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*Article*

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**Abstract:** Background: Worldwide, around 73 million induced abortions take place every year. Of these, 45% are unsafe and can lead to complications. The evolution of the legal and practical landscape of abortion in the Democratic Republic of the Congo (DRC) over the last few years necessitates a re-examination of the experience of induced abortion, leading this study to measure the incidence of abortion among young women (15 to 29 years of age), as well as the heterogeneity of this problem according to the residence of these young women (slum vs. non-slum areas). Methodology: We used representative survey data on women aged 15–49 in Kinshasa, collected from December 2021 to April 2022. The survey included questions about the respondents' and their closest confidants' experience of induced abortion, including the methods and sources used. We estimated abortion incidence and heterogeneity over one year based on residence in the city of Kinshasa according to sociodemographic characteristics. Results: The incidence rate of induced abortion among the confidants (close friends) in 2021 was 131.5 per 1000 (95% CI: IQR 99.4–163.6). These rates were significantly higher than the corresponding estimates of those surveyed. The incidence of induced abortion was 24.4 per 1000 (95% CI: 15.8–32.9) abortions per 1000 women among the respondents. The incidence rates of induced abortion were much higher among the respondents residing in slums than among those residing in non-slums (29.2 vs. 13.0 per 1000; $p < 0.001$). Conclusions: More precise estimates of the incidence of abortion indicate that the incidence rate of abortion was higher among young women residing in slums, who were unmarried and had no children. These incidences were higher among confidants than among respondents. There is still a lot of work to be done to fulfill the obligations outlined in the Maputo Protocol. This includes establishing easily accessible services that offer complete abortion care with a focus on women's needs, particularly in slum areas. The aim is to decrease the occurrence of unsafe abortions and their associated effects.

**Keywords:** incidence of abortion; slum; Kinshasa; closest confidants

## 1. Background

Induced abortion is a prevalent occurrence in global reproductive health, with an annual rate of around 39 abortions per 1000 women aged 15-49 years [1]. When conducted in accordance with medical protocols and under the supervision of healthcare practitioners, induced abortion appears to be highly secure. Nevertheless, unsafe abortion is responsible for approximately 8% of maternal fatalities worldwide [2].

The majority of these fatalities transpire in the Global South, particularly in sub-Saharan Africa, where a substantial number of abortions transpire outside the established healthcare system. The reasons for this are legislative constraints, social disapproval, financial burden, and the scarcity or unavailability of secure abortion facilities [3]. An analysis of abortion rates and safety trends is necessary to track advancements and provide information for ongoing reforms due to the changing legal and practical situation surrounding abortion in the Democratic Republic of the Congo (DRC) in

recent years. Unsafe abortion contributes significantly to maternal morbidity and mortality, accounting for approximately 10% of maternal deaths in Africa [2] and especially among individuals residing in socioeconomically deprived or impoverished communities. A significant majority of the impoverished urban population in numerous sub-Saharan nations reside in slums, which are frequently isolated from official public services, including FP programs [4]. Municipal authorities frequently fail to recognize slums as essential components of urban areas. Consequently, individuals living in slums are often excluded from official systems that provide services [4]. Due to the predominantly governmental nature of most FP programs, the urban underprivileged, especially those residing in slums, frequently face barriers while attempting to receive these services. Considering that the majority of urban population growth in the future will occur in developing countries, it is crucial to conduct research on the disparities in family planning outcomes between slum and non-slum residents. This research should also investigate the role of access to family planning services in contributing to these disparities, given the significant health implications of urbanization.

The growth of the urban population imposes an extra strain on the already limited resources of local governments [5]. Insufficient knowledge exists regarding the diversity of reproductive health outcomes, including fertility desires, family planning utilization, and unintended pregnancies, in both urban slums and non-slum areas, despite the associated health consequences. Limited information exists regarding the induced abortion and availability of reproductive health services for individuals living in urban poverty. Limited research has been conducted on the utilization of contraception among women residing in African slums and non-slum areas [6–8]. Akilimali published abortion incidence in Kinshasa [9], These alarming statistics have prompted unprecedented policy action to reduce the morbidity and mortality associated with unsafe abortion in the DRC. However, the incidence was not presented in relation to the two groups of neighborhoods (slum vs non-slum), despite the existence of compelling grounds for the variability between these two types of populations in the city of Kinshasa.

