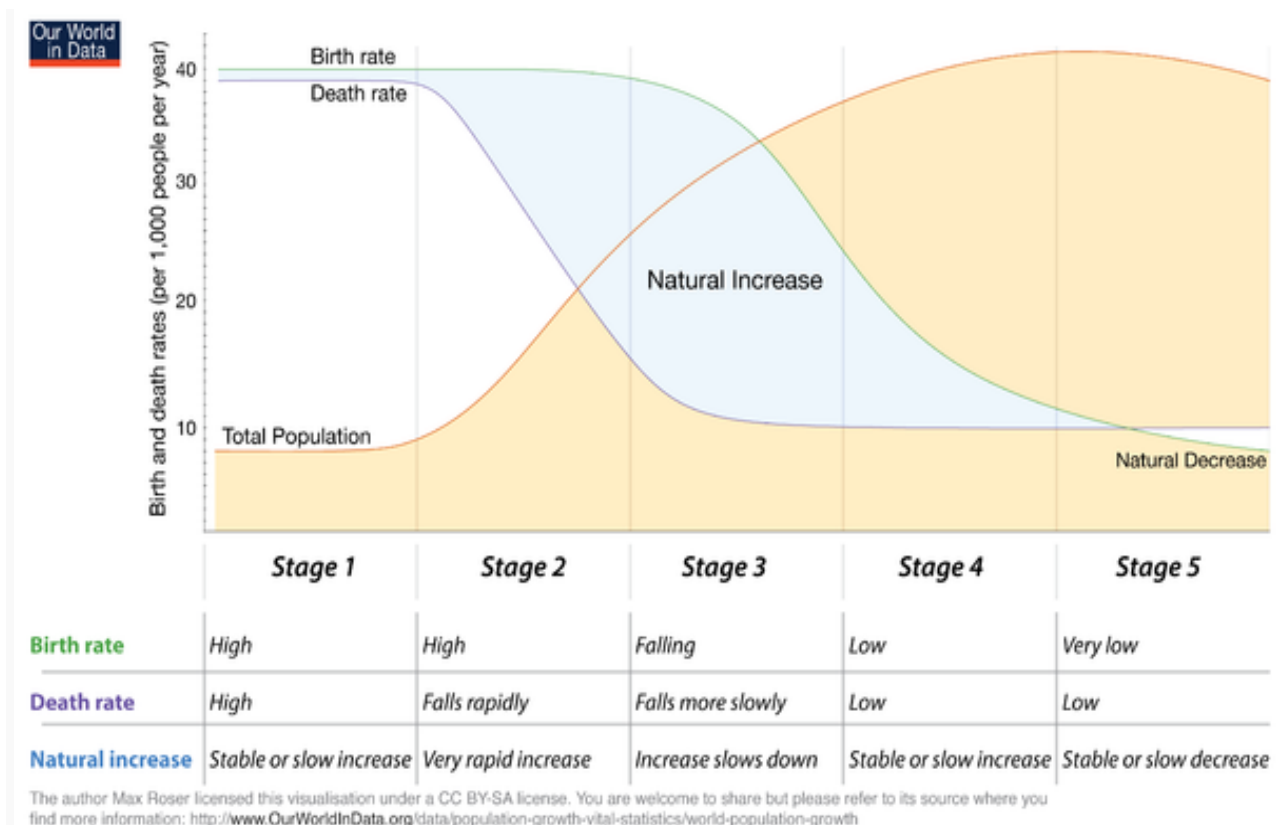


Demographic Transition

Demographic transition (DT) refers to the transition from high birth and death rates to low birth and death rates as a country develops from a pre-industrial to an industrialized economic system. This is typically demonstrated through a **demographic transition model (DTM)**. The theory is based on an interpretation of demographic history developed in 1929 by the American demographer Warren Thompson (1887-1973). Thompson observed changes, or transitions, in birth and death rates in industrialized societies over the previous 200 years. Most developed countries are in stage 3 or 4 of the model; the majority of developing countries have reached stage 2 or stage 3. The major (relative) exceptions are some poor countries, mainly in sub-Saharan Africa and some Middle Eastern countries, which are poor or affected by government policy or civil strife, notably Pakistan, Palestinian territories, Yemen, and Afghanistan. Adolphe Landry of France made similar observations on demographic patterns and population growth potential. In the 1940s and 1950s Frank W. Notestein developed a more formal theory of demographic transition.



