Fertility Decline in Egypt: From Overpopulation Fears to Below-Replacement Fertility and Policy Challenges

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Abstract

Although Egypt's fertility rate has rapidly declined since 1950, fears of overpopulation are mounting in media outlets and government agendas. This paper argues that these fears are exaggerated and unjustifiable and could pose demographic & development challenges for Egypt. Therefore, the paper aims to statistically examine the projected fertility rates in Egypt until 2100. According to United Nations data, three significant results have been reached. First, Egypt is projected to go below the replacement fertility of 2.32 by 2045 and the replacement fertility of 2.11 by 2058. According to the European Commission's Joint Research Centre (JRC) data, these dates are projected to be 13 to 21 years earlier, in 2032 and 2037, respectively. Second, by 2100, Egypt's fertility rate will go as low as 1.85 (United Nations data) and only 1.59 (JRC data). Third, by 2100, Egypt will almost have the same fertility level as France, Germany, Japan, and Italy, all currently suffering acute demographic problems. These results demonstrate that fertility rates in Egypt are projected to continue declining; thus, fears of overpopulation are exaggerated and unjustifiable. However, Egyptian governments since 1976 viewed the fertility level as "Too High." This situation could be inappropriate for Egypt and pose many demographic and development challenges.

Keywords

Demographic challenges; Egypt; fertility decline; overpopulation; projected fertility 2100

Introduction

Challenges associated with low fertility

Almost all current official demographic publications in Egypt are over-praising the economic and environmental advantages of low fertility (demographic dividend, demographic window & environmental sustainability advantages), but none has mentioned the Demographic Tax that usually follows the demographic dividend (BNP Paribas, 2019; Dufrénot, 2018). Many recent official publications recommend and justify targeting low & below-replacement fertility levels (Ministry of Planning and Economic Development (MPED) [Egypt], 2021; National Population Council [Egypt], 2023). This is why this paper focuses on highlighting the overlooked negative demographic and development impacts of low and very low fertility.

In examining the extent and impacts of fertility decline, it is helpful to start by clarifying the differences between the different fertility levels, as when to say it is high or low. According to the United Nations (2007) and World Bank (2010), high fertility is a total fertility rate of 5.0 or higher. For the United Nations (2007), a total fertility rate below 1.3 is considered "very low fertility." For some other studies, "very low fertility" is less than 1.5 (McDonald, 2008). This is while replacement fertility is considered the minimum fertility sought at the global and country levels. However, there is a substantial international variation in replacement fertility, ranging from less than 2.1 to nearly 3.5. This wide range is mainly because of cross-country differences in mortality (Espenshade et al., 2003). Espenshade et al. (2003) stressed that policymakers must be sensitive to own-country replacement rates.

Thornton (2013) described the consequences of fertility decline as the coming demographic crisis, highlighting the socioeconomic impacts of low fertility associated with fertility decline. Cheadle (2016), at Business Insider, sees dropping fertility rates, on global and national levels, as a threat to the worldwide economy. The Economist (2023) defined the economic consequences of below-replacement fertility for the United States and developed countries. In 2018, the United Nations Population Fund (UNFPA) defined many socioeconomic challenges posed by low fertility in developing countries, especially Latin America and the Caribbean (Cabella & Nathan, 2018).

The main problem of sustained fertility decline is that it usually leads to low fertility. In all countries that tried to curtail birth rates towards the replacement rates, the birth rate has continued to fall in nearly all populations that have reached the replacement level (Brainerd, 2014; Furuoka, 2013; McDonald, 2001; United Nations, 2020b, 2022). Most of the sustained low fertility implications arise from its effects on the population's growth and age composition (Becker & Posner, 2013). Low fertility has three main implications. First, it does not reduce the population of all ages, but only among the young. Second, it produces an age structure that creates momentum for future population decline, a situation that must be stopped at some point if the population is to be demographically sustainable. Third, populations with low fertility can fall in size at an extremely rapid rate (McDonald, 2001). The longer low fertility is maintained, the harder it becomes to reverse population decline (Karra et al., 2017; McDonald, 2001). Without massive immigration, these effects are inevitable in any population where low fertility continues for several generations. For countries with sustained fertility decline, such as Japan, Germany, France, Italy, and recently China, reversing the population decline they suffer is challenging.

According to many studies, fertility decline can be considered a threat in certain contexts, depending on the specific circumstances and perspectives involved. According to the United Nations (2019), "World Population Prospects 2019: Highlights", in countries where fertility rates have fallen below replacement level, there is concern about a potential population decline that could have economic, social, and political consequences. The number of countries with below replacement is rapidly increasing (Brainerd, 2014; Furuoka, 2013; McDonald, 2001; United Nations, 2020b, 2022). Since the 1970s, fertility rates have declined in almost all developed and developing countries (Teitelbaum & Winter, 1985). Now, falling fertility rates and too few births have become a cause for concern. Since 2000, below-replacement fertility started emerging in less predictable places: on the densely populated island of Java in Indonesia, in many provinces in Iran, and in Addis Ababa in Ethiopia (McDonald, 2001; Ritchie et al., 2022). In such situations, fertility decline seems to be an imminent problem on global and national levels.

