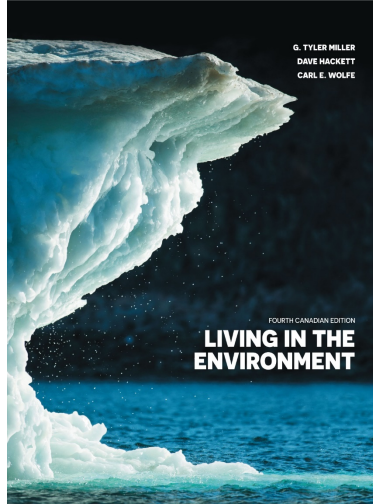


**NETA PowerPoint® Slides**

to accompany

prepared by  
Ian Dawe

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**Chapter 10****Applying Population Ecology:  
The Human Population**

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## Key Concepts

Factors affecting human population size

– Birth, death, fertility, migration, age

Challenge: Managing population growth

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## Why Is Demography Important?

Size, composition, distribution of human populations

Causes and consequences of changes in human populations

Health, social, economic, environmental consequences

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## Population Effects of Birth and Death Rates

$$\text{Population Change} = (\text{Births} + \text{Immigration}) - (\text{Deaths} + \text{Emigration})$$

### Crude Birth Rate

– Number of live births per 1000 people

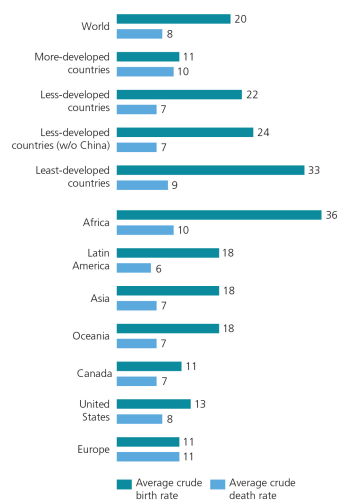
### Crude Death Rate

– Number of deaths per 1000 people

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## Crude Birth and Death Rates (2011)



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## How Fast Is the World's Population Growing?

1.2% annual population growth (2014)  
Slower than in 1963 but still  
dangerously fast

### **Doubling time**

- Doubling time (years) 70 / percent growth
- 2014: 58 years

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## How Have Global Fertility Rates Changed?

### **Replacement-Level Fertility**

- Number of children per couple to maintain population size

### **Total Fertility Rate (TFR)**

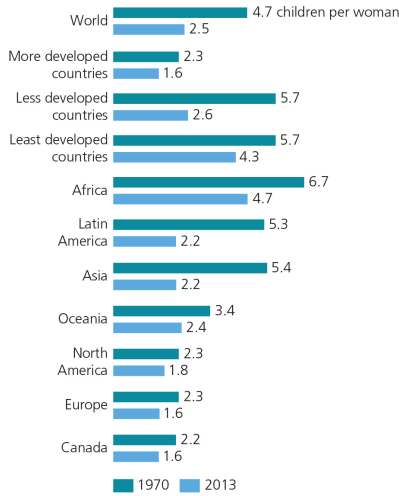
- Average number of children born to a woman during reproductive years

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## Decline in Total Fertility Rates (1950–2011)

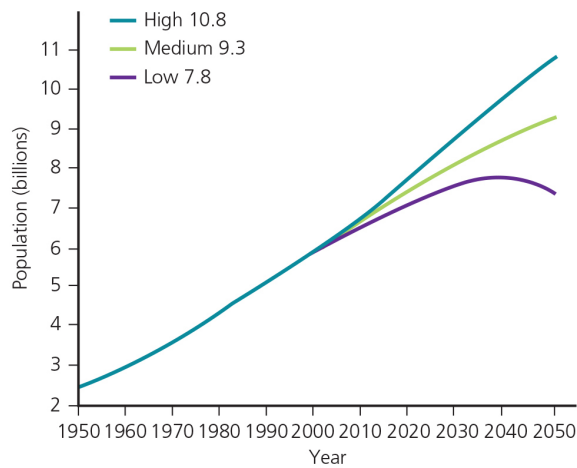


Source: Data from United Nations and Population Reference Bureau

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## UN World Population Projections

