The Population Puzzle: Fertility Trends in the Most & Least Populated Countries

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Abstract

Fertility trends are central to understanding global population dynamics. This study analyses global fertility patterns, comparing rates in the most and least populated countries, and identifies key factors influencing fertility. Findings reveal stark contrasts, with high-population countries experiencing declining fertility and low-population nations facing demographic sustainability challenges. The study highlights the influence of socio-economic, cultural, and political factors on fertility rates and provides recommendations for population policy planning.

Keywords: population, fertility rate,

INTRODUCTION

Fertility rate, defined as the average number of children born per woman during her reproductive years, is a crucial indicator of demographic health. A rate of approximately 2.1 children per woman is considered the replacement level. Over the past decades, global fertility patterns have shown a sharp decline, particularly in high-population countries such as China, India, and the United States. Conversely, the world's least populated countries, including microstates like Tuvalu, Nauru, and San Marino, exhibit diverse fertility behaviours influenced by different socio-economic and environmental contexts. This study aims to provide a comparative understanding of these dynamics and the factors influencing them.

Objectives of the Study

The study on **"The Population Puzzle: Fertility Trends in the Most & Least Populated Countries"** aims to achieve the following objectives:

1. To analyse Global Fertility Trends.
2. To Compare Fertility Rates in the Most & Least Populated Countries
3. To Determine Factors Influencing Fertility Rates.

Review of Literature

Understanding global fertility patterns requires analysing a broad spectrum of scholarly research and demographic reports. This section presents a synthesis of key studies and publications relevant to fertility trends, comparisons across population sizes, and the socio-economic factors influencing fertility rates.

Bongaarts (2017) and the United Nations (2022) highlight a widespread global decline in fertility rates since the mid-20th century. The average global fertility rate has fallen from over 5 children per woman in 1950 to around 2.3 in recent years. The decline is particularly pronounced in developed and highly populated countries, where increased urbanization, education, and access to family planning services have significantly reduced birth rates.

Studies such as those by Wang et al. (2020) emphasize the dramatic fertility decline in China following the implementation of the one-child policy in 1979. Despite the relaxation of a three-child policy, cultural and economic factors continue to suppress fertility.

Similarly, research by Guilmoto (2012) and Arokiasamy (2018) shows India's fertility decline is linked to improvements in female education, healthcare access, and socio-economic development.

In the United States, Mathews and Hamilton (2022) report persistent declines in fertility since the Great Recession (2008), driven by economic insecurity, shifting marriage patterns, and a growing preference for smaller families.

There is limited but growing literature on fertility trends in microstates and sparsely populated nations. Studies by the Pacific Community (SPC) and Small States Forum (World Bank, 2020) have documented relatively higher fertility in Pacific island nations like Tuvalu and Nauru, attributed to traditional norms, lower female employment, and limited access to contraceptives. However, these nations also face out-migration and environmental threats, which complicate demographic stability.

In contrast, European microstates such as San Marino and Liechtenstein have fertility patterns similar to neighbouring developed countries, with rates well below replacement levels due to aging populations and delayed family formation (Eurostat, 2021).

Jejeebhoy (1995) and Bloom et al. (2009) found a strong inverse relationship between women's education levels and fertility rates.

Dyson (2010) notes that urban living tends to discourage high fertility due to space constraints, cost of living, and shifting family values.

Studies by Gauthier (2007) examine pronatalist policies (e.g., tax breaks, parental leave) in countries like France and Hungary, with mixed results in influencing long-term fertility trends.

Lee and Mason (2011) emphasize that fertility transition often follows rising income, better healthcare, and improved child survival rates.

The **Demographic Transition Theory** remains central in fertility research. It suggests that countries move from high fertility and mortality to low fertility and mortality as they develop economically.

The **Second Demographic Transition Theory**, developed by Lesthaeghe (2010), builds on this by explaining recent ultra-low fertility through cultural shifts like individualism and changing gender roles.

