# MEDICALLY ASSISTED REPRODUCTION AND FERTILITY IN THE LATIN AMERICAN CONTEXT: THE CASE OF BRAZIL (2010-2023)[1]

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*ABSTRACT*

In 1994, the International Conference of Population and Development in Cairo urged countries to guarantee sexual and reproductive health rights. Thirty years later, the achievement of desired fertility demands not only contraception but also assisted reproduction. Based on Brazilian vital statistics (2010-2023), this paper points to increased live births delivered using medical-assisted reproduction (MAR) and, more specifically, assisted reproduction treatments (ART). This fact is associated with (a) the low or very low fertility levels in Latin America together with a delayed fertility pattern; (b) the surge of negative discrepant fertility, in which couples have fewer children than desired; and (c) the increase in available assisted reproductive treatment and success rates in Latin America and around the world. Since no broad public policies focus on discrepant fertility and infertility in Brazil, MAR babies are predominantly delivered by the most privileged social groups (white, most educated, and living in the wealthiest areas), so reproductive rights are unequally accessed.

*Keywords: assisted reproduction; fertility; low fertility; reproductive rights; Brazil*

## *1. Introduction*

In 1994, the International Conference of Population and Development in Cairo urged countries to guarantee sexual and reproductive health rights. Thirty years later, the achievement of desired fertility demands not only contraception but also assisted reproduction.

Fertility levels have sharply declined in most developing countries since at least 1970. In 2024, Latin America exhibits a dual trend of low fertility rates (with a TFR around 1.5 in relatively large countries such as Brazil, Chile, and Colombia) and postponed childbearing. The literature reviewed, produced since the 1980s, leads to the conclusion that this duality can be explained by a complex structural and conjunctural framework (see, for example, Van de Kaa, 1987; Lesthaeghe and Surkyn, 1988; Sobotka, 2004; Nathan and Pardo, 2019; Beaujouan, 2020), a concept that can also be applied to developing countries.

As it is well known, the preference for postponing childbearing is not always fully realized and affects both cohort and period fertility. The decision to have children later in life to achieve desired fertility can significantly impact a woman's ability to conceive, as female fertility declines with age (Cunha et al., 2022). In contexts where fertility rates may fall further, this gap will likely widen and become a social issue (Carvalho et al., 2018). Medically Assisted Reproduction (MAR)[2],

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[2] Medically Assisted Reproduction (MAR) refers to a range of medical procedures and treatments that go to the clinical primary treatments, including fertility medications and drugs up to assisted reproductive technologies (ART) such as In Vitro Fertilization (IVF); Intracytoplasmic Sperm Injection (ICSI); Cryopreservation of eggs, sperm, or embryos; Artificial Insemination: Sperm is

particularly Assisted Reproductive Technologies (ART), has become an essential option for procreation, especially in developed countries, where ART is beginning to signal its contribution. Its importance is twofold: first, while early research suggested ART would not compensate for fertility declines after age 35, recent data shows its impact on Total Fertility Rate (TFR) reaching nearly 10% in some countries. Second, ART's acceptance reflects social transformations, challenging the traditional nuclear family model and promoting diverse family structures, including same-sex parenthood. These factors, along with limited research on MAR in Latin America, highlight the relevance of this study.

The primary aim of this study is to indirectly demonstrate the presence of Assisted Reproductive Technologies (ART) in a Latin American context, specifically in Brazil, as an emerging tool for implementing fertility preferences. Using data from the Ministry of Health's Live Birth Information System (2010–2023), we analyze the profiles of women with selected characteristics to test the hypothesis that, though still in its early stages, MAR is becoming a factor in fertility patterns. The underlying assumption is that a higher-than-expected prevalence of multiple births among older women during the reproductive period serves as an indirect indicator of the presence of MAR in Brazilian fertility.

