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Descriptive Finding

The big decline: Lowest-low fertility in Uruguay (2016–2021)

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Contents

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Abstract

BACKGROUND
In recent years, fertility rates have declined substantially in most Latin American countries. Uruguay has been at the forefront of this regional process, as the country's total fertility rate plummeted from 2 children per woman in 2015 to 1.37 in 2021 (and continued to drop to 1.28 in 2022, according to preliminary data).

OBJECTIVE
We decompose fertility decline by age and birth order in Uruguay, and identify the probable mechanisms (e.g., postponement, stopping) behind this decline.

METHODS
Combining census data and vital statistics, we estimate period fertility rates by age and conditional period fertility rates by birth order and age. We also decompose the relative contribution of decline in each age and birth order to total decline in TFR.

RESULTS
Our findings suggest that the postponement of births, especially among adolescent and very young women, was the main driver of the big fertility decline. Additionally, the fall in higher-order births, mostly among middle-aged women, played a significant role in the overall decline. The findings also reveal an increase of nearly two years in age at first birth between 2016 and 2021.

CONCLUSIONS
This unprecedented decline in fertility appears to be leveling off. Moreover, we expect that some of the births by adolescents and young women that were avoided during the big fertility decline will take place at some point in the future, probably generating a slight rebound in the total fertility rate.

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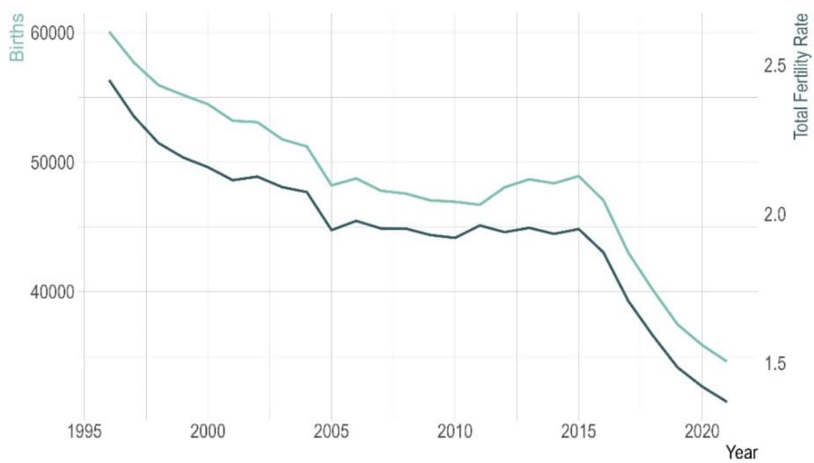
CONTRIBUTION
Our paper is the first to identify the demographic mechanisms leading to lowest-low fertility in Uruguay. It also contributes to discussions on the impact of the current adolescent fertility decline in short- and medium-term fertility trends.

1. Introduction

After 2016, Uruguay experienced an unprecedented decline in fertility. The total fertility rate (TFR) decreased from near 2.0 to 1.37 children per woman (1.28 according to the preliminary figures for 2022) in just six years, while the total number of births declined from nearly 47,000 to 33,000. From the mid-1990s the evolution of the TFR comprised three phases: (1) a decline below replacement-level fertility (1996–2005), (2) a period of relative stability (2006–2015), and (3) a particularly sharp decrease from low to lowest-low fertility levels (2016–2021) (Figure 1).

Figure 1: Total fertility rate and annual births in Uruguay (1996–2021)

