2.4 (Part 1) Population Dynamics
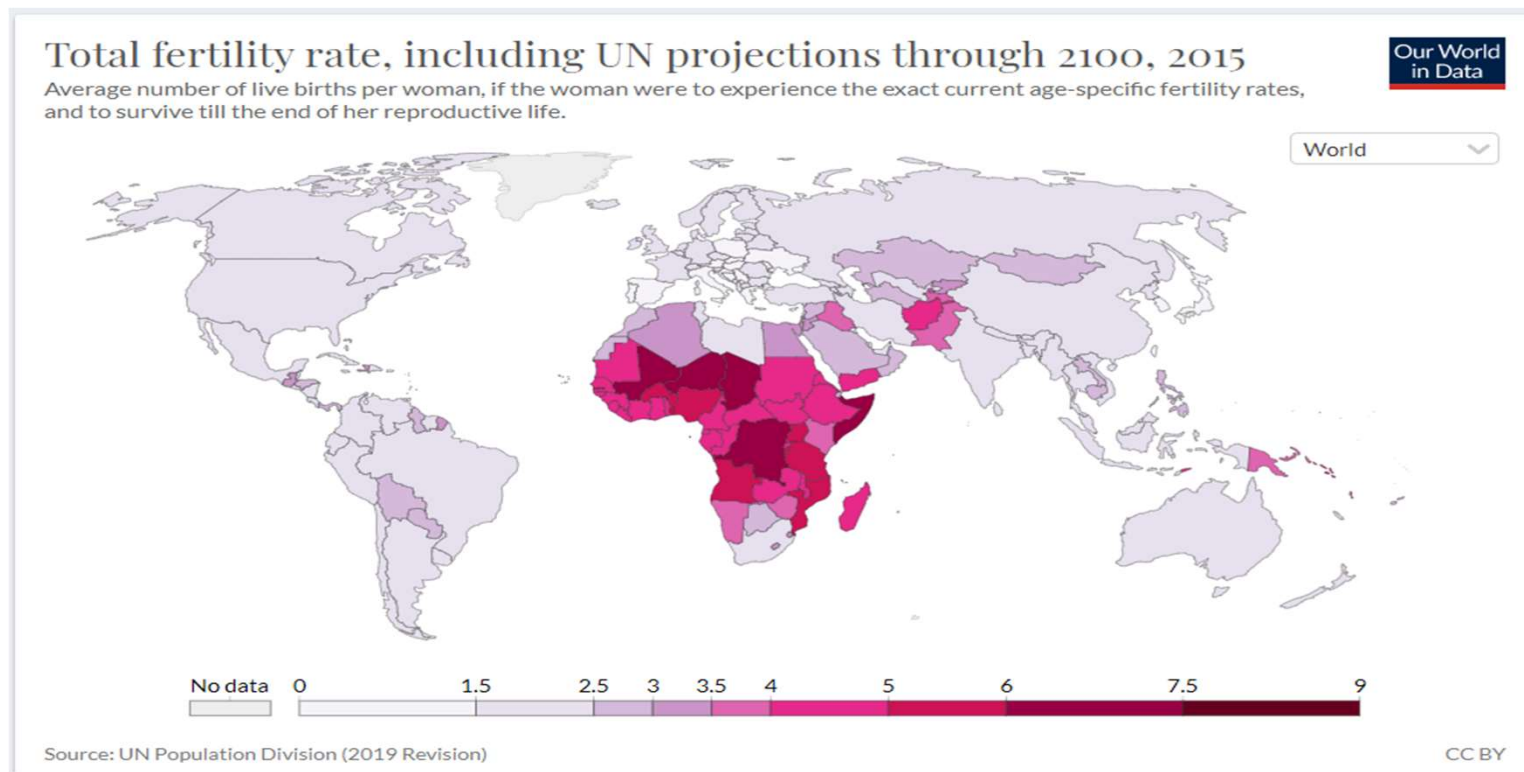
Objective and Essential Learning