## *2. Assisted reproduction techniques: an overview*

In developed countries with low fertility rates, assisted reproductive technologies (ART) have become an essential part of the reproductive landscape over the past two decades, contributing to fertility increases. Global statistics show growing trends in ART usage, with more clinical centers and procedures worldwide, including Latin America. In the U.S., ART accounts for 2–3% of births, while in Europe, countries like Denmark, Iceland, and Spain report significant percentages of births from ART, with Spain reaching 10%. European data consistently show an upward trend in ART use. Australia follows suit. Lazzari et al. (2021) have pointed to the relevance of ART to the increase in births to women 33 or older, especially for the first birth, whereas Lazzari et al. (2023) found significant increases in ASFR at older ages, with increases from 11.9% in the 1968 cohort to 25.3% in the 1986 cohort at ages 40-44; steeper increases were registered in the oldest age group. Despite skepticism due to costs and side effects, scholars note a positive link between increased ART use and delayed motherhood, as well as low fertility. This has led some governments to expand ART access and integrate it with maternity support policies to address fertility decline.

In Latin America, despite data challenges, studies by Zegers-Hochschild et al. (2014, 2023) show a notable rise in ART services, with a 5.6% average annual increase in ART cycles from 2012 to 2020. The age of ART users is also increasing, with 75.3% aged 35 or older in 2020. Argentina, Peru, and Brazil lead in ART treatments for women aged 40 and over. Although access remains low, the authors believe there will be changes in countries such as Argentina and Uruguay, with laws providing universal access to ART as part of the reproductive rights.

Even with limited research in applied social sciences, scholars have explored the implications of ART in Brazil for nearly three decades. Scavone (1998) highlights that while ART was initially developed to address infertility, it has created a market for procreation and expanded embryo research that enabled new possibilities, such as post-mortem parenthood and pregnancies at older ages. Besides that, after nearly three decades, ART has raised ethical and social concerns, affecting both women and babies. The growing global use of ART, including in Brazil, reflects a

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directly inserted into a woman's uterus or cervix. ( https://www.medicalnewstoday.com/articles/assisted-reproductive-technology)

broader trend. Yet there are few studies examining the impact of MAR and ART on fertility in Brazil from a demographic perspective.

## 3. Data and methods

The analysis uses live birth statistics from SINASC [3] (2010-2023) and focuses on descriptive data. Although the database lacks details on reproductive care services, it has characteristics like primiparity and multiple births, which may indicate ART use, especially among older women. Data are presented by socioeconomic variables (region, education, and race/color). The assumption is that the likelihood of multiple births is generally constant with age, with rare natural twin pregnancies (11 per 1,000 births). Thus, ART is more likely among older primiparous women and those with multiple pregnancies.

## 4. Results

Table 1 presents live birth data for women who were either nulliparous or had multiple pregnancies from 2014-2023, with some data beginning in 2010. Panel (a) shows a lower proportion of nulliparous women among older age groups, alongside a steady increase in first births among older women over time. This increase may be due to fertility postponement, a trend noted in Brazil since at least 2010, though higher ART use among older nulliparous women also plays a role. Panel (b) indicates that the percentage of multiple pregnancies has risen over the years, particularly among older women. This trend is consistent with reports from FEBRASGO, which link increased twin pregnancies in Brazil to greater ART access. In 2017, SBRA reported that 32.3% of ART pregnancies were twins, reflecting international trends.

Table 1 - Proportion of multiple live births among previously nulliparous women and women with multiple pregnancies, according to selected age groups - Brazil, 2014-2022

| Period* | (a) Nulliparous ** | | (b) Multiple pregnancies | | (c) Single Pregnancy **** | |
|---|---|---|---|---|---|---|
| | Age of mother *** | | | | | |
| | Up to 34 | 35 or more | Up to 34 | 35 or more | Up to 34 | 35 or more |
| 2010-2013 | - | - | 1.87 | 2.98 | - | - |
| 2014-2016 | 37.41 | 14.37 | 1.86 | 3.15 | 60.73 | 82.48 |
| 2017-2019 | 36.44 | 14.59 | 1.91 | 3.18 | 61.65 | 82.24 |
| 2020-2022 | 35.34 | 14.24 | 1.96 | 3.17 | 62.69 | 82.59 |
| 2023 | 35.51 | 14.60 | 2.02 | 3.26 | 62.47 | 82.14 |
| Annual average of live births | | | | | | |
| 2010-2023 | 879,217 | 61,250 | 51,215 | 13,503 | 2,611,937 | 412,645 |

