



# POPULATION PYRAMID

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## ABSTRACT

*Population typically refers the number of people in a single area whether it be a city or town, region, country, or the world. Governments typically quantify the size of the resident population within their jurisdiction by a process called a census (a process of collecting, analysing, compiling, and publishing data regarding a population). A population pyramid or "age-sex pyramid" is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically takes the shape of a pyramid when the population is growing. Males are usually shown on the left and females on the right, and they may be measured in absolute numbers or as a percentage of the total population. The pyramid can be used to visualize the age of a particular population. It is also used in ecology to determine the overall age distribution of a population; an indication of the reproductive capabilities and likelihood of the continuation of a species. There are three main trends in populations that affect the shape of a population pyramid. The first is when there are both high fertility and high mortality rates among younger members. This type of population, known as "expansive," creates a sharp triangle shape in the graph. Expansive pyramids mean that the population does not increase much in total number and has many young people. The second trend, known as "constrictive," is when there is a lower mortality rate with the fertility rate remaining constant. These population pyramids are wider in the middle of the graph as the population has high numbers of middle aged and elderly people, but fewer young people. The third trend is "stationary" which is a population with low mortality and low fertility rates. These graphs have a square or "pillar" shape rather than a pyramid one. These population pyramids represent a stable population that will not change significantly barring any sudden changes to fertility or mortality rates.*

**KEYWORDS:** *population, pyramid, graph, fertility, mortality, ecology, shape, age*

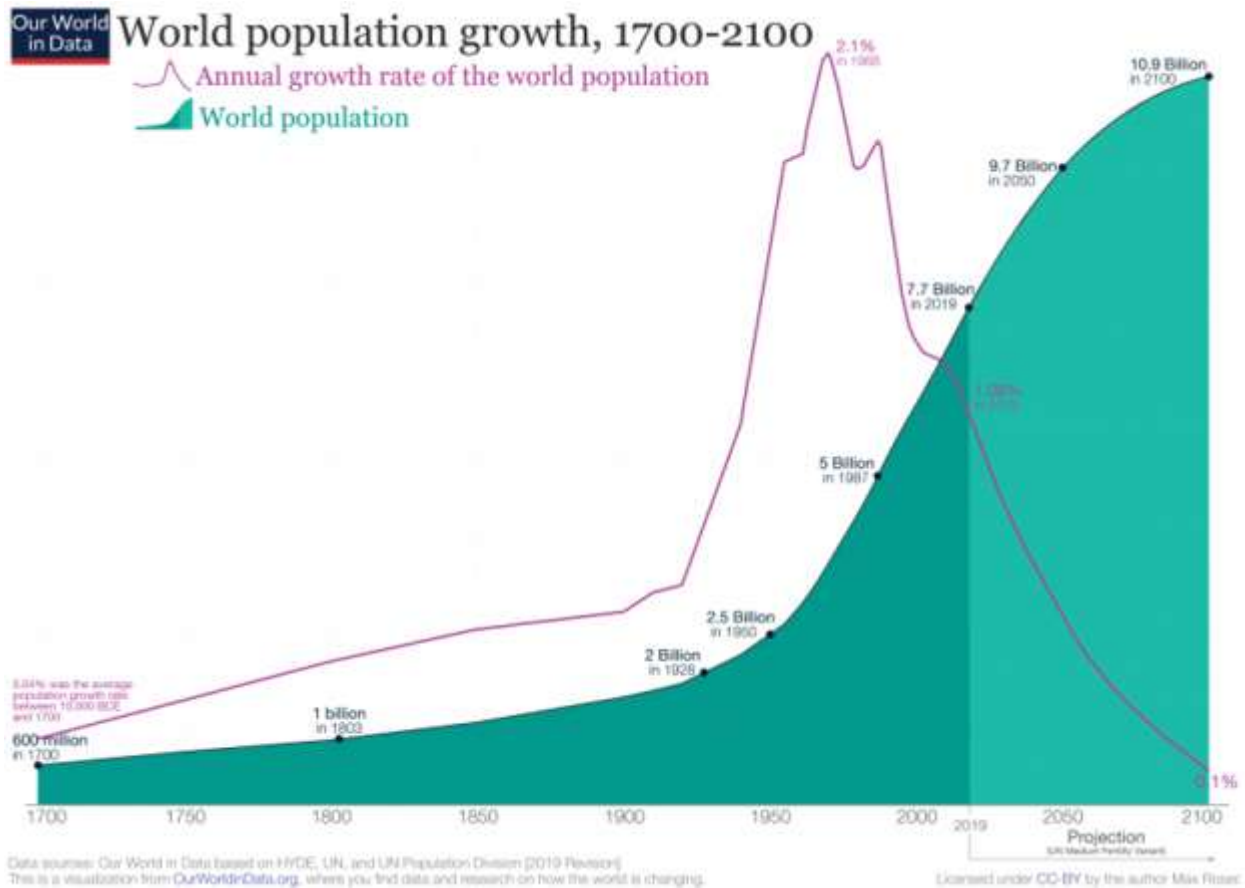
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## INTRODUCTION

