

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

DEMOGRAPHY (lecture 1)

Dr. Sidrah Nasim

Learning objectives

- Definition
- Demographic process
- Demographic transition
- Population momentum
- Population doubling time
- Growth rate

DEFINITION

- **Demography** is the scientific study of human population.

Demographers are interested in:

- 1) *Population changes,*
- 2) *Population composition,*
- 3) *Population distribution,*
- 4) *Causes of changes in these factors over time,*
- 5) *Consequences of these changes over time.*

Population

???

Demographic processes

- Fertility
- Mortality
- Marriage
- Migration
- Social mobility

SOURCES OF DEMOGRAPHIC STATISTICS

- Census
- National surveys
- Registration of vital events
- demographic studies

Why?

- Importance

World Population Trends

- DEMOGRAPHIC TRENDS?????

WORLD POPULATION TRENDS

- 1800 years-----1 billion
- 130 years-----2 billion
- 30 years-----3 billion
- 15 years-----4 billion
- 12 years ----- 5 billion
- 12 years----- 6billion
- 2025----- 8 billion

DEMOGRAPHIC TRANSITION

Slow growing population-----rapid-----slow

High fertility and mortality to low fertility and mortality

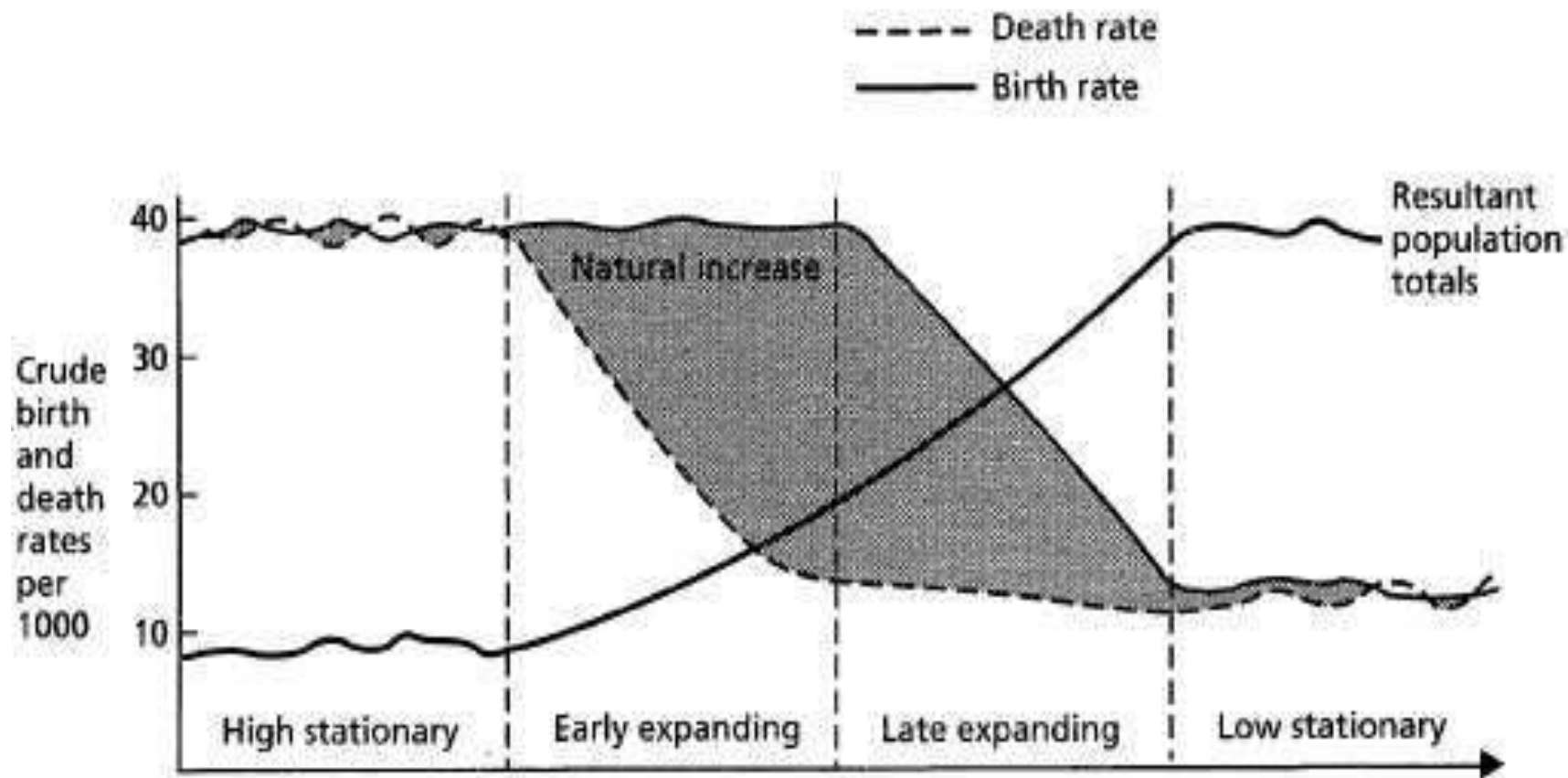
Old balance----new balance

Developed countries have passed through transition

Developing countries still passing through...

Demographic cycle

- 5 stages through which a nation passes during transition
- 1) HIGH STATIONARY STAGE (\uparrow CBR & CDR) e.g. Amazon valley)
- 2) EARLY EXPANDING STAGE (\uparrow CBR & \downarrow CDR) e.g. Bangladesh)
- 3) LATE EXPANDING STAGE (\downarrow CBR & $\downarrow\downarrow$ CDR) e.g. India/Pakistan)
- 4) LOW STATIONARY STAGE (\downarrow CBR & \downarrow CDR) e.g. Sweden 0 GR)
- 5) DECLINING STAGE ($\downarrow\downarrow$ CBR & \downarrow CDR) e.g. Germany (—ve GR)



U.K. dates present example

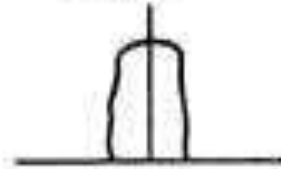
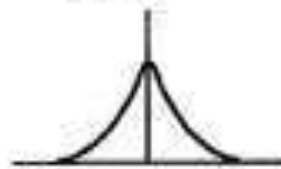
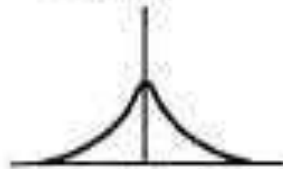
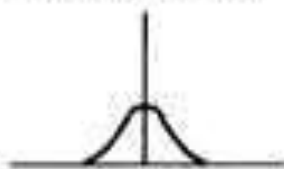
Pre 1760
Amazon basin

