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The relationship between insecurity and the quality of hospital care provided to women with abortion-related complications in the Democratic Republic of Congo: A cross-sectional analysis

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Abstract

Objective: To examine the relationship between insecurity and quality of care provided for abortion complications in high-volume hospitals in the Democratic Republic of Congo (DRC).

Methods: Using the WHO Multi-Country Survey on Abortion complications, we analyzed data for 1007 women who received care in 24 facilities in DRC. For inputs of care, we calculated the percentage of facilities in secure and insecure areas meeting 12 readiness criteria for infrastructure and capability. For process and outcomes of care, we estimated the association between security and eight indicators using generalized estimating equation models.

Results: Facilities in secure areas were more likely to report functioning electricity (93.3% vs 66.7%), availability of an obstetrician 24/7 (42.9% vs 28.6%), and the ability to offer several short-acting contraceptives (83.3% vs 57.1%). However, a higher percentage of facilities in insecure areas reported the availability of a telephone or radio (100% vs 80.0%). Women in insecure areas appeared more likely to experience poor quality clinical care overall than women in secure areas (aOR 2.56; 95% CI, 1.13–5.82, $P = 0.03$). However, there was no association between security and incomplete medical records ($P = 0.20$), use of dilatation and curettage (D&C) ($P = 0.84$), women reporting poor experience of care ($P = 0.22$), satisfaction with care ($P = 0.25$), and severe maternal outcomes ($P = 0.56$). There was weak evidence of an association between security and nonreceipt of contraceptives ($P = 0.07$), with women in insecure areas 70% less likely to report no contraception (aOR 0.31, 95% CI, 0.09–1.09). Use of D&C was high in secure (43.7%) and insecure (60.4%) areas.

Conclusion: Quality of care did not seem to be very different in secure and insecure areas in DRC, except for some key infrastructure, supply, and human resources elements. The frequent use of D&C for uterine evacuation, the lack of good record keeping, and the lack of contraceptives should be urgently addressed.

KEYWORDS

abortion complications, conflicts, Democratic Republic of Congo, insecurity, quality of care

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1 | INTRODUCTION

The highest levels of maternal mortality and severe obstetric complications are found in conflict and postconflict settings,¹ with the number of maternal deaths per 100 000 live births typically above 800. According to a recent analysis of African demographic and health surveys, local exposure to armed conflict events increases the mortality risk during pregnancy and childbirth by 10% for each additional logged event.²

Abortion complications may be a particularly prominent cause of maternal deaths and severe complications in settings with insecurity, as women without easy access to services may use dangerous methods to abort, seek termination of pregnancy at later gestational ages, or experience delays in care for a miscarriage. However, little information exists to quantify the number of abortion complications and their proportional share in the number of maternal deaths. The authors of an international study of maternal mortality in 25 refugee camps in 10 countries chose not to report abortion as a cause of maternal death because they felt it was under-reported given heavily restricted legal reasons for terminations of pregnancy in most of these settings.³ This study illustrates the difficulties in obtaining accurate information on abortion-related complications and deaths in humanitarian contexts.

The insecurity created by conflicts disrupts health systems, including the availability of infrastructure, human resources, commodities, rapid communication, and good governance.^{4,5} Insecurity can also increase delays in accessing maternity care and safe abortion services. Women may postpone their decision to seek care or may face undue delays in transportation when the roads are not safe or there are travel restrictions and checkpoints.⁶ They may also experience delays in receiving good quality care in health facilities and pharmacies in insecure areas because infrastructure is damaged and supplies and human resources are lacking. Because of insecurity and therefore lack of employment, women may not have sufficient financial resources to pay for the necessary costs associated with health care.⁶

Ensuring the quality of abortion services in all settings, within what is permitted by legal frameworks, is essential to ensure that women's sexual and reproductive rights are achieved. At its simplest, quality of care can be measured in terms of inputs to care, process of care, and health outcomes.⁷ A recent World Health Organization (WHO) conceptual framework for maternity care also distinguishes between the provision and the experience of care with respect to the process of care and its outputs.⁸

The Democratic Republic of Congo (DRC) has suffered insecurity, human rights violation, and population displacement linked to armed conflicts since 1996, particularly in its eastern regions. Sexual violence is reported to be common,^{9,10} used as a "weapon of war",¹⁰ and there is a very high unmet need for contraception among women (40% in 2020).¹¹ A recent study conducted in the safe setting of Kinshasa, the capital city of the DRC, suggested that induced abortion was common and mostly conducted in private facilities, which were often using outdated methods.¹² This comprehensive study found that the incidence of induced abortion in Kinshasa was

56 terminations per 1000 women aged 15–49 years and that two-thirds of postabortion care patients experienced severe or moderate complications.¹² However, little information exists on the volume of abortion complications and the adequacy of abortion care in areas where insecurity remains prevalent in the DRC.

