

Human Population Growth

The History of Human Population Growth

Years Elapsed	Year	Human Population
3,000,000	10,000 B.C.E. (Agricultural Revolution)	5-10 Million
10,000	1 A.D.	170 Million
1,800	1800 (Industrial Revolution)	1 Billion
130	1930	2 Billion
30	1960	3 Billion
15	1975	4 Billion
12	1987	5 Billion
12	1999	6 Billion
13	2012*	7 Billion
13	2025*	8 Billion

* Projected; Source: U.S. Census Bureau, International Data Base

HUMAN POPULATION GROWTH CHART

(including projections)

I THINK I CAN...
I THINK I CAN...
I HOPE I CAN...
I REALLY HOPE I CAN...
MAN, HOPE I CAN...

POP. IN BILLIONS

12.5

10

7.5

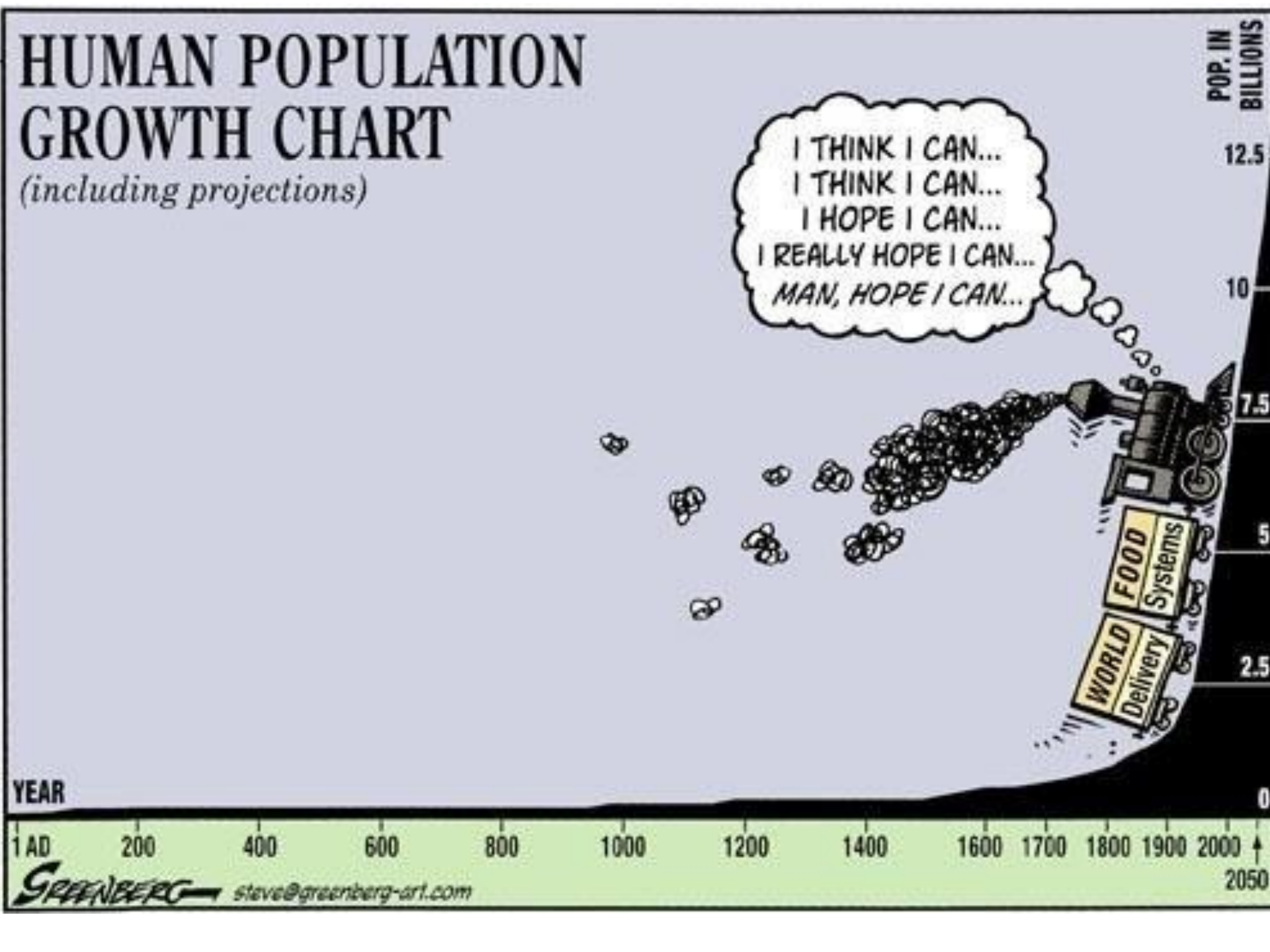
5

2.5

0

YEAR

1 AD 200 400 600 800 1000 1200 1400 1600 1700 1800 1900 2000 2050



List 3 things → exponential growth in
the 20th century

- Industrial revolution
- Better sanitation
- Modern medicine

Define sustainable

- Development that is good for the environment, people and economies now and in the future

