There are a number of different ways, taking different factors into account, to measure fertility rate.

LEARNING OBJECTIVE[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/issues/new/)]

* Examine the impact of fertility rates on society and the various ways fertility is computed and discussed

KEY POINTS[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/issues/new/)]

* + There are a number of different approaches to measuring [fertility rate](https://www.boundless.com/sociology/definition/fertility-rate/)—such as crude [birth rate](https://www.boundless.com/sociology/definition/birth-rates/) (CBR), general fertility rate (GFR), child-woman ratio (CWR), total fertility rate (TFR), gross reproduction rate (GRR), and net reproduction rate (NRR).
  + Fertility rates are influenced by a number of factors, including intentional measures such as [contraception](https://www.boundless.com/sociology/definition/contraception/) and major social events.
  + Demographers have posited a demographic-economic paradox, in which fertility rates [decline](https://www.boundless.com/sociology/definition/decline/) as countries become [more](https://www.boundless.com/sociology/definition/mores/) economically developed.
  + Almost universally, higher levels of [educational attainment](https://www.boundless.com/sociology/definition/educational-attainment/) correspond to lower fertility rates.

TERMS[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/issues/new/)]

* [fecundity](https://www.boundless.com/definition/fecundity/)

Ability to produce offspring.

* [contraception](https://www.boundless.com/definition/contraception/)

The use of a device or procedure to prevent conception as a result of sexual activity.

* [fertility](https://www.boundless.com/definition/fertility/)

The birthrate of a population; the number of live births per 1000 people per year.

EXAMPLE[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/issues/new/)]

* + [Replacement level](https://www.boundless.com/sociology/definition/replacement-level/) refers to the fertility rate needed to maintain a stable [population](https://www.boundless.com/sociology/definition/population/) size. Imagine that you have a fish tank with four fish, and that every year, one fish dies. In order to meet the replacement level, one new fish would have to be born every year to maintain a population of four fish over time. If three of the original fish were female and capable of laying an egg, they would have to exhibit a fertility rate of .33 to reach replacement level.

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FULL TEXT[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/issues/new/)]

In [demography](https://www.boundless.com/sociology/definition/demography/), fertility refers to the actual [production](https://www.boundless.com/sociology/definition/production/) of offspring, rather than the physical capability to produce, which is called [fecundity](https://www.boundless.com/sociology/definition/fecundity/). To estimate how quickly a population is growing, demographers must know how frequently people are added to the population by being born, so they measure fertility. There are a number of different approaches to measuring fertility rate—such as crude birth rate (CBR), general fertility rate (GFR), child-woman ratio (CWR), total fertility rate (TFR), gross reproduction rate (GRR), and net reproduction rate (NRR).

Period Measures

Crude birth rate (CBR) is the number of live births in a given year per 1,000 people alive at the middle of that year. General fertility rate (GFR) is the number of births in a year divided by the number of women of childbearing [age](https://www.boundless.com/sociology/definition/age/) (usually 15 to 49 years old, or sometimes 15 to 44 years old), times 1000. It focuses on potential mothers only, and takes the age distribution into account. Child-Woman Ratio (CWR) is the ratio of the number of children under 5 to the number of women 15-49, times 1000.

Cohort Measures

Age-specific fertility rate (ASFR) is the number of births in a year to women in a 5-year age [group](https://www.boundless.com/sociology/definition/group/), divided by the number of all women in that age group, times 1000. The usual age groups are 10-14, 15-19, 20-24, etc.

Total fertility rate (TFR) is the total number of children a woman would bear during her lifetime if she were to experience the prevailing age-specific fertility rates of women and survive until the end of her reproductive life . TFR equals the sum for all age groups of 5 times each ASFR rate. The TFR is a synthetic rate, not based on the fertility of any real group of women since this would involve waiting until they had completed childbearing. The TFR represents the average number of children a woman would have were she to fast-forward through all her childbearing years in a single year, under all the age-specific fertility rates for that year.

[Total Fertility Rate](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/images/total-fertility-rate/)

*[This map shows countries coded by total fertility rates, with 0-1 children at the bottom of the spectrum and 7-8 at the top. A number of factors, such as development index and religious tradition, contribute to variations in fertility rates.](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/images/total-fertility-rate/)*

The TFR (or TPFR—total period fertility rate) is a better index of fertility than the crude birth rate because it is independent of the age structure of the population, but it is a poorer estimate of actual completed [family](https://www.boundless.com/sociology/definition/family/) size than the total cohort fertility rate. In [particular](https://www.boundless.com/sociology/definition/particular/), the TFR does not necessarily predict how many children young women now will eventually have, as their fertility rates in years to come may change from those of older women now.