The aims of this research were to the heterogeneity of abortion incidence between slum and non-slum residence specifically among youth aged under 30 years. This age group is currently undergoing the emergence of sexual urges and the chance to explore their sexuality [10]; yet emotional maturity is typically not yet fully established. Consequently, teenagers and young individuals are more prone to participate in sexual activities that can be classified as "high-risk". These actions refer to engaging in sexual intercourse without using a condom, whether it be vaginal, anal, or oral sex, or having sex while under the influence of drugs or alcohol. These behaviors can result in unplanned pregnancy and/or the transmission of sexually transmitted illnesses [11]. The heightened probability of participating in high-risk sexual behavior renders sexual health a crucial health concern in those under the age of 30.

## 2. Methodology

### 2.1. Sampling and Data Collection

Data from the Performance Monitoring for Action (PMA) study were used, which was conducted in Kinshasa and Central Congo between December 2021 and April 2022. PMA conducts nationally or regionally representative reproductive health surveys in nine countries in Africa and Asia [12]. The PMA DRC carried out surveys in two provinces, Kinshasa and Kongo Central, utilizing a two-stage cluster sampling methodology. The selection of clusters was conducted using probability proportional to size sampling. Within each cluster, a complete enumeration of all households was conducted, and a random selection of 35 households was made to obtain a representative sample. All females between the ages of 15 and 49 who were listed in the household survey were asked to take part in the women's survey throughout the 2019-20 period (Phase 1). The ladies were tracked on a yearly basis during Phase 2 (2020-21) and Phase 3 (2021-22). Out of the initial database of 2326 women in Kinshasa, we specifically chose 1397 women who were between the ages of 15 and 29. For more details on the PMA selection procedures, see www.pmadata.org/data/survey-methodology. Ethical

approval for this study was obtained from the Institutional Review Board at the Johns Hopkins University Bloomberg School of Public Health (approval #14590) in November 2021 and from the Comité d'Éthique at the Kinshasa School of Public Health (approval #ESP/CE/159B/2021) in October 2021. More details on sampling and data collection are described in our former article [9].

*2.2. Measures*

The abortion experience of both the friends and respondents was evaluated by two sets of inquiries: one inquiring about any previous actions taken to terminate a pregnancy, and another inquiring about any previous actions taken to manage a delayed menstrual cycle. To ascertain the reason for the action taken, a subsequent inquiry was made regarding whether it was motivated by concerns of potential pregnancy during menstrual regulation. This study defines abortion as any deliberate action to terminate a pregnancy, whether it is through successful methods of termination or by successful methods of inducing menstruation due to concerns about pregnancy. The following inquiries examined the timing of the most recent abortion encounter, the techniques and origins employed, and whether any complications arose.

We utilized data pertaining to reported sources and techniques of abortion in order to construct a categorical metric that determines whether the abortion procedure employed a recommended method and/or source. This measure was derived from the latest indicator of abortion safety provided by the World Health Organization (WHO). As to the World Health Organization (WHO), safe abortions are defined as procedures conducted by skilled practitioners using approved techniques, such as surgical abortion or the use of misoprostol alone or in combination with mifepristone. Safe abortions can be performed by trained providers using suggested procedures. However, the least safe abortions are carried out by untrained clinicians using non-recommended methods.

Using our data, which did not account for provider training, we categorized abortions obtained from various public or private clinical sources, including national hospitals, regional hospitals, government health centers, family planning clinics, maternity clinics, community health workers, private hospitals, NGOs, private health centers, private practices, private physicians, mobile nurses, and community health workers, as being sourced from a recommended provider. All sources, except for those providing information on medical abortion pills, were deemed non-recommended. In order to incorporate the World Health Organization's most recent abortion recommendations, which state that self-managed medical abortion can be considered safe in some circumstances, we classified all abortions involving medical abortion pills (such as misoprostol with or without mifepristone) from any source as being associated with a recommended source [13]. Despite our limited knowledge on the precise details of the surgical or medicinal abortion pill regimen, we categorized both surgical abortions and medical abortion pills as approved procedures. Any techniques other than pills, injections, or traditional procedures were categorized as not recommended. As a result, our categories evaluated whether the abortion utilized a "recommended method and source", a "non-recommended method or source", or a "non-recommended method and source".

