


Induced Second Trimester Abortion and Associated Factors at Debre Markos Referral Hospital: Cross-Sectional Study

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Abstract

Background: Although most induced abortions in Ethiopia are performed in the first trimester, many women will still require second trimester abortions. While access to abortion in Ethiopia is limited, few data are being available concerning the demand for and associated outcomes of second trimester abortions. This knowledge is important for planning the health service response to abortion.

Objective: The main objective of this study was to determine the proportion and associated factors of second trimester abortion among women presenting for abortion care services at Debre Markos Referral Hospital, Debre Markos, Northwest Ethiopia.

Methods: An institution-based cross-sectional study was conducted at Debre Markos Referral Hospital on a sample of 262 calculated using the single population proportion formula. Women who sought abortion services were interviewed consecutively from 12 February 2017 to 14 March 2017. Data were collected in a face-to-face exit interview and document review and analyzed using SPSS version 24.0 software. Bivariate and multivariable analyses were undertaken to identify factors.

Result: Of the women who presented for abortion care services in Debre Markos Referral Hospital, 73 (29.6%) had induced second trimester abortion. Unmarried women (adjusted odds ratio = 4.93, 95% confidence interval = 1.41–17.16) and women employed at private business (adjusted odds ratio = 6.17, 95% confidence interval = 1.16–32.76) were associated with induced second trimester abortion.

Conclusion: This study revealed that almost one-third of women who presented for abortion care services at Debre Markos Referral Hospital had induced second trimester abortions. Raising awareness of the health consequence of second trimester abortion at community levels and counseling to avoid further occurrences are helpful to minimize the problem. Furthermore, early management of induced second trimester abortion is very crucial to prevent further complications.

Keywords

associated factors, Debre Markos Referral Hospital, Ethiopia, induced second trimester abortion

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Background

Globally, around 56 million induced abortions occur every year with an annual rate of 35 abortions per 1000 women of childbearing age occurring in low and lower middle income countries (LMICs).¹ Abortion-related maternal deaths worldwide range from 8% to 18%,²⁻⁴ and death due to legally induced abortion in the United States is 0.7 out of 100,000 procedures.⁵ Moreover, abortion imposes a high financial burden on the limited healthcare resources of LMIC with an annual cost of US\$562 million for post-abortion care.² Induced second trimester abortion is associated with high maternal complications and varies across different regions of the world, such as India, South Africa,⁶ Kenya,⁷ Nigeria,⁸ and Ethiopia.⁹

According to literature published in South Africa, Ethiopia, and India, poor utilization of modern contraceptive methods, restrictive abortion laws and policies, gender discrimination, a lack of safe abortion services, and abortion-related stigma were the main factors associated with second trimester termination of pregnancies.¹⁰⁻¹⁵

Induced abortion or the deliberate termination of pregnancy is one of the most controversial issues in legal discourse. In 2005, the Ethiopian Government amended the country's Penal Code to expand instances in which a woman could legally obtain an abortion. Prior to this time, abortion was only allowed in cases, done to save the pregnant woman from grave and permanent danger to life or health, which is impossible to avert in any other way. This determination had to be made by two physicians, qualified as specialists in the alleged defect of health from which the pregnant woman was suffering, compounding the risk to pregnant women in a country that had just one physician for every 50,000 Ethiopians in 2000.¹⁶ At the time, Ethiopia amended its Penal Code, the country's maternal mortality rate (MMR) was 743 per 100,000 live births, among the highest in the world, though decreasing slightly due to the introduction and uptake of modern contraceptives and expanding healthcare infrastructure especially in urban areas.¹⁷

Following revision, standards and guidelines that first took effect in Ethiopia in 2006 now allow abortion to be performed legally in cases involving rape or incest, if the woman has a physical or mental disability, to preserve her life or health or if she is a minor who is physically or mentally unprepared for childbirth.¹⁸ In 2008, Ethiopia had an abortion rate of 24 per 1000 women of reproductive age, which is lower than that for the Eastern Africa region (34 per 1000).^{19,20} Nonetheless, changing generations of behaviors resulting in unsafe abortions and ending centuries of stigma and silence may take time.²¹⁻²³ Although the scaling up of legal abortion services throughout the healthcare system has progressed relatively rapidly since legal reform,^{23,24} women continue to use unsafe methods to induce abortions outside of health facilities. In addition, the provision of skilled abortion care has been hampered by a shortage of trained healthcare providers and variable

health service availability across the largely rural population of more than 95 million people.^{25,26}