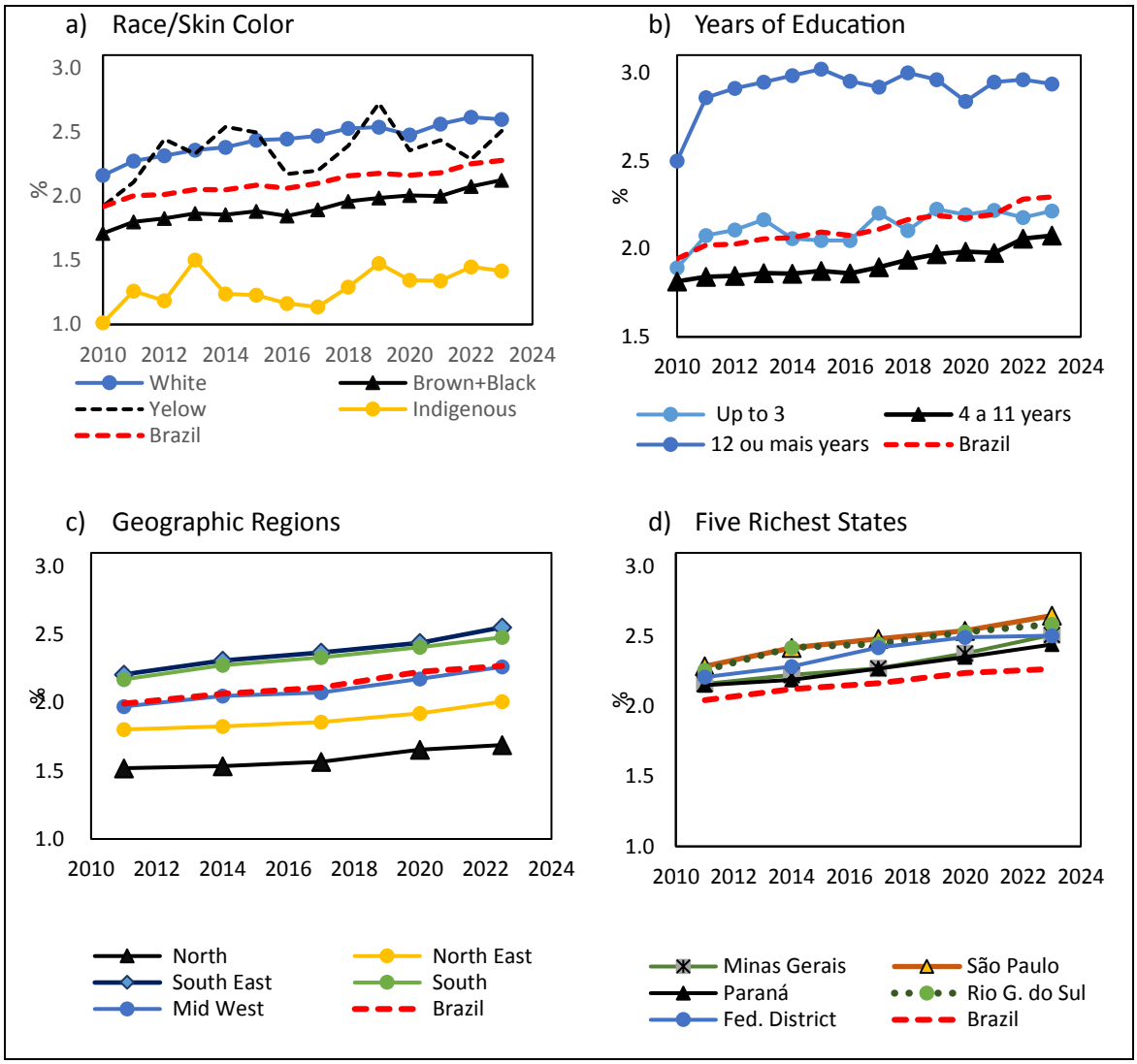
Source: Original data from http://tabnet.datasus.gov.br/ - Ministry of Health.
* Annual Average
**Information available after 2014. It does not include nulliparous women with a previous cesarean section, singleton pregnancy, cephalic, in spontaneous labor and with gestational age ≥ 37 weeks
*** Up to age 64.
**** Live births from nulliparous pregnancies from 2010 to 2014