According to the United Nations (2022) "World Population Prospects 2022", the global fertility rate has halved over the last 65 years, from 4.97 in 1950 to just 2.5 in 2015. By 2021, the world has gone below the replacement fertility of 2.33; it is expected to surpass the replacement fertility of 2.1 by 2055. In developed countries, sub-replacement fertility is any rate below approximately 2.1 children born per woman, but the threshold can be as high as 3.4 in some developing countries because of higher mortality rates. Taken globally, the total fertility rate at replacement was 2.33 children per woman in 2003 (Espenshade et al., 2003; Gietel-Basten & Scherbov, 2019a; 2019b). The percentage of the world population living in countries with below replacement fertility (2.1) increased from only 0.04% in 1950 to about 50% in 2015 (United Nations, 2017). Based on the analysis of the United Nations population and fertility medium scenario data, "World Population Prospects 2022", 67.8% of the world population lived in countries below the replacement level of 2.11. Although this percentage will increase to only 68.1% in 2050, it is projected to reach 96.1% in 2100. By 2100, only eight out of the 237 countries/places studied will have replacement fertility above 2.11. Most countries outside of sub-Saharan Africa are projected to enter a period of sustained low fertility and a decline in working-age populations (Kanem & Murray, 2020; Ritchie et al., 2022).

China, driven by the fears of overpopulation, adopted the one-child policy in 1980 when the fertility rate was 2.74. However, because of the rapid decline in the fertility rate, the Chinese government abolished that policy in 2015, as the fertility rate has declined to only 1.67. Beginning in early 2016, all families were allowed to have two children, but this policy change did not lead to a sustained increase in birth rates. China's fertility rate continued declining to only 1.16 in 2021 (United Nations, 2022), much below the replacement fertility. Although China formally revised its laws in August 2021 to allow and incentivize couples to have up to three children, China will continue below-replacement fertility until the end of this century, reaching only 1.48 in 2100 (United Nations, 2022). With such a fertility rate, China started suffering a decline in the working-age population in 2014 (BNP Paribas, 2019). China's working-age population is projected to decline, from 999 million in 2017 to 896 million in 2037, losing 98 million workers in 20 years. This is inevitable as most people are already alive (Laurent, 2018).

For Egypt, the United Nations Population Fund argues that the country is going through a demographic transition as the number of persons aged 60+ is expected to double between 2020 and 2050 from 8.4 million (8% of the total population) to 22 million (14%). This is while the number of persons aged 15 to 24 will increase only 1.5 times over the same period (UNFPA, 2021).

The decline in fertility has been very rapid in Egypt since 1950. It declined from 6.99 in 1950 to only 2.96 in 2020, losing 57.6% of its value in 1950 (United Nations, 2022). However, driven by the same demographic fears of overpopulation that drove China to adopt the regretted one-child policy, Egyptian officials spoke publicly, overstressing the implications of overpopulation. Egypt's Minister of Planning and Economic Development said in 2021 about the need to address overpopulation, stressing that "overpopulation is one of the most critical challenges that Egypt is facing" and emphasized the importance of family planning initiatives (Al-Youm, 2018). In 2019, Egypt's Minister of Social Solidarity highlighted the link between overpopulation and poverty in the country. They indicated that overpopulation is a major cause of poverty in Egypt (Al Sherbini, 2017). In 2018, Egypt's former Minister of Health, Ahmed Emad El-Din Rady, spoke about the health implications of overpopulation. They indicated that overpopulation spreads diseases and epidemics and emphasized the importance of family planning and reproductive health services (El Tawil, 2023). In 2016, the head of Egypt's Central Agency for Public Mobilization and Statistics announced that overpopulation is more dangerous than terrorism for the country (Shrouk News, 2023).

Although these official warnings of overpopulation are stringent, no official study statistically examined the projected fertility change in Egypt during the remaining years of this century.

Materials and methods

This article is based on secondary sources of information. All the demographic data used in this research are mainly from: "World Population Prospects 2019" and "World Population Prospects 2022", published by the Population Division of the United Nations Department of Economic and Social Affairs. The research uses demographic data from Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS). All economic data used in this research are mainly from the World Bank Open Data portal. In examining the projected trends of fertility change in Egypt, the paper compares UN projections to those of other reputable demographic centers, such as the Joint Research Centre (JRC) of the European Commission, the International Institute for Applied Systems Analysis (IIASA), Institute of Health Metrics and Evaluation (IHME) and the Wittgenstein Centre for Demographic and Global Human Capital. In "World Population Prospects 2022", the United Nations Population Division compared its projections for world population with the predictions of these centers.

Concerning research methodology, the article adopts inductive-deductive, qualitative-quantitative methodologies. It presents a literature review on the progression and implications of low fertility globally and in Egypt. It then proceeds to demonstrate the growing fears of overpopulation in Egypt. Then, this research statistically examines the current and projected trends of fertility decline in Egypt and conducts a statistical comparative analysis of fertility decline trends in Egypt and some countries that precede Egypt in demographic transition and are currently suffering demographic problems. This is mainly to find out if Egypt is taking a demographic path similar to those of these countries.

