Iran’s Population Dynamics and Demographic Window of Opportunity

Farzaneh Roudi
Former Director of MENA Program at the Population Reference Bureau

Pooya Azadi *
Stanford Iran 2040 Project, Stanford University

Mohsen Mesgaran
Stanford Iran 2040 Project, Stanford University

* Corresponding author

Working Paper No. 4
October 2017
About the Stanford Iran 2040 Project

The Stanford Iran 2040 Project is an academic initiative that serves as a hub for researchers all around the world—particularly scholars of the Iranian diaspora—to conduct research on economic and technical matters related to the long-term development of Iran and to evaluate their possible implications in a global context.

The project encourages quantitative and forward-looking research on a broad array of areas relating to Iran's economic development. It seeks to envision the future of the country under plausible scenarios. The sectors that will be covered within the first phase of the project include the economy, energy, water, environment, food and agriculture, and transportation. The project has been co-sponsored by the Hamid and Christina Moghadam Program in Iranian Studies and the Freeman Spogli Institute for International Studies at Stanford.

Stanford Iran 2040 Project

Encina Hall West, Room 206
Stanford University
Stanford, CA 94305-6055
www.iranian-studies.stanford.edu/iran2040

Disclaimer

The Stanford Iran 2040 Project is an academic initiative with the sole objective of promoting scientific collaboration in economic and technical areas related to the long-term sustainable development of Iran. The project does not advocate or follow any political views or agenda. The contributors are selected solely based on their research skills; the center is not aware of, and not responsible for, the political views of the contributors and affiliates. Likewise, contributors and affiliates are not responsible for the political views of other contributors or affiliates.

Citation and Correspondence

Please cite this working paper as:
Farzaneh Roudi, Pooya Azadi, and Mohsen Mesgaran, Iran’s Population Dynamics and Demographic Window of Opportunity, Working Paper 4, Stanford Iran 2040 Project, Stanford University, October 2017

Address correspondence to:
Pooya Azadi, Stanford Iran 2040 Project
pazadi@stanford.edu
About the Authors

**Farzaneh Roudi** is a senior demographer and policy analyst with more than thirty years of experience researching and writing on Middle Eastern population and development issues. She worked at the Population Reference Bureau from 1987 until 2016, where she initiated and directed PRB’s Program for the Middle East and North Africa. She led policy communications trainings in the region and has written several policy briefs and articles, including for the United Nations and the European Union.

**Pooya Azadi** is the manager of the Stanford Iran 2040 Project. His multidisciplinary research interests include energy, environment, and economics. Particularly, he is interested in the development of mathematical models to tackle complex problems at different scales. Before joining Stanford, he worked as a researcher at the universities of Oxford and Cambridge and at MIT for several years.

**Mohsen Mesgaran** is a research fellow at Stanford University. Prior to joining Stanford, he worked on population dynamics and climate niche modeling of plant species at the University of Melbourne for six years. Using statistical and mechanistic models, he has been studying temporal and spatial trends of dynamic phenomena at multiple scales.
Executive Summary

A sound understanding of Iran’s population dynamics is of paramount importance for understanding its potential for development in the long run. Herein, we discuss the past trends and future projections of Iran’s population dynamics and evaluate the contributions of its major determinants (i.e., fertility, mortality, and migration). We then discuss changes in women’s reproductive behavior and population age distribution and place Iran’s fertility decline in an international context through a comparative analysis. Subsequently, we explore the distribution and select compositions of the population at a provincial level. Finally, we discuss unemployment as well as the rising trend of young people pursuing education beyond high school and project the future educational attainments of Iranians.

According to the 2016 census, Iran’s population reached close to 80 million while its growth rate dropped to 1.2% a year—a rate similar to today’s world average but substantially lower than its peak a few decades earlier. Between the 1976 and 1986 censuses, Iran’s population grew from 34 million to nearly 50 million, corresponding to an average annual growth rate of 3.9% (3.2% from natural increase and 0.7% from net migration). A decade later, however, Iran surprised the world when the results of its 1996 census showed a rapid decline in the population growth rate due to a record fertility decline. In a mere ten-year period, the country’s total fertility rate declined from 6.2 births per woman in 1986 to 2.5 births per woman in 1996.

