Associação Moçambicana de Obstetras e Ginecologistas (AMOG) is the Mozambican Society of Obstetricians and Gynecologists. AMOG has a membership of experienced providers and scholars capable of promoting the judicious use of misoprostol, advocating for policy changes, and implementing interventions to increase the demand for and access to misoprostol in the country. They are on the forefront of supporting community-based interventions to improve maternal health, and provide key insight to the Ministry of Health in Mozambique to assist in policy decision-making.

Venture Strategies Innovations (VSI) is a California-based nonprofit organization committed to improving women’s health in developing countries by creating access to effective and affordable technologies on a large scale. VSI’s innovative approach involves partnerships that build upon existing infrastructure, resources and markets. VSI focuses on reducing barriers to access and enhancing human capacity to bring about sustainable improvements in health.

Bixby Center for Population, Health, and Sustainability is a research center located at the University of California, Berkeley (UCB) School of Public Health. The Center is dedicated to developing innovations to improve reproductive health in resource-poor settings, including reliable health information systems, local access to essential technologies, and guidelines for prioritizing interventions to maximize health impact. The Center assists in the implementation of maternal health programs and seeks to improve the health outcomes of the world’s poorest and most vulnerable women and their families.

Associação Moçambicana de Obstetras e Ginecologistas
Rua Caetano Viegas, nº 70, R/Chão
Maputo, Mozambique
Tel +258 82 4800 782
Website: www.amogmz.org

Venture Strategies Innovations
2401 East Katella Avenue, Suite 400
Anaheim, California 92806 USA
Tel +1 714 221 2040
Website: www.vsinnovations.org

Bixby Center for Population, Health, and Sustainability
School of Public Health
17 University Hall
University of California
Berkeley, CA 94720-7360
Tel + 1 415 502 4086
Website: http://bixby.berkeley.edu
Acknowledgements

We wish to acknowledge our collaborators in Mozambique who shared their wealth of experience as we developed this operational research. By sharing their knowledge of community health programs, monitoring and evaluation, and delivery of health care in Mozambique, they aided us in our effort to increase access to the life-saving drug misoprostol for postabortion care. We wish to thank expert staff and colleagues at the Associação Moçambicana de Obstetras e Ginecologistas for their dedication to the operational research and invaluable contributions to its development. We are indebted to the staff of VSI and the Bixby Center for Population, Health and Sustainability at the University of California, Berkeley for their tireless support, which made this operational research possible.

Prepared by:

Cassimo Bique, Ndola Prata, Martine Holston, Molly Moran, Rachel Weinrib

Additional Contributors:

Natalie Williams, Emma Nesper, Deborah Koh
Executive Summary

Complications of unsafe abortion contribute significantly to global maternal mortality. Mozambique has a maternal mortality ratio of 599 deaths per 100,000 live births, and it is estimated that 17% of maternal deaths in East Africa can be attributed to unsafe abortions. In 1999, Manhiça District in Maputo Province reported that 55% of obstetric complications in the district were due to incomplete abortion, and that this represented only a third of all expected obstetric complications in the district, suggesting many women suffer from the complications of unsafe abortion and other obstetric complications outside of facilities in Mozambique. Further, surgical supplies used to treat incomplete abortion, such as manual vacuum aspiration (MVA), are often out of stock in many Mozambican facilities.

Postabortion care (PAC) is a package of services that includes treatment of incomplete abortion, postabortion contraceptive services, and referral mechanisms for additional interventions and/or contraceptive method of choice. In order to reduce maternal mortality from complications of abortion in Mozambique, PAC services should be available at community health facilities as well as in hospital settings.

In July 2010, Associação Moçambicana de Obstetras e Ginecologistas (AMOG), Venture Strategies Innovations (VSI) and the Bixby Center for Population, Health and Sustainability at the University of California, Berkeley, initiated operational research in Mozambique with the goal of increasing access to PAC services by introducing misoprostol for the treatment of incomplete abortion and miscarriage at all levels of the health care system. The operational research aimed to demonstrate that the provision of misoprostol, an effective non-surgical alternative to MVA, for the treatment of incomplete abortion is feasible in all health facilities within the Mozambican health system. An additional objective was to use the results of this operational research to determine the most appropriate strategy for providing PAC services in the Mozambique context.

The operational research was undertaken in two rural districts, Monapo District (Nampula Province) and Macia District (Gaza Province). This operational research introduced misoprostol for the treatment of incomplete abortion among women presenting with a uterine size equivalent to gestational age up to 12 weeks without signs of complications, integrated within a functional referral system and along with contraceptive services. Misoprostol was introduced as the first line treatment of incomplete abortion, with MVA reserved for more complicated cases, larger uterine size, or as a backup method if misoprostol did not successfully complete the abortion.

Each level of the health care system (Centro de Saúde or CS 2/3, CS 1, and hospital) offered PAC services in this operational research. Misoprostol was introduced in the health facilities in July 2010 and implementation of the operational research continued through January 2011. During that time period, 300 women who presented at participating facilities with incomplete abortion underwent treatment with misoprostol. Providers conducted exit interviews with 188 women, or 63% of those who were treated with misoprostol.

Maternal and child health (MCH) nurses provided the majority of PAC services (86%) across all facility levels. All providers in the operational research reported that they gave the correct dose of misoprostol (a single dose of 600 mcg), via the correct route (oral). The majority of women (80%) did not experience
side effects. The most common side effects reported were headache (11%), shivering (10%) and nausea (8%).

No adverse events due to treatment and no maternal deaths were reported in this project. Of the 200 women who were treated with misoprostol for incomplete abortion and miscarriage and returned for a follow-up visit, 94.5% had a complete procedure with a single dose of misoprostol (95% CI 91.3% to 97.7%). Only 11 out of the 200 women who returned for a follow-up visit required additional interventions for completion. Protocols were in place to ensure that women would receive comprehensive services, but no referrals were necessary for the initial treatment or for additional treatment during the follow-up visit.

Most women stated during the exit interview that they received contraceptive counseling from their provider (100% at CS 2/3s, 98% at CS 1s and 100% at the hospital). The majority of women received a contraceptive method at the initial visit (81%); women at CS 2/3 facilities and CS 1 facilities were more likely to leave with a contraceptive method at the conclusion of their initial visit than at the hospital (92% and 83%, respectively, compared to 54%). The most common contraceptive methods given to women were oral contraceptive pills (55%) and injectable contraceptives (17%).

Client satisfaction with misoprostol was very high, with 89% of women stating that they would rate their overall experience with misoprostol as “good” (as opposed to “bad” or “okay”). Across all facility levels, over 90% of women said that they would use misoprostol again if they had the same condition and had a choice of treatment methods. Women receiving care at the hospital (73%) were more likely to agree that it was inconvenient as compared to those who received care at CS 2/3s and CS 1s (9% and 7%, respectively). Across all levels of provider, women reported that their pain was managed appropriately.

Twenty-eight providers participated in the provider interview representing all three facility levels. All providers agreed or strongly agreed that it was easy to learn how to use misoprostol to treat incomplete abortion, that they felt comfortable using misoprostol to treat incomplete abortion, that the training they received made them confident in using misoprostol for incomplete abortion, and that they would recommend the use of misoprostol for treatment of incomplete abortion to other qualified health care providers. Of those trained in MVA (all nurses and tecnicos medicina, n=21), all reported that they prefer misoprostol to MVA for treatment of incomplete abortion if both are available.