Hans Rosling TED talk

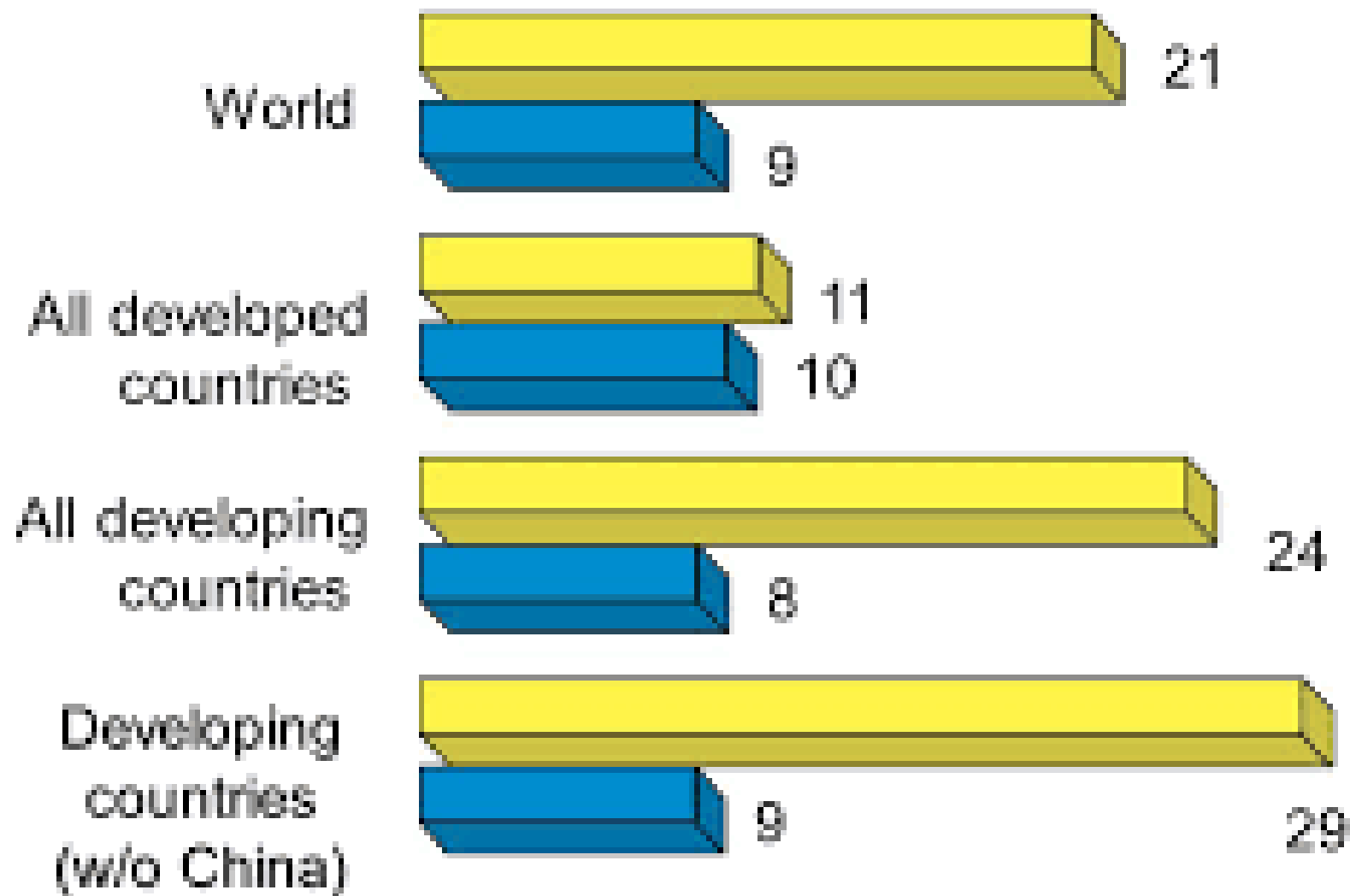
- http://www.ted.com/talks/lang/eng/hans_rosling_on_global_population_growth.html
-

Define crude birth and crude death

- Crude birth = births/1000
- Crude death = deaths/1000

Crude Birth
Rate CBR

Crude Death
Rate CDR



Mathematically state why human population growth growing

- Birth rates are higher than death rates

Use 2017 population sheets →
doubling time for each of the following

- World
- More developed world
- Less developed countries
- Less developed countries - China

Birth Rate terms

Replacement-level fertility =

- number of children that a couple should have to replace both parents (= 2.1 - 2.5)
- Needs to be higher if there is high infant mortality

Total fertility rate (TFR) =

- average number of children that a woman will have over her reproductive years (0 - 5+)
- 2017 world TFR = _____
 - _____ in developed countries
 - _____ in developing countries (excluding China)

Watch: World in the Balance “India”

List factors affecting fertility rates

- Education and employment opportunities for women
- Cultural / social / religious beliefs (ex: desire for boys in a patriarchal society)
- Importance of children in labor force
- Infant mortality (access to health services for children)
- Access to birth control (abortions/ birth control)

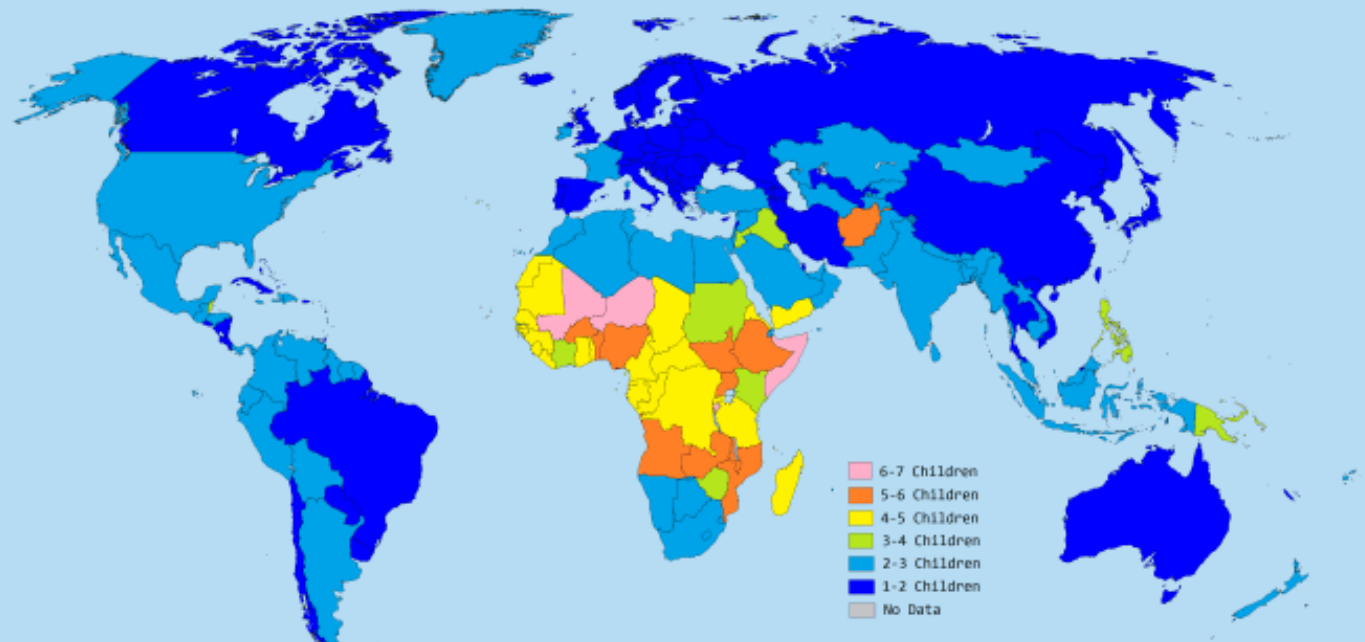
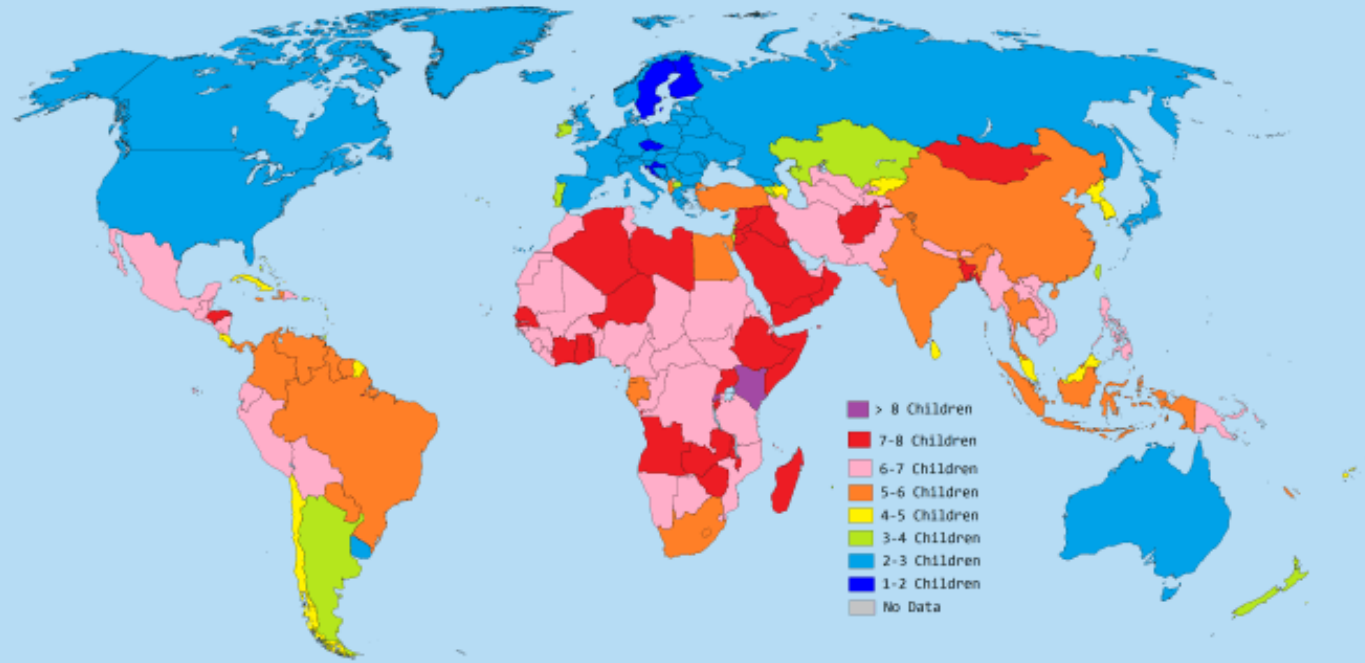
What is the single most important way
to decrease TFR in a country