Existing literature provides comprehensive insight into fertility trends and their drivers in both densely and sparsely populated regions. However, there is a research gap concerning the long-term demographic and policy implications in the least populated nations, particularly those facing climate-related and migratory pressures. Comparative studies are essential to form a nuanced understanding of fertility transitions in varying socio-economic contexts.

1. Research Methodology

1.1 Research Design

This study adopts a **descriptive and comparative research design**. The objective is to analyze fertility trends globally and draw comparisons between the most and least populated countries. The research uses a **quantitative approach**, relying on secondary data sources to explore fertility rate trends, regional disparities, and influencing factors.

1.2 Data Sources

The research is based entirely on **secondary data** collected from credible international organizations and academic publications, including:

- **United Nations Department of Economic and Social Affairs (UNDESA)**

- **World Bank World Development Indicators**
- **OECD Family Database**
- **National statistical agencies** of selected countries
- **Peer-reviewed journals**, demographic surveys, and census reports

1.3 Data Collection Methods

Data was gathered through: Reviewing publicly available demographic datasets and databases, accessing published government and institutional reports, Extracting historical and current fertility data (1950–2023), Collecting regional fertility data and socio-economic indicators (GDP, education, healthcare access, etc.)

1.4 Data Analysis Techniques

The data was analysed using the following techniques:

- **Descriptive Statistics**: Mean, trends, and percentage changes in fertility rates over time
- **Comparative Analysis**: Cross-sectional comparison between high- and low-population countries
- **Graphical Representation**: Use of line graphs, bar charts, and tables to illustrate trends
- **Correlational Analysis** (optional): To examine the relationship between fertility rates and socio-economic variables (e.g., female literacy, urbanization, income levels)

2. GLOBAL FERTILITY TRENDS (1950-2023): –

Over the last few decades, global fertility patterns have changed dramatically. In 1951, the world fertility rate was approximately 4.99 children per woman. In 2023, the world fertility rate halved to 2.41 children per woman.

Table-1

GLOBAL FERTILITY TRENDS (1950-2023)

Year	Total Fertility Rate (%)
1951	4.99
1961	4.97
1971	4.65
1981	3.69
1991	3.17

2001	2.70
2011	2.54
2021	2.43
2023	2.41

Source: United Nations–World Population Prospects.

(www.macrotrends.net)

During the 1950s, families typically had more children than they do today, with women, on average, giving birth to more than 5 children. However, from 1950 to 1971, the total fertility rate remained relatively stable because both birth rates and mortality rates were high, keeping the two in balance. From 1981–91, the global fertility rate was 3%. The total fertility rate began in the 1970s. During 1970–1975, half of the countries in the world had a total fertility rate exceeding 4.65 births per woman. After this period, a significant decline in the world's fertility rate was observed. The total f

Fertility rate fell from 3.69 children per woman in 1981 to 2.43 children per woman in 2021, and in 2023, reached a historically low level of 2.41 children per woman. However, this decline has not been uniform across all countries and regions. Europe has the lowest fertility rate at 1.6 children per woman, while Africa maintains the highest fertility rate at 4.7 children per woman.

According to the fertility estimates from the United Nations (2013, 2015), 75 countries (39 in Europe, 19 in Asia, 12 in Latin America and the Caribbean, 2 in Africa and North America, and 1 in Oceania) have fertility levels below 2.1 children per woman. Conversely,126 countries had total fertility levels at or above 4 children per woman; among these, 31 countries have fertility rates at or above 5 children per woman, and 12 countries have fertility rates of 6 or above children per woman.

This analysis indicates that most of the countries with declining fertility rates are developed. The main reasons for this decline in developed countries include improved healthcare facilities resulting in lower mortality rates, rising cost of living, young people intentionally delaying childbirth, better access to contraception, increased education for women who prefer to focus on their careers rather than having children, and urbanization.

3. Fertility Rates in the Most & Least Populated Countries

In contrast, in least-developed countries, the total fertility rates tend to be higher. This higher fertility is often attributed to the belief that more children lead to more sources of income and the lack of education for females, which limits their awareness of their rights and options.