This operational research demonstrated that quality PAC services can be provided at all levels of the Mozambican health care system; therefore, we recommend that the use of misoprostol for treatment of incomplete abortion and miscarriage be scaled up throughout Mozambique, at all levels of the health system. The introduction of misoprostol expanded access to PAC by building the capacity of providers not previously trained in MVA, particularly parteira elementar (elementary midwives), to treat incomplete abortion. The technical guidelines for treatment of incomplete abortion should be updated to include misoprostol and disseminated to all key stakeholders and providers of PAC services so they can be implemented and services expanded. Additional efforts should be made to educate women and communities about how to prevent unwanted pregnancy, the consequences of unsafe abortion, and the availability of PAC services in Mozambique. Misoprostol, MVA equipment, family planning methods, and other supplies (e.g. pregnancy tests) need to be in stock and readily available to ensure that all women have access to PAC services.
## Acronyms and Local Terms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agente medicina</td>
<td>Medicine agent, a health worker with very basic health knowledge (one level below <em>enfermeira basica</em>)</td>
</tr>
<tr>
<td>AMOG</td>
<td>Associação Moçambicana de Obstetras e Ginecologistas</td>
</tr>
<tr>
<td>CS</td>
<td>Health Center (<em>Centro de Saúde</em>)</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
</tr>
<tr>
<td>MCH nurse</td>
<td>Maternal and Child Health nurse, the lowest primary level provider trained in MVA</td>
</tr>
<tr>
<td>MISAU</td>
<td>Ministry of Health (<em>Ministério da Saúde</em>)</td>
</tr>
<tr>
<td>MVA</td>
<td>Manual vacuum aspiration</td>
</tr>
<tr>
<td><em>Enfermeira basica</em></td>
<td>Elementary nurse not trained in MVA</td>
</tr>
<tr>
<td>PAC</td>
<td>Postabortion care</td>
</tr>
<tr>
<td><em>Parteira elementar</em></td>
<td>Elementary midwife, a low-level midwife not trained in MVA</td>
</tr>
<tr>
<td>PI</td>
<td>Principal Investigator</td>
</tr>
<tr>
<td>Posto da Saúde</td>
<td>Health post</td>
</tr>
<tr>
<td><em>Tecnico de medicina</em></td>
<td>Medical technician, a medium-level assistant medical officer trained in MVA</td>
</tr>
<tr>
<td>VSI</td>
<td>Venture Strategies Innovations</td>
</tr>
</tbody>
</table>
Table of Contents

Acknowledgements ........................................................................................................ iii
Executive Summary ......................................................................................................... iv
Acronyms and Local Terms ............................................................................................. vi
Table of Contents ........................................................................................................... vii
List of Boxes, Tables and Figures .................................................................................. viii

1. Introduction .................................................................................................................. 1
   1.1 Maternal Health and Unsafe Abortion in Mozambique .......................................... 1
   1.2 Misoprostol for Treatment of Miscarriage and Incomplete Abortion ...................... 2
   1.3 Partnerships ............................................................................................................ 2

2. Description of the Operational Research ..................................................................... 2
   2.1 Goals and Objectives of the Operational Research ............................................... 2
   2.2 Location and Participants ...................................................................................... 3
   2.3 Operational Research Timeline ............................................................................ 4
   2.4 Ethical Review ....................................................................................................... 4

3. Methods ....................................................................................................................... 5
   3.1 Strategy and Design .............................................................................................. 5
   3.2 Personnel and Training .......................................................................................... 6
      3.2.1 Organizational Structure .............................................................................. 6
      3.2.2 Training Structure ....................................................................................... 7
   3.3 Data Management and Analysis ............................................................................ 7
      3.3.1 Data Collection and Management .................................................................. 7
      3.3.2 Data Analysis ............................................................................................... 8

4. Results ........................................................................................................................ 8
   4.1 Background Characteristics of Study Population .................................................... 8
   4.2 Feasibility: PAC Service Provision ....................................................................... 10
   4.3 side Effects, Complications and Adverse Events .................................................. 11
   4.4 Referrals and Follow-up Outcomes ...................................................................... 12
   4.5 Family Planning Counseling and Provision .......................................................... 13
   4.6 Client Satisfaction ............................................................................................... 14
   4.7 Provider Perspectives ......................................................................................... 15

5. Conclusions ................................................................................................................ 17

6. Recommendations .................................................................................................... 18

7. References ................................................................................................................. 20

8. Appendix: Clinical Flow Charts ............................................................................... 22
List of Boxes, Tables and Figures

Table 1: Population and public health resources of operational research districts ........................................... 3
Table 2: Data collection ........................................................................................................................................ 8
Table 3: Characteristics of women seeking PAC services ................................................................................ 9
Table 4: Need for additional interventions at follow-up visit due to method failure ....................................... 13
Table 5: Contraceptive method provision: Initial visit ....................................................................................... 13
Table 6: Contraceptive service provision at the initial visit by ever use of contraceptives ................................. 14
Table 7: Satisfaction with method .................................................................................................................... 14
Table 8: Preferred location for service ............................................................................................................... 15
Table 9: Women’s perceived quality of care by level of provider ....................................................................... 15
Table 10: Characteristics of the providers .......................................................................................................... 16

Figure 1: Map of operational research districts ................................................................................................. 3
Figure 2: Operational research timeline ............................................................................................................... 4
Figure 3: PAC operational research services and referral linkages ..................................................................... 6
Figure 4: Organizational structure for PAC operational research ..................................................................... 7
Figure 5: Mode of transport to health facility, by health facility ......................................................................... 10
Figure 6: PAC service provision over time ......................................................................................................... 10
Figure 7: Provider of PAC services by facility level .......................................................................................... 11
Figure 8: Client report of experience of side effects .......................................................................................... 12
1. Introduction

1.1 MATERNAL HEALTH AND UNSAFE ABORTION IN MOZAMBIQUE

Persistent high maternal mortality rates continue to be a key public health issue for many countries in Africa. Complications of unsafe abortion contribute significantly to maternal mortality, and can include hemorrhaging, infection and poisoning from substances used to induce abortion (Grimes et al. 2006).

Unsafe abortion is defined by the World Health Organization (WHO) as a procedure for terminating an unintended pregnancy either by individuals without the necessary skills or in an environment that does not conform to minimum medical standards, or both (WHO 1993). An estimated 21.6 million unsafe abortions occur each year, resulting in the deaths of approximately 47,000 women, almost all of which could have been prevented (Shah and Ahman 2010). Nearly all (97%) unsafe abortions take place in developing countries (Grimes et al. 2006). Furthermore, rural and poor women are more likely to turn to unsafe abortion and therefore experience health complications, yet are less likely to receive postabortion care for complications (Singh et al. 2009).

Mozambique has a maternal mortality ratio of 599 deaths per 100,000 live births (Hogan et al. 2010), and it is estimated that 17% of maternal deaths in East Africa can be attributed to unsafe abortion (WHO 2007). In 2003, the Mozambican Demographic and Health Survey (DHS) found that the average number of children that a woman will bear over her lifetime, or total fertility rate (TFR), was 5.5 children, with a higher rate of 6.1 in rural areas. Desire for smaller families coupled with low levels of contraceptive use can lead to high levels of unintended pregnancy, and the DHS found that only 12% of married women were using a contraceptive method. The unmet need for family planning among married women and women with partners is approximately 18% (Instituto Nacional de Estatística, Ministério da Saúde and ORC Macro 2005).

Complications due to incomplete abortion contribute significantly to high levels of maternal mortality and morbidity in Mozambique. In 1999, Manhiça District in Maputo Province reported that 55% of obstetric complications in the district were due to incomplete abortion, and that this represented only a third of all expected obstetric complications in the district (Jamisse et al., 2004). Further, surgical supplies used to treat incomplete abortion, such as manual vacuum aspiration (MVA), are often out of stock in many Mozambican facilities. Ipas, a nonprofit organization, conducted a comprehensive assessment of abortion-related services in 45 public health facilities in 2002 and 2003, and found that almost half (46%) of the facilities reported having only one provider or no one trained in MVA clinical skills; less than two-thirds (61%) of the facilities stated that they currently possessed MVA instruments; and almost half (43%) of the facilities did not use high-level disinfection to sterilize the MVA cannulae before reuse (Dgedge et al., 2005).