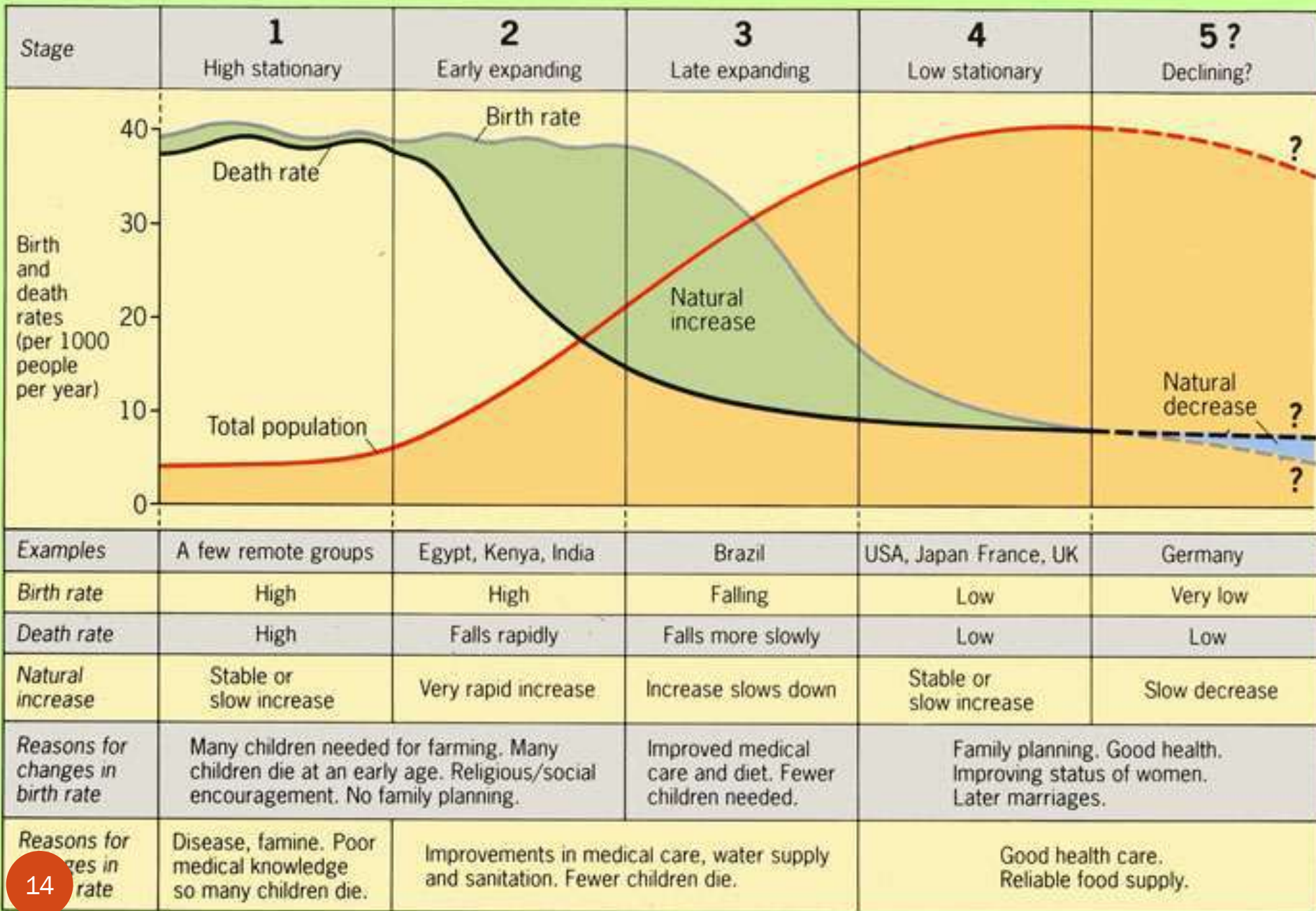
1760–1870
Kenya

1870–1950
Cuba

Post 1950
Japan

Associated population pyramid





LIMITATIONS

- It failed to consider, or to predict, several factors and events:
- Birth rates in several MEDCs have fallen below death rates (Germany, Sweden). This has caused, for the first time, a population decline which suggests that perhaps the model should have a fifth stage added to it.
- The model assumes that in time all countries pass through the same four stages. It now seems unlikely, however, that many LEDCs, especially in Africa, will ever become industrialised.
- The model assumes that the fall in the death rate in Stage 2 was the consequence of industrialisation. Initially, the death rate in many British cities rose, due to the insanitary conditions which resulted from rapid urban growth, and it only began to fall after advances were made in medicine. The delayed fall in the death rate in many developing countries has been due mainly to their inability to afford medical facilities.

- In many countries, the fall in the birth rate in Stage 3 has been *less* rapid than the model suggests due to religious and/or political opposition to birth control (Brazil), whereas the fall was much *more* rapid, and came earlier, in China following the government-introduced 'onechild' policy.
- The timescale of the model, especially in several South-east Asian countries such as Hong Kong and Malaysia, is being squashed as they develop at a much faster rate than did the early industrialised countries.
- Countries that grew as a consequence of emigration from Europe (USA, Canada, Australia) did not pass through the early stages of the model.

- **Stage One**
- The first stage, seen in pre-industrial/traditional societies, is characterized by high death rates and birth rates which result in fluctuations in population and an overall slow growth rate. The high death rates are a result of a lack of sanitation, medical care, famine, drought... The high birth rates are can be accounted for by traditional cultures where a large family is valued, a lack of family planning, and the need for children to help financially support the family.
- The change in population has a strong positive correlation with the food supply. As the the supply of food increases so does the population, but when there is a shortage or decrease in the food supply, the population will decline. In this stage, **Malthusian theory** is observable.
- While no country today is considered to be in stage one, there are a few remote, traditional societies who reflect trends in stage one.