Iran’s fertility decline stands out not only for its fast pace but also for occurring in the absence of a coercive government policy (e.g., China’s one-child policy) or the legalization of abortion (e.g., Turkey). Iran’s current TFR is estimated at 1.9–2.1 births per woman, which is close to the replacement level (i.e., 2.1 births per woman) but higher than the average TFR for the more-developed countries. The country’s fertility decline has had a significant impact on its age composition. The ratio of children (younger than 15) and elderly (65 and older) to the working age population (ages 15 to 65), known as the age dependency ratio, decreased from 0.95 in 1990
to 0.45 in 2005. With fewer dependents to support, Iran is currently in the midst of a demographic window of opportunity which will last about four decades before its working-age population starts to diminish in the mid-2040s. The opportunity must be seized now before the share of the working-age population shrinks and the population grows older.

Iran has reduced illiteracy among youths and has significantly increased its capacity for higher education. The total number of students enrolled at universities almost doubled between 2006 (2.3 million) and 2016 (4.3 million) with women constituting nearly half of student enrollments in higher education programs. By 2026, Iran is projected to accommodate a large number of highly educated people when more than half of the residents aged 25–34 are expected to hold a bachelor’s degree or higher. Whether this positive trend in Iranians’ education will translate to economic growth is subject to uncertainty because of the chronic high unemployment rates. In fact, the tight job market has been a driving force for many graduates to continue their education beyond their bachelor’s degree.
Iran’s Population Dynamics and Demographic Window of Opportunity

In the second half of the twentieth century, Iran completed its demographic transition from high to low mortality and, with a time lag, from high to low fertility. This transition first resulted in a high population growth rate which slowed later due to rapid fertility decline—causing the population to reach a point where it now resembles a two-edged sword. On the one hand, the rapidly expanding population has been linked to nearly every problem confronting the nation: unemployment, poverty, water scarcity, undernourishment, urban pollution, and the soaring domestic use of energy. On the other hand, the rise in the share of working-age population can potentially serve as a driver for economic growth and development [1]. The extent to which Iran can harness this transient opportunity primarily depends on its human capital endowment and the capacity of its economy for creating new employment.

A sound understanding of current demographic trends is of vital importance to policies and programs concerning Iran’s development in the long run. In our previous studies, we evaluated the long-term availability of resources for the energy [2,3] and agriculture [4] sectors as two of the main pillars of the Iranian economy. In this study, we discuss the past trends and future projections of Iran’s population dynamics, evaluate the contributions of its major determinants (fertility, mortality, and migration), and discuss Iran’s rapidly changing age composition. We then place Iran’s record fertility decline in an international context through a comparative analysis. Subsequently, we explore the distribution and select compositions of the population at a provincial level. Finally, we discuss unemployment and the rising trends in the pursuit of education beyond high school and project the future educational attainments of Iranians.

The analyses presented in this study are primarily based on the results of Iran’s 2016 and previous censuses and data from Iran’s National Organization for Civil Registration, Iran’s Ministry of Higher Education, the Population Division of the United Nations Department of Economic and Social Affairs, and the World Bank.

1. Population Growth and Its Determinants

The latest Iranian census conducted in 2016 put Iran’s population at 79,926,270 with a male to female ratio of 1.027. The census shows that the annual population growth rate of the country has dropped to 1.24%—a rate similar to today’s world average but significantly lower than its peak a few decades earlier [5]. The highest population growth rate in Iran occurred around 1980–1985, when the population grew by nearly 4% per year (Figure 1).