Gross reproduction rate (GRR) is the number of girl babies who would be born to a woman completing her reproductive life at current age-specific fertility rates. It assumes that all of the baby girls will grow up and live to at least age 50. Like the TFR, the GRR ignores [life expectancy](https://www.boundless.com/sociology/definition/life-expectancy/). It assumes that all women will survive at least until the end of their reproductive lives.

Net reproduction rate (NRR) starts with the GRR and adds the realistic assumption that some of the women will die before age 59; therefore they will not be alive to bear some of the potential babies that were counted in the GRR. NRR is always lower than GRR, but in countries where mortality is very low, almost all the baby girls grow up to be potential mothers, and the NRR is practically the same as GRR.

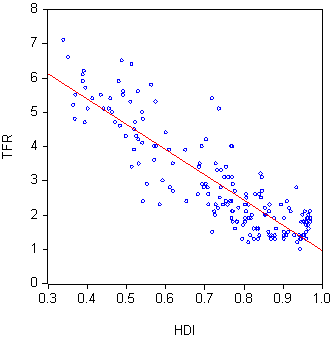
Factors Impacting Fertility

Human fertility depends on a long list of factors, including physical health and nutrition, sexual behavior, [culture](https://www.boundless.com/sociology/definition/culture/), instinct, endocrinology, timing, economics, way of life, and emotions. Fertility rates vary among countries and cultures because these factors vary. Demographers study the factors that affect fertility in order to better understand fertility patterns and their variance. Three of the major categories they study are physical health and nutrition, sexual behavior and human fertility, and political issues regarding childbirth and childrearing.

Population [Control](https://www.boundless.com/sociology/definition/control/)

The birth rate is an issue of concern for many governments and policymakers. Some, including those of Italy and Malaysia, seek to increase the national birth rate using pronatal measures such as financial incentives to new mothers. Conversely, other countries have policies to reduce the birth rate, such as China's former one-child policy.

In some places, government policies have been focused on reducing birth rates by improving women's sexual and reproductive health and rights. Typically, high birth rates have been associated with health impairments and low life expectancy, low living standards, low [status](https://www.boundless.com/sociology/definition/status/) of women, and low levels of education. There are claims that as countries go through [economic development](https://www.boundless.com/sociology/definition/economic-development/) and [social change](https://www.boundless.com/sociology/definition/social-change/), birth rate declines. Indeed, demographers consistently find that one of the strongest predictors of fertility rates is women's educational attainment. Almost universally, higher levels of educational attainment correspond to lower fertility rates.

[[](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/images/fertility-rate-and-human-development-index/)](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/images/fertility-rate-and-human-development-index/)

[Fertility Rate and Human Development Index](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/images/fertility-rate-and-human-development-index/)

*[Fertility has been found to correlate to human development index, with more developed countries having lower fertility rates than less developed ones.](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/images/fertility-rate-and-human-development-index/)*

Source: Boundless. “Fertility.” *Boundless Sociology*. Boundless, 30 Jun. 2016. Retrieved 12 Oct. 2016 from <https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/fertility-683-8680/>

Mortality rate measures the number of deaths in a population over a given period of time.

#### LEARNING OBJECTIVE[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/issues/new/)]

* Explain the various ways mortality is calculated, such as the crude death rate, infant mortality rate and life expectancy

#### KEY POINTS[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/issues/new/)]

* + Like [fertility](https://www.boundless.com/sociology/definition/fertility/), [mortality rate](https://www.boundless.com/sociology/definition/mortality-rate/) can be measured in a number of ways.
  + Specific measures of mortality include the [crude death rate](https://www.boundless.com/sociology/definition/crude-death-rate/), the [infant mortality rate](https://www.boundless.com/sociology/definition/infant-mortality-rate/), and [life expectancy](https://www.boundless.com/sociology/definition/life-expectancy/).
  + Infant mortality rates measure the annual number of deaths of chldren less than 1 year old per thousand live births.
  + Life expectancy measures the number of years that an individual at a given [age](https://www.boundless.com/sociology/definition/age/) can expect to live, given present mortality rates.
  + Different [causes of death](https://www.boundless.com/sociology/definition/causes-of-death/) become [more](https://www.boundless.com/sociology/definition/mores/) or less prevalent as countries become more economically developed, and death rates vary between countries.
  + Different causes of death become more or less prevalent as countries become more economically developed, and death rates vary between countries.

#### TERMS[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/issues/new/)]

* [crude death rate](https://www.boundless.com/definition/crude-death-rate/)

the total number of deaths per year per 1000 people

* [life table](https://www.boundless.com/definition/life-table/)

In actuarial science and demography, a life table is a table which shows, for each age, what the probability is that a person of that age will die before his or her next birthday ("probability of death").

* [Causes of death](https://www.boundless.com/definition/causes-of-death/)

The causes of death tend to vary between countries. For example, mortality due to malnutrition tends to be much higher in developing countries, whereas in developed countries, people are more likely to die of age-related diseases.