Results

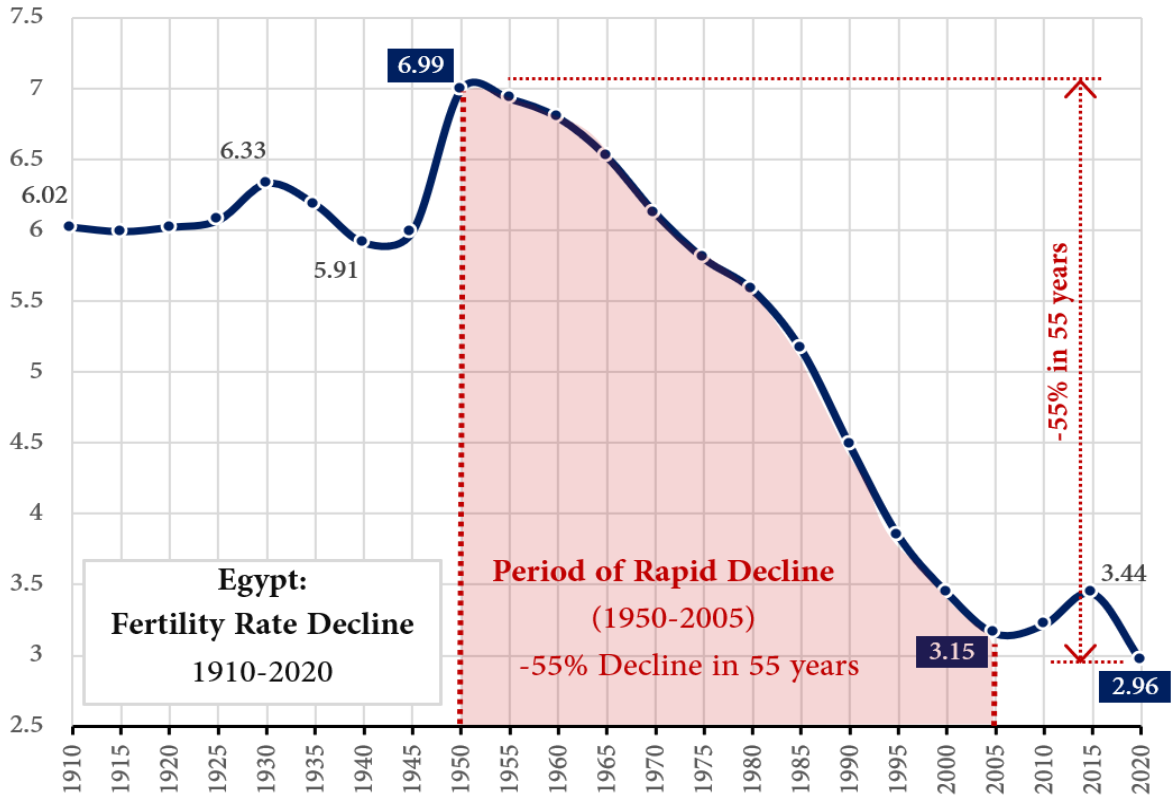
In examining trends and patterns of fertility decline in Egypt, this analysis will cover two chronical stages: (1) The previous period with actual data, from the start of the 20th century

to 2020, for a period of 120 years; (2) The future period with projected data, from 2020 to the end of this century, 2100, a period of 80 years. On the other hand, the study includes an analysis of fertility change in Egypt, compared with other countries that have reached acute low fertility levels.

Rapid fertility decline during 1910–2020

At the beginning of the 20th Century, in 1910, the fertility rate in Egypt was 6.02, and it increased to 6.99 in 1950 (Figure 1). Since then, the fertility rate has been rapidly and steadily declining in Egypt. It declined from 6.99 in 1950 to only 3.15 in 2005, losing 55% of its value in 1950 (United Nations, 2022). Although the fertility rate has increased for a short period after the 2011 revolution, it has started declining at a faster rate since 2015.

Figure 1: Fertility Rate Decline in Egypt From 1910 to 2020

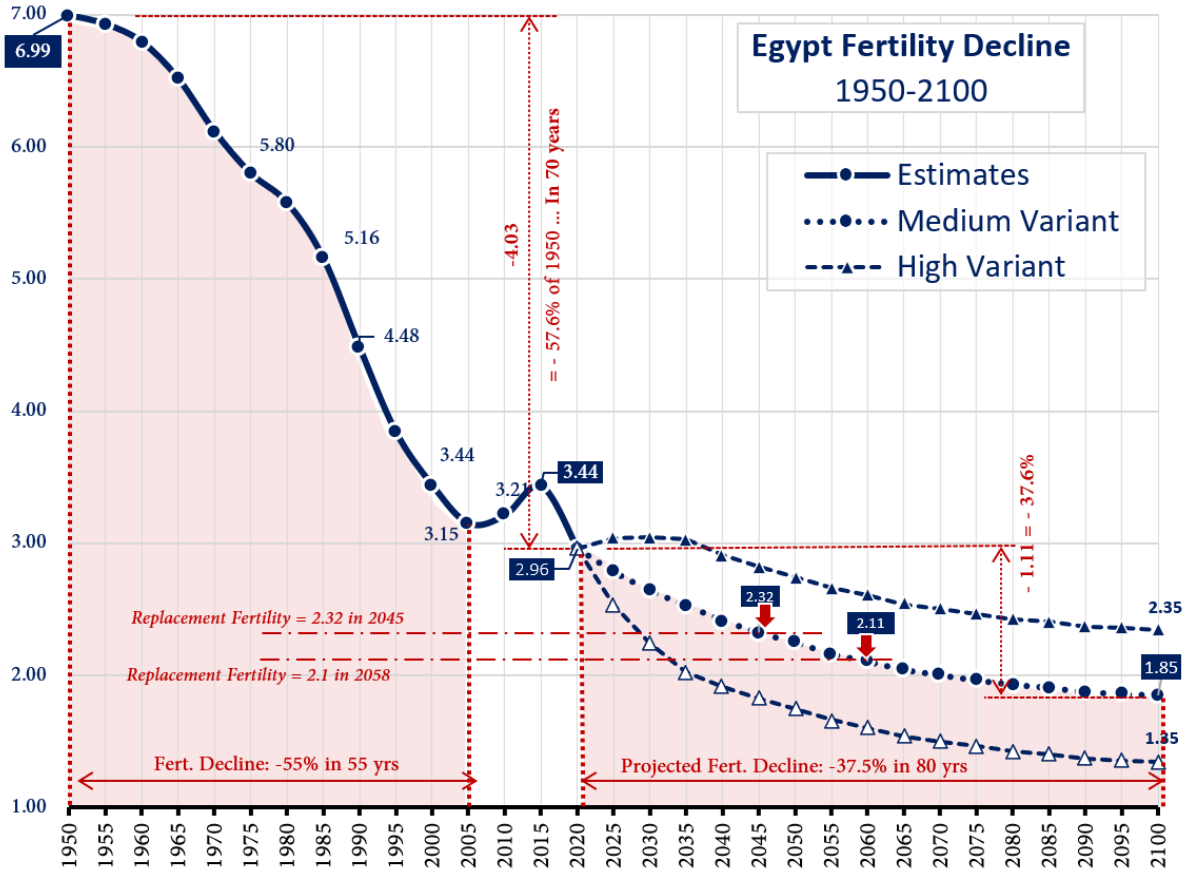


Note: Prepared by the researcher for years 1910–1945 (Statista, 2024b) and for years 1950–2020 (United Nations, 2022)