Even though second trimester abortion accounts only for a small percentage of all induced abortions, it is associated with two-thirds of the major abortion-related complications and half of the abortion-related mortality.²⁷ Second trimester abortion is associated with higher rates of complications than first trimester terminations such as uterine perforation, uterine rupture, infection, and hemorrhage.¹⁸

The Ethiopian Ministry of Health has estimated that abortion, including second trimester abortion-related deaths accounted for more than 30% of all maternal deaths in the country.²⁸ Among mothers who needed post-abortion complication care, over one-third presented due the second trimester period in Ethiopia.²⁹ The prevalence of induced second trimester abortion in Northern Ethiopia was reported at 31.3% in 2006.⁹ Providing universal access to sexual and reproductive health and reducing the global MMR to less than 70 per 100,000 live births by 2030 is a key to the attainment of the Sustainable Development Goals. The provision of safe abortion care is a critical part of meeting these goals. Despite the country's enormous improvements in contraceptive use over the past two decades, one in four married women in Ethiopia has an unmet need for contraception.³⁰ As a result, more than one in three pregnancies in Ethiopia are unintended. According to a national study on abortion conducted in 2008, 42% of unintended pregnancies ended in abortion—contributing to an abortion ratio of 13 abortions per 100 live births.¹⁹ Similarly, the magnitude of unsafe abortion is attributable to poverty, social inequity, and denial of women's human rights. Countries with restricted abortion or where abortions are clandestine and unsafe, its consequences to women's health are harmful, particularly for young, poor, and low-education women. Therefore, assessing the nature of induced second trimester abortion is important for designing interventions to avert the problem and to protect mothers from abortion-related morbidity and mortality. Thus, this study was conducted to assess the proportion of induced second trimester abortion and associated factors at Debre Markos Referral Hospital.

Methods

Study design and setting

An institution-based cross-sectional study of women seeking abortion care was conducted from 12 February 2017 to 14 March 2017, at Debre Markos Referral Hospital. This hospital is located 300 and 265 km from Addis Ababa and Bahar Dar, the capitals of Ethiopia and the Amhara Regional State, respectively. The hospital is situated in Debre Markos town and provides comprehensive maternal and child-related services to an estimated catchment population of 3.5 million. During data collection, there were approximately 998 patients receiving abortion services in

Debre Markos Referral Hospital in the previous 6 months. At the time of the study, there were 192 nurses, 25 midwives, 28 general practitioners, three emergency surgeons, 10 specialists, three gynecologists, and obstetricians. The hospital has 20 outpatient clinics including one for gynecology and one for obstetrics and one gynecology and obstetrics ward.³¹ In Ethiopia, mothers delivered at health facility were 34%,³² and 620,300 induced abortions were performed,³³ whereas in Debre Markos Referral Hospital, 1 month prior to study conducted, the number of deliveries was 1300 and induced abortion cases were 270.

Sample size and sampling technique

The sample size was calculated using the formula for a single population proportion by taking the proportion of induced second trimester abortion as 19.2%,³⁴ a confidence level of 95%, and degree of precision of 5%, in addition, a 10% of non-response rate, yielded a total sample size of 262. However, the total population was too small during the study period. As a result, all of them were included in the study (census method). Female patients who presented for abortion care services were interviewed from 12 February 2017 to 14 March 2017.

Data collection and data quality assurance

Data were collected by interview using structured questionnaire and document review by three trained diploma graduate midwives. Data collection took 30 days, and the principal investigator followed the process daily. To ensure data quality, the questionnaire was pretested on 5% of the populations at Finote Selam Hospital, 1 week before the study commenced. In response to this, several modifications were made to the questionnaire and the interview protocol. Facilitators were trained and given information about the importance of the study. Data were reviewed and checked for completeness before data entry.