The aim of the present study was to examine the relationship between insecurity and quality of care provided for abortion complications in high-volume hospitals in the DRC. Our hypothesis is that facilities in insecure areas are less able to provide good quality of care and that women receiving care in these facilities have worse health and satisfaction outcomes.

2 | MATERIALS AND METHODS

We conducted a secondary analysis of data from the DRC obtained from the WHO Multi-Country Survey on Abortion complications (WHO MCS-A), which was conducted in 11 African countries including the DRC. The protocol for the WHO MCS-A has been described by Kim et al.¹³ and the results for the multicountry dataset are presented by Qureshi et al.¹⁴ The sampling of health facilities in the DRC was done in two stages: first, a random selection of three provinces (Kinshasa, Bandundu, and North-Kivu); second, a random selection of nine high-volume facilities in Kinshasa and Bandundu and 11 high-volume facilities in North-Kivu.

In the DRC, data collection took place between August 1, 2017 and November 30, 2017, during a period when the penal code prohibited access to termination of pregnancy under all circumstances; however, the DRC code of medical ethics enabled women to have access to termination of pregnancy to save their lives, providing the abortion was induced by a doctor and approved by two other doctors.¹² This was shortly before an important change in abortion legislation, requiring that all health facilities provide termination of pregnancies, in case of rape, sexual abuse, or when women's physical or mental health is at risk. The DRC signed the Maputo protocol (legal instrument of the African Union for women's rights) in 2008 and the content of this protocol has been implemented by law since March 2018.¹⁵

The DRC sample includes individual data for 1007 women who received facility-based care for abortion complications or early pregnancy loss in 16 private and 8 public facilities over a 3-month period ($n = 24$). These were large facilities, delivering more than 1000 women per year, all with a gynecological ward and surgical capability. The 16 private facilities included 15 faith-based hospitals.

Data were collected by data collectors supervised by hospital coordinators (one data collector and one hospital coordinator per health facility) using three types of instrument: an institutional form with facility-level data on infrastructure and equipment; a medical record extraction form with individual-level data on signs, symptoms, and management; and an Audio Computer-Assisted Self-Interview (ACASI) questionnaire, for a subsample of women who were admitted or had a prolonged hospital stay (more than 24 h). Participants answered in the privacy of a room in the health facility

using a tablet by themselves, to respond to questions eliciting information on their pathway to care, respectful care, satisfaction with care, and uptake of postabortion contraception.

As there is no standard definition or threshold measures for assessing insecurity, hospitals were classified as being in secure and insecure areas using the local knowledge of the DRC country team for the MCS-A study, confirmed by open sources of data on conflict (the Armed Conflict Location & Event Data Project (ACLED) and the Uppsala Conflict Data Program (UCDP) databases). ACLED (<https://acleddata.com/about-acledd/>) collects location and date information on all types of reported "political conflicts" on a daily basis, while UCDP (<https://www.pcr.uu.se/research/ucdp/about-ucdp/>) collects information on "organized violence" on a rolling basis. Hospitals in Oicha (one facility), Beni (one facility), Butembo (4 facilities), Mangina (one facility), Kyondo (one facility), and Musienene (one facility) localities were classified as being in insecure areas. In total, there were nine hospitals in insecure areas and 15 in secure areas.

We used the three categories of Donabedian's classic framework for quality-of-care assessment: inputs, process, and outcomes.⁷ For the input indicators, we started by calculating the percentage of facilities in secure and insecure areas that had the infrastructure and capability to provide quality abortion-related care, captured by 12 different indicators. These can be broadly categorized into two types of indicators: (1) infrastructure; and (2) service readiness for postabortion care. For infrastructure, we looked at four different indicators (available and functioning: electricity, telephone/radio, water, and sewerage). The service readiness indicators were adapted from Campbell et al.¹⁶ and covered eight indicators. These included the availability of the following services: removal of retained products, parenteral antibiotics, uterotonics (oxytocin or misoprostol), intravenous fluids, and blood transfusion. Also included was the availability of an obstetrician 24/7 at the facility, at least three short-acting contraceptives offered, and at least one long-acting reversible contraceptive offered.