Fertility decline is projected to continue during 2020–2100

The United Nations' World Population Prospects 2022 developed three scenarios for the projected change in the fertility rate in Egypt. In all these scenarios, fertility rates in Egypt are projected to continue declining till 2100 (Figure 2). According to the medium variant scenario, the fertility rate in Egypt is expected to decline to 2.25 children per woman in 2050, decreasing by 24% of 2020 value, and to decline to only 1.85 children per woman in 2100, which is much below replacement fertility, decreasing by 37.5% of 2020 value.

Figure 2: Previous and Projected Fertility Rate Decline in Egypt 1950–2100



Note: Prepared by the researcher (United Nations, 2022)

According to the United Nations' World Population Prospects 2022 medium scenario and considering that replacement fertility in Egypt is 2.33, not 2.1, Egypt is expected to go below replacement fertility by 2045, only about 20 years ahead. Despite replacement fertility of 2.1, according to a medium scenario, Egypt will likely go below replacement fertility by 2058, only 35 years ahead.

According to the United Nations' World Population Prospects 2022 low scenario, Egypt will fall below the replacement fertility of 2.33 by 2028, only five years ahead, and below the replacement fertility of 2.1 by 2032, only nine years ahead.

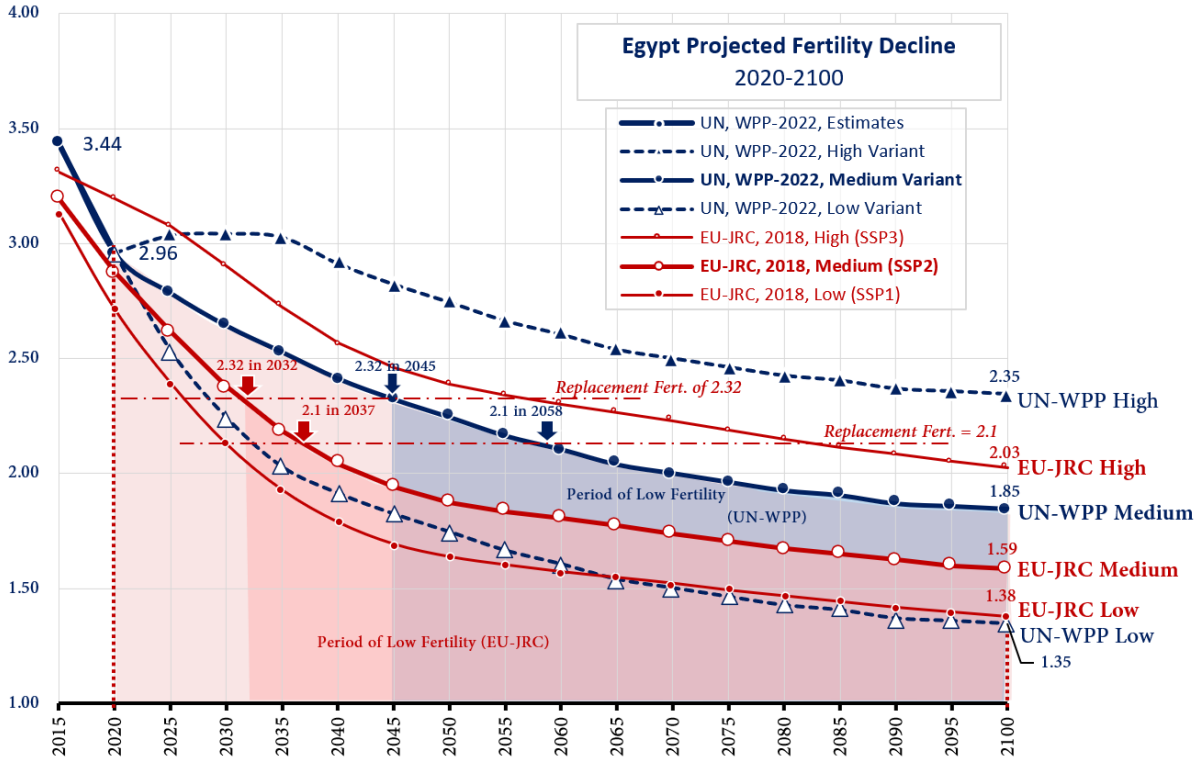
For a more precise examination of the projected fertility change in Egypt during 2020-2100, the paper compared fertility decline projected by United Nations in World Population Prospects 2022 to that of the joint research work conducted in 2018 by the EU-Joint Research Centre (JRC) in collaboration with Wittgenstein Centre for Demographic and Global Human Capital (WCDE), the International Institute for Applied Systems Analysis (IIASA), and Institute of Health Metrics and Evaluation (IHME) (Figure 3).