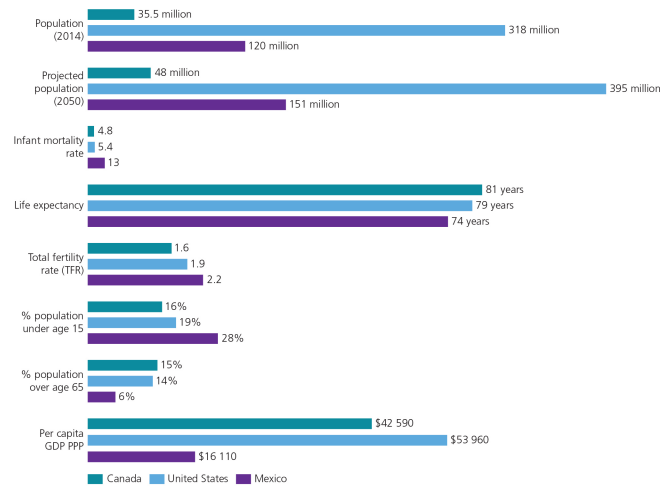


Source: Data from United Nations

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## Demographic Comparison (2013-2014)



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## Factors Affecting Birth and Fertility Rates

Children in the labour force

Cost of raising and educating children

Availability of pension systems

Urbanization

Education and employment for women

Infant mortality rate

Average marrying age

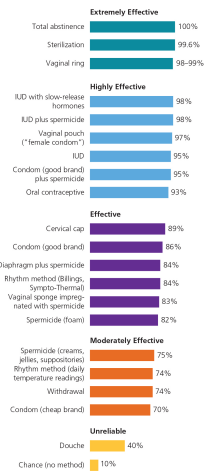
Availability of legal abortions

Availability of birth control

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## Contraception and Birth Rate

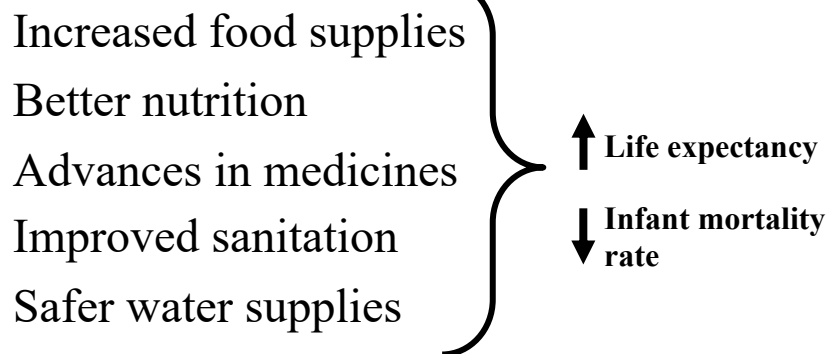


Source: Data from Alan Guttmacher Institute, Henry J. Kaiser Family Foundation, and the United Nations Population Division

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## Factors Affecting Death Rates



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## Population Growth in Canada

Growth may stabilize between 2030 and the end of century.

Fifty percent of Canadian mothers are over the age of 30.

Total fertility rate is now below minimum for replacement.

By 2031, 1/4 of the population will be over the age of 65.

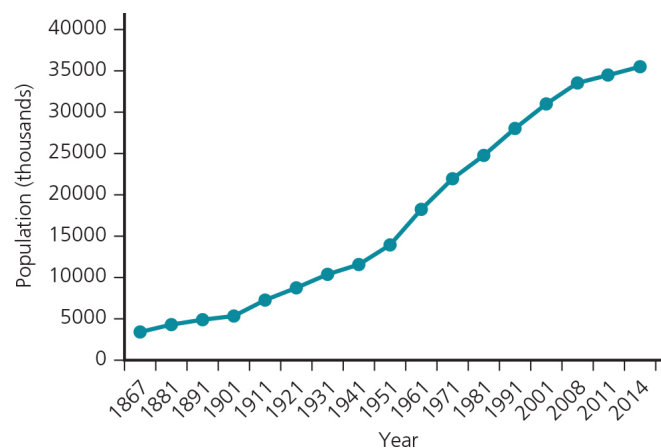
Immigration remains crucial.

- Most migrants are drawn to larger cities.
- Today, about half of the people in Toronto and Vancouver are visible minorities.