2.4 Explain factors that account for contemporary and historical trends in population growth & decline.

- Demographic factors that determine a population's growth and decline are fertility, mortality and migration.
- Geographers use the rate of natural increase and population doubling time to explain population growth and decline.
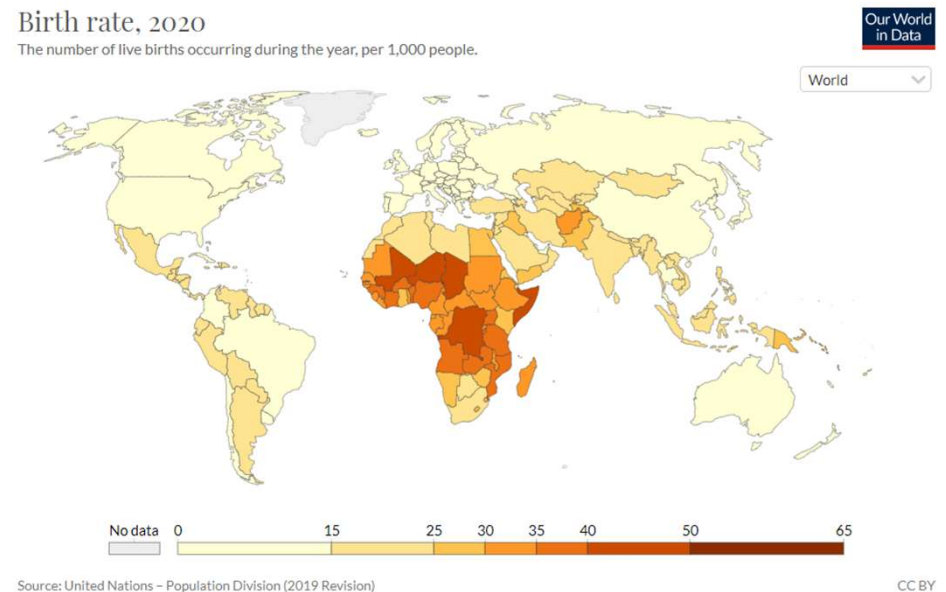
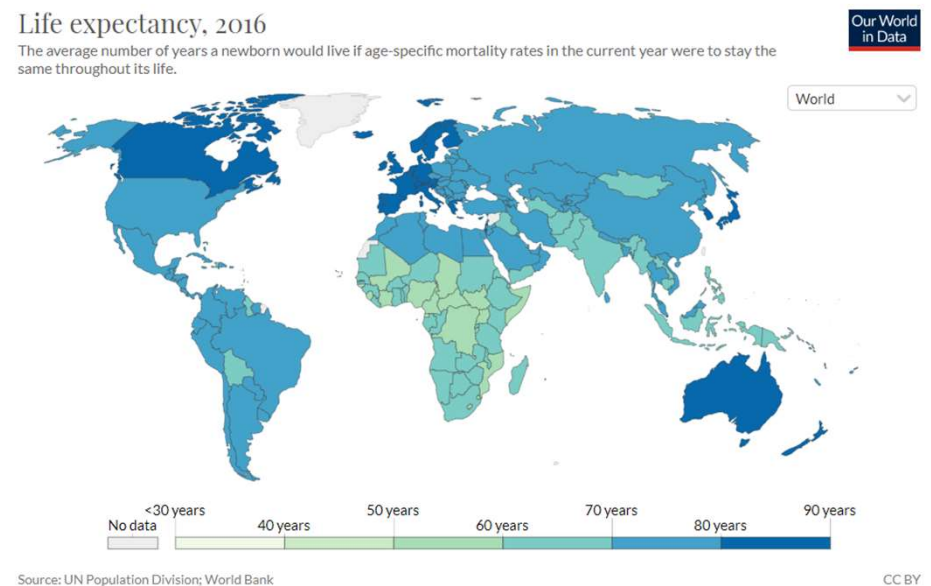# What factors determine a population's growth & decline?

Total fertility rate, including UN projections through 2100, 2015

Average number of live births per woman, if the woman were to experience the exact current age-specific fertility rates, and to survive till the end of her reproductive life.