Postabortion care (PAC) is a package of services that includes treatment of incomplete abortion, postabortion contraceptive services, and referral mechanisms for additional interventions and/or contraceptive method of choice. Postabortion Care services should be available at community health facilities, in addition to hospital settings, in order to reduce maternal mortality (ACOG 2009).
1.2 MISOPROSTOL FOR TREATMENT OF MISCARRIAGE AND INCOMPLETE ABORTION
Incomplete abortion is the retention of products of conception after an induced abortion or a spontaneous abortion (also known as miscarriage). Women presenting with incomplete abortion typically have vaginal bleeding and a dilated cervix. WHO has defined the treatment of incomplete abortion as an essential element of obstetric care (WHO 1991); further, the treatment of uncomplicated incomplete abortion can be provided at the primary care level (Raghavan and Bynum J, 2009). Because women can receive misoprostol for treatment of incomplete abortion at a primary care facility, the caseload of patients seeking treatment at higher level health facilities could be reduced (FLASOG, 2007).

While surgical methods, such as MVA, for treating incomplete abortion exist, misoprostol provides a safe, non-surgical alternative that mid- and low-level providers can administer to women. Misoprostol treatment can be provided almost anywhere and has minimal service delivery requirements (Ipas and VSI, 2011). The drug has efficacy rates of 91% to 99%, which are comparable to the efficacy rates of 91.5% to 100% for surgical evacuation procedures (Raghavan and Bynum, 2009), and is a low-cost means of uterine evacuation (Blum et al. 2007). Numerous studies have revealed that over 90% of women are satisfied or very satisfied with treatment of incomplete abortion using misoprostol (Bique et al., 2007; Dao et al., 2007; Diop et al., 2009); providers also report high levels of satisfaction with the treatment (Ipas Nigeria and SOGON 2011).

The WHO included misoprostol in its Model List of Essential Medicines in April 2009 for the management of incomplete abortion and miscarriage (WHO, 2010) and the Priority Medicines for Mother and Children (WHO, 2011). Further, it has been recommended for use in postabortion care by the International Federation for Obstetricians and Gynecologists (Shaw 2007), along with many other international professional organizations and associations (ACOG, 2009).

1.3 PARTNERSHIPS
The Expanding Access to PAC Services in Mozambique operational research was a collaboration among the Associação Moçambicana de Obstetras e Ginecologistas (AMOG), Venture Strategies Innovations (VSI), and the Bixby Center for Population, Health and Sustainability at the University of California, Berkeley. These partners have previously worked together successfully on a community-based operational research to introduce misoprostol for prevention of postpartum hemorrhage.

2. Description of the Operational Research

2.1 GOALS AND OBJECTIVES OF THE OPERATIONAL RESEARCH
The overall goal of this operational research was to increase access to PAC services by introducing misoprostol for the treatment of incomplete abortion and miscarriage in all levels of the health care system. Ultimately, the results of this operational research will contribute to the development of programs and policies that will reduce the number of unplanned pregnancies and abortions by providing safe, high-quality reproductive health services that are acceptable to women and as close to their homes as possible.
The specific objectives of this operational research were:

1. To demonstrate that the provision of misoprostol for the treatment of incomplete abortion is feasible in all health facilities within the Mozambique health system;
2. To understand the barriers, logistical components, and other service delivery management implications of scaling up the use of misoprostol for treatment of incomplete abortion in all public sector settings;
3. To determine the most appropriate strategy for providing PAC services in the Mozambique context;
4. To understand postabortion contraceptive uptake, method choice, barriers to method use, client characteristics and choices, and quality care issues;
5. To provide empirical evidence for revising clinical guidelines to include misoprostol for the treatment of incomplete abortion in Mozambique for all providers and at all facility levels; and
6. To document provider perspectives on the inclusion of misoprostol in PAC services.

2.2 LOCATION AND PARTICIPANTS
Two rural districts participated in this operational research: Monapo District (Nampula Province) and Macia District (Gaza Province). All public health facilities and providers in the districts participated in the operational research. The locations of the districts are shown on the map in Figure 1.

Figure 1: Map of operational research districts

Table 1 presents the population and number of public facilities and providers in each district.

Table 1: Population and public health resources of operational research districts

<table>
<thead>
<tr>
<th></th>
<th>Monapo</th>
<th>Macia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>334,939</td>
<td>158,805</td>
<td>493,744</td>
</tr>
<tr>
<td>Public Health Facilities</td>
<td>10</td>
<td>11</td>
<td>21</td>
</tr>
<tr>
<td>Centro de Saúde 2 and 3</td>
<td>6</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Centro de Saúde 1</td>
<td>2</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Hospital</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Public Health Care Providers</td>
<td>37</td>
<td>36</td>
<td>62</td>
</tr>
</tbody>
</table>

1Censo 2007, INE, Instituto Nacional de Estatística
The public health facilities in this operational research are broken down into three levels: Centro de Saúde (CS) 2/3, CS 1 and hospital.

- **CS 2/3**: A CS 3 facility, also referred to as Posto da Saúde (health post), is the lowest level health facility and is typically staffed with one parteira elementar (elementary midwife) and sometimes with a enfermeira basica (elementary nurse). CS 2s are slightly higher level than CS 3s, with three to seven workers that include at least one maternal and child health (MCH) nurse or parteira elementar, one enfermeira basica, and one agente de medicina (medicine agent). For the purposes of this report, CS 2 and 3 are combined because they have few distinctions in terms of their capacity to provide PAC services.

- **CS 1**: A CS 1 is the highest primary level facility before a hospital, which usually has a small maternity ward but cannot conduct surgery. CS 1s are typically staffed with four to six MCH nurses, administrative workers, one basic level pharmacist, one medical doctor, and occasionally one basic level lab technician.

- **Hospital**: One hospital participated in this operational research, located in Monapo District. It is a referral facility for the district and the three surrounding districts. This hospital has a much larger staff than CS 2/3 and 1s, composed of doctors, tecnico de medicinas (medical technicians), nurses, parteira elementar and administrative staff, and has an operating theater for surgery.

### 2.3 OPERATIONAL RESEARCH TIMELINE

The development, implementation and analysis of this operational research took place over the course of 18 months. VSI and AMOG developed the operational research proposal, manual of operations and data collection tools between November 2009 and April 2010. Training took place between June and July 2010. Implementation of the operational research began in July 2010 as providers were trained and concluded at the end of January 2011 (seven months). The VSI Monitoring and Evaluation (M&E) team completed the data analysis and wrote the final report in April 2011.

**Figure 2: Operational research timeline**

<table>
<thead>
<tr>
<th>Nov ’09 – Apr ’10</th>
<th>Jun – Jul ’10</th>
<th>Jul ’10 – Jan’11</th>
<th>Feb – Apr ’11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>Training</td>
<td>Implementation</td>
<td>Analysis</td>
</tr>
</tbody>
</table>

### 2.4 ETHICAL REVIEW

The operational research was granted ethical clearance by the Comite de Bioetica da Saude of Mozambique. The researchers obtained ethical approval for analysis of service delivery data and to conduct exit and provider interviews from the University of California, Berkeley Committee for the Protection of Human Subjects (#2010-03-930). Before conducting the exit and provider interviews, the researchers obtained informed consent from participants.
3. Methods

3.1 STRATEGY AND DESIGN

This operational research introduced misoprostol for the treatment of incomplete abortion, integrated within a functional referral system, with the ultimate aim of increasing access to PAC services and reducing severe abortion-related morbidity and mortality. The program was comprehensive in both the services it provided and the involvement of all levels of the health care system (Figure 3).