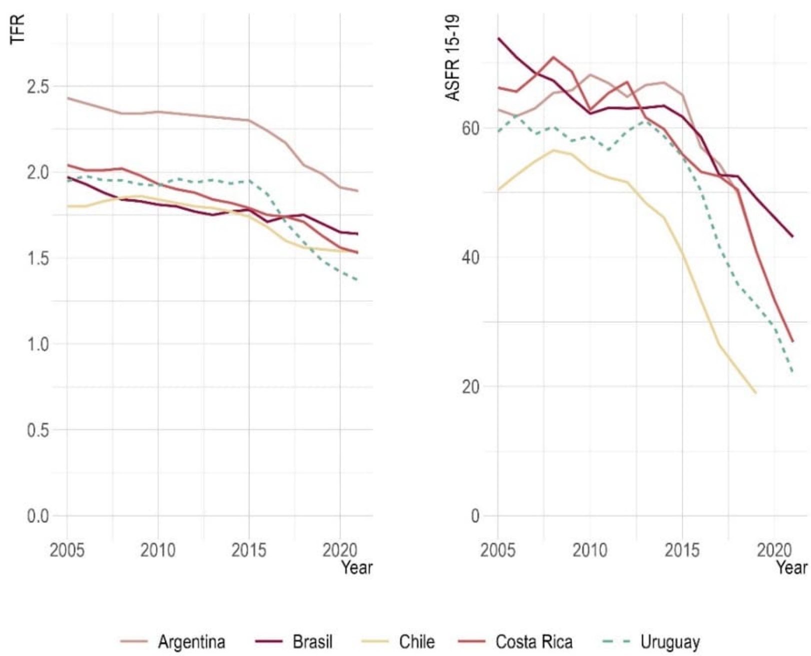


Source: Live Birth Certificate of the Ministry of Public Health; Population Estimates and Projections (2013 Revision), National Institute of Statistics.

During the 20th century Uruguay had been a unique case within Latin America, as its fertility tended to be low (the TFR was nearly 3 children per woman mid-century), following a very early demographic transition and in the context of an extremely urbanized population (Pellegrino 2010). However, later demographic changes in the country have aligned more closely with regional trends. During the 1990s a reduction in Latin American fertility attenuated cross-country heterogeneity (ECLAC 2012; Cabella and Pardo 2014). Thereafter, fertility converged toward values of around 2 children per woman in most Latin American countries.

Figure 2 shows the evolution of the TFR and the adolescent (15–19 years old) fertility rate in selected countries. Noticeably, Chile led the decline, followed by Brazil and Uruguay. Argentina and Costa Rica began their decline at higher levels, falling below the threshold of 2 children per woman a decade later. The decline in the Uruguayan TFR is apparent in the steep slope visible after 2015 (Cabella, Nathan, and Pardo 2019). In the subsequent years the Uruguayan rate went below the threshold of 1.5 children per woman, along with that of Chile and Costa Rica. In all cases, there was also a steep decline in adolescent fertility.

Figure 2: Total fertility rate and adolescent fertility rate (‰) in selected LAC countries (2005–2021)



Source: Live Birth Certificate of the Ministry of Public Health and Population Estimates and Projections (INE 2013 Revision) for Uruguay, CEPALSTAT for the rest of the countries.

What has induced the reduction in period fertility, given that the COVID-19 pandemic only accounted for a decline of 600 to 1,000 births between December 2020 and February 2021 (Cabella and Pardo 2022)? Fertility trends can be influenced by changes in reproductive behavior across the life course, including stopping progression to more children once a desired number is reached (Coale 1973), timing (advancement or postponement of first and higher-order births), spacing of subsequent births, and lifetime childlessness (Kohler, Billari, and Ortega 2002). The latter has become increasingly significant in European societies (Kreyenfeld and Konietzka 2017) but has had a limited impact in South America, and in Uruguay in particular (Binstock and Cabella 2021; Pardo, Cabella, and Nathan 2020).

In the previous phase (1996–2005) the main mechanism influencing decline was the increasing adoption of a behavior of stopping after 2 children, as most of the decline was explained by a decline in fertility rates of order 3 or higher (Nathan, Pardo, and Cabella 2016). Postponement played a minor role because of divergent behaviors among women from different socioeconomic strata. Those from the medium and upper social strata postponed having their first child, whereas those from lower socioeconomic strata showed little to no change in age at first birth and an increased rate of adolescent fertility. Consequently, the mean age at first birth showed very moderate changes and, more importantly, reflected the magnitude of social polarization evident in inequalities in female reproductive trajectories (Castro, Batyra, and Myrskylä 2022; Nathan 2013; Lima et al. 2018; Nathan 2015; Pardo and Cabella 2018).

