Baobab

Generating Evidence to Enhance Sexual and Reproductive Health and Rights in Refugee Settings

Measuring Abortion Incidence, Severity of Complications, and Health Facilities' Capacity to Provide Abortion Care in Refugee Settings in Ethiopia: Technical Report

May 2025

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Acknowledgements

The implementation of this study was made possible with the support of a range of stakeholders. We gratefully acknowledge our collaboration with the Government of Ethiopia's Refugee and Returnees Service (RRS), the Ministry of Health, and the Regional Health Bureaus, whose leadership and coordination enabled access and engagement with key stakeholders and health facilities across the refugee settings. We also extend our deepest appreciation to the Zonal and Woreda Health Offices from all the refugee camps – for their guidance, facilitation, and ongoing commitment to improving health outcomes within their communities.

Our gratitude goes to the health facility managers, healthcare providers, and administrative staff of all participating health facilities for their cooperation and support throughout the research process. We especially recognize the critical role played by data collection teams, including health providers, whose dedication and tireless efforts during data collection were essential to the successful execution of the study.

We are also grateful to the non-governmental organization (NGO) partners, and private facilities who allowed us to collect data in the facilities they support, and to the United Nations High Commissioner for Refugees (UNHCR) Ethiopia and its implementing partners for providing technical supports.

This work was made possible through funding provided by the United Kingdom's Foreign, Commonwealth and Development Office (FCDO) through the Baobab Research Programme Consortium (Award No. PO8612), and the Norwegian Agency for Development Cooperation (NORAD) through the Guttmacher Institute (NORAD Award No. QZA-21/0135).

The findings and conclusions in this report are those of the authors and do not necessarily reflect the positions or policies of the donors.

Study Teams

This study was conducted by the Baobab Research Programme Consortium (RPC), comprising the Population Council, Inc.; Population Council, Kenya; and the African Population and Health Research Center, in collaboration with the Guttmacher Institute.

Africa Population and Health Research Center (APHRC)

1. Yohannes Dibaba Wado
2. Yadeta Dessie Bacha
3. Bonnie Wandera
4. Caroline Kabiru

Population Council, Kenya

1. George Odwe
2. Francis Obare
3. Peter Kisaakye
4. Stephen Kizito

Population Council - Ethiopia Office

1. Dagim Habteyesus

Population Council, Inc.

1. Stella Muthuri
2. Chi-Chi Undie
3. Gloria Seruwagi

Guttmacher Institute

1. Margaret Giorgio
2. Stephanie Küng
3. Caitlin Rich

Recommended Citation:

Baobab Research Programme Consortium and Guttmacher Institute. 2025. Measuring abortion incidence, severity of complications, and health facilities' capacity to provide abortion care in refugee settings in Ethiopia: Technical Report. Nairobi, Kenya: African Population and Health Research Center; Population Council, Kenya; Population Council, Inc. New York, USA: Guttmacher Institute.

List of Abbreviations

AICM	Abortion Incidence Complications Method
CAC	Comprehensive Abortion Care
HC	Health Center
HF	Health Facility
LARC	Long-acting reversible contraception
HFS	Health Facility Survey
KIS	Knowledgeable Informant Survey
MRR	Medical Records Review
PAC	Post-Abortion Care
PLTC	Potentially Life-Threatening Complication
PMS	Prospective Morbidity Survey
RA	Research assistant
SMO	Severe Maternal Outcome
SRH	Sexual and Reproductive Health
UNHCR	United Nations High Commission for Refugees
UP	Unintended pregnancy
WHO	World Health Organization

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Executive Summary

Background

Humanitarian crises disrupt essential services, making it difficult for people to access basic care, including sexual and reproductive health (SRH) services. While data on SRH services in humanitarian settings is lacking, even less is known about how common abortion is or the severity of abortion-related complications in these settings. This study aimed to estimate the incidence of induced abortion, determine the severity of abortion related complications, and assess the capacity of the health system to offer safe abortion and quality post-abortion care to women living in refugee settings.

Methodology

This study used a modified application of the Abortion Incidence and Complications Methodology (AICM) to generate estimates of abortion incidence and abortion related complications. Data for this analysis were collected in 22 refugee camps in Ethiopia between March and May, 2024 through three data collection efforts:

1. Health Facilities Survey (HFS): The HFS was conducted in 75 health facilities providing post-abortion care (PAC) or safe abortion care (SAC) around or within refugee camps. HFS respondents were asked to estimate the number of women who received PAC and SAC at their facility and the percentage of those women who were refugees. The HFS also collected information on the recent provision of services needed to perform safe abortions and provide care for abortion-related complications, as well as the current availability of equipment, supplies, and staff necessary to provide those services.
2. Knowledgeable Informants Survey (KIS): Sixty-nine individuals familiar with induced abortion among women in refugee settings in Ethiopia were interviewed. Respondents were asked to estimate the likelihood of having a complication after an induced abortion outside of a formal health facility and the proportion of these complications that would receive treatment at a formal health facility.
3. Prospective Morbidity Study (PMS): The PMS was implemented in a subset of the HFS facilities (n=47). All PAC patients who presented at the study facilities during the

study period were eligible to participate. Data on the management and severity of abortion-related health complications were collected through a provider survey and Medical Record Review (MRR).

Key Findings

Induced abortion rate

- In 2023, an estimated 9,083 induced abortions occurred among women living in refugee camps, translating to an abortion incidence rate of 38.3 per 1,000 women aged 15-49. There were slight regional differences in the induced abortion rate.
- An estimated 9,044 women received PAC across 75 facilities that served women in refugee settings, 3,424 of whom were refugees. This corresponds to a PAC treatment rate of 14.4 per 1,000 women living in refugee settings aged 15-49. Out of all induced abortions, 8,041 were estimated to occur outside of a facility setting, while only 11.5% were safe abortions obtained from the facilities.

Management of post-abortion complications and severity of complications

- In the 47 health facilities sampled for the PMS, the majority of PAC patients were from the host community and living outside a refugee camp (71%), aged 20 to 34 (76%), and married or cohabiting (87%).
- Manual vacuum aspiration was the most common uterine evacuation procedure used (MVA; 71%).
- The majority of women were treated by a nurse or midwife (61%) and received pain medication during their uterine evacuation (79%). While almost all women received contraceptive counseling (97%), 69% left the facility with a contraceptive method.
- Overall, nearly 2% of PAC patients experienced a severe maternal outcome, and 21% had a potentially life-threatening complication (PLTC.) One in three (35%) experienced moderate complications, and 42% had mild complications.

Health facility capacity to provide PAC and SAC services

- Capacity to provide PAC was generally high, with 83.3% of hospitals able to provide comprehensive PAC and 61.9% of primary level facilities providing basic PAC services.