According to Iran’s birth registry, the annual number of births increased almost linearly from 0.9 million in 1960 to 1.4 million in 1978 but then sharply rose to about 2.5 million within the first few years after the Islamic Revolution. This was followed by a reverse trend that continued until 2000 when the annual number of births reached approximately 1.1 million (Figure 1). Since 2000, the number of births has increased again, echoing the increase in the number of women of reproductive age. Over the past few years, the annual number of births is fluctuating around 1.5 million births per year.
The UN data suggest that the number of deaths in Iran over the past several decades varied within a narrow range, with a hump occurring between 1975 and 1990 (Figure 1). Embraced within this period is the Iran-Iraq war (1980–1988), which claimed the lives of several hundred thousand Iranians. Furthermore, the high number of births in this time period, in conjunction with the country’s relatively high child mortality rate of the time, was another driver for the increased number of deaths in that time period. See Appendix A for a more detailed discussion on the number of deaths and the inconsistency between different sources.

![Figure 1. Iran’s population size and growth rate [5, 6] (left) and number of births [7] and deaths [6] (right).](image)

Improvements in health—which in turn resulted in higher life expectancy—have also contributed to Iran’s population growth as increasingly more infants have survived to adulthood and have children of their own, and as adults have lived longer. The life expectancy at birth for males increased from 51 years in 1970 to 75 years in 2015, while that of females increased from 51 to 77 years (Figure 2). Such increases in average life expectancy at birth were largely due to rapid declines in infant and child mortality; since 1970, the under-five mortality rate dropped from 188 to 17 deaths per 1,000 live births. Improvements in health also increased survival rates of older age groups. During the same period, for example, the life expectancy of men and women at age 60, increased from 13 to 19 years, and from 15 to 20 years, respectively [6].

Immigration and emigration have also had considerable impacts on Iran’s population. The 2016 census shows that 2.2% of Iran’s population (i.e., 1.8 million people) are foreign nationals (Figure 3), of which 90% are from Afghanistan. However, the real figure is likely to be higher as censuses often tend to undercount foreign nationals. An overwhelming majority of foreign nationals in Iran originally came as refugees in waves and their numbers grew through natural increase. Provinces with the largest populations of foreign nationals are Tehran (32%), followed by Razavi Khorasan (14%), Esfahan (12%), and Kerman (8%). With millions of its nationals living abroad [8], Iran is also notorious for its brain drain, as those leaving the country are generally highly educated. The United Nations’ population estimates suggest that, in net numbers, Iran
Stanford Iran 2040 Project

gained population through international migration in the 1980s (as large numbers of refugees arrived from Afghanistan) and in the latter half of the 1990s (again, refugees from neighboring countries surpassed the number of Iranians emigrating) while losing population in the first half of the 1990s and from the early 2000s through today [6].

**Figure 2.** Trends in life expectancy at birth by sex (left) and child mortality rates (right) [6].

**Figure 3.** Changes in number of foreign nationals living in Iran based on census data (1996–2016) [5, 9].
2. Fertility and National Policies

A multitude of socioeconomic factors affected the reproductive behavior of Iranian women [10], including the rise in urbanization, female education, age at first marriage, as well as their increased access to family planning services. Marriage, a requirement for lawful reproduction in Iran, has undergone major changes both in terms of the share of women ever married (Figure 4) and their age at first marriage. According to Iran’s censuses [5], between 1986 and 2016, the average age at first marriage for females increased from 19.8 to 23.0 and for males increased from 23.6 to 27.4. Also, during this period, the percentage of ever-married women aged 30–34 decreased from 95% to 85%. This reduction in percentage of women ever married has been more pronounced for the younger age groups; the percentage of married women aged 15–19 almost halved in this time period and that of women aged 20–24 was reduced by approximately 25%. The slight increase in share of married women under age 25 observed between 2006 and 2016 demands further investigation to shed light on the underlying factors influencing the change. One possible factor could be the changing age structure of the population that favors young women in the marriage market, as their numbers are far less than those of their prospective husbands, who usually are older and belong to the earlier cohorts that are larger in size (see Age Structure).