In the second part of the analysis, for the measurement of the process of care, we looked at the association between security and some aspects of the quality of care that women received during their facility stay for abortion-related complications. There were seven main outcomes that we explored as part of this analysis, which covered poor-quality clinical care, postabortion contraceptive provision, and poor experience of care. Table 1 provides an overview of each of these outcomes in more detail. Generalized estimating equation models were used to account for clustering of women by facility. We first calculated the crude association between whether the woman received care in an insecure area and each outcome, and then adjusted for age, marital status, and education as potential confounders.

Finally, we explored if there was any evidence for an association between security and abortion-related outcomes for women, which covered the severity of the complications and satisfaction with care. These are described in Table 1. Generalized estimating equation models were used to calculate first the crude association between security and each of these outcomes, and then the adjusted association between security and these outcomes, accounting for age, marital status, and education.

The study was approved by the WHO Ethical Review Committee (protocol: 0002699) and the WHO Human Reproduction Programme (HRP) Review Panel on Research Projects. The study was also approved by the Comité d'Ethique de l'Ecole de Santé Publique in the DCR and the LSHTM ethics committee (reference 22121/RR/19562). Informed consent was obtained from women who participated in the exit interview survey using ACASI.

3 | RESULTS

In the secure area, whilst they all met the inclusion criteria for participating facilities, five facilities were classified as primary level, eight secondary level, and two tertiary level. Almost all the facilities in insecure areas were secondary level ($n = 8$), with one facility tertiary level. The median number of beds in the facilities was slightly higher in secure areas (median 45, interquartile range [IQR] 26–72) than in insecure areas (median 39, IQR 24–51). The monthly number of deliveries per facility was lower in secure areas (median 99, IQR 44–111) than in insecure areas (median 160, IQR 130–182).

Figure 1 shows the percentage of facilities in secure and insecure areas that had basic facility infrastructure available, as well as the capability to provide key components of postabortion care. Facilities in secure areas were more likely than facilities in insecure areas to report functioning electricity (93.3% vs 66.7%), availability of an obstetrician 24/7 (42.9% vs 28.6%), and the ability to offer three or more types of short-acting contraceptives (83.3% vs 57.1%). A higher percentage of facilities in insecure areas reported availability of a telephone/radio than facilities in secure areas (100% vs 80.0%). Further details on the facility capability to provide postabortion care is provided in Table S1.

A total of 1007 women with abortion-related complications had information extracted from their medical records, of which 703 attended facilities in secure regions and 304 attended facilities in insecure regions. The distribution of these women by key sociodemographic characteristics is provided in Table S2. Of note, pregnancy was of gestational age below 13 weeks for 41.5% of women in insecure areas compared with 69.1% of women in secure areas, although gestational age remained undetermined for 24.3% of women in insecure areas. Of the 1007 women, 265 completed the ACASI: 203 in secure regions and 62 in insecure regions. In the ACASI, 33.0% of women with abortion-related complications in secure areas reported using methods to end their pregnancy compared with 6.7% in insecure areas (Table S2). The elicited methods were wide ranging including, for example, use of misoprostol, tablets, herbs, or other types of substances taken orally, inserting something into the vagina, other procedures, and abdominal massage. Table S3 shows the range in frequencies of dilatation and curettage (D&C) among women who needed uterine evacuation in hospitals in insecure areas (0%–100%) and in hospitals in secure areas (5.7%–100%).

Table 2 shows the association between insecurity and poor-quality clinical care, nonreceipt of contraception, and report of poor experience of care. There was evidence that women in insecure areas are more likely to experience poor-quality clinical care than women

TABLE 1 Description of the outcomes of interest when looking at the association between whether women received care in a secure or insecure area and the quality of care received

