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RESEARCH

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A surge in female condom distribution during the COVID-19 pandemic in Gauteng province, South Africa

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Abstract

Background Female Condoms are 90–95% effective against HIV transmission when correctly and consistently used and are also cost-effective. In general, condoms prevent sexually transmitted infections (STIs) and unwanted pregnancies. Although the COVID-19 pandemic had the potential to undermine routine healthcare services delivery and utilisation, there is limited evidence about the pandemic's effect on Female Condom uptake in Gauteng, one of the hardest-hit provinces in South Africa. This study aimed to compare female condom distribution in Gauteng Province, South Africa, before and during COVID-19, to inform decision-making for the attainment of universal access to sexual and reproductive health (SRH) by 2023 as per the sustainable development goal 3.7 and also, to empower women over their SRH during future pandemics.

Methods This secondary data anslysis examined the percentage change in routine female condom distribution in Gauteng province and its five districts as an indirect effect (lockdown) of the COVID-19 pandemic, by comparing the aggregated District Health Information System (DHIS) data collated from primary health care facilities within the ditrict, before COVID-19 (2018–2019) and during COVID-19 (2020). Analysis in MS Excel 2016 illustrates the changes in the patterns and the trend in female condom distribution over the study period.

Results In 2020, during the COVID-19 pandemic, Gauteng province experienced a 43.7% increase in female condom distribution compared to the pre-COVID-19 period of 2019. The highest female condom distribution during the pandemic was observed in the Ekurhuleni Metropolitan (150.0%), followed by the Sedibeng (92.8%) and the Johannesburg Metropolitan (67.9%) districts respectively. However, the Tshwane Metropolitan (-8.5%) and the West Rand (-16.6%) districts experienced a decline in female condom distribution during COVID-19.

Conclusion Gauteng province witnessed a substantial surge in female condom distribution during COVID-19 in 2020, with a disproportionate district variation in demand. Female condom distribution is crucial, necessitating its enhancement and the continuum of distribution and stakeholders stockpiling at all times with particular attention to a potential increase in demand during outbreaks with lockdowns. Undisrupted access to female condoms will enable a consistent and correct use and empower women against HIV, STIs and unintended pregnancies, as a strive towards universal access to SRH.

Keywords Female condoms, COVID-19, HIV/STIs, Pregnancy, Routine, Health services, Sexual and reproductive health

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Introduction

Condoms are a crucial intervention with a biomedical effectiveness of 90–95% in reducing the risk of human immunodeficiency virus (HIV) transmission, when used correctly and consistently [1, 2]. Also, condoms prevent

unwanted pregnancies and other sexually transmitted infections (STIs) like gonorrhoea [3–5]. As such, condoms are highly recommended for groups at risk of HIV and STIs, such as sex workers (SW) and men who have sex with men (MSM) [3]. In countries with generalized HIV epidemics, condoms are recommended for all women and men. Such evidence mandated the World Health Organization (WHO) to incorporate condoms in the list of a combination of preventive interventions against HIV including pre-and post-exposure prophylaxis (PrEP and PEP, respectively), Voluntary Medical Male Circumcision (VMMC), education and behavioural risk reduction [6]. Plus, religious entities have advocated for abstinence and fidelity to mitigate HIV transmission, but, Public Health scientists have urged that abstinence and fidelity must be accompanied by the aforementioned biomedical technology [7].

Female condomshave been shown to have the same effectiveness (90–95%) as male condoms in preventing HIV incidence, STIs and unintended pregnancies [4, 5, 8]. Female condoms also provide women with an opportunity to play a more active role in reducing their risk of HIV/STIs, and adverse pregnancy outcomes and take charge of their sexual and reproductive health (SRH) [9]. Moreover, female condoms have a low probability of adverse events and condomization efficacy is highest when both male and female condoms are used alongside each other [4]. Yet, female condoms are more expensive and less accessible compared to male condoms [10]. This is often exacerbated by the poor socioeconomic status like predominant unemployment and financial dependence of most women in low and middle-income countries (LMICs) which renders female condoms unaffordable to them, placing women at a high risk of STIs compared to their male counterparts [11]. Also, evidence from a systematic review shows that female condom acceptability in LMICs including South Africa is often hampered by partners' arguments like loss of pleasure or satisfaction, functionality and discomfort, aesthetic dislike and insertion difficulties [12]. Additionally, cultural barriers and societal practices that stigmatize women from carrying condoms and limited education or information hinders the correct and consistent use of female condoms [13, 14]. The aforementioned factors explain the provincial variations in female condom use in South Africa, ranging from 10.6% in KwaZulu-Natal to 28.3% in Mpumalanga [15].

