**THE CONCEPT OF DEMOGRAPHY**

 Demography is the statistical study of human populations. It includes the study of the size, structure, and distributions of different populations and changes in them in response to birth, migration, aging, and death. It also includes the analysis of the relationships between economic, social, cultural, and biological processes influencing a population. Demographic data can be used by governments, academic researchers, and businesses. One of the most well-known examples of a demographic survey is the U.S. Census, which measures the U.S. population and is used to determine political representation as well as how funds are spent. Demography is widely used for various purposes and can encompass small, targeted populations or mass populations. Governments use demography for political observations, scientists use demography for research purposes, and businesses use demography for the purpose of advertising. Statistical concepts essential to demography include birth rate, death rate, infant mortality rate, fertility rate, and life expectancy. These concepts can be further broken down into more specific data, such as the ratio of men to women and the life expectancy of each gender.

 A census helps provide much of this information, in addition to vital statistic records. In some studies, the demography of an area is expanded to include education, income, the structure of the family unit, housing, race or ethnicity, and religion. The information gathered and studied for a demographic overview of a population depends on the party utilizing the information. In the United States, one of the best-known examples of demography is the U.S. Census. Every 10 years, each household is sent a survey containing questions about each household member's age, race, and gender, as well as information about how each household member is related. In addition to the Census, the American Community Survey is sent to a randomly chosen subset of Americans each year, in order to gather additional information (such as occupational status and education, for example). Responding to the Census (and to the American Community Survey, if one's household has been selected) is legally required, but there are policies in place to protect respondents' privacy. Census data is used by the federal government to determine how many members of the House of Representatives each state has, and it can impact how federal funds are spent. Additionally, many researchers analyse Census and American Community Survey data, which is known as secondary data analysis. Conducting secondary data analysis allows researchers to study demography even if their research group does not have the resources to collect its own demographic data.

**The Thomas Malthus Theory of Population**

 Thomas Malthus theorized that populations grew in geometric progression. A geometric progression is a sequence of numbers where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio. For example, in the sequence 2, 10, 50, 250, 1250, the common ratio is 5. Additionally, he stated that food production increases in arithmetic progression. An arithmetic progression is a sequence of numbers such that the difference between the consecutive terms is constant. For example, in series 2, 5, 8, 11, 14, 17, the common difference of 3. He derived this conclusion due to the Law of Diminishing Returns. From this, we can conclude that populations will grow faster than the supply of food. This exponential population growth will lead to a shortage of food. Malthus then argued that because there will be a higher population than the availability of food, many people will die from the shortage of food. He theorized that this correction would take place in the form of Positive Checks (or Natural Checks) and Preventative Checks. These checks would lead to the Malthusian catastrophe, which would bring the population level back to a ‘sustainable level.’ He believed that natural forces would correct the imbalance between food supply and population growth in the form of natural disasters such as floods and earthquakes and human-made actions such as wars and famines. To correct the imbalance, Malthus also suggested using preventative measures to control the growth of the population. These measures include family planning, late marriages, and celibacy.

 The Malthusian Trap (or “Malthusian Population Trap”) is the idea that higher levels of food production created by more advanced agricultural techniques create higher population levels, which then lead to food shortages because the higher population needs to live on land that would have previously used to grow crops. Even as technological advancement would normally lead to per capita income gains, theorizes Malthus, these gains are not achieved because in practice the advancement also creates population growth. Once the population exceeds what food supplies can support, this supposedly creates a Malthusian crisis with widespread famine as well as rampant disease which ends up decreasing the population to earlier levels.