Figure 1 illustrates the levels of multiple live births among women with different characteristics. First, it is worth noting that the indigenous population is the only group in which the percentage of multiple births is consistently below 1.5%. Given the limited access to ART among this population due to their rural lifestyle and early age at childbearing, this low percentage suggests, by contrast, that ART has a notable presence among other groups. The highest incidence of multiple births is observed among white women and the yellow (oriental) population, who are relatively less socially vulnerable, with an average incidence of 2.5%. Additionally, women with higher education levels show a significantly higher incidence of multiple births, approaching 3%. Figure 1 also presents data by geographic region and the five

[3] SINASC stands for the National Health Register of Births from the Ministry of Health with a high and homogeneous coverage of around 95%. (SZWARCWALD et al. 2019).

wealthiest states, including São Paulo, the most prosperous state. These data further support the notion that ART is more prevalent in the most affluent sectors of Brazilian society.

Figure 1- Brazil, 2010-2023: Proportion of women aged 15-64 delivering births, according to selected characteristics (Percent)




*Moving 3-year average

Source: Original data from http://tabnet.datasus.gov.br/ - Ministry of Health

## 5. *Preliminary discussion*

Preliminary results indicate that access to assisted reproductive technologies in Brazil remains limited compared to developed countries. This study offers indirect evidence on the use of ART by analyzing available vital statistics, revealing that Brazil has significant inequalities in access to ART, as the literature indicates for developing areas. Factors such as race/skin color, education, and geographic location play an important role in this scenario, with white, highly educated women from more developed settings having greater access to ART. The full paper to be submitted is expected to consider women aged 35 and over, who are the main users of ART, with data subject to statistical modeling to assess the likelihood of having that access.

The inaccessibility to ART also raises the question of how women from lower socioeconomic backgrounds can deal with infertility issues. It is worth remembering that during the COVID-19 pandemic, when health services were reduced or shut down, particularly among the most vulnerable population, access to and use of ART did not decrease in Brazil.

The lack of systematized data is a major limitation of this article. Yet we conclude that ART is significant in Brazilian fertility and shows an upward trend. A rough estimated number of live births produced by these techniques is around 100,000 births per year.

This study is exploratory, and there is still much to be studied and analyzed in the context of TRA. As a first approach to the topic, we are now familiar with a phenomenon that, although not entirely new, is relatively little discussed in Brazilian demography. It is crucial to carry out more detailed quantitative and qualitative research, which will allow us to build more accurate scenarios of the possible impact of TRA on fertility in Latin America. Having demonstrated the unequal presence of ART, our next research question points towards how ART, as a possibility of implementing the couple's reproductive preferences, could influence reproductive behavior, upholding the already very low Brazilian ASFR at more advanced ages[4]. At the same time, given the rise in ART and the presence of patterns of delayed fertility in developing settings, such as Brazil, a potential fertility compensation scenario could be considered.

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[4] By the early 2020s, Brazilian women in their 30s had lower ASFR than their counterparts in Northern or Southern Europe (WPP-UN-DESA, 2024).