- **Stage Two**

- This stage is marked by a sharp decrease in death rates due to improvements in food production (a stable food supply) and sanitation (water improvements, sewage, food storage). This can clearly be seen in a decrease in the infant mortality rate and an overall increase in life expectancy.
- These improvements in health, sanitation, and overall life expectancy result in a high growth rate as the gap between birth rates and death rates increases

- **Stage Three**

- The third stage is reached when birth rates begin to fall. As health improves and the infant mortality rate is decreased, parents no longer need to have large numbers of children to ensure that they are taken care of when they become elderly. The rural to urban migration also contributes to lowered birth rates, as the traditional cultural norms of having large numbers of children are diluted by city life. Women in wage earning jobs must juggle work and raising children, and costs of mandatory education ameliorate the idea of children being economically beneficial to families

- **Stage Four**
- A country has reached stage four when there are low birth rates and death rates; however, death rates may rise slightly as a result of an aging population which is reaching the end of their life span. The growth rate becomes steady.
- During stage four, fertility rates may fall below replacement level (< 2.1).

- **Stage Five**
- Stage five has been added by some demographers to illustrate changes in population seen in MEDCs which have below replacement level fertility rates (<2.1). Most European countries have death rates which are above birth rates and are considered to be in stage five.

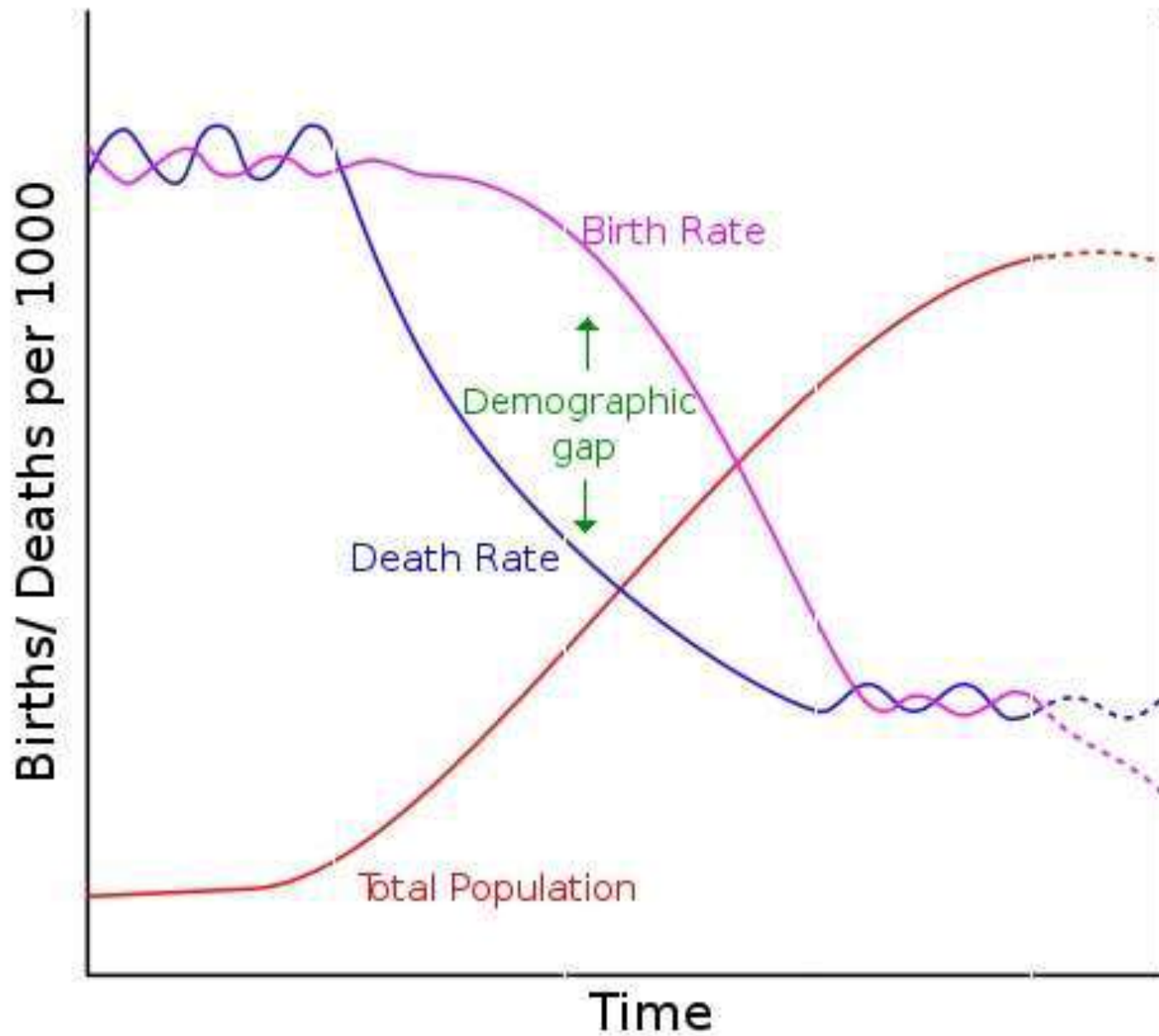
MALTHUS THEORY OF POPULATION