- Education and jobs for women

Use the graphic on the next slide to answer the following

- What has happened to TFR around the world from 1970-2014?
- Which countries still have high TFR?

Fertility Rates in 1970



Fertility Rates in 2014

Population Growth →

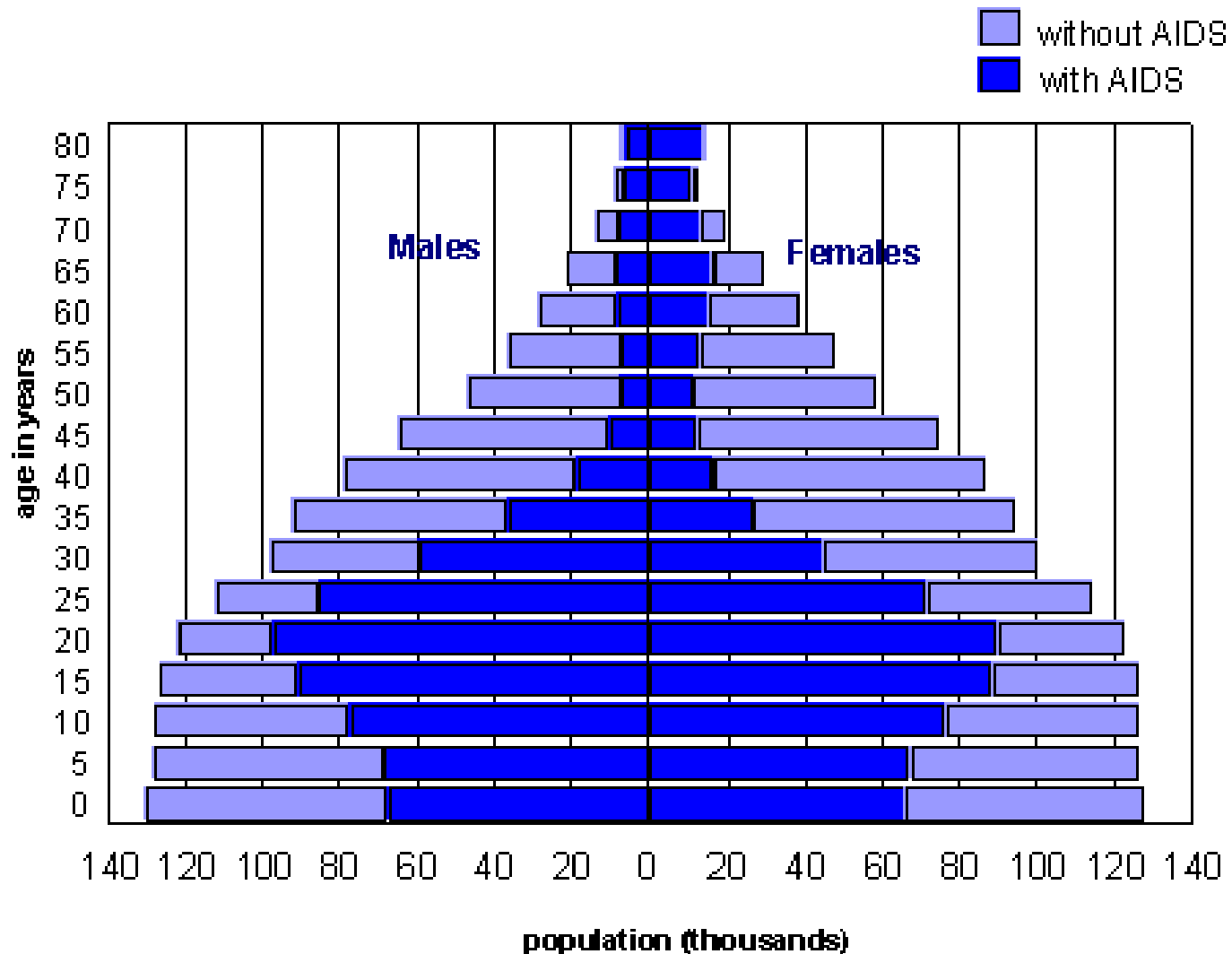
- Stress on Water and Food resources
- Need for jobs
- If needs are not met → more crime and political instability

Watch: World in the Balance “Sub-Saharan Africa”

Sub-Saharan Africa

- Affected by AIDS mortality → inc. death
 - 19.4% So. African pop. Living w/AIDS (23.7% women)
 - HIV = virus infects T lymphocytes →
 - decreased ability to fight infections and control cancer → AIDS

- High fertility rates in Sub-Saharan Africa →
- Pyramid shaped age structure diagram → growth



Too much growth →

- Dec. in living conditions → increase in conflicts and environmental crises
- Deforestation threatens ecosystems and native people depending on those ecosystems for survival