Stage One

In pre-industrial society, death rates and birth rates were both high, and fluctuated rapidly according to natural events, such as drought and disease, to produce a relatively constant and young population. Family planning and contraception were virtually

nonexistent; therefore, birth rates were essentially only limited by the ability of women to bear children. Emigration depressed death rates in some special cases (for example, Europe and particularly the Eastern United States during the 19th century), but, overall, death rates tended to match birth rates, often exceeding 40 per 1000 per year. Children contributed to the economy of the household from an early age by carrying water, firewood, and messages, caring for younger siblings, sweeping, washing dishes, preparing food, and working in the fields. Raising a child cost little more than feeding him or her; there were no education or entertainment expenses. Thus, the total cost of raising children barely exceeded their contribution to the household. In addition, as they became adults they become a major input to the family business, mainly farming, and were the primary form of insurance for adults in old age. In India, an adult son was all that prevented a widow from falling into destitution. While death rates remained high there was no question as to the need for children, even if the means to prevent them had existed.

During this stage, the society evolves in accordance with Malthusian paradigm, with population essentially determined by the food supply. Any fluctuations in food supply (either positive, for example, due to technology improvements, or negative, due to droughts and pest invasions) tend to translate directly into population fluctuations. Famines resulting in significant mortality are frequent. Overall, population dynamics during stage one are comparable to those of animals living in the wild. According to Edward, Revocatus. (2016) This is the earlier stage of demographic transition in the world and also characterized by primary activities such as small fishing activities, farming practices, pastoralism and petty businesses.

Stage Two

World population 10,000 BC - 2000 AD

This stage leads to a fall in death rates and an increase in population. The changes leading to this stage in Europe were initiated in the Agricultural Revolution of the 18th century and were initially quite slow. In the 20th century, the falls in death rates in developing countries tended to be substantially faster. Countries in this stage include Yemen, Afghanistan, the Palestinian territories, Bhutan and Laos and much of Sub-Saharan Africa (but do not include South Africa, Zimbabwe, Botswana, Swaziland, Lesotho, Namibia, Kenya and Ghana, which have begun to move into stage 3).

The decline in the death rate is due initially to two factors:

- First, improvements in the food supply brought about by higher yields in agricultural practices and better transportation prevent death due to starvation and lack of water. Agricultural improvements included crop rotation, selective breeding, and seed drill technology.

- Second, significant improvements in public health reduce mortality, particularly in childhood. These are not so many medical breakthroughs (Europe passed through stage two before the advances of the mid-20th century, although there was significant medical progress in the 19th century, such as the development of vaccination) as they are improvements in water supply, sewerage, food handling, and general personal hygiene following from growing scientific knowledge of the causes of disease and the improved education and social status of mothers.

A consequence of the decline in mortality in Stage Two is an increasingly rapid rise in population growth (a "population explosion") as the gap between deaths and births grows wider. Note that this growth is not due to an increase in fertility (or birth rates) but to a decline in deaths. This change in population occurred in north-western Europe during the 19th century due to the Industrial Revolution. During the second half of the 20th century less-developed countries entered Stage Two, creating the worldwide population explosion that has demographers concerned today. In this stage of DT, countries are vulnerable to become failed states in the absence of progressive governments.

Another characteristic of Stage Two of the demographic transition is a change in the age structure of the population. In Stage One, the majority of deaths are concentrated in the first 5-10 years of life. Therefore, more than anything else, the decline in death rates in Stage Two entails the increasing survival of children and a growing population. Hence, the age structure of the population becomes increasingly youthful and more of these children enter the reproductive cycle of their lives while maintaining the high fertility rates of their parents. The bottom of the "age pyramid" widens first, accelerating population growth. The age structure of such a population is illustrated by using an example from the Third World today.