- In *Essay on the Principle of Population*, Malthus proposes the principle that human populations grow exponentially (i.e., doubling with each cycle) while food production grows at an arithmetic rate (i.e. by the repeated addition of a uniform increment in each uniform interval of time). Thus, while food output was likely to increase in a series of twenty-five year intervals in the arithmetic progression 1, 2, 3, 4, 5, 6, 7, 8, 9, and so on, population was capable of increasing in the geometric progression 1, 2, 4, 8, 16, 32, 64, 128, 256, and so forth. This scenario of arithmetic food growth with simultaneous geometric human population growth predicted a future when humans would have no resources to survive on. To avoid such a catastrophe, Malthus urged controls on population growth.

POPULATION MOMENTUM

It is defined as the tendency for population growth to continue beyond the time that replacement level fertility has been achieved because of the relatively high concentration of people in the child bearing age.

For instance if population of a country is controlled abruptly by bringing down the birth rate to replacement level, the population will still continue to grow for many years as it comprises many future mothers, who are in their child bearing years.



Demographic Transition

➤ **Old Balance**: (*High fertility & High Mortality*)

A large supply of births was necessary to compensate for the large number of deaths. MMR & IMR extremely high

➤ **New Balance**: (*Low fertility & Low Mortality*)

Represents an improved condition of human efficiency & health, with fewer deaths considerably less efforts required to bring a generation to maturity. Production of agricultural & industrial commodities is greater & life style is more comfortable