Compared to other forms of HIV/STI prevention, UNAIDS has highlighted the cost-effectiveness of condoms [16]. A recent South African study has elaborated the emphasis on the cost-effectiveness of condoms in preventing HIV/AIDS transmission [17]. This is promising for a country like South Africa, which has the highest active antiretroviral therapy (HAART) programme globally, catering for more than 8 million people living with HIV/AIDS [18, 19].

Despite the biomedical and cost-effectiveness of condoms in reducing HIV and STIs and assisting in family planning [1–9, 16, 17], uptake can be disrupted by external circumstances. The COVID-19 pandemic, like previous outbreaks such as Ebola [20], indirectly affected routine healthcare services, including SRH services like access to condoms [21, 22]. For instance, in Sub-Saharan Africa, COVID-19 disrupted HIV testing and enrolment into anti-retroviral therapy (ART), adding to the disruption of essential healthcare services like child immunization [23]. Likewise, in Southern African countries like South Africa, Zambia, Zimbabwe and Botswana, COVID-19 undermined access to SRH services and products [21, 22, 24, 25]. Even advanced health systems such as in the United States of America (USA) and China experienced drastic effects of COVID-19 on the HIV care continuum [26, 27]. Globally, the main reason for the disruption in health services and measures like lockdowns (restricted mobility) was an intent to galvanize resources and adequately respond to the COVID-19 pandemic [23, 26]. Nonetheless, there is conflicting literature about sexual behaviour changes during the pandemic, with a majority of the systematic reviews and meta-analyses showing a statistically significant decline in sexual risk behaviours during COVID-19 [28, 29], countered by a scoping review [30]. Such conflicting studies emphasize the need for more research to clarify the situation in other settings.

Although Gauteng was one of the hardest hit South African provinces by COVID-19 [31], the effect of the pandemic on female condom uptake in Gauteng province has not been described. Filling this knowledge gap is of paramount importance to inform SRH policy going forward, thereby assisting in the achievement of the sustainable development goal (SDG) target 3.7 which seeks to ensure universal access to SRH and family planning services like female condoms, and information and education about them by 2030 [32]. This will further empower vulnerable groups such as dependent women to take responsibility for their SRH going forward. Therefore, this study aimed to compare female condom distribution to service users in Gauteng province before (2018–2019) and during the COVID-19 pandemic (2020).

Methods

This is a secondary data analysis of female condom distribution over three years (2018-2020), from the District Health Information System (DHIS) data. DHIS data is collected routinely by the Gauteng Department of Health

(GDoH) on essential public healthcare services, including female condom distribution.

Setting

South Africa has the highest prevalence of HIV/AIDS worldwide [18]. This study was conducted in the Gauteng province of South Africa. With over 16 million people, Gauteng is the most populated province in South Africa, with five districts namely, the Johannesburg Metropolitan which is the economic capital of the country, the Tshwane and Ekurhuleni Metropolitans, and the Sedibeng and West Rand districts [18]. Again, Gauteng province besides being one of the provinces in the country that were highly affected by COVID-19 bore the highest incidence of COVID-19 and second highest mortality [31], while contributing to South Africa's burden of STIs like HIV [18] and unwanted pregnancies for which condoms are an effective intervention. For example, in 2019 before COVID-19, the prevalence of HIV among pregnant women in Gauteng was 28.1%, with the Ekurhuleni (32.8%), Sedibeng (30.9%) and West Rand (28.5%) as the leading districts, plus, Ekurhuleni had the highest percentage (51.2%) of unintended pregnancies [33]. The diversity of Gauteng in a demographic and socioeconomic context highly attracts different groups of people, leading to a dense population with vulnerable groups such as SW and MSM. Free female condoms are accessible in the 426 fixed and mobile public healthcare facilities in Gauteng province.