#### EXAMPLES[ [edit](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/issues/new/)]

* + If you have a tank of one thousand goldfish and 100 die in the first year, they exhibit a mortality rate, or crude death rate, of 100 deaths/1000 members of the [population](https://www.boundless.com/sociology/definition/population/), or 10%.
  + Men and women may have different life expectancies, so mortality rates can vary with the [gender](https://www.boundless.com/sociology/definition/gender/) distribution of a population. Thus, for example, the number of deaths per 1000 people can be higher for [developed nations](https://www.boundless.com/sociology/definition/developed-nations/) than in less-[developed countries](https://www.boundless.com/sociology/definition/developed-country/), despite life expectancy being higher in developed countries due to standards of health being better.

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Mortality rate is a measure of the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time. Mortality rate is typically expressed in units of deaths per 1,000 individuals per year; thus, a mortality rate of 9.5 (out of 1,000) in a population of 1,000 would mean 9.5 deaths per year in that entire population, or 0.95% out of the total. This measure is also called the crude death rate. As of July 2009 the crude death rate for the whole world is about 8.37 per 1000 per year according to the current CIA World Factbook.

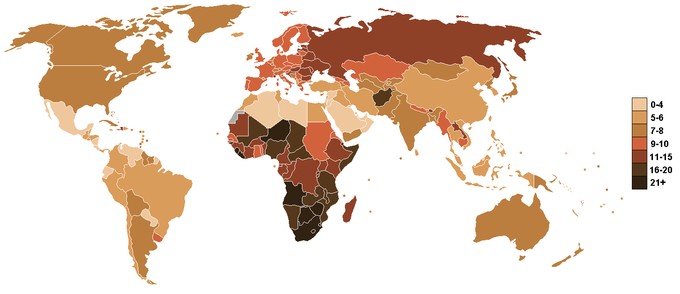
Just as demographers measure fertility in different ways, they also measure mortality in various ways. Some of the more common demographic measures of mortality include the crude death rate (the annual number of deaths per 1000 people), the infant mortality rate, or the annual number of deaths of children less than 1 year old per thousand live births, and life expectancy, which measures the number of years that an individual at a given age can expect to live, given present mortality rates.

Like fertility, mortality also depends on the age and gender distribution of a population. Older people are more likely to die, so countries with a higher proportion of old people may also have a higher mortality rate. Similarly, men and women may have different life expectancies; therefore, mortality rates can vary with the gender distribution of a population. Thus, for example, the number of deaths per 1000 people can be higher for developed nations than in less-developed countries, despite life expectancy being higher in developed countries due to better standards of health. This happens because developed countries typically have a completely different population age distribution, with a much higher proportion of older people, due to both lower recent [birth rates](https://www.boundless.com/sociology/definition/birth-rates/) and lower mortality rates.

To more accurately estimate mortality rates, demographers calculate age and gender specific mortality rates. These rates are compiled in a [life table](https://www.boundless.com/sociology/definition/life-table/), which shows the mortality rate separate for each age [group](https://www.boundless.com/sociology/definition/group/) and gender. A life table is necessary to give a good estimate of life expectancy.

Like fertility, mortality rates vary between countries, especially between developing and developed countries. Overall, [developing countries](https://www.boundless.com/sociology/definition/developing-country/) tend to have higher mortality rates, higher infant mortality rates, and lower life expectancies. The causes of death also tend to vary between countries. For example, mortality due to malnutrition tends to be much higher in developing countries, whereas in developed countries, people are more likely to die of age-related diseases.

[Sociologists](https://www.boundless.com/sociology/definition/sociologist/) have theorized that one of the best predictors of [longevity](https://www.boundless.com/sociology/definition/longevity/), or a high life expectancy, is education, even when other factors are controlled, people with more education tend to live longer. A few additional years of schooling statistically corresponds to several additional years of life expectancy and vastly improved health in old age. The mechanism through which this works is not the schooling itself, but rather schooling's [influence](https://www.boundless.com/sociology/definition/influence/) on other health-related behaviors. Education tends to lower the likelihood of smoking and engaging in unhealthy and high risk behaviors. Education also increases the probability of engaging in healthy behaviors, like exercise.

[[](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/images/crude-death-rate-by-country/)](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/images/crude-death-rate-by-country/)

## [Crude Death Rate by Country](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/images/crude-death-rate-by-country/)

*[The crude death rate is a measure of how many people per 1000 members of a population die each year. It varies between countries based on various economic, social, and environmental factors.](https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/images/crude-death-rate-by-country/)*

Source: Boundless. “Mortality.” Boundless Sociology. Boundless, 27 Jun. 2016. Retrieved 13 Oct. 2016 from https://www.boundless.com/sociology/textbooks/boundless-sociology-textbook/population-and-urbanization-17/population-dynamics-121/mortality-684-7855/