As shown in Figure 5, in the late 1980s and the 1990s, fertility rates declined sharply for almost all age groups of women of reproductive age. A comparison of the changes in marriage and fertility of women in different age groups (Figures 4 & 5) reveals that the decline in fertility has been primarily caused by the desire of couples to limit the number of children, with only minor contributions from the changes in marriage patterns. For example, while the percentage of women ever married for the age group 25–29 between 1986 and 1996 decreased by 6% (Figure 4), their corresponding fertility rates dropped by 48% (Figure 5). During 1996 to 2006, the same age group observed a further 10% reduction in marriage while the reduction in the fertility rate
amounted to 34%. One exception to this general observation is the decline in the fertility of women aged 15–19 that occurred between 1985 and 1995 which seems to be more closely correlated with the changes in their marriage pattern.

![Figure 5. Changes in age-specific fertility rates [6].](image)

After the dramatic decline in the fertility rate, Iran’s average household size followed suit. In 2016, there were 24.2 million households in Iran with an average size of 3.3 persons—almost two persons smaller than what it was a generation ago, in 1986 (Figure 6). Of particular interest is the change in the average size of rural households, which fell from 5.5 persons in 1986 to 3.4 persons in 2016, nearly closing the gap between rural and urban areas. The reductions in the average sizes of both urban and rural households are attributed to the decrease in the number of children; the average number of adults per household (i.e., 2.5–2.8) has remained constant or even has slightly increased over time [11].

![Figure 6. Changes in average number of people living in a household [5].](image)
In the past five decades, Iran has seen four radical reversals in its government’s fertility policies. The first family planning program was rolled out in 1967 as part of the country’s development plan to improve maternal and child health, lower fertility, and slow population growth. According to estimates [12], the program had limited impact on lowering fertility before it ended soon after the Islamic Revolution in 1979. Then, the new government adopted pronatalist policies that were implemented for the next ten years until 1989 when, in a sharp turnaround, the government launched a national voluntary family planning program to lower fertility and control population growth. Lastly, concerned with what was seen as the country’s low fertility in the face of an aging population and the possibility of the population declining in the long run, the Iranian government once again has been taking a pronatalist stand since the early 2010s, encouraging couples to have more children.

The astonishing fertility decline in Iran began around 1985 in the midst of governmental advocacy for more children and four years before the inauguration of the national family planning program by the government [13]. When launched, the family planning program was effective in accelerating the fertility decline by removing social and economic barriers to contraceptive use and by making modern contraceptives available free of charge throughout the country. Family planning counseling and services were provided to rural couples through the country’s rural health networks [14]. At the same time, the desire for smaller family size was on the rise [10] and therefore the program enjoyed a high level of social acceptance. The use of modern contraceptives increased from 27% to 57% between 1989 and 2004 [15]. In all, the level and speed of the fertility decline went far beyond the government’s original conservative targets [15].

Around three decades later, concerned with what was seen as a decade-long fertility decline far below the replacement level, Iranian officials issued a directive in 2014 to change the population policy of the country to a pronatalist position yet again. The directive calls on all government agencies to implement direct and indirect measures to help raise the total fertility rate to, or above, the replacement level. However, given the high number of births in the past few years (i.e., more than 1.5 million per year), it is likely that some of the previous cross-sectional fertility rate analyses underestimated the tendency of the current generation for reproduction. Iran's TFR, calculated based on 2011 census, was reported at 1.8 [5] (while references [16, 17] have reported values between 1.8 and 2.0 using alternative methods and data). However, compared to the 2011 baseline, the annual number of births in 2016 has increased by 10.7% (i.e., 148 thousands per year) while the number of women within the fertile age range (i.e., age 15–49) only increased by 1.6%—suggesting that Iran's current TFR is likely to be between 1.9 and 2.1 births per women. Owing to the above limitations, the decision to implement a pronatalist policy seems premature and would benefit from a more holistic analysis, particularly as more data will become available over time to allow for a longitudinal analysis of the fertility of the new generation. The directive also falls short of calling for universal access to family planning services. Lack of universal access to modern contraception jeopardizes women’s and children’s health and can have costly and unintended consequences for the government (e.g., caring for a
a larger number of women suffering complications from unsafe abortions). Furthermore, imposing such limitations on access to contraceptives is a matter of social inequity affecting the less privileged segments of society more profoundly, especially in rural areas. More privileged residents are better equipped to meet their needs through the private health sector more readily available in urban areas.

