The short-term impact of Covid-19 on fertility and use of contraceptive methods in Manicaland, east Zimbabwe

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Theoretical focus

Infectious disease pandemics have had substantial impacts on fertility in the past [1, 2] and there is emerging evidence for changes in birth rates in higher income countries during and following the Covid-19 outbreak [3, 4]. In sub-Saharan Africa, some studies have described changes in fertility intentions, related practices and availability of contraceptive services [5, 6]. However, as yet, there is little published empirical data on the impact of the pandemic on fertility outcomes in the region [7, 8].

Early in the Covid-19 pandemic, Aassve and colleagues published a brief review of short-term and longer-term fertility changes occurring after previous natural disasters including the 1918-1919 H1N1 influenza A pandemic, and speculated on possible post-Covid-19 pandemic fertility trajectories [9]. Channels identified for the typically negative short-term fertility effects of past natural disasters included increased mortality and morbidity in adults of reproductive age (noted to be less likely for the Covid-19 pandemic as most deaths have occurred in older adults[1]), increased maternal mortality and stillbirths, and slowdowns in conceptions due to fear of infection, decreased social mixing, and economic losses and uncertainty. Channels identified for subsequent positive fertility effects included catch-ups of postponed marriages and childbearing amongst reunited couples and to replace lost children, and reduced access to contraception. For Covid-19, Aassve and colleagues hypothesised that, whilst in high income countries (HICs), the pandemic will reinforce fertility declines, in low and middle income countries (LMICs), it's net effect could be to increase fertility. In LMICs, in transition economies and urban areas, they felt it was uncertain whether upward pressures on birth rates from reduced access to contraception would outweigh downward pressures due to economic losses and uncertainty. However, in rural areas, this upward pressure was likely to be reinforced by Covid-19-related disruptions to development leading to increases in fertility.

In this paper, we will explore these hypotheses for LMICs in a case study in Manicaland, Zimbabwe.

Data

Study setting

This study is being carried out in 8 sites spread across 4 districts in Manicaland, Zimbabwe's eastern province that runs along the border with Mozambique [11]. These sites represent 4 of the main socio-economic strata in Zimbabwe – urban (2), peri-urban (2), agricultural estates (2) and rural areas (2).

Prior to Covid-19, successive DHS surveys recorded a decline in TFR from 6.7 in 1982-1983 to 3.8 in 2002-2005 followed by a stagnation up to 2012-2015 (4.0) [12]. In the 2022 national Census, TFR was measured at 3.7 live births per women (urban areas: 3.0, rural areas: 4.4; Manicaland province: 4.2).

[1] Although there is some evidence that moderate Covid-19 could affect male fertility at least in the short-term 10. Wang S, Zhang A, Pan Y, Liu L, Niu S, Zhang F, et al. **Association between COVID-19 and male fertility: systematic review and meta-analysis of observational studies**. *The World Journal of Men's Health* 2023; 41(2):311-329.

Fertility in the Manicaland study sites declined between 1998 and 2005 with an average TFR of 3.46 being recorded for the period as whole [13]. Zimbabwe has experienced one of the largest HIV epidemics globally but also one of the earlier and most rapid declines in prevalence [14]. In the Manicaland study areas, HIV prevalence in adults of reproductive age declined from 26% in 1998-2000 to 17% in 2012-2013 [15]. Lower fertility was recorded in women living with HIV than in uninfected women [16] and, based on the fertility experience of uninfected women, we estimated that the TFR would have been 3.73 in the absence of the HIV epidemic. Thus, the population-attributable reduction in fertility associated with HIV/AIDS in 1998–2005 was estimated to have been 8% [13]. More data are needed to establish clearly the extent to which antiretroviral treatment reduces subfertility in infected women [17].

The first cases and deaths from Covid-19 in Zimbabwe were recorded in March 2020 and were quickly followed by the introduction of a strict national lockdown on March 29th. The scale of the first wave of the epidemic is hard to quantify due to the very limited testing for SARS-CoV-2 infection that was possible during the early months. However, this wave seems to have been contained to some degree by the initial lockdown measures. This wave of SARS-CoV-2 infections was followed by three further major waves (Figure 1) with the largest numbers of Covid-19 deaths being reported during the second wave (Beta variant, B.1.351; December 2020 to March 2021) and the third wave (Delta variant, B.1.617; June 2021 to October 2021) [18].