Demographic transition curves

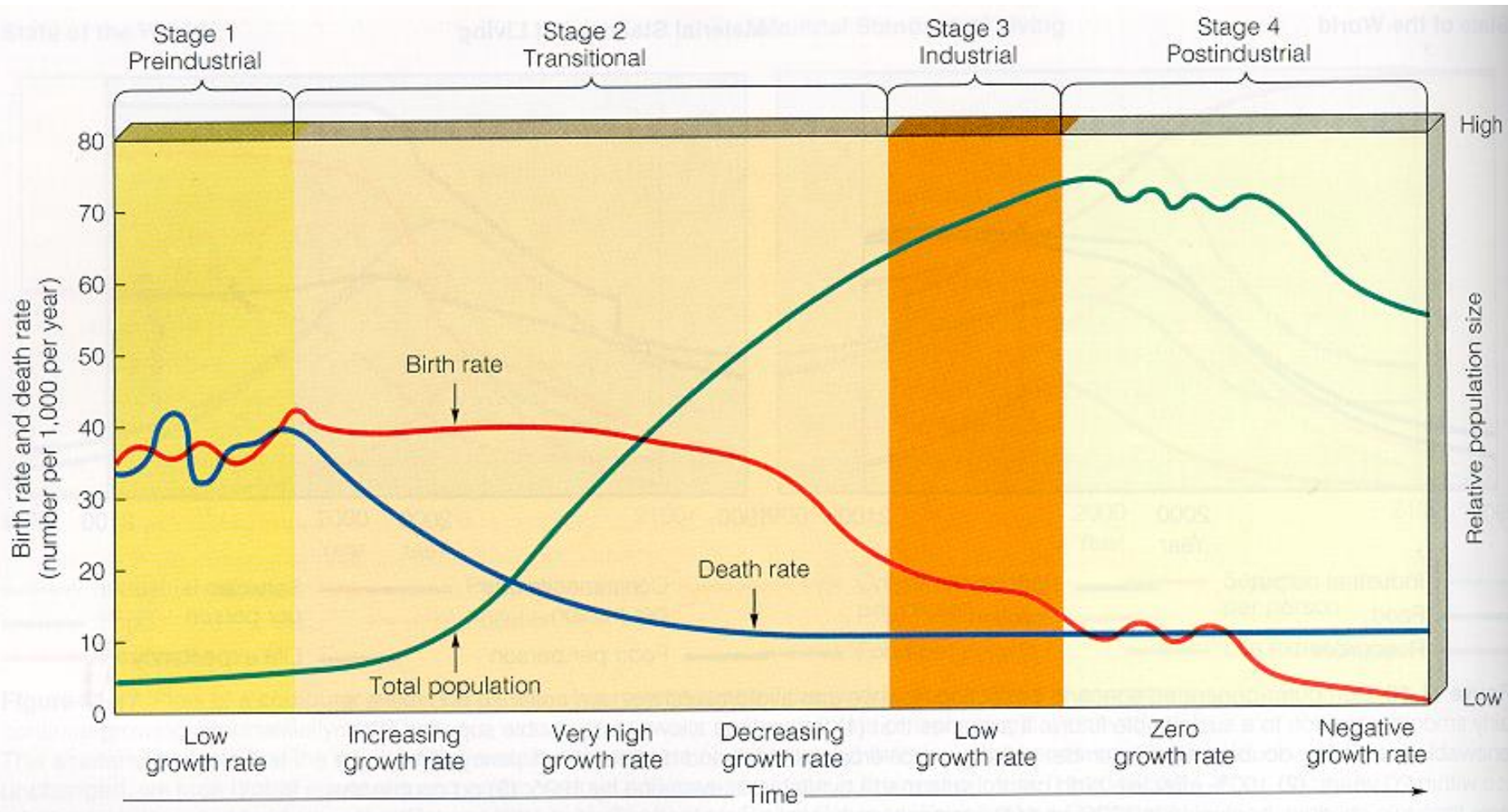
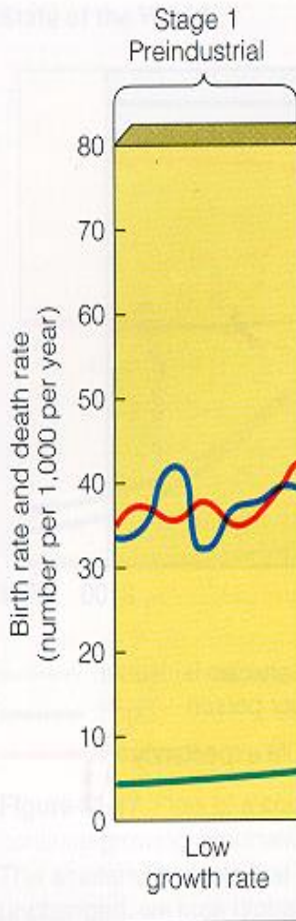


Figure 11-19 Generalized model of the demographic transition.

Stage 1: Preindustrial



- High birth rate
- High infant mortality rate (IMR) → high death rate
- Births = deaths →
- ZPG = zero population growth