Table-2

Top 10 Countries with the Highest Fertility Rates

S.No.	Countries	2018	2019	2020	2021	2022	2023
1	Niger	6.95	6.86	6.77	6.68	6.59	6.50
2	Somalia	6.12	6.02	5.93	5.84	5.75	5.66
3	Democratic Population of the Congo	5.96	5.86	5.76	5.66	5.56	5.46
4	Mali	5.92	5.83	5.73	5.64	5.55	5.46
5	Chad	5.79	5.70	5.60	5.51	5.41	5.31
6	Angola	5.55	5.48	5.41	5.34	5.28	5.21
7	Burundi	5.45	5.36	5.28	5.20	5.12	5.04
8	Nigeria	5.41	5.34	5.28	5.21	5.14	5.07
9	Gambia	5.25	5.18	5.11	5.04	4.97	4.90
10	Burkina Faso	5.23	5.15	4.99	4.99	4.91	4.83

3.1. Top 10 Countries with the Highest Fertility Rates

This study section will discuss the top 10 countries with high fertility rates. These are as follows–

3.1.1. Niger -

The country with the highest fertility rate in the world is Niger, located in West Africa. It is one of the least developed countries and one of the poorest countries in the world, as measured by GDP per capita. Niger's population growth rate is among the highest in the world. Niger has the highest fertility rate in the world, and as of 2019, the TFR of Niger was 6.86 births per woman. In 2020, this rate slightly declined to 6.77 births per woman, marking a 1.3% decrease from the previous year. The TFR continued to decline, reaching 6.68 in 2021 and 6.59 in 2022. As of 2023, TFR for Niger is 6.50 births per woman, which represents a 1.33% decline from 2022. Although Niger has experienced a downward trend in fertility rates since 2018, it still holds the title for the highest fertility rate in the world.

According to Aaron O'Neill (2022), with a fertility rate of almost 7 children per woman, Niger is the country with the highest fertility rate in the world, followed by Mali. The rapid growth of Niger's population is one of the top 10 fastest-growing in the world.

A significant factor contributing to the high fertility rate in Niger is the prevalence of child marriage. Reports to the UN indicate that "Niger has the highest rate of child marriage globally. According to UNICEF, 76% of girls are married before the age of 18, and 28% are married before they turn 15. This often leads to girls being removed from school early to start families."

3.1.2. **Somalia–**

Somalia, officially known as the Federal Republic of Somalia, is a country located in the Horn of Africa. As of 2023, the total fertility rate in Somalia is 5.66 children born per woman, the second highest in the world. One of the primary reasons for this high fertility rate is the significant number of children born to women who do not use contraception. Additionally, marriages in Somalia often occur at a very young age, which allows women more childbearing years and consequently leads to a higher number of children per woman.

3.1.3. **Democratic Republic of the Congo (DRC)–**

The Democratic Republic of the Congo (DRC) (also known as Congo Kinshasa) is the second-largest country in Africa, after Algeria, and the 11th-largest in the world. The TFR of DRC was 5.96in 2018 and has since decreased to 5.46, which placed it third among the top 10 countries with high fertility rates. The factors that influence fertility in the DRC include women's education, mortality rates, socioeconomic development, civil conflicts and economic crises, misconceptions about family planning, and limited access to contraception.

3.1.4. **Mali–**

Mali is a landlocked country in West Africa and the eighth-largest country in Africa. In 2018, the total fertility rate of Mali was 5.92 children per woman. And it remained relatively stable with a TFR of 5.64 in 2021 compared to 5.73 in 2020. As of 2023, Mali's TFR is 5.46, making it the fourth highest globally.
Historically, Mali's high fertility rate can be attributed to low rates of contraceptive use, inadequate sexual health education, a cultural preference for larger families, and a lack of women's empowerment and education.

3.1.5. **Chad–**

Chad, officially known as the Republic of Chad, is a landlocked country located in North and Central Africa. In 2018, the fertility rate for Chad was 5.79 children per woman, which gradually decreased from 5.70 (2019) to 5.31 (2023). Despite this decline, the fertility rate remains alarmingly high. The main factors contributing to

high fertility in Chad are civil unrest and political instability, which have hindered investment in public health and access to sexual health services.