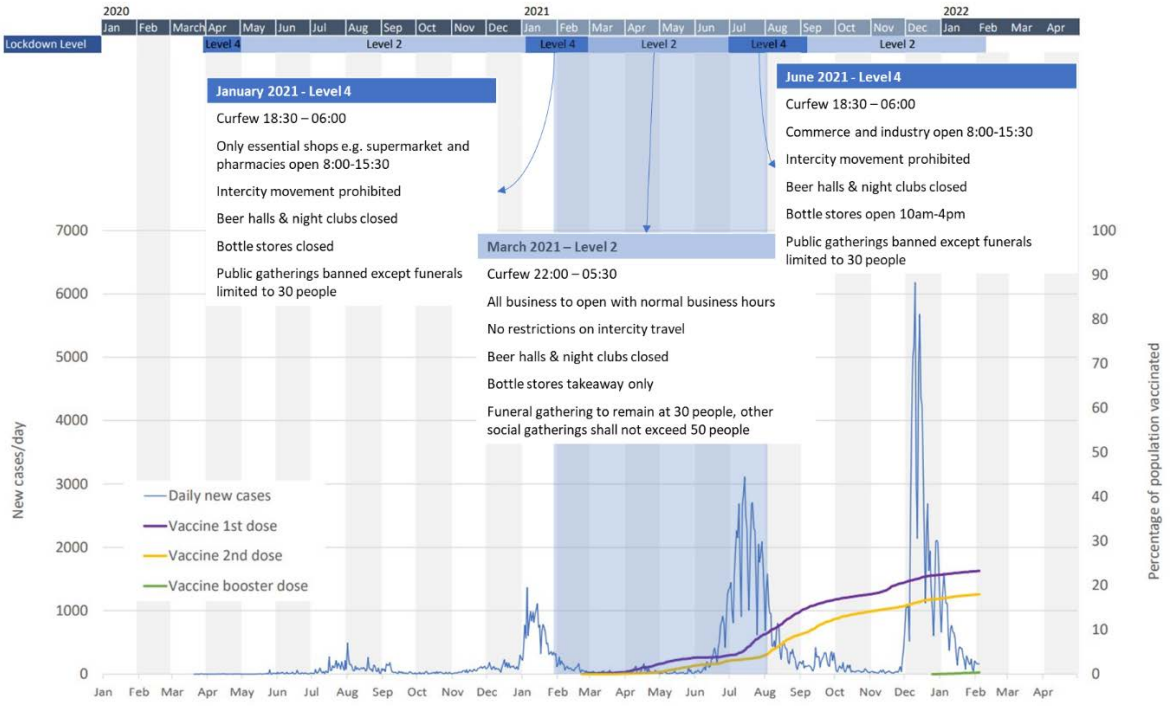

Fig 1. Trends in reported national COVID-19 infections and vaccinations, 2020 to 2022. Source: Morris *et al.* PLoS Global Public Health 2024.[19]

During the major waves of the epidemic, the Government of Zimbabwe responded by tightening the lockdown measures (Figure 1) [20]. These lockdown measures, together with spontaneous population responses due to fear of Covid-19-related illness and death, led to a number of changes that could have had an impact on pregnancy and birth rates. For example, the initial ban on public gatherings introduced in April 2020 included all weddings; although this was relaxed somewhat in September 2020 to allow for weddings with up to 50 people attending subject to observance of World Health Organisation protocols on social distancing, sanitising and masking. Impact

mitigation initiatives were also implemented. For example, in September 2020, UNFPA noted that the COVID-19 outbreak had affected women and girl's access to contraception, and launched a partnership with the World Food Programme (WFP) and Ministry of Health to distribute male and female condoms at the WFP's food distribution points throughout the country. https://zimbabwe.unfpa.org/en/news/midst-covid-19-pandemic-unfpa-and-partners-call-greater-efforts-ensure-access-contraceptives

Data collection

The data for this study are taken from a series of three general population surveys conducted shortly before the first outbreak of the Covid-19 pandemic in Zimbabwe (July 2018 to October 2019), during the pandemic (February 2021 to July 2021), and a few months after the fourth major wave of the pandemic (July 2022 to January 2023).

In each round of the survey, an initial household census was carried out in each study site and individuals aged ≥15 years resident in the enumerated households were eligible and invited to participate in individual interviews. In the pre-Covid-19 survey, all younger people (males: 15-29 years; females: 15-24 years) were eligible to participate but older people were eligible only if they were resident in a random sample of two-thirds of households [11]. This random sampling allows for serial cross-sectional analysis of population-level changes occurring between the survey rounds. Interviews were done face-to-face at participants' households and provider-initiated HIV testing and counselling (PITC) was conducted. Participants who opted out of PITC were requested to provide dried blood spot (DBS) samples for laboratory testing. In the during-Covid-19 and post-Covid-19 surveys, eligibility for the individual interview was restricted to those resident in the random sample of two-thirds of households for participants of all ages. These surveys were limited by Covid-19 safety measures with interview procedures adapted to take place over the telephone and self-reported data collected on HIV testing and infection status. Zimbabwe's national lockdown measures had been eased by the time of the post-Covid-19 survey so the census for this survey was done at participants' households. Individual interviews were still done on the telephone due to funding constraints.