Data analysis

Data were entered into EpiData version 3.1 and exported to SPSS version 24.0. Frequencies, percentages, and means were used to describe demographic and associated health characteristics. The outcome variable was illustrated by demographics and health-related characteristics using cross tabulations. *P*-values ($P < 0.2$), crude odds ratio (COR), and 95% confidence intervals (CIs) were employed to present the results of the bivariate analysis. All predictor variables which had associations in the bivariate analysis with a *P*-value less than 0.2 were entered in the multivariable logistic regression model to assess associated variables.

Multivariable analyses using the logistic regression models were performed to evaluate the predictors of induced second trimester abortions and to control the

potential confounders. The variables that showed higher values of *P* were removed one by one until only variables with statistical significance remained in the final model. The association of outcome variables with independent variables was described using adjusted odds ratios (AORs) with 95% CIs. Statistical significance was defined at a probability level of 0.05. The Hosmer–Lemeshow goodness-of-fit statistic was used to check if the necessary assumptions for the multivariable logistic regressions were fulfilled, and the model had a *P*-value = 0.105 (> 0.05) which proved the model was good.

Ethical considerations

Ethical approval was obtained from the Debre Markos University Ethical Clearance Committee with reference number of HSC/R/C/Ser/Co/141/11/10. Permission to gather data was provided by the manager of Debre Markos Referral Hospital. All women receiving induced second trimester abortion were informed about the study in order to obtain their verbal consent. Verbal consent was also obtained from each client and introduced the objective of the study that it contributes to set interventions and strategies to improve services. Any client who was not willing to participate in the study had the right to refuse at any time of interviewing. Data were collected after full informed consent is obtained and confidentiality of the information was maintained by excluding names as identification in the questionnaire and keeping their privacy during the interview by interviewing them alone.

Results

Of the 262 women recruited, 247 completed the interview-based questionnaire with a response rate of 94.3%. A detailed analysis was undertaken of the data from the 73 (29.6%) of mothers who had induced second trimester abortion as diagnosed by the obstetrician.

Socio-demographic characteristics

Out of the participants included in the study, 67 (27.1%) were in the age range of 20–24 years. The majority, 152 (61.5%), of the respondents were urban dwellers, 220 (89.1%) Orthodox Christians, 234 (94.7%) Amhara by ethnicity, 123 (49.8%) married, 115 (46.4%) had received secondary and above by education, and 99 (40.1%) earned less than Ethiopian Birr (ETB) 500.00 (\$18 US dollar), as indicated in Table 1.

Proportion of induced second trimester abortion

The proportion of induced second trimester abortion among women who presented for the service at Debre Markos Referral Hospital was 29.6% ($n = 73$). The cases

Table 1. Socio-demographic characteristics of women who presented for abortion care services in Debre Markos Referral Hospital, Northwest Ethiopia, 2017 ($n=247$).

Variables	Category	Frequency	Percentage (%)
Age	15–19	26	10.5
	20–24	67	27.1
	25–29	54	21.9
	30–35	61	24.7
	>35	39	15.8
Marital status	Married	123	49.8
	Single	89	36.0
	Divorced	29	11.7
	Widowed	6	2.4
Religion	Orthodox	220	89.1
	Muslim	16	6.5
	Protestant	11	4.5
Occupation	Government employee	59	23.9
	NGO employee	14	5.7
	Private organizations	56	22.7
	No employment	18	7.3
	Student	70	28.3
	Other	30	12.1
Highest education level	Cannot read and write	35	14.2
	Can read and write	19	7.7
	Primary	14	5.7
	Secondary	64	25.9
Ethnicity	Secondary and above	115	46.6
	Amhara	234	94.7
	Oromo	8	3.2
	Tigry	2	0.8
	Guragie	3	1.2
Residence	Urban	152	61.5
	Rural	95	38.5
Monthly income	<500	99	40.1
	500–1000	67	27.1
	1001–2000	40	16.2
	2001–3000	30	12.1
	>3001	11	4.5

NGO: non-governmental organization.

were classified as an early second trimester (between gestational ages of 13 and 20 weeks) which comprised 63 (25.9%) and late second trimester (between 21 and 28 weeks) consisting of 10 (17.4%).