3.1.6. **Angola–**

Angola, officially referred to as "The Republic of Angola," is situated on the western central coast of southern Africa. The total fertility rate in Angola was 5.28% (2022) and 5.21% (2023) children born per woman, making it the 6th highest in the world. A Lack of family planning education and low contraceptive usage contribute to Angola's elevated fertility rate, with an average woman giving birth to more than 5 children in her lifetime.

3.1.7. **Burundi–**

Burundi, officially known as the Republic of Burundi, is a landlocked country located in the Great Rift Valley at the intersection of the African Great Lakes region and East Africa. The TFR in Burundi was reported at 5.45 children born per woman in 2018 and 5.21 children born per woman in 2023. Burundi remains one of the countries with a high fertility rate and is one of the most densely populated nations in the world. Factors contributing to a lower fertility rate include urban residence, increased educational levels for both women and men, a lack of history regarding infant mortality, and an increase in age at first marriage or first birth. Conversely, factors associated with a high fertility rate, including residing in the Southern region, agricultural occupations of both women and men, household poverty, lack of knowledge of any contraceptive methods, and the non-use of modern contraceptive methods, are associated. (Nibaruta Baali et al. 2021)

3.1.8. **Nigeria–**

Moving to Nigeria, officially the Federal Republic of Nigeria, it is located in West Africa. From 2021 and 2022, the total fertility rate in Nigeria remained relatively stable at approximately 5.21 children born per woman and 5.14 children born per woman. Respectively, Children are often seen as the primary source of income; therefore, having more children is associated with increased income. Factors contributing to the high fertility rate include joint families, shared occupation, a caste system, lack of social mobility, and the low status of women.

3.1.9. **Gambia–**

The Gambia, a small West African country, has one of the highest fertility rates in the region. The TFR in the Gambia was reported at 4.97 children born per woman in 2022 and 4.90 children per woman in 2023. Early marriage, low age at first birth, patriarchal cultural practices such as polygamy, preference for high fertility, and male child preference are found to be the key reasons for high fertility in Gambia.

3.1.10. Burkina Faso–

In Western Africa, Burkina Faso had a TFR of 4.91 children per woman in 2022 and 4.83 children born per woman in 2023. It is among the countries with the highest fertility rate. The main reasons for this high fertility rate are a lack of access to modern contraceptive techniques and the prevalence of polygamy.

3.2. Top 10 Countries with the Lowest Fertility Rates

In this section of the study, we will discuss the top 10 countries with the lowest fertility rates. The following are the details-

Table- 3

Top 10 Countries with the Lowest Fertility Rates

S.No.	Countries	2018	2019	2020	2021	2022	2023
1	**South Korea**	1.11	1.10	1.09	1.08	1.08	1.07
2	**Puerto Rico (U.S. Territory)**	1.22	1.21	1.20	1.19	1.18	1.17
3	**Taiwan**	1.15	1.16	1.18	1.20	1.21	1.23
4	**Singapore**	1.20	1.21	1.22	1.23	1.23	1.24
5	**Macau**	1.20	1.21	1.23	1.25	1.27	1.29
6	**Italy**	1.33	1.32	1.31	1.31	1.30	1.29
7	**Japan**	1.37	1.36	1.36	1.36	1.36	1.36
8	**Spain**	1.33	1.34	1.35	1.36	1.37	1.39
9	**Hong Kong**	1.32	1.34	1.36	1.37	1.39	1.41
10	**Ukraine**	1.44	1.44	1.44	1.43	1.43	1.43

Source: United Nations – World Population Prospects (www.macrotrends.net)

3.2.1. South Korea–

South Korea, officially known as the Republic of Korea, is located in East Asia and is experiencing a fertility rate crisis. Its fertility rate dropped to 1.08 in 2022 and further declined to 1.07 in 2023, lower than the previous

year's record of 1.11 in 2016, making it one of the countries with the lowest fertility rates in the world. The main factors contributing to the declining fertility rate in South Korea include childcare costs, delayed childbearing among young couples due to skyrocketing housing prices, and the high cost of education, etc.

