

Doubling Time - Rule of 72

$$\text{doubling time} = \frac{72}{\text{growth rate}}$$

ie/ annual growth rate of 8%

$$\begin{aligned}\text{doubling time} &= 72/8 \\ &= 9 \text{ years}\end{aligned}$$

Recap from Friday...

VIDEO: Easter Island



click here or copy/paste...

<http://safeshare.tv/w/SXONUCCGZCm>

[Read - Lessons from Easter Island.pdf](#)

Comprehension quiz tomorrow!

DISCUSSION...from Lessons of Easter Island

- summarize the article.
 - major environmental issue???
 - relation to population growth...
 - carrying capacity, exponential vs logistic growth and limiting factors
 - relation to the Lorax...
 - relation to the Earth...
 - limited resources, population growth, altering the space around us
- Have 'we' found a way of life that does not fatally deplete the resources that are available?**

The screenshot shows the Poodwaddle World Clock application. At the top left is a large analog clock with a circular calendar around it. The main display area shows the world population as 7,214,370,187, with birth and death rates. Below this is a calendar for February 2014. At the bottom, there are four smaller analog clocks for New York, London, Moscow, and Tokyo. A sidebar on the left contains a menu of topics and a smile icon with the text 'It ain't all bad news'.

Poodwaddle World Clock Stats Time | Date | Life | ?

YR. MTH. WK. DAY NOW

World Population
7,214,370,187

Births: 18,751,865 Deaths: 7,852,265

February 2014

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

New York Feb 18 10:37:52 AM London Feb 18 3:37:52 PM Moscow Feb 18 7:37:52 PM Tokyo Feb 19 12:37:52 AM

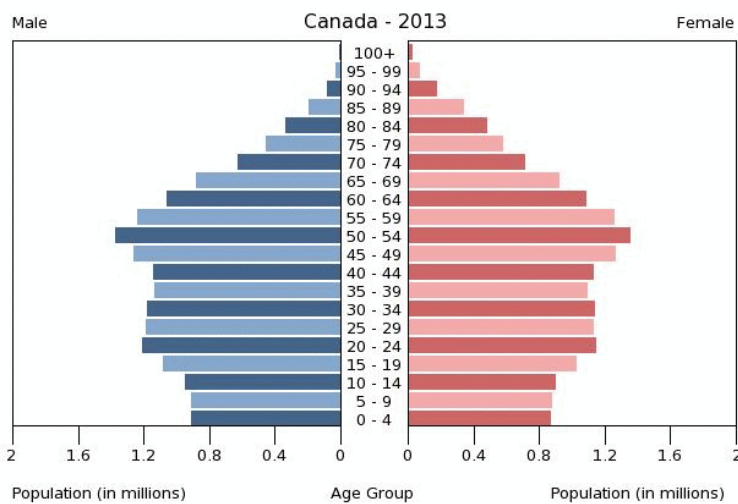
Intro
Population
Mortality
Illness
Environment
Energy
Food
Economy
Crime
:) Smile It ain't all bad news

Forecasting Population Size

- Age structure
 - › Distribution of various age groups
 - › Population pyramids can be made to show trends
 - › High growth rates have young populations
- Survivorship
 - › Determine how much of a population survives to a given age
- Fertility Rates
 - › Number of babies born each year per 1000 women
- Migration
 - › Movement of individuals in and out of a population
 - Immigration (into a country)
 - Emigration (out of a country)

Population Pyramid

A population pyramid illustrates the age and sex structure of a country's population and may provide insights about political and social stability, as well as economic development. The population is distributed along the horizontal axis, with males shown on the left and females on the right. The male and female populations are broken down into 5-year age groups represented as horizontal bars along the vertical axis, with the youngest age groups at the bottom and the oldest at the top. The shape of the population pyramid gradually evolves over time based on fertility, mortality, and international migration trends.

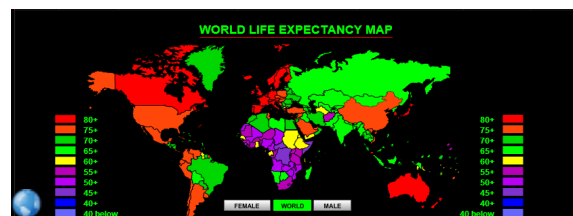
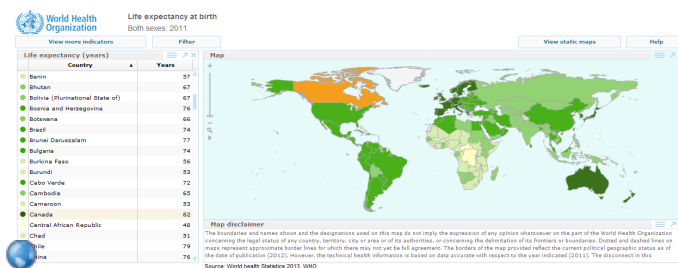


Age structure: 0-14 years: 15.5% (male 2,753,263/female 2,617,600)
15-24 years: 12.9% (male 2,285,268/female 2,160,005)
25-54 years: 41.4% (male 7,253,587/female 7,067,997)
55-64 years: 13.3% (male 2,285,072/female 2,329,760)
65 years and over: 16.8% (male 2,574,216/female 3,241,443) (2013 est.)