	Data source	Description
Poor-quality clinical care (composite)	Medical record	Women were categorized as having poor-quality clinical care if any of the following was apparent from their medical record: 1. Near miss even after arrival at the facility 2. Use of D&C 3. Missing any one of the following key pieces of information: estimate of gestational age, duration of symptoms, information on vital signs, or final diagnosis
Poor-quality clinical care (use of D&C)	Medical record	Women who required uterine evacuation were categorized as having poor-quality clinical care (use of D&C) if the following was apparent from their medical record: Use of D&C
Poor-quality clinical care (medical record incomplete)	Medical record	Women were categorized as having poor-quality clinical care (medical record incomplete) if the following was apparent from their medical record: Missing any one of the following key pieces of information: estimate of gestational age, duration of symptoms, information on vital signs, or final diagnosis
Not given information on contraception	ACASI	Women were categorized as not being given information on contraception if they answered no to the question: "Were you given information on contraception or ways to prevent pregnancy before leaving the hospital?"
Nonreceipt of contraception before discharge	ACASI	Women were categorized as not provided with a method of contraception if they reported leaving the facility without a contraceptive or a prescription for a contraceptive
Poor experience of care	ACASI	Women who answered negatively on one or more of 8 questions on respectful care were classified as having reported at least one incident of poor experience of care. The 8 questions were about communication, informed consent, mistreatment, privacy, waiting time
Severe/near-miss complication/mortality	Medical record	Women were categorized as having a severe complication if they had a potentially life-threatening complication, a near-miss complication, or they died
Consistently satisfied or very satisfied with care	ACASI	Women were categorized as consistently satisfied or very satisfied with care if they responded that they were either satisfied or very satisfied for the five questions as outlined above

Abbreviation: D&C, dilatation and curettage.

in secure areas (adjusted odds ratio, aOR 2.56; 95% CI, 1.13–5.82, $P = 0.03$) after adjusting for age, education, and marital status. When we look at the individual components of clinical quality of care, there was no association between security and incomplete medical records ($P = 0.20$) or use of D&C ($P = 0.84$). There was some weak evidence of an association between security and nonreceipt of contraceptives ($P = 0.07$), with women in insecure areas 70% less likely to report nonreceipt of contraception compared with women in secure areas (aOR 0.31; 95% CI, 0.09–1.09), but no evidence of an association between security and receiving information on contraception. After adjusting for sociodemographic characteristics, women in insecure areas had nearly double the odds of reporting poor experience of care compared with women in secure areas (aOR 1.93; 95% CI, 0.67–5.59); however, there was no statistical evidence for a difference ($P = 0.22$).

Table 3 shows the association between security and both the severity of complications and the satisfaction with care. There was no evidence that women in insecure areas were more likely to have a severe maternal outcome or potentially life-threatening condition compared with women in secure areas (aOR 0.78; 95% CI, 0.34–1.79, $P = 0.56$). Women with abortion complications in insecure areas had nearly 50% lower odds of reporting being consistently very satisfied or satisfied with care compared with women in secure areas (aOR 0.49; 95% CI, 0.15–1.66), but there was no statistical evidence for a difference ($P = 0.25$).

4 | DISCUSSION

Our initial hypothesis that women with abortion complications experienced poorer quality of hospital care in insecure areas compared with secure areas is only partially confirmed. Women with abortion complications in insecure areas were indeed more likely to be treated in facilities with infrastructural and commodities deficiencies and shortages of trained specialists, with a substantial proportion of these facilities having no electricity, no obstetrician/gynecologist, or anesthetist for the treatment of complicated cases, and providing limited contraceptive choice. However, these facilities also had better communication means and they were more likely to provide surgical or medical termination of pregnancy. In addition, we only found significant differences in the provision of care between facilities in insecure and secure areas for our combined score of clinical quality of care (with higher odds of poor quality of care in facilities in insecure areas, mostly driven by poor recording of key clinical information) and, to a weaker level, for the provision of contraception to women (with facilities in insecure areas performing better than facilities in secure areas). We also did not find that women with abortion complications in facilities in insecure areas were more likely to experience a near-miss event or death. Although women attending facilities in insecure areas reported substantially lower odds of satisfaction with care, this was also not significant. There was some