Associated factors of induced second trimester abortion

Reproductive characteristics

Over half, 139 (56.3%), of all respondents seeking abortion care had regular menstrual cycles while 108 (43.7%) had irregular ones prior to abortions. Two hundred and three (82.2%) respondents had been pregnant one to three

Table 2. Reproductive characteristics of women who sought abortion services in Debre Markos Referral Hospital, Northwest Ethiopia, 2017 ($n=247$).

Reproductive factors	Category	Frequency	Percentage (%)
Nature of menses	Regular	139	56.3
	Irregular	108	43.7
Gestational age	<9	79	32.0
	9–12	61	24.7
	13–20	64	25.9
	21–28	43	17.4
Gravidity	1–3	203	82.2
	4–6	38	15.4
	>6	6	2.4
Parity	0	142	57.5
	1	43	17.4
	2	26	10.5
	>2	36	14.6
Number of live children	0	152	61.5
	1	42	17.0
	2	25	10.1
	>2	28	11.3
Abortion history	Yes	28	11.3
	No	219	88.3
Contraceptive history	Yes	96	38.9
	No	151	61.1
Planned pregnancy	Yes	79	32
	No	168	68

times before their recent abortion. More than half of the cases, 142 (57.5%), were nullipara. Of the 152 (61.5%) respondents have no living children. Twenty-eight (11.3%) of the women had abortions earlier. One hundred and sixty-eight participants (68.0%) reported that they had not planned their pregnancies (Table 2).

Medical factors

Sixty-four (25.9%) of the respondents were scanned with ultrasound and 7(2.8%) of the respondents surveyed had had their pregnancies terminated as a result of fetal-related problems. The pregnancies of two women (0.8%) were terminated as a result of chronic illnesses of the mothers themselves.

Bivariate and multivariate analyses

Data analysis was conducted on 247 who presented for abortion care services. Age, marital status, occupation, monthly income, nature of menses, parity, number of live children, and planned pregnancy were found to be associated in the bivariate analysis at P -value less than 0.2. The variables were entered into the multivariable logistic regression model. Finally, the model retained only factors which had significant associations at P -value < 0.05 level. Factors such as occupation and marital status were associated, whereas age,

Table 3. The bivariate and multivariate logistic regression results on factors associated with induced second trimester abortion in Debre Markos Referral Hospital, Northwest Ethiopia, 2017 (n = 247).