- However, the capacity to provide SAC was lower, with 41.7% of hospitals meeting the criteria for comprehensive SAC availability and 33.3% of primary-level facilities meeting the criteria for basic SAC availability.

Recommendations

- Promote the use of contraceptive methods to prevent unintended pregnancies through primary health facilities and community-based programs.
- Strengthen the capacity of health facilities in refugee settings to provide safe abortion services and quality post-abortion care services.
- Increase awareness of existing policies and guidelines, including the legal provisions of safe abortion care and comprehensive abortion care among community members and health care providers.
- Provide training in SAC, including second-trimester abortions with dilation and curettage (D&C), and support equipment and commodities to increase access to both basic and comprehensive SAC.

Introduction

Over the past decade, the global humanitarian crisis has risen to unprecedented levels. Data from the United Nations High Commissioner for Refugees (UNHCR) shows that, by the end of 2023, around 117.3 million people worldwide had been forcibly displaced due to conflict, natural disasters, and other humanitarian crises, with 31.6 million identified as refugees (1). Ethiopia alone hosts over a million refugees, mainly from South Sudan, Somalia, Eritrea, and Sudan (2). Humanitarian crises disrupt essential services, making it difficult for people to access basic care, including sexual and reproductive health (SRH) services.

Where data on SRH services in humanitarian settings is lacking, even less is known about the magnitude of unintended pregnancy and abortion in these settings. It is important to design studies that explicitly investigate the sexual and reproductive health needs and outcomes of refugee populations, as it is likely that these factors differ among refugee populations as opposed to the general population. Indeed, research shows that sexual and reproductive health (SRH) needs, and particularly abortion, are often absent in humanitarian programming. This is due to myriad factors, including the increased risk of sexual violence, transactional sex, disruption in access to and provision of sexual and reproductive health (SRH) services in home countries and difficulties navigating new health systems in host countries, as well as the de-prioritization of SRH services in crisis situations (3,4). Estimates show that women and adolescent girls from displaced populations account for over half of the global deaths and complications during pregnancy and childbirth, indicating the urgent need to address and improve access to quality SRH services in humanitarian settings (5).

We implemented the Abortion Incidence Complications Method (AICM) to understand the incidence of abortion and the capacity of health facilities to provide post-abortion care (PAC) in refugee settings in Uganda and Ethiopia. This evidence can be used to advocate for the need for improved access to comprehensive SRHR services, including comprehensive abortion care (CAC), among refugee populations. This report presents results from the application of the AICM in refugee settings in Ethiopia.

Methods

Main Study Components

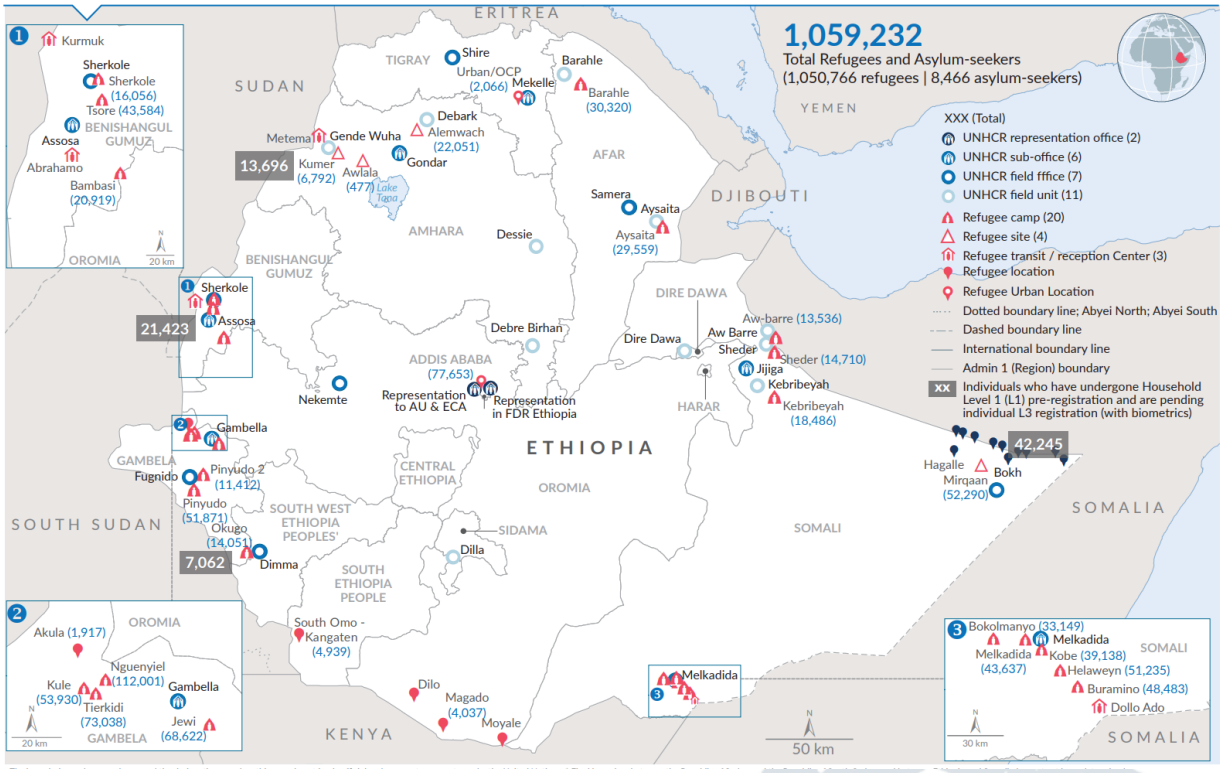
Our implementation of the AICM in this study included three main data collection efforts. First, we fielded a Health Facility Survey (HFS). The primary purpose of the HFS is to estimate the number of women who receive treatment in facilities after an induced abortion. This is done by asking respondents to estimate post-abortion care (PAC) caseloads in their facilities. In Ethiopia, where safe abortion is legal under several indications, the HFS also collects information on safe abortion care (SAC) caseloads. Finally, the HFS contains questions aimed at measuring a facility's capacity to provide basic and comprehensive post-abortion care (as defined by the Signal Functions Approach), the provision of post-abortion care family planning, adherence to World Health Organization (WHO) PAC guidelines on infection prevention, barriers to providing abortion services, and access to services for patients who are differently abled. We also administered a Knowledgeable Informant Survey (KIS) to collect information on the proportion of all women living in refugee settings that have had abortions and received facility-based treatment for abortion-related complications. This information is used to compute the multiplier, or the number by which the number of PAC cases (estimated with the HFS above) must be multiplied to arrive at the total number of induced abortions that take place among women in refugee settings in Ethiopia. Finally, we implemented a Prospective Morbidity Study (PMS). In this last effort, we collect data from multiple sources to classify the severity of post-abortion complications, as well as provide insight into women's experiences accessing this care. The aim of these efforts is to collect information from all women arriving at health facilities for PAC over a 30-day period. Clinical data on complication severity is gathered from interviewing the medical professional who provided the care to each patient (Provider Survey) and conducting a medical records review (MRR) after care was complete. Additional information on women's experiences is generated by interviewing the patients themselves (Patient Survey).