According to the UN instant replacement population projection scenario (where TFR is assumed to stay at the replacement level of 2.1 births per woman), the population of Iran will increase to 107 million by 2050 and then stabilize at around 114 million in the following decades (Figure 7). This estimate highlights the fact that Iran’s high fertility of past decades could still give momentum to its population growth. If it materializes, Iran’s new pronatalist policy not only could boost Iran’s population to 100 million before 2040 but could also create momentum for further population increases in the following decades. Although the aging of the population brought about by low fertility could have economic consequences for Iran in the long run (e.g., beyond 2040), a further increase in population will exacerbate the existing challenges facing the nation. The economy has been unable to create enough employment for the country’s expanding labor force, resulting in chronically high unemployment rates, particularly for the youth. With current trends in the use of automation, it is likely that creation of routine jobs will become even more difficult in the future. Furthermore, a faster population growth, fueled by the new pronatalist policy, will inevitably add to the country’s unprecedented water crisis affecting the lives of more than 80 million people. Based on data from the Food and Agriculture Organization of the United Nations (FAO) [18], Iran’s current per-capita renewable water is estimated at 1,600 cubic meters per year, which is already below the water stress threshold (i.e., 1,700 m³/y) as defined by the United Nations [19]. Further population growth would inevitably reduce per capita freshwater availability, which could in turn cause serious food security challenges.

Figure 7. Trends in population growth and total fertility rate [5, 6, 17]. Future population projection is based on UN instant-replacement scenario.
Box 1: Iran’s Fertility Decline in an International Context

Iran surprised the world when the results of its 1996 census showed that its total fertility rate had declined by more than half in ten years, from an average of 6.2 births per woman in 1986 to 2.5 births per woman in 1996. Iran’s fertility decline has been particularly impressive in rural areas. In the course of only one generation, the total fertility rate in rural areas dropped by three-quarters, from 8.1 births per woman in the mid-1970s to 2.1 births per woman in 2006. To put this into perspective, it took around three hundred years for some European countries to experience a similar decline. Iran’s total fertility rate is currently estimated at 1.9–2.1 births per woman. This rate is close to many Eurasian and European countries, although Iran’s per-capita income falls well below that of most European countries (Figure B1). Today, 85 countries and territories have fertility rates below 2.1 births per woman [20].

Figure B1. Total fertility rate (TFR) versus GDP per capita for select countries in 2015 [5,20].

The extraordinary rate of fertility decline in Iran becomes apparent when compared with those of select countries (Figure B2) representing a wide range of economic development, religion, and cultural background. It is also worth mentioning that such rapid decline was achieved in the absence of a coercive government policy (e.g., China’s one-child policy) or the legalization of abortion (e.g., Turkey). Iran’s fertility rate has been below that of the world average and replacement level since 1997 and 2001, respectively.
3. Age Structure

Shaped by changing mortality and fertility trends, the age composition of Iran’s population has undergone marked changes over the past four decades (Figures 8 & 9). During its high-fertility period, i.e., 1970s and 1980s, Iran’s age structure resembled a pyramid with a wide base. In the wake of rapid fertility decline, in the 1990s, Iran’s population pyramid became narrower at the bottom, giving rise to a youth bulge. With the largest cohorts in the population rising up the pyramid, in the 2010s, the distribution of younger age groups in the population is becoming more uniform over time. It should be noted that, in 2016, the two largest female cohorts (age 25–29 and 30–34) constituted the age groups that also have the highest fertility rates (Figure 5). As a result, they gave rise to the annual number of births reflected in the 2016 age pyramid’s slightly wider base (Figure 8).

