**Title: Disparities is access to abortion care among women in Nairobi**

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**Short Abstract**

Restrictive abortion laws expose all pregnant people to the risk of poor-quality abortion services and/or unsafe abortion. That said, it is likely that the burden of this risk is disproportionately shouldered by more marginalized individuals; social and economic injustice systematically predispose some people to a greater risk of unintended pregnancies and may also deny them access to high quality care. Kenya has a relatively high incidence of induced abortion and a restrictive law the prevents women from easily obtaining safe abortions within the formal health system. Few studies have collected data to examine inequities in access to safe abortions from a representative population in Kenya or sub-Saharan Africa. Our analysis compares results from two studies that used respondent-driven sampling (RDS) to sample and recruit women living in Nairobi who have had a recent abortion. One study was designed to sample the general population of women in Nairobi, while the other was conducted in two lower income informal settlements within the city. While the results of this work reveal that all women in Nairobi are experiencing barriers to accessing safe abortion services, women living in informal settlements are shouldering a disproportionate burden of the negative outcomes associated with this limited access.

## Introduction

Available global data on the incidence and safety of abortion highlights inequity in access to safe abortions. Low- and lower-middle income countries in sub-Saharan Africa where the law is restrictive have the highest prevalence of unsafe abortions globally (Ganatra et al. 2014). The most recent study in Kenya on induced abortion estimated an annual abortion incidence of 48 abortions per 1,000 women of reproductive age (Mohamed et al. 2015), compared to estimates of 34 per 1,000 in the East Africa region (Bearak et al. 2022). Further, it is estimated that approximately 61% of all pregnancies in Kenya were unintended, and 4 in 10 of those intended pregnancy will end in an induced abortion (Bearak et al. 2022). A recent study highlighted that, within the legally restrictive Kenyan context, access to recommended abortion methods and providers can be highly inequitable and is subject to women having the social resources that provide information on how to obtain an abortion method as well as the resources to afford it (Ouedraogo et al. 2024).

Collecting empirical data on abortion processes and outcomes is challenging because of the stigma associated with terminating a pregnancy. As a result, population representative data on abortion safety is rare, which impedes a clear understanding of the barriers people face in accessing care, their experience of care, and the outcomes they experience after obtaining abortions (Rossier et al. 2022). For this reason, researchers have started to test network-based sampling approaches that have been used to study other "hidden" populations such as respondent driven sampling (RDS) to recruit and study people who have obtained abortions (Gerdts et al. 2017; Giorgio et al. 2022). RDS leverages a peer recruitment sampling system that allows for the estimation of sample weights to correct for biases associated with traditional chain referral sampling. The approach starts by purposively selected initial participants (known as "seeds") to recruit their peers. Eligible recruits subsequently recruit their peers, and so on. RDS must meet several assumptions to be an appropriate and effective sampling methodology. The population being recruited must be able to identify one another as members of the target population and be sufficiently "networked." Furthermore, the sample size must be small in comparison to the overall size of the target population (Gile, Johnston, and Salganik 2015).

In this paper, we compare information collected using RDS methodology to recruit people who have obtained abortions amongst two communities in Nairobi Kenya: two lower income informal settlements and the general population of Nairobi. We compare women's experiences seeking and accessing abortion in informal settlements with women in the general population in Nairobi. Understanding disparities in access to care, experience of care and outcomes of the abortion are important to advocate for harm reduction strategies and programs that can better meet the needs of the different women in Nairobi and reduce the impact of unintended pregnancies on their health.

## Methods

*Sampling and data collection*

Data for this study comes from two separate data collection efforts. Fieldwork for the study conducted in informal settlements (IS) took place between August and November 2021. The study among women living in general Nairobi (GN) was conducted March-May 2024. In both studies, initial seeds were recruited through local contacts including health providers, pharmacies where women obtain medication abortion, community health partners (CHPs), community organizations, and youth champions of sexual and reproductive health. Eligible seeds and subsequent participants must have had at least one abortion that occurred in the last five years, be between the ages of 15 and 49 at the time of data collection and live in the study area (the informal settlements or in broader Nairobi). Once each participant had participated in the survey, they were given three coupons with a unique ID, which they used to recruit additional participants. Respondents received a primary incentive for participating in the interview and a secondary incentive for each person they successfully recruit into the study. These remunerations are intended to defray the costs of traveling to the interview and contacting their peers, to incentivize the peer-to-peer recruitment process, and as a token of appreciation for their time. All interviews took place in a private location agreed upon by the respondent.