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## Population Growth in Canada

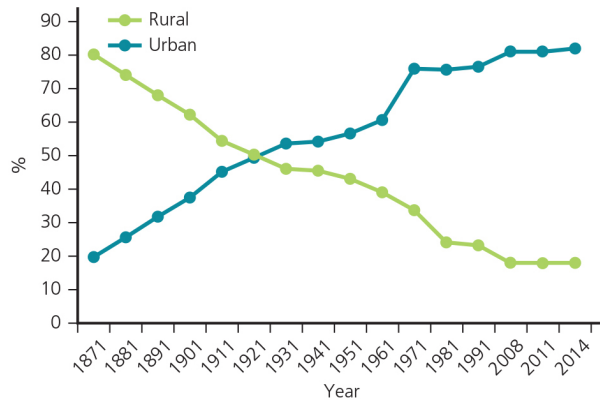


Source: Statistics Canada, Population urban and rural, by province and territory.  
<http://www40.statcan.ca/l01/cst01/demo62a-eng.htm>

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## Population Shift in Canada

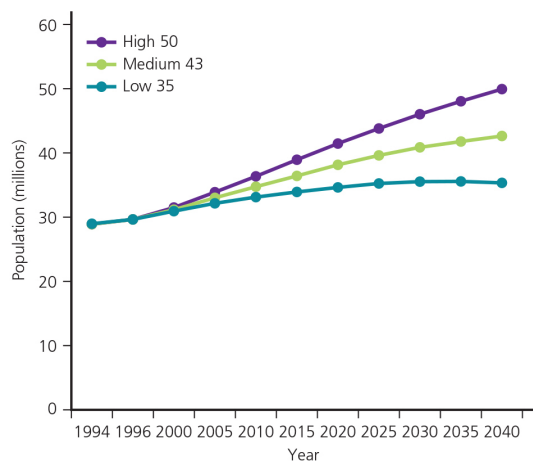


Source: Statistics Canada, Population urban and rural, by province and territory, <http://www40.statcan.ca/l01/cst01/demo62a-eng.htm>

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## Population Projections for Canada

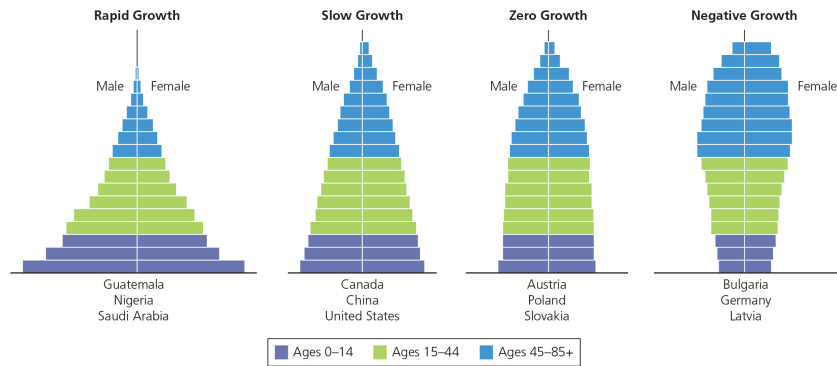


Source: Statistics Canada, Population urban and rural, by province and territory, <http://www40.statcan.ca/l01/cst01/demo62a-eng.htm>

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## Types of Population Age Structures

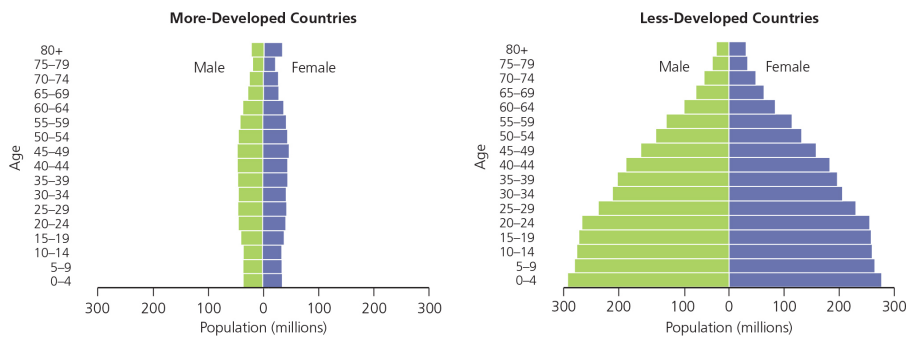


Source: Data from Population Reference Bureau

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## Age Structure in Developed vs. Developing Countries



