies in Nepal (Tamang et al 2015, Tamang et al 2017) also showed women's capacity to administer MA drugs successfully at home through information and guidance provided by trained pharmacists (Tamang et al 2015-2017).

In the case of telemedicine, women were capable of self-administering mifepristone and misoprostol at home without the presence of a provider, so long as proper information and clear instructions were given on how and when to use the drugs.

4.6.3 Ability of women to assess the medical abortion outcome (completeness of pregnancy termination)

Another challenge and concern of self-use of MA is women's ability to assess completeness of abortion and obtain follow-up care as needed. Recent studies conducted in India and Nepal observed the feasibility of self-assessment as a successful approach. A study conducted in India to understand the feasibility of self-assessment of completion of abortion using a low sensitivity urine pregnancy test recorded a high degree of success in assessment of completion of pregnancy (Iyengar et al 2016). The study of Nepal has echoed similar results without even using pregnancy testing device (Tamang et al 2015 & 2017).

These studies suggested that the common practice of scheduling a clinical contact after every medical abortion may not be necessary to ensure safety; enabling patients to determine for themselves whether a contact is needed can be a reasonable approach (Raymond et al 2017).

4.6.4 Ability of women to identify complications and seek care if needed

Studies revealed that women who experienced complications were capable of handling them either by themselves or by seeking medical help. It was rare that a woman undergoing an abortion and in need of treatment would not seek medical help. Signs and symptoms of hemorrhage or severe bleeding were clear to women and they would present themselves to a facility for care (Shannon and Winnikoff 2008, Banerjee et al 2012). A study conducted in India to explore the pathways of unsafe abortion has also shown the ability of women to identify complications after self-use of MA. Further, the majority of these complications after self-use were not severe and life threatening, as it could be with other invasive procedures that women may seek to terminate a pregnancy (Banerjee et al 2012a).

The challenge, of course, is the loss of time to reach to any health facility for treating complications. When women live in remote areas with limited access to medical care, they often approach another informal provider who is

not capable of treating and managing complications and lose important time when the woman is having minor or heavy bleeding or minor infection (Banerjee 2012a). The argument in this case is not to restrict availability of MA drugs but to empower women by giving them informed choices and correct information. For women, the safest and most effective choice is to take mifepristone and misoprostol with minimum medical supervision and for them to receive adequate information and assistance to help them make informed choice (Shannon and Winnikoff 2008).

4.6.5 Cost of treating complications after self-use of MA

Although the cost of self-use of MA was often reported being low (Banerjee et al 2017), the cost to women of treating incomplete abortion is often very high. Several studies have shown higher cost of treating complications primarily because of multiple visits and to a far-away facility that would suggest medicines and clinical tests not required for successful abortion with self-use of MA (Banerjee et al 2012b). This additional cost mostly affects the poor segment of population who approached higher-level urban facilities for treating incomplete abortion (Banerjee et al 2016, Banerjee et al 2012b).

4.6.6 Ability of pharmacist to ensure safe access to MA

Several studies examined the capacity of pharmacists to ensure access to appropriate MA information and services. In the 2015 Tamang et al study in Nepal, a majority of pharmacists in the intervention district showed significant improvement on knowledge of gestation (improved from 65% to 97%), recommended regimen (improved from 22% to 88%), time interval between mifepristone and misoprostol (improved from 48% to 93%) and assessment of completeness of abortion and postabortion complication requiring medical attention. Thus, comprehensive training and follow-up can ensure safe access to MA through pharmacists. However, the major advantage of implementation of the Nepal program was that around 66% of the pharmacists were mid-level providers who had formal training on health issues.

The picture of pharmacists without any comprehensive training on medical abortion is entirely opposite. A study conducted in India among pharmacists of Madhya Pradesh (Powell-Jackson et al 2015) interviewed 591 pharmacists from 60 local markets and observed a poor quality of knowledge and advice. A majority of pharmacists (69%) stated that abortion was illegal in India, 34% didn't know how to calculate gestational age, 69% were not aware of the legal gestation limit for medical abortion, and 45% didn't know the dosage and timing of MA drugs in combination packs. Knowledge of what questions to ask, what advice should be given, and the warning signs of potential complications was not universal.

Further, this study observed significant variations between knowledge and real practice. For example, 67% knew to ask clients the timing of the last menstrual period but only 39% did so in practice. While 91% recognized heavy bleeding as a warning sign, only 50% of pharmacists gave advice on this matter.

Thus, knowledge and practice of untrained pharmacists seem to be a major challenge and barrier of implementing MA through pharmacist. There is a high likelihood that women or the husband/partner of pregnant women who purchase MA drugs from pharmacists receive incorrect or no information on the safe use of medical abortion.

4.6.7 Serious adverse events associated with self-use of MA

Systemic infections and major hemorrhage occur in approximately one in 5000-10,000 MA procedures, requiring immediate care and these signs and symptoms are very clear to women (Shannon and Winikoff 2008). Toxic shock syndrome resulting from severe infections has rarely been reported after self-use of MA. One concern is self-diagnosis of life-threatening complications in time to seek competent medical help.

The pros and cons of restricting access to MA considering possible fatal infections needs to be reviewed carefully. Clinicians must be made aware of this rare but potentially fatal adverse event as they play a key role in prevention of fatal injury. They need to inform women about the possibility of clinical toxic shock after medical abortion, especially with unsafe and clandestine medical abortion that may result in prolonged, heavy bleeding and incomplete abortions because of differences in regimens of mifepristone and misoprostol (Cittadini et al 2014). However, one must bear in mind that women with an unintended pregnancy will seek ways and means to terminate it which may at times result in serious, or may be fatal, complications or incomplete abortion. In legally restrictive environments or in countries where abortion is legal but services are not easily available, withholding mifepristone would deny women a positive health intervention (Shannon and Winikoff 2008). Some policy makers and providers have raised concerns on consequences of incomplete abortion or ongoing pregnancy that may result, in rare cases, in morbidity or mortality. Available evidence indicates that this can be treated effectively with misoprostol which is often a preferred alternative to surgical intervention (Shannon and Winikoff 2008).

4.6.8 Quality of MA drugs

Concerns have also been raised on the quality of MA drugs supplied through pharmacies and web-based channels. With multiple brands and cost variations it is difficult for women to assess drug quality, as pills may not contain the right amount of medication or may be fake. In addition misoprostol needs to be kept in double-aluminum blister packs to retain its effectiveness.