All RDS interviews were conducted face-to-face, using Open Data Kit (ODK) based software on Android smartphones or tablets. Completed ODK forms were submitted to a secure cloud server using Wi-Fi or mobile data networks accessible only to the study team. This study received ethical approval from Institutional Review Boards at the World Health Organization Guttmacher Institute and the African Population and Health Research Center.

*Measures*

Both studies collected data on women socioeconomic characteristics (age, education, marital status, and parity) as well as information about her most recent abortion. For this analysis, we use the World Health Organization's definition of abortion safety; a safe abortion is one conducted by a trained provider (ie. physician, nurse midwife, etc.) using a recommended method (MVA/EVA or medication abortion) (Ganatra et al. 2014). Medication abortion is defined as either using misoprostol alone or in combination with mifepristone. We also compare women's self-reported experience of postabortion complications and whether she sought care for these complications in a formal health facility.

*Analyses*

The preliminary analyses presented in this abstract compare descriptive statistics for each sample. In future analyses, we will include RDS diagnostic statistics that assess the performance of the RDS in each site. We will also include a robust measure of socioeconomic status, a more refined measure of abortion methods that accounts for whether some "unidentified pill" use was in fact medication abortion, and a measure of abortion complications that attempts to better identify those with associated fever or infection. Finally, we plan to combine the datasets and conduct multivariable analyses that control for socioeconomic status and other demographic factors to better assess differences in key abortion outcomes by site.

**Results**

We observed some differences in the two applications of RDS to sample and recruit women who have had abortions (Table 1). The general Nairobi (GN) sample began with 8 seeds, and the informal settlement (IS) sample began with 12. However, while there was only 1 unproductive seed in the GN sample, there were 4 in the IS sample. Women in the IS sample reported a higher average number of network members who have had a recent abortion than in the GN sample (5.9 vs. 4.6, respectively), although the GN sample resulted in a higher average number of recruits per productive seed and longer maximum wave chain length than the IS sample. The RDS process results in a final sample size of 518 for GN and 551 for IS.

We also observed differences in the sociodemographic characteristics between the two group (Table 2). As compared to women in GN, a larger proportion of women in the IS were adolescents (17.5% vs. 11.0%) and had only achieved a primary level education (48.7% vs. 38.2%). While differences by marital status were small, a larger proportion of IS women reported having no children at the time of their last/only abortion as compared to women in GN (50.4% vs. 38.9%).

In both studies, we estimate that the majority of women accessed their abortion in the first trimester of pregnancy (GN=69.2%, IS=70.4%), and similar proportions of women reported accessing their abortion from a trained clinician (GN=22.7%, IS=19.8%) and/or from a health facility (GN=16.2%, IS=18.1%) (Table 3). However, other important differences in abortion experiences emerged. While only 4.5% of women in IS reported using medication abortion (MA), this method was by far the most common method reported by women in GN (59%). Conversely, while 38.3% of IS women reported using a pill that they could not identify the name of, only 2.0% of GN women reported unidentified pills. Harmful methods were much more commonly used by women in the IS (19.2%) versus women in GN (5.9%). The proportion of women in GN who met the WHO definition for a safe abortion was almost double that of women in the IS (19.2% vs. 9.9%). Further, women in the IS more commonly reported experiencing a

health complication after their abortion (57.2% vs. 34.7%) or seeking care for a health complication (36.1% vs. 17.0%) than women in GN.

**Discussion**

The results of this analysis reveal important disparities in women's access to abortion in Nairobi. Women in informal settlements has much poorer abortion experiences and reported more network members who had obtained a recent abortion, were younger, less educated, less likely to have obtained a safe abortion and more likely to experience a poor outcome.

The majority of women in both samples reported that they access their abortion within the first trimester of pregnancy. This is an important indicator of access, suggesting that women across Nairobi identified their pregnancies early and were able to make and take the decision to terminate them early.

The results of this analysis suggest that women living in informal settlements may have less knowledge about and/or access to medication abortion methods. While a very small proportion of women living in the IS indicated that they used a form of medication abortion, this was by far the most common method reported by GN women. However, it is likely that the true proportion of MA use within the informal settlement was much higher than the estimated 4.5%. Almost one third of women in the IS reported using an unknown type of pill, and it is possible that some or many women in this group actually used a form of medication abortion but could not identify it as such. Given how common MA use was among women in the GN sample and how uncommon it was for those women to be unable to identify what pills they used, these findings suggest that women living in informal settlements in Nairobi may be less knowledgeable about medication abortion. That said, even if all reported unknown pills use was in fact a medication abortion, we would still observe a large disparity in medication abortion use between women in the IS and GN samples. Taken together, these findings suggest that women living in the informal settlement in Nairobi have a more difficult time accessing medication abortion, either due to disparities in knowledge about medication abortion itself, knowledge about how to access medication abortion, or geographic availability of medication abortion within Nairobi. Even in restricted contexts, access to medication abortion which is a safe and WHO recommended abortion method has led to significant reductions in severe abortion-related outcomes in many settings(Henderson et al. 2013). Examining how to disseminate information on MA to marginalized groups of women such as those in informal settlements is important for advocates and service providers to consider in order to reduce the impact of unsafe abortion on women's health.