Variables	Category	Induced second trimester abortion		COR (95% CI)	AOR (95% CI)	P-value
		Yes	no			
Age	15–19	15 (6.1%)	11 (4.5%)	5.284 (1.759, 15.870)		
	20–24	28 (11.3%)	39 (15.8%)	2.457 (0.980, 6.163)		
	25–29	13 (5.3%)	41 (16.6%)	1.229 (0.454, 3.329)		
	30–35	10 (4.0%)	51 (20.6%)	0.853 (0.309, 2.352)		
	>35	7 (2.8%)	32 (13.0%)	1	1	1
Marital status	Married	17 (6.9%)	106 (43.0%)	1	1	1
	Single	44 (17.8%)	45 (18.2%)	5.213 (2.720, 9.991)	4.928 (1.414, 17.166)	0.012
	Divorced	9 (3.6%)	20 (8.1%)	2.625 (1.033, 6.667)	2.382 (0.674, 8.416)	0.178
	widowed	3 (1.2%)	3 (1.2%)	11.667 (1.998, 68.458)	6.609 (0.895, 48.792)	0.064
Occupation	Government employee	8 (3.2%)	51 (20.6%)	0.222 (0.092, 0.537)	1.862 (0.264, 13.121)	0.533
	NGO employee	5 (2.0%)	9 (3.6%)	0.785 (0.238, 2.587)	5.044 (0.329, 77.353)	0.245
	Private organization	15 (6.1%)	41 (16.6%)	0.517 (0.242, 1.105)	6.172 (1.163, 32.761)	0.033
	No employment	8 (3.2%)	10 (4.0%)	1.131 (0.398, 3.214)	1.457 (0.440, 4.828)	0.538
	Student	29 (11.7%)	41 (16.6%)	1	1	1
	Other	8 (3.2%)	22 (9.0%)	0.514 (0.201, 1.314)	4.604 (0.793, 26.720)	0.089
Monthly income	<500	45 (18.2%)	54 (21.9%)	1		
	500–1000	15 (6.1%)	52 (21.1%)	0.361 (0.179, 0.725)		
	1001–2000	5 (2.0%)	35 (14.2%)	0.179 (0.065, 0.494)		
	2001–3000	7 (2.8%)	23 (9.3%)	0.455 (0.185, 1.119)		
	>3001	1 (0.4%)	10 (4.0%)	0.125 (0.015, 1.014)		
Nature of menses	Yes	48 (19.4%)	91 (36.8%)	1		
	No	25 (10.1%)	83 (33.6%)	0.571 (0.324, 1.007)		
Parity	0	53 (21.5%)	89 (36.0%)	1		
	1	8 (3.2%)	35 (14.2%)	2.467 (1.010, 6.024)		
	2	5 (2.0%)	23 (9.3%)	0.947 (0.307, 2.924)		
	>2	7 (2.85)	10 (4.0%)	0.986 (0.275, 3.539)		
	Number of live children	0	51 (20.6%)	101 (40.9%)	1	
	1	11 (4.5%)	31 (12.6%)	1.963 (0.750, 5.139)		
	2	5 (2.0%)	20 (8.1%)	1.146 (0.363, 3.613)		
	>2	6 (2.4%)	22 (9.0%)	0.698 (0.172, 2.830)		
Planned pregnancy	Yes	12 (4.9%)	67 (27.1%)	1		
	No	61 (24.7%)	107 (43.3%)	3.183 (1.596, 6.347)		

COR: crude odds ratio; CI: confidence interval; AOR: adjusted odds ratio; NGO: non-governmental organization.

monthly income, nature of menses, parity, number of live children, and planned pregnancy status were not associated with induced second trimester abortion in the multivariate analyses.

Unmarried mothers were five times more likely to have induced second trimester abortion compared to married ones (AOR=4.928, 95% CI=1.414–17.166). Women employed at private organization were six times more likely to undergo induced second trimester abortions than students (AOR=6.172, 95% CI=1.163–32.761) (Table 3).

Discussion

This study describes risk factors for second trimester abortion in a setting where safe abortion service has been recently made available by law. Unmarried women and

women employed at private businesses were strong predictors for induced second trimester abortions. Hence, unmarried women account for a disproportionate share of late abortions in our study, a notably, due to fear of the stigma attached to non-marital sexual activity, are having particular difficulties in avoiding unintended pregnancies. This fear may inhibit them from obtaining contraceptive services and from using methods correctly and consistently. Single women are susceptible to induced abortion because of the stigmatizing and economic conditions that makes single motherhood highly disadvantaged. Similarly, women employed at private businesses were also shared high number of late abortions in our study. This is due to financial insecurity if they gave birth. Moreover, the private profit oriented organizations never tolerate for delivery leave, since it has negative impact on their profit.

This finding is in line with earlier studies in South Africa which reported proportions of 25%–30%⁷ and in India³⁵ but less than those in Kenya (34%).^{7,36} However, we found a greater proportion of induced second trimester abortion than reported in hospitals in the Amhara region of Ethiopia where induced second trimester abortions were recorded at 19.2%.⁹ There are several reasons why induced second trimester abortions are higher in our study. Many women may seek care at the Debre Markos Referral Hospital because it is only zonal hospital in East Gojjam zone serving more than 3.5 million people. Private health institutions and other district public hospitals in the area are not equipped to provide abortion care in advanced pregnancy in the catchment area. Moreover, contraceptive utilization is very low among poorly educated and illiterate mothers. As a result, many young women may not have been exposed to sexual and reproductive health education particularly in the rural part of catchment area. Finally, there are many reasons why women may have delayed seeking an early abortion that are linked to changes in personal circumstances often leading to indecision. Delays in detecting a pregnancy may also affect late care seeking and health service-related barriers that hindered access to abortion services. Even though abortion is legal in Ethiopia, it is still stigmatized and not a subject discussed openly in the communities. As a result, some women are reluctant to visit healthcare providers or clinics within their communities for fear of being recognized and ostracized, consequently impacting on their right to choose early an abortion service.