In ecology, a population is a group of organisms of the same species who inhabit the same particular geographical area and are capable of interbreeding. The area of a sexual population is the area where interbreeding is possible between any pair within the area and more probable than cross-breeding with individuals from other areas.[1,2]

In ecology, the population of a certain species in a certain area can be estimated using the Lincoln index. Population pyramids are useful for studying the future of a region as well as examining historical and current population trends. If part of the population has been affected by sudden changes, such as casualties from armed conflict, high female mortality in childbirth, or the migration of young workers out of

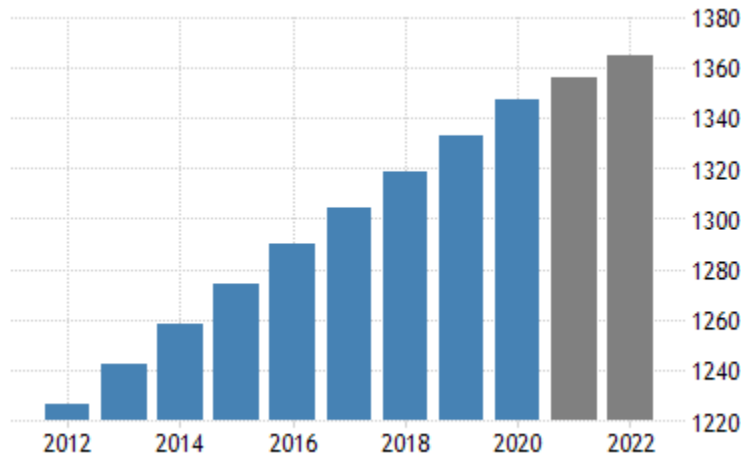
poorer regions, the graph will offer a way to visualize how the future population will be affected. They can also help direct government and private industry distribution of services for regions based on population needs. The population pyramid represents the breakdown of the population by gender and age at a given point in time. It consists of two histograms, one for each gender (by convention, men on the left and women on the right) where the numbers are shown horizontally and the ages vertically. The numbers by gender and by age depend on interactions between fertility, mortality and migrations. The shape of the pyramid and its variations over the years depend above all on the variations in fertility.[3,4]



## WORLD POPULATION GROWTH

In a population pyramid, the size of the population under investigation is depicted on the horizontal axis, and age is aligned on the vertical axis. The result is a series of bars stacked on top of one another, each representing an age category (typically in 5-year age groups), with the youngest age group represented by the bottom bar and the oldest age group by the uppermost bar. The horizontal length of each bar represents the number of individuals in the specific age group for the population depicted. The age groups that correspond to each bar are displayed along the central axis or along one side or both sides of the graph. Often

the years of birth for each age category are also displayed on the graph. To maintain proportionality, the age groups are the same size (e.g., 1-year, 5-year, or 10-year age groups), and the bars are all of equal height. The age (vertical) axis is often truncated at the age group 80 to 84, depending on the data available for the population depicted. For some populations, data for the older age groups are incomplete or inaccurate or there are few people in the older age categories. Population pyramids intended for comparison should be drawn to the same scale and should depict the same age categories.[5,6]