Source: Data from United Nations Population Division and Population Reference Bureau

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## Canada and the United States: They're Not the Same

**TABLE 10-1 COMPARISON OF CANADIAN  
AND U.S. POPULATIONS**

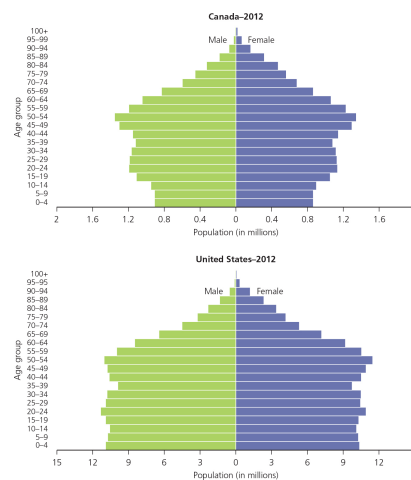
	Canada	United States
% Urban	82	81
% Married women using contraception	74	77
% Access to improved water	100	99
Area (sq. km)	9 984 670	9 826 675
Population (mid-2014)	35.5 million	318 million
Density (per sq. km)	3.5	32

Source: Population Reference Bureau and CIA *World Factbook*

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## Age Structure in North America: The Baby Boom

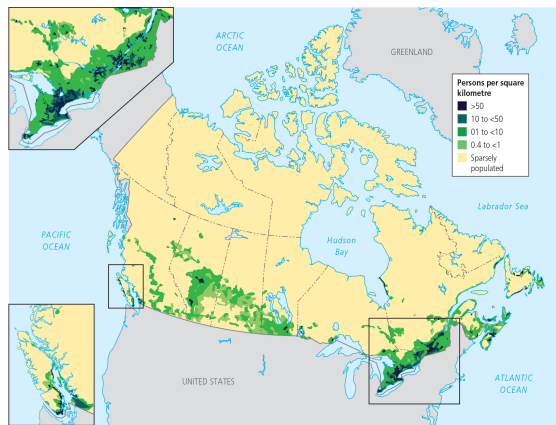


Source: U.S. Census Bureau International Database

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## Canada Has High Local Population Density

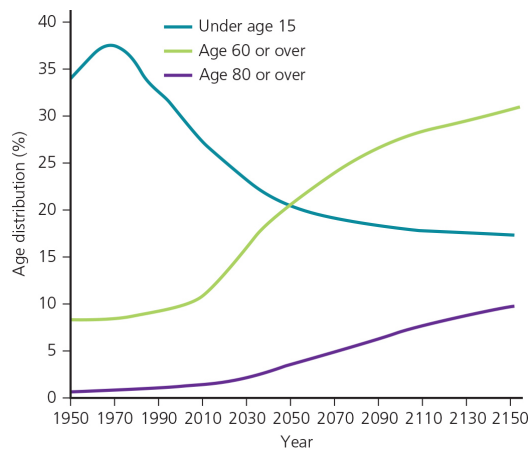


Source: Statistics Canada, Canadian Demographics at a Glance; CIA World Factbook Canada 2012

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## Population Age Structure: Global Aging



Source: Data from the United Nations

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## **Population Decline from Reduced Fertility**

Rise in population of elderly  
 Consume larger share of health care  
 Consume larger share of pensions  
 Labour shortages  
 Low taxation revenues make pension  
 funding difficult.

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## **Population Decline from Rising Death Rates**

### **The AIDS Tragedy**

278 million premature deaths in 50 years  
 Largely kills young adults  
 Sharp drop in average life expectancy  
 High numbers of orphans  
 Shortage of productive workers to  
 support elderly and young

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## Influencing Population Size: Should We Be Reducing Birth Rates?