In this program, PAC services included:

- **Treatment of incomplete abortion:** Both misoprostol and surgical methods were used for the treatment of women who sought care for incomplete abortion. All public health providers in the districts participating in the operational research were trained on the use of misoprostol for treatment of incomplete abortion and to follow medical protocol based on the level of health facility and provider (e.g. referral for treatment beyond the capacity of provider and/or facility, as demonstrated below in Figure 3). Misoprostol was introduced as the first line treatment for incomplete abortion, followed by MVA according to medical protocols.

- **Contraceptive counseling and services:** All women were to receive postabortion family planning counseling and provision of their choice of an effective contraceptive method.

- **Referral:** To ensure comprehensive provision of services, referral linkages were established at all health facility levels. The lower levels of the health care system, CS 2/3 and CS 1, were included to improve the accessibility of the services to women, and were linked with higher levels of facility for supervision and referrals.

This operational research expanded PAC services by adding misoprostol for treatment of incomplete abortion for women presenting with a uterine size equivalent to gestational age up to 12 weeks without signs of complications. Within Mozambique’s health system, all MCH and higher level nurses should be trained in and provide MVA for treatment of incomplete abortion; however, in reality, lack of training and/or supplies hinders nurses’ ability to treat women presenting with incomplete abortion. The use of misoprostol as the first line treatment of incomplete abortion allows providers to offer PAC services in light of these realities, with MVA reserved for more complicated cases, greater uterine size, or as a backup method if misoprostol does not complete the abortion.

Every level of Mozambique’s health care system offered PAC services in this operational research. Figure 3 gives an overview of PAC service provision at the CSs with and without MVA capacity, and at hospitals. While both CS 2/3 and 1s should have a provider trained in MVA and supplies available, this is not always the case. Therefore, the service delivery guidelines and medical protocols for this operational research were designed based on whether a facility had the capacity to provide MVA, and not by the facility level. Referral for complicated cases or where the treatment necessary was beyond the capacity of the facility followed the appropriate referral guidelines. At every facility level, providers counseled women on family planning and offered them their choice of methods after the procedure.

Refer to Appendix: Clinical Flow Charts for more detailed information.
Figure 3: PAC operational research services and referral linkages

**3.2 PERSONNEL AND TRAINING**

**3.2.1 Organizational Structure**
Dr. Cassimo Bique and Dr. Momade Ustá served as the principal investigators (PIs) for this operational research and were housed at the AMOG office in Maputo (Figure 4). The PIs were responsible for supportive supervision of the data entry and field supervisors (who were responsible for the routine activities of the operational research), carrying out monitoring visits, ensuring compliance with medical and programmatic protocols developed for this operational research, following up on any reported adverse effects and overseeing data management. Additional co-investigators, Professor António Bugalho of AMOG and Dr. Ndola Prata, Associate Professor in Residence, University of California, Berkeley School of Public Health, Scientific Director of the UC Berkeley Bixby Center, and Medical and Programs Director of VSI, supported the operational research development, implementation and evaluation. Martine Holston, VSI Director of Research and Implementation, served as the M&E Coordinator and oversaw the data analysis and writing of the final report. All health care providers working in Monapo and Macia districts provided PAC services along with their regular service provision.
3.2.2 Training Structure
The PIs, with support from VSI staff, trained 36 providers in Macia District and 37 in Monapo District between June and July 2010. Each district had a two-day training, covering the use of misoprostol (600mcg orally) to treat women presenting with symptoms of an incomplete abortion, diagnosis of complete abortion by assessing the uterine size with bimanual examination, a refresher course in MVA for PAC as a back-up method to misoprostol, and comprehensive counseling on family planning and contraceptives.

Due to high turnover in the health facilities, field supervisors and facility staff continually trained replacement staff on the operational research protocol.

3.3 DATA MANAGEMENT AND ANALYSIS
3.3.1 Data Collection and Management
All women seeking PAC services had their clinical service-related information recorded on a client record developed for this operational research, the **Service Delivery Form**. All women who presented for PAC services were told to return for a follow-up visit within 14 days of service provision. Clinical follow-up assessment and treatment information were also recorded in the **Service Delivery Form**.

Women were asked if they would be willing to participate in an exit interview when they returned to the facility. The exit interview consisted of a short series of questions about the woman’s experience with the specific procedure, as well as her satisfaction with the services provided by the facility and provider. A provider who did not provide services to the woman at her initial or follow-up visits administered the interview using the **Exit Interview Questionnaire**.

The field supervisors collected the forms on a regular basis and sent them to Principal Investigator Dr. Cassimo Bique. Data entry and management were conducted by data entry personnel overseen by Dr. Bique. All data were entered using **Census and Survey Processing System** (CSPro).
The PI conducted interviews using the **Provider Interview Questionnaire** during supervisory visits. The purpose of these interviews was to examine providers’ perspectives on the feasibility of integrating misoprostol into PAC services and to assess their acceptability of and satisfaction with misoprostol for treatment of incomplete abortion.

### 3.3.2 Data Analysis
The VSI M&E team conducted all data analyses in *Stata/SE* 10 (StataCorp 2007) in April 2011, summarizing the results using frequency tables and cross-tabulations.

### 4. Results

Health facilities involved in the operational research began providing PAC services with misoprostol in July 2010. Implementation and data collection continued at the health facilities until January 2011. During that time period, 300 women presented at participating facilities with incomplete abortion and were treated with misoprostol. Providers conducted exit interviews with 188 women, or 63% of the women who were treated with misoprostol.

The following analyses are based on the **Service Delivery Form** data of the 300 women who were treated with misoprostol for incomplete abortion and data from the 188 **Exit Interview Questionnaires** (Table 2). In addition, 28 providers participated in the provider interview.

**Table 2: Data collection** (July 2010 – January 2011)

<table>
<thead>
<tr>
<th></th>
<th>CS 2/3s</th>
<th>CS 1s</th>
<th>Hospital</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Delivery Form</td>
<td>109</td>
<td>134</td>
<td>57</td>
<td>300</td>
</tr>
<tr>
<td>Exit Interview Questionnaire</td>
<td>81 (74.3%)</td>
<td>92 (68.7%)</td>
<td>15 (26.3%)</td>
<td>188 (62.7%)</td>
</tr>
</tbody>
</table>

#### 4.1 BACKGROUND CHARACTERISTICS OF STUDY POPULATION

The background characteristics of the women seeking PAC services at the health facilities are presented in Table 3. For clients at all health facilities, the mean age was around 25 years and the mean number of previous abortions was less than one. Of those who had a previous abortion (n=59), the mean number of abortions was 1.5 (data not shown).

Hospital clients were more likely to be illiterate (54%) than CS 2/3 (34%) clients and CS 1 clients (26%). About half of all CS 2/3 and CS 1 clients had at least a primary education (48% and 50%, respectively) compared to a quarter of hospital clients (25%). More CS 2/3 clients reported never being married (75%) than CS 1 clients (55%) and hospital clients (47%).

