Hunter College - CUNY
Dept. of Geography & Environmental Science
GEOG 101 Lecture Presentation Summary
Spring 2020

***NOTE**: In the absence of face-to-face lecturing and explanation of the material presented in the lecture slides, I will summarize the content of each lecture presentation stressing the concepts and interrelationships that are essential to an introductory geography course.*

If, after viewing the lecture presentation, the imbedded short videos and hot links to articles, and after reading this summary, you have any questions, would like to contribute a comment or two, need clarification by other examples or would like additional information on the topic, please do not hesitate to email me at agrande@hunter.cuny.edu.

LECTURE 20: Life on Earth: Population Geography 1

- **This lecture and the next looks at the geographic issues of studying a population.** Two lectures are condensed into one since I would normally use half a class period to go over Exam II; see the exam comments emailed to you and posted on BlackBoard. The next lecture deals with aspects of health and nutrition --medical geography -- and ends with a brief introduction to biogeography and ecology.

  There are many maps included in this series. The important thing is to look at patterns and trends, not the details. Any numbers/statistics that you need to know will be highlighted.

- **Slide 4 defines population geography** as the study of people in relation to their habitat and studies spatially their distribution, make-up, movement, well-being and growth potential. In contrast demography is the study of a population using statistics and is more likely to be found in a Sociology program.

- **Slide 5** is a *qualitative choropleth map presentation* showing the distribution of the world' people by their location, not by country. The colors show density per square mile/kilometer and the yellow dots indicate the location of selected urbanized areas with over a million people. **So as geographers we ask the questions:** *Why does this pattern exist? Why did people select these areas to live? What conditions allowed for populations to grow there?* and *Why do some areas have extremely low population densities?*

- **Slides 6 and 7.** We look at the numbers relating to where people live. **About 50% of the world's people occupy only 5% of the land,** 95% of the people are on 40% of the land and 60% of the land has only 5% of the world's people. Of all the people on earth, 55% are found in East and South Asia, 15% in Europe and 5% in eastern North America with another 7% concentrated in scattered locations. So, **over 80% of the world's people live in high-density situations, and they need food, water, various resources and living space.**

- **Slide 8** is a *quantitative choropleth map presentation* showing country populations (not true distribution) from the *Population Reference Bureau*. *Use the hot link to reach the interactive map and scroll over the countries to get specific information. Do the same for the sim-*

ilar maps included in this lecture. The world's 10 most populated countries in 2019 are shown. China (1.4 billion) and India (1.3 billion) are the largest by far, with the USA, Indonesia and Pakistan following.

- **Slide 9** is from *World Population Review*, a different source. The web site is interactive and updates population figures on a regular basis. Every country in the world is listed. I'm showing you the 10 most populated countries. The first 2 columns compare 2019 and 2020. The next 2 columns give the country's area and population density (here it is people per sq. km.). The 5th column is the current annual growth rate in percent. The 6th column tells what percent of the world's people live within its borders. Note that China and India account for over 36% of the world people. Also note the population density of Bangladesh compared to that of Russia. The two countries have similar populations, but Bangladesh (#92 in area) is much smaller than Russia (#1 in area), thus the country's extremely high population density. *Bangladesh suffers from loss of land due to river and coastal flooding. Sea level rise will greatly impact Bangladesh's living space by flooding areas with salty ocean water, ruining farmland and contaminating fresh water supplies.*

- **Slide 10 is a *cartograph* of world population.** Compare the cartograph to the standard map projection at the upper left to recall land area. You can go back to the interactive material in Slide 9 to look the numbers for the examples I have included at the lower left.

- **Slide 11** is the *UN Population Division's* estimate of **natural population growth rates** through 2100. This is based on crude birth rate and death rate estimates and does not take into account any migration (into or away). Russia, Eastern Europe and Japan are all shown as losing population. African countries show the highest gains. *NOTE: On its mapping page the UN Population Division uses a sliding bar so you can see past mapped statistics back to 1950 and projections to 2100.*

- **Slides 12 and 13 explore the reasons behind settlement and higher population densities.** These factors are variables that people have employed over time to decide where to settle and are they are able to exist at higher densities in the area selected. We talked about the first seven in Part II of the course. Item 8 will be addressed under health and nutrition. All the natural factors and their use/interaction by people, are modified by people's development of technology and economic principles employed. They are also influenced by historical circumstances (including natural hazard occurrence, colonization and war) and cultural parameters, including human perception and ideology.

- **Slide 14.** The first thing we need to focus on is **food supply**. Without ample supply of food (and fresh water) people cannot exist in large numbers close to each other. These two maps compare population density and naturally fertile areas which most easily support agriculture. Notice the similar patterns. Most clearly is the Nile River Valley of Egypt and Sudan with high population density and fertile land that cuts through desert lands. Without the Nile's fresh water and annual flooding there would be no one living there.