The study incorporated various sociodemographic and reproductive health factors for both the respondents and their friends. These factors included age, education level, marital status, province of residence (assuming that the friend lived in the same province as the respondent), parity, current use of contraceptives, and current use of long-acting reversible contraceptives (LARCs), such as intrauterine devices (IUDs) and implants. We conducted a focused analysis on the frequency of LARC (Long-Acting Reversible Contraceptives) usage. This was done because individuals and their acquaintances are likely to provide more precise information regarding these methods, which are used over a longer period of time, compared to methods that include behavior, sexual activity, or user control, which may be initiated and discontinued more often. Prior studies have indicated that by comparing the prevalence of long-acting reversible contraception (LARC) among survey participants and their friends, we can verify the premise that surrogate samples in social network-based approaches are similar and that less sensitive reproductive health behaviors are shared [14]. We also analyzed the wealth tertiles of respondents by using a principal components analysis. This analysis was based on information about household assets, water, sanitation, and construction

materials. The methodology we used was similar to that used in the Demographic and Health Surveys. Unfortunately, we were unable to acquire the household information for the friends, which prevented us from analyzing the correlation between wealth and abortion trends in the proxy sample.

*2.3. Analysis*

To examine and adjust for potential violations of assumptions (selection and transmission biases) in the friend data, we followed a five-step process described in our former article [9].

We compared the fully adjusted friend estimates to the respondent rates by assessing whether the confidence intervals overlapped, as no appropriate statistical test was available due to the post hoc nature of the transmission bias adjustment described above.

We then analyzed the distribution of abortion methods and sources for both the respondents and their friends. In addition, we examined the sociodemographic characteristics associated with the use of non-recommended abortion methods and sources, which may pose the greatest risk of adverse outcomes, for both the respondents and their friends. Design-based F-tests were used to assess the statistical significance of these differences.

All analyses were conducted with Stata version 17 (Stata Corp, College Station, TX). We constructed survey design weights separately for each province to account for the complex sampling strategy, reflecting the inverse probability of selection and nonresponse. We computed robust standard errors to adjust for clustering. The design weights were then combined with the post-stratification weights for the proxy sample.

## 3. Results

*3.1. Sociodemographic Characteristics of Respondents and Confidants*

Our sample included 1397 women with a mean age 21.9 years. Of these, 21% were married, 36% had children, and 97% had attained a higher level of education. At the time of the survey, 42% of the women were using contraception, and 8% were using long-acting reversible contraceptives (LARCs). In addition, 70% of the respondents lived in slum areas. See Tables 1 and 2 for more details.

**Table 1.** Distribution of characteristics of respondents aged 15–29 and their confidant aged 15–45 in Kinshasa, DRC*.

| Characteristics | Respondents | | Confidants Adjusted | | Confidants Fully Adjusted ** | | *p* |
|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | |
| **Age Group (years)** | | | | | | | |
| 15–19 | 516 | 37.0 | 294 | 33.5 | 480 | 34.8 | **<0.0001** |
| 20–29 | 881 | 63.0 | 457 | 52.2 | 792 | 55.9 | |
| 30–39 | | | 100 | 11.5 | 100 | 7.5 | |
| 40–49 | | | 25 | 2.7 | 25 | 1.8 | |
| Total | 1397 | 100.0 | 876 | 100.0 | 1397 | 100.0 | |
| **Education** | | | | | | | |
| None/primary | 56 | 3.6 | 31 | 3.3 | 55 | 3.6 | 0.192 |
| Secondary | 1053 | 75.6 | 633 | 72.0 | 1030 | 74.3 | |
| Tertiary | 288 | 20.9 | 221 | 24.7 | 312 | 22.2 | |
| Total | 1397 | 100.0 | 885 | 100.0 | 1397 | 100.0 | |
| **Marital Status** | | | | | | | |
| Not married | 1088 | 78.7 | 661 | 75.1 | 1038 | 74.9 | **0.051** |
| Married/in cohabitation | 309 | 21.3 | 228 | 24.9 | 359 | 25.1 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Total | 1397 | 100.0 | 889 | 100.0 | 1397 | 100.0 |
| **Socio-Economic status** | | | | | | |
| Low | 487 | 31.6 | 487 | 31.6 | | |
| Middle | 464 | 32.7 | 464 | 32.7 | | |
| High | 446 | 35.7 | 446 | 35.7 | | |
| Total | 1397 | 100.0 | 1397 | 100.0 | | |
| **Residence** | | | | | | |
| Non-slum | 327 | 30.1 | 327 | 30.1 | | 0.999 |
| Slum | 1070 | 69.9 | 1070 | 69.9 | | |
| Total | 1397 | 100.0 | 1397 | 100.0 | | |
| **Parity** | | | | | | |
| 0 | 898 | 65.1 | 572 | 64.8 | 886 | 63.9 | 0.855 |
| ≥1 child | 499 | 34.9 | 317 | 35.2 | 511 | 36.1 | |
| Total | 1397 | 100.0 | 889 | 100.0 | 1397 | 100.0 | |
| **Recent Contraceptive Use** | | | | | | |
| No | 849 | 59.4 | 499 | 55.2 | 820 | 57.7 | 0.082 |
| Yes | 548 | 40.6 | 391 | 44.8 | 577 | 42.3 | |
| Total | 1397 | 100.0 | 890 | 100.0 | 1397 | 100.0 | |
| **Recent Use of LARCs** | | | | | | |
| No | 1319 | 93.6 | 817 | 91.0 | 1292 | 92.0 | **0.031** |
| Yes | 78 | 6.4 | 73 | 9.0 | 105 | 8.0 | |
| Total | 1397 | 100.0 | 890 | 100.0 | 1397 | 100.0 | |