**INDIA POPULATION-2022 DATA**

**Observations**

LICs (Low Income Country) Developing Countries  
 This population pyramid is wide at the base, which means there are a large proportion of young people in the country. It tapers very quickly as you go up into the older age groups, and is narrow at the top. This shows that a very small proportion of people are elderly. This

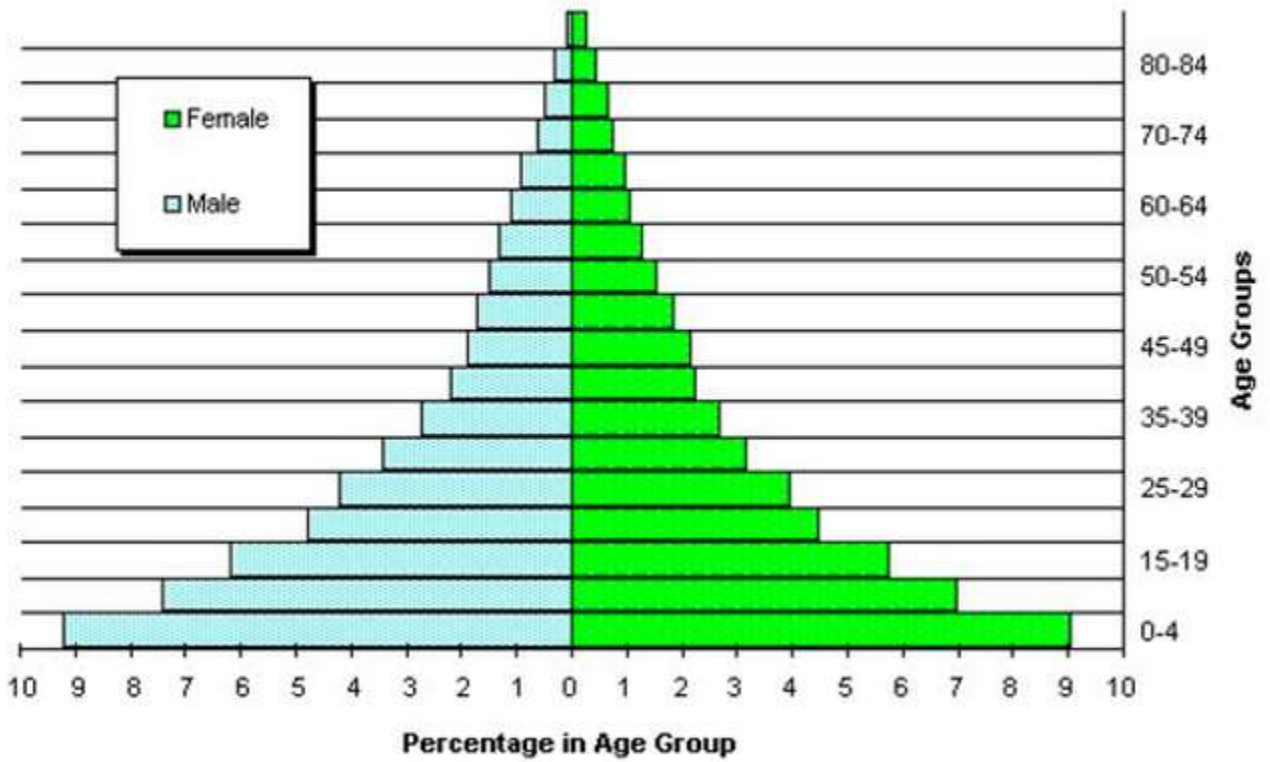
shape of pyramid is typical of an LIC, such as Kenya or Vietnam.