Data collection took place between February and March 2024 for the HFS and KIS, and from April to May 2024 for the PMS. For all study components, trained study staff completed interviews using Open Data Kit software on tablets. For the PMS, translators from facilities, or multi-lingual data collectors themselves, assisted in interviewing patients when necessary.

Sampling and Data Collection

We aimed to administer the HFS in a census of all health facilities capable of providing PAC or SAC that serve women living in all 24 refugee camps in Ethiopia (Figure 1). This included all facilities located within the boundaries of refugee camps, as well as those located outside but near each camp that are commonly used by women living in refugee camps. However, one camp in the Amhara region was excluded due to security concerns, and another camp in the Afar region (Serdo camp) was recently closed. A total of 22 refugee camps were finally included in the three abortion surveys.

Figure 1: Map of Ethiopia with refugee camps and refugee population numbers (March 2024).



Source: UNHCR Operational Data Portal.

A list of these facilities (n=93) that had the potential to provide abortion-related care was provided by the Refugees and Returnees Service (RRS) in Ethiopia, and an additional 11 facilities were identified by the study team during fielding. Trained interviewers contacted all 104 facilities to ask about their provision of PAC and SAC to refugees; 29 facilities were excluded after contact as it was discovered they either did not provide PAC or SAC or did not

serve refugees, resulting in a total sample of 75 facilities (Table 1). At each facility, a senior staff member who was knowledgeable about the provision of PAC and had been working at their facility for at least 6 months was interviewed.

Table 1: Census of health facilities in refugee camps in Ethiopia, 2024

Camp	Total HFS Facilities	Facility Level			Location	
		Hospital	Private Medium & Higher Clinics	HCs	Outside camp	Within camp
All Camps	**75**	**12**	**29**	**34**	**53**	**22**
Eastern & Northeastern camps	40	8	17	15	30	10
Western camps	35	4	12	19	23	12

For the KIS, study staff purposely identified and sampled individuals who are knowledgeable about induced abortion among refugee populations in Ethiopia. These individuals included providers who serve women living in refugee settings, including nurses, midwives, clinical officers, doctors, social workers, traditional birth attendants, and community health providers, as well as district-level health officers and coordinators and staff at NGOs that provide services to women living in the refugee camps. The final sample consisted of 69 of these knowledgeable informants.

A subsample of HFS facilities were selected for participation in the PMS. Facilities that reported not providing PAC or not serving refugees in the HFS were not invited to participate in the PMS. Of these 64 facilities, 47 were able to send providers to attend the PMS training and thereby participate in the PMS. Table 2 displays the final PMS sample, by region and facility level.

Table 2: PMS sample, by region and facility level

Camp	Total PMS Facilities	Facility Level		
		Hospital	Private Medium & Higher Clinics	HCs
All Camps	**47**	**10**	**10**	**27**
Eastern & Northeastern camps	18	6	4	8

Western camps	29	4	6	19

Data collection for the PMS lasted between 35 and 56 days; data collection was extended in certain facilities due to low PAC caseloads. All women who arrived at a study facility for PAC during this period and whose gestational age was 26 weeks or less were eligible to participate in the study. Women aged 15-49 were taken through the informed consent process and asked if they wanted to participate in the study. For those who consented, the facility-based data collectors interviewed the patient and then administered the provider survey to collect additional clinical information about her care. Finally, the MRR was completed for each patient after their care was completed. Patients younger than 15 were not eligible for the patient survey. However, study staff asked for informed consent to interview their provider and conduct the MRR. In the rare case that a patient's outcome was death or coma, this study received ethical approval to conduct the provider survey and MRR without obtaining the patient's consent. This is because these cases represent some of the most severe post-abortion outcomes, and excluding their clinical data from this study would result in an underestimation of the severity of post-abortion complications in this setting.

We collected PMS/MRR data on a total of 424 PAC patients during the data collection period. Of these 424, 314 (74.1%) were PAC patients for whom a PMS survey and MRR was completed. Seventeen (4.0%) were administered a PMS survey without an MRR, and 93 (21.9%) had an MRR only.

Estimating Abortion Incidence

The main objective of this study was to estimate the incidence of abortion among women living in refugee camps in Ethiopia. To calculate abortion incidence, we used the Abortion Incidence Complications Methodology (AICM). A full description of the AICM is published elsewhere (6). Our first step was to generate an estimate of the total number of PAC cases seen in facilities that serve refugees in Ethiopia in the past 12 months using HFS data. HFS respondents were asked to provide their best estimate of the number women who received PAC at their facility, both as inpatients and outpatients, in the past month and in a typical month. In order to avoid possible double counting, these estimates excluded patients who were later referred to a higher-level facility due to a need for more advanced care. Past month

and typical month estimates were then averaged together and multiplied by 12 to obtain an annual estimate of the total number of PAC patients seen in each facility.

Unlike a typical AICM, we also needed to account for the fact that not all patients accessing PAC services at the study facilities were members of our target population. As such, we also asked HFS respondents to estimate the proportion of PAC patients who are refugees vs. members of the host community. We then multiplied our annualized caseload estimates by the proportion of PAC patients that are refugees, to obtain annualized estimates among refugees only.

