DEMOGRAPHY

ABSTRACT

Demography is the statistical study of human populations, focusing on their size, structure, distribution, and changes over time due to births, deaths, migration, and aging. The primary aim of demography is to study the size, composition, and distribution of human populations and how they change over time due to births, deaths, migration, and aging. As the world faces challenges such as aging populations, declining birth rates in some regions, and rapid population growth in others, demography remains essential for sustainable planning and development. Demography helps governments and organizations in planning resources, such as healthcare, education, housing, and employment opportunities, by providing insights into population growth or decline. Demography plays a vital role in community health nursing by providing essential data on population characteristics, health trends, and disease patterns. It helps nurses and healthcare professionals understand the composition of a community, including age distribution, birth and death rates, and prevalent health conditions. This chapter will discuss concept, scope, importance and different demographic indicators with challenges of demographic trends in India.

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I. INTRODUCTION

Demography is one of the populations of people statistically. It measures the dimensions and dynamics of populations. From birth to death, it explores the people's population statistically and mathematically described by statisticians. It helps to understand the societies, plan the future, and also implement the policies effectively in prescribed areas of health care, education, and urban development. India is the seventh-largest country by area with above 1.3 billion residents.

II. MEANING

The “Demography” word is derived from the Greek word

Demo means People

Graphy means description or writing

Demography is meant by the description or study of people. It is explained by interplays of birth, mitigation, and death.

III. DEFINITION

- Demography is defined as the statistical study of human populations: composition, their size and how they change through the interplay of fertility, mitigation and mortality.

- Wikipedia

- Demography is defined as the scientific study of population including understanding population dynamics and numbering the people.

– Emily Grundy

- Demography is defined as the statistical study of human populations, including their structure & change, the factors behind their dynamics and the consequences of population change.

– Jacques Vallin

- Demography is defined as the mathematical knowledge of populations, their natural and social history and their physical, civil, intellectual and moral conditions.

– AchilleGuillard

IV. HISTORY

 **John Graunt (1620-1674)**	**John Grauntis the founder of Demography**. He has developed early human statistical and census method that provided a framework for modern demography. He was one of the first demographer and first epidemiologist. He was published the book "Bills of mortality" in the year of 1662 (Old style) and 1663 (New style). Graunt's descriptional approach of data collection for the Bills of mortality also serves as an illustration of Graunt's use of scrutiny in assessing the data he was analysed.

- An ancient India in 300 BC may have a population range of 100 – 140 million.
- The population was believed to be at 100 million in 1600 and stayed relatively constant until the late 1800s. The census conducted in 1881 showed that it had grown to 255 million.
- When England started its census in 1800, the history of the census officially began. A census was carried out in a few British Indian towns and provinces using this methodology.
- India's first census was conducted in 1871, but the current one didn't begin until 1881. Since then, India's census has consistently produced population figures every ten years.

V. OBJECTIVES OF DEMOGRAPHY

1. To gain an understanding of the population's size, composition, organization, and dispersion.
2. To illustrate the current distribution, historical evolution, and anticipated population shifts in every region.
3. To secure future demographic assessments and the anticipated consequences of population growth in all regions.
4. To investigate population patterns and how they relate to the various aspects of the social system in all areas.

VI. CONCEPT OF DEMOGRAPHY

The concept of demography is based on the phenomenon that birth, migration, fertility, life expectancy and death.

- **Birth rate** is the number of live births per 1000 people in a population per year. When the birth rate is high, population also high.
- **Migration** is people moved from one place to another place. When the people are moving from living place, population size also affected.
- **Fertility** is one of the concepts of demography. Now a days fertility rate is decreased due to cause of lack of fertility, lack of conception, hormonal imbalance etc. it's affecting the population size and structure.
- **Life expectancy** is important to living people that processes in living human being without illness and sickness. Some morbidity issue leading the cause of less life expectation from birth to death.
- **Death** is major concept of demography. When birth rate is increasing, population will be increased. But the death rate is continuously increasing due to unknown reason of illness or pandemic situation. It leads changes in demography.

SCOPE OF DEMOGRAPHY

The scope of the study was wide in demography because demography causes show or rapid growth of birth rate. The following scope of demography is described here

1. Causes and changes in birth and death rate
2. Population growth
3. Sex and literacy ratio
4. Health rates and ratio
5. Dependency and independency ratio
6. Calculation of population
7. Size of population
8. Production and consumption
9. Socio economic status
10. Standard of leaving
11. Marital status and family composition

VII. IMPORTANCE OF DEMOGRAPHY

The importance of demography explains in the following

1. **Economy:** Economy is very important in studying the population. When population helps to know the rate of growth and how far growth rate of an economy is keeping, it considering the importance of demography.