Three-quarters of all women lived one hour or less from the health facility that they attended, indicating that PAC services were being offered to women relatively close to where they live. Around half of the women (58%) indicated that their current pregnancy was planned, but that they had a miscarriage.
Table 3: Characteristics of women seeking PAC services

<table>
<thead>
<tr>
<th></th>
<th>CS 2/3 clients (N=109)</th>
<th>CS 1 clients (N=134)</th>
<th>Hospital clients (N=57)</th>
<th>Total (N=300)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (min; max)</td>
<td>24.6 (15; 45)</td>
<td>26.0 (13; 47)</td>
<td>24.6 (15; 48)</td>
<td>25.3 (13; 48)</td>
</tr>
<tr>
<td>Obstetrical history (mean)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravida (min; max)</td>
<td>3.4 (1; 11)</td>
<td>3.9 (1; 15)</td>
<td>3.3 (1; 8)</td>
<td>3.6 (1; 15)</td>
</tr>
<tr>
<td>Abortions (min; max)</td>
<td>0.2 (0; 2)</td>
<td>0.3 (0; 4)</td>
<td>0.3 (0; 2)</td>
<td>0.3 (0; 4)</td>
</tr>
<tr>
<td>Parity (min; max)</td>
<td>2.2 (0; 9)</td>
<td>2.7 (0; 13)</td>
<td>2.3 (0; 8)</td>
<td>2.5 (0; 13)</td>
</tr>
<tr>
<td>Education level^</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>37 (33.9%)</td>
<td>35 (26.1%)</td>
<td>31 (54.4%)</td>
<td>103 (34.3%)</td>
</tr>
<tr>
<td>Primary</td>
<td>52 (47.7%)</td>
<td>67 (50.0%)</td>
<td>14 (24.6%)</td>
<td>133 (44.3%)</td>
</tr>
<tr>
<td>Secondary</td>
<td>18 (16.5%)</td>
<td>30 (22.4%)</td>
<td>11 (19.3%)</td>
<td>59 (19.7%)</td>
</tr>
<tr>
<td>Above secondary</td>
<td>1 (0.9%)</td>
<td>2 (1.5%)</td>
<td>1 (1.8%)</td>
<td>4 (1.3%)</td>
</tr>
<tr>
<td>Marital status^</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>82 (75.2%)</td>
<td>74 (55.2%)</td>
<td>27 (47.4%)</td>
<td>183 (61.0%)</td>
</tr>
<tr>
<td>Ever married^</td>
<td>26 (23.9%)</td>
<td>60 (44.8%)</td>
<td>30 (52.6%)</td>
<td>116 (38.7%)</td>
</tr>
<tr>
<td>Distance to health facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One hour</td>
<td>82 (75.2%)</td>
<td>104 (77.6%)</td>
<td>41 (71.9%)</td>
<td>227 (75.7%)</td>
</tr>
<tr>
<td>Two hours</td>
<td>13 (11.9%)</td>
<td>13 (9.7%)</td>
<td>5 (8.8%)</td>
<td>31 (10.3%)</td>
</tr>
<tr>
<td>Three hours</td>
<td>7 (6.4%)</td>
<td>6 (4.5%)</td>
<td>1 (1.8%)</td>
<td>14 (4.7%)</td>
</tr>
<tr>
<td>Four or more hours</td>
<td>4 (3.7%)</td>
<td>8 (6.0%)</td>
<td>2 (3.5%)</td>
<td>14 (4.7%)</td>
</tr>
<tr>
<td>No response</td>
<td>3 (2.8%)</td>
<td>3 (2.2%)</td>
<td>8 (14.0%)</td>
<td>14 (4.7%)</td>
</tr>
<tr>
<td>Desire for current pregnancy^</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unplanned, wanted to get pregnant later</td>
<td>34 (31.2%)</td>
<td>39 (29.1%)</td>
<td>9 (15.8%)</td>
<td>82 (27.3%)</td>
</tr>
<tr>
<td>Unplanned, did not want to get pregnant at all</td>
<td>13 (11.9%)</td>
<td>23 (17.2%)</td>
<td>4 (7.0%)</td>
<td>40 (13.3%)</td>
</tr>
<tr>
<td>Planned, but miscarriage</td>
<td>58 (53.2%)</td>
<td>71 (53.0%)</td>
<td>44 (77.2%)</td>
<td>173 (57.7%)</td>
</tr>
<tr>
<td>Planned, but now unwanted or health issue requiring intervention</td>
<td>3 (2.8%)</td>
<td>1 (0.8%)</td>
<td>0 (0%)</td>
<td>4 (1.3%)</td>
</tr>
</tbody>
</table>

Source: Service Delivery Form

^Includes divorced and widowed women

^No response from 0.9% of CS 2 clients

As seen in Figure 5, the majority of women seeking PAC services at all levels of health facilities walked to the facility for treatment. More women seeking treatment at CS 2/3 used a bike (7%) compared to those traveling to CS 1 (1%) and the hospital (4%).
Figure 5: Mode of transport to health facility, by health facility (N=300)^

Source: Service Delivery Form
Note: Error bars indicate minimum and maximum values
^Note: No response from 0.9% of CS 2 clients and 0.8% of CS 1 clients.

4.2 FEASIBILITY: PAC SERVICE PROVISION

A total of 300 women were treated with misoprostol for incomplete abortion at operational research sites between July 2010 and January 2011. Service utilization increased over time but significantly more in CS 2/3s and CS 1s (Figure 6).

Figure 6: PAC service provision over time (July 2010 – January 2011) (N=300)

Source: Service Delivery Form

The mean uterine size (in weeks) of women presenting with an incomplete abortion differed by facility level. On average, women presenting at CS 2/3 had a mean uterine size of 9.5 weeks gestation; women
presenting for treatment at CS 1s had a mean uterine size of 8.2 weeks gestation; and women presenting at the hospital had a mean uterine size of 7.6 weeks gestation. There were two cases of intrauterine fetal death at CS 1s; one woman was at eight weeks gestation and the other was at 20 weeks gestation (data not shown).

Figure 7 presents the distribution of provider of services by facility level. Nurses provided the majority of PAC services across all facility levels. Overall, MCH nurses provided services for 257 women (86%); parteira elementar provided care for 40 women (13%) and tecnico de medicinas provided care for three women (1%) (data not shown). Parteira elementar treated one-third of the cases at CS 2/3s, which are generally staffed by a nurse or parteira elementar, and fewer cases at CS 1s and the hospital (4% and 2% respectively).

**Figure 7: Provider of PAC services by facility level (N=300)**

![Bar chart showing the distribution of provider of services by facility level.](chart.png)

Source: Service Delivery Form

All providers in the operational research reported that they gave the correct dose of misoprostol (a single dose of 600 mcg), via the correct route (oral). Only one woman had missing information about route (data not shown).

### 4.3 Side Effects, Complications and Adverse Events

Providers noted the clients’ experience of side effects after being treated with misoprostol for an incomplete abortion, the severity and duration of any side effects experienced, and whether the clients sought further medical treatment on the Service Delivery Form.

The majority of women (80%) did not experience side effects. The most common side effects reported were headache (11%), shivering (10%) and nausea (8%) (Figure 8). Side effects were generally transient, lasting fewer than four hours on average (data not shown).
According to data from the Service Delivery Form, 34 women (11% of the total number of women treated with misoprostol) took additional medication to manage side effects.

Only three women (1% of all those who took misoprostol) said that one or more of the side effects they experienced were severe or very severe (data not shown).

### 4.4 Referrals and Follow-up Outcomes

All women who received PAC services were advised to return to the same facility where they received services one to two weeks after their initial visit, in order to ensure that the procedure was successful and that uterine evacuation was complete. The mean time from initial visit to follow-up visit was around 10 days for all facility levels (12 days for CS 2/3s; eight days for CS 1s; and nine days for the hospital) (data not shown). The rate of follow-up attendance varied by facility level, with higher follow-up rates seen at the lower-level facilities: 62% of CS 2/3 clients, 90% of CS 1 clients and 33% of women who were treated at the hospital returned for follow-up visits.