Studies on the assessment of quality of MA drugs have been extremely rare. A recent study carried out in the USA by Murtagh et al (2017) to examine the chemical assays observed that 18 tablets labeled 200mg mifepristone contained between 184.3mg and 204.1mg mifepristone, while 20 tablets labeled 200 mcg misoprostol contained between 34.1 mcg and 201.4 mcg of the active ingredient. Studies in this regard are still limited and have almost no evidence in developing countries.

4.7 Conclusion

MA has been a ground-breaking innovation making non-invasive abortion a reality for women. It is evident that women are becoming increasingly aware of the safety of using MA, either through combination of mifepristone and misoprostol or misoprostol alone, to terminate an unintended pregnancy. In countries where abortion is legally restricted women can access MA drugs and, if necessary, use them without any clinical support. This means that women who are poor and do not have access to services can opt for a less-invasive medical abortion rather than undergo a termination through use of invasive and often dangerous methods. Where services are restricted due to laws or lack of accessibility, women can obtain MA drugs through physicians, pharmacies, drug sellers, online or even the black market.

The role of pharmacies in ensuring access to abortion services is already being established globally. With proper training and post-training follow-up support, pharmacists can ensure that women have the drugs and information necessary for self-use of MA. However, pharmacists without training are more likely to simply sell women the MA drugs without providing correct information on drug protocols, regimen, potential complications, and post-abortion complications.

Telemedicine and the internet are innovations that cannot be ignored in ensuring that women who need a termination will have access to drugs, particularly in countries where the laws are very restrictive.

Telemedicine and the internet are innovations that cannot be ignored in ensuring that women who need a termination will have access to drugs, particularly in countries where the laws are very restrictive. Mobilizing community groups and women's groups are other forums with great potential for increasing access to MA drugs. Evidence from a variety of studies shows that women are able to determine appropriate gestational age, use MA drugs per instructions and obtain follow-up care as needed for adverse events. As such, the use of MA drugs through informal systems may be feasible, so long as those systems provide women with basic information on safety and procedures around MA use.

Chapter 5

Summary and discussion

5.0 Summary and discussion

This systematic review clearly suggests that self-administration of medical abortion is a feasible and acceptable option for women wanting to terminate an unintended pregnancy across varying legal and cultural contexts. It is safe and effective (with efficacy ranging between 84-97%). Women find it acceptable- given the option, women prefer to undergo the entire abortion process at home. And studies show that the ssuccess rate of abortion is not significantly affected by the choice of women to consume it at home or clinic – the overwhelming majority of women successfully terminated their pregnancy using the option of home-use for both MA drugs.

In countries where abortion is restricted, the use of channels such as the internet or telemedicine has opened new avenues for accessing safe abortion. Women can access medical abortion drugs after an assessment by a provider via email. Studies show that this is safer, less invasive and a better alternative to traditional methods. However, results should be interpreted with caution as the evidence gathered for each aspect was limited by the small number of observational and OR studies.

In addition, the findings had several implementation challenges and barriers which might influence the outcome of self-use of MA. Additional prospective studies are needed to explore the many gaps identified during the review. The charts below summarize the overall findings of this systematic review, under few selected headings of interest.

Summary of evidence on self-use of medical abortion

Issues	Review findings	Certainty in the evidence	Available evidence /country
Acceptance and perceptions of self-administration of medical abortion			
1. Approval & acceptance of women	The overwhelming majority of women approved the concept of self-use of MA globally.Around 92% to 99% of women who self-administered MA at home indicated that they would opt for home-use again if need arose in future.	Strong	Ganatra et al. 2010/India WHO 2015/Global Chong et al 2015/USA Swica et al 2013/USA Conkling et al 2015/Nepal Platais et al 2016/Kazakhstan Mundle et al 2008/India
2. Satisfaction with self-use at home	Women were overwhelmingly satisfied with self-administration of MA drugs at home. Satisfaction levels ranged from 83% to 98% when women chose to take misoprostol at home and reached 98% when women opted self-administration of combined mifepristone and misoprostol at home.	Strong	Plaitas et al 2016/Kazakhstan Elul et al 2000/USA Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Iyengar et al 2016/India Bracken et al 2010/India Mundle et al 2008/India Kalyankar et al 2014/India Fiala et al 2004/Sweden Clark et al 2005/ France Blanchard 2015/South Africa Lokeland et al 2014/ Norway
3. Reasons for choosing self-administration of MA drugs at home (perceived benefits of self-administration)	Women found self-administration of MA at home more desirable because they did not have to pay for additional visits to the clinic; it was more confidential and convenient to take the MA drugs in presence of a family member or spouse; it helped them in managing routine household chores; it also helped them to decide the time of bleeding.	Strong	Elul et al 2000/USA Akin et al 2004/ Turkey Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Ngoc et al. 2004/ Vietnam Elul et al 2001/Vietnam/Tunisia Fiala et al 2004/Sweden Clark et al 2005/ France Blanchard 2015/South Africa Boersma et al. 2011/Netherlands Kopp Kallner 2010/ Sweden Lokeland et al 2014/ Norway Stillman et al 2014/India Ganatra et al 2010/India Bracken 2010/India Mundle et al 2008/India Ramachander et al 2005/India Shah et al 2005/India
4. Perceived concerns of self-administration of MA drugs at home	Women primarily expressed some concerns about completion of abortion.	Moderate	Conkling et al 2015/ Nepal Swica et al 2013/USA Platais et al 2016/ Kazakhstan