- **Slide 15-17. It all boils down to habitat decisions: finding a viable and safe place to live.** We all need food, water, shelter, a variety of resources, living space and, what we usually forget, a place to dispose of all our wastes – bodily waste and discarded materials: *It has to go somewhere and if we don't do this properly, unsanitary conditions leading to sickness and death may result!* People make choices based on perception and experience. **We are influenced by PUSH - PULL - STAY factors that are defined in Slide 16.** *Remember these terms for economic and urban geography. They will come back.* **Slide 17** lists some of the variables that influence the Push-Pull-Stay factors. These factors may motivate the migration of people within an area and/or away from an area as they seek better conditions for themselves and their families.

- **Slides 18-20 bring population dynamics into the picture.**

- With **Slide 18** we return to the population distribution map and now **focus on how to evaluate a population**. The data we need are <u>numbers of people</u> (headcount), <u>concentration of people</u> (density) and any other information that will help us to <u>assess the quality of life</u> of these people.

- **Slide 19.** We ask the questions: *Where are the people located? What is the growth rate (positive or negative) they are experiencing? How are they grouped and how do they interact within their location? What is the proportion of people living in cities as opposed to those living in rural areas?* Finally, we need to address the relationship between people and their local environment. *How is the resource base (food/water/shelter) holding up in face of the needs of the people?* and *How is people's use of resources affecting the area's carrying capacity, i.e., the quality of habitat? You can insert the Bangladesh example here, too.*

- **Slide 20.** Here are two simple, yet extremely important, terms: **carrying capacity** and **overpopulation.** An assessment of carrying capacity allows us to evaluate the quality of a habitat to support life. (This may be applied to any living space, human or non-human.) When carrying capacity is reached, the quality of life decreases. That area is now said to be overpopulated. So, the **definition of overpopulation is simply too many people for the resources available.** This applies to animal habitats, too. <u>There is no number attached to this.</u> The more resources available for use, the greater the population that can be supported and vice versa. One person placed on a sand dune in a desert has just overpopulated that sand dune: there is no food, no water, no shelter. *(During this shelter in place period for Covid-19 many of us may feel that the carrying capacity of our apartment (living space) has been exceeded and maybe even become overpopulated as we run low on food, reach data caps and have less private space.)*

- **Slide 21.** This leads us into a discussion of population growth and the earth's ability to support more people. To answer these questions, we need data. **Demography – the statistical study of a population – helps us do this**. *We need to be careful of the numbers and know the source. UN statistical information is not always reflective of the situation because member countries provide the data.*

- **Slides 22-23.** The graph illustrates **population growth throughout history**. Growth was slow and steady over time until the late 1700s, when world population began to increase rapidly over a short period of time. This turned the gentle upsloping graphic into a **J-curve**. What caused the dramatic uptick that gave the graph its distinctive name? <u>*Newly developed technologies in engineering, understanding of science and advances in medicine slowed the death rate, including infant mortality*</u>.

- **Slides 24-25.** Using currently collected statistics and looking at historic circumstances and trends, population geographers and demographers can start to make *guesstimates* of what the earth and its regions will be like in the future: headcount and carrying capacity. Remember: these estimates are based on current situations and parameters. We could not have foreseen the impact of AIDS in southern Africa or now know how the Covid-19 virus pandemic will impact the future. On **Slide 24** notice that the rates of increase are different for the more developed and less developed areas. On the pie graphs, note how the regions of the world have different rates of growth. **Slide 25** shows the Population Reference Bureau's estimates of areas that will experience the largest increases in headcount between 2018-2050 and those that will decrease size. ***View the interactive map and data charts but no need to memorize anything there.***

- **Slide 26** returns to the population density slide and the question about evaluating a population.

- **Slides 27-36 focus on aspects of the worldwide population change scenario.** The links are interactive so you can look at individual countries by hovering the cursor over a country outline, or where available on the source home page, select and click on a region to review. From here you are able to do comparative studies.

- **Slides 27-28: Population change**. Here we see what happened in the recent past (last 5 years, 2015-2020) and project to the year 2050. The past uses real data; the future is based on presumed scenarios.

- **Slide 29: World Birth Rates (BR) and Death Rates (DR).** BR and DR vary with culture and circumstances. Advances in technology lower the death rate but not the birth rate because the birth rate is cultural and takes a longer period to change (as opposed to getting one vaccine, for example, that prevent a person from becoming ill and dying). Notice that the BR and DR maps are near mirror images of each other. The reason places have higher death rates could be a result of either an older population (age structure) or lack of medical care, proper nutrition and/or poverty.

- **Slides 30-31: Total Fertility Rate (TFR) and Zero Population Growth (ZPG).** TFR and ZPG are two concepts that people studying population use to gage the future. **TFR** projects the number of children child-bearing women could have in their life-time. The younger and larger the population, the greater the potential for a high number of babies being born. The graph at the bottom right shows scenarios with different TFR rates. **Slide 31** is the world TRF map. Note that some areas of Africa have TRFs of 5-7 children per child-bearing age females.