Given that abortion is highly legally restricted in Kenya, it is not surprising that access to safe abortion services was limited in both study settings. Among women in the GN sample, 1 one in 5 reported having

an abortion that was performed using a WHO recommended method by a trained health provider. Access to these services was even more limited in the informal settlement, within only 1 in 10 women meeting these criteria. In our final paper, we will investigate how much of this disparity may be due to misclassification of MA as an unidentified pill among women in the IS. (saying something about reproductive autonomy, women's right to access routine health care.)

Researchers have argued that increased access to medication abortion over the past decide has likely reduced the number of women who resort to using harmful methods to end their pregnancy(Ramos, Romero, and Aizenberg 2014; Zamberlin, Romero, and Ramos 2012). We see some evidence of this, as only 6% of women in the GN sample reported using a harmful method (ie. drinking a caustic substance or inserting something sharp into their vagina) to end their pregnancy. However, the use of harmful methods was much more common among women in informal settlements, which may in part be driven by the disparities in access to medication abortion noted above. This is an important finding, as the use of these harmful methods has the potential to cause severe maternal morbidity or even death. We also observe similar patterns in differences in women's self-reported experiences of postabortion complications by study site; women in the informal settlement more commonly reported experiencing a health complication as a result of their abortion and seeking care for this complication from a health facility than women in the GN sample. Without detailed clinical data, it is difficult to interpret the extent to which these reports reflect true abortion-related morbidity versus other care seeking patterns. For example, there is some evidence to suggest that lack of knowledge about what to expect after taking medication abortion or a desire to confirm the abortion has completed may drive some women to seek clinically unnecessary postabortion care (cite). However, these results do suggest that women in the informal settlement are receiving poorer quality abortion care.

Restrictive abortion laws and policies expose people who are or may become pregnant to the risk of an unsafe abortion. They also cause greater harm to those who are marginalized and experience different forms of social and economic injustice that systematically predispose them to a greater risk of unintended pregnancies but deny them access to high quality care. For this reason, women in marginalized communities experience the greatest burden of poor abortion-related outcomes. Highlighting these disparities in access are important to understand the impact of poorer to safe abortion care on the most vulnerable women and girls and to advocate for changes in laws and policies to prevent and reverse the harmful effects.

In our ongoing analysis for the final paper, we will examine and produce additional RDS diagnostic indicators to conclude on the comparative performance of the method in both population subgroups in Nairobi; compare other indicators of abortion experiences, including the experience of stigma among

women who have abortions; and run multivariable models for the relationship between the study site and abortion safety that control for education, age, and marital status. – to see if differences in these characteristics by site are the main drivers of differences in safety or if there are other more "neighborhood" effects.

**References**


Bearak, Jonathan Marc, Anna Popinchalk, Cynthia Beavin, Bela Ganatra, Ann-Beth Moller, Özge Tunçalp, and Leontine Alkema. 2022. 'Country-Specific Estimates of Unintended Pregnancy and Abortion Incidence: A Global Comparative Analysis of Levels in 2015–2019'. *BMJ Global Health* 7 (3): e007151. https://doi.org/10.1136/bmjgh-2021-007151.

Ganatra, Bela, Özge Tunçalp, Heidi Bart Johnston, Brooke R Johnson Jr, Ahmet Metin Gülmezoglu, and Marleen Temmerman. 2014. 'From Concept to Measurement: Operationalizing WHO's Definition of Unsafe Abortion'. *Bulletin of the World Health Organization* 92 (3): 155–155. https://doi.org/10.2471/BLT.14.136333.

Gerdts, Caitlin, Sarah Raifman, Kristen Daskilewicz, Mariette Momberg, Sarah Roberts, and Jane Harries. 2017. 'Women's Experiences Seeking Informal Sector Abortion Services in Cape Town, South Africa: A Descriptive Study'. *BMC Women's Health* 17 (1): 95. https://doi.org/10.1186/s12905-017-0443-6.