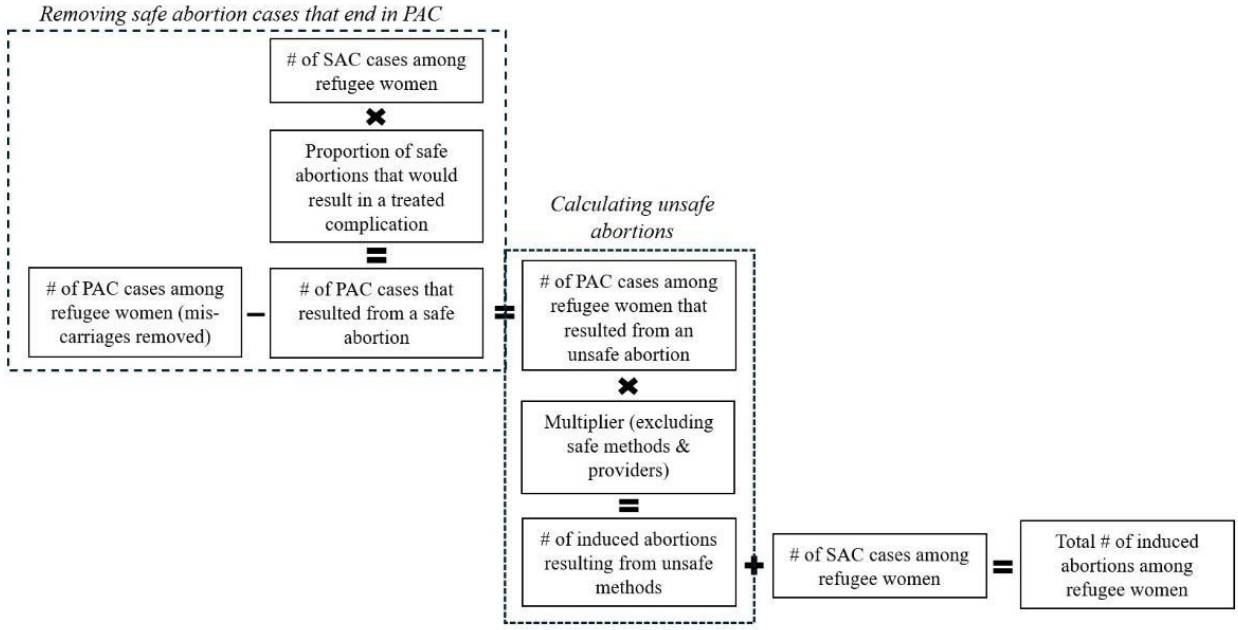
The next step in the AICM calculation is to estimate the number of PAC cases likely due to spontaneous abortion (aka miscarriage). The AICM relies on the assumption that women who experience miscarriages that occur in the second trimester are most likely to need to receive post-abortion care in a health facility. To estimate the number of second trimester miscarriages, we first estimated the total number of births in the past year among all refugees living in camps in Ethiopia by inflating the number of in-facility birth data (provided by the Ethiopian RRS) to account for the proportion of women living in refugee settings and who give birth outside of health facilities. Then, using the assumption that second-trimester miscarriages account for 3.4% of all live births, we multiplied total births to refugees by 3.4% to estimate the total number of second trimester miscarriages. We then subtracted these miscarriages from total PAC cases to arrive at an estimate of the number of PAC cases among women living in refugee settings attributed to induced abortion.

Finally, the HFS also collected data on the number of SAC cases from the past month and typical month, which were averaged to estimate the number of SAC cases provided at each of the health facilities. We did not assess and adjust for out-referrals in SAC caseloads due to the non-emergency nature of this routine health procedure.

The relative availability of safe abortion in Ethiopia required modifications to the standard AICM in the calculation of our multiplier and abortion incidence (Figure 2). The first modification is done to avoid double counting women who experience a complication after receiving safe abortion care and subsequently receive PAC. To do this, we used KIS data to calculate the proportion of safe abortions (ie. those performed with procedural and medication methods by doctors/nurses) that would end in a complication and, of those, the proportion that would be treated in a health facility. We compute the total number of PAC cases due to SAC by multiplying the total number of HFS-estimated SAC cases among refugees

by the estimated proportion that would end in a treated complication, and we subtract this number from the PAC caseload estimate.

Figure 2: Adjusting for safe abortion.



The next modification was to our multiplier. For every induced abortion that results in a complication that is treated in a health facility, the multiplier represents the additional number of induced abortions that either did not result in a health complication or were not treated in a facility. Traditionally, the multiplier incorporates complication and treatment rates for all methods and providers, including abortions that would be classified as "safe" using the WHO framework (i.e. abortions conducted using recommended procedural and medication methods provided by a trained provider). This is because women living in legally restrictive abortion contexts may access safe abortion services clandestinely from these providers, and the HFS is not designed to capture these safe abortion cases. However, in Ethiopia we assume that KIS estimates of procedural and medication abortions provided by doctors and nurses represent those women accessing legal safe abortion services in facility settings. Because we were able to collect SAC caseloads in the HFS in this study, maintaining these estimates in our multiplier would effectively result in the double-counting of SAC cases. Thus, our multiplier was calculated to account for the proportion of women in refugee settings estimated to obtain

medication abortion from non-trained providers and "other" abortions from each provider type. This was done separately for long-term refugee residents and women who had been living in the camps for one year or less, with the assumption that those residing in the host country for longer experience fewer barriers to care. Estimates were weighted by the proportion of refugees in each group. Regional multipliers were calculated separately for KIS respondents from the Eastern and Northeastern Ethiopia and Western Ethiopia. Some KIS respondents work across multiple camps; these respondents were assigned to both regions for regional estimates. Multiplying this adjusted multiplier by the number of PAC cases resulting from non-facility-based abortions yields an estimate of the number of induced abortions that were not obtained through safe abortion care.

To obtain the total number of induced abortions, we add the number of induced abortions resulting from unsafe methods to our SAC caseload estimates for refugees. This final figure represents the total number of induced abortions among women living in refugee camps in Ethiopia in the year prior to data collection. Region-specific estimates were also produced by calculating region-specific SAC caseloads and applying regional multipliers to the region-specific PAC estimates based on facility location. We calculated the proportion of all induced abortions estimated to be performed in-facility by dividing SAC cases to refugees by the total number of induced abortions to refugees, overall and by region. Finally, we calculated one-year induced abortion incidence rates overall and by region by dividing the total number of induced abortions by women of reproductive age living in refugee settings, multiplying by 1,000.

Signal Functions

A secondary objective of this study was to measure the capacity of facilities that serve women living in refugee camps to provide basic and comprehensive post-abortion care and safe abortion care using the Signal Functions Approach. The HFS includes a set of indicators designed to measure a health facility's ability to treat common post-abortion complications and provide safe abortion care. Specifically, the HFS asks about the provision of certain services, stock of key equipment and supplies, and facility staff. We based our analysis on signal function classification systems used in previous studies (7–9) with certain modifications. For one, we classified facilities as fulfilling two different definitions of capacity: one which is based on the provision of the service in the past 6 months ("availability") and

one which considers provision of the service and stock of necessary equipment and supplies on the day of data collection (which we deem "readiness"). Our readiness definition goes beyond standard approaches to measuring facility capacity by assessing whether the facility can provide the service on a given day. If a facility did not have stock of necessary equipment or medicines on the day of the interview, they were classified as not meeting readiness criteria, while availability only assesses a facility's self-reported provision of the service; comparing these two criteria can highlight where stock is a barrier to care provision. For signal functions that require multiple commodities to be able to provide the service (for example, laparotomy and blood transfusion), a full list of necessary equipment was developed by medical doctors on the study team.

The indicators used to measure availability and readiness for PAC are presented in Table 3. Facilities had to satisfy all basic PAC indicators to be classified as capable of providing basic PAC, and had to fulfill all basic PAC indicators plus the three comprehensive indicators (provision of LARC, surgical/laparotomy, and blood transfusion) to be classified as capable of providing comprehensive PAC.