There are mainly three types of female condoms distributed by the GDoH namely, FC2, Cupid and Pleasure More female condoms. While selected providers are contracted to supply these condoms, nurses are often trained in communication skills on how to educate users and destigmatise the user, to create an enabling environment where everyone can feel free and unshy or ashamed to collect the condoms. Further counselling on the importance of condoms is provided at all public healthcare facilities during sexual and reproductive health consultation, particularly during HIV screening, treatment and outreach campaigns.

Study population

The study population comprised all 426 fixed and mobile public healthcare facilities in Gauteng province, that distributed female condoms free of charge to service users as a public good, from 1st January 2018 to 31st December 2020.

Data collection

This study used the DHIS dataset provided by the GDoH. The DHIS is a longitudinal dataset, routinely collected at public health facilities and entered into an electronic system for aggregation at the provincial and national levels. The number of female condoms distributed is one of the indicators in the DHIS. The indicators are used for monitoring disease conditions and evaluating service delivery and health outcomes over time. The requested data was received in MS Excel 2016 as count data. The data is kept in a secured encrypted Google Drive strictly accessible to the researchers only.

Analysis

This study relied on secondary data analysis to examine the total number of female condoms distributed at the provincial and district levels from 2018 to 2020. We used the formula below to determine the percentage change in female condom distribution between 2018 and 2019 and between 2019 and 2020. The years 2018 and 2019 were the control period termed "before COVID-19" while 2020 was the experimental year known as the period "during COVID-19". Several recent studies have made use of this descriptive statistics approach in evaluating changes in health services during COVID-19 and recounted the reliability and validity of the method in informing policy [34].

$$\%\ change = \frac{current\ year\ female\ condoms\ distributed - base\ year\ female\ condoms\ distributed}{base\ year\ female\ condoms\ distributed} x \frac{100}{1}$$

First, bar charts were drawn in MS Excel 2016 to illustrate the patterns of female condom distribution over the study period, proceeded by comparison and description of the percentage change in female condom distribution in Gauteng province before (2018/2019) and during (2020) the COVID-19 pandemic.

Results

Table 1 presents the number of female condoms distributed to service users in Gauteng province from 2018 to 2020. We show the pre and post COVID-19 numbers in two parts, first at the provincial level and second, at the district level. There was a 9.9% increase in the numbers of female condoms distributed in 2019 compared to 2018. In 2020 there was a 43.7% increase in distribution compared to 2019.

Gauteng provincial distribution of female condoms

Overall, Gauteng province witnessed an increase in the female condom distribution from 2018 to 2020 as depicted in Fig. 1, suggesting a positive trend over time.

Table 1 Gauteng provincial and district female condom distribution to service users 2018–2020

Area		Before COVID-19		During COVID-19	% change in 2019	% change in 2020
		2018	2019	2020		
Gauteng Province		3,937,073	4,327,333	6,216,816	9.9	43.7
Districts	Johannesburg Metropolitan	1,315,889	877,955	1,474,267	*−33.3*	67.9
	Tshwane Metropolitan	875,406	1,476,466	1,350,806	68.7	*−8.5*
	Ekurhuleni Metropolitan	733,205	804,373	2,010,900	9.7	150.0
	Sedibeng	356,536	371,649	716,558	4.2	92.8
	West Rand	656,037	796,890	664,285	21.5	*−16.6*

Although there was an increase in female condom distribution in Gauteng province over the three years, the most remarkable increase was recorded in 2020 during the COVID-19 pandemic, with 6,216,816 female condoms distributed. Relative to the preceding years, there was a 43.7% change in 2020 compared to 2019, and a 9.9% change in 2019 compared to 2018 in the number of female condoms distributed in the province as further illustrated in Fig. 2.

Stricto sensu, the real increase in female condoms distributed in Gauteng province in 2020 during the COVID-19 pandemic was more than three-fold compared to the distribution between 2018 and 2019, amounting to a 33.8% (43.7−9.9 = 33.8) net increase in female condom distribution in Gauteng province in 2020 during COVID-19 compared to the period 2018–2019. Summarily, there was a higher distribution of female condoms in Gauteng province in 2020 during the COVID-19 pandemic compared to the pre-COVID-19 period of 2018 and 2019. After examining the indirect effect of the COVID-19 pandemic on female condom distribution at the Gauteng provincial level, it was important to evaluate the effect thereof at the district level.