Our World in Data

World

No data   0   1.5   2.5 3 3.5 4   5   6   7.5   9

Source: UN Population Division (2019 Revision)

CC BY

Fertility

a. Crude Birth Rate (CBR)
   i. The number of live births occurring in one year per 1,000 people.

b. Total Fertility Rate (TFR)
   i. Average number of children who would be born per woman during her childbearing years.
   ii. Globally TFR has been significantly decreasing over time.

Birth rate, 2020
The number of live births occurring during the year, per 1,000 people.

No data 0   15   25 30 35 40   50   65

Source: United Nations – Population Division (2019 Revision)   CC BY

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Mortality

a. Life Expectancy
   i. The number of years the average person will live.
   ii. This has been steady increasing over time, which has contributed to population growth.

b. Crude Death Rate (CDR)
   i. The number of deaths occurring in one year per 1,000 people.

Life expectancy, 2016

The average number of years a newborn would live if age-specific mortality rates in the current year were to stay the same throughout its life.

Our World in Data

World

<30 years
No data   40 years   50 years   60 years   70 years   80 years   90 years

Source: UN Population Division; World Bank

Mortality
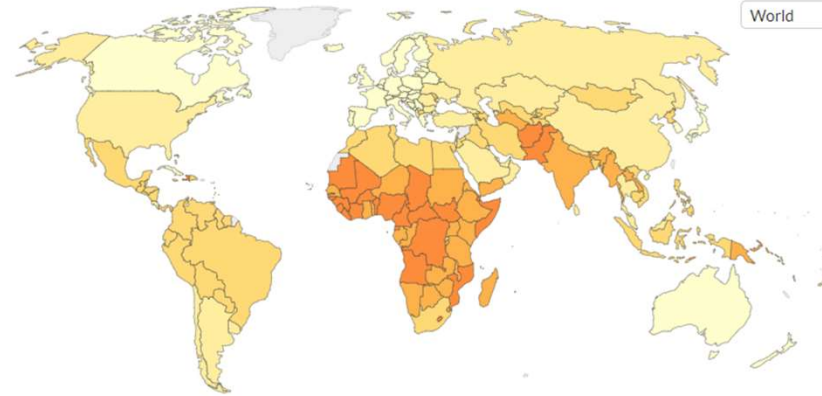
c. Infant Mortality Rate (IMR)

    i. The number of children who die before one year of age.

    ii. Typically, when IMR goes down, life expectancy goes up which leads to higher population growth.

Infant mortality rate, 2017
The share of newborns who die before reaching one year of age.

Our World in Data

World

No data 0% 0.5% 1% 3% 5% 10% 15% 20% 30%

Source: UN Interagency Group for Child Mortality Estimation (IGME)

OurWorldInData.org/child-mortality/ • CC BY

How do geographers calculate population growth & decline?

a. **Natural Increase Rate (NIR)** *or* **Rate of Natural Increase (RNI)** – shows the popluation growth within a coutry
   i. Does not account for migration.
   ii. Can be a negative number, indicating population decrease.
   iii. Usually expressed in a percentage
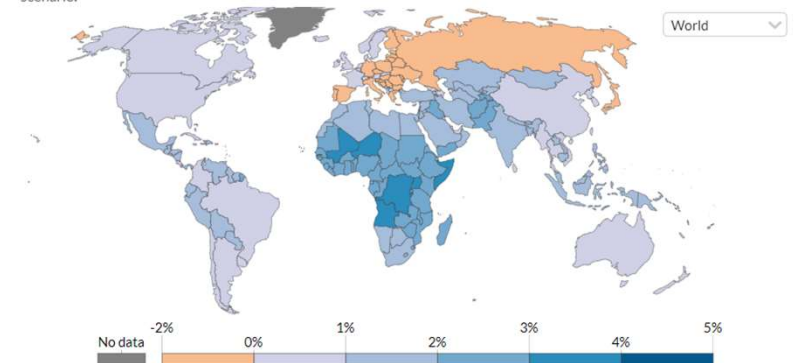
$$\frac{CBR - CDR}{10}$$

Natural population growth, 2020

Natural population growth is the population increase determined by births and deaths. Migration flows are not taken into account. This is shown from 1950, with UN projections to 2099 based on its median scenario.