The European Commission's Joint Research Centre (JRC) projected fertility rate values (2018), in all scenarios and during the whole period of 2020–2100, were much lower than those of the United Nations, World Population Prospects 2022. In 2100, the JRC projected medium scenario fertility value is 1.59, halfway between the United Nations, World Population Prospects 2022 medium and low scenario values, 1.85 and 1.38.

Also, according to the JRC (2018) medium scenario, Egypt will go below replacement fertility earlier than the projection of the United Nations' World Population Prospects 2022. While Egypt is projected to go below replacement fertility of 2.32 in 2045, according to the United Nations, World Population Prospects 2022, medium scenario, it is projected to go below such replacement fertility 13 years earlier, in 2032, according to the JRC medium scenario. Also, while Egypt is projected to go below replacement fertility of 2.1 in 2058, according to the United Nations, World Population Prospects 2022, medium scenario, it is projected to go below such replacement fertility 21 years earlier, in 2037, according to the JRC medium scenario. While Egypt is projected to go below replacement fertility in 22–35 years, according to the United Nations' World Population Prospects 2022 data, it is projected to go below replacement fertility in only 9 to 14 years, according to JRC data.

After falling to replacement fertility of 2.32 in 2032, according to the JRC (2018) medium scenario, and in 2045, according to the United Nations, World Population Prospects 2022 medium scenario, Egypt is projected to enter a period of "low" and almost "very low" fertility through the end of the century (Figure 3). By 2100, and according to a medium scenario, the fertility rate in Egypt will go as low as 1.59 according to JRC and 1.85 according to the United Nations, World Population Prospects 2022. Both values can be considered "low" fertility (United Nations, 2007). Under a low scenario, the fertility rate in Egypt will go lower, reaching only 1.38, according to JRC, and 1.35, according to the United Nations, World Population Prospects 2022. Both values can be considered "very low" fertility (McDonald, 2008).

Figure 3: Fertility Decline and Low Fertility in Egypt During 2020–2100 According to United Nations and JRC Projections



Note: Prepared by the researcher (European Commission's Joint Research Centre, 2018; United Nations, 2022)

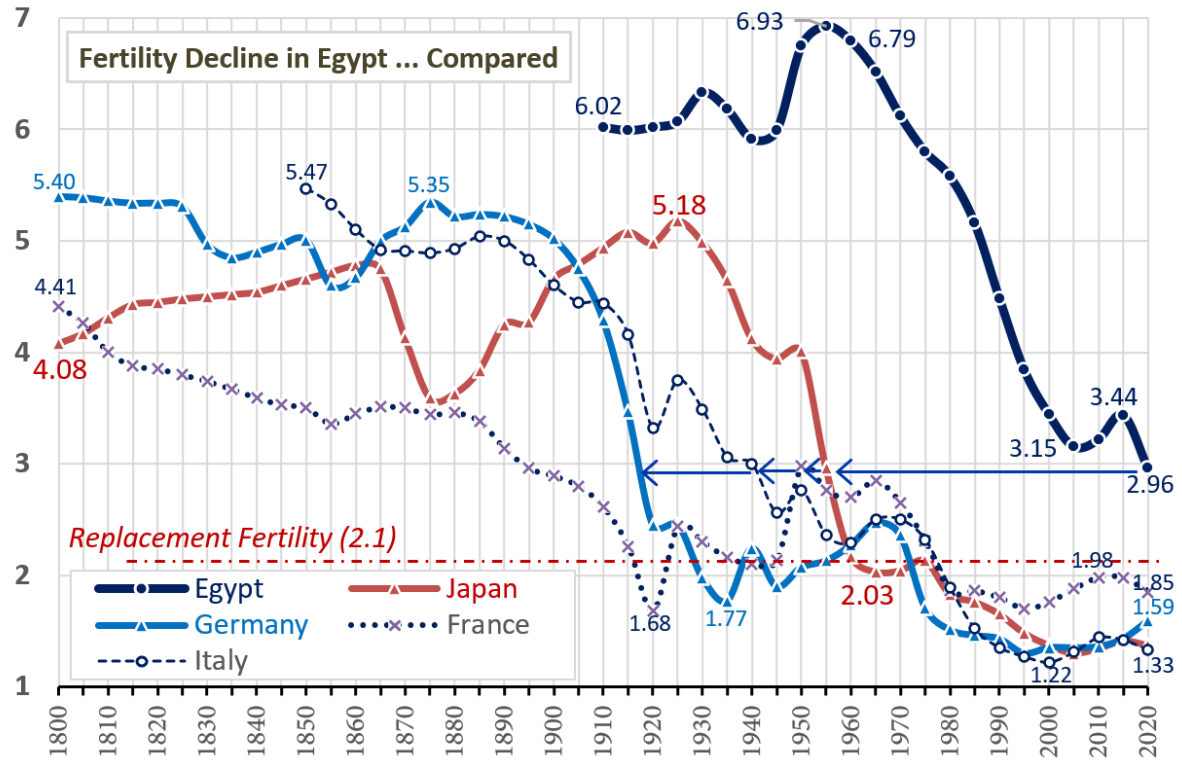
Fertility decline in Egypt: Comparative analysis

Comparing the fertility decline in Egypt to that on a global level and to countries currently with the lowest fertility levels and facing demographic problems will give a clearer idea about the fertility decline situation in Egypt and its expected impacts. This comparison will be made regarding the trends and the scale of fertility decline, as well as the projected situation of fertility levels by 2100. The comparison will be made during the past period (1950–2020), the future period (2020–2100), and during the whole period (1950–2100).