Table 3: Signal functions to measure the availability of post-abortion care and health facility readiness to perform post-abortion care

	Signal function	Availability measure	Readiness measure
Basic	Parenteral (non-oral) antibiotics	Provided in the last 6 months	And has at least one antibiotic* in stock
	Uterotonics/oxytocics	Provided in the last 6 months	And has at least one uterotonic/oxytocic† in stock
	IV fluids	Provided in the last 6 months	And has a functional IV fluid set available
	Removal of retained products of conception (RPOC)	Provided in the last 6 months using medication (MA), an aspiration method (MVA or EVA), or a dilation method (D&E)	And has MA medicines‡ or a functional MVA set in stock
	Short-acting contraceptives	Offers male or female condoms, daily birth control pills, emergency contraceptive pills, or injectables	And at least one of their offered methods in stock

	Family Planning provided 24/7	Offers contraceptive counseling 24 hours per day, 7 days per week	NA
	Communication means or referral capacity	Phone service or access to an ambulance	Facility has a phone service that is available and functional or access to a fueled ambulance
	Open 24/7	Offers patient services and care 24/7	NA
	Facility has at least one health professional trained in PAC on duty	Always, on site or on call, or on duty-most of the time	Always, on site or on call
Comprehensive	Long-acting reversible contraceptives	Offers implants or IUDs	And has their offered method in stock
	Surgical/laparotomy capability	Provided in the last 6 months or would have provided if a patient needed it	And has equipment in stock
	Blood transfusion	Provided in the last 6 months or would have provided if a patient needed it	And has blood products and functional tests¶ in stock

* Includes amoxicillin, ampicillin, ceftriazone, ciprofloxacin, gentamicin, metronidazole, or doxycycline
† Includes oxytocin, ergometrine, or tranexamic acid
‡ Mifepristone 200 mg tablet, Misoprostol + Mifepristone combipack, or Misoprostol 200 micrograms tablets
¶ Blood grouping and cross-matching, hemoglobin test/full blood count

Indicators used to assess SAC capacity are displayed in Table 4. Indicators for short and long-acting contraception and communication means/referral capacity are identical to those used for PAC capacity. Capacity to perform uterine evacuation using the availability criteria was measured by whether uterine evacuation was performed in the past 6 months using both medication abortion (MA) and an aspiration method (MVA or EVA); to comply with the readiness criteria both a functional MVA set, and MA medicines had to be in stock on the day of data collection. Given that induced abortions can be scheduled on days when family planning services are provided and trained health professionals are available, facilities had only to offer contraceptive counseling at least once per week and have at least one health professional capable of providing PAC registered at the facility. Facilities had to satisfy all basic SAC indicators to be classified as capable of providing basic SAC and had to fulfill all basic SAC indicators and the two comprehensive indicators (provision of LARC and dilation and evacuation) to be classified as capable of providing comprehensive SAC.

Table 4: Signal functions to measure the availability of safe abortion care and health facility readiness to perform safe abortion care

	Signal Function	Availability measure	Readiness measure
Basic	Uterine evacuation	Provided in the last 6 months using medication (MA) *and* an aspiration method (MVA or EVA)	And has both a functional MVA set available and MA medicines‡ in stock
	Short-acting contraceptives	Offers male or female condoms, daily birth control pills, emergency contraceptive pills, or injectables	And has and at least one of their offered methods in stock
	FP at least once per week	Offers contraceptive counseling at least once per week	NA
	Communication means or referral capacity*	Phone service or access to an ambulance	Facility has a phone service that is available and functional or access to a fueled ambulance
	Facility has at least one health professional capable of PAC registered	At least one health professional capable of PAC registered	NA
Comprehensive	Long-acting reversible contraceptives	Offers implants or IUDs	And has their offered method in stock
	Dilation and evacuation	Provided in the last 6 months	And has a functional MVA set available

‡ Mifepristone 200 mg tablet, Misoprostol + Mifepristone combipack, or Misoprostol 200 micrograms tablets

To investigate PAC and SAC capacity within our study facilities, we first ran basic frequencies of the number of facilities meeting each separate signal function indicator using both the availability and readiness criteria for both PAC and SAC. We then created composite indicators to count the number of facilities that met all basic and comprehensive indicators using the availability and readiness definitions. Health centers and private clinics were collapsed for analysis of basic PAC and SAC composite indicators, and comprehensive PAC and SAC capacity was only assessed among hospitals expected to provide advanced surgical

procedures and blood transfusion. Basic and comprehensive composite indicators are mutually exclusive: facilities that only meet all basic signal functions are counted under the basic composite indicator, while those that meet all basic and comprehensive signal functions are counted under the comprehensive composite indicator.

Severity

Finally, PMS and MRR data allows us to assess the types of abortion-related complications that cause women to seek medical attention for post-abortion care services. Thus, our third objective was to understand the severity of abortion-related complications among PAC patients in facilities serving refugees in Ethiopia. Severity was assessed among all PAC patients, not just those self-identifying as refugees, to get a full picture of abortion-related complications in this setting. We use a four-category classification system used in previous analyses (10,11) to define abortion-related complications as either mild, moderate, potentially life-threatening complications (PLTC), or severe maternal outcomes (SMO) which include cases of near-miss and death (Figure 3). Complication categories are mutually exclusive, and patients were categorized into the highest level of severity for which they met the criteria. Clinical information from both the PMS and MRR were used to categorize patients into severity categories; where information was inconsistent between PMS and MRR records, we generally deferred to MRR records which were completed using patient charts as opposed to provider recall. In certain cases, and especially where patients were categorized into severe complication categories, case reviews were conducted by clinicians on the study team.

Table 5: Severity criteria for analysing the severity of abortion complications

Severe Maternal Outcomes	Potentially life-threatening complications	Moderate	Mild
Organ dysfunction, or death	Conditions	Conditions	Signs and symptoms on initial assessment

Cardiovascular	Severe hemorrhage *At least one of the 4 items:* *1) Blood loss greater than 1000mL* *2) Any bleeding with hypotension (systolic blood pressure < 100 mm Hg)* *3) Any bleeding requiring blood transfusion* *4) Any bleeding with Hb < 4 g/dL*	Severe bleeding *At least one of the 3 items:* *1) Heavy bright red vaginal bleeding (with or without clots),* *2) Blood-soaked pads/towels/clothing* *3) Pallor*	Vaginal Bleeding (including product of conception)
Respiratory	Severe systemic infection *- Presence of fever (body Temperature ≥ 38 degrees Celsius) and* *- Confirmed or suspected infection (e.g. Septic abortion, endometritis, chorioamnionitis, generalized peritonitis) and* *- at least one of the following signs:* *1. new/worsened altered mentation,* *2. respiratory rate ≥ 22,* *3. systolic blood pressure ≤ 100 mm Hg*	Abdominal syndrome *At least one of the 4 items:* *1) Abdominal pain/cramping and nausea, vomiting* *2) distended/tense/hard abdomen* *3) Shoulder pain* *4) Decreased bowel sounds, rebound, tenderness*	Cervix open
Renal	Uterine perforation *Rupture of uterus confirmed by laparotomy*	Uterine Infection *At least one of the 2 items:* *1) Chills, fevers, Sweats*	Abnormal vital signs *based on temperature, heart rate,*