Gile, Krista J., Lisa G. Johnston, and Matthew J. Salganik. 2015. 'Diagnostics for Respondent-Driven Sampling'. *Journal of the Royal Statistical Society Series A: Statistics in Society* 178 (1): 241–69. https://doi.org/10.1111/rssa.12059.

Giorgio, Margaret, Solomon Shiferaw, Assefa Seme, Fredrick Makumbia, Simon Kibira, Sara Nabukeera, Selena Anjur-Dietrich, Mahari Yihdego, Niguse Tadele, and Elizabeth Sully. 2022. 'Using Respondent Driven Sampling (RDS) to Study People Who Have Abortions: A Feasibility Assessment in Ethiopia and Uganda'. In . Atlanta, GA.

Henderson, Jillian T., Mahesh Puri, Maya Blum, Cynthia C. Harper, Ashma Rana, Geeta Gurung, Neelam Pradhan, et al. 2013. 'Effects of Abortion Legalization in Nepal, 2001–2010'. Edited by Colette Kanellopoulos-Langevin. *PLoS ONE* 8 (5): e64775. https://doi.org/10.1371/journal.pone.0064775.

Mohamed, Shukri F., Chimaraoke Izugbara, Ann M. Moore, Michael Mutua, Elizabeth W. Kimani-Murage, Abdhalah K. Ziraba, Akinrinola Bankole, Susheela D. Singh, and Caroline Egesa. 2015. 'The Estimated Incidence of Induced Abortion in Kenya: A Cross-Sectional Study'. *BMC Pregnancy and Childbirth* 15 (1): 185. https://doi.org/10.1186/s12884-015-0621-1.

Ouedraogo, Ramatou, Shelmith Wanjiru, Moussa L. Zan, Clementine Rossier, Onikepe Owolabi, Sherine Athero, Clement Oduor, Martin Bangha, and the N-MAS team. 2024. '"I Always Know She Cannot Betray Me." Disclosure of Abortion and Methods of Abortion Used in Informal Settlements in Nairobi, Kenya'. Edited by Muthusamy Sivakami. *PLOS Global Public Health* 4 (7): e0003252. https://doi.org/10.1371/journal.pgph.0003252.

Ramos, Silvina, Mariana Romero, and Lila Aizenberg. 2014. 'Women's Experiences with the Use of Medical Abortion in a Legally Restricted Context: The Case of Argentina'. *Reproductive Health Matters* 22 (sup44): 4–15. https://doi.org/10.1016/S0968-8080(14)43786-8.

Rossier, Clémentine, Onikepe Owolabi, Seni Kouanda, Martin Bangha, Caron R. Kim, Bela Ganatra, Dennis Feehan, et al. 2022. 'Describing the Safety of Abortion at the Population Level Using Network-Based Survey Approaches'. *Reproductive Health* 19 (1): 231. https://doi.org/10.1186/s12978-022-01518-3.

Zamberlin, Nina, Mariana Romero, and Silvina Ramos. 2012. 'Latin American Women's Experiences with Medical Abortion in Settings Where Abortion Is Legally Restricted'. *Reproductive Health* 9 (1): 34. https://doi.org/10.1186/1742-4755-9-34.

**Table 1. RDS recruitment statistics**

| | General Nairobi Sample | Informal Settlement Sample |
|---|---|---|
| Total number of seeds | 8 | 12 |
| Number of productive seeds | 7 | 8 |
| Number of unproductive seeds | 1 | 4 |
| Average number of close relations among abortions seekers | 4.6 | 5.9 |
| Mean number of recruits per productive seeds | 72.9 | 67.4 |
| Maximum number of waves | 10 | 5 |
| Final sample size | 518 | 551 |

**Table 2. Abortions according to sociodemographic characteristics in two samples of women who have had an abortion in Nairobi**