Based on the 200 women who returned for a follow-up visit, misoprostol had a completion rate of 94.5% for treatment of incomplete abortion (95% CI 91.3% to 97.7%). Of the 98 women who returned for a follow-up visit at CS 2/3s, seven clients required additional interventions: five were treated with misoprostol and two were treated with MVA (Table 4). Only four of the 83 women who returned for follow-up at CS 1s required additional interventions for completion (three were treated with misoprostol and one with MVA). None of the women returning for follow-up at the hospital required additional interventions due to treatment failure.
Table 4: Need for additional interventions at follow-up visit due to method failure

<table>
<thead>
<tr>
<th>CS 2/3 clients (N=109)</th>
<th>CS 1 clients (N=134)</th>
<th>Hospital clients (N=57)</th>
<th>Total (N=300)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of women returning for follow-up visit</td>
<td>98</td>
<td>83</td>
<td>19</td>
</tr>
<tr>
<td>Additional interventions given for completion at follow-up visit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misoprostol</td>
<td>5</td>
<td>3</td>
<td>---</td>
</tr>
<tr>
<td>MVA</td>
<td>2</td>
<td>1</td>
<td>---</td>
</tr>
</tbody>
</table>

Source: Service Delivery Form

There were no referrals from CS 2/3s or CS 1s to hospitals for uterine size or complicated cases during the initial visit. There were also no referrals at follow-up and no maternal deaths (data not shown).

4.5 FAMILY PLANNING COUNSELING AND PROVISION

According to service delivery protocols developed for the operational research, all women should be counseled during both their initial and follow-up visit to discuss their fertility desires and contraceptive choices. Women noted high rates of counseling in the exit interview, with 100% of women at CS 2/3s (n=81); 98% of women at CS 1s (n=90); and 100% of women in the hospital (n=15) stating that they received contraceptive counseling from their provider (data not shown).

Most women received a contraceptive method at the initial visit (81%); women at CS 2/3s and CS 1s were more likely to leave with a contraceptive method at the conclusion of their initial visit than at the hospitals (92% and 84% vs. 54%). The most common contraceptive methods given to women were oral contraceptive pills (55%) and injectable contraceptives (17%). Condoms (8%) and intrauterine devices (1%) were provided in smaller numbers (Table 5).

Table 5: Contraceptive method provision: Initial visit

<table>
<thead>
<tr>
<th>CS 2/3 clients (N=109)</th>
<th>CS 1 clients (N=134)</th>
<th>Hospital clients (N=57)</th>
<th>Total (N=300)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received contraceptive method</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral contraceptive pills</td>
<td>61 (56.0%)</td>
<td>76 (56.7%)</td>
<td>27 (47.4%)</td>
</tr>
<tr>
<td>Condoms</td>
<td>14 (12.8%)</td>
<td>10 (7.5%)</td>
<td>1 (1.8%)</td>
</tr>
<tr>
<td>Intrauterine device</td>
<td>1 (0.9%)</td>
<td>1 (0.8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Injectable contraceptive</td>
<td>24 (22.0%)</td>
<td>25 (18.7%)</td>
<td>3 (5.3%)</td>
</tr>
<tr>
<td>None</td>
<td>9 (8.3%)</td>
<td>22 (16.4%)</td>
<td>26 (45.6%)</td>
</tr>
</tbody>
</table>

Source: Service Delivery Form

The majority of women who had never used contraceptives (79%) left their initial visit with a contraceptive, as did women who had used contraceptives before (88%) (Table 6). Of the 49 women who had never used contraceptives and did not leave with a contraceptive after their initial visit, 38 of these women had stated that they had wanted the pregnancy but had experienced a miscarriage (data not shown).
Table 6: Contraceptive service provision at the initial visit by ever use of contraceptives

<table>
<thead>
<tr>
<th></th>
<th>Never used contraceptives (N=235)</th>
<th>Ever used contraceptives (N=65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left with a method after initial visit</td>
<td>186 (79.2%)</td>
<td>57 (87.7%)</td>
</tr>
<tr>
<td>Did not leave with a method after initial visit</td>
<td>49 (20.9%)</td>
<td>8 (12.3%)</td>
</tr>
</tbody>
</table>

Source: Service Delivery Form

4.6 CLIENT SATISFACTION

Women who sought treatment of incomplete abortion at a participating health facility were asked by their healthcare provider to participate in an exit interview at the conclusion of their visit. The providers asked the women several questions about their experiences, including their satisfaction with the PAC services, method of treatment and provider, as well as their experience of post-procedure family planning counseling. The Exit Interview Questionnaire included both open-ended questions with codes for common responses and a series of statements that respondents indicated their level of agreement using a five-point Likert scale (ranging from Strongly Disagree to Strongly Agree).

Client satisfaction with misoprostol was very high, with 89% of women stating that they would rate their overall experience with misoprostol as “good” (as opposed to “bad” or “okay”) (Table 7). Across all facility levels, over 90% of women said that they would use misoprostol again if they had the same condition and had a choice of treatment methods. The most common reasons that women gave for choosing misoprostol again were: less injury to body (28%), more effective (22%), less invasive (21%), and more natural (21%). The most common reasons women gave for not choosing misoprostol again were: worried about effectiveness of drug (4%), side effects of drug (2%), too much bleeding (1%) and too much pain (1%) (data not shown).

Table 7: Satisfaction with method

<table>
<thead>
<tr>
<th></th>
<th>CS 2/3 clients (n=81)</th>
<th>CS 1 clients (n=92)</th>
<th>Hospital clients (n=15)</th>
<th>Total (n=188)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you rate your overall experience with the treatment method?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>72 (88.9%)</td>
<td>81 (88.0%)</td>
<td>14 (93.3%)</td>
<td>167 (88.8%)</td>
</tr>
<tr>
<td>Bad</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1 (0.5%)</td>
</tr>
<tr>
<td>Okay</td>
<td>8 (9.9%)</td>
<td>11 (12.0%)</td>
<td>1 (6.7%)</td>
<td>20 (10.6%)</td>
</tr>
<tr>
<td>If you ever suffered from this condition again and had a choice of methods for treatment, would you choose the same method?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>74 (91.4%)</td>
<td>83 (90.2%)</td>
<td>14 (93.3%)</td>
<td>171 (91.0%)</td>
</tr>
<tr>
<td>No</td>
<td>1 (1.2%)</td>
<td>2 (2.2%)</td>
<td>1 (6.7%)</td>
<td>4 (2.1%)</td>
</tr>
<tr>
<td>Not sure</td>
<td>6 (7.4%)</td>
<td>7 (7.6%)</td>
<td>0 (0%)</td>
<td>13 (6.9%)</td>
</tr>
</tbody>
</table>

Source: Exit Interview

^No response from 1.2% of CS 2/3 clients

Women receiving care at CSs 2/3s and CSs 1s were less likely to agree or strongly agree that it was inconvenient to receive services at the facility (9% and 7%, respectively) (Table 8). However, 73% of women who received services at the hospital agreed or strongly agreed that it was inconvenient for them to receive services at this location. Most clients would chose to use the same level of facility where they received the procedure (94%).
Table 8: Preferred location for service

<table>
<thead>
<tr>
<th>CS 2/3 clients (n=81)</th>
<th>CS 1 clients (n=92)</th>
<th>Hospital clients (n=15)</th>
<th>Total (n=188)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>It was inconvenient for me to receive services at this facility</strong> (in terms of time, cost, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree/Strongly Agree</td>
<td>7 (8.6%)</td>
<td>6 (6.5%)</td>
<td>11 (73.3%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>4 (4.9%)</td>
<td>2 (2.2%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Disagree/Strongly Disagree</td>
<td>70 (86.4%)</td>
<td>84 (91.3%)</td>
<td>4 (26.7%)</td>
</tr>
<tr>
<td><strong>Level of facility where client would chose to have the procedure is the same as where they got the procedure</strong></td>
<td>81 (100%)</td>
<td>82 (89.1%)</td>
<td>14 (93.3%)</td>
</tr>
</tbody>
</table>

*Source: Exit Interview*

Across all provider levels, women reported that their pain was managed appropriately (Table 9). The perceived quality of counseling sessions from all providers was also high; the majority of women stated that they felt comfortable discussing their family planning options with the provider (97%). All women who received care from a *parteira elementar* or a *tecnico de medicina* agreed or strongly agreed with the statement “I am totally satisfied with my experience with this provider,” and 98% of women who received care from a nurse agreed or strongly agreed with the statement (data not shown).