The global proportion reported was 10%–15%,³⁷ while studies carried out in the United States, Nigeria,³⁸ England and Wales,³⁵ and New Delhi³⁹ found 12%, 10%, 8.6%, and 2%, respectively, which is lower compared to this finding. The possible explanation might be the socio-demographic differences among study areas.

In our study, being single was associated with induced second trimester abortion, and women in this category were five times more likely to have an induced second trimester abortion than married respondents (AOR=4.93, 95% CI=1.41–17.12). This finding is similar to studies in Israel,⁴⁰ Jimma, and Southwest Ethiopia⁴¹ and could be due to fear of discrimination and stigma that follows premarital sexual activity, as well as difficulties associated with accessing abortion for unintended pregnancies.

In this study, second term abortion was associated with a woman's employment in a private business. Being employed may have affected the ability of these women to attend a health service to gain a termination. They may not have had time due to long working hours or held on making a decision in the hope that their partner indicated a desire for marriage.

Even though educational status, age, and monthly income were not associated with second trimester abortion in the multivariate analysis, there were high frequencies at

cross tab results. However, less than half (45%) of the women with secondary school education and above had had induced second trimester abortions. This finding is consistent with those studies at universities and colleges in the northwestern parts of Ethiopia.⁴² Women with high educational status are likely to have greater awareness about the legal status of abortion and are more likely to have induced abortions.

Young girls in the age group of 20–24 years were less likely to have second trimester abortions compared to the age group of 15–19 years just like study reports in Israel,⁴⁰ the Netherlands,⁴³ and Jimma.⁴¹ The proportion of induced second trimester abortions among women with less than ETB 500 was higher compared to others, and this is similar to that of a study in the Amhara region because of fear of family, community, and economic problems.^{34,44,45} In this study, mothers who delivered once were 95.3% less likely to undergo induced second trimester abortion than nulliparous mothers. The result is similar to that of a study conducted in Jimma in the southwest of Ethiopia.⁴¹ But it contradicts the findings in United States that reported that 59% of the abortions were by patients who had at least one previous birth.⁴⁶

A study by Mulat et al. found that 46% of all women requesting abortions were neither married nor cohabiting. Such women may not be adequately prepared to prevent unintended pregnancies due to low knowledge of the consequences of unprotected sex or a lack of access to contraceptives. In the Amhara regional state of Ethiopia logistics, rural residence, inability to recognize pregnancy early, and the irregular nature of menses were found to be associated with the second trimester abortion.³⁴

The strength of this study is that it investigated the little known area of second trimester abortion. However, the study is likely to have some limitations. First, social desirability bias might have interfered with the provision of correct answers although conditions were facilitated in the method to control or minimize it. In addition, recall bias might have also have affected the responses to questions about past events. Finally, the consecutive sampling technique of the study is likely to have a limiting effect on the generalizability of the results.

Conclusion

This study revealed that one-third of the women who presented for abortion care services at Debre Markos Referral Hospital had induced second trimester abortions. Unmarried women and women employed at private businesses were associated with induced second trimester abortions. Creating community awareness on safe second trimester abortion services for indicated cases, increasing accessibility of contraceptive methods, counseling reproductive age group mothers especially unmarried, employed at private businesses are helpful to

reduce late abortions. Furthermore, early management of induced second trimester abortion is very crucial to prevent further complications.

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Author contributions

M.T. conceived and designed the study, performed analysis and interpretation of data. B.T. supervised the design conception, analysis, interpretation of data, and made critical comments at each step of the research. B.T. drafted the article. A.F. read and approved the final article.

Availability of data and materials

All the data supporting the study findings are within the article.

Declaration of conflicting interests

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Ethics approval and consent to participate

The study was reviewed and approved by the Debre Markos University Ethical Clearance Committee. All participants were informed about the aim of the study and their full right to withdraw or refuse to participate before their verbal consent was obtained.