Districts distribution of female condoms in Gauteng province

Figure 3 depicts a variation in the percentage change in female condom distribution to service users among the five districts in Gauteng province before (2018-2019) and during the COVID-19 pandemic (2020).

Considering that the provincial total is the sum of the district's performance, we wanted to explore if the pattern of demand for female condoms among the five districts in Gauteng in 2020 during COVID-19 was the same (an increase). However, this was not the case. A disproportionate variation was observed among the districts. For instance, the Johannesburg metropolitan district saw a 33.3% decline in female condom distribution in 2019 compared to 2018 (Table 1; Fig. 1). But in 2020 during COVID-19, there was an increase to 67.9% in female condoms in the Johannesburg district. Contrarily, Tshwane (68.7%) and West Rand (21.5%) had a high distribution of female condoms in 2019 but experienced declines of 8.5% and 16.6% respectively, in 2020. Only the Sedibeng and Ekurhuleni districts consistently reported increases in the distribution of female condoms over the three-year study period.

In 2020 during the COVID-19 pandemic, the highest percentage change in female condom distribution was 150.0% in Ekurhuleni, followed by Sedibeng (92.8%) and Johannesburg (67.9%) districts. While Tshwane (68.7%) and West Rand (21.5%) districts were the highest performing districts in female condom distribution in 2019, they both experienced a drastic decline in 2020 (−8.5% and −16.6%, respectively). There was no clear pattern to suggest a distinction in female condom distribution between the three metropolitan municipalities (Johannesburg, Tshwane and Ekurhuleni) and the two non-metropolitan districts (Sedibeng and West Rand).

Discussion

This study aimed to compare female condom distribution before and during the COVID-19 pandemic in Gauteng province. Provincially, the results suggest an overall 43.7% increase in female condom distribution during COVID-19 in 2020 compared to the pre-COVID-19 period of 2019. Substantial district variations in female condom distribution were observed amongst the five districts in Gauteng province in 2020 during COVID-19 as follows; Ekurhuleni 150.0%, Sedibeng 92.8%, Johannesburg 67.9%, Tshwane −8.5% and West Rand −16.6%, indicating a disproportionate variation in the demand for female condoms among the respective districts.

The current study highlights a remarkable increase of 47.3% in female condom distribution in Gauteng province in 2020 during the COVID-19 pandemic (Fig. 2). This result is contrary to several findings that have reported the disruption of essential healthcare services by the COVID-19 pandemic. For example, one study showed that nationwide, 22.4% of South Africans could

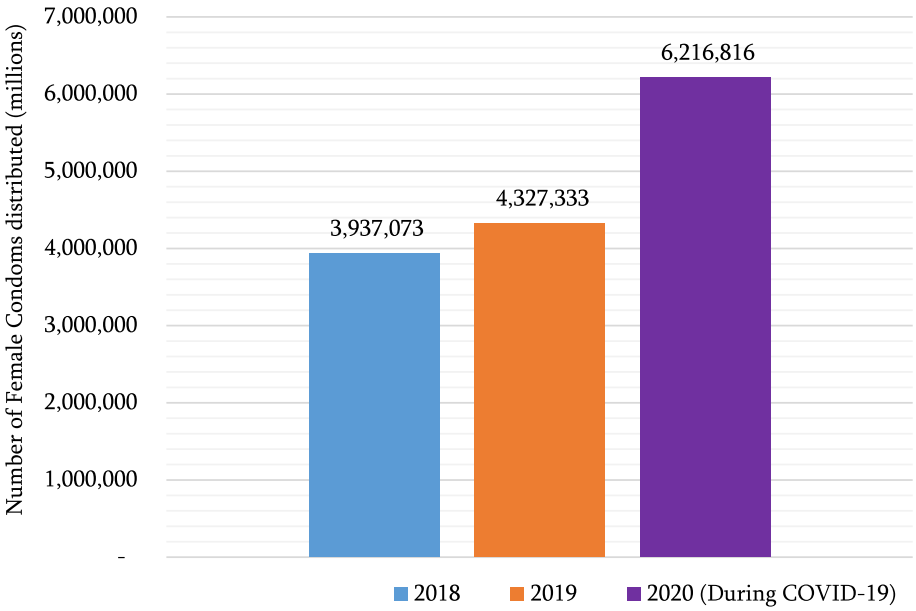

Fig. 1 Female condom uptake in Gauteng province (2018-2020)