LARCs: long-acting reversible contraceptives. *Estimates weighted; Ns unweighted; bold indicates p-value for design-based F test (reference respondents) less than 0.05. **Estimates include respondent characteristics in place of "missing" confidantes; post-stratification weights applied.

**Table 2.** Distribution of the characteristics of female respondents aged 15 to 29 by the number of confidants in Kinshasa, DRC *.

| | 0 Confidant | | ≥1 Confidant | | All Respondents | | p Value |
|---|---|---|---|---|---|---|---|
| Characteristics | * N | % | N | % | N | % | |
| Age Group (years) | | | | | | | |
| 15–19 | 183 | 37.6 | 333 | 36.7 | 516 | 37.0 | 0.623 |
| 20–29 | 324 | 62.4 | 557 | 63.3 | 881 | 63.0 | |
| Education | | | | | | | |
| None/primary | 21 | 3.2 | 35 | 3.6 | 56 | 3.6 | 0.177 |
| Secondary | 395 | 79.4 | 658 | 73.6 | 1053 | 75.6 | |
| Tertiary | 91 | 17.4 | 197 | 22.7 | 288 | 20.9 | |
| Marital Status | | | | | | | |
| Not married | 376 | 74.4 | 712 | 80.8 | 1088 | 78.7 | 0.011 |
| Married/in cohabitation | 131 | 25.6 | 178 | 19.2 | 309 | 21.3 | |
| Socio-Economic status | | | | | | | |
| Low | 180 | 34.1 | 307 | 30.3 | 487 | 31.6 | 0.055 |

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| Middle | 184 | 35.0 | 280 | 31.5 | 464 | 32.7 |  |
| High | 143 | 30.9 | 303 | 38.1 | 446 | 35.7 |  |
| Residence |  |  |  |  |  |  |  |
| Non-slum | 98 | 26.4 | 229 | 32.0 | 327 | 30.1 | 0.007 |
| Slum | 409 | 73.6 | 661 | 68.0 | 1070 | 69.9 |  |
| Parity |  |  |  |  |  |  |  |
| 0 | 313 | 61.9 | 585 | 66.7 | 898 | 65.1 | 0.127 |
| ≥1 child | 194 | 38.1 | 304 | 33.3 | 498 | 34.9 |  |
| Recent Contraceptive Use |  |  |  |  |  |  |  |
| No | 321 | 62.8 | 528 | 57.6 | 849 | 59.4 | 0.142 |
| Yes | 186 | 37.2 | 362 | 42.4 | 548 | 40.6 |  |
| Recent Use of LARCs |  |  |  |  |  |  |  |
| No | 475 | 94.0 | 844 | 93.4 | 1319 | 93.6 | 0.371 |
| Yes | 32 | 6.0 | 46 | 6.6 | 78 | 6.4 |  |
| Use of Modern Contraceptive Methods |  |  |  |  |  |  |  |
| No | 383 | 75.2 | 654 | 73.2 | 1037 | 73.9 | 0.396 |
| Yes | 124 | 24.8 | 236 | 26.8 | 360 | 26.1 |  |
| History of Abortions |  |  |  |  |  |  |  |
| No | 414 | 97.9 | 829 | 97.3 | 1243 | 97.5 | 0.081 |
| Yes | 7 | 2.1 | 29 | 2.7 | 36 | 2.5 |  |
| Total | 507 | 100.0 | 890 | 100.0 | 1397 | 100.0 |  |

*: N's were weighted, and %'s were unweighted. LARCs: long-acting reversible contraceptives.