Table 9: Women’s perceived quality of care by level of provider

<table>
<thead>
<tr>
<th>MCH nurse (n=158)</th>
<th>Parteira elementar (n=27)</th>
<th>Tecnico de medicina (n=3)</th>
<th>Total (n=188)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Felt the provider was able to manage my pain</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree/Strongly Agree</td>
<td>152 (96.2%)</td>
<td>27 (100%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>2 (1.3%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Disagree/Strongly Disagree</td>
<td>3 (1.9%)</td>
<td>0 (0%)</td>
<td>1 (33.3%)</td>
</tr>
<tr>
<td><strong>Felt comfortable discussing my family planning choices with this provider</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree/Strongly Agree</td>
<td>152 (96.2%)</td>
<td>27 (100%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>2 (1.3%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Disagree/Strongly Disagree</td>
<td>4 (2.5%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

*Source: Exit Interview*

^No response from 0.6% of clients receiving services from an MCH nurse

CLIENT PERSPECTIVES

“I am very glad. I request for this service to exist at all health units”
– age 31, parity 2, at CS 1

“Satisfied with the method. [It] should continue in all hospitals.”
– age 20, parity 1, at CS 1

“Thanks for having satisfied my need”
– age 20, parity 3, at CS 2

“I liked the reception and manner of this service very much”
– age 27, parity 3, at CS 1

4.7 PROVIDER PERSPECTIVES

As seen in Table 10, 28 providers participated in the provider interview: 19 MCH nurses (six at CS 2/3s, nine at CS 1s, and four at the hospital), seven *parteira elementar* (six at CS 2/3s and one at a CS 1), and
two *tecnico medicinas* (one from a CS 2 and one from the hospital). All providers were female. Duration of experience varied by provider: most nurses had 10 or fewer years experience (84%) whereas over half of the *parteira elementar* had 11 or more years of experience (57%). Providers were split evenly between rural and urban areas.

MCH nurses reported the highest average number of women presenting with incomplete abortion per month (4.6), while *parteira elementar* reported the lowest PAC client caseload with an average of 2.3 women presenting with incomplete abortion per month. All nurses and *tecnico de medicinas* were trained in MVA; only one out of seven *parteira elementar* was trained in MVA.

<table>
<thead>
<tr>
<th>Table 10: Characteristics of the providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCH nurse (n=19)</td>
</tr>
<tr>
<td>Level of facility</td>
</tr>
<tr>
<td>CS 2/3</td>
</tr>
<tr>
<td>CS 1</td>
</tr>
<tr>
<td>Hospital</td>
</tr>
<tr>
<td>Duration of experience</td>
</tr>
<tr>
<td>1 – 5 years</td>
</tr>
<tr>
<td>6 – 10 years</td>
</tr>
<tr>
<td>11 – 15 years</td>
</tr>
<tr>
<td>15 – 20 years</td>
</tr>
<tr>
<td>21 – 25 years</td>
</tr>
<tr>
<td>Primary area of work</td>
</tr>
<tr>
<td>Rural</td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td>Average monthly caseload of PAC clients (min;max)</td>
</tr>
<tr>
<td>Trained in MVA</td>
</tr>
</tbody>
</table>

All providers agreed or strongly agreed that it was easy to learn how to use misoprostol to treat incomplete abortion, that they felt comfortable using misoprostol to treat incomplete abortion, that the training they received made them confident in using misoprostol for incomplete abortion, and that they would recommend the use of misoprostol for treatment of incomplete abortion to other qualified health care providers (data not shown).

Of those trained in MVA (MCH nurses and *tecnico medicinas*, n=21), all reported that they prefer misoprostol to MVA for treatment of incomplete abortion if both are available. The most common reasons providers cited for their preference for misoprostol included ease of use (71%), quickness of the procedure (36%), and lack of complications (32%) (data not shown).

Additionally, all 21 providers trained in MVA indicated that they believed women preferred misoprostol to MVA. The three most common reasons providers cited for believing this were that misoprostol caused less injury to the client’s body (68%), less pain for the client (39%), and that the drug is less invasive (36%) than MVA (data not shown).
5. Conclusions

This operational research introduced a comprehensive program to increase access to quality PAC postabortion services in Mozambique. By treating a total of 300 incomplete abortion and miscarriage cases with misoprostol over the course of seven months (July 2010 through January 2011), this operational research demonstrated that quality PAC services can be provided at all levels of the Mozambican health care system.

PROVISION OF SAFE AND HIGH-QUALITY PAC SERVICES
No adverse events due to treatment and no maternal deaths were reported in this operational research. Of the 300 women who were treated with misoprostol for incomplete abortion and miscarriage, 94.5% had a complete procedure with a single dose of misoprostol. Only 11 out of the 200 women who returned for a follow-up visit required additional interventions for completion of the procedure. While referral protocols were in place to ensure women would receive comprehensive services, no referrals were necessary for the initial treatment or for additional treatment during the follow-up visit. Therefore, providers were able to treat incomplete abortion cases with misoprostol within the capacity of their respective health facilities.

Further, women were satisfied with their providers, services received, treatment method, and health facilities. If requiring treatment for an incomplete abortion, approximately 91% of all women participating in the operational research would choose misoprostol again if they suffered from the same condition; the majority of the women would also choose to receive misoprostol in the future at the same level of facility where they received their initial treatment.

INTRODUCTION OF MISOPROSTOL EXPANDS ACCESS TO PAC SERVICES
The introduction of misoprostol expanded access to PAC services by building the capacity of providers not previously trained in MVA, particularly parteira elementar, to treat incomplete abortion. Women receiving care at CS 2/3s and CS 1s were more likely to disagree with the statement that it was inconvenient for them to receive services at that facility. Ensuring that providers at lower facility levels are equipped with misoprostol and trained in the drug’s use expands access to PAC services, particularly for women in rural areas.

MCH NURSES PROVIDE THE MAJORITY OF PAC SERVICES
MCH nurses were the primary providers of PAC services, across all facility levels. Since the majority of cases of incomplete abortion and miscarriage are generally early in pregnancy and uncomplicated, MCH nurses can easily handle and treat these cases using misoprostol. Consequently, higher-level providers are reserved for complicated cases, saving both human and financial resources to the health care system.

QUICK ADOPTION OF MISOPROSTOL FOR TREATMENT OF INCOMPLETE ABORTION AND MISCARRIAGE
Prior to the implementation of this operational research, MVA was the primary uterine evacuation method available. However, the majority of women presenting with incomplete abortion during the operational research were treated with misoprostol. Additionally, all participating providers indicated that misoprostol was easy to learn how to use and felt confident in its use for treatment of incomplete
abortion. These providers were previously either using MVA or were not trained in treating incomplete abortion at all, demonstrating their rapid uptake of misoprostol for this indication.

**MCH NURSES AND PARTEIRA ELEMENTAR PROVIDE HIGH-QUALITY PAC SERVICES**

This operational research demonstrated that MCH nurses and *parteira elementar* can provide PAC services to women at low-level health facilities. Over the course of seven months, MCH nurses treated 257 women (86%) for incomplete abortion and miscarriage using misoprostol and *parteira elementar* treated 40 women (13%). Women were very satisfied with their experience of seeking PAC services from nurses and *parteira elementar*: over 96% stated that they felt the *parteira elementar* or nurse was able to manage their pain and that they were comfortable discussing their contraceptive choices with this provider. MCH nurses and *parteira elementar* are both integral to the primary health care system in Mozambique, and this operational research provided strong evidence that they are able to deliver safe, high-quality PAC services to women in rural communities of Mozambique.