HICs (High Income Country) Developed Countries  
 This shape is typical of a developed country. It is narrow at the base, wider in the middle, and stays quite wide until the very top, as there is a sizable percentage of older people. Note that there are more old women than men. Italy and Japan have population structures that are of this shape[7,8]

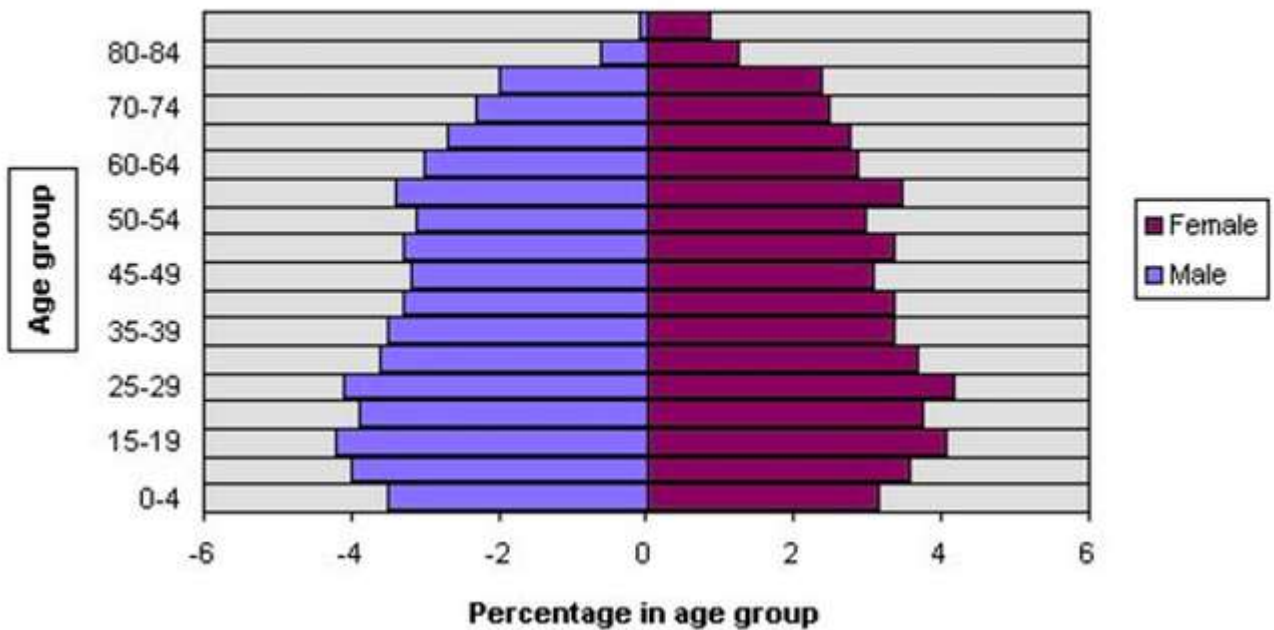




Population Pyramid for a Developing country



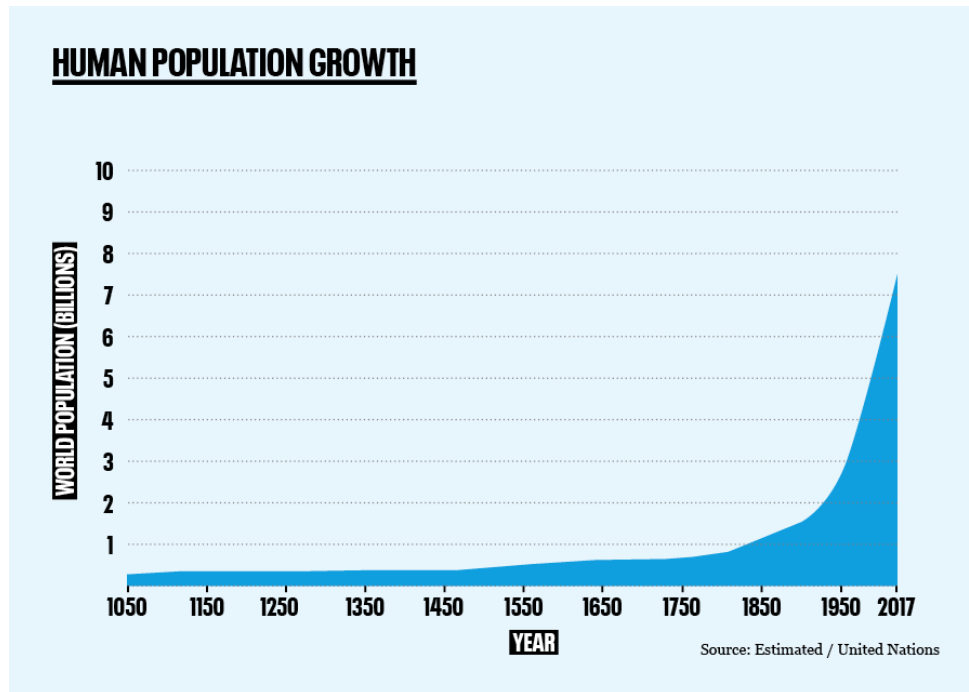
Population Pyramid for a Developed country





There are generally three types of population pyramids created from age-sex distributions-- expansive, constrictive and stationary. Examples of these three

types of population pyramids appear at the end of this report. [9,10] Definitions of the three types follow:



1. **EXPANSIVE** population pyramids show larger numbers or percentages of the population in the younger age groups, usually with each age group smaller in size or proportion than the one born before it. These types of pyramids are usually found in populations with very large fertility rates and lower than average life expectancies. The age-sex distributions of Latin American and many Third World countries would probably display expansive population pyramids.

2. **CONSTRUCTIVE** population pyramids display lower numbers or percentages of younger people. The age-sex distributions of the United States and Pennsylvania fall into this type of pyramid.

3. **STATIONARY** or near-stationary population pyramids display somewhat equal numbers or percentages for almost all age groups. Of course, smaller figures are still to be expected at the oldest age groups. The age-sex distributions of some European countries, especially Scandinavian ones, will tend to fall into this category.[11,12]

## DISCUSSION

Population trends

- Long-term trends of fertility and mortality rates:
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- Fertility rate:

- Important influence on the shape of the pyramid
- Represented by the width or base of the pyramid
- More children = broader base

- Death rate: slope of the pyramid

- Life expectancy: height of the pyramid

- Short-term trends and significant events:

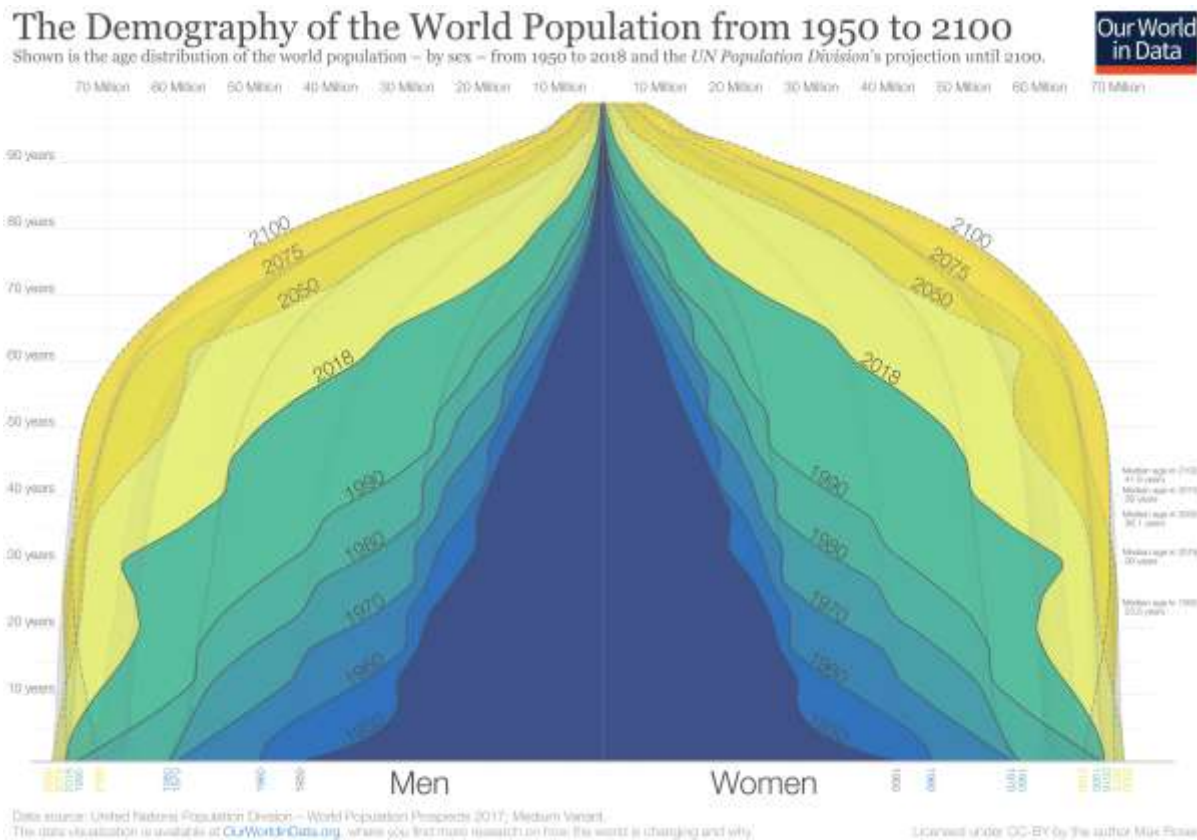
- Kinks or indents in the pyramid: indicate decline in birth rates or increase in death rates (e.g., wars, famine, disease)
- Bulges in the pyramid: indicate increase in birth rates (e.g., baby booms)

- Information about sex ratio of a population and effects of migration

- Data on future growth of the population:

- Median age of the population: lower median age, higher population growth[13,14]





In the darkest blue you see the pyramid that represents the structure of the world population in 1950. Two factors are responsible for the pyramid shape in 1950: An increasing number of births broadened the base layer of the population pyramid and a continuously high risk of death throughout life is evident by the pyramid narrowing towards the top. There were many newborns relative to the number of people at older ages. The narrowing of the pyramid just above the base is testimony to the fact that more than 1-in-5 children born in 1950 died before they reached the age of five. The change from 1950 to today and the

projections to 2100 show a world population that is becoming healthier. When the top of the pyramid becomes wider and looks less like a pyramid and instead becomes more box-shaped, the population lives through younger ages with very low risk of death and dies at an old age. The demographic structure of a healthy population at the final stage of the demographic transition is the box shape that we see for the entire world for 2100.[15,16]