Overall, about 64% of the respondents reported having a confidant living in the DRC. The confidants (according to the unadjusted and adjusted proxy samples) were very similar to the respondents. The adjusted sample of confidants was slightly younger than the sample of respondents (Table 1). Having at least one child, educational attainment, current contraceptive use, and long-acting contraceptive use were similar between the respondents and confidants. After adjustment, it was found that the confidants were slightly more likely to be married than the respondents.

*3.2. Sociodemographic and Economic Characteristics of Respondents Who Reported an Abortion and Shared It with a Confidant, According to Type of Abortion*

The slum-dwelling respondents were more likely to have shared their end-of-pregnancy experiences with their confidants than the non-slum-dwelling respondents (59% vs. 50%; *p* = 0.005). Overall, when end-of-pregnancy experiences and menstrual regulation were combined, it was found that the slum-dwelling respondents shared more with their confidants than the non-slum-dwelling respondents (57% vs. 42%; *p* <0.001).

To account for transmission bias, we examined the percentage of respondents who shared their abortion experience with their closest friend among those who reported having had an abortion and a close friend. Among this group, 56% reported sharing their abortion experience with their closest friend, while 59% reported sharing their menstrual regulation experience with their closest friend (Table 3).

**Table 3.** Distribution of sociodemographic and economic characteristics of respondents aged 15 to 29 who reported an abortion and shared it with a confidant, according to type of abortion in the city of Kinshasa, DRC *.

| Characteristics | Terminated Pregnancy | | Regulated Menstrual Period | | Both Combined | | Methods Networking Question Confidant | | Networking :Question Confidant | |
|---|---|---|---|---|---|---|---|---|---|---|
| | % | N | % | N | % | N | % | N | % | N |
| Age Group (years) | | | | | | | | | | |
| 15–19 | 72.9 | 12 | 100.0 | 1 | 73.5 | 13 | 60.4 | 4 | 78.4 | 9 |
| 20–29 | 53.3 | 80 | 57.9 | 13 | 49.3 | 90 | 47.5 | 45 | 50.8 | 45 |
| Education Level | | | | | | | | | | |
| None | 100.0 | 1 | 69.2 | 8 | 100.0 | 1 | 100.0 | 1 | 58.0 | 42 |
| Primary | 52.5 | 68 | 69.2 | 6 | 53.6 | 74 | 46.4 | 32 | 58.0 | 12 |
| Secondary/tertiary | 65.5 | 23 | 46.5 | | 49.1 | 28 | 50.0 | 16 | 48.0 | |
| Marital Status | | | | | | | | | | |
| Married/in cohabitation | 68.6 | 62 | 54.9 | 9 | 62.1 | 69 | 56.5 | 32 | 66.3 | 37 |
| Not married | 32.8 | 30 | 66.3 | 5 | 34.2 | 34 | 33.9 | 17 | 34.5 | 17 |
| Socio-Economic status | | | | | | | | | | |
| Low | 55.9 | 39 | 18.7 | 5 | 50.8 | 44 | 43.8 | 24 | 58.8 | 20 |
| Middle | 55.9 | 29 | 18.7 | 5 | 50.8 | 33 | 43.8 | 16 | 58.8 | 17 |
| High | 51.1 | 24 | 73.0 | 4 | 54.9 | 26 | 70.0 | 9 | 44.5 | 17 |
| Residence | | | | | | | | | | |
| Non-slum | 49.8 | 22 | 0.0 | 4 | 42.1 | 26 | 38.2 | 13 | 46.5 | 13 |
| Slum | 58.7 | 70 | 85.7 | 10 | 56.8 | 77 | 54.0 | 36 | 58.7 | 41 |
| Total | 56,3 | 92 | 59.0 | 14 | 52.6 | 103 | 48.6 | 49 | 55.8 | 54 |

*Estimates weighted; bold indicates p-value for design-based F test less than 0.05.