Figure 11-19 Generalized

Stage 2 Transitional

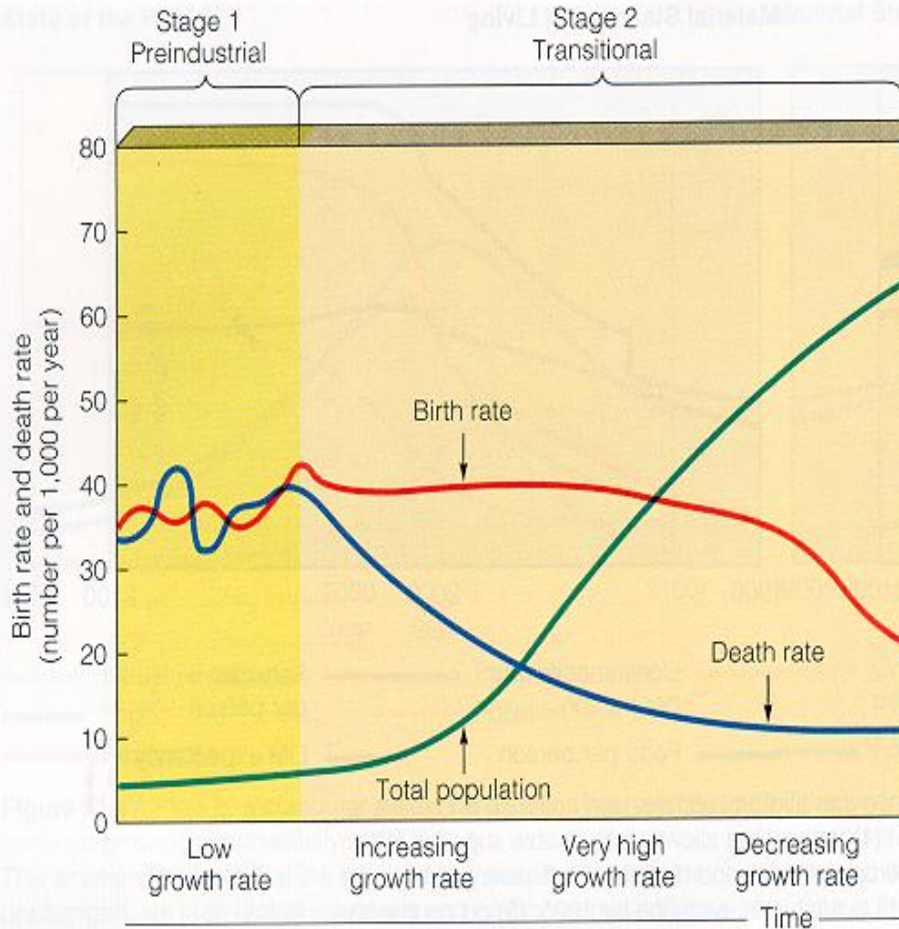
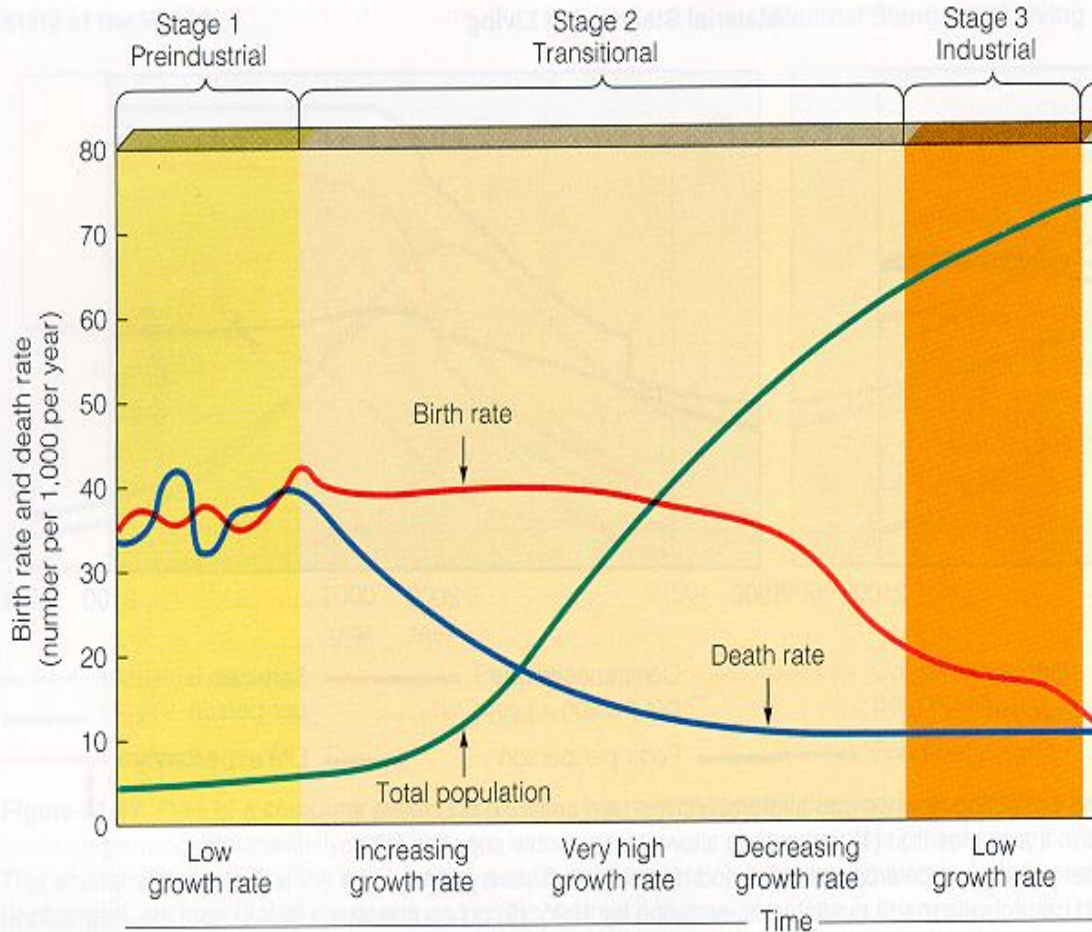


Figure 11-19 Generalized model of the demographic transition.

- Industrialization → more food and medicine
- Death rates decrease
- Birth rates remain high →
- Rapid population growth
- Goal is to get through this stage as quickly as possible

Stage 3 Industrial

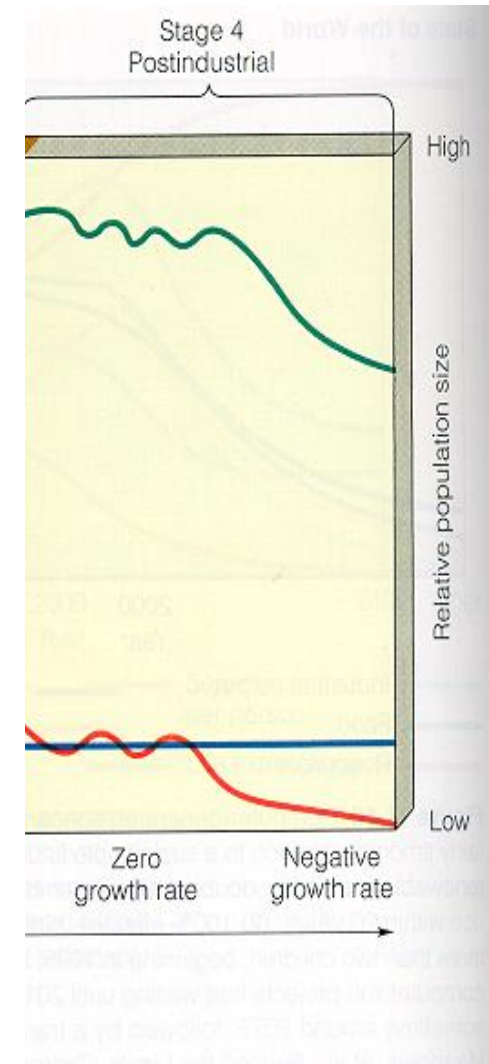


- Birth rates fall
- Better jobs and education for women
- Decrease in IMR
- Growth rate begins to decline

Figure 11-19 Generalized model of the demographic transition.