Trends of fertility decline

The comparative analysis of fertility decline trends, presented in Figure 4, reveals that the fertility decline experienced in Egypt since 1950 is highly similar to that experienced three to four decades ago in countries currently with the lowest fertility rates in the world and suffering population decline. The fertility rate in Egypt, which declined by 57% during the last 60 years (1960–2020), is similar to that in Germany, which declined by 66% in 60 years (1875–1935), and is identical to that in Japan that declined by 60% in 40 years (1925–1965). The lowest fertility level reached in Egypt, 2.96 in 2020, was reached in Japan in 1952 and went below replacement fertility just 13 years later, in 1965. Also, it was reached in Germany around 1917 and went below replacement fertility just 13 years later, in 1930. It was reached in Italy around 1941 and went below replacement fertility forty years later, in 1980 (Figure 4).

Figure 4: Fertility Decline in Egypt Compared to Countries Facing Demographic Problems



Note: Prepared by the author for years 1800–1950 (Statista, 2024a) and for years 1950–2020 (United Nations, 2022)

Another characteristic of fertility change in these countries is the rapid rate of fertility decline they experienced. Although these countries currently have the lowest fertility rates in the

world and are suffering from population decline, the following points affirm that all these countries had fertility rates above replacement level fifty years ago:

- Europe's fertility rate is only 1.6 children per woman, higher than the replacement level (2.17) in 1975, less than fifty years ago.

- Japan's fertility rate is only 1.37, higher than the replacement level (2.13) in 1975, less than fifty years ago.

- Italy's fertility rate is only 1.42, higher than the replacement level (2.32) in 1975, less than fifty years ago.

- Germany's fertility rate is only 1.59, higher than the replacement level (2.36) in 1970, about fifty years ago.

This analysis proves that all these countries were above the replacement fertility level less than 50 years ago. Thus, for Egypt, which is currently facing a rapid rate of fertility decline and accelerating population-control efforts, the possibility of going below replacement fertility in about 35 years, according to the United Nations' medium scenario, seems to be a reasonable projection.

Another striking fact is that all these countries, Japan, Italy, and Germany, after falling below replacement fertility of 2.1, their fertility continued declining to the lowest level of about 1.22 in less than 30 years. This fact raises worries about the future fertility situation in Egypt after reaching its replacement level.

Compared to China, which is currently regretting adopting the one-child policy, Egypt is going through the same demographic path as China. While the decline in fertility rate in China, since adopting the one-child policy in 1980 till 2020, has reached 53.3%, the fertility decline in Egypt was very close to that, reaching 47% during the same period without adopting that policy.

Concerning the scale of fertility decline

Comparing the scale of fertility decline in Egypt to that in countries that currently have the lowest fertility rates in the world and are suffering from acute population decline will give a clear idea of how severe is the fertility decline in Egypt.

The comparison during the past period (1950–2020), the future period (2020–2100), and during the whole period (1950–2100), reveal three crucial facts:

First, although fertility levels declined in all these countries during the past period, 1950–2020, such decline was much higher in Egypt. During that period, fertility decline in Egypt reached 57.7%, which is higher than that of the world average (51.6), Europe (45.6%), Italy (50.2%), Germany (27.3%), and France (40.1) (Table 1). In 2020, the total fertility in Egypt was (2.96), which is lower than that of France in 1950 (2.99), which is currently facing severe demographic challenges as immigration became the only solution to avoid population drop (Mataillet, 2022).

Second, although fertility decline trends in these countries are expected to be reversed during the future period, 2020–2100, the fertility level in Egypt is projected to continue declining. During that period, 2020–2100, the fertility decline in Egypt is projected to reach 37.6%, while it is projected to go positive in Europe (13.6%), Italy (20.6%), Japan (20.2%), China (15.6%), Germany (5.9%), and only 1.7% in France (Table 1).

Third: Looking at the whole period, 1950–2100, fertility decline in Egypt is expected to reach 73.6%, which is higher than the world average, 1.3 times that of Japan, 1.5 times that of France, almost double that of Europe and Italy, and more than three times that of Germany.

Table 1: Fertility Decline in Egypt Compared to World Average and Other Countries

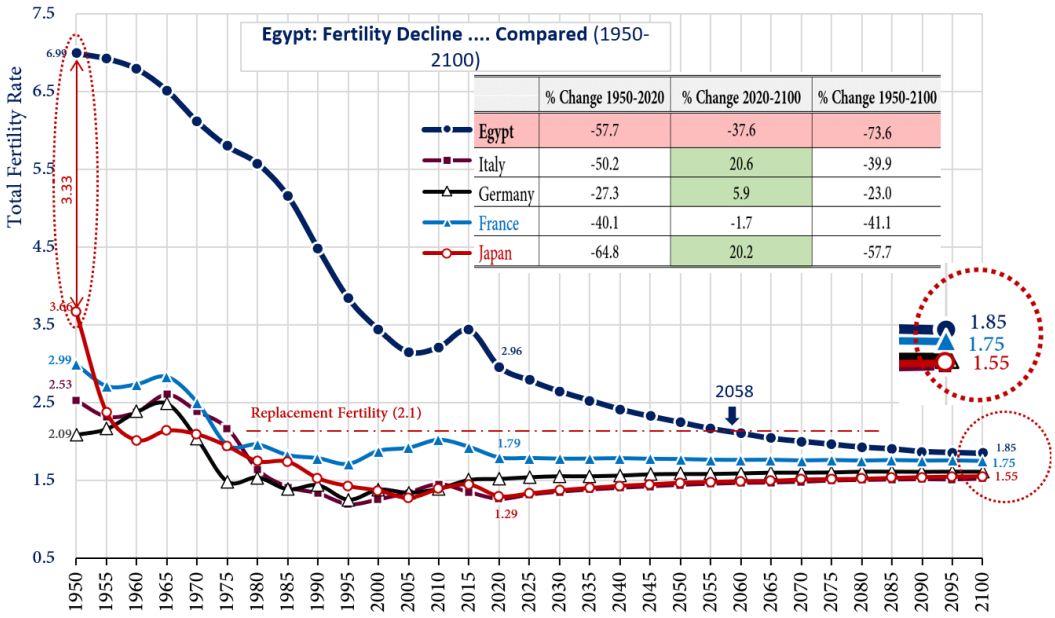
	1950	2020	2100	% Change 1950–2020	% Change 2020–2100	% Change 1950–2100
Egypt	6.99	2.96	1.85	57.7	37.6	73.6
WORLD	4.86	2.35	1.84	51.6	21.7	62.1
Europe	2.7	1.47	1.67	45.6	13.6	38.1
Italy	2.53	1.26	1.52	50.2	20.6	39.9
Germany	2.09	1.52	1.61	27.3	5.9	23.0
France	2.99	1.79	1.76	40.1	1.7	41.1
Japan	3.66	1.29	1.55	64.8	20.2	57.7