		2) Foul smelling vagina discharge +/- History of interference with pregnancy	*systolic/diastolic blood pressure, and respiratory rate*
Hematologic/Coagulation *≥5 blood units prescribed*			Uterine tenderness
Neurologic	Generalized peritonitis - T°C≥ 38°C and - Abdominal guarding (contracture = hard abdomen like rock) or rebound +/- ileus (decreased/no bowels sound, tenderness)		Abnormal mental status *Agitated, lethargic, comatose*
Hepatic	Other intrabdominal perforations *Evidence of bladder, rectum, bowels mechanical perforation confirmed by laparotomy or examinations*		Abnormal abdominal examination
Uterine			Abnormal appearance *Sick-looking, pallor, jaundice, clammy*
Death			Foul smelling vaginal discharge
			Evidence of foreign body
			Adnexal mass

Results

Abortion Incidence

Overall, we estimate that 9,044 women were treated for PAC and 2,946 women received SAC in health facilities serving refugees in the 12 months prior to data collection (Table 5). On average, 43% of PAC patients and 40% of SAC patients were estimated to be refugees, and this proportion varied widely between within-camp and outside-camp facilities. On average, 90% of PAC patients and 80% of SAC patients at within-camp facilities were estimated to be refugees, while this was only 24% and 25% at outside-camp facilities, respectively.

Table 6: Total PAC and SAC caseloads and proportion of patient populations who are refugees, overall and by facility location

	Overall		Within Camp		Outside Camp	
	Caseload estimate	% refugees (average)	Caseload estimate	% refugees (average)	Caseload estimate	% refugees (average)
PAC						
All Camps	**9044**	**43**	**1666**	**90**	**7378**	**24**
Eastern & Northeastern camps	5108	38	507	86	4601	22
Western camps	3936	50	1159	93	2778	27
SAC						
All Camps	**2946**	**40**	**480**	**80**	**2466**	**25**
Eastern & Northeastern camps	1386	38	90	79	1296	24
Western camps	1560	41	390	81	1170	26

After adjusting PAC cases for refugees, we estimate a total of 3,424 PAC cases and 1,042 SAC cases among refugees in the year prior to data collection, which translates to a PAC treatment rate of 14.4 per 1,000 women aged 15-49 years (Table 6). After deducting late miscarriages (n=613) and SAC cases estimated to end in a complication (n=28), we estimate 2,782 of these PAC cases were due to induced abortions happening outside of health

facilities. Multiplying this number by our multiplier (2.89) yields a total of 8,041 abortions which, after adding SAC cases to women living in refugee settings (n=1,042), results in a total of 9,083 induced abortions to women living in refugee settings in the year preceding data collection. This translates to an induced abortion incidence rate of 38.3 per 1,000 women living in refugee settings of reproductive age. The induced abortion rate was marginally higher among women living in refugee settings in the Eastern and Northeastern camps (which primarily host refugees from Somalia and Eritrea), when compared to Western camps (which primarily host refugees from Sudan and South Sudan): these rates were 39.9 and 36.9 per 1,000, respectively. PAC treatment rates were nearly identical between our two regions. The proportion of abortions estimated to be obtained from the formal health system was 11.5% in all camps, with a slightly higher proportion of abortions estimated to take place within facilities in Western camps (12.9%) compared to Eastern and Northeastern camps (9.7%).

Table 7: Estimates of the number of post-abortion care cases, induced abortions, and the induced abortion incidence rate among women living in refugee settings in Ethiopia

	All Camps	Eastern & Northeastern camps	Western camps
Population WRA	237151	99156	137995
Total number of PAC cases	3424	1424	1999
Number of late miscarriages	613	203	410
Number of PAC cases due to SAC	28	10	17
PAC cases due to out-of-facility induced abortion	2782	1211	1572
Multiplier	2.89	2.95	2.82
Total number of abortions (not including SAC)	8041	3572	4434
Total SAC	1042	386	656
Total number of induced abortions	9083	3958	5090
Proportion of abortions conducted in-facility (%)	11.5	9.7	12.9
PAC treatment rate*	14.4	14.4	14.5
Induced abortion rate*	38.3	39.9	36.9

*Per 1,000 women aged 15-49.

Signal Functions

Over 80% of facilities in our sample satisfied the availability criteria for each individual signal function for basic PAC, and this proportion decreased slightly when the readiness criteria was applied (Table 7). The least commonly met signal functions were availability and functionality of a phone *or* access to an ambulance with fuel of the day of data collection (68.0%) and having at least one health professional trained in PAC always on site or on call (75%). Encouragingly, hospitals scored exceptionally well on all individual basic PAC signal functions; all 12 hospitals in our sample fulfilled all availability and readiness criteria with the exception of having a PAC provider always on site or on call (91.7%).

As expected, comprehensive PAC capacity was lower, although only hospitals are excepted to meet this criteria. Most facilities offer implants or IUDs (88%) and have these in stock (86.7%), and all hospitals met this criteria. very few facilities in our sample have the capacity to perform surgery or laparotomy (13.3%) or blood transfusion (26.7%). Fulfillment of providing surgery/laparotomy and/or blood transfusion was higher for hospitals than health centers and private clinics; 83.3% of hospitals reported providing surgery/laparotomy in the past 6 months, and 91.7% had provided a blood transfusion. However, application of the readiness criteria reveals that few hospitals had the equipment available to provide a surgery/laparotomy service or blood transfusion on the day of data collection (16.7% and 58.3%, respectively).