3.2.2. Puerto Rico–

Puerto Rico, officially known as the Commonwealth of Puerto Rico, is an unincorporated territory of the United States. The fertility rate in Puerto Rico, the fertility rate has been declining for nearly a decade, plummeting from around 5 children per woman in the 1950s to less than one child today. In 2022, Puerto Rico's fertility rate was 1.18 2022 falling to 1.17 in 2023. Several factors have influenced this decline, including Natural disasters like Hurricane Maria, major earthquakes in 2019, greater access to effective birth control, rising incomes, increased participation of women in the labor force, higher educational attainment, and significant out-migration for economic opportunities.

3.2.3. Taiwan–

Taiwan, officially known as the Republic of China, is another East Asian country facing low fertility rates. According to a National Development Council (NDC) report, Taiwan is projected to surpass South Korea with the world's lowest fertility rate by 2035. Its TFR was 1.21 children per woman in 2022. A key reason for this low fertility rate includes young people struggling with low wages, unaffordable house prices, and work-related pressures that create an unfriendly environment for families. Additionally, many educated women with stable jobs choose to postpone or forgo marriage and having children.

3.2.4. Singapore–

Singapore (the Republic of Singapore) is an Island country and city-state located in maritime Southeast Asia. The TFR in Singapore has declined from 4.7 children per woman in 1965 to 1.23 children per woman in 2022. Hashmi and Mok (2013) identified three key determinants of this fertility decline in Singapore: age at marriage, household income, and the number of siblings' children. A survey indicates that 3 out of 10 people were not keen on having babies, with the reasons being uncertainty over financial stability and safety concerns due to the 2019 pandemic.

3.2.5. Macau (Macoo)–

Macau, also known as Macao, is a small, special administrative region (SAR) of China that operates under the “one country, two systems” principle (www.unvertopedia.com). The total fertility rate in Macau was just 1.27 births per woman in 2022. Experts suggest that the low fertility rate in Macau is largely due to the new generation’s reluctance to have children, citing the high cost of raising children and a lack of time for nurturing. Many individuals prefer to maintain their freedom. Additionally, increasing entered the labor market makes the

traditional male breadwinner model seem outdated. In this context, women enjoy equal power within the family and have equal ambitions for their careers, education, and personal lives, leading them to delay marriage and family planning and ultimately choose to have fewer children.

3.2.6. Italy–

Italy is a country in Southern and Western Europe. Italy, which is known for its big families, is now facing a crisis of unparalleled proportions. It was one of the first countries in the world to reach "lowest-low" fertility levels, with a total fertility rate of 1.19 children per woman in the mid-1990s. Since 2000, a slight recovery has brought

3.2.7. Japan–

Japan is an island country in East Asia. The TFR of Japan was 1.37 in 2018; after that, its TFR was in a stable stage at 1.36 from 2019 to 2023. However, Japan is currently experiencing one of the most severe demographic crises in the world. In Japan dropping fertility rates are a result of several reasons, like as growing expenses, many young individuals placing greater importance on their professional and personal objectives than starting a family, an increase in the number of women in the workforce, and as well as easier access to contraception, which encourages, women to have fewer children found difficulties of balancing work and family life and Japan is ranked one of the world's most expensive places to raise a child, housing prices and education costs are very high in Japan.

3.2.8. Spain–

Spain, officially the Kingdom of Spain, is a country primarily located in Southwestern Europe. At the beginning of the 20th century, Spain's TFR was 1.2 children per woman, reaching its lowest point in 2000. However, after this period, the TFR increased slightly. In 2018, it was 1.33 children per woman, and it rose to 1.37 children per woman in 2022. Despite this increase, Spain's fertility rate remains low compared to the global average. Significant decline in fertility rates in Spain is attributed to increased contraceptive use and social change, improved quality of life and education, and greater employment opportunities for women, etc.