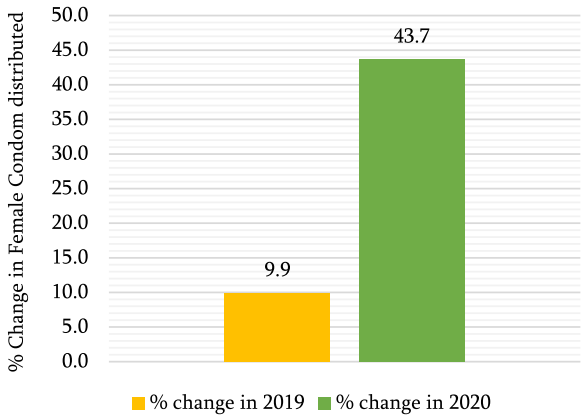

Fig. 2 Percent change in female condom uptake in Gauteng province (2018-2020)

not access condoms during COVID-19 [35]. Similarly, in a mixed-method study on SRH among women conducted in South Africa and Zambia during COVID-19, in particular, Zambian women reported limited access to SRH information and condoms [24]. Likewise, a study conducted in the eastern part of Zimbabwe reported that "condoms are hard to get by" during COVID-19 [22] with the same view experienced by 16.7% of Indonesian female SW [36], highlighting a widespread interruption of condom supply, indirectly associated with the COVID-19 lockdown and movement restrictions measures. In a very local context, an earlier study conducted in April 2020 in Gauteng province, just two months into COVID-19 revealed a decline in contraception uptake [37]. This was reinforced by a South African cohort study which noted a skewed distribution of condoms with less access among Blacks/Africans although the residents of KwaZulu-Natal and Mpumalanga provinces were more likely to access condoms [35]. The aforementioned studies [22, 24, 37] took place concurrently with the current study and recounted that women were unable to access SRH, whereas our study suggests otherwise for women in Gauteng province regarding female condoms.

To our knowledge, there were no other studies specifically on female condoms during COVID-19, which limits our ability to compare our results. Among the studies that evaluated access to condoms in general during COVID-19 some already mentioned, we identified some that corroborate our findings that a pandemic does not necessitate a disruption in healthcare services. For example, in North Carolina-USA, undergraduate and graduate students reported that they maintained access to contraceptives, the most common of which were condoms [38]. A similar study conducted in Britain found that only 6.9% of women participants, who were mostly Black, reported that their demand for condoms went unmet during COVID-19 [39].

Concerns about widespread disruptions to health service access by COVID-19 may have been overstated or oversimplified during the pandemic. For instance, a study in Gambia established that their health system's childhood vaccination services were resilient; they observed improvements in coverage and timelines during the critical second and third waves of the COVID-19 pandemic [40]. Similarly, in an attempt to prevent the acquisition of