Issues	Review findings	Certainty in the evidence	Available evidence /country
5. Perceptions of providers	Research studies revealed that providers overwhelmingly approved self-administration of medical abortion. However, they uniformly suggested that women have guidance from a trained person to help ensure the safety of the process.	Strong	Acharya et al 2012/India Ganatra et al 2005/India WHO 2015/global
6. Providers' reluctance to suggest self or home administration of MA to rural and relatively less educated women	Studies have shown that providers' attitude about self-use are transitioning. Recent studies have successfully recruited more rural and less-educated women for self-administration and observed no significant variations in the success rate of abortion through self-administration of MA.	Low	Iyengar et al 2016/India Mundle et al 2008/India
Safety and efficacy of MA among women used mifepristone at clinic and misoprostol at home			
7. Preferred choice of women for using misoprostol at home and clinic	Given a choice between home and clinic use of MA, the majority indicate that they would prefer using misoprostol at home.	Strong	Berer 2005 Akin et al 2004/ Turkey Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Ngoc et al. 2004/ Vietnam Elul et al 2001/Vietnam/Tunisia Mundle et al 2008/India
8. Intervention protocol and regimen followed	Almost similar protocol across all studies. Gestation: 49-70 days; Regimen: 200-400/800; Dosages: after 48 hours of taking mifepristone; Routes: Oral, vaginal, buccal (piloted all routes); Follow-up visits: Day 14; Counselled on: what to expect, complications that need medical attention, follow-up contacts	Strong	Akin et al 2004/ Turkey Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Ngoc et al. 2004/ Vietnam Elul et al 2001/Vietnam/Tunisia Fiala et al 2004/Sweden Clark et al 2005/ France Blanchard 2015/South Africa Boersma et al. 2011/Netherlands Kopp Kallner 2010/ Sweden Lokeland et al 2014/ Norway
9. Successful completion of abortion among women administered mifepristone at clinic and misoprostol at home versus women used both at clinic: Global evidence	Successful completion of abortion after self-use of misoprostol ranged from 89% to 97% at home; the completion rate at clinic ranged from 80% to 97%. There were no significant variations in outcome between home-use and clinic-use of misoprostol.	Strong	Akin et al 2004/ Turkey Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Ngoc et al. 2004/ Vietnam Elul et al 2001/Vietnam/Tunisia

Issues	Review findings	Certainty in the evidence	Available evidence /country
10. Successful completion of abortion among women administered mifepristone at clinic and misoprostol at home without any comparison group: Global evidence	Successful completion of abortion after self-administration of misoprostol ranged from at 94% to 98%.	Strong	Fiala et al 2004/Sweden Clark et al 2005/ France Blanchard 2015/South Africa Boersma et al. 2011/Netherlands Kopp Kallner 2010/ Sweden Lokeland et al 2014/ Norway
11. Successful completion of abortion among women administered mifepristone at clinic and misoprostol at home versus women who used both at clinic: Indian evidence	Studies in India also showed no variations in completion rates of abortion among women self-administering misoprostol at home and in clinic. The success rates ranged from 86% to 98% after self-use at home and 94% to 96% with clinical support.	Strong	Iyengar et al 2016/India Bracken et al 2010/India Mundle et al 2008/India Chunni et al 2010/India Kalyankar et al 2014/India
12. Serious adverse event and complications	Prevalence of reported adverse events were low after the self-administration of misoprostol. Few required hospitalizations, with cluster of symptoms and excessive bleeding, and one woman in Sweden diagnosed with deep vein thrombosis unrelated to the abortion. However, a number of cases diagnosed with serious adverse events were insignificant. Reported complications and side effects included ongoing pregnancy, bleeding, abdominal pain, nausea and vomiting.	Strong	Akin et al 2004/ Turkey Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Ngoc et al. 2004/ Vietnam Elul et al 2001/Vietnam/Tunisia Fiala et al 2004/Sweden Blanchard 2015/South Africa Lokeland et al 2014/Norway
13. Follow-up visits after self-administration of misoprostol	Although women were uniformly instructed to contact the provider in case of any complications or questions, around 4%-31% reported making an unscheduled visit to the clinic mainly to discuss their concerns about completion of abortion and normal or excessive bleeding.	Strong	Akin et al 2004/ Turkey Bracken et al 2006/ Albania Hajri et al 2004/Tunisia Karki et al 2009/ Nepal Ngoc et al. 2004/ Vietnam Elul et al 2001/Vietnam/Tunisia Fiala et al 2004/Sweden Clark et al 2005/ France Blanchard 2015/South Africa Boersma et al. 2011/Netherlands Kopp Kallner 2010/ Sweden

Issues	Review findings	Certainty in the evidence	Available evidence /country
14. Contraception after self-administration of misoprostol	Studies uniformly have given no emphasis to examining the use of contraception after home-use of MA.	No	
Safety and efficacy of self-administration of mifepristone and misoprostol at home with clinical guidance			
15. Available scientific global evidence	Scientific evidence is limited. We reviewed four studies conducted during 2009 and 2013 in Nepal, USA and Kazakhstan. These studies explored comparative efficacy of using MA at home and clinic using non-randomized prospective study design.	Moderate	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
16. Preferred choice of women for using both mifepristone and misoprostol at home and clinic	Eligible women were given a choice of administration of MA drugs either at home or in the clinic. Choosing an option of self-administration at home was not very high in the USA (32%-46%). In contrast, in Kazakhstan (64%) and Nepal (72%), a majority opted for self-administration of MA at home.	Moderate	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
17. Intervention protocol and regimen followed	Variations were noted in the study protocol. Gestation age: 63-70 days; Regimen: 200mg of mifepristone and 400-800µg of misoprostol; Dosages: after 24-48 hours of taking mifepristone (two studies), 24-72 hours (one study) and 6-48 hours (one study); Routes of misoprostol administration: buccal and sublingual; Follow-up visits: Day 14; Counseled on: What to expect, complications that need medical attention, follow-up contacts	Moderate	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
18. Successful completion of abortion among women administered mifepristone and misoprostol at home versus women who used both at clinic	There was no difference in abortion outcome between women self-administering MA at home and clinic. The success rates of complete abortion after self-administration of MA ranged from 96% to 97%. The difference in outcome between home-use and clinic use was insignificant and the net variations were within the range of about one percentage point. The study conducted in Kazakhstan did not report abortion outcome separately for home and clinic use; the overall success rate was marked as 99%.	Moderate	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan

Issues	Review findings	Certainty in the evidence	Available evidence /country
19. Occurrence of serious adverse event and complications	No adverse events were reported during the study period. Further, home and clinic use of MA had marked no difference in ongoing pregnancy and incomplete abortions. Two studies that provided segmented data by home and clinic observed six ongoing pregnancies (Home: 3 & Clinic: 3) and 12 incomplete abortions (Home: 6 & Clinic: 6).The most commonly reported side effects included chills (59.6%), diarrhoea (30.9%), nausea (21.1%) and vomiting (15.4%).	Moderate	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
20. Adherence to protocol of administering MA drugs at home and clinic	Adherence to protocol was reported at length in all studies and was found to be high in both home use and clinic-use of MA. The range of taking mifepristone on scheduled date and time was 74% to 100%. Adherence to time protocol for misoprostol was even better, particularly among home users. Home users took misoprostol on time, ranging from 94% to 100%, while at clinic the same proportion ranged from 91% to 100%. The average (median) gap between mifepristone and misoprostol was around 24 to 25 hours both at home and clinic.	Moderate	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA
21. Preference of deciding the day for self-administration of misoprostol	Women who planned to take misoprostol on weekend was higher among home users, indicating desire to manage their bleeding when at home. Around 33% to 50% home-users took misoprostol during the weekend.	Moderate	Conkling et al 2015/Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
22. Follow-up contacts and visits after self-administration of mifepristone and misoprostol at home	Evidence revealed no major differences in unscheduled telephone contacts and visits among women who self-administered MA at home and women who received MA under clinical supervision and support. Among home users, 15% contacted provider over phone and 4.5% visited provider in-person, while the same ranged from 12% (telephone) to 2.5% (visits) among their in-clinic counterparts.	Moderate	Conkling et al 2015/Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
23. Reasons for opting for self-administration of MA drugs at home	Most commonly mentioned reasons were: 'allows more flexibility in schedule' (62-31%), 'can save days for work' (21-32%), and 'can manage everything along with household duties' (13-31%).	Strong	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan

Issues	Review findings	Certainty in the evidence	Available evidence /country
24. Reasons for opting for administration of MA at clinic	Women's shared reasons for opting for clinic administration included 'desire to start the process immediately' (27-59%), 'presence of provider' (14-85%), 'less anxiety' (16-56%), and 'comfort of being at clinic' (35-45%).	Strong	Conkling et al 2015/ Nepal Chong et al 2015/USA Swica et al 2013/USA Platais et al 2016/ Kazakhstan
25. Contraception after self-administration of mifepristone and misoprostol	Studies uniformly have not researched the pathways and use of contraception after home administration of MA. This area reveals serious gaps in research and implementation.	No	Studies uniformly have given no emphasis on postabortion contraception
Evidence of self-use of MA through pharmacy / pharmacy workers			
26. Pharmacists as a potential source of health care	Almost universally serve as a first source of health care	Strong	Beitz, 2004 Bista et.al 2002/Nepal Mayhew et al 2001/Ghana Mayhew et al 2001a/Ghana
27. Pharmacists (medicine sellers) as abortion provider and information source	Global: Pharmacists were a major source of consultation and abortion service provision, particularly in developing countries	Strong	Berer 2005 Dzuba et al 2013/Lat. America Erdman et al 2012 Kapp et al 2017/Global Tamang et al 2015/Nepal
	India: Role of pharmacists to ensure abortion services has increased substantially over time. Recent estimate suggests 73% of abortions are being carried out outside of health system.	Strong	Banerjee et al 2017/India Banerjee et al 2012/India Powell-Jackson et al 2015/India Singh et al 2018/India Stillman et al 2014/India Kumar et al 2013/India Zavier et al 2012/India Elul et al 2004
28. Knowledge and practice of pharmacy workers	Without proper training, pharmacy workers had incorrect knowledge about MA, drug protocol and legal aspects, which often led their wrong practice	Low	Ganatra et al 2005/India Powell-Jackson et al 2015/India Tamang et al 2015/Nepal Tamang et al 2017/Nepal
29. Availability of OR study to assess the outcome of self-administration of MA through pharmacists	Limited evidence. This document reviewed four OR studies conducted in Bangladesh and Nepal.	Low	Footman et al 2016/Bangladesh Footman et al 2016/Bangladesh Tamang et al 2015/Nepal Tamang et al 2017/Nepal
30. Outcome of self-administration of MA through pharmacists: Global	Pharmacy workers, if oriented adequately, can effectively provide safe MA services to women. 94% (in Bangladesh) to 99% (in Nepal) reported complete abortion. However, the completion rate was 75% among women who used only misoprostol. Reported complications were minor and cured through medical intervention.	Low	Footman et al 2016/Bangladesh Footman et al 2016/Bangladesh Tamang et al 2015/Nepal Tamang et al 2017/Nepal

Issues	Review findings	Certainty in the evidence	Available evidence /country
31. Outcome of self-administration of MA through pharmacists: India	No scientific evidence was found that explored what happened to women who accessed MA drugs at the pharmacy and didn't return to a facility. A household survey indicated a complication rate of 30% among women who self-administered tablets.	Low/No	Banerjee et al 2017/India
32. Sources of information of MA	Male partners, family or friends, or drug stores	Low	Sheris et al 2008/Latin America
Evidence of self-use of MA online: hotlines, SMS, & telemedicine			
33. Feasibility of ensuring MA through hotlines/ online/SMS	This option is feasible with proper education and information. Evidence suggested that women for whom clinic-based abortion was not available or acceptable or restricted may safely consider self-sourcing pills.	Low	Murtagh et al 2017/USA
34. Quality of MA drugs provided via online order	Chemical assays for 200mg mifepristone observed a range 184.3mg to 204.1mg of the active ingredients; for 200mcg misoprostol, the active ingredients ranged from 34.1mcg and 201.4mcg. Such studies were not available for developing countries, including India.	Low	Murtagh et al 2017/USA
35. Outcome of self-administration of MA through online services (web-based) and telephone	Self-administration of MA drugs through WoW (women on Web) services and telemedicine showed complete abortion of 95% to 98% among women who received MA drugs online or by post.	Low	Aiken et al 2017/Ireland Berer M 2015 Grossman et al. 2013/Iowa-USA
36. Postabortion complicationsor adverse events	With early gestation, approximately 5% of women required some intervention. However, gestational age has been instrumental to influence the success rates. Almost half of the women with >12 weeks of gestational required surgical intervention and 7% had ongoing pregnancy.	Low	Aiken et al 2017/Ireland Gomperts et al 2008 Gomperts et al 2012 Gomperts et al 2014/Brazil Grossman et al. 2013/Iowa-USA
37. Satisfaction and acceptability of web/telephone based service provision	Women were very satisfied with the process of telemedicine (94%) compared to women receiving services face-to-face clients (88%)	Low	Grossman et al. 2011/Iowa-USA Grossman et al. 2013/Iowa-USA Reprod. Heal. Tech. Pro 2017
Evidence of ensuring MA through community-based interventions			
38. Available evidence and feasibility	Limited evidence available. PHI and Ipas Kenya piloted a community-based intervention to explore the feasibility of providing correct information on the usage of misoprostol for abortion and postpartum hemorrhage in Kenya and Tanzania. CBOs developed innovative ways of informing women and ensuring access to misoprostol by connecting CBOs with the local pharmacists selling misoprostol.	Low	Coeytaux et al 2014/Kenya & Tanzania