Table 8: Proportion of health facilities with each signal function for post-abortion care (N=75)

	Total (N=75)		Hospital (N=12)		Health Center & Private Clinic (N=63)	
	n	%	n	%	n	%
Basic signal functions						
Parenteral (non-oral) antibiotics						
Provided in the last 6 months	75	100.0	12	100.0	63	100.0
Provided, and has at least one antibiotic in stock	73	97.3	12	100.0	61	96.8
Uterotonics/oxytocics						

Provided in the last 6 months	65	86.7	12	100.0	53	84.1
Provided, and has at least one uterotonic/oxytocic in stock	59	78.7	12	100.0	47	74.6
IV fluids						
Provided in the last 6 months	74	98.7	12	100.0	62	98.4
Provided, and has a functional IV fluid set available today	73	97.3	12	100.0	61	96.8
Removal of retained products of conception						
Provided PAC using MA, aspiration, or dilation in past 6 months	75	100.0	12	100.0	63	100.0
Provided, and has corresponding MVA set or medicines today	73	97.3	12	100.0	61	96.8
Short-acting contraceptives						
Offers condoms, pills, injectables, or EC	75	100.0	12	100.0	63	100.0
Offers, and has offered methods in stock	75	100.0	12	100.0	63	100.0
FP 24/7	61	81.3	12	100.0	49	77.8
Communication means or referral capacity						
Facility has a phone service or access to an ambulance	61	81.3	12	100.0	49	77.8
Phone service available and functional or ambulance w/ fuel	51	68.0	12	100.0	39	61.9
Open 24/7	61	81.3	12	100.0	49	77.8
Facility has at least one health professional trained in PAC on duty						
Always, on site or on call, or on duty-most of the time	61	81.3	12	100.0	49	77.8
Always, on site or on call	57	76.0	11	91.7	46	73.0
Comprehensive signal functions						
Long-acting reversible contraceptives						
Offers implants or IUDs	66	88.0	12	100.0	54	85.7
Offers, and has offered method in stock	65	86.7	12	100.0	53	84.1

Surgical/laparotomy capability						
Provided in the last 6 months	10	13.3	10	83.3	0	0.0
Provided, and has equipment in stock	2	2.7	2	16.7	0	0.0
Blood transfusion						
Provided in the last 6 months	20	26.7	11	91.7	9	14.3
Provided, and has equipment and blood in stock	15	20.0	7	58.3	8	12.7

Table 8 displays individual signal functions for basic and comprehensive SAC. All facilities fulfilled the criteria on provision of short-acting contraception and stock, offer of family planning services at least once a week, and having at least one health professional capable of providing PAC registered. However, less than half of facilities in our sample (45.3%) reported providing SAC using procedural methods and medication in the past 6 months, and slightly less (44.0%) had MVA sets and MA medicines in stock. Slightly less than half of hospitals (41.7%) and only 3.2% of health centers and private clinics reported providing SAC using D&E in the past 6 months and having equipment in stock.

Table 9: Proportion of health facilities with each signal function for safe abortion care (N=75)

	Total (N=75)		Hospital (N=12)		Health Centre & Private Clinic (N=63)	
	n	%	n	%	n	%
Basic signal functions						
Uterine evacuation						
Provided SAC using medication and a surgical method (MVA or EVA) in past 6 months	34	45.3	10	83.3	24	38.1
Provided, and has MVA set and medicines today	33	44.0	10	83.3	23	36.5
Short-acting contraceptives						
Offers condoms, pills, injectables, or EC	75	100.0	12	100.0	63	100.0

Offers, and has at least one offered method in stock	75	100.0	12	100.0	63	100.0
FP at least once per week	75	100.0	12	100.0	63	100.0
Communication means or referral capacity						
Facility has a phone service or access to an ambulance	61	81.3	12	100.0	49	77.8
Phone service available and functional or ambulance w/ fuel	51	68.0	12	100.0	39	61.9
Facility has at least one health professional capable of PAC registered	75	100.0	12	100.0	63	100.0
Comprehensive signal functions						
Long-acting reversible contraceptives						
Offers implants or IUDs	66	88.0	12	100.0	54	85.7
Offers, has offered method in stock	65	86.7	12	100.0	53	84.1
Dilation and evacuation						
Provided SAC using D&E in the past 6 months	7	9.3	5	41.7	2	3.2
Provided, and has an MVA set	7	9.3	5	41.7	2	3.2

As seen in Table 9, 61.9% and 42.9% of health centers and private clinics reported basic PAC availability and readiness, respectively. Capacity to provide basic PAC was higher among health centers across both sets of criteria (88.2% availability, 67.7% readiness) when compared to private clinics (31.0% availability, 13.8% readiness). Capacity to provide PAC was also better at facilities located within refugee camps (90.9% availability, 77.3% readiness) compared to those located outside of camps (46.3% availability, 24.4% readiness). Overall, SAC capacity was low; only 33.3% of health centers and private clinics were categorized as having basic SAC services available and only 27.0% as being ready to provide basic SAC. Similar to the capacity to provide basic PAC, health centers had better capacity to provide basic SAC (41.2% vs. 24.1% using the availability criteria, and 35.3% vs. 17.2% using the readiness criteria) compared to private clinics.

Table 10: Capacity to provide basic post-abortion care and safe abortion care among health centers and private clinics serving refugees in Ethiopia (N=63)

	Basic Post-Abortion Care				Basic Safe Abortion Care			
	Availability		Readiness		Availability		Readiness	
	n	%	n	%	n	%	n	%
Overall	39	61.9	27	42.9	21	33.3	17	27.0
By owner								
Public Health Centre	30	88.2	23	67.6	14	41.2	12	35.3
Private Clinic	9	31.0	4	13.8	7	24.1	5	17.2
By region								
Gambella	10	47.6	8	38.1	1	4.8	1	4.8
Somali Jijiga	6	50.0	5	41.7	5	41.7	5	41.7
Somali Melkadida	7	70.0	5	50.0	2	20.0	2	20.0
Benishangul	9	90.0	5	50.0	8	80.0	6	60.0
Afar	7	70.0	4	40.0	5	50.0	3	30.0
By location to camp								
Outside	19	46.3	10	24.4	13	31.7	10	24.4
Within	20	90.9	17	77.3	8	36.4	7	31.8

Comprehensive PAC service, in general, was available in 83.3% of the hospitals, but could only be readily provided on the day of the survey in 16.7% of them (Table 10). All hospitals that reported comprehensive SAC availability also reported comprehensive SAC readiness (41.7%).

Table 11: Capacity to provide comprehensive post-abortion care and safe abortion care among hospitals serving refugees in Ethiopia (N=12)

	Comprehensive Post-Abortion care				Comprehensive Safe Abortion Care			
	Availability		Readiness		Availability		Readiness	
	n	%	n	%	n	%	n	%
Overall	10	83.3	2	16.7	5	41.7	5	41.7

By owner								
Public Hospital	9	81.8	2	18.2	5	45.5	5	45.5
Private Hospital	1	100.0	0	0.0	0	0.0	0	0.0
By region								
Gambella	2	66.7	0	0.0	3	100.0	3	100.0
Somali Jijiga	2	66.7	0	0.0	0	0.0	0	0.0
Somali Melkadida	2	100.0	0	0.0	2	100.0	2	100.0
Benishangul	1	100.0	0	0.0	0	0.0	0	0.0
Afar	3	100.0	2	66.7	0	0.0	0	0.0

Note: All hospitals are located outside refugee camps.