## RESULTS

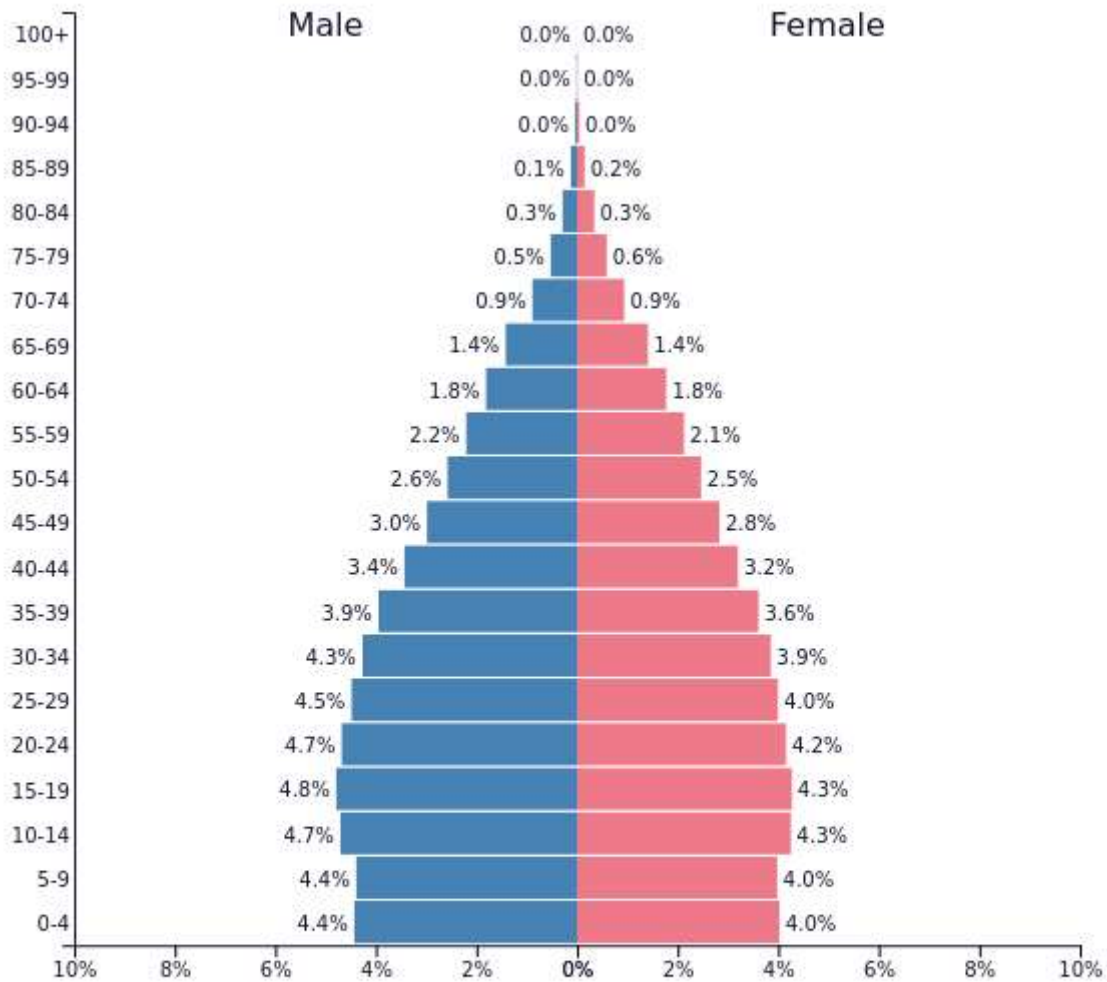
### Population of India



India is the second most populated country in the world with nearly a sixth of the world's population. According to the 2019 revision of the World Population Prospects the population stood at 1,352,642,280. In December 2021, India's population crossed 1.4 Billion. (The Worldometers clock page said "The current population of India is 1,399,716,988 as of Wednesday, December 15, 2021, based on Worldometer elaboration of the latest United Nations data." on December 16, 2021, after the population was already above 1.4 billion ). Between 1975 and 2010, the population doubled to 1.2 billion, reaching the billion mark in 1998. India is projected to surpass China to become the world's most populous country by 2024.[9] It is expected to become the first country to be home to more than 1.5 billion

people by 2030, and its population is set to reach 1.7 billion by 2050. Its population growth rate is 1.13%, down from 2.3% from 1972 to 1983, ranking 112th in the world in 2017.[17]

India has more than 50% of its population below the age of 25 and more than 65% below the age of 35. In 2020, the average age of an Indian is 29 years, compared to 37 for China and 48 for Japan; and, by 2030, India's dependency ratio will be just over 0.4. However, the number of children in India peaked more than a decade ago and is now falling. The number of children under the age of five peaked in 2007, and since then the number has been falling. The number of Indians under 15 years old peaked slightly later (in 2011) and is now also declining.[18]