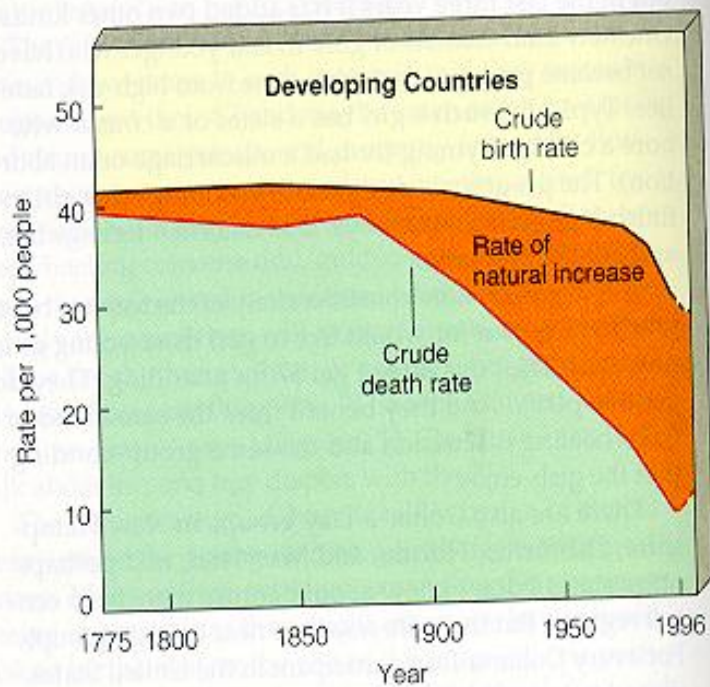
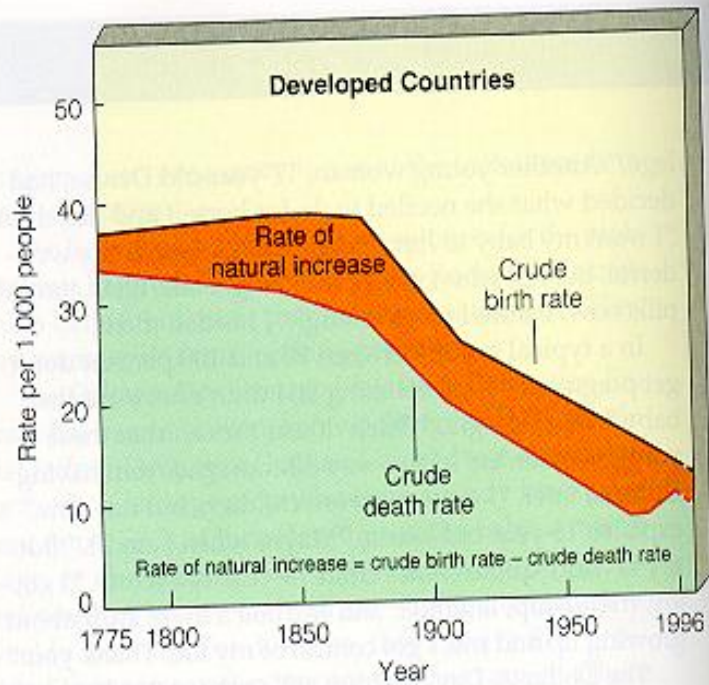
Stage 4 Postindustrial

- When births = deaths → ZPG
- If births are lower than deaths → declining population



Recent human pop growth has been due to decreased deaths

- List reasons
- Better medicine
- Better sanitation
- Safe water supplies
- Reliable food supplies



Death rate terms

Infant Mortality Rate = # of babies/1000 that don't make it to their 1st yr

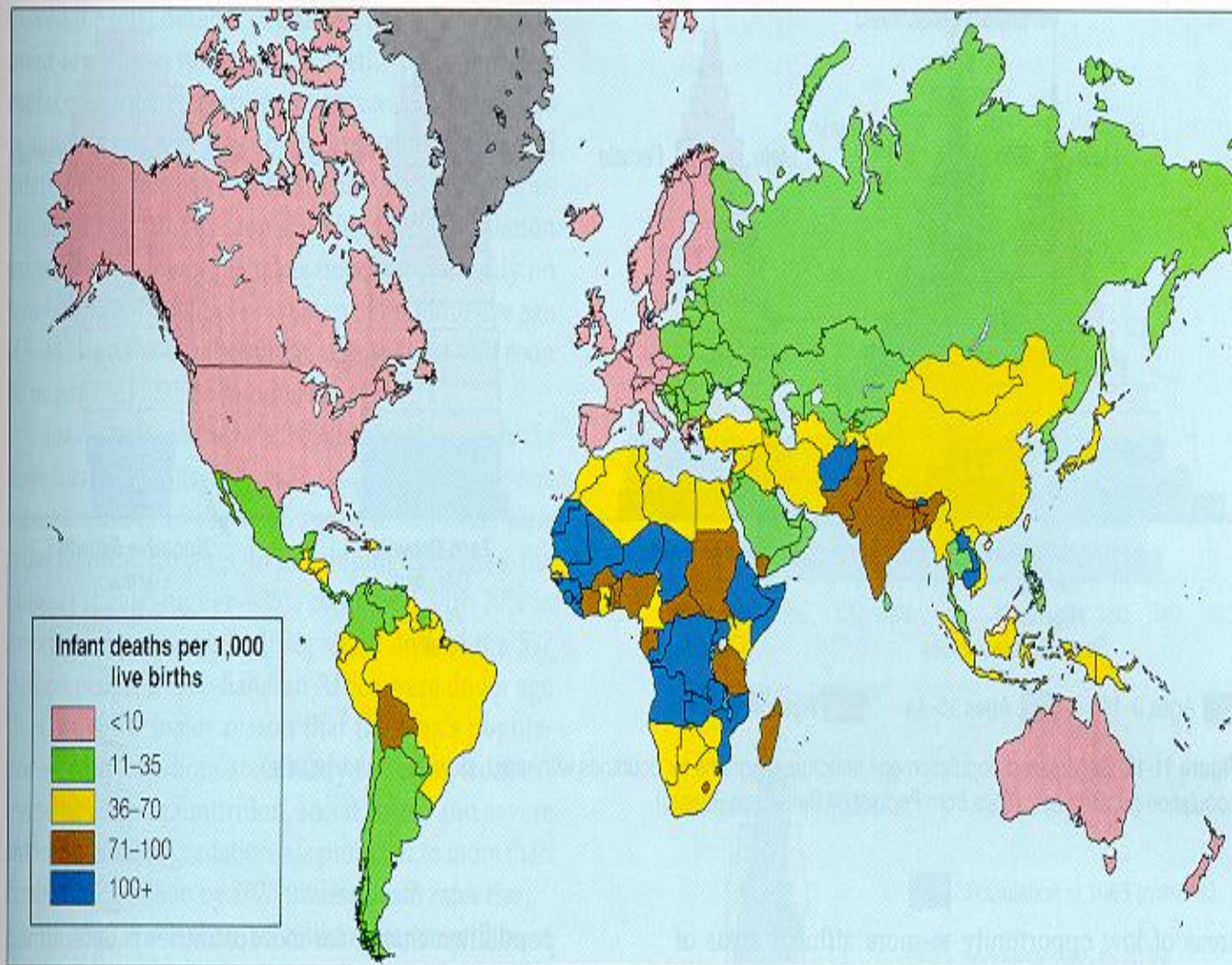
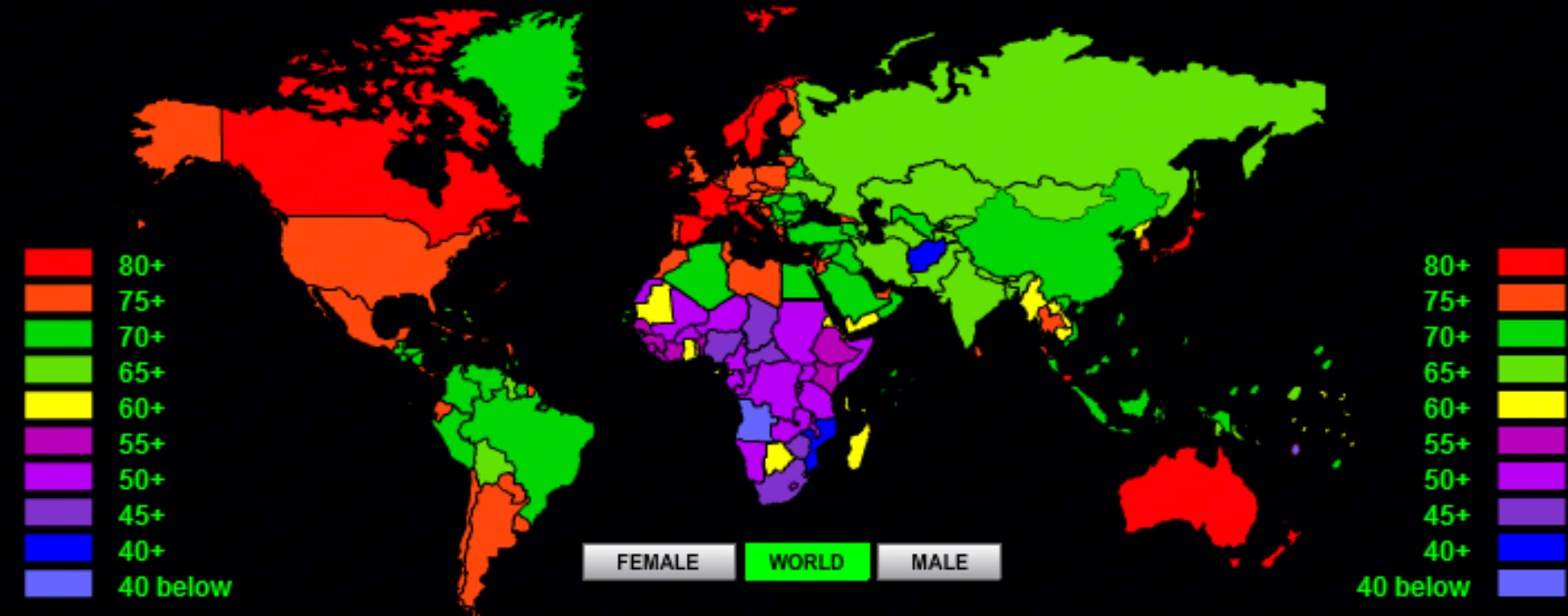


