

Exploring the Sociocultural Factors Behind the Decline of US Birthrates*

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Since the early 21st century, birthrates in the United States have been steadily declining. This paper uses data from the American Economic Association to investigate the decline in birthrates in the US and to explore potential factors behind this phenomenon. Based on the exploration of the data, there is strong evidence that the differences in women's sociocultural values between generational groups are key players behind the decline of US birthrates since 2007. The results of this study are significant, as a country's birthrate is indicative its economic development, social dynamics and policy development.

1 Introduction

The birthrate is the average annual number of live births during a year per 1,000 individuals in the population at midyear (The World Factbook 2021). The National Center for Health Statistics (NCHS) gathers data on birthrates for women by different demographic factors such as age group, ethnic identity and education level. These information are compiled and made available through the National Vital Statistics System (National Center for Health Statistics 2024). Researchers are interested in a country's birthrate as it is a indicative of an economy's health and it is useful for population predictions. A declining birthrate tends to result in a smaller workforce and an aging population, which puts economic pressure on younger generations and on government spending (Pettinger 2021). Hence, in order to predict and reduce these consequences, many previous literature explore factors behind declining birthrates in the US such as cost of living, access to contraceptives and environmental concerns (Nargund 2009).

In this paper I am interested in the sociocultural factors behind the declining birthrates in the US. Using data from the the article "The Puzzle of Falling US Birthrates since the Great

*Code and data supporting this analysis are available at: https://github.com/DeniseChang9/Covid-19_Cases.git

Recession” (Kearney, Levine, and Pardue 2022), I explore the differences in birthrates between different age cohorts for women from 1980 to 2019 for more insights on the influence of generational value gaps. I also take a closer look at the birthrates by state in which birthing mothers reside in to estimate whether regional values influence birthrates. I find that, although all age cohorts witness a decline in birthrates, younger age cohorts of mothers present a sharper decrease in birthrates than older age cohort. The data also suggests that states in the southwest of the US have a greater change in birthrates than states in the rest of the US.

The remainder of this paper is structured into 3 distinct sections. Section 2 discusses the data collection and the studied variables. Section 3 presents the results and finding of the exploration of the dataset with the help of visualized data. Section 4 explores further insights from the results and discusses a few weaknesses of this paper. This section also briefly mention potential next steps following this paper.

2 Data

2.1 Data Collection

The dataset used in this paper is obtained from the replication package of “The Puzzle of Falling US Birthrates since the Great Recession” (Kearney, Levine, and Pardue 2022) published in the Journal of Economic Perspectives (AEA 2022). The replication package contains dataset compiled from a variety of sources including, but not limited to, the National Center for Health Statistics (NCHS), the Current Population Survey Annual Social and Economic Supplement, the Integrated Public Use Microdata Series (IPUMS) and the New York Federal Reserve/EQUIFAX and the Pew Research Center.

For this study, I am interested in the aggregated data on birthrates by age cohorts and by state of residency of mothers. The dataset was built by Kearney, Levine and Pardue (2022), the authors of the replication package, using data from the SEER program at NCHS and data from Vital Statistics. The built dataset that captures birthrates by age cohorts organizes the mothers into 6 cohorts of 5 years from 1968 to 1997 inclusively. The built dataset that captures the birthrates by the state of residency contains data from 1990 to 2019 inclusively.

The dataset used for this paper was retrieved on February 5 2024.

2.2 Variable of Interest

The data was cleaned and processed using the statistical programming language R (R Core Team 2022). Statistical libraries such as `tidyverse` (Wickham et al. 2019), `janitor` (Firke 2023), `knitr` (Xie 2021) and `here` (Müller 2020) are leveraged in the data processing as well.

2.2.1 National Birthrates

Birthrate in the US is calculated as the annual average number of live births per 1,000 individuals in the country at midyear. Births resulting in a child showing evidence of life, such as beating of the heart, pulsation of the umbilical cord and breathing, are considered live births. Live births can originate from any delivery method and from any duration of pregnancy, such that premature babies and babies delivered through Cesarean. The number of live births is measured by the number of birth certificates, which are issued shortly after delivery. Individuals who are considered in the calculation of the birthrate include US citizens and US residents. The national population is measured through a government-funded survey, which is mandatory for all citizens and residents of the US.

Table 1: First Ten Rows of the National Birthrate Data

Year	National Birthrate
1980	68.4
1981	67.3
1982	67.3
1983	65.7
1984	65.5
1985	66.3
1986	65.4
1987	65.8
1988	67.3
1989	69.2

Table 1 is a sample of the ten first rows of the national birthrate data in the US. Each column in this dataset represents a different year in chronological order from 1980 to 2019 inclusively. The “Year” column adds a sense of succession to the data, which allows readers to get more insights on the evolution of birthrates throughout time. The “National Birthrate” column is the calculated national birthrate for its respective year.

2.2.2 Maternal Age Cohort

Maternal age was documented in the US through a voluntary survey to track the age of the mother at the time of delivery. Since this variable was self-reported on a voluntary basis, certain mothers opted out or chose not to provide their age at childbirth. These cases are marked as “NA” in the dataset, and was removed from the compilation of the data.

Table 2: First Ten Rows of the Birthrate by Maternal Age

Year	15-19 Years Old	20-24 Years Old	25-29 Years Old	30-34 Years Old	35-39 Years Old	40-44 Years Old
1980	53.0	115.1	112.9	61.9	19.8	3.9
1981	52.2	112.2	111.5	61.4	20.0	3.8
1982	52.4	111.6	111.0	64.1	21.2	3.9
1983	51.4	107.8	108.5	64.9	22.0	3.9
1984	50.6	106.8	108.7	67.0	22.9	3.9
1985	51.0	108.3	111.0	69.1	24.0	4.0
1986	50.2	107.4	109.8	70.1	24.4	4.1
1987	50.6	107.9	111.6	72.1	26.3	4.4
1988	53.0	110.2	114.4	74.8	28.1	4.8
1989	57.3	113.8	117.6	77.4	29.9	5.2

Table 2 shows a sample of the first 10 rows of the birthrates by maternal age cohorts. Each row in this table represents a year from 1980 to 2019 in chronological order. Similarly to Table 1, the “Year” column allows better estimations of the evolution of birthrates for each of the age cohorts. The remaining 6 columns represent the birthrates of 6 different age cohorts relative to the year of childbirth. For this study, only the mothers aged 15 to 44 were considered in

2.2.3 State of Residency of Mothers

In the gathering of the data, the NCHS randomly sampled each states for their birth certificate count. In other words, certain states have as much as 100 percent of their population sampled, while other states sampled about half of the state population.

which variables am I interest in and why? why not other variables birth rate compiled using birth certificates : <https://www.cdc.gov/nchs/nvss/births.htm>

Show snippets of what I kept in the end (TABLES ONLY)

3 Results

Convey findings (USE GRAPHS) which had lower birthrate and which had higher birthrate? By how much different were they?

4 Discussion

4.1 3-4 sections interesting points

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- 1 section weaknesses of paper 1 potential next steps

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