PopulationPyramid.net

**India - 2021**  
Population: **1,393,409,032**

India's growth rate has declined significantly over the past few decades, attributed to growing urbanization, rising education levels, specifically among women, and At year 2022, population distribution of India is:

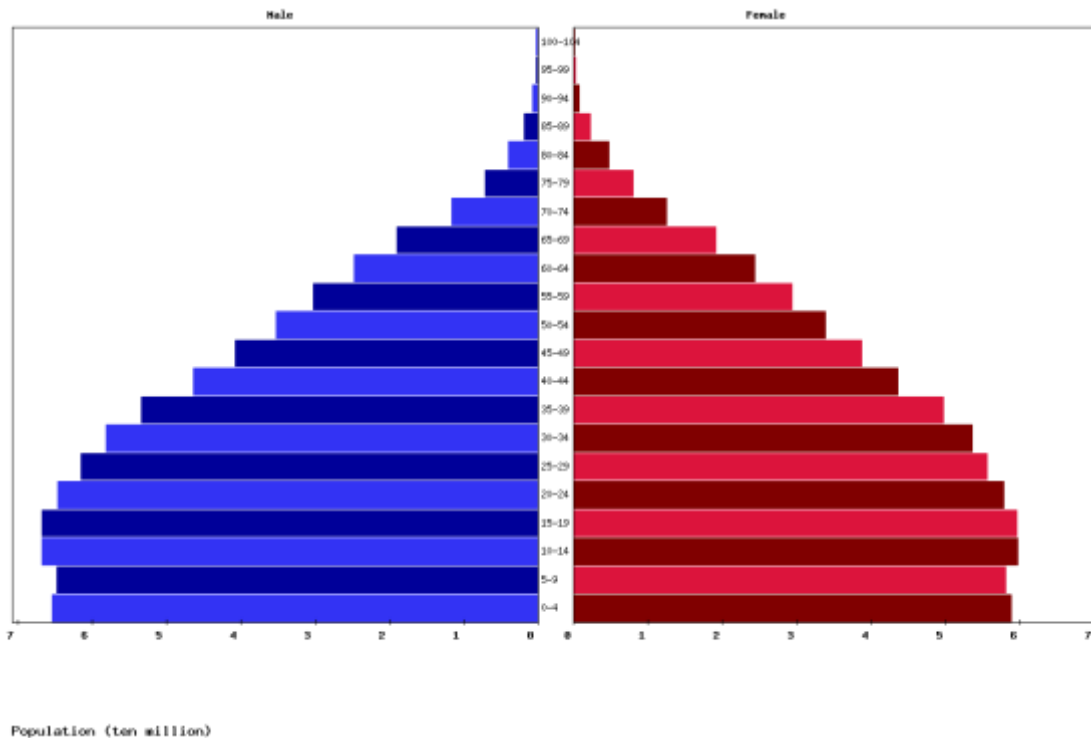
Total Population	1,406,631,781	100%
Young Population	356,733,454	25.36%
Working Age Population	951,807,838	67.67%
Elderly Population	98,090,489	6.97%

increasing alleviation of poverty. India's population continues to grow fairly steadily as the years progress.

Working age population will be less than 60% of total population at year 2093. Total population reaches its peak in 2059 at 1,651,349,931.[19,20]

The elderly population will account for 26.73% of India's population in 2100, population aging is serious.





## CONCLUSION

Population momentum, when a population's birth rates continue to increase even after fertility rate has declined to replacement level, can even be predicted if a population has a low mortality rate since the population will continue to grow. This then brings up the term doubling time, which is used to predict when the population will double in size. Lastly, a population pyramid can even give insight into the economic status of a country from the age stratification since the distribution of supplies is not evenly distributed through a population.

Because of population momentum the global population will continue to grow, although at a steadily slower rate, for the remainder of this century, but the main driver of long-term future population growth will be the evolution of the global average fertility rate.[21]

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