2. **Society:** Rapid population growth causes number of issues for society, such as inadequate access to water and energy, transportation and communication, and lack of public and health education.

3. **Economic Planning:** Economic plan is also helping to collect data, formulating economic policy in country, fixing target of industrial and agricultural products and other educational institutions, hospitals etc.

4. **Administration:** Population studies are useful to run the government and non-governmental sectors in under developed countries. These economic and social problems are associated with the growth of population and find the solutions of this problem.

5. **Political System:** This democratic political system is on the basis of census figures pertaining to different areas done by the election commission of this country.

VIII. DEMOGRAPHY CYCLE

Demographic cycle is the process of five stages based on demographic transition model. These stages are in the following

Stages of Demographic Cycle	Explanation	Birth Rate	Death Rate
First stage (High stationary stage)	In this stage, marked by high birth rate and death rate. The population remains stable, when the country is economically weak. This stage was started from 1920 in India.	↑↑	↑↑
Second stage (Early expanding stage)	In this stage, begins with declining of death rate while birth rate still remains high. The Death rate decline is mainly due to improvements in food supply, health care and sanitation. At present, Asia and Africa countries are in this stage. The birth rate is also increased when the countries improved health care provisions and shortening period of breast feeding.		↓

Third stage (Late expanding stage)	In this stage, the death rate declines and birth rate begins to fall. The falling of birth rate is resulting from access to contraceptives, women empowerment. For Example, the birth rate of China and Singapore is too declined very fast. In India, this stage is to be appeared	↓	↓↓
Fourth stage (Low stationary stage)	In this stage, starts with low birth and death rate. Most of the countries of Sweden, Japan, Denmark, and Switzerland were in this stage due to this ageing population under this demographic transition model.	↓	↓
Fifth stage (Declining stage)	In this declining stage, is characterized that birth rate is lower than the death rate. The population begins with declining. Most of the north and east European countries under this stage still.	↓↓	↓

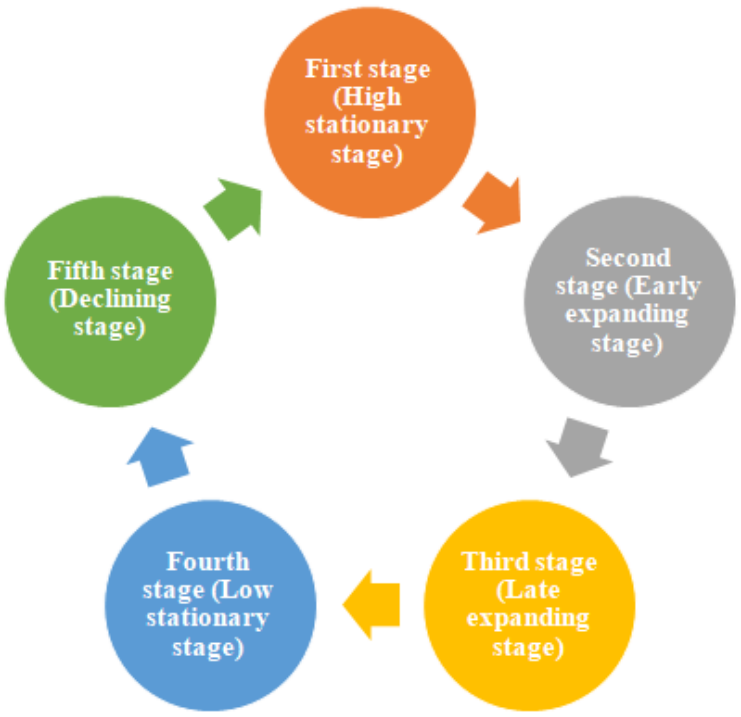
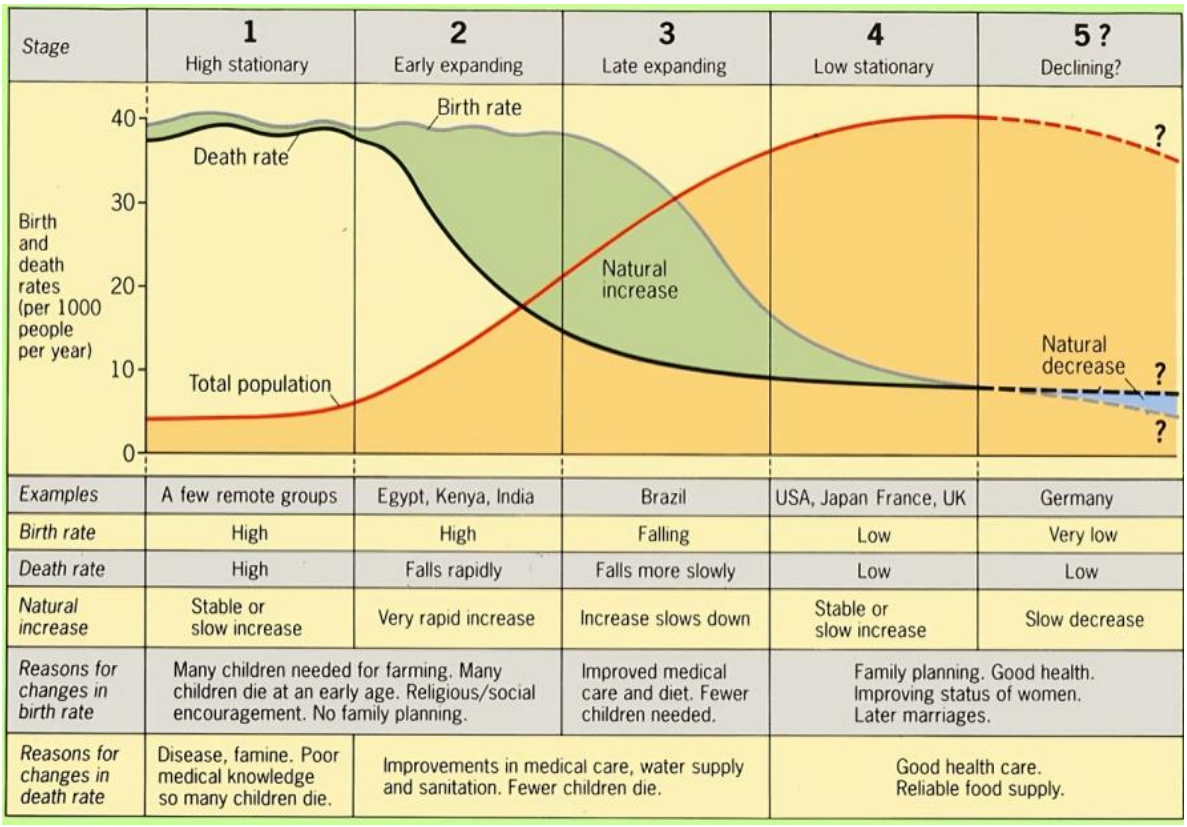