The percentage of children under age 15 declined from 46% of the total population in 1986 to 24% in 2016 (Figure 9). In the same period, the share of population aged 15–64, commonly known as the working-age population, increased from 51% to 71% while the share of elderly (65 and older) increased by only 2 percentage point. Over these thirty years, the median age of Iranians increased from 17 to 31, suggesting that the population as a whole was aging for about 11 hours each day. While the absolute number of elderly persons in the future can be projected with confidence because they have already been born and the sizes of their cohorts are known, projecting their share of the population mainly depends on future fertility assumptions. Nevertheless, Iran’s population is aging and the proportion of its elderly population in 2050 is likely to reach roughly 20%. For the sake of comparison, current population compositions of select countries are shown in Figure 10. Iran’s age composition in 2050 will be older than the current population of the United States and younger than the current population of Japan.
Figure 8. Iran’s population age pyramids [5, 6]. The 2026 projection is based on the UN Population Division’s instant-replacement scenario.
Figure 9. Changes in population distribution by broad age groups and future projections based on the UN instant-replacement scenario [6].

Figure 10. Comparison of Iran’s population age distribution with those of selected countries in 2015 [6].

Figure 11 shows that the number of people in the working-age population (15–64 years old) is expected to reach its peak at about 65 million in the mid-2030s before starting to decline as the baby-boomers of the 1970s and 1980s reach age 65 and give momentum to the elderly population to grow rapidly. It also shows that the number of children under age 15 is going to fluctuate around 20 million in the next few decades. In all, these numbers indicate that Iran is currently presented with a demographic window of opportunity where its working-age population (i.e., 15 to 64) outnumbers its so-called dependent population (i.e., those above 65 or under 15 years old). The dependency ratio has fallen below 0.5 since 1997 and is projected to remain below this level until the mid-2040s.
Thus, Iran is positioned to reap its demographic dividend should the appropriate economic policies—nationally and internationally—be adopted to address its current high rate of unemployment (discussed in a later section). With fewer dependents to support, the country has the potential for rapid economic growth if it can absorb enough capital from domestic and international sources to create a rather large number of well-paid jobs in the future. The opportunity must be seized now before the share of the working-age population shrinks and the dependency ratio rises.

4. Geographical Distribution

The distribution of population among Iran’s provinces varies greatly (Figure 12). The most populous provinces include Tehran (16.6% of the total), Razavi Khorasan (8.1%), Esfahan (6.4%), Fars (6.1%), and Khuzestan (5.9%). Ilam, Semnan, and Kohgiluyeh Boyer Ahmad are the least populated provinces, each home to less than 1% of the population [5]. A map of Iran’s provinces is provided in Appendix B.

Through the five-year period leading to the 2016 census, the highest annual rate of population growth was found in South Khorasan (3.0%). Hamedan and North Khorasan were the only provinces that lost population in that time period [5].
While the latest census shows that 74% of Iran’s population resides in urban areas, the degree of urbanization among provinces varies within a range of 49% to 95% (Figure 13). Qom, Tehran, Alborz, and Esfahan have the lowest shares of rural residents in their populations, while Sistan & Baluchestan, Golestan, and Hormozgan have the highest. Sistan & Baluchestan, with 1.4 million inhabitants, is one of the least developed provinces and is the only province in which the majority of the population resides in the rural areas (Figure 13). About half of Iran’s urban population (equal to 37% of the total population) lives in the country’s top 20 largest cities (Figure 14) while the remainder lives in over four hundred smaller cities. Based on the 2006 and 2016 censuses, the cumulative share of top 20 large cities in the total population of the country has remained flat, indicating that the population growth rate in these cities (including the impact of migration) was similar to the overall population growth of the country. In 2011, the total fertility rate of Iran’s provinces ranged from 1.3 births per woman in Gilan to 3.5 births per woman in Sistan & Baluchestan [5]. Gilan and Sistan & Baluchestan also have the lowest and highest shares of children under the age of 15 among Iran’s provinces, respectively (Figure 15). It is important to note that Sistan & Baluchestan has the lowest economic participation rate (see Section 5) and also the lowest literacy rate (see Appendix C) among all provinces.
Figure 13. Shares of urban and rural populations by province in 2016 [5].

