Exploring the effects of COVID-19 pandemic on sexual and reproductive health: a Brazilian framework using Kohler-Ortega tempo-adjusted fertility rates

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Theoretical focus

The first babies made during Covid-19 are now being born. As we are anxiously waiting for the official data on live births to be released, we count the number of deaths in Brazil: 428,034 in May 13th 2021 and increasing rates of infections, despite the vaccination. Research questions that we will pursue in the next months are: who are the women whose reproductive plans were most affected by Covid-19? How and for what means were they affected? How are these differences felt by women of different races, location, SES, and age groups?

The consequences of the pandemic and its mitigation (i.e. social distancing) for reproductive behavior has yet to be understood. A considerable part of the population transitioned to performing their work activities from home, and/or remained in their homes for a longer time due to decline of those activities, which also implies an increase in domestic activities and care for children and the elderly. Some of those, and others who engaged in essencial paid activity, are also suffering from economic instability such as unemployment, reduced income, loss of rights and other modifications on their work schedule that might interrupt family plans. Besides, psychological consequences of the epidemic such as the loss of loved ones may affect the choice of having or not having (more) children.

In past scenarios of public health crises and catastrophic events, a temporary reduction in the number of births is observed, followed by a recovery in the first five subsequent years in response to the improvement in the economic, social and public health scenario (STONE, 2020). The Spanish Flu, Hurricane Katrina and the Ebola epidemic are examples of mortality crises affecting fertility rates. Nevertheless, fertility is way below replacement level in Brazil and previous trend analysis shows declining rates over the past year (with the exception of the recuperation after the decline led by the Zika epidemics).

Other demographic characteristic of Covid-19 are the association of the most severe cases with pre-existing conditions (BORGES; CRESPO, 2020; NEPOMUCENO et al., 2020) and a greater chance of infection in places where there is greater circulation of people and more precarious general conditions (CORDES; CASTRO, 2020; FIOCRUZ, 2020). The latter is formed by residents of favelas and suburbs of large cities which lack not only sanitation and proper house infrastructure for reducing infections, but economic resources for survival, concentrating informal and insecure employment positions, higher unemployment rates, or jobs that require physical presence (cannot be replaced by home office). Besides, the overload on the health system imposed by the pandemic can also be reflected in the quality of reproductive health care, from the availability of contraceptive methods in health centers to the quality of prenatal and natal care provided to the mother and child.

When listing the factors that could impact the fertility of Brazilian women, we are faced with those that can cause an increase, albeit temporary, in the number of births, but also factors that can

contribute to the lowering of fertility in the short and long term. Often, the multiple social determinants of fertility operate in opposite directions or are quite different according to socio-demographic characteristics, which may maintain the total Brazilian level without major changes.

The factors that can contribute to an increase in fertility rates due to the COVID-19 context can be divided into two major groups: those related to difficulties and loss of access to sexual and reproductive health services and those related to issues of social distancing and confinement, such as sexual and gender violence, mental health problems and review of parental costs.

In regards to access to contraception, half of pregnancies are considered unplanned in Brazil (THEME-FILHA et al., 2016). Specifically in the Brazilian case, Bahamondes & Makuch (2020) emphasize the importance of guaranteeing access to family planning services during the pandemic.

In addition to the user's difficulty in obtaining contraceptives, there is a fear or impediment of visiting health institutions for non-urgent services.

Regarding gender violence, alcohol abuse, stress and financial difficulties, all of which are very common during pandemics, are considered factors that trigger domestic violence (LEWIS, 2020) which in turn can lead to a greater number of pregnancies, especially unplanned pregnancies, as was the case in Sierra Leone during the Ebola crisis (GOLDSTEIN, 2020; UNPD, 2015). Besides, depression and anxiety can contribute to risky behavior (SOLEIMANI et al., 2017) reducing autonomy and self-sufficiency and reflecting in less use of contraception and greater fatalism (CARVAJAL et al., 2014; STEINBERG; RUBIN, 2014).