Stage Three

Stage Three moves the population towards stability through a decline in the birth rate. Several fertility factors contribute to this eventual decline, and are generally similar to those associated with sub-replacement fertility, although some are speculative:

- In rural areas continued decline in childhood death means that at some point parents realize they need not require so many children to be born to ensure a comfortable old age. As childhood death continues to fall and incomes increase parents can become increasingly confident that fewer children will suffice to help in family business and care for them in old age.
- Increasing urbanization changes the traditional values placed upon fertility and the value of children in rural society. Urban living also raises the cost of dependent children to a family. A recent theory suggests that urbanization also contributes to reducing the birth rate because it disrupts optimal mating patterns. A 2008 study

in Iceland found that the most fecund marriages are between distant cousins. Genetic incompatibilities inherent in more distant outbreeding makes reproduction harder.

- In both rural and urban areas, the cost of children to parents is exacerbated by the introduction of compulsory education acts and the increased need to educate children so they can take up a respected position in society. Children are increasingly prohibited under law from working outside the household and make an increasingly limited contribution to the household, as school children are increasingly exempted from the expectation of making a significant contribution to domestic work. Even in equatorial Africa, children now need to be clothed, and may even require school uniforms. Parents begin to consider it a duty to buy children books and toys. Partly due to education and access to family planning, people begin to reassess their need for children and their ability to raise them.

A major factor in reducing birth rates in stage 3 countries such as Malaysia is the availability of family planning facilities, like this one in Kuala Terengganu, Terengganu, Malaysia.

- Increasing female literacy and employment lowers the uncritical acceptance of childbearing and motherhood as measures of the status of women. Working women have less time to raise children; this is particularly an issue where fathers traditionally make little or no contribution to child-raising, such as southern Europe or Japan. Valuation of women beyond childbearing and motherhood becomes important.
- Improvements in contraceptive technology are now a major factor. Fertility decline is caused as much by changes in values about children and sex as by the availability of contraceptives and knowledge of how to use them.

The resulting changes in the age structure of the population include a reduction in the youth dependency ratio and eventually population aging. The population structure becomes less triangular and more like an elongated balloon. During the period between the decline in youth dependency and rise in old age dependency there is a demographic window of opportunity that can potentially produce economic growth through an increase in the ratio of working age to dependent population; the demographic dividend.

Countries that have experienced a fertility decline of over 40% from their pre-transition levels include: Costa Rica, El Salvador, Panama, Jamaica, Mexico, Colombia, Ecuador, Guyana, Philippines, Indonesia, Malaysia, Sri

Lanka, Turkey, Azerbaijan, Turkmenistan, Uzbekistan, Egypt, Tunisia, Algeria, Morocco, Lebanon, South Africa, India, Saudi Arabia, and many Pacific islands.

Countries that have experienced a fertility decline of 25-40% include: Honduras, Guatemala, Nicaragua, Paraguay, Bolivia, Vietnam, Myanmar, Bangladesh, Tajikistan, Jordan, Qatar, Albania, United Arab Emirates, Zimbabwe, and Botswana.

Countries that have experienced a fertility decline of 10-25% include: Haiti, Papua New Guinea, Nepal, Pakistan, Syria, Iraq, Libya, Sudan, Kenya, Ghana and Senegal.

Stage Four

This occurs where birth and death rates are both low, leading to a total population which is high and stable. Death rates are low for a number of reasons, primarily lower rates of diseases and higher production of food. The birth rate is low because people have more opportunities to choose if they want children; this is made possible by improvements in contraception or women gaining more independence and work opportunities. Some theorists consider there are only 4 stages and that the population of a country will remain at this level. The DTM is only a suggestion about the future population levels of a country, not a prediction.

Countries that are at this stage (Total Fertility Rate of less than 2.5 in 1997) include: United States, Canada, Argentina, Australia, New Zealand, most of Europe, Bahamas, Puerto Rico, Trinidad and Tobago, Brazil, Sri Lanka, South Korea, Singapore, Iran, China, Turkey, Thailand and Mauritius.