Figure 14. Cumulative shares of top 20 largest cities in Iran’s population in 2006 and 2016 [5].
5. Employment

Iran has been plagued with chronically high rates of unemployment which has fluctuated over the range of 10–15% in the last decade. In this time period, on average, the economy created 174,000 jobs per year with a maximum of 718,000 jobs in 2013, while in 2008, 2010, 2011, and 2014 the job market contracted [5].

A recent labor survey conducted in the summer of 2016 [21] showed that 26.4 million people were participating in the labor force (those 10 years old and over who had a job or were looking for one), putting the country’s labor force participation rate at 40.4% (those aged ten-plus in the labor force divided by the total ten-plus population) [21]. This national average, however, masks disparities among different population groups. Only 16% of the female population aged 10 and older was in the labor force as compared to 65% of male counterparts. The overall labor participation rates in rural and urban areas were only 2 percentage points apart, but varied significantly across provinces, ranging from 33% in Sistan & Baluchestan to 45% in Zanjan (Figure 16).

Of the 26.4 million people in the labor force in 2016, 3.4 million (13%) were unemployed and looking for a job. The overall unemployment rate among females was twice that of males, and urban areas’ unemployment rate was almost twice that of rural areas. The unemployment rate is particularly high among youth and women. Nearly 2 million (60%) of the unemployed were between the ages of 15 and 29. Despite their low labor force participation, women constitute about one third of the country’s unemployed population. Most notably, 44% of women aged 15–29 were unemployed in 2016. Moreover, these unemployment rates are an underestimate, not truly revealing how tight the job market is for young people entering the labor force. Technically, those who were looking for a job during the week before the survey were defined as
“unemployed,” leaving out the discouraged ones who had given up searching. Also, the measure hides underemployment by counting as “employed” those who had worked for even as little as one hour in the week before the survey. Unemployment rates are high among the educated segments of the labor force (especially women) as their share in the population is increasing over time.

![Labor Force Participation and Unemployment Rates (2016)](image)

**Figure 16.** Labor force participation and unemployment rates, summer 2016 [21].

### 6. Education

Iran ranked 85th among 130 countries evaluated for their overall human capital index by the World Economic Forum, published in 2016 [22]. However, the country ranked 44th and 69th for human capital indices for the age groups of under-15 and 15–24, respectively. While Iran has substantially reduced illiteracy among children and youth, still a sizable proportion of its elderly population is illiterate (Figure 17). Overall illiteracy, both in terms of numbers and rates, has been diminishing over time as the share of members of the elderly population who are illiterate has kept shrinking. Between 2006 and 2016, illiteracy among those aged 65 and older dropped

---

*Stanford Iran 2040 Project*
from 9.8 million to 8.8 million and it is expected to dip to 6.6 million by 2026.

With a rapid expansion of capacities for tertiary education, more radical changes have occurred in higher education attainments of Iranians. From 2006 to 2016, the share of people over age 20 with a bachelor’s degree or higher increased from 7% (i.e., 2.9 million) to 11% (i.e., 6.4 million). Our projection indicates that, by 2026, higher degree holders will constitute approximately 20% (i.e., 12.5 million) of the population over age 20—with more than half the population aged 25–34, both male and female, will hold a bachelor’s degree or higher (Figure 17).

An overview of the major trends in Iran’s higher education over the past three decades is provided in Figure 18. Since 1990, the number of students enrolled in the higher education system (i.e., associate’s degree and higher) increased by approximately 4 million to reach about 4.4 million in 2016 [23]; about a quarter of the students were enrolled in associate’s degree programs (kärdäni), about half in programs that offer a bachelor’s degree, and the remaining quarter in master’s, PhD, or medical programs. Pursuing education beyond a bachelor's degree is becoming more prevalent in Iran. The share of master’s degree students in the total number of students increased from 4% in 1997 to 22% in 2016 [23]. Based on the number of admissions to bachelor's and master’s degree programs in the recent years, in rough terms, of every five bachelor's degree students in Iran two of them will continue their education toward a master's degree.