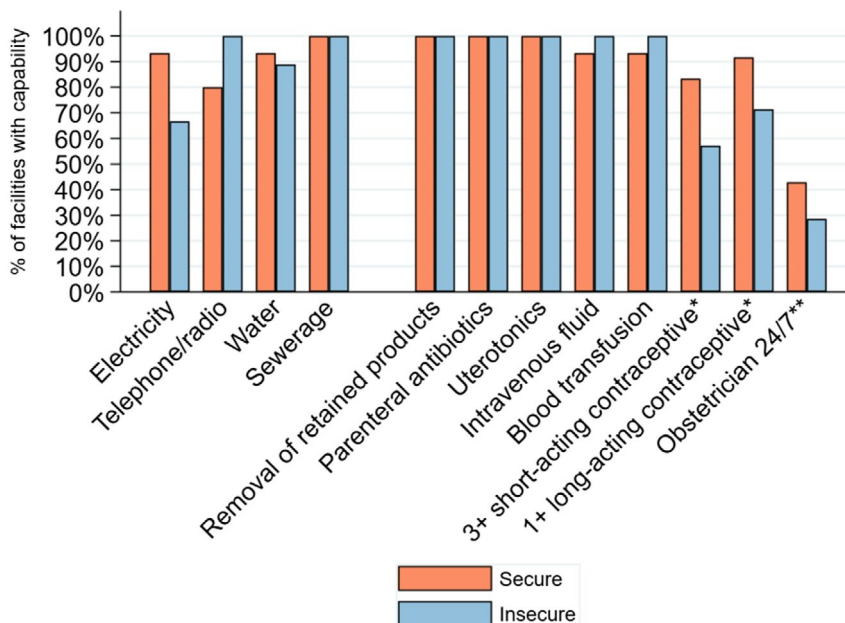


FIGURE 1 Facility capability to provide care for abortion-related complications, stratified by whether the facility is in a secure or insecure area (n = 15 in secure areas and n = 9 in insecure areas). *Five facilities missing data: three in secure areas and two in insecure areas. **Three facilities missing information: one in secure and two in insecure areas

TABLE 2 The association between insecurity and whether women with abortion-related complications have poor-quality clinical care or have not received contraceptives

Process of care outcome ^a Exposure	Total number	% with outcome	Crude odds ratio (95% CI)	P value	Adjusted odds ratio ^b (95% CI)	P value ^b
Outcome (1): Poor-quality clinical care (composite)						
Secure	703	44.0	1		1	
Insecure	304	79.0	1.57 (1.04–6.39)	0.04	2.56 (1.13–5.82)	0.03
Outcome (1a): Poor-quality clinical care (use of D&C) ^c						
Secure	442	43.7	1		1	
Insecure	235	60.4	0.95 (0.31–2.90)	0.93	0.89 (0.29–2.72)	0.84
Outcome (1b): Poor-quality clinical care (medical record incomplete) ^d						
Secure	703	29.0	1		1	
Insecure	304	51.0	2.17 (0.89–5.25)	0.09	1.84 (0.72–4.69)	0.20
Outcome (2a): Not given information on contraceptives ^e						
Secure	203	24.6	1		1	
Insecure	62	27.4	1.21 (0.51–2.85)	0.67	0.94 (0.41–2.12)	0.87
Outcome (2b): Nonreceipt of contraceptive before discharge ^e						
Secure	185	58.4	1		1	
Insecure	60	30.0	0.38 (0.13–1.14)	0.08	0.31 (0.09–1.09)	0.07
Outcome (3): Poor experience of care ^e						
Secure	184	49.5	1		1	
Insecure	58	65.5	1.95 (0.91–4.18)	0.09	1.93 (0.67–5.59)	0.22

^aSee Table 1 for operational definition of analysis outcomes related to the process of care.

^bAdjusted for age, education, marital status.

^cRestricted to women who required uterine evacuation.

^dMedical record had missing data for at least one of: estimate of gestational age, duration of symptoms, information on vital signs, or final diagnosis.

^eRestricted to women who completed the ACASI survey, and answered all required questions in the ACASI.

TABLE 3 The association between insecurity and whether women with abortion-related complications had a severe outcome or were satisfied with care

Outcome/exposure	Total number	% with outcome	Crude odds ratio (95% CI)	P value	Adjusted odds ratio ^a (95% CI)	P value ^a
Outcome (1): Severe/near-miss complication/mortality ^b						
Secure	703	12.2	1		1	
Insecure	304	9.5	0.56 (0.29–1.10)	0.09	0.78 (0.34–1.79)	0.56
Outcome (2): Consistently satisfied or very satisfied with care ^c						
Secure	185	44.9	1		1	
Insecure	57	33.3	0.74 (0.28–2.00)	0.56	0.49 (0.15–1.66)	0.25

^aAdjusted for age, education, marital status.

^bIncludes 10 deaths (8 in secure, 2 in insecure facilities).