Issues	Review findings	Certainty in the evidence	Available evidence /country
39. Outcome of success	CBOs had adopted a harm reduction approach and openly shared information about misoprostol with community members and referred women for using it without any political backlash. However, no evidence was available on the outcome of the self-use of misoprostol.	Low	Coeytaux et al 2014/Kenya & Tanzania
Operational barriers to implement self-administration of MA through informal providers / channels (pharmacists, hotline, internet, SMS, CBOs)			
40. Women's ability to assess gestational age (GA)	This has been highlighted as an important barrier. However, evidence revealed that women with proper orientation can recall their LMP and determine the duration of their pregnancy regardless of education. Majority can calculate their GA with a small margin of error which is of no consequence to efficacy of MA.	Strong	Kapp et al 2017/Global Schonberg 2014/Global Clark et al 2007/Global Shannon et al 2008/Global
41. Women's ability to self-administer MA drugs	There is ample evidence that women with proper orientation and information can safely take both mifepristone and misoprostol at home. Studies have also shown that women can follow the instruction and guidance of providers.	Strong	Erica et al 2015/USA Swica et al 2013/USA Conkling et al 2015/Nepal Platais et al 2016/Kazakhstan Tamang et al 2015/Nepal Tamang et al 2017/Nepal
42. Women's ability to assess the abortion outcome	Evidence and research were limited. Women faced no complications after using MA were often being assessed as complete abortion. However, there was no systematic research. A recent study conducted in the USA exploring the feasibility of self-assessment of pregnancy outcome using MLPT found a high feasibility and success rate. A similar study was also conducted in India to understand the feasibility of self-assessment of completion of abortion using low sensitivity urine pregnancy test, and recorded high degree of feasibility. Success of this approach would enable women to decide whether a follow-up contact is needed. Further research is needed to test this approach in other countries.	Low	Raymond et al 2017/USA Iyengar et al 2016/India

Issues	Review findings	Certainty in the evidence	Available evidence /country
43. Women's ability to identify serious complications that need medical attention	Signs and symptoms of hemorrhage or severe bleeding were clear to women and they would present themselves to a facility for care. The challenges, however, were the loss of time to reach to any health facility for treating complications. This was primarily because of lack of understanding of the difference between normal and expected bleeding; lack of information from the providers; and lack of awareness of a provider who could treat complications (multiple visits).	Moderate	Shannon et al 2008 Banerjee et al 2012/ India
44. Cost-burden of treating postabortion complications	Unsuccessful self-administration of MA led to a higher cost burden and often impacted the poor segment of population. Understanding on this subject is limited.	Low	Banerjee et al 2012b/ India Banerjee et al 2016/ India Banerjee et al 2017/ India
45. Skill & ability of pharmacists to ensure safe access to MA	There was no uniformity in the knowledge and skill of the pharmacist by countries. Studies in Nepal and India have shown poor knowledge and practices of pharmacists without comprehensive training. However, the OR study of Nepal has shown significant improvement after training. Further, the profile of pharmacist (with or without prior training on the health issues) was found instrumental in their practice.	Moderate	Powell-Jackson et al 2015/India Tamang et al 2015/Nepal Tamang et al 2017/Nepal
46. Serious adverse events associated with self-use of MA	One concern is self-diagnosis of life threatening complications that require seeking competent medical help. However, the reported prevalence of fatal infections after self-use of MA was rare. In general, infections and major hemorrhage had occurred in about one in 5000-10,000 procedures. Toxic shock syndrome resulting from severe infections has rarely been reported after MA. Although, a few studies reported higher prevalence of post-abortion complications after self-use of MA, the level and nature of those complications needs to be reviewed carefully as women often failed to identify the difference between expected and adverse outcome.	Low	Shannon et al 2008 Cittadini et al 2014 Cittadini et al 2014/Italy
47. Quality of MA drugs	Literature was limited on the quality of MA and other Ayurvedic drugs. One study carried out in the USA to assess the quality of drugs provided through online delivery services found a varied range of chemical compositions. However, evidence was extremely limited in developing countries selling multiple brands of MA drugs.	Low	Murtagh et.al. 2017/USA Ganatra et al 2005/India Powell-Jackson et al 2015/India

5.1 The way forward: Filling the evidence gaps

This review has clearly highlighted that, for a multitude of reasons, many women prefer having a medical abortion in the privacy of their homes—and that, when given instructions in simple and clear language, they can manage the abortion on their own, without the need for medical supervision. They are able to schedule the timing of the abortion and their bleeding, they are capable of following the correct protocol and regimen, and they know when to seek medical care for complications.

This strongly suggests it is time to move away from highly supervised procedures- a step that would greatly expand women's access to a safe and effective method of terminating pregnancy, particularly in contexts where safe abortion services at health facilities are legally restricted or not easily accessible. However, there are evidence gaps that need further research, to ensure that adequate safety measures and support systems are in place. We strongly urge further research of these gaps, which would include:

- Further documentation of successful interventions on the safe use of medical abortion outside the formal health system
- Further documentation of interventions designed to change pharmacy policies related to pharmacists' providing medical abortion
- Follow-up studies on women who obtained medical abortion drugs from informal providers and then managed their abortions at home by themselves
- More research into the outcome, complications and management of complications after self-use of MA
- Further study of whether women are using contraception immediately after self-use of MA
- More research on the quality of MA drugs available in the market place, as the efficacy of self-use of MA will primarily rely on drug quality when women follow the correct regimen and protocol
- Further research into different regimens, routes of administration and use for varied gestational ages for the self-use of MA.