Definition: This entry provides the distribution of the population according to age. Information is included by sex and age group (0-14 years, 15-64 years, 65 years and over). The age structure of a population affects a nation's key socioeconomic issues. Countries with young populations (high percentage under age 15) need to invest more in schools, while countries with older populations (high percentage ages 65 and over) need to invest more in the health sector. The age structure can also be used to help predict potential political issues. For example, the rapid growth of a young adult population unable to find employment can lead to unrest.

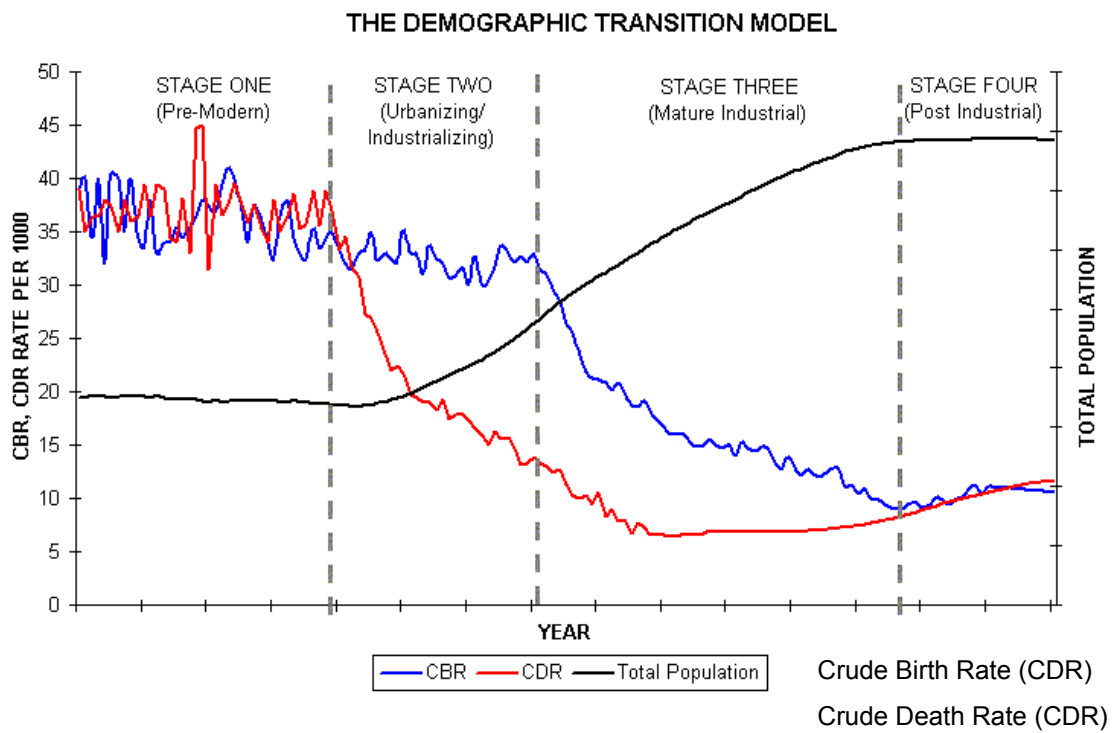
Declining Death Rates

- Access to food, cleaner water, better medicine, safe sewage disposal have contributed to people living longer
- Global life expectancy has increased to 70 years
- In developed countries, it is upwards of 80 years



The Demographic Transition

- A model that describes how changes can occur to a country's population growth rate
- Stage 1
 - › Preindustrial condition (birth and death rate are high); population rate is stable
- Stage 2
 - › Population explosion occurs
- Stage 3
 - › Birth rate decreases (equal to death rate), population stabilizes; population much larger than before
- Stage 4
 - › Birth rate drops, population declines

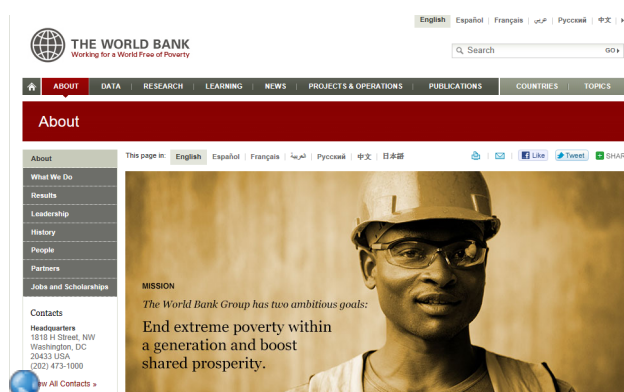


Women and Fertility

- Increased education and economic independence has contributed to birth decline
- Countries that want to reduce their birth rate typically put incentives in place to increase education of women