Figure 11-11 Infant mortality rates in 1996. (Data from Population Reference Bureau)

- Life Expectancy = how long a newborn can expect to live

WORLD LIFE EXPECTANCY MAP



- Why are life expectancies lower in US than Japan, Italy, and Canada?

World in the Balance “Japan”

- High cost of living forces women into workforce → postpone marriage and children
- → fewer children
- Inverted age structure diagram

Problem with negative population growth

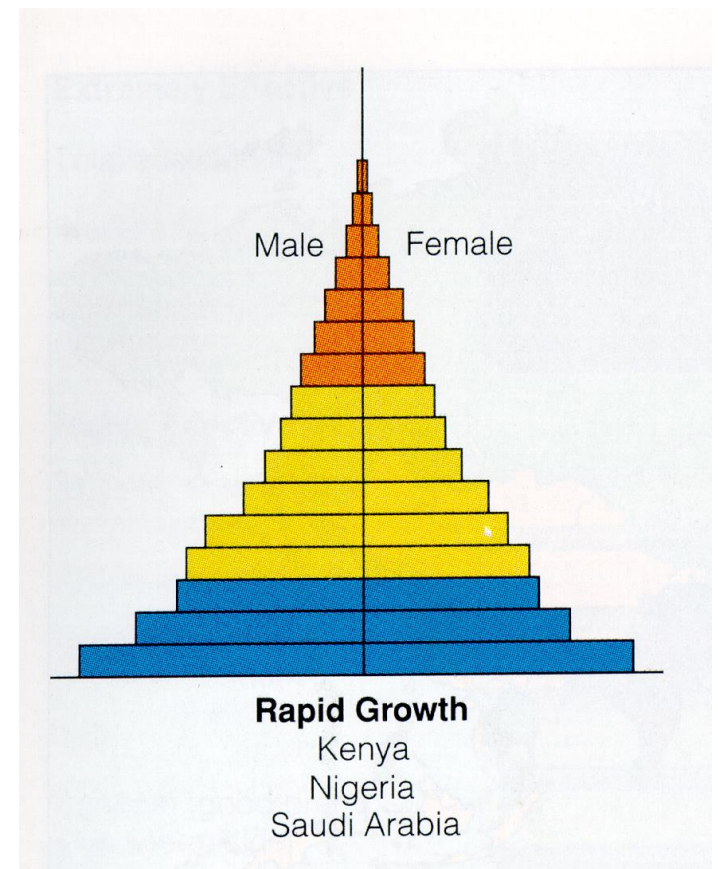
- Too few children to support aging society
- Fewer employers and consumers can → economic decline and recession

Factors affecting fertility rates in US

- US = developed nation that is still growing because of :
- large number of baby boomers
- increase in unwed mothers
- high fertility rates for some minority groups
- high legal and illegal immigration

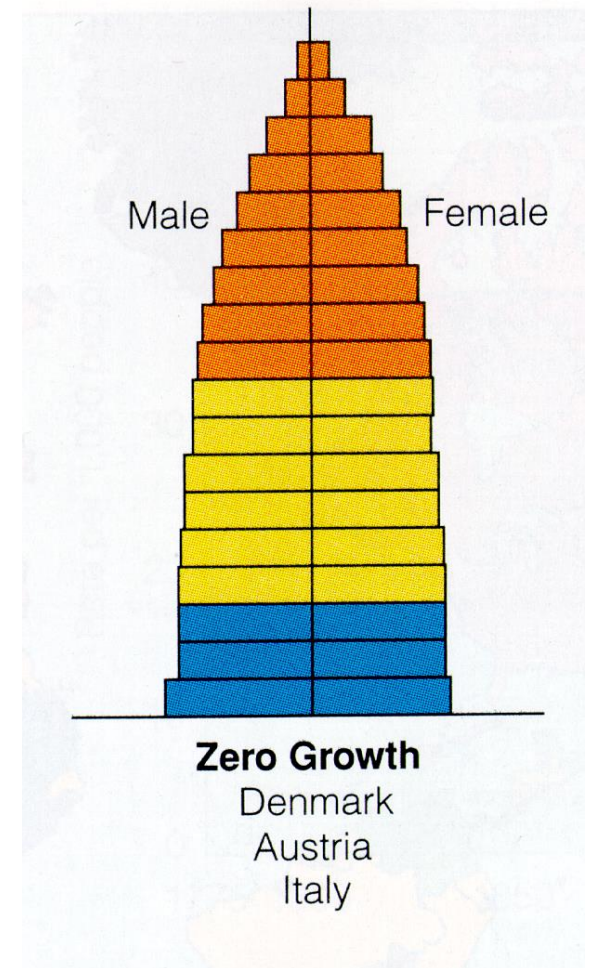
Countries experiencing rapid growth

- Undeveloped countries in Africa, Middle East and parts of Asia
- Use data sheets → list some