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ANNEXURE

Table A1: Summary of included studies comparing the efficacy of taking misoprostol at home and clinic: Global 2001 and 2009

Study/ Country	Regimen/ Route	Gestation	# of women recruited (LFU)		Complete abortion (%)		Follow up with service provider	
			H	C	H	C	H	C
Elul et al 2001. Vietnam	200, 400 oral	56 days	106 (8)	14 (0)	102 (96)[a]	11 (80)	Unscheduled clinic visits- 31% Calls to clinic- 8%	27% 7%
Elul et al 2001. Tunisia	200, 400 oral	56 days	170 (4)	25 (0)	158 (93)[a]	22 (88)	Unscheduled clinic visits- 8% Calls to clinic- 18%	18% 24%
Hajri et al 2004. Tunisia	200, 400 oral	56 days	250 (9)	82 (0)	233 (96.7)[b]	76 (92.7)	Unscheduled clinic visits - 5.4% called study hotline- 14.6%	12.3% 18.5%
Ngoc et al. 2004. Vietnam	200, 400, oral	56 days	1390 (24)	174 (0)	1231 (88.6)[a]	164 (94.3)	Unscheduled clinic visit- 9% Calls to clinic- 15.5%	4.6% 6.9%
Bracken et al 2006. Albania	200, 400, oral	56 days	361 (6)	48 (1)	345 (97.2)[b]	46 (97.9)	Unscheduled clinic visit[1]- 4.2% Calls to clinic-27%	4.2% 27%
Akin et al 2004. Turkey	200, 400, oral	56 days	104 (4)	104 (3)	92 (88.5)[a]	83 (79.8)	Unscheduled clinic visit-3.8% Calls to clinic-11.5%	11.5% 14.4%
Karki et al 2009. Nepal	200, 400, oral	56 days	323 (31)	77 (2)	267 (91.4)[)b]	68 (90.7)	Unscheduled clinic visit-11.1% Calls to clinic-19.5%	16.9% 20.8%
All Seven studies	200, 400, oral	56 days	2,704 (86)	524 (6)	2428 (92.7)[c]	470 (90.7)[c]	Unscheduled clinic visit-8.8% Calls to clinic-17.9%	10.2% 14.9%

H= Home users; C= Clinic users; LFU= Loss to Follow up; a: Authors calculated success rates based on all samples (including LFU); b: Authors calculated success rates based on reduced samples after excluding LFU)c: Summary measures are calculated after excluding loss to follow up

Table A2: Summary of included studies comparing the side effects of MA among women taking misoprostol at home and clinic

Study/ Country	OP n (%)		IC n (%)		Pain/Cramps Mean no. of days		Nausea Mean no. of days		Vomiting Mean no. of days		Fever/chills Mean no. of days		Heavy bleeding Mean no. of days	
	H	C	H	C	H	C	H	C	H	C	H	C	H	C
Elul et al 2001. Vietnam	1 (1)[a]		6 (5)[a]		2.3[a]		1.1		0.4*		NA		2.4*	
Elul et al 2001. Tunisia	3 (2)[a]		6 (3)[a]		2.6[a]		1.1		0.7*		NA		2.9*	
Hajri et al 2004. Tunisia	4 (1.7)	1 (1.2)	3 (1.2)	1 (1.2)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ngoc et al 2004. Vietnam	43 (3.1)	1 (0.6)	81 (5.8)	6 (3.4)	1.7	1.4	1.5	0.8	0.6	0.2	0.4	0	2.5	2.4
Bracken et al 2006. Albania	2 (0.6)	1 (2.1)	2 (0.6)	0 (0)	0.6	0.5	1.1	1.2	0.7	0.7	0.3	0.3	1.9	2.0
Akin et al 2004. Turkey	2 (1.9)	1 (1.0)	8 (7.7)	11 10.6)	2.9	2.6	2.0	1.8	0.8	0.4	1.0	0.4	2.1	1.7
Karki et al 2009. Nepal	9 (3.1)	0	11 (3.9)	5 (6.7)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
All Seven studies	60 (2.3)[b]	4 (0.8)[b]	105 (4.0)	23 (4.4)	1.7	1.5	1.5	1.3	0.7	0.4	0.6	0.4	2.2	2.0

a:data not available for Home and Clinic users separately; b: First two studies were not included here because of non-availability of segregated data for home users and clinic users
OP- Ongoing Pregnancy; IC- Incomplete Abortion, NA: Not available

Table A3: Summary of included studies with client satisfaction and acceptability of home-based and clinic-based medical abortion

Study/ Country	Satisfied or Highly satisfied with method (%)		Would choose same place of administration (%)	
	H	C	H	C
Elul et al 2001. Vietnam	91.0	87.0	93	7
Elul et al 2001. Tunisia	94.0	91.0	96	5
Hajri et al 2004. Tunisia	96.3	89.4	91.3	NA
Ngoc et al 2004. Vietnam	83.6	91.4	96.1	61.5
Bracken et al 2006. Albania[a]	90.6	90.3	95.6	60
Akin et al 2004. Turkey	NA	NA	94	55.6
Karki et al 2009. Nepal	88.3	97.2	NA	NA
All Seven studies	87.3	91.8	95.3	NC

a: 40% of the clinic users reported they would prefer home administration in the future

Table A4: Summary of included studies with outcome of taking misoprostol at home: Global 2004 and 2015

Study/ Country	Mifepristone (mg; Misoprostol (µg) Route	# of women recruited (Loss to follow up)	Complete abortion n (%)	Maximum gestational age (days)	Contact with service provider n (%)
Fiala et al 2004. Sweden	600, 400 + 400, oral	100 (0)	98 (98%)	≤49	Unscheduled clinic visit: 6 (6%)
Clark et al 2005. France[1]	200, 400 + 400, oral	30 (3)	26 (96)	≤49	Unscheduled clinic visit: 1 (4%)
Blanchard 2015. South Africa	200, 800 buccal or vaginal	865 (122)	719 (96.8)	≤ 63	Unscheduled clinic visit: 27 (3.6)
Boersma et al 2011. Curacao	200, 800 buccal 24–36 h	331 (23)	300 (97.7)	70	NA
Kopp Kallner 2010. Sweden	200, 800 vaginal	395 (0)	≤49 199 (98%) < 50–63 186 (96.9%)	63	unscheduled visit: ≤49: 12 (5.9%); 50–63: 6(3.1%)
Lokeland et al 2014. Norway	200, 800 vaginal	1018 (48)	953 (93.6)	63	NA
All Six studies	200-800	2739 (196)	2481 (97.5)	49-70	52 (4.1)

Table A5: Summary of included studies withreported side effects and complicationsafter taking misoprostol at home