The present paper describes the unprecedented decline in fertility that took place from 2016 to 2021 after a decade of stability, and identifies the demographic mechanisms that may account for it.

2. Data and indicators

We obtained birth data from the Live-Birth Certificate (CNV in Spanish) and the Perinatal Information System (SIP in Spanish). Both were provided by the Ministry of Public Health (MSP 2023a, MSP 2023b; Simini 1999). For this period, the CNV covers all births (UNICEF 2016); the SIP omitted only 2.5% of births in 2021 (for a more detailed description of the completeness of the age and birth order data of the SIP, see Cabella, Nathan, and Pardo (2014)). The data on the age of mothers in the CNV are more than 99% complete for the period in question, and 100% complete after 2017. There are also no significant problems with the reporting of age (i.e., age heaping, age preferences).

The mid-year female population of childbearing age is taken from official projections published by the National Institute of Statistics (INE 2013), based on the 2011 census; there are no projections by age after that date. As of the completion of this manuscript, the 2023 census microdata are not yet available, but official preliminary results allow the assumption that net migration during the intercensal period does not significantly alter the projections. The denominator needed to compute the conditional fertility rate indicators by birth order was the distribution of women of reproductive age by parity and year. Because these data were only available for the last census year (2011), we used the female population by age and parity as measured by the census and updated the following years' distribution by cumulating the fertility of cohorts over their childbearing ages. This method is known as the Golden Census (computation specifics in Jasilioniene et al. 2015).

Using the R library *hfdPeriodFertilityTable* from the Max Planck Institute for Demographic Research (Nash et al. 2011), we estimated unconditional period fertility rates using births (B) by age (x) and year (t), and conditional period fertility rates by age (x), order (i), year (t), and female population exposures (E), as follows:

$$f(x,t) = \frac{B(x,t)}{E(x)}$$

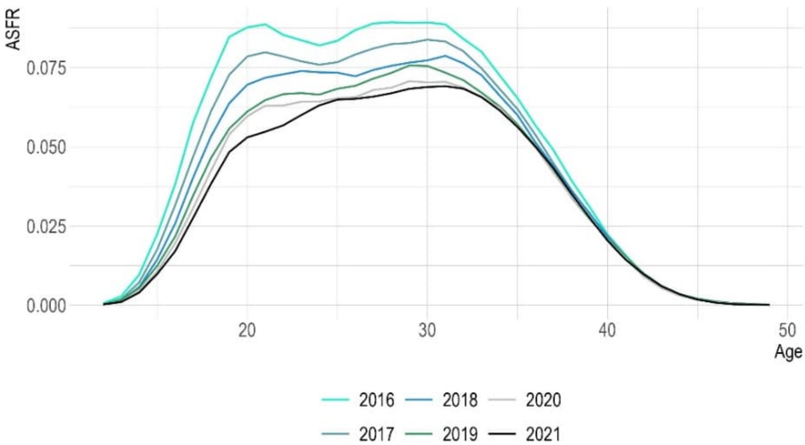
$$m_i(x,t) = \frac{B_i(x,t)}{E_{i-1}(x,t)}$$

We also computed the relative contribution of each age and birth order to the decline in TFR.

3. Results

First, we examined age-specific rates over time. A large decline is apparent in all age groups but particularly among younger women. This is reflected in the rightward shift of the peak of fertility rates (approximately up to age 22) (Figure 3).

Figure 3: Age-specific fertility rates in Uruguay (2011–2021)