**STRONG PROVISION OF FAMILY PLANNING AND CONTRACEPTIVE SERVICES AT CS 2/3 AND CS 1 LEVELS**

Family planning counseling was near universal. Most women left their initial visit with a contraceptive method (81%). Women who received treatment at CS 2/3s and CS 1s were more likely to receive a contraceptive method, highlighting the need to strengthen postabortion family planning services at the hospital level. The majority of women who had never used contraceptives (79%) left their initial visit with a contraceptive, as did women who had ever used contraceptives (88%). Most women were provided with oral contraceptive pills.

**6. Recommendations**

Findings from this operational research demonstrate that postabortion care services can be integrated into every level of the Mozambican health care system. We recommend to policy makers and key stakeholders that misoprostol be included in PAC services as described in this operational research and be scaled up nationwide in Mozambique.

**UPDATE GUIDELINES TO INCORPORATE OPERATIONAL RESEARCH FINDINGS**

Given the demonstrated feasibility of the medical and procedural protocols of this PAC operational research in Mozambique, and its ability to increase accessibility of PAC services, the technical guidelines for treatment of incomplete abortion should be updated to include misoprostol. Disseminating these updated guidelines to all key stakeholders and providers of PAC services will enable the implementation of the new guidelines and the expansion of PAC services.

**TRAIN ALL PROVIDERS IN THE USE OF MISOPROSTOL FOR POSTABORTION CARE**

Mid and lower-level providers (MCH nurses and *parteira elementar*) were the cornerstone of abortion-related service provision in this operational research, at every level of the health care system. These providers demonstrated their ability to treat incomplete abortion with misoprostol, which increases the reach of PAC services to rural Mozambican women. While all mid-level providers should also be trained in MVA, this along with other surgical methods can be reserved for more complicated cases if misoprostol is available to treat incomplete abortion.
INCREASE COMMUNITY AWARENESS ABOUT PREVENTION OF UNWANTED PREGNANCY, THE DANGERS OF UNSAFE ABORTION, AND THE AVAILABILITY OF PAC SERVICES
Additional effort needs to be made to educate women and communities about how to prevent unwanted pregnancy, the consequences of unsafe abortion, and the availability of PAC services in Mozambique. Providers need to be made aware of the importance of their role in providing timely PAC services.

ENSURE SUPPLY OF REPRODUCTIVE HEALTH COMMODITIES
Misoprostol, MVA equipment, family planning methods, and other supplies (e.g. pregnancy tests) need to be available consistently to ensure that all women have access to PAC services where and when they need them. To be truly comprehensive, a PAC program should include all methods of uterine evacuation and make all methods of family planning regularly available. To that end, partners working with the Ministry of Health in reproductive health should collaborate to ensure that quality supplies are available at every level of the health care system, while being attentive to issues of demand, continuity of supply, and expiration date.
7. References


HEALTH CENTER without MVA – Initial Visit

**Woman comes to Health Center**
- Medical History
- Physical & Pelvic Exam
- Initial Assessment

**Shock**
- Sepsis
- Uterine Perforation
- Intrauterine Fetal Death*

**Abnormal vaginal bleeding (Not Pregnant)**
- Refer

**Pregnant with bleeding or other complications**
- Refer

**Incomplete Abortion or Miscarriage**
- Uterine Size ≤ 12 weeks
  - 600 mcg misoprostol, oral Single Dose
  - Monitor for 3 hours
  - Book follow-up visit in 1-2 weeks
- Uterine Size > 12 weeks or complicated cases
- Refer

* Fetal demise of 13 weeks or greater
HEALTH CENTER without MVA – FOLLOW-UP VISIT

Woman returns to health center 1 to 2 weeks after initial visit

Initial Assessment and Pelvic Exam

Little or no bleeding
Normal size uterus
No signs of infection

Treatment Successful:
Contraceptive Services Discharge

Same/smaller uterine size
Bleeding and/or pain
No sign of other complications

Repeat single dose of misoprostol
600 mcg, oral

Monitor for 3 hours
Contraceptive Services
Book follow-up visit in 1-2 weeks

Second dose of misoprostol failed
Signs of complications

Refer for MVA
HEALTH CENTER with MVA – INITIAL VISIT

1. Woman comes to Health Center
   - Medical History
   - Physical & Pelvic Exam
   - Initial Assessment

2. Shock
3. Sepsis
4. Uterine Perforation
5. Intrauterine Fetal Death*

6. Abnormal vaginal bleeding (Not Pregnant)
   - Refer if needed
   - Treat as appropriate
   - Contraceptive Services

7. Pregnant with bleeding or other complications
   - Treat or refer if needed

8. Treatment of Incomplete Abortion or Miscarriage
   - Uterine Size ≤ 12 Weeks
     - 600 mcg misoprostol, oral
     - Reassess after 3 hours
     - Book follow-up visit in 1-2 weeks
     - Contraceptive Services
   - Uterine Size >12 Weeks, second dose of misoprostol failed, or complicated cases
     - MVA
     - Book follow-up visit in 1-2 weeks
     - Contraceptive Services

* Fetal demise of 13 weeks or greater
HEALTH CENTER with MVA – FOLLOW-UP VISIT

Woman returns to health center 1 to 2 weeks after initial visit

Initial Assessment and Pelvic Exam

Little or no bleeding
Normal size uterus
No signs of infection

Treatment Successful:
Contraceptive Services
Discharge

Same/smaller uterine size
Bleeding and/or pain
No sign of other complications

Repeat single dose of misoprostol
600 mcg, oral

Monitor for 3 hours
Contraceptive Services
Book follow-up visit in 1-2 weeks

Second dose of misoprostol failed and/or complicated cases

MVA

Book follow-up visit in 1-2 weeks
Contraceptive Services
HOSPITAL – INITIAL VISIT

Woman comes to Hospital

Medical History
Physical & Pelvic Exam
Initial Assessment

Shock
Sepsis
Uterine Perforation
Intrauterine Fetal Death*

Abnormal vaginal bleeding (Not Pregnant)
Treat as appropriate Contraceptive Services

Pregnant with complications
Treat as appropriate Contraceptive Services

Treatment of Incomplete Abortion or Miscarriage
Uterine Size ≤ 12 Weeks
For uncomplicated cases
600 mcg misoprostol, oral
Reassess after 3 hours
Book follow-up visit in 1-2 weeks
Contraceptive Services

For complicated cases or second dose of misoprostol failed
MVA
Book follow-up visit in 1-2 weeks
Contraceptive Services

>12 weeks and/or complicated cases
Uterine evacuation (medical or surgical) as necessary
Book follow-up visit in 1-2 weeks
Contraceptive Services

* Fetal demise of 13 weeks or greater
HOSPITAL – FOLLOW-UP VISIT

**Woman returns to hospital 1 to 2 weeks after initial visit**

Initial Assessment and Pelvic Exam

**Little or no bleeding**
- Normal size uterus
- No signs of infection
  
  **Treatment Successful:**
  - Contraceptive Services
  - Discharge

**Same/smaller uterine size**
- Bleeding and/or pain
- No sign of other complications
  
  **Repeat single dose of misoprostol 600 mcg, oral**

  **Monitor for 3 hours**
  - Contraceptive Services
  - Book follow-up visit in 1-2 weeks

**Second dose of misoprostol failed and/or complicated cases**

  **MVA or uterine evacuation (medical or surgical) as necessary**

  **Book follow-up visit in 1-2 weeks**
  - Contraceptive Services