### 3.3. Incidence of Induced Abortion among Respondents Aged 15–29 and Their Confidants

The incidence rates of induced abortion were significantly higher among confidants than among respondents. The one-year incidence of induced abortion among respondents in 2021 was 24.4 per 1000 women (95% CI: 15.8–32.9), while the fully adjusted abortion rate among confidants was 131.5 per 1000 women (95% CI: 99.4–163.6). The highest abortion rates among both respondents and confidants were observed among women aged 20–29 years and single women.

Abortion rates were highest among respondents with higher levels of education; however, the abortion rate among confidants was lowest among those most highly educated. In addition, the incidence rate of induced abortion was significantly higher among respondents living in slums than among those living in non-slum areas (29.2 vs. 13.0 per 1000; $p < 0.001$) (Table 4).

**Table 4.** Distribution of the incidence of induced abortion (per 1000) among respondents aged 15 to 29 and their confidants according to sociodemographic and economic characteristics in Kinshasa, DRC *.

| Characteristic | Respondent | | | Partially Adjusted Confidant ** | | | Adjusted Confidant *** | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rate | 95% CI | | Rate | 95% CI | | Rate | 95% CI | |
| Age Group (years) | | | | | | | | | |
| 15–19 | 21.1 | 10.9 | 40.8 | 84.8 | 48.1 | 121.4 | 139.9 | 79.4 | 200.3 |
| 20–29 | 27.2 | 18.3 | 40.5 | 85.4 | 64.1 | 106.8 | 141.0 | 105.7 | 176.2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Education Level** | | | | | | | | |
| None | 16.9 | | 49.5 | 129.0 | 27.9 | 230.2 | 212.9 | 46.0 | 379.8 |
| Primary | 20.6 | 12.1 | 29.1 | 78.6 | 58.0 | 99.3 | 129.8 | 95.7 | 163.9 |
| Secondary/tertiary | | | | 74.8 | 33.1 | 116.5 | 123.4 | 54.6 | 192.2 |
| | | | | | | | | |
| **Marital Status** | | | | | | | | |
| Not married | 24.6 | 13.5 | 35.7 | 94.2 | 69.8 | 118.7 | 155.5 | 115.1 | 195.8 |
| Married/in cohabitation | 23.6 | 6.1 | 41.0 | 36.5 | 20.7 | 52.3 | 60.2 | 34.1 | 86.3 |
| **Socio-Economic status** | | | | | | | | |
| Low | 36.6 | 14.7 | 58.5 | | | | | | |
| Middle | 29.2 | 13.8 | 44.7 | | | | | | |
| High | 9.4 | 1.2 | 17.5 | | | | | | |
| **Residence** | | | | | | | | |
| Non-slum | 13.0 | 0.9 | 25.1 | | | | | | |
| Slum | 29.2 | 19.4 | 39.0 | | | | | | |
| **Parity** | | | | | | | | |
| 0 | 24.1 | 11.6 | 36.6 | 76.6 | 50.0 | 103.2 | 126.5 | 82.6 | 170.4 |
| ≥1 child | 24.9 | 10.6 | 39.3 | 85.0 | 55.5 | 114.6 | 140.3 | 91.5 | 189.0 |
| Total | 24.4 | 15.8 | 32.9 | 79.7 | 60.3 | 99.2 | 131.5 | 99.4 | 163.6 |

*Estimates weighted; Ns unweighted; bold indicates 95% confidence intervals do not overlap (reference respondents) \*\*Estimates include respondent characteristics in place of "missing" confidantes; post-stratification weights and transmission bias adjustment applied.

### 3.4. Characteristics of Abortions Achieved by Respondents and Their Confidants

Among the respondents in Kinshasa, surgery was the most common method of abortion (35%), followed by medical abortion pills (28%). Injections (23%) and other non-medical abortion pills (15%) were also commonly used. The most common source of care was private facilities (45%), followed by pharmacies (36%). The relative frequency with which women relied on specific methods and sources was similar between provinces, but they involved more non-recommended methods (Table 5 ).