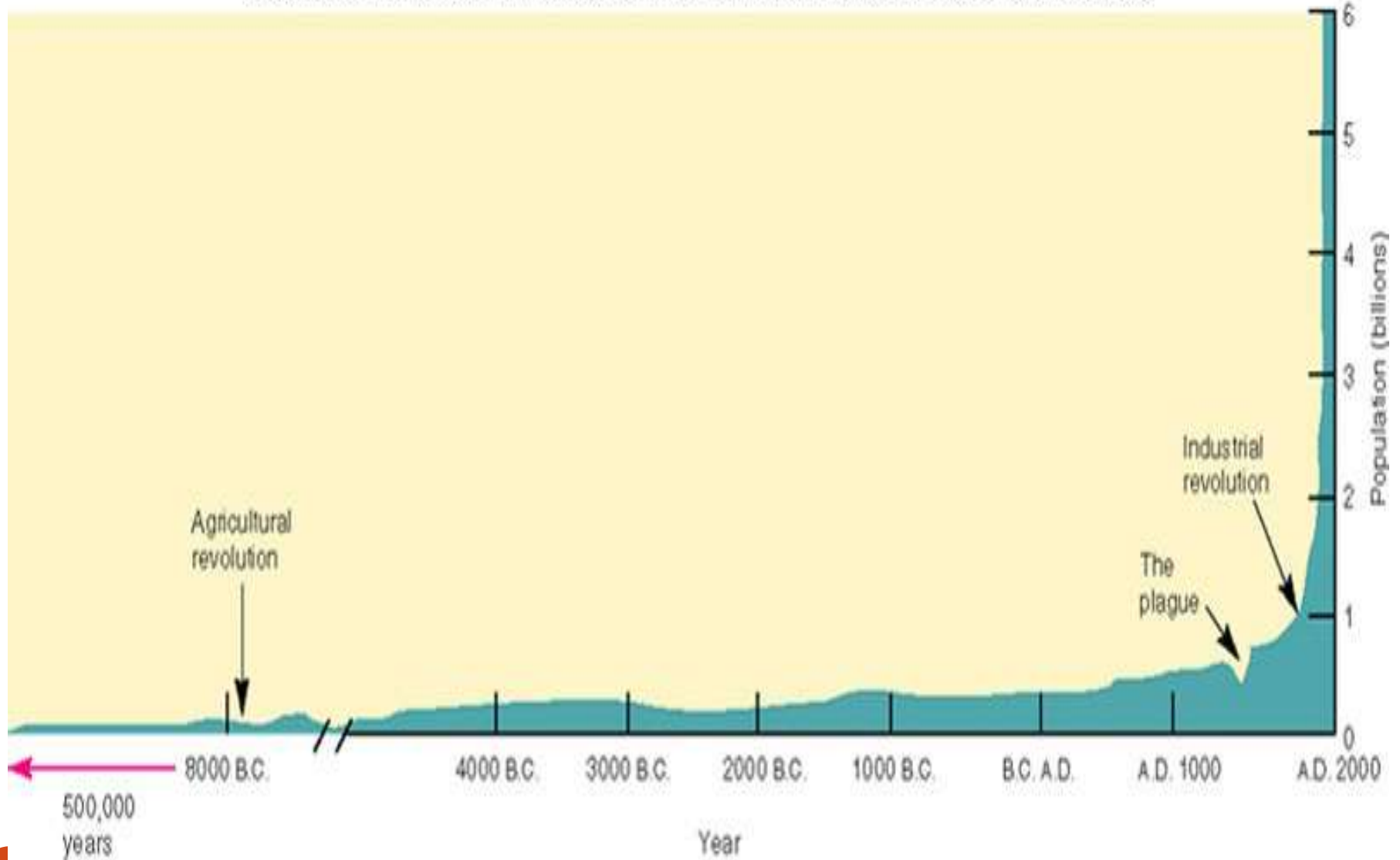
➤ **Imbalance**: (*High Fertility & Low Mortality*)