^cRestricted to women who completed the ACASI survey and answered questions on satisfaction.

evidence of delay in needing, seeking, or accessing care, with 41.5% of women in insecure areas having a gestational age below 13 weeks compared with 69.1% of women in secure areas; but this result was undermined by the larger proportion of abortion complications with unknown gestational age in the insecure areas.

The explanations for these findings are multiple. First, the profile of users of the facilities in secure and insecure areas—although controlled for in the calculation of adjusted odd ratios—was different. For example, a higher percentage of women with abortion-related complications attending facilities in insecure areas were married compared with women in secure areas. We were only able to adjust for a limited number of potential confounders, given the sample size and information collected, and it is likely that there is residual confounding (e.g. by socioeconomic status). Second, hospitals in insecure areas were more likely to be faith-based hospitals. It is possible that women with complications related to a termination of pregnancy may have been less likely to attend them, although these facilities are also more likely to provide termination of pregnancy. Third, as not all facilities in the three randomly selected provinces were included, we do not have a population-level sample of near-miss abortion cases. While it can be hypothesized that near-miss abortion cases are only found in hospitals because they could not survive in the community without hospital care, this limits our interpretation of the findings. Different proportions of women may have received care for mild, moderate, and severe abortion complications in other facilities in secure and insecure areas. Finally, the lack of relationship between insecurity and severe complications outcomes may be explained by more abortion-related deaths in the community, referrals of severe cases to facilities in more secure areas, women travelling further away for care, or a lower proportion of termination of pregnancies, including using unsafe methods, in insecure areas.

Quality of care was suboptimal overall for a range of indicators, including electricity, the availability of methods of contraception, and the quality of record keeping. Several hospitals are conducting D&C for all ($n = 4$) or most uterine evacuations (above 50% in $n = 14$), a method that is no longer recommended below 14 weeks of pregnancy.¹⁷ This suggests that women delay seeking care for postabortion complications, or that hospitals provide outdated methods of care in these regions of the DRC due to lack of manual vacuum aspirators and trained health professionals in the use of it. Our finding contrasts

with a recent analysis of service data for 29 facilities (including one hospital and 4 referral health centers) in the DRC. It found that only 3% of postabortion care patients had D&C in the DRC in 2017 compared with 19% in 2012, suggesting progress.¹⁸ It should be noted that, while there may be overlap, the list of health facilities included in the study by Gallagher et al.¹⁸ is different from the list of hospitals included in our study. Nevertheless, our much higher estimates of D&C reveal that there is still room for improvement in high-volume facilities.

The main strengths of our study include the use of standardized data collection instruments and ACASI, which improve the reliability and validity of our findings. In addition, prospective identification of complications took place in the participating facilities, which is a superior approach to retrospective data collection. The study used WHO criteria for near-miss abortion complications.¹³ Limitations include the small size of our sample, especially for the ACASI interviews, which limited the power to detect a significant difference for the respectful care and satisfaction outcomes, and a relationship between deficiencies in signal functions and outcomes of care.¹⁹ Our number of hospitals was relatively small, reducing our ability to investigate differences between secure and insecure areas for facility capabilities. Insecurity was defined a posteriori and mostly subjectively, based on local knowledge and observations done by JJW during site visits confirmed by open sources of data on conflicts. However, there will be a range of insecurity level experienced by these facilities that we did not account for. Our sample includes an unknown proportion of women with spontaneous abortion complications, which may be differential in facilities in secure and insecure areas. Women with miscarriages are less likely to develop severe complications than women with an unsafe termination of pregnancy and have different care pathways and experiences. Finally, it is difficult to interpret differences in the hospital near-miss proportions without having all hospitals in the provinces included in the study.

5 | CONCLUSION

Quality of care for abortion complications does not seem to be very different in secure and insecure areas in the DRC in our study,

except for some key infrastructure, supply, and human resources elements. A larger study should be conducted in the DRC and other countries affected by insecurity to assert differences in the process of care and health outcomes for abortion complications, including all health facilities in the same region so that population estimates can be calculated, and a qualitative component to understand with greater depth the strengths and shortcomings in the care provided. The frequent use of D&C for uterine evacuation, the lack of good record keeping, and the lack of contraceptives in high-volume facilities should be urgently addressed.

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CONFLICTS OF INTEREST

CC reports consultancy fees paid to her institute from WHO. VF reports WHO funding to support data analysis in this study.