3.2.9. Hong Kong–

Hong Kong, officially known as the Hong Kong Special Administrative Region of the People's Republic of China, is a city and a special administrative region in China. With a fertility rate of 1.39 births per woman, Hong Kong has one of the lowest rates in the world. The decrease in fertility rates in Hong Kong can be linked to increased education and workforce participation among women. For many young women, the traditional roles of housework, childcare, and elderly care have become less attractive. Additionally, the High cost of

raising children, along with financial and health uncertainties stemming from COVID-19, led many couples to postpone or abandon their plans for having children.

3.2.10. Ukraine–

Ukraine is a country in Eastern Europe, and after Russia, it is the second-largest country in Europe. In 2022, the TFR in Ukraine dropped to 1.43 children per woman, which experts classify as a very low fertility rate. This trend reflects a broader modernization movement where family dynamics are evolving and many women are choosing to postpone or forgo having children. Safety concerns due to increasing political and social uncertainty, alongside rising household expenses, have many families hesitating to have more children.

4. FACTORS THAT INFLUENCE FERTILITY RATES

Fertility rates vary across countries due to a mix of social, economic, cultural, and policy-driven factors. Here are some key influences at the international level:

I.Economic and Educational Factors

- **Income levels**: Higher GDP per capita is often linked to lower fertility rates, as economic stability allows families to invest more in fewer children.
- **Education**: Increased education, particularly for women, tends to correlate with lower fertility rates.

II.Cultural and Religious Influences

- **Religiosity**: In some regions, strong religious beliefs encourage larger families, while secular societies often see lower fertility rates.
- **Marriage norms**: Early marriage is associated with higher fertility rates, while delayed marriage leads to fewer children.

III.Healthcare and Family Planning

- **Access to contraception**: Countries with strong family planning programs and high contraceptive prevalence rates tend to have lower fertility rates.
- **Infant mortality rates**: Higher child survival rates often result in lower fertility, as parents may not feel the need to have more children.

IV.Urbanization and Lifestyle Changes

- **Urban vs. rural living**: Urban areas generally have lower fertility rates due to lifestyle choices, career priorities, and cost-of-living considerations.

- **Changing family structures**: In many developed nations, shifting social norms around marriage and parenting contribute to declining birth rates.

References

1. United Nations. (2021). *World Fertility Data*. Retrieved from https://www.un.org/development/desa/pd/data/world-fertility-data.
2. The Lancet. (2021). *Global Fertility Trends (1950-2021)*. Retrieved from https://www.healthdata.org/research-analysis/library/global-fertility-204-countries-and-territories-1950-2021-forecasts-2100.
3. United Nations. (2021). *World Population Policies 2021*. Retrieved from https://digitallibrary.un.org/nanna/record/3964710/files/undesa_pd_2021_wpp-fertility_policies.pdf.
4. World Bank. (2022). *World Development Indicators: Fertility Trends Across Nations*. Retrieved from https://data.worldbank.org.
5. Pew Research Centre. (2021). *Global Fertility Decline: Causes and Consequences*. Retrieved from https://www.pewresearch.org.
6. United Nations Department of Economic and Social Affairs. (2020). *Fertility Patterns and Projections*. Retrieved from https://www.un.org/en/development/desa.
7. Population Reference Bureau. (2022). *World Population Data Sheet*. Retrieved from https://www.prb.org.
8. Bongaarts, J. (2017). *The Causes of Educational Differences in Fertility in Sub-Saharan Africa.*
9. UN Department of Economic and Social Affairs. (2022). *World Population Prospects.*
10. Guilmoto, C. Z. (2012). *Fertility Transition in India: Between Tradition and Modernity.*
11. Mathews, T. J., & Hamilton, B. E. (2022). *Total Fertility Rates in the United States.*
12. Bloom, D. E., et al. (2009). *Fertility, Female Labor Force Participation, and the Demographic Dividend.*
13. Gauthier, A. H. (2007). *The Impact of Family Policies on Fertility in Industrialized Countries.*
14. Lesthaeghe, R. (2010). *The Second Demographic Transition: A Concise Overvie*