Study	OP n (%)	IC n (%)	Pain/Cramps Mean no. of days	Nausea Mean no. of days	Vomiting Mean no. of days	Fever/chills Mean no. of days	Heavy bleeding Mean no. of days
Fiala et al 2004. Sweden	0	2 (2)	3.5	2.3	1.7	1.5	3.3
Clark et al 2005. France[a]	1 (4)	0					
Blanchard et al 2015. South Africa	2 (0.3)	22 (3.0)	NA	NA	NA	NA	NA
Boersma et al 2011. Curacao	0	1	NA	NA	NA	NA	NA
Koppkellner et al 2011. Sweden	≤49: 1 (10) < 50–63: 3 (30)	≤49: 2 (20) < 50–63: 2 (20)	NA	NA	NA	NA	NA
Lokeland et al 2014. Norway	2 (4%)	3 (6%)	NA	NA	NA	NA	NA
All six studies	9 (0.4)	32 (1.6)	NC	NC	NC	NC	NC

a: Clark et al reported side effects jointly for France and Sweden

Table A6: Summary of included studies comparing client satisfaction and acceptability of home-based medical abortion

Study	Satisfied or Highly satisfied with method n(%)	Would choose method again n (%)	Would choose same place of administration n (%)	Would recommend method to someone n (%)
Fiala et al 2004. Sweden	96 (96)	98 (98)	99 (99)	NA
Clark et al 2005. France,	24 (92)	NA	24 (92)	NA
Blanchard 2015. South Africa	724 (98.4)	683 (93.7)	NA	717 (98.0)
Boersma et al 2011. Curacao	NA	NA	NA	NA
Koppkellner 2011. Sweden	NA	NA	≤49: 144 (92.3) <50-63: 142 (86.6)	NA
Lokeland et al 2014. Norway	913 (95.8)	NA	NA	NA
All six studies	1757 (95.4)	781 (94.2)	409 (91.5)	717 (98)

Table A7: Summary of included studies in India comparing the efficacy of taking misoprostol at home and clinic: India 2008 and 2016

Study/ Country	Regimen/ Route	Number of women recruited (LFU)		Complete abortion n (%)		Maximum Gestational Age (days) and mean	Contact with service provider
		H	C	H	C		
Mundle et al 2008. Maharashtra, India	200, 400, sublingual	76 (1)	23	72 (94.7)	22 (95.6)	≤56. Mean 42.8	Unscheduled visits: H-13% C-4%. Calls: H-28% C-10%. Mainly to discuss concern about their abortion status and/or bleeding
Chunni et al 2009. Sikkim, India	200, 400, Oral	112 (5)	None	92 (86)[a]	None	≤63 Mean-50.6 days	NA
Bracken et al 2010. Maharashtra, New Delhi, UP	200, 400, Oral	530 (21)	69 (3)	453 (89)	61 (92.4)	≤56 Mean 44.5 days	NA
Kalyankar 2014. Maharashtra, India	200, 400, Oral	80 (0)	None	78 (97.5)[b]	None	≤63 Mean – 49 days	NA
Iyengar et al 2016. Rajasthan, India	200, 800 sublingual (55%), vaginal (17%) & oral (28%).	342 (15)c	389 (16)[c]	308 (94.2)	352 (94.4)	≤63	H- 47 (16.2) C- 72 (21.9)
All five studies	200-800	1140 (42)	481 (19)	1003 (91.3)	435 (94.2)	GA: 56-63 Mean: 45.5	Visits H: 16%, C: 20.9%

a: 92.8% for GA≤49 days, 83% for GA 50-56 days, 80% for GA 57-63 days; b: 100% for GA ≤49 days and 95.5% for 50-63 days; c:15 women among home users and 16 women among clinic users didn't complete the protocol of mifepristone and misoprostol.

LFU= Loss to Follow Up; NA: Not available;

Table A8: Summary of included studies conducted in India comparing the side effects of MA among women taken misoprostol at home and clinic

Study/ Country	Ongoing pregnancy n (%)		Incomplete abortion n (%)		Pain/Cramps Mean no. of days		Nausea Mean no. of days		Vomiting Mean no. of days		Fever/chills Mean no. of days		Heavy bleeding Mean no. of days	
	H	C	H	C	H	C	H	C	H	C	H	C	H	C
Mundle et al 2008. India	2 (2.6)	1 (4.3)	1 (1.3)	0 (0.0)	3.8	3.0	2.4	1.8	1.7	1.2	2.4	2.3	3.5	3.3
Chunni et al 2009. India	2 (1.8)	NA	8 (7.7)a	NA	NA	NA	GA wise:	NA	NA	NA	NA	NA	NA	NA
Bracken et al 2010. India	4 (0.8)	1 (1.5)	35 (6.9)	2 (3.0)	NA	2.0	NA	NA	NA	NA	NA	NA	NA	NA
Kalyankar et al 2014. India	1 (1.3)	NA	1 (1.3)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iyengar et al 2016. India	3 (0.9)	4 (1.1)	16 (4.9)	17 (4.6)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
All five studies	12 (1.1)	6 (1.3)	61 (4.7)	19 (4.1)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

a: Total failure was 15 which includes ongoing pregnancy 2, incomplete 8, medical indication 5; NA: Not available, NC: Not calculated

Table A9: Summary of included studies with client satisfaction and acceptability of home based and clinic based medical abortion in India

Study/ Country	Satisfied or Highly satisfied with method n (%)		Would choose same place of administration n (%)		Would recommend method to friend n (%)	
Mundle et al 2008. Maharashtra, India	60 (80)	19 (82.6)	66 (88)	14 (63)	NA	NA
Chunni et al 2009. Sikkim, India	NA	NA	NA	NA	NA	NA
Bracken et al 2010. Maharashtra, New Delhi, Uttar Pradesh, India	448 (90.7)	60 (92.3)	485 (95.3)	44 (67.1)	NA	NA
Kalyankar 2014. Maharashtra, India	78 (97.5)	NA	NA	NA	NA	NA
Iyengar et al 2016. India	276 (95.2%)1	320 (96.7%)[1]	236 (81.9)	224 (68.1)	181 (62.8%)	234 (71.1%)
All five studies	862 (91.8)	399 (95.0)	787 (90.2)	282 (67.7)	NC	NC

1: Calculated among 290 home users and 331 clinic user who had a scheduled contact; NC: Not calculated

Table A10: Selected studies on home-based administration of mifepristone, misoprostol and medical abortion outcomes