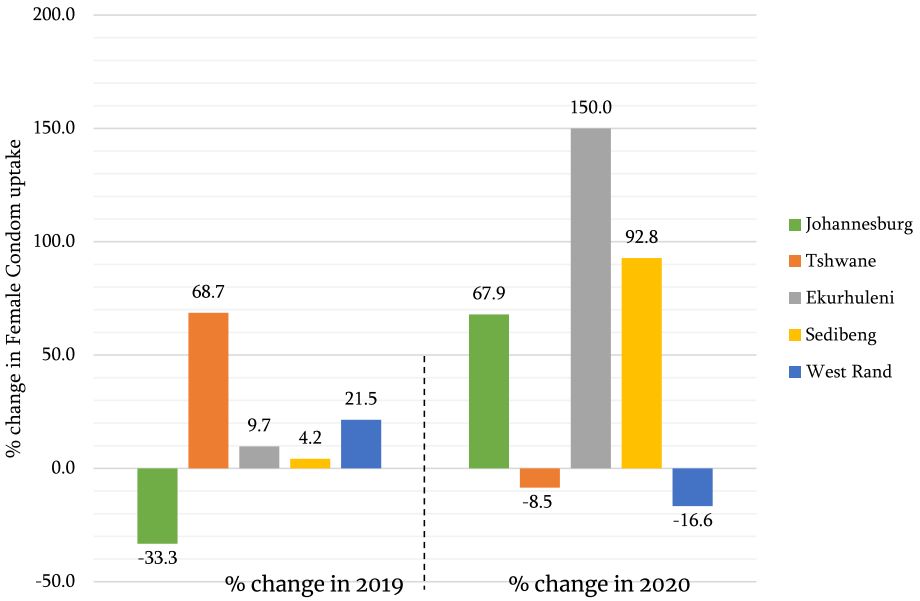

Fig. 3 District variation in female condom uptake in Gauteng province (2018-2020)

HIV, Zimbabwean female SWs reported increased uptake of PrEP by 51% during COVID-19 [41]. These studies [38, 39, 41] seemingly suggest that COVID-19 did not only fail to disrupt the continuum of HIV and unwanted pregnancy interventions in some settings but also may have had a positive effect of an increase in the utilization of services. One such example is the net increase in female condom uptake in Gauteng province observed in our study. This may convey a message of high protection against HIV/STIs in Gauteng province in 2020 during COVID-19, everything being equal that the female condom uptake translated into utilization. However, this is contested because the study cannot establish such an assumption as a fact.

Also, the tremendous increase in female condom uptake in our study seems to suggest a heightened awareness of the need for protection against STIs or unwanted pregnancy, particularly among females. We cannot say if this implies that there were higher levels of sexual activity during the COVID-19 pandemic, specifically in lockdown, or if the increased demand was driven by other dynamics, e.g. stockpiling, fears of gender-based violence, power dynamics in women to negotiate sex or increased economic stressors. The different patterns of uptake at the district level suggest a need to look at specific contextual factors, cautioning against overly simplistic explanations. The crucial information this does provide for policymakers, SRH, HIV/STI and contraceptive service providers is to scale up their stock of female condoms during future emergencies that may necessitate lockdowns or movement restrictions.

Furthermore, the increase in female condom uptake may be attributed to lessons learned from previous outbreaks like Ebola, that emphasized the need for health systems to maintain essential healthcare services delivery during emergencies [20]. Such a call was resounded in South Africa at the early stage of COVID-19 to ensure the continuum of HIV and Tuberculosis among other services to prevent the reversal of the health gains made over the years against such diseases [42].

Likewise, one possible reason for such a surge in female condom uptake during COVID-19 could be that sexually active people anticipated the closure of distribution centres (clinics/hospitals) during the lockdown wherein, the South African government invoked Sect. 3 of the Disaster Management Act of 57 of 2000 [37]. Hence, clients collected more condoms to keep at home as movement restrictions such as curfews were going to hinder access to healthcare facilities and result in unmet demand for female condoms because attention was directed to dealing with the pandemic [21, 22]. Also, there was a remarkable movement of people to their homes just before the lockdown wherein, partners engaged in distance-performing occupations such as truck and lorry drivers, and miners returned home, in addition to retrenched workers and students who relocated due to the closures of learning institutions [43]. Again, most of these migrants were sexually active which may account for the increased demand for female condoms in our study. However, our attempts to explain the potential reason for the surge in female condom uptake in the current study are

speculative, further research is needed to understand this phenomenon.

Of note, what is more complicated to unpack are the variations in female condom uptake among the five districts in our study (Fig. 3). This highlights the diverse geographical effects (positive/negative, increase/decline) of COVID-19 on routine healthcare services. The highest percentage change in female condom uptake of 150.0% during COVID-19 in the Ekurhuleni Metropolitan district is interesting because another study pointed out Ekurhuleni as a district with high HIV rates but with sub-optimal condom and ART usage [44]. On the other hand, two districts; the Tshwane Metropolitan Municipality and the West Rand District recorded a decline in female condom uptake in 2020 during COVID-19 compared to the per-COVID-19 era. This signifies more vulnerability for groups that are at risk of HIV/STI and unwanted pregnancies in these districts, particularly for adolescent girls who may be attending school and often stigmatised to publicly demand or pick up condoms. According to Kgoele et al. [45], 63.2% of the HIV-positive postnatal women in the Tshwane Metropolitan district reported regular condom use during sexual encounters in 2017. This high uptake of condoms is similar to the 68.7% female condom uptake in 2018/2019 before COVID-19 in the current study for the Tshwane and 21.5% for the West Rand district although both districts experienced a decline in 2020 during COVID-19. Although our study slightly contradicts the findings of Bolarinwa (2021) who demonstrated limited access to condoms in general during COVID-19 in South Africa, both studies highlight a geographical variation in condom uptake during COVID-19 [35].