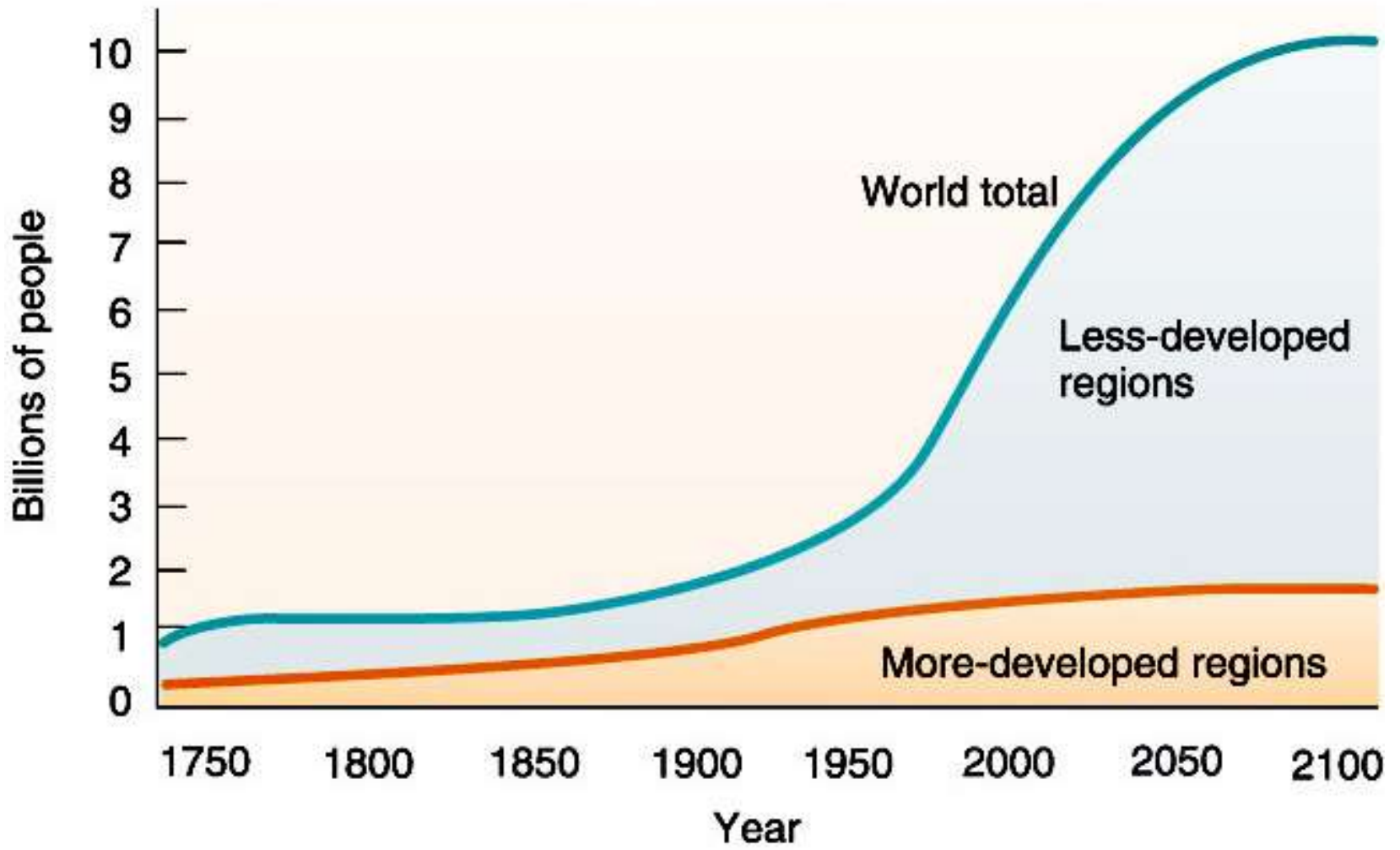
In between old & new balance is the period of rapid natural increase. This growth is helpful for under-populated nations. Too fast growth of population leading economic, social & political chaos (being faced by numerous developing countries including Pakistan

DEMOGRAPHIC TRAP

- the combination of high fertility (birth rates) and declining mortality (death rates) in developing countries, resulting in a period of high population growth rate (PGR)

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.





Situation in Pakistan

1970-----1980s

1990 -----economic crises

Late expanding to low stationary???

GROWTH RATE

- (%/ year) is the rate at which a given population is expected to increase in a given period of time.
- $\text{CBR} - \text{CDR} = \text{AGR (Migration)}$

- Population Growth = Natural Increase
+ Net Migration

Population Doubling Time

Time that would take a population to double

$$T = \log(2) / \log(1 + r/100)$$
$$= 70/r \text{ (r=annual growth rate)}$$

Rating	Annual growth rate %	Number of years required for the population to double in size
Stationary population	No growth	
Slow growth	Less than 0.5	More than 139
Moderate growth	0.5 to 1.0	139-70
Rapid growth	1.0 to 1.5	70-47
Very rapid growth	1.5 to 2.0	47-35
Explosive growth	2.0 to 2.5	35 -28
	2.5 to 3.0	28 - 23
	3.0 to 3.5	23 -20
	3.5 to 4.0	20 -18

- How long a population would take to double in size if its growth rate is 2%

- $70/2 = 35$ years

How long a population would take at its current Growth Rate of 1% to double in size

- Population of Pakistan--- 188 million (2013-14)
- Growth rate 1.95 % (2013 -2014)

THANKS