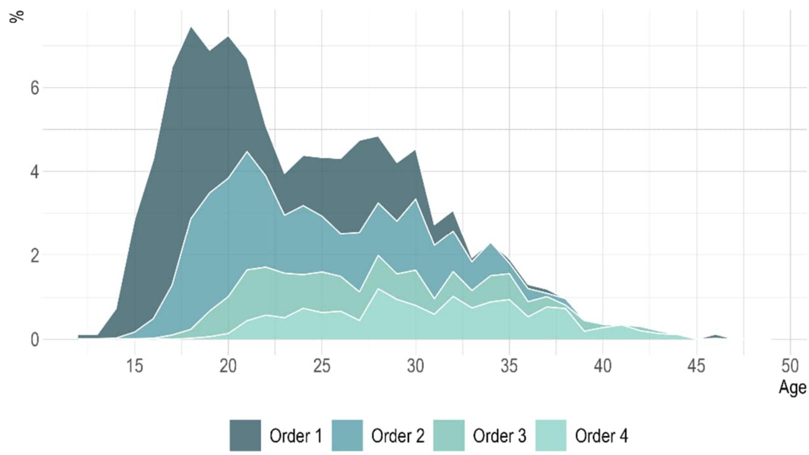


Source: Certificate of Live Birth, Ministry of Public Health; Population Estimates and Projections (2013 Revision), National Institute of Statistics.

The decline in fertility rates for 15-to-19-year-olds is very significant. Those rates halved, and in most single age groups they fell to less than a third of their initial value. The drop is particularly noticeable among 19-year-old women, as the rate fell from 87 to 48 births per 1,000 women over the period.

Figure 4 summarizes the contribution of each age and birth order to the reduction in TFR (a supplementary table at the end of the paper shows the contribution of each age group). In the area corresponding to order 1, the reduction in first births before the age of 24 accounts for 30% of the total decline over the period. This is due primarily to first births at young ages. Second births among women under 24 years of age was another important contributory factor, accounting for 15% of the total decline. Finally, 22% of the decline is explained by the decrease in third and higher-order births among women in their late 20s or above.

Figure 4: Decomposition of the 2016–2021 decline in the total fertility rate by single age and parity in Uruguay

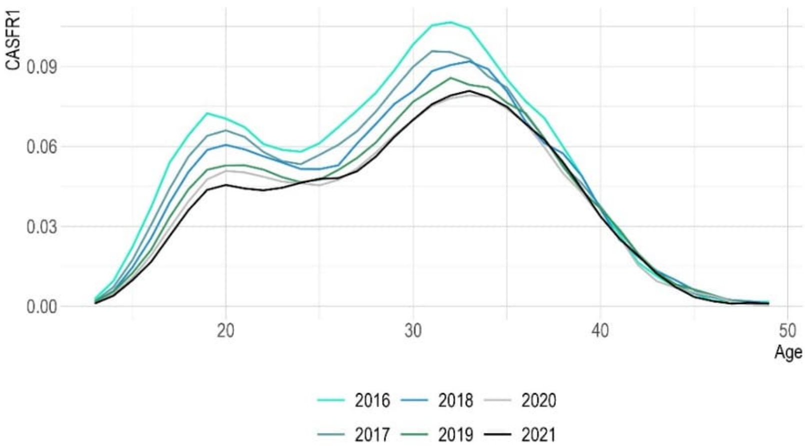


Source: Live Birth Certificate and Perinatal Informatics System of the Ministry of Public Health; Population Estimates and Projections (2013 Revision), National Institute of Statistics.

In sum, a sharp decline in first births in adolescence and early youth, associated primarily with the postponement of the first birth, played a fundamental role in the decline, as did stopping, the most probable mechanism behind the reduction of higher-order fertility rates among older women.

Additionally, the sudden decrease in adolescent and early fertility led to a significant shift in the mean age at first birth. This indicator had remained stable around age 24 for 40 years and increased by barely a year between 1978 and 2011 (Nathan 2015), but climbed by 1.5 years during the six years of the big fertility decline (from 24.9 to 26.4 years of age).

Figure 5: Conditional age-specific first birth rates in Uruguay (2011–2021)



Source: Live Birth Certificate and Perinatal Information System of the Ministry of Public Health; Population Estimates and Projections (2013 Revision), National Institute of Statistics.

Graphically, this change in the fertility regime can be noticed from the blurring of the so-called bimodal curve of the age at first child (Figure 5). Previous studies (Nathan 2013; Nathan, Pardo, and Cabella 2016; Pardo and Cabella 2018) have provided evidence of the social polarization of Uruguayan reproductive behavior, reflected in the concentration of conditional rates of the age at first child in two peaks that gave shape to a bimodal curve. The current decline in the conditional rates of first births of adolescent and young women, coupled with a stable level of first birth rates among women in their late thirties, decreased the dispersion. Eventually, first birth rates by age in 2021 produced a flattened pattern that contrasted drastically with the two-humped image from 2016.