AUTHOR CONTRIBUTIONS

JW-M was country lead investigator for the WHO Multi-Country Survey on Abortion (MCS-A) in the DRC. CC conducted the analysis with contribution from RS and in consultation with the other authors. VF and CC prepared the first draft of the manuscript. All six authors contributed to subsequent drafts, with revisions coordinated by VF.

REFERENCES

- World Health Organization. *Trends in Maternal Mortality 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. Report no.: 9789241516488. WHO; 2019.
- Kotsadam A, Ostby G. Armed conflict and maternal mortality: a micro-level analysis of sub-Saharan Africa, 1989–2013. *Soc Sci Med*. 2019;239:1989–2013.
- Hynes M, Sakani O, Spiegel P, Cornier N. A study of refugee maternal mortality in 10 countries, 2008–2010. *Int Perspect Sex Reprod Health*. 2012;38:205–213.
- Kruk ME, Kujawski S, Moyer CA, et al. Next generation maternal health: external shocks and health-system innovations. *Lancet*. 2016;388:2296–2306.
- Tunçalp O, Fall IS, Phillips SJ, et al. Conflict, displacement and sexual and reproductive health services in Mali: analysis of 2013 health resources availability mapping system (HeRAMS) survey. *Confl Health*. 2015;9:28.
- Parmar PK, Jin RO, Walsh M, Scott J. Mortality in Rohingya refugee camps in Bangladesh: historical, social, and political context. *Sex Reprod Health Matters*. 2019;27:1610275.
- Donabedian A. Evaluating the quality of medical care. *Milbank Q*. 2005;83(4):691–729.
- Tunçalp O, Were WM, MacLennan C, et al. Quality of care for pregnant women and newborns—the WHO vision. *BJOG*. 2015;122:1045–1049.
- Freedman J. Explaining sexual violence and gender inequalities in the DRC. *Peace Review*. 2011;23:170–175.
- van Wieringen K. To counter the rationality of sexual violence: existing and potential policies against the genocidal use of rape as a weapon of war in the Democratic Republic of Congo. *J Int Humanit Action*. 2020;5:8.
- Family Planning 2020. FP2020: the arc of progress, 2019–2020. Accessed November 11, 2021. http://progress.familyplanning2020.org/sites/default/files/FP2020_ProgressReport2020_WEB.pdf
- Lince-Deroche N, Kayembe P, Blades N, et al. *Unintended Pregnancy and Abortion in Kinshasa, Democratic Republic of Congo: Challenges and Progress*. Guttmacher Institute; 2019.
- Kim CR, Tunçalp Ö, Ganatra B, Gülmezoglu AM. WHO multi-country survey on abortion-related morbidity and mortality in health facilities: study protocol. *BMJ Global Health*. 2016;1(3):e000113.
- Qureshi Z, Mehrtash H, Kouanda S, et al. Understanding abortion-related complications in health facilities: results from WHO multi-country survey on abortion (MCS-A) across 11 sub-Saharan African countries. *BMJ Glob Health*. 2021;6:e003702.
- Acte d'adhesion au protocole a la charte africaine des droits de l'homme et des peuples, relatif aux droits de la femme en Afrique. *Journal-Officiel-de-la-République-Démocratique-du-Congo*. March 14, 2018 ed2018. Accessed November 11, 2021. <https://www.leganet.cd/Legislation/JO/2018/JOS%2014%2003%202018.pdf>
- Campbell OMR, Aquino EML, Vwalika B, Gabrysch S. Signal functions for measuring the ability of health facilities to provide abortion services: an illustrative analysis using a health facility census in Zambia. *BMC Pregn Childbirth*. 2016;16:105.
- World Health Organization. *Safe abortion: technical and policy guidance for health systems – 2nd ed*. WHO; 2012.
- Gallagher M, Morris C, Aldogani M, et al. Postabortion care in humanitarian emergencies: improving treatment and reducing recurrence. *Glob Health Sci Pract*. 2019;7(Suppl 2):S231–S246.
- Atuhairwe S, Gemzell-Danielsson K, Byamugisha J, Kaharuza F, Tumwesigye NM, Hanson C. Abortion-related near-miss morbidity and mortality in 43 health facilities with differences in readiness to provide abortion care in Uganda. *BMJ Glob Health*. 2021;6:e003274.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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