**Table 5.** Distribution of characteristics of recent abortions reported by respondents aged 15 to 29 and their confidants aged 15 to 49 in Kinshasa, DRC *.

| Characteristics | Respondents | | Confidants (overall) | |
|---|---|---|---|---|
| | % | N | % | N |
| **Method Used (Multiple Selection)** | | | | |
| Surgery | 34.9 | 56 | 43.9 | 100 |
| Mifepristone/misoprostol pills | 28.0 | 51 | 25.3 | 56 |
| Other identified pills | 15.3 | 33 | 16.4 | 52 |
| Unknown type of pill | 4.7 | 10 | 4.7 | 12 |
| Injection | 23.2 | 46 | 14.0 | 38 |
| Traditional/other methods | 8.5 | 15 | 15.1 | 33 |
| Don't know/no response | 1.9 | 4 | 5.6 | 12 |

| | | | | |
|---|---|---|---|---|
| Source Used (Multiple Selection) | | | | |
| Public facility | 12.5 | 23 | 13.3 | 32 |
| Private facility | 44.7 | 81 | 62.4 | 145 |

*Estimates weighted; Ns unweighted; bold indicates p-value for design-based F test (reference respondents) less than 0.05 **Estimates include respondent characteristics in place of "missing" confidantes, post-stratification weights.

### 3.5. Characteristics Related to the Safety of the Last Abortion Among Respondents and Their Confidants

Abortions using recommended methods and sources accounted for 57% of the respondents' abortions, with confidential data suggesting a similar level at 61%, which was not significantly different from respondents' estimates. Approximately one in five abortions (20%) among respondents involved non-recommended methods and sources, with a corresponding estimate of 18% among the confidants (Table 6).

**Table 6.** Distribution of the level of safety of the last abortion among respondents aged 15 to 29 and their confidants aged 15 to 45 in Kinshasa, DRC.

| | Overall | | | | Last 3 years | | | |
|---|---|---|---|---|---|---|---|---|
| Categories | Respondents | | Confidants Adjusted ** | | Respondents | | Confidants Adjusted * | |
| | % | N | % | N | % | N | % | N |
| Current WHO Safety Measures ** | | | | | | | | |
| Safe (recommended methods and sources) | 38.1 | 65 | 41.6 | 90 | 31.6 | 34 | 52.5 | 26 |
| Less safe (one criterion met) | 41.4 | 77 | 40.3 | 92 | 44.1 | 49 | 34.9 | 17 |
| Unsafe (non-recommended methods and sources) | 20.6 | 42 | 18.1 | 50 | 24.3 | 29 | 12.6 | 10 |
| With New Self-Managed MA Reflected *** | | | | | | | | |
| Safe (recommended methods and sources) | 57.2 | 99 | 60.7 | 132 | 51.8 | 55 | 64.5 | 31 |
| Less safe (one criterion met) | 22.2 | 43 | 21.2 | 50 | 23.9 | 28 | 22.9 | 12 |
| Unsafe (non-recommended methods and sources) | 20.6 | 42 | 18.1 | 50 | 24.3 | 29 | 12.6 | 10 |
| Total | 100 | 184 | 100 | 232 | 100 | 112 | 100 | 53 |

*Adjusted friend data includes respondent abortion details for respondents who reported having no friends. **Surgery and medication abortion from clinical source = safe. ***Surgery from facility and medication from any source = safe.

## 4. Discussion

This study was conducted to describe the prevalence of abortion among adolescent and young adult females, aged 15 to 29, residing in the city of Kinshasa. We performed a secondary analysis of data obtained from PMA surveys conducted in Kinshasa from December 2021 to April 2022. The analysis focused on abortions among women who are capable of carrying children. The objective was to ascertain the prevalence of abortions among this demographic and to examine the disparity in prevalence based on the young woman's place of living (slum vs. non-slum areas). This study aimed to understand the experience of induced abortion among women residing in the slums of Kinshasa, where there is restricted availability of formal healthcare services.