| | General Nairobi Sample | | | Informal Settlement Sample | | |
|---|---|---|---|---|---|---|
| | **n** | **%** | **95% CI** | **n** | **%** | **95% CI** |
| **Age group at the abortion** | | | | | | |
| 15–19 | 55 | 11.0 | [8.3;14.4] | 104 | 17.5 | [14.6;20.8] |
| 20–24 | 160 | 32.1 | [27.5;37.2] | 178 | 29.9 | [26.4;33.7] |
| 25–34 | 216 | 40.4 | [35.5;45.5] | 223 | 37.5 | [33.7;41.5] |
| 35–49 | 87 | 16.5 | [13.1;20.6] | 90 | 15.1 | [12.5;18.2] |
| **Marital status at the abortion*** | | | | | | |
| Never married | 161 | 30.4 | [26.0;35.3] | 211 | 35.5 | [31.7;39.4] |
| Married/cohabiting | 236 | 48.6 | [43.5;53.8] | 292 | 49.1 | [45.1;53.1] |
| Divorced/separated/widowed | 121 | 20.9 | [17.3;25.1] | 92 | 15.4 | [12.8;18.6] |
| **Education *** | | | | | | |
| No education | 11 | 1.8 | [0.9;3.4] | 9 | 1.5 | [0.8;2.9] |
| Primary | 215 | 38.2 | [33.7;43.4] | 290 | 48.7 | [44.7;52.8] |
| Secondary/higher | 295 | 59.8 | [54.8;64.6] | 296 | 49.8 | [45.7;53.8] |
| **Parity at the abortion** | | | | | | |
| Without children | 186 | 38.9 | [34.0;44.1] | 300 | 50.4 | [46.4;54.4] |
| 1 to 2 children | 243 | 45.1 | [40.0;50.3] | 162 | 27.2 | [23.8;31] |
| 3 to 7 children | 89 | 16.0 | [12.7;19.8] | 133 | 22.4 | [19.2;25.9] |
| * : at the time of the survey | | | | | | |

**Table 3. Distribution of abortions by safety characteristics**

| | General Nairobi Sample | | | Informal Settlement Sample | | |
|---|---|---|---|---|---|---|
| | **No.** | **%** | **95% CI** | **No.** | **%** | **95% CI** |
| **Gestational trimester** | | | | | | |
| 1 | 362 | 69.2 | [64.2;73.8] | 419 | 70.4 | [66.6;74] |
| 2 | 149 | 29.3 | [24.8;34.2] | 173 | 29.1 | [25.6;32.9] |
| 3 | 7 | 1.5 | [0.7;3.4] | 3 | 0.5 | [0.2;1.6] |
| **Type of method used** | | | | | | |
| MA only | 300 | 59.0 | [53.9;63.9] | 27 | 4.5 | [3.1;6.5] |
| MVA only | 63 | 11.2 | [8.4;14.7] | 39 | 6.6 | [4.8;8.9] |
| MA and/or MVA in combination with other methods | 8 | 1.2 | [0.6;2.6] | 40 | 6.7 | [5;9] |
| Unidentified pills | 17 | 2.0 | [1.2;3.4] | 228 | 38.3 | [34.5;42.3] |
| Plant based teas and ovules | 88 | 18.5 | [14.8;22.9] | 128 | 21.5 | [18.4;25] |
| Innocuous beverages and food | 13 | 2.2 | [1.2;3.9] | 19 | 3.2 | [2;5] |
| Known harmful methods | 29 | 5.9 | [3.9;8.9] | 114 | 19.2 | [16.2;22.5] |
| **Providers** | | | | | | |
| Trained clinician (without TBA/informal provider) | 122 | 22.7 | [18.7;27.3] | 118 | 19.8 | [16.8;23.2] |
| Pharmacist (without TBA/informal provider) | 272 | 52.9 | [47.7;57.9] | 269 | 45.2 | [41.2;49.2] |
| TBA or other informal providers | 69 | 14.6 | [11.3;18.8] | 203 | 34.1 | [30.4;38] |
| Self-induced alone or with friends | 55 | 9.9 | [7.4;13.1] | 5 | 0.9 | [0.3;2] |
| **Place abortion was performed** | | | | | | |
| Health facility only | 91 | 16.2 | [12.8;20.2] | 108 | 18.1 | [15.3;21.5] |
| Shop/pharmacy/health facility/drugstore | 267 | 52.4 | [47.2;57.5] | 89 | 15.0 | [12.3;18.1] |
| Provider's house | 11 | 1.9 | [1.0;3.6] | 78 | 13.1 | [10.6;16.1] |
| Woman/friend/relative house | 149 | 29.6 | [25.1;34.5] | 320 | 53.8 | [49.8;57.8] |
| **Safety indicators** | | | | | | |
| Meets WHO definition for a safe abortion (recommended method from a trained provider) | 108 | 19.2 | [15.6;23.5] | 59 | 9.9 | [7.8;12.6] |
| Self-reported postabortion complication | 187 | 34.7 | [30.1;39.6] | 283 | 57.2 | [43.6;51.6] |
| Sought care for health complication | 99 | 17.0 | [13.7;20.8] | 215 | 36.1 | [32.4;40.1] |