4. Conclusions

The evolution of Uruguayan fertility from 2016 to 2021 was extraordinary; an unprecedented decline led to lowest-low fertility rates for the first time in the country's history. Adolescent and early fertility played a leading role, accounting for more than half of the total decline. This indicates that most women were deferring their first child during the period, probably through the recent widespread use of subdermal contraceptive implants (Ceni et al. 2021; Paseyro and Pereira 2024).

Considering that postponement occurred very early in the reproductive cycle (age 15–22 years), we expect that a considerable part of the births that were avoided by adolescent and young women during the big decline will take place in the coming years, with increasing rates in the 25–29 and older age groups. This might trigger a slight rebound in the TFR at some point, although it is difficult to predict whether it will be in the near or more distant future. As was the case in countries that experienced rapid first birth postponement in the past (Bongaarts and Feeney 1998), tempo-adjusted TFR in Uruguay is above the conventional TFR (1.7 vs. 1.3).

Another factor contributing to the big decline was a fall in the fertility rates of second births in the middle or later stages of the reproductive years. This suggests that interpregnancy intervals might be getting longer, or that the stopping mechanism is fostering an emergent one-child trend. Furthermore, the fall in third birth rates underscores the widespread preference for two children and the ability to realize it. The results also show that there was still a margin for a fall in fertility rates at birth orders 4 and higher, which contributed to an acceleration of the overall decline.

These changes led to the convergence of Uruguayan reproductive behavior with countries with lowest-low fertility and to smaller heterogeneity within the Uruguayan population. Dispersion in age at first birth remains higher than in other low-fertility populations, but it is significantly lower than it was just six years ago, as the bimodal curve fades. Trends in the TFR by level of education also support the idea of an increasingly convergent reproductive behavior.

The fall in fertility affected women of all educational levels but was most intense among the least-educated; during the big decline, their TFR dropped by nearly 1 child (2.7 to 1.8), while the TFR of the most educated women fell from 1.6 to 1.2 (Cabella and Velazquez 2023). The results of this study show that behavioral changes within educational groups played a predominant role, while educational expansion had a marginal effect.

The factors behind women's decision not to have a(nother) child merit further debate, but several contextual aspects may be considered. After a three-decade period of extensive family change that resembled the Second Demographic Transition, Uruguay witnessed large-scale public debates on sexual and reproductive health rights, and the implementation of associated policies. For instance, abortion and same-sex marriage were legalized in 2012 and 2013, respectively. Some years later, official sex education programs were amended, and the National Strategy for the Prevention of Unintentional Adolescent Pregnancy was introduced (López-Gómez et al. 2021).

Due to the spread of feminism in the Southern Cone, the period of the big decline also overlapped with intense social change. Some of the main issues that were brought into question in the public debate were the difficulties of reconciling work and raising children, the potential conflict between family life and leisure, and the social normativity associated with motherhood. Further research is needed to unravel the factors influencing reproductive behavior during the period 2016–2021, given that no other societal or economic shocks can be identified.

5. Acknowledgments

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Supplementary material

Table A-1: Decomposition of the 2015–2021 decrease in the total fertility rate by age group and parity in Uruguay (%)

	Order 1	Order 2	Order 3	Order 4	Total
Less than 15	0.9	0.0	0.0	0.0	1.0
15–19	19.7	7.2	0.8	0.1	27.8
20–24	9.0	10.9	5.1	2.4	27.4
25–29	8.4	6.3	3.8	3.7	22.2
30–34	2.3	5.4	2.8	4.0	14.6
35–39	0.3	0.8	1.6	3.2	5.8
40–44	0.0	0.0	0.2	1.0	1.1
45–49	0.1	0.0	0.0	0.0	0.1
Total	40.7	30.6	14.2	14.4	100.0

Source: Live Birth Certificate and Perinatal Information System of the Ministry of Public Health; Population Estimates and Projections (2013 Revision), National Institute of Statistics.