Note: Prepared by the researcher (United Nations, 2022)

Egypt projected fertility level by 2100: Compared

In Figure 5, the paper compares the fertility decline in Egypt to that in Italy, Germany, France, and Japan, which are all currently facing severe demographic problems. Although the fertility gap between Egypt and these countries was substantial, reaching 3.33 children per woman in 1950, this gap is projected to shrink to only 0.1 children per woman in 2100. This means that this fertility gap will be closed by 2100 and that Egypt will be at the same fertility level as Japan, Germany, France, and Italy. This situation reveals two crucial conclusions. First, Egypt would go through the demographic problems these developed countries face now, a long time before 2100. Second, for Egypt to be at the same fertility level as these industrial countries is not appropriate for Egypt, given its non-industrial economy.

Figure 5: Projected Fertility Decline in Egypt - Compared (1950–2100)



Note: Prepared by the researcher (United Nations, 2022)

Egyptian government views and response concerning fertility level

The statistical analysis provided demonstrates that Egypt's fertility rate is rapidly declining. However, according to the United Nations (2020a, 2021), the successive governments in Egypt, from 1976 until 2019, viewed fertility levels in the country as "Too High" (Table 2). The government views the fertility rate in 2019, which was 3.0, as "Too High." In comparison, the United Nations (2007) and the World Bank (2010) consider a fertility rate to be "High" if it is 5.0 or higher.

Table 2: Egypt's Government Views and Policies Concerning Fertility Level.

	1976	1986	1996	2005	2011	2015–2019*
View on fertility level	Too High	Too High	Too High	Too High	Too High	Too High
Policy on fertility level	Lower	Lower	Lower	Lower	Lower	Lower

*Note: Compiled by the researcher (United Nations, 2020a); *World Population Policies Database (United Nations, 2021)*

World population policies 2021-Policies related to fertility

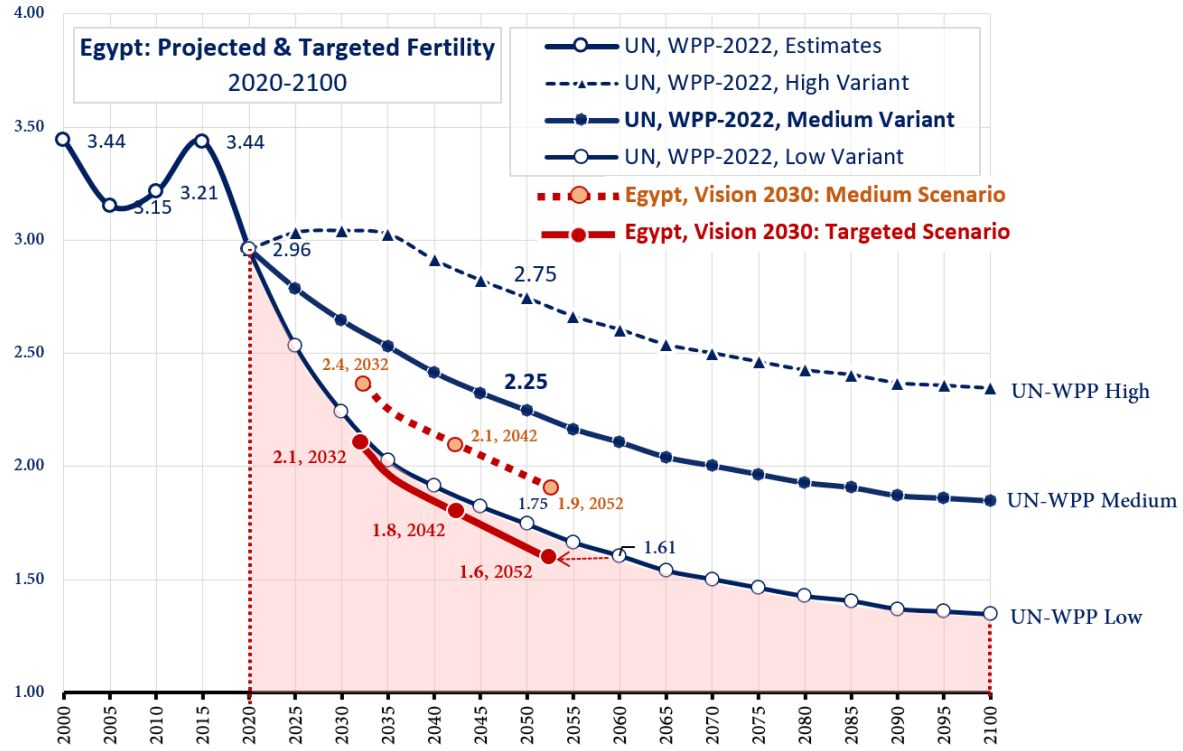
Concerning policies adopted on fertility levels viewed as "Too High," successive governments, from 1976 until 2019, have adopted a constant policy to "Lower" fertility levels. To implement such a policy, in 1966, the government initiated a nationwide birth control program and started taking severe actions to further lower fertility rates (Metz, 1991). In 2017, the Egyptian government launched a national campaign to raise awareness about the negative impacts of overpopulation and to encourage family planning. The campaign included television and radio advertisements and outreach efforts to rural areas (El Tawil, 2022). In 2020, the Egyptian government announced that it would launch a new family planning program intending to reduce the population growth rate to 1.5% per year by 2030. The program includes initiatives to increase access to contraception and family planning services and awareness-raising campaigns (El Sawy, 2023a).