Optimum sustainable population  
Cultural carrying capacity

Personal rights and freedoms

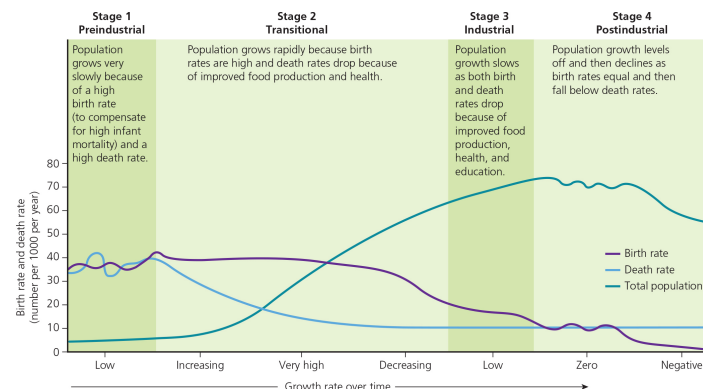
vs.

Ability to sustain adequate living  
conditions

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## Influencing Population Size: The Demographic Transition



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## Influencing Population Size: Family Planning

Educational and clinical services

- Birth spacing
- Birth control
- Health care

Responsible for 55% drop in TFR in developing nations (1960–2008)

- But 42% of all pregnancies still unplanned

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## Influencing Population Size: Family Planning

### Case Study: Iran

**1979:** Removal of family planning program

Growth rate increased to 4.4%

**1989:** New family planning program

- Requires couples to take a contraception class before marriage
- Increased female literacy

**2013:** Growth rate only 1.4%

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## Influencing Population Size: The Key Is Empowering Women

Women tend to have fewer children if they are

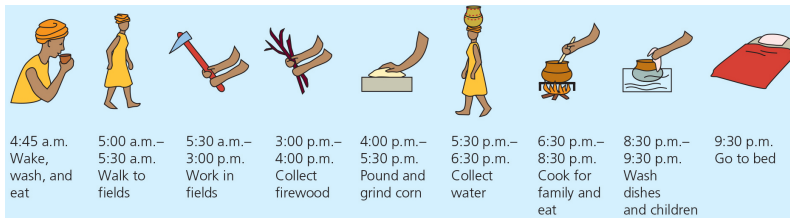
- Educated
- Employed outside the home
- Granted civil rights

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## Influencing Population Size: The Key Is Empowering Women

The typical *unpaid* workday for a woman in rural Africa leaves little time for education.

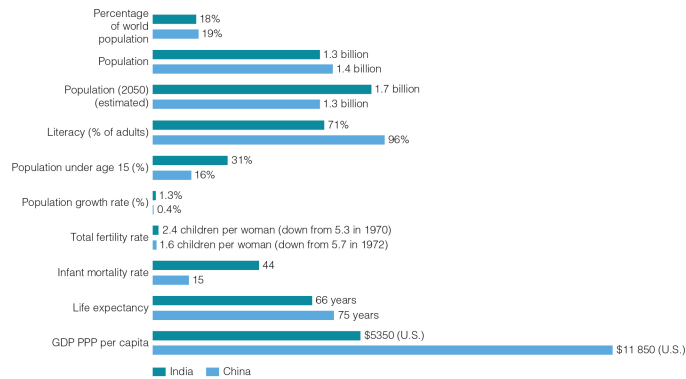


Source: Data from the United Nations

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## Case Studies: India and China



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## Case Study: Slowing Population Growth in India

Generally disappointing results

- Poor planning
- Bureaucratic inefficiency
- Low status of women
- Extreme poverty
- Lack of administrative or financial support

Population continues to increase rapidly

- Increased by 20 million in 2013
- Women have an average of 2.6 children

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## **Case Study: Slowing Population Growth in China**

### **Government-enforced one-child policy**

- Economic initiatives
- Free contraception and care
- Preferential treatment to family and child
- Local administration
- Strict state controls

Population predicted to peak in 2040 and then slowly decline.

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## **What Can We Do to Slow Population Growth?**

Universal access to family planning and health care

National population policies

Improve status of women

Increase education, particularly for girls

Increase male involvement in parenting

Reduce poverty

Reduce unsustainable consumption

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## Conclusion

Controlling human population growth is a key factor in environmental and economic sustainability.

Our track record is mixed—some successes, some disappointments.

The key is empowering women.