Study/ Country	Regimen/ Route	Maximum Gestational Age (days)	# of women recruited (Loss to follow up)		Contact with service provider		N for whom complete abortion status available		Complete abortion n (%)		OP n (%)		IC n (%)	
			H	C	H	C	H	C	H	C	H	C	H	C
Erica Chong et al 2015. USA	200, 800 buccal	≤63	128 (19) Onedid not take mife	272 (43)	Calls – 25 (0-3) Unscheduled visit- 2 (0–1)	40 (0-4) 4 (0–1)	108	229	104 (96.3)	222 (96.9)	2 (1.9)	3 (1.3)	2 (1.9)	3 (1.3)
Swica et al 2013. USA	200, 800 as per clinic protocol –not specified	≤63	139 (13)	162 (25)	Calls – 40 (0-8) Unscheduled visit- 7 (0–1)	25 (0-4) 2 (0–1)	127[a]	137[a]	121 (96.7) of 127	131(95.6) of 137	NA	NA	NA	NA
Plaitas et al 2016. Kazakhstan	200, 600 sublinguals	≤ 70	185 (1) One didn't take Mife	105 (0)	Calls- 10 (0-2) Unscheduled visits-2 (1.1)	5 (0-1) 4 (3.8)	184[b]	105	286 (99)[c]		1 (0.3)		2 (0.7)	
Conkling et al 2015. Nepal	200, 400 sublinguals	≤63	144 (8)	56(0)	Calls- 17 (11.8) Unscheduled visits – 16 (11.1)	2 (3.6) 5 (8.9)	136	56	130 (95.6)	53 (94.6)	1 (0.7)	0	4 (2.9)	3 (5.4)
All-four studies	Range: 200-800	≤63& ≤70 days	596 (41)	595 (68)	Calls 92 U-Visit:27	Calls 72 U-Visit:15	555	527	537 (96.8)	510 (96.8)	3 (1.2)	3 (1.1)[d]	6 (2.5)	6 (2.1)[d]

a: Home and clinic-based samples are estimated based on literature
b: One women in the home group decide not terminate pregnancy. Thus, 289 women were included for analyses
c: Success rate was defined here as complete abortion without surgical intervention; three women required surgical intervention during the study;
d: Calculated for two studies where ongoing pregnancy and incomplete abortion data were available separately by home and clinic administration

Table A11: Selected studies on compliance, timing of administration of MA drugs

Study/ Country	Mifepristone at scheduled time % (n)			Took misoprostol 24-48 hrs after mifepristone % (n)				Took misoprostol on weekend n (%)	
	On time		Median delay-Home (range)	On time n (%)		Median mifepristone-misoprostol interval (range)			
	H	C		H	C	H	C	H	C
Erica Chong et al 2015. USA	89 (82.4) of 108	NA	25 h (8 h to 4 days)	107 (99.1)	223 (97.4)	25 h (23–48 h)	25 h (0.5–53 h)	54 (50.0)	83 (36.2)
Swica et al 2013. USA	86 (73.5) of 117	NA	25 h (7 h–9 d)	81 (94.2)	113 (91.1)	24 (6–49 h)	24 (5–69 h)	48 (41.0)	45 (35.4)
Plaitas et al 2016. Kazakhstan	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conkling et al 2015. Nepal	132 (97.1) of 136	NA	36.5 (7.0–72.0)	135 (99.3)	54 (96.4)	24.0 (19.0–70.0)	24.0 (24.0–25.5)	39 (33.0)	9 (19.1)
All four studies	307 (85.0)	NA	NC	323 (97.8)	390 (95.4)	24.0 (NC)	24.0 (NC)	141 (39.1)	137 (33.3)

NA: Not available; NC: Not calculated

Table A12: Selected studies on acceptability of home based and clinic based medic0al abortion

Study/ Country	Satisfied or Highly satisfied with method n (%)		Would choose method again n (%)		Would choose same place of administration of mifepristone n (%)		Would recommend home use method to friend n (%)	
	H	C	H	C	H	C	H	C
Erica Chong et al 2015. USA	NA	NA	NA	NA	107 (99.1)	207 (90.4)	103 (96.0)	110 (48.0)
Swica et al 2013. USA	NA	NA	NA	NA	114 (95)	103 (81.7)	115 (97.5)	93 (75)
Plaitas et al 2016. Kazakhstan	179 (98.4)	101 (99.0)	178 (97.8)	100 (97.1)	168 (92.3)	8 (7.8) of 103	NA	NA
Conkling et al 2015. Nepal	NA	NA	NA	NA	133 (97.8)	42 (75.0)	133 (97.8)	51 (91.1)
All four studies	179 (98.4)[a]	101 (99.0)	178 (97.8)	100 (97.1)	522 (95.6)	360 (70.0)	351 (97.0)	254 (62.0)

a: Calculated from one study where data was available for satisfaction

Table A13: Summary of included studies with self-administration of MA through pharmacies in Nepal and Bangladesh[a]

Study/ Country	Study approach	Training	Successful sample	Maximum Gestational Age (week)	Regimen/Route	Complete abortion/ complication	Improved knowledge among pharmacists	Client satisfaction
Tamang 2015. Nepal	Self-use of MA through pharmacists. Quasi-control; Cluster sampling.	Training provided to intervention group using harm reduction approach	5,594 women	Up to 9 weeks	Mifepristone 200 mg (day1) ; Oral & Misoprostol 200 mcg 4 tablets (day 2) ; Intra-vaginal, buccal, sublingual	Complete abortion: 99.7% Only 0.3% reported complication	Correct GA `improved from65% to 97% (Intervention) 69% to 62% (comparison) Regimen- 22% to 88% (Intervention) 23% to 41% (comparison)	NA
Tamang 2017. Nepal	Self-use of MA through pharmacists; Non-inferiority design. Purposive sampling	Two groups -pharmacies trained in 2015 and trained in 2010 using harm reduction approach	992 women	Up to 9 weeks	200 mg of mifepristone; orally, followed by 800 mcg of misoprostol (24-48 hours); vaginal, buccal or sublingual.	Complete abortion- 96.9% 2015 batch and 98.8% from 2010 batch	Training provided at two different timeframes, Retained knowledge to dispense MA safely and with a high efficacy rate, irrespective of year of training.	95% reported satisfaction
Footman 2017. Bangladesh	Self-use of MA through pharmacists; Prospective cohort study	No training provided to pharmacists	109 women	combination of Mifepristone& Misoprostol- Up to 9 weeks, Misoprostol only -up to 12 weeks	combination of 200 mcg mifepristone and 800 mcg Misoprostol, 24h interval. Only misoprostol- <800 mcg to r 2400 mcg.	Complete abortion 89.9 % ; - 94.3% among combi users &75.0% among Miso only. 31.2% experienced complications	NA	NA

a: Meta-analysis was not carried out because of varied methodologies

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