Stage Five

The original Demographic Transition model has just four stages, but additional stages have been proposed. Both more-fertile and less-fertile futures have been claimed as a Stage Five.

Some countries have sub-replacement fertility (that is, below 2.1-2.2 children per woman). Replacement fertility is typically 2.1-2.2 because this replaces the two parents and boys are born more often than girls (somewhat 1.05-1.1 to 1) and adds population to compensate for deaths (i.e. members of the population who die without full reproducing, for example, in the age of 30-35, giving a birth just to one baby) with approx. 0.1 additional. Many European and East Asian countries now have higher death rates than birth rates. Population aging and population decline may eventually occur, assuming that the fertility rate does not change and sustained mass immigration does not occur.

In an article in the August 2009 issue of *Nature*, Myrskylä, Kohler and Francesco Billari argue that the previously negative relationship between "development", as measured by the Human Development Index (HDI), and birth rates has become J-shaped. The HDI is a composite of life expectancy, income, and level of education. Development promotes fertility decline at HDI levels below 0.9, but further advances in HDI cause a minor rebound in fertility. In many countries with very high levels of

development, fertility rates are now approaching two children per woman — although there are exceptions, notably Germany, Italy and Japan.

In the current century, most developed countries have increased fertility. From the point of view of evolutionary biology, richer people having fewer children is unexpected, as natural selection would be expected to favor individuals who are willing and able to convert plentiful resources into plentiful fertile descendants. This may be the result of a departure from the environment of evolutionary adaptedness.^[17] Thus, from the perspective of evolutionary psychology, the modern environment is exerting evolutionary pressure for higher fertility.

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What is Demographic Transition?

Over the course of human history, there have been many people who have been interested in the characteristics of the human population and the future of population growth. After analyzing how western populations have changed over time, one pattern was discovered that indicated there was a connection between population growth and the economic development of a country. It was observed that in countries with high standards of living the population grew at a slow rate, while in countries with low standards of living the population grew more rapidly.

This discovery resulted in the creation of the concept of **demographic transition**, which is a series of stages that a country goes through when transitioning from non-industrial to industrial. The demographic transition concept involves four stages that are based on changes to population size and social behaviors.

Stages of Demographic Transition

The first stage of the demographic transition is the pre-industrial stage. During this stage, the population is stable, with both high birth rates and high death rates. The death rates are high because there is increased disease, minimal medical care, poor sanitation, and limited food supplies. As a result of the high death rate, people tend to produce more offspring to try to compensate for the mortality. Although the birth rate and death rate can fluctuate slightly, overall they remain equal which results in zero population growth.

Following the pre-industrial stage is the transitional stage. During this stage, the human population begins to increase, due to high birth rates and declining death rates. The death rates are decreasing because as the country transitions into an industrial country, there are improvements in the economy and social conditions. These changes lead to the control of diseases, the production of more food, better jobs, and improved medical care and sanitation. As the death rates decrease, the birth rates remain high because people are still accustomed to producing more children, and during this stage they have more food and resources to support larger families. As a result of the

declining death rates and high birth rates, the human population will increase at a rapid pace.

The third stage of the demographic transition is the industrial stage, which is characterized by an increasing population with declining birth rates and low death rates. The death rates remain stable and low during this stage due to the continuation of the economic and social changes that improved the standard of living during the previous stage. During this stage, the birth rates begin to decline for many reasons. For the most part, people realize that they no longer have to produce large numbers of offspring because the offspring they do produce have a higher chance of surviving to adulthood. Many people also start to prefer smaller families, where they can concentrate more resources on less people and increase overall livelihood. The decline in birth rates also correlates with an increase in employment opportunities for women and the increased access to contraception. Although the birth rates are declining, the population continues to increase due to the low death rates and the momentum of the population from the previous stage. The high birth rates in the previous stage produced more overall people that will reach reproductive age, and even if they produce fewer offspring than previous generations, they are still adding to the population.