Indeed, the prevalence of abortion was greater among individuals residing in slums (29.2 per 1000) than among those who did not reside in slums (13 per 1000), being more than double. These findings are consistent with the data presented in a study conducted by Bell SO et al. in Côte d'Ivoire in 2020. Their study found a rate of 29 per 1000 among women aged 15 to 49 [15]. The elevated prevalence of this phenomenon among young females residing in impoverished urban areas is believed to stem from the limited accessibility to reproductive health services in disadvantaged regions, including family planning (FP) services, where abortion is the preferred method of contraception. Additionally, the restricted availability of FP services for young individuals further contributes to this issue. In 2015, a study conducted by Behera D et al. in Mumbai, India, also corroborated these findings. The study reported an incidence rate of 116 per 1000 [16], which was attributed to cultural factors that hinder the use of contraceptive methods and consequently contribute to a substantial number of unintended pregnancies. It is important to highlight that these abortions are frequently carried out by individuals living nearby, and they pose significant risks and hazards. Research has shown that slum populations experience higher levels of unmet need for family planning (FP) [17] services, making them more susceptible to resorting to induced abortion methods. In addition, reproductive services, such as abortion, are highly uncommon in slums [18,19].

The young women included in this investigation were mostly unmarried (more than three-quarters of our group). Among the confidants, unmarried women had a higher rate of resorting to abortions than married women (156 vs. 60). This occurrence can be attributed to the unfavorable societal view towards children born to unmarried parents [20]. These findings align with those of a study conducted by Santos et al. in Brazil in 2012, which revealed that unmarried women were approximately 3.6 times more likely to resort to unsafe abortion than married women [21]. The findings of Akilimali et al.'s studies on the entire sample align with our own results. In Kongo Central, the incidence rate among unmarried women was 29 per 1000, while among married women, it was 8 per 1000 [9].

Regarding economic status, those with a low economic level had a higher incidence of abortion (37 per 1000), which was four times more than those with a high economic level (9 per 1000). This disparity is attributed to the inability to meet the financial demands involved with caring for a newborn. This finding contradicts that of a previous study conducted in Abidjan, which found that individuals with a higher socioeconomic position had a greater occurrence rate than those from lower socioeconomic classes [22]. Poverty poses a barrier to the act of welcoming a new child [23].

It is crucial to highlight that 43% of these abortions were categorized as unsafe. Approximately 20% of abortions were performed using procedures and sources that are not recommended. The estimate for the confidants was 18%, which aligns with the findings of Bankole, A. et al.'s study conducted in sub-Saharan Africa in 2020. Specifically, that study revealed that three out of four (77%) abortions were unsafe [24]. In terms of the techniques employed, surgery was the most commonly utilized approach among the participants (35%), followed by the administration of medical abortion pills (28%). Private institutions were the predominant source of care, accounting for 45% of cases, followed by pharmacies at 36%. This is in contrast to the findings of Aké-Tano, P. et al.'s study conducted in Yamoussoukro in 2017, where the predominant strategy utilized by participants was the consumption of medical items, accounting for 92% of cases [25].

The findings of this study are unquestionably valuable and can be utilized nationwide, as well as in other countries impacted by abortions, particularly unsafe abortions, which are a major contributor to maternal mortality. The findings of this study will assist policymakers in implementing interventions aiming to improve access to reproductive health services for adolescent girls. The objective is to decrease the occurrence of unsafe clandestine abortions, which are a significant contributor to maternal morbidity and mortality in Kinshasa, particularly in disadvantaged neighborhoods. The potential for selection bias in our study is a concern, as we conducted a secondary analysis on an existing database and had no influence over the recruitment process for the subjects in our sample.

Another constraint arises from the inclusion of close friends/confidants who were not all under the age of 30, which complicates the comparison of incidence between the respondents and their friends. Furthermore, we lack data regarding the living arrangements of close acquaintances

(whether they reside in slums or non-slum areas) in order to provide a comprehensive understanding of the occurrence of abortions among close friends or confidants. Nevertheless, we managed to mitigate this bias by accurately establishing inclusion criteria for picking our sample from the extensive PMA database.

## 5. Conclusions

This study found that the prevalence of abortion was greater among young women residing in impoverished urban areas, young women who were not married, those who had not yet become mothers, and those who did not utilize contemporary contraceptive techniques; these occurrences were marginally more frequent among acquaintances than among the survey participants.

There is still a significant amount of work that needs to be carried out to fulfill the obligations outlined in the Maputo Protocol. Specifically, efforts should be focused on establishing easily accessible services that offer complete abortion care with a strong emphasis on women's needs. This is particularly important in slum areas, as it will help to decrease the occurrence of unsafe abortions and mitigate their negative effects.

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