ZPG is the policy of maintaining a replacement population: for every mother and father (2 people), two babies will be born. Any higher number increases the population; any lower number reduces it. *That is why Singapore and China enforced the "one child policy" to slow population growth. Now both are encouraging larger families because the projected number of adults in 20 years will not match the needs of the country (workers/elder care providers/tax revenues/strain on social services, etc.).*

- **Slides 32-36: Changing age structure.** This graph shows the change in age structure of the world's people from 1960 projected to 2050. Age structure affects quality of habitat (stress on the environment), economic viability (workers) and social services (dependencies). The world's population on the whole is living longer and reaching older ages. *Dependency ratios at both ends (very young/very old) are increasing putting a burden on people in the middle of the age groupings. See the following slides.*

- **Slide 33 shows the percent of population under 15 years old.** This ties into the TFR. Note that most of Africa (with Southwest Asia following) has 40%+ of its people under 15 years old and ready to enter child-bearing age.

- **Slide 34 shows infant mortality rates.** Again, Africa (with Southwest Asia) has the highest percentage rates. This leads to higher birth rates because you are not sure your baby will survive the first year. It goes hand-in-hand with TFR and eventually the death rate. However, once medical technology reduces infant mortality and the death rate, a "population explosion" may result. A **population explosion** is when the there's a great difference between the BR and DR in a short period of time. Usually, it is caused when the DR is quickly reduced by technology but the BR lags behind because its cultural characteristic. More people are alive adding to overall numbers.

- **Slide 35 shows the percent of population over 65 years old.** Notice the difference from the other two maps.

- **Slide 36: Life Expectancy is the final map in the series.** One map is for males, the other for females. If a baby survives infancy, that person can expect to live the average number of years color-coded for his/her country. Note that Africa has people with the shortest life expectancy. *Check out the BR/DR maps on Slide 29.*

- **Slides 37-38: Population Pyramids.** The make up of a population by age and sex can be graphed. This is a helpful tool that allows a snapshot of a location's population similar to a climograph that allows us to see a snapshot of the climate of a location. **An ideal population pyramid is a triangle**: wide at the bottom; narrow at the top. The triangle is composed of parallel layers that contain numbers of males and females within age groups. Many people are born each year (base layer) and every year people of all ages die reducing the size of those layers. Each layer has less people with the smallest group consisting of the number of oldest people at the very top of the triangle. Every year people in each age group move up the pyramid, losing members along the way. The pyramid changes shape depending on the number of people in each age group. Variables governing shape include the following: during wartime, the male side loses more people than the female side; during a pandemic, both sides lose people; women tend to outlive men so the female side of the top of the pyramid is wider than the male side; etc.; etc. **Slide 38** illustrates age/sex groups for different areas of the USA. *See textbook page 218-19.* NOTE: When viewing a population pyramid take note of the following: size of age group (usually 5 year-intervals but could be 10-year), method of representation (usually percentage by could be headcount), and male side vs female side (sometimes reversed).

- **Slides 39-44 link population to economic activity.**

- **Slide 39: Malthusian Theory.** Malthus theorized in 1798 that the world would run out of food and anarchy would happen because population was increasing at such a rapid rate in Europe. He calculated that population growth was so much faster than the growth of agricultural production. Of course, he could not image the growth of technology with the industrial revolution and its positive affect on agriculture.

- **Slide 40 begins the discussion of the Demographic Transition Model.** Here the J-curve (Slide 22) becomes and S-curve when carrying capacity is reached and population growth slows and levels off (plateaus). The J-curve returns when new technologies are invented and methods implemented that allow people to live healthier and longer lives. <u>**Slide 41** pairs BR and DR with economic development</u>. In Stage 1: Agrarian Society there is a high BR and high DR so population remains stable. Industrialization (technology) drops the DR in Stage 2. Remember that because of its cultural nature, the BR is slower to react to technological developments and lags behind (the gap is the population explosion) until urbanization (Stage 3) takes root. In Stage 4 a highly developed society has a low BR and DR and stability returns. When a population is dominated by older people (Stage 5; DR higher than BR) the population goes into decline, as does economic development (no workers/high dependency). **Slide 42** is from your textbook (Fig. 6-10) and is the same themed diagram as Slide 41.

- **Slide 43 compares BR/DR and economic development in developed and developing countries.** The affect is slower and gradual in developed area where technology and methodology were invented and tried out. Developing countries benefited from success but also where subjected to more stress by the proven fixes that may have worked too well and dropped the DR too quickly.

- **Slide 44: Homeostatic Plateau.** This diagram shows J-curves and S-curves in relation to technological developments: agricultural revolution, industrial revolution, urbanization, medical revolution. How long can this go on? What is the next magic trick? Will it be biotechnology to genetically modify foodstuffs (see chapter 9)?