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References

1. Facts on induced abortion worldwide global incidence and trends NYGI, 2016, <https://www.guttmacher.org/fact-sheet/induced-abortion-worldwide>
2. Singh S, Darroch J and Ashford L. *Adding it up: the costs and benefits of investing in sexual and reproductive health*. New York: Guttmacher Institute, 2014.
3. Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, et al. Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014; 384(9947): 980–1004.
4. Say L, Chou D, Gemmill A, et al. Global causes of maternal death: a WHO systematic analysis. *Lancet Global Health* 2014; 2(6): e323–e333.
5. Bartlett LA, Berg CJ and Shulman HB. Risk factors for legal induced abortion-related mortality in the United States. *Obst Gynecol* 2004; 103(4): 729–737.
6. Dalvie SS. Second trimester abortions in India. *Reprod Health Mat* 2008; 16(31): 37–45.
7. Gebreselassie H, Gallo MF, Monyo A, et al. The magnitude of abortion complications in Kenya. *BJOG* 2005; 112(9): 1229–1235.
8. Awusi VO and Okeleke V. Post induced abortion morbidity and mortality in Oleh, Nigeria. *Benin J Postgrad Med* 2011; 12(1): 63501.
9. Senbeto E, Alene GD, Abesno N, et al. Prevalence and associated risk factors of induced abortion in Northwest Ethiopia. *Ethiopian J Health Develop* 2005; 19(1): 37–44.
10. Singh S. Hospital admissions resulting from unsafe abortion: estimates from 13 developing countries. *Lancet* 2006; 368(9550): 1887–1892.
11. Turner KL, Hyman AG and Gabriel MC. Clarifying values and transforming attitudes to improve access to second trimester abortion. *Reprod Health Mat* 2008; 16(31): 108–116.
12. Prata N, Bell S, Holston M, et al. Factors associated with choice of post-abortion contraception in Addis Ababa, Ethiopia. *Afr J Reprod Health* 2011; 15(3): 51–57.
13. Healy J, Otsea K and Benson J. Counting abortions so that abortion counts: indicators for monitoring the availability and use of abortion care services. *Int J Gynecol Obst* 2006; 95(2): 209–220.
14. Ceylan A, Ertem M, Saka G, et al. Post abortion family planning counseling as a tool to increase contraception use. *BMC Pub Health* 2009; 9: 20.
15. Harries J, Orner P, Gabriel M, et al. Delays in seeking an abortion until the second trimester: a qualitative study in South Africa. *Reprod Health* 2007; 4: 7.
16. World Health Organization. *Success factors for women's and children's health Ethiopia*. Geneva: World Health Organization, 2015.
17. Federal Ministry of Health. *Technical and procedural guidelines for safe abortion services in Ethiopia*. Addis Ababa, Ethiopia: Federal Ministry of Health, 2006.
18. Federal Ministry of Health. *Technical and procedural guidelines for safe abortion services in Ethiopia*. Addis Ababa, Ethiopia: Federal Ministry of Health, 2014.
19. Singh S, Fetters T, Gebreselassie H, et al. The estimated incidence of induced abortion in Ethiopia, 2008. *Int Perspect Sex Reprod Health* 2010; 36(1): 16–25.
20. Sedgh G, Bearak J, Singh S, et al. Abortion incidence between 1990 and 2014: global, regional, and subregional levels and trends. *Lancet* 2016; 388(10041): 258–267.
21. Jewkes R, Brown H, Dickson-Tetteh K, et al. Prevalence of morbidity associated with abortion before and after legalization in South Africa. *BMJ* 2002; 324(7348): 1252–1253.
22. Jewkes RK, Gumed T, Westaway MS, et al. Why are women still aborting outside designated facilities in metropolitan South Africa? *Br J Obst Gynaecol* 2005; 112(9): 1236–1242.
23. Guttmacher Institute. *Making abortion services accessible in the wake of legal reforms: a framework and six case studies*. New York: Guttmacher Institute, 2012.