Management and Severity of Post-Abortion Complications

The majority of patients receiving PAC received Manual or Electrical Vacuum Aspiration (MVA or EVA) as their method of evacuation (71.5%), either alone or in combination with MA (Table 11). Nearly one in five (19.6%) received medication abortion (MA) alone. In a majority of cases, (60.7%) the main provider was a nurse or midwife, and the pregnancy was in the first trimester (86.9%). Most patients either did not have to spend the night in the facility (45.9%) or only spent one night in the facility (41.0%). Lastly, approximately three-quarters of PAC patients (79.0%) received pain medication during their evacuation procedure, most (97.3%) received contraceptive counseling, and over two-thirds (69.0%) left the facility with a method of contraception.

Table 12: Management of PAC cases at health facilities serving refugees in Ethiopia

	Ethiopia (N=315)	
	n	%
Method of evacuation		
MVA/EVA[6]	293	71.5
MA	89	19.6
D&E	4	0.8
D&C	2	0.4
No evacuation procedure	33	7.7
Provider of evacuation		
General doctor/OBGYN	72	29.2

Clinical officer/physician assistant	13	10.1
Nurse/midwife	194	60.7
Gestational age¥		
First trimester (≤ 13 weeks)	356	86.9
Second trimester (14 to 26 weeks)	62	13.1
Number of nights in the facility		
0	122	45.9
1	142	41.0
2+	47	13.0
Patient received pain medication during uterine evacuation	250	79.0
Patient received contraceptive counseling¥	390	97.3
Patient left facility with a method of contraception¥	249	69.0

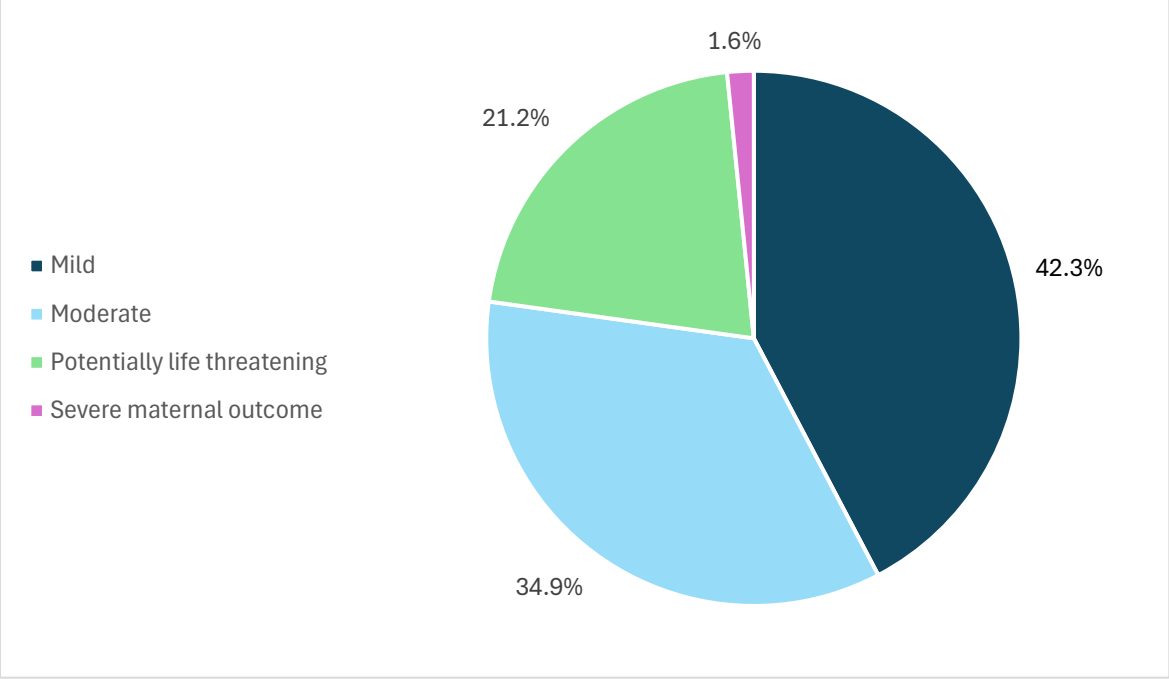
All percents are weighted

¥ Using both the provider survey and MRR to report gestational age, reception of contraceptive counseling, reception of a contraceptive method, and method of evacuation. For these indicators, the overall N is 424.

[6] Alone or with MA

Nearly one-quarter of PAC patients in our sample (22.8%) experienced a PTLC or SMO, indicating high levels of abortion-related morbidity in facilities serving refugee populations in Ethiopia (Figure 4). One-third (34.9%) experienced moderate complications, and nearly one-half (42.3%) received care for mild complications.

Figure 3: Classification of severity outcomes (n=424)



All percents are weighted.

Conclusions and Study Implications

This study has several important implications for the sexual and reproductive health of people living in refugee settings in Ethiopia.

Induced abortion is a common event among women living in refugee settings in Ethiopia, with an estimated induced abortion rate of 38.3 per 1,000 women of reproductive age. This is substantially higher than the national induced abortion rate, which was estimated in 2014 to be 28 per 1,000 women of reproductive age (12). This highlights that women living in refugee settings may be at increased risk of unintended or mistimed pregnancy and therefore have an increased demand for induced abortion when compared to the general population. The national study was however conducted ten years ago, making direct comparisons difficult.

Despite the relative availability of safe abortion in Ethiopia, our results show that women in refugee camps are not readily accessing these services. We estimate that only 11.5% of abortions were estimated to take place in the formal health system. This is much lower than national studies that estimate that more than half of all abortions in Ethiopia take place in health facilities (12,13); this may be due to the fact that most women in refugee camps are not aware that safe abortion can be readily accessed in health facilities in Ethiopia, but may also reflect low capacity of health facilities serving refugee populations to provide safe abortion care.

Hospitals in refugee settings are largely capable of providing basic and comprehensive PAC, but capacity lags for basic SAC in health centers and private clinics. Compared to PAC capacity, across the board fewer health centers, private clinics, and hospitals met all the criteria for provision of basic and comprehensive SAC. When the stricter readiness criteria was applied, capacity to provide PAC and SAC among our sample of facilities dropped substantially, illustrating that stock-outs of critical equipment and commodities is an obstinate barrier to provision of life-saving abortion care.

Finally, our results point to a high level of abortion-related morbidity among patients presenting to facilities in refugee settings. This may reflect a high level of unsafe abortion happening in refugee settings in Ethiopia, as well as a tendency to delay care-seeking for abortion-related complications. These complications are avoidable, as research has consistently shown that expanding access to safe abortion care reduces the incidence of abortion-related complications, severe morbidity, and death (14).

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Baobab

Generating Evidence to Enhance
Sexual and Reproductive Health and Rights
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info@popcouncil.org