In each survey, data were collected on births, pregnancies, sexual behaviour, contraceptive use, HIV infection and antiretroviral treatment status, and (in the during-Covid-19 and post-Covid-19 surveys) broader population responses to Covid-19 hypothesized to lie on causal pathways between Covid-19 and changes in fertility rates.

Research methods

Data analyses completed to date

Descriptive statistics (proportions and 95% confidence intervals) were calculated for ever having had a birth, for birth and pregnancy in the last 12 months, and for current pregnancy. Logistic regression analysis was carried out to calculate adjusted odds ratios (AORs) for differences between the first two surveys. AORs were adjusted for age and study site type (urban, peri-urban, farming estate and rural).

Proportions and AORs were calculated for overall use of contraception and for the main methods used (pill, LARC, barrier methods, sterilisation, withdrawal/cycles).

Data analyses planned

The analyses conducted for the first two surveys will be extended to include the data collected in the post-Covid-19 survey to assess slightly longer-term effects of the pandemic on fertility and contraceptive use in the study sites. These analyses will include calculation and comparison of period TFRs and ASFRs and proportions reporting contraceptive use (overall and by method) across the three survey rounds. Sub-analyses by HIV infection and ART status will be conducted.

The analyses will be carried for all sites combined and in the data disaggregated by socio-economic context to assess for the differences between urban and rural areas hypothesised by Aassve et al.[9]

Expected findings

Preliminary findings – during Covid-19 survey vs. pre-Covid-19 survey

9803 (77.2% participation rate) and 8497 (90.6%) individuals were interviewed in the pre- and during Covid-19 surveys respectively. In the pre-Covid-19 survey, the highest proportions of participants were from the estates and the rural sites. In part because of the switch from face-to-face to telephone interviews, these proportions were reduced in the during-Covid-19 survey, and the proportions living in urban and peri-urban sites both increased.

No changes in the TFR were found between the pre-Covid-19 and during-Covid-19 surveys. However, during Covid-19, smaller proportions of young women (15-24 years) reported ever having had a birth (33.8% *vs.* 42.0%; AOR=0.65, *p<0.001*) and a pregnancy in the last year (18.6% *vs.* 25.6%; AOR=0.68, *p<0.001*). In young women, the proportions who had started sex (46.2% *vs.* 55.7%; AOR=0.64, *p<0.001*) and were married (34.7% *vs.* 43.2%; AOR=0.69, *p<0.001*) declined. For sexually-active young women, the proportion using contraception also declined (59.8% *vs.* 65.5%; AOR=0.64, *p<0.001*). For women aged 25-34 years, there was borderline statistical evidence for an increase in current pregnancies in the during Covid-19 survey (AOR=1.34, *p=0.05*).

In women aged 15-54 years who had started sex, the proportion using a method of contraception did not change between the two surveys (AOR=0.96, *p=0.51*). However, there was a reduction in the proportion using the contraceptive pill as their main method (53.7% *vs.* 58.3%; AOR=0.84, *p=0.003*). In the during Covid-19 survey, women of all ages who had become pregnant were less likely to have attended for antenatal care in the first trimester than in the pre-Covid-19 survey.

Anticipated findings – post-Covid-19 survey vs. pre- and during Covid-19 surveys

During the period between the second and third of our series of surveys, the fourth wave of the pandemic passed through the study population. However, this fourth wave was driven by the less virulent Omicron variant and the reporting period also saw good progress in increasing uptake of Covid-19 vaccinations as well as a steady scaling-back of the national lockdown measures. As a consequence, we believe that there was a widespread sense that the Covid-19 situation was easing and that many people did their best to restore normality and move on with their lives. However, fertility indicators generally reflect events that either accumulate over multiple months or years (e.g. current pregnancy or births in the last year) so the changes – or lack of changes – that we see will still reflect relatively short-term impacts of Covid-19 and Government, community and individual responses to the pandemic. Therefore it may be too soon to see any rebound that occurs as the young women who delayed marriage and sexual activity during Covid-19 marry and start to have children. The preliminary results from the first two surveys suggest that UNFPA's and GoZ mitigation activities may have been largely successful in maintaining access to family planning methods so substantial increases in use of contraception seem unlikely. Hopefully though, we will see a recovery in prompt uptake of antenatal clinic services as fear of Covid-19 eases and these services returned to normal.

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