Moreover, the increase in female condom uptake in the Ekurhuleni and Sedibeng districts in 2020 during COVID-19 is encouraging and worth noting because these two districts had the highest HIV prevalence among pregnant women ages 15–49 years in Gauteng in 2019 [33]. Everything being equal, this study seemingly justifies why the two districts may have been targeted by GDoH to increase female condom distribution and the increased uptake can only suggest a reduction in antenatal HIV prevalence and mother-to-child transmission. However, the remarkable decline in female condom uptake in the West Rand district in 2020 is concerning and counters this theory of GDoH increasing the distribution of female condom uptake because West Rand was the district with the third highest HIV antenatal prevalence but while the other two districts (Ekurhuleni and Sedibeng) improved their female condom upkate during COVID-19, West Rand uptake deteriorated. Overall, the surge in female condom uptake in the current study may equally explain the 1.7% reduction in antenatal HIV prevalence in the Gauteng province in the preceding year 2022, contributing to a 2.5% reduction nationwide, compared to 2019 [33, 46]. Again, this is a speculation which can only be justified by further studies because male condoms and PrEP may have also played a significant role in preventing HIV transmission in the district. Notably, the use of female condoms must not only be attributed to cisgender women or those in heterosexual relationships because research shows that female condoms are equally used by MSM [47]. This is why the female condom was renamed the "single-use internal condom" in 2018 [48].

Although we observed a substantial increase in female condom uptake in Gauteng province during COVID-19 in 2020, followed by a reduction in antenatal HIV prevalence in 2022, we however wondered if the uptake translated to optimal and consistent utilization. This is because from 2020 to early 2024, there seems to be a proportionate increase in other STIs in Gauteng province as recently reported by the GDoH [49]. For example, in the fiscal year (April and December) of 2023, there was a Syphilis incidence of 1.9% in women who attended antenatal care for the first time in public facilities within Gauteng province and a concerning increase in teenage pregnancy was reported by the GDoH during COVID-19 [49]. Also, in 2020, there was a 12% incidence of Male Urethritis Syndrome (MUS) and this increased to 40% in the 2023 fiscal year, with predominant causes of MUS being gonorrhoea and chlamydia nationwide. Perhaps the increase in female condom uptake in the current study was not sustained post-COVID-19 or during the relaxed lockdown. Or, the controversy about the increase in female condoms in the current study and the reduction in HIV and unintended pregnancy among 15–49 years women alongside a rise in teenage pregnancy underscore the fact that elderly females/women may have high access to and usage of female condoms compared to those less than 15 years or adolescents girls in general. However, the GDoH further reiterated that the high increase in PrEP uptake among women has unfortunately led to an increase in unprotected sex and multiple sexual partners. Hence, GDoH embarked on a combination of preventive interventions against HIV/STIs and unwanted pregnancies like (female) condoms, PrEP, testing and treatment, health education and promotion [6, 49]. We suggest that although the GDoH has dedicated the month of February to SRH awareness [49], such campaigns should be extended into other quarters of the year and partnering with educational institutions, non-governmental organisations (NGOs) and inter-ministerially could help to improve the expected outcomes.

Generally, the positive trend of an increase in female condom uptake in the current study is seemingly an indication of the good dividend of SRH health promotion. As

earlier highlighted, several studies have emphasized the need to address the cultural, religious, psychosocial and socioeconomic barriers that hinder the uptake of condoms with higher odds of low uptake amongst vulnerable populations and at-risk groups such as Female SW and MSM [11, 13, 50–52]. This is influenced by most women's financial vulnerability with the inability to negotiate for protected sex, lack of education, cultural stigma in discussing contraceptives, alcohol and substance abuse, religion, and ethnic concordance [11, 13, 50–52]. Therefore, the current study seems to suggest that GDoH is on a succeeding path in addressing these constraining factors and increasing female condom uptake in its population. However, more is still to be done to sustain the high female condom uptake in this study to attain the SDG target 3.7 of ensuring universal access to SRH, particularly for women and adolescent girls by 2030, barely five years into this critical deadline [32].