Our World in Data

World

No data   -2%   0%   1%   2%   3%   4%   5%

Source: United Nations – Population Division (2019 Revision)   OurWorldInData.org/world-population-growth/ • CC BY

b. Doubling Time: The number of years in which a population will double assuming the growth rate remains stable.

$$\frac{70}{NIR} \qquad \frac{70}{0.41\%} = 175 \text{ years}$$

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2.4 (Part 2)
Population Dynamics

Objective and Essential Learning

2.4 Explain factors that account for contemporary and historical trends in population growth & decline.

- Social, cultural, political, and economic factors influence fertility, mortality and migration rates.
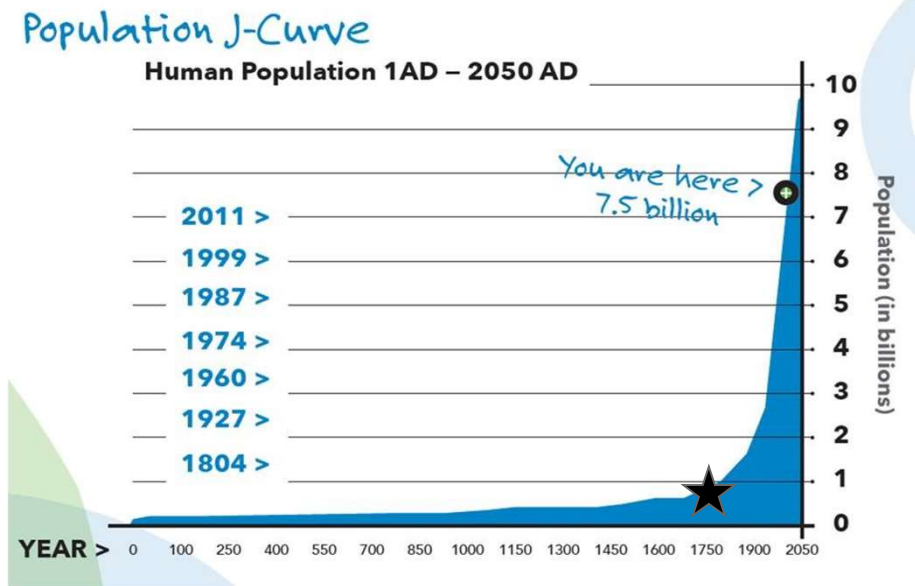
2.8 Explain how the changing role of females has demographic consequences in different parts of the world.

- Changing social values and access to education, employment, health care, and contraception have reduced fertility rates in most parts of the world.
- Changing social, economic, and political roles for females have influenced patterns of fertility, mortality....

Historical Trends in Population Growth & Decline

- **What created the population boom?**

- **When did the population boom ?**

- **Where is most population growth taking place?**

Source: https://www.populationconnection.org/talking-about-population-growth/

What causes population to grow & decline?

ECONOMIC

Population Growth
- Agricultural societies
  - Need children to labor on the farm
- Advancements in food production & nutrition
  - Mechanization of agriculture
  - Farming efficiency
- Advancements in sanitation
  - Less water contamination & disease
  - Water treatment plants
  - Garbage pickup
- Economic prosperity
- Access to healthcare
  - Core countries provide better healthcare services
    - Prevention & cure of disease.
    - Women have access to pre & post-natal care

What causes population to grow & decline?

ECONOMIC

Population Decline
- Industrial & post-industrial society
  - Women more involved in the workforce
  - Urbanization -> small living quarters
- Economic hardship
  - Children are expensive, provision of food & resources
- Access to healthcare
  - Women have access to contraceptives

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What causes population to grow & decline?

Population Growth

- Religion
  - Traditional cultures encourage big families
  - Restriction of contraceptive use and abortion.
  - Earlier marriages = more children

SOCIAL

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What causes population to grow & decline?

SOCIAL

<mark>**Population Decline**</mark>

- Role of Women - Education & Workforce
  - Cultural expectations have changed in many MDCs -> more women in the workforce/education -> postpone having children -> reduction in child bearing years -> less children.
- Healthcare
  - How to care for babies -> lower IMR, CDR, higher life expectancy
  - Access & understanding of contraception -> lower TFR

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