Figure 3: Stages of Demographic Cycle



IX. DEMOGRAPHIC INDICATORS

The demographic indicators are divided into the following statistics

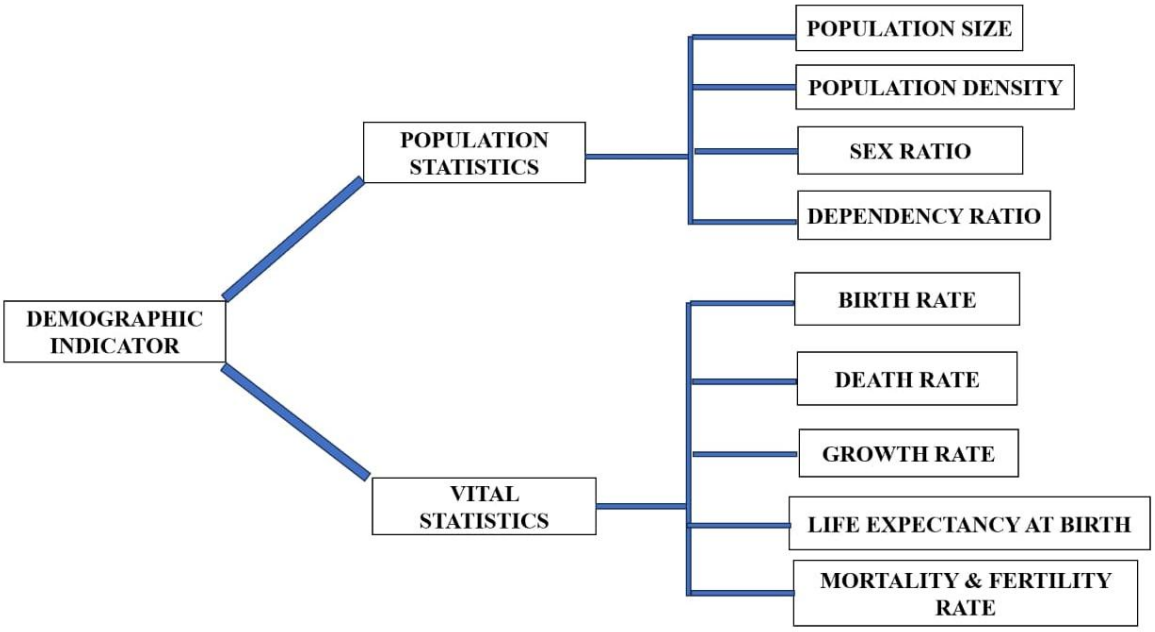


Figure: 4 Demographic Indicators

POPULATION STATISTICS	**1. Population size:** In India, the current population of people is 1.21 billion. The growth rate of population for India is in the last decade of 17.4%
	2. Population density: The population density was occupied 2.4% of the world surface area. It was supporting 17.5% of world population. Total density is 382 per square km.
	3. Sex ratio: The number of females per 1000 males in the population is used to calculate the sex ratio. The reason for the low sex ratio includes a strong preference for a male child, gender bias, neglect of a girl child, female foeticide (sex-selective abortion), male-dominated migration, and high MMR in population enumeration.
	4. Dependency ratio: Dependency ratio was calculated by the following formula For the year 2024, the young age dependency ratio is 47.9%, and also old age dependency ratio is 7.9%. Increased TDR and the cause of economic burden were the current burden of demography.
VITAL STATISTICS	**1. Birth rate:** Birth rate is the number of live births in a population over a specific period, usually expressed as number of births per 1000 people per year. Birth rate is an important demographic indicator of population growth and simplest indicator of fertility. $\text{Birth Rate} = \left(\frac{\text{Number of Birth in a Year}}{\text{Total Population}}\right) \times 100$
	2. Death rate: The death rate (mortality rate) refers to the number of deaths in specific population, typically measured per 1,000, over specific period. It reflects the overall health and well being of a population and is influenced by factors such as healthcare quality, lifestyle, and environmental conditions. $\frac{\text{Number of deaths during the year}}{\text{Mid} - \text{year population}} \times 1000$
	3. Population Growth rate: The growth rate also known as per capita growth rate is calculated by following formula. $\text{Population Growth Rate} = \frac{\text{New Population} - \text{Original Population}}{\text{Original Population}} \times 100$

	4. **Life expectancy at birth:** Life expectation at birth is the average number of years a newborn is expected to live, according to the mortality pattern prevalent in that country. In this world, 46.5 years in 1950, 68 years in 2024
	5. **Mortality & Fertility rate:** Mortality rate refers to number of deaths. In India, currently maternal and infant mortality rate is high due to the cause of hemorrhage, sepsis, and eclampsia. Maximum infant mortality rate in Madhya Pradesh and minimum infant mortality rate in Kerala from the statistics of 2024. $\text{IMR} = \frac{\text{Number of deaths of children less than one year of age in a year}}{\text{Number of live in the same year}} \times 100$ **Fertility