The United Nations Population Fund (UNFPA), the USAID, the World Bank, the European Union, and other donor organizations (such as Rockefeller and Ford Foundations and the Population Council in New York) are generously and actively supporting Egypt's population control plans (Askary, 2011). According to the UNFPA (UNFPA Egypt, 2022), Egypt's government-led national family planning program has succeeded in raising the contraceptive prevalence rate from 48% in 1991 to 59% in 2014. Furthermore, the total fertility rate has slowly declined from 4.4 live-born children per woman in 1988 to 3 in 2008.

In 2014, Egypt's Constitution introduced the management of population growth as a national objective. Article 41 of the Egyptian Constitution stipulates that "the state is committed to implementing a population program aimed at achieving a balance between population growth rates and available resources, maximizing investment in human capital and improving its characteristics, within the framework of achieving sustainable development." In a statement issued on November 22, 2018, the Egyptian Prime Minister announced that starting in January 2019, the government will cap welfare payments at two children per family to reach more needy families and reduce the country's population growth rate (Abbamonte, 2018). The Prime Minister affirmed, "The government has decided not to give any kind of monetary subsidies to families with three children" (Ahram Online, 2018).

On February 16, 2021, the Minister of Planning and Economic Development announced that Egypt's Vision 2030 targets two scenarios for fertility change during the coming decades: the medium and desired scenarios (MPED [Egypt], 2021). Both scenarios target fertility rates below the replacement level. Figure 6 shows the desired scenario below the United Nations' World Population Prospects 2022 low variant scenario.

Figure 6: Egypt Vision 2030 Targeted Fertility Compared to United Nations' World Population Prospects 2022 (1950–2100)



Note: Prepared by the researcher (United Nations, 2022)

In its latest population control tactics, the government introduced some financial incentives for women with two children or less at 45 in 2023. Women aged between 21 and 45 with two or fewer children will receive 1,000 Egyptian pounds annually (El Sawy, 2023b). Also, these incentives include an insurance policy worth 60,000 Egyptian pounds that will be payable to women upon reaching the age of 45, provided that certain health conditions are met (Ali, 2023).

All these measures are expected to speed up fertility decline in Egypt much faster than United Nations projections.

Conclusion

Through its different stages, the paper came to the following important conclusions:

First, the fertility decline in Egypt was and is projected to continue faster than in many countries currently suffering from population decline. During 1950–2020, the fertility decline in Egypt reached 57.7%, which is higher than that of the world average (51.6), Europe (45.6%), Italy (50.2%), Germany (27.3%), and France (40.1). Compared to China, the fertility rate declined by 53.3% from adopting the regretted one-child policy in 1980 till 2020; the fertility decline in Egypt was very close to that, reaching 47% during the same period without adopting such a policy. During the future period, 2020–2100, the fertility decline in Egypt is projected to reach 37.6%, while it is projected to turn positive in Europe (13.6%), Italy (20.6%), Japan (20.2%), China (15.6%), Germany (5.9%), and only 1.7% in France.

Second, according to the United Nations' World Population Prospects 2022 data, Egypt is projected to go below the replacement fertility of 2.32 by 2045, after 22 years, and below the replacement fertility of 2.11 by 2058, after 35 years. These dates are projected to be much earlier according to European Commission's Joint Research Centre (JRC) data (2018): after nine years, in 2032, for the replacement fertility of 2.32, and after 14 years, in 2037, for the replacement fertility of 2.11.

Third, after falling to replacement fertility, Egypt is projected to enter a period of "low" and almost "very low" fertility through the end of the century. By 2100, and according to a medium scenario, the fertility rate in Egypt will go as low as 1.59 according to JRC and 1.85 according to the United Nations, World Population Prospects 2022. Both values can be considered as low fertility (United Nations, 2007). According to a low scenario, the fertility rate in Egypt will go lower, reaching only 1.38 according to JRC and 1.35 according to the United Nations, World Population Prospects 2022. Both values are very low fertility (McDonald, 2008).

Fourth, by 2100, Egypt will almost be in the same fertility level as France (1.75), Germany (1.61), Japan (1.55), and Italy (1.52), which all are currently of the globally lowest fertility rates and suffering acute demographic problems.

Recommendations

As Egypt is projected to go below replacement fertility and move into low fertility rates, it is highly recommended to examine the demographic and developmental challenges associated with such low fertility rates in the country.

On the other hand, for Egypt to slow its fertility decline and avoid reaching such a low fertility rate by 2100, the Egyptian government needs to revise its views and responses regarding fertility levels. Then, the country needs to review the targets of its population control plans accordingly. Moreover, the government needs to review its population control policies, shifting from traditional contraceptive-provision policies to more balanced, development-oriented policies. In this regard, "Development is the best contraceptive," coined by Dr. Karan Singh at the World Population Conference in Bucharest in 1974 (Mathai, 2008), could be an appropriate approach for population control in Egypt.

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