The pandemic also represents a reduction in the opportunity costs of planned pregnancies (GOLDIN, 2006; GOLDIN; KATZ, 2000). Since women, especially the more educated, have invested more time in their accumulation of human capital and in paid labor outside the home, being unemployed or working from home during the pandemic may reduce their opportunity cost to have children.

The effects of reducing fertility rates due to COVID-19 are grouped into four groups: the increase in uncertainty regarding the future, which may cause the desire to postpone pregnancy to more favorable moments or even an entire reconsideration of reproductive plans; the stressful family routine caused by confinement; fear of coronavirus infection during pregnancy and its consequences on the health of women, fetuses, and newborns; and the possible decline in non-marital sexual intercourse that generate pregnancies.

Couples feel unable to engage in childbearing due to the fact that at the present time there is no complete stability or conviction that the economic and social panorama will follow any better direction (LUPPI; ARPINO; ROSINA, 2020; MICELI, 2020).

Regarding the new family routines imposed by confinement, it is possible to anticipate the challenge of reconciling domestic work, childcare or school supervision, and remote paid work (or outside the home at risk of infection), already in a context of high gender inequality, will likely shape reproductive plans.

A third reason for COVID-19 to negatively impact fertility is the concern for women's health. Although there is no evidence so far that infection during pregnancy may have consequences for fetal health (SCHWARTZ, 2020) as happened with Zika, pregnant and postpartum women are at higher risk of presenting severe forms of the disease and requiring hospitalization (mechanical ventilation or

admission to an intensive care unit) (ELLINGTON, 2020; HANTOUSHZADEH et al., 2020). In the case of Brazil, maternal mortality rates due to the Covid-19 are now one of the highest in the world and one of the reasons is overcrowding of health services and lower quality of obstetric and neonatal care for Covid-19 patients (SOUZA; AMORIM, 2021).

Regarding adolescents, as much as opportunities for sexual encounters might become scarcer leading to fewer unplanned pregnancies, loss of access to the educational system can be another major factor in increasing adolescent fertility. The impossibility of attending schools for a reasonable period can lead to future permanent dropouts, which impairs the acquisition of human capital by young women, decreases awareness and knowledge of practices related to reproductive sexual health and which may lead to unprotected sexual relations. In addition, the Ebola epidemic showed how public health crises drove adolescents out of schools and made them more vulnerable and exposed to sexual exploitation and rape (PLAN INTERNATIONAL, 2014).

Authors analyzing the effect of Covid-19 on fertility have identified a common desire to postpone the arrival of children, with many of them having given up on becoming pregnant (LUPPI; ARPINO; ROSINA, 2020; MICELI, 2020). The results, however, present important sociodemographic differences, as in the study by Marteleto et al. (2020) about Zika. Younger women (<25) were more likely to postpone or forego pregnancy while older women stayed on plans. In addition, the most educated and the most financially stable tend to maintain their plans while the group with lower education chose to postpone or forego. Finally, in regions with the highest number of COVID-19 cases detected, abandonment or postponement is greater (LUPPI; ARPINO; ROSINA, 2020). While young women can postpone, each year an older woman postpones a pregnancy may reduce the likelihood of having a child in the future (BONGAARTS; FEENEY, 2008), which will also reflect in a quantum effect of the epidemic.

Data

In the absence of Census Data (cancelled in 2020 and 2021), ongoing work is using data on live births from the Sistema de Informação do Nascido Vivo (SINASC) of the Brazilian Ministry of Health to shed light on the fertility response to Covid-19 epidemics.

Research methods

We will conduct Kohler-Ortega tempo-adjusted measures of fertility rates (ORTEGA; KÖHLER, 2002) to examine the fertility fluctuations in the last decade and understand how much has fertility rates departed from the hypothetical TFR (estimated based on the assumption of what would have happened if no change in mean age at fertility and parity composition had occurred). Intensity functions are used by Köhler & Ortega decomposition to control fertility rates by birth order and women´s age. We will be able to evaluate what proportion of the decline observed is due to a postponement effect (Tempo) or to women foregoing fertility (true Quantum effect, free of distortion of postponement and parity). We will stratify our analysis by geographic location, race, marital status and education level to explore how mechanisms of reproductive behavior differ according to a women´s sociodemographic profile.

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