In 2016, women constituted 50% of students enrolled in programs that offer a bachelor’s degree or higher and 46% of student enrollments in all higher education programs (associate’s degree and higher) combined [23]. The engineering field is dominated by male students, whereas female students are the majority in all the other major fields of study, especially in medicine and the basic sciences, where they have accounted for upward of 65% of students enrolled in these
fields for almost two decades. Humanities and engineering are the largest fields of study in Iran, encompassing 46% and 30% of all students enrolled in higher education, respectively. Iran ranked 5th in the number of recent graduates in STEM subjects (science, technology, engineering, and mathematics) in the world [22], after China, India, the United States, and Russia—all of which are considerably more populous than Iran.

Whether these promising trends in Iranians’ education will translate to economic growth is contingent upon immediate improvements in the job market. Thus far, the tight job market facing educated youth has been arguably a major driving force for the increase in the average years of schooling. This may be particularly true in persuading those with bachelor’s degrees to attend post-graduate programs to seemingly improve their competitiveness in the job market [25] or simply buy time for a job opportunity to present itself.

Figure 18. Students currently enrolled in higher education [5, 9, 23, 24].
7. Harnessing Demographic Dividends

When a country's fertility rate falls, there is a period of typically five decades during which its labor force grows more rapidly than the rest of its population [26], allowing for allocation of more resources for investment in economic development. This so-called first demographic dividend can only yield a transitory bonus because the population grows older and eventually its share of working-age adults shrinks and, as such, countries generally have only one chance to reap the benefits of their demographic window of opportunity. However, a second demographic dividend is also possible should the workers during the first demographic dividend invest and save for their retirement, thereby transforming the initial bonus into increased assets and economic development in the longer term [1].

Figure 19 illustrates the conceptual framework behind the demographic dividends, highlighting the point that demographic dividends are not necessarily guaranteed after a country experiences fertility decline. Investments in health and education and appropriate and effective social and economic policies are needed to help a large working-age population live up to its potential and contribute to the economy through work and investment savings.

Figure 19. A conceptual framework for harnessing demographic dividends [27].

Iran's chance of benefiting from its demographic window of opportunity boils down to creating as many jobs as possible, as quickly as possible—especially skilled and high-paying jobs to employ its large and well-educated labor force. This workforce can become the engine of Iran's economic growth well into the future, before the share of its working-age population shrinks and the population grows older.
Glossary

FAO Food and Agriculture Organization of the United Nations
IMF International Monetary Fund
LFP Labor force participation rate
NPBO National Plan and Budget Organization
STEM Science, technology, engineering, and mathematics
TFR Total fertility rate
UN United Nations

References

8. Iran’s Statistical Yearbook 1389 [2010–2011], Statistical Center of Iran (in English).
21. A Selection of Labor Force Survey Results–Summer 1395 (June 21–September 21, 2016), Statistical Center of Iran (in English).
24. Iran’s Statistical Yearbook 1394, Statistical Center of Iran, (in Farsi).
Appendix A: Annual Number of Deaths from UN and Sabt-e-Ahval

Compared with the data provided by UN for the number of deaths in Iran, the data from Iran's National Organization for Civil Registration (Sabt-e-Ahval) depict more of an intuitive trend wherein mortality declines gradually over a period from 1957 to 1978, followed by a period of increasing mortality which almost coincides with the Iran-Iraq war. These data, however, undercount the number of deaths. An effort conducted in 1995–1998 to correct for the unregistered deaths identified over 5.5 million cases not included in the mortality data of the previous decade.

![Number of Deaths in Iran](image)

| Table A1. Total number of deaths registered between 1995 and 1998, including the identified unregistered deaths of the previous decades. |
| --- | --- | --- | --- |
| **Death Registration** | **1995** | **1996** | **1997** | **1998** |
| | 2,538,078 | 2,756,482 | 1,240,975 | 1,031,836 |
Appendix B: Map of Iran’s Provinces
Appendix C: Iran’s Literacy Rate by Province

Iran’s Provincial Literacy Rate (2016)

- 76 - 78%
- 78 - 80%
- 80 - 82%
- 82 - 84%
- 84 - 86%
- 86 - 88%
- 88 - 90%
- 90 - 92%
- 92 - 94%