Limitations

The study is not without limitations. As with all secondary data analyses, this study depended on the quality of the primary data which could not be improved. We note that the distribution of female condoms cannot be conflated with correct and consistent use and it is difficult to establish whether the number of condoms distributed could be linked to individuals. However, the reduction in antenatal HIV prevalence among women aged 15–49 years suggests high adherence to preventive measures including female condoms [46]. Also, it was difficult to disentangle the demand and supply effects of the increased female condom uptake in this study. However, by comparing female condom uptake between periods, the study was able to isolate patterns that could be attributed to COVID-19. Furthermore, we acknowledge that this study only used DHIS data, without private healthcare data to reconcile the uptake of female condoms in the province from both sectors. Nonetheless, the large sample size of the over 426 public facilities in Gauteng province suffices for the generalization of the findings. Plus, recent findings show that during COVID-19, 7 of every 10 South Africans choose to access condoms from public healthcare facilities [35], supporting the reliability of this DHIS data set.

Conclusion

The Gauteng province witnessed a substantial overall improvement in female condom uptake during the COVID-19 pandemic, characterized as a surge, contrary to the expectation of the disruptive effect of the pandemic on health services. However, district variations highlight some nuances suggesting a disproportionate geographical effect of the pandemic on female condom uptake and distribution. Considering the uncertainty surrounding the correlation between distribution and usage, the most plausible explanation for the surge could be attributed to stockpiling. An important policy implication of the current study is that Female condom uptake is crucial, necessitating its enhancement and the continuum of distribution and stakeholders stockpiling at all times with particular attention to a potential increase in demand during outbreaks with lockdowns. Undisrupted access to female condoms will enable consistent and correct use and empower women against HIV, STIs and unintended pregnancies, as a strive towards the attainment of universal access to SRH. Additionally, it's conceivable that heightened public health promotion campaigns for safer sex practices and increased healthcare awareness initiatives contributed to this trend. To delve deeper into understanding the motivations behind usage or the increased uptake, further research employing surveys and interviews would be imperative. The fight against HIV, STIs and unintended pregnancies is very crucial and critical, and the response to outbreaks must be tactical to not undermine the gains of health system interventions like female condoms, aimed at empowering women to take responsibility for their SRH needs, as envisaged in the SDG target 3.7.

Recommendations

This study suggests some recommendations going forward. To begin, this seems to be the first study, particularly in Sub-Saharan Africa that solely focused on the effect of COVID-19 on female condom distribution or uptake. Hence, further studies, with a qualitative component, should investigate the reasons, including the cultural and socioeconomic factors or mechanisms that influenced the surge in female Condoms in Gauteng province during the COVID-19 pandemic to inform policymakers on how to plan for SRH service delivery during future emergencies. Such study designs should be able to determine whether such service uptake like condoms directly translates into consumption as it was difficult to measure in this study. The decline in female condoms experienced by the Tshwane and West Rand districts against significant uptake in the other three districts should be investigated to learn about the strategies and leadership role in maintaining services during health crises. As well as designing behavioural change communication interventions to improve or sustain the increase in female condom uptake in this study. Such studies should be designed to disentangle the demand and supply effects as it was problematic in the current study.

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Authors' contributions
Conceptualisation, C.B.F; Study design, C.B.F and N.C; Data Curation, C.B.F; Data analysis, C.B.F and N.C; Manuscript preparation, C.B.F and N.C; Both authors approved the final article.

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Data availability
Data for this study is available upon request to the corresponding author.

Declarations

Ethics approval and consent to participants
This study was conducted according to the guidelines of the Declaration of Helsinki and approved by the University of the Witwatersrand Human Research Ethics Committee (HERC) Ref No: M220149, and the South African National Health Research Department Ref No: NHRDGP_202203_031, in 2022, as part of a larger project that assessed the impact of the COVID-19 pandemic on essential healthcare services in Gauteng province, South Africa. Written informed consent was not applicable because this was a secondary data analysis of aggregated data.

Competing interests
The authors declare no competing interests.

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