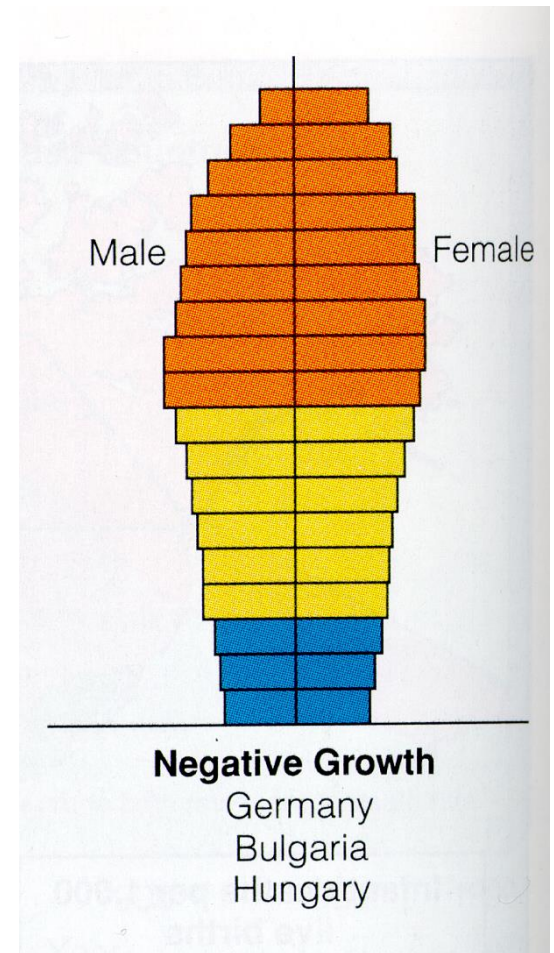
Countries experiencing slow or no growth

- ZPG = zero population growth
- Look at reference tables
→ countries with ZPG



Inverted pyramids = declining populations

- Most of population is in post-reproductive age class
- Look up examples on your reference tables

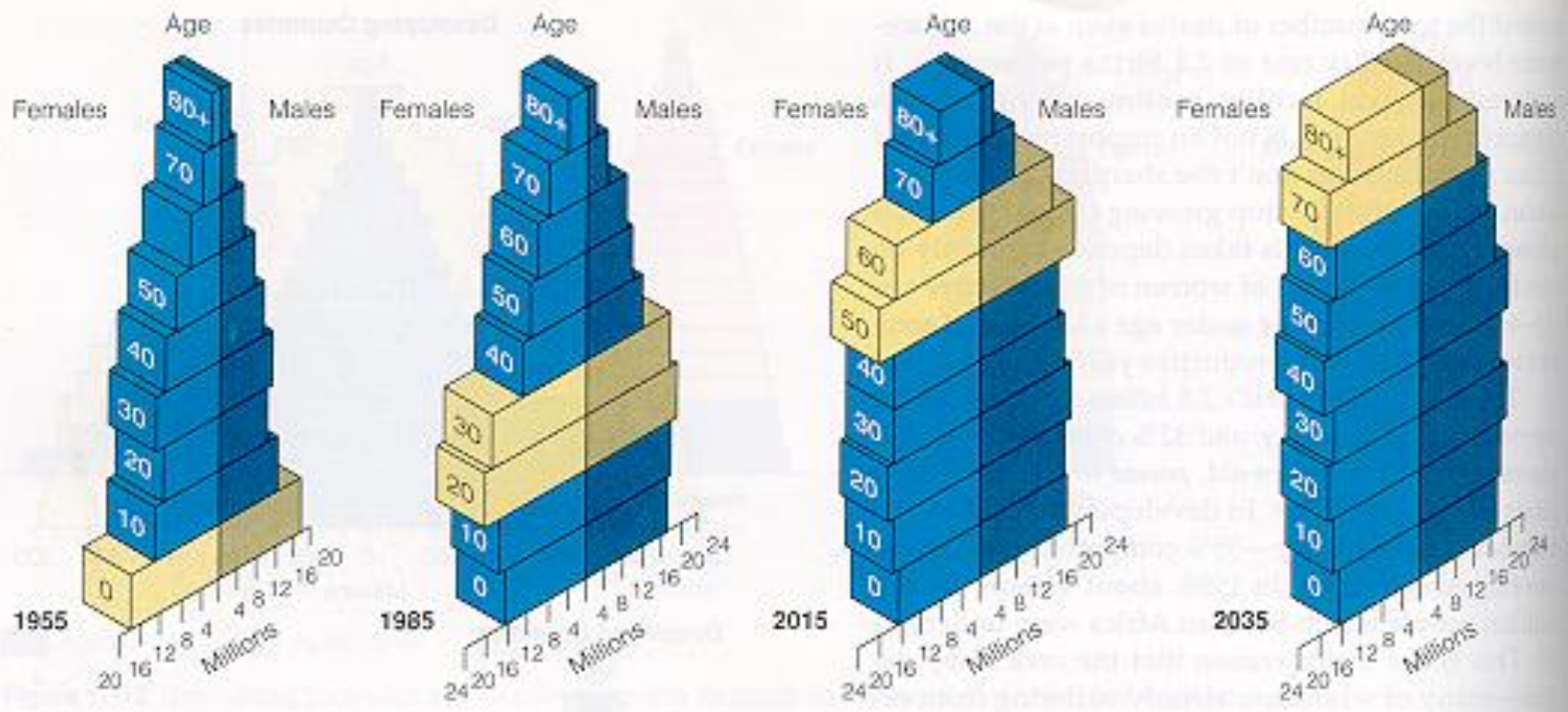


World Migration

- Only 1% of annual population growth in developing countries is absorbed by developed countries
- So, the greatest effect on growth rates is fertility rates and death rates, not migration

Age structure diagrams – baby boomers

- US baby boom was huge as they age →
- Drain social security, medicare etc.



US Immigration Reform and Control Act (1952-65)

- Basic Immigration law in effect in the US
- Gives 3 groups of people priority when Migrating:
 - 1) Those with family members in the US
 - 2) Those who can fill vacant jobs
 - 3) Refugees seeking political asylum