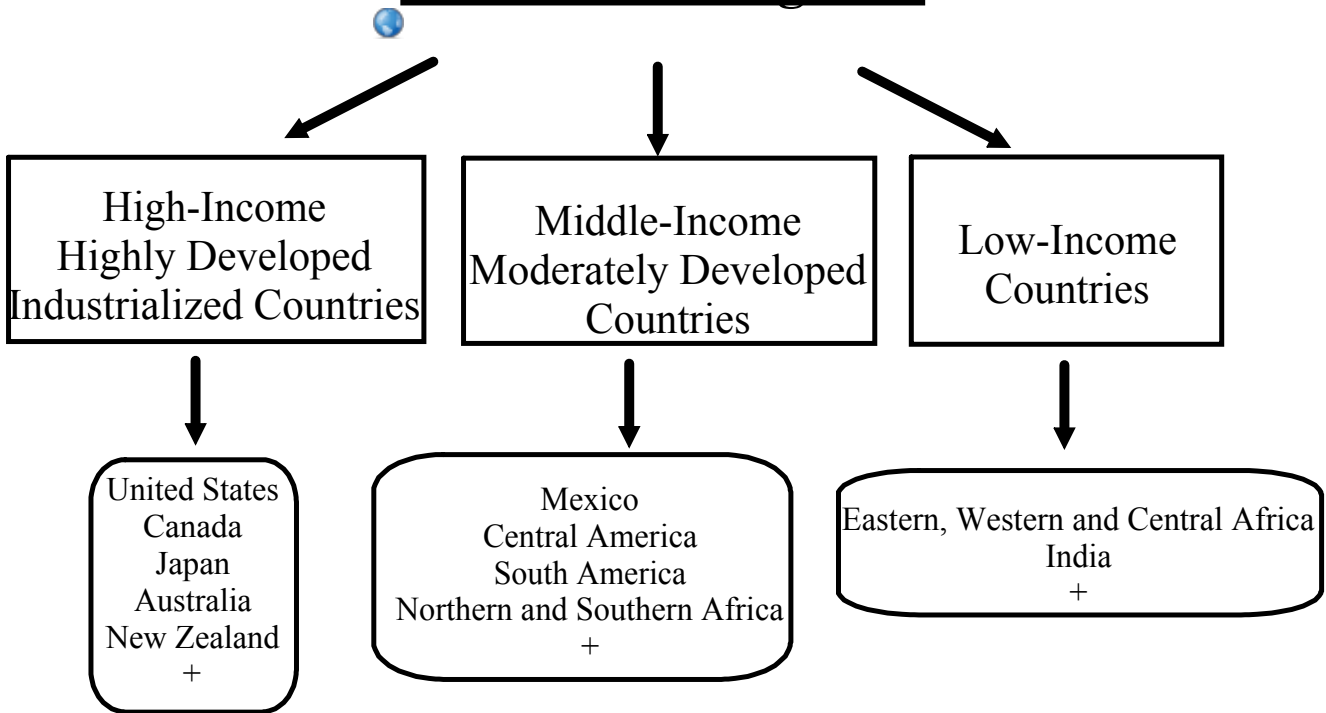


- The World Bank is a vital source of financial and technical assistance to developing countries around the world.
- Its mission is to fight poverty with passion and professionalism for lasting results and to help people help themselves and their environment by providing resources, sharing knowledge, building capacity and forging partnerships in the public and private sectors.



- The World Bank divides the countries of the world into three main economic categories according to **gross national income (GNI) per capita** (per person).

Economic Categories



GNI per capita is the dollar value of a country's final income in a year, divided by its population. It reflects the **average income of a country's citizens**.

Average Income of a Canadian Citizen (2013)

Median family income in Canada is \$76,000, Statscan survey shows



CTV National News: Cash-strapped Canadians

The latest numbers from the 2011 National Household Survey reveal how much Canadians are making. Omar Sachedina breaks down the numbers.

CTV News Channel: What the results mean

Merella Fernandez says the National Household survey releases Canadians are spending more money than they should and taking on much debt.

Highly Developed Countries

20% of world's population
80% of world's wealth

Developing Countries

80% of world's population
20% of world's wealth

Environmental Impact \propto $\frac{\text{Population Size} \times \text{Affluence of Lifestyle}}{\text{Stewardship}}$

proportional to

Social Modernization

- **Social modernization** is a process of sustainable development that leads developing countries through demographic transitions.
- A **demographic transition** is a process of changing a population from a condition of high birthrate and a high death rate to a condition of low birthrate and low death rate.
 1. education - especially improving literacy and educating girls and women equally with boys and men
 2. improving health - especially lowering infant mortality
 3. making family planning accessible
 4. enhancing income through employment opportunities
 5. improving resource management

Effects of Increasing Affluence

- provision of safe drinking water, sanitary sewage systems and sewage treatment, collection and disposal of refuse
- conservation and management of resources
- better agricultural practices
- pollution control
- emissions of carbon dioxide, chlorofluorocarbons (CFC's), hazardous chemicals, production of nuclear waste
- exploitation or over-exploitation of resources
- oil spills
- endangered species

EVOLUTION & ADAPTION?



Bird_fishing_with_bread.mpeg



Attachments

Bird_fishing_with_bread.mpeg

Read - Lessons from Easter Island.pdf