rate:** the fertility rate is a demographic measure computed by the total number of children borne by a woman over her child bearing age (15 to 45 years). The total fertility rate gives an idea of total family size. The total fertility rate in India is 2.68 (NFHS – 3). Family size depends on the education of the couple, duration of the marriage, no of live births, contraception method, and socioeconomic status $\text{GFR} = \frac{\text{Number of live births in an area}}{\text{Mid year female population age } 15-44 \text{ (or 49) in the same area in same year}} \times 1000$

X. CHALLENGES OF DEMOGRAPHIC TRENDS IN INDIA

1. **Dependency Ratio Shift:** When the total fertility rate declines or falls in the dependency ratio and also the working age population results in a large sharing of elderly dependents. **For example:** China, Japan, and European countries have observed this shift in the dependency ratio

2. **Uneven Transition across States:** The fall level of fertility rate is not a uniform across all states in India. Uttar Pradesh, Bihar and Jharkhand are taking much time to achieve the level of fertility replacement.

3. **Labour Productivity and Economic Growth:** Labour productivity was increased and spurs economic growth while the demographic transition potentially. It also challenges in terms of managing the workforce and adequate skill of younger population.

4. **Increased Women Participation in Workforce:** The main challenges of women participation in workforce is increased due the reason for improving and promoting women empowerment and active participation of everywhere in India to in cultivate the situations of women problem.

XI. APPLICATIONS OF DEMOGRAPHY

1. **Population Health Indices:** It is applied in birth rate, death rate, average life expectancy and reproductive final parameters.

2. **Population Laws:** It is estimated of population reproduction laws and also uniformity of structure.

3. **Public Health Services:** It is planning, accommodation and forecasting of public health services in staff networks. It was based on the population size and structure.

4. **Medical Social Planning:** It is applied to estimate the effectiveness of medical social planning and forecasting.

5. **Statistical Analysis:** It is applicable to analysis the statistics of health, medical and operational planning of exact work.

XII. CONCLUSION

Demographic studies are gaining greater importance not only in India but all over the world. In fact, India's shifting demographics are creating a strong impulse for economic growth. Policy makers have various alternatives to make this potential demographic dividend a reality. At the same time, there arise many problems in India: a problem of poverty, of unemployment, significant increases in the demand for food and water and energy. So, to control population growth it was necessary.

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