24. Prata N, Bell S and Gessesew A. Comprehensive abortion care: evidence of improvements in hospital-level indicators in Tigray, Ethiopia. *BMJ Open* 2013; 3: e002873.
25. Abdella A, Fetters T, Benson J, et al. Meeting the need for safe abortion care in Ethiopia: results of a national assessment in 2008. *Global Pub Health* 2013; 8(4): 417–434.
26. Alemayehu T, Otsea K, Gebremikael A, et al. *Abortion care improvements in Tigray, Ethiopia: using the safe abortion care (SAC) approach to monitor the availability, utilization and quality of services*. Chapel Hill, NC: IPAS, 2009.
27. Shah I and Ahman E. Unsafe abortion: global and regional incidence, trends, consequences, and challenges. *J Obstet Gynaecol Can* 2009; 31(12): 1149–1158.
28. Lalitkumar S, Bygdeman M and Gemzell-Danielsson K. Mid-trimester induced abortion: a review. *Human Reprod* 2007; 13(1): 37–52.
29. Guttmacher Institute and Ipas Convene report on Unsafe Abortion in Africa, March 2006, <https://www.guttmacher.org/article/2006/03/guttmacher-institute-and-ipas-convene-consultation-unsafe-abortion-africa#>
30. Central Statistical Agency and ICF International. *Ethiopia demographic and health survey 2011*. Addis Ababa, Ethiopia: Central Statistical Agency; Calverton, MD: ICF International, 2012.
31. Debre Markos referral hospital human resource management monthly local report, 2017.
32. Central Statistical Authority. *Ethiopia demographic and health survey 2011*. Addis Ababa, Ethiopia: Central Statistical Authority, 2011.
33. Moore AM, Gebrehiwot Y, Fetters T, et al. The estimated incidence of induced abortion in Ethiopia, 2014: changes in the provision of services since 2008. *Int Perspect Sex Reprod Health* 2016; 42(3): 111.
34. Mulat A, Bayu H, Mellie H, et al. Induced second trimester abortion and associated factors in Amhara region referral hospitals. *BioMed Res Int* 2015; 2015: 256534.
35. Ingham R, Lee E, Clements SJ, et al. Reasons for second trimester abortions in England and Wales. *Reprod Health Mat* 2008; 16(31): 18–29.
36. Sibanda A, Woubalem Z, Hogan DP, et al. The proximate determinants of the decline to below-replacement fertility in Addis Ababa, Ethiopia. *Stud Fam Plann* 2003; 34(1): 1–7.
37. *Facts on induced abortion worldwide*. New York: Guttmacher Institute, 2007.
38. Gallo MF and Nghia NC. Real life is different: a qualitative study of why women delay abortion until the second trimester in Vietnam. *Soc Sci Med* 2007; 64(9): 1812–1822.
39. Adler NE, David HP, Major BN, et al. Psychological responses after abortion. *Science* 1990; 24: 41–44.
40. Janiak E, Kawachi I, Goldberg A, et al. Abortion barriers and perceptions of gestational age among women seeking abortion care in the latter half of the second trimester. *Contraception* 2014; 89(4): 322–327.
41. Bonnen KI, Tuijje DN, and Rasch V. Determinants of first and second trimester induced abortion—results from a cross-sectional study taken place 7 years after abortion law revisions in Ethiopia. *BMC Preg Child* 201; 14(1): 416.
42. Tuei VC, Maiyoh G and Ha CE. Type 2 diabetes mellitus and obesity in sub-Saharan Africa. *Diabetes Metab Res Rev* 2010; 26(6): 433–445.
43. Okereke CI. Assessing the prevalence and determinants of adolescents' unintended pregnancy and induced abortion in Owerri Nigeria. *J Biosoc Sci* 2010; 42: 619–632.
44. International conference on second trimester abortion: recommendations 29–31 March 2007. *Reprod Health Mat* 2007; 16: 205–206.
45. Dalvie SS. Second trimester abortions in India. *Reprod Health Matters* 2008; 16(31): 37–45.
46. Guttmacher Institute. Induced Abortion in the United States (Fact sheet), <https://www.guttmacher.org/fact-sheet/induced-abortion-united-states>.