



# Physical Activity Epidemiology

## Chapter 2

# Thinking about... Physical Activity Epidemiology

- ▶ Have you ever thought about the consequences of being inactive—in terms of disease, death, and disability?
- ▶ Can you imagine living in a world without modern technologies (imagine not having a washing machine or vacuum cleaner, for example)? Would you ever voluntarily give up a time-saving device to save electricity or to be more active?

# Epidemic of Physical Inactivity

Physical inactivity and poor diet

Diseases

- Cardiovascular disease, type 2 diabetes, and some cancers

Increased technology

# A Primer on Measurement of Physical Activity Behavior

- ▶ Subject/self-report
- ▶ Objective/technological:
  - Smart phone apps
  - Heart rate monitor
  - Pedometer
  - Accelerometer
  - GPS units



# Self-Report of Physical Activity Behavior

## Godin Leisure-time Exercise Questionnaire

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1. During a typical **7-day period** (a week), how many times on the average do you do the following kinds of exercise for **more than 15 minutes** during your free time (write in each square the appropriate number).

(a) **Strenuous Exercise** (heart beats rapidly)

(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross-country skiing, judo, roller skating, vigorous swimming, vigorous long-distance bicycling)

Times per week

(b) **Moderate Exercise** (not exhausting)

(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

Times per week

(c) **Mild Exercise** (minimal effort)

(e.g., yoga, archery, fishing from riverbank, bowling, horseshoes, golf, snowmobiling, easy walking)

Times per week

2. During a typical 7-day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

Often

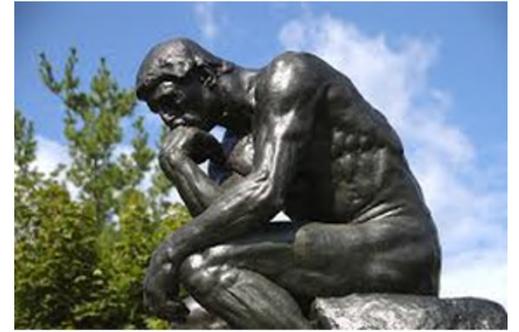
Sometimes

Never/Rarely

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\*Godin Leisure-time Exercise Questionnaire," adapted from Godin, G., Jobin, J., Bouillon, J. (1986). Assessment of leisure time exercise behavior by self-report: A concurrent validity study. *Canadian Journal of Public Health*, 77, 359-631. Used with permission.

# Your Way of Thinking



Why do you think physical activity participation rates are so low?

How would you try to increase your own physical activity as well as that of friends/family?

# Global Physical Activity Participation Patterns

- ▶ Countries studied:
  - Australia, Brazil, Canada, England, Scotland, United States
- ▶ Demographics studied:
  - Age, gender, ethnicity, socioeconomic status, education level

# Epidemiology— Studying Physical Activity Patterns

Five W's:

- ▶ Who exercises?
- ▶ Where, when, and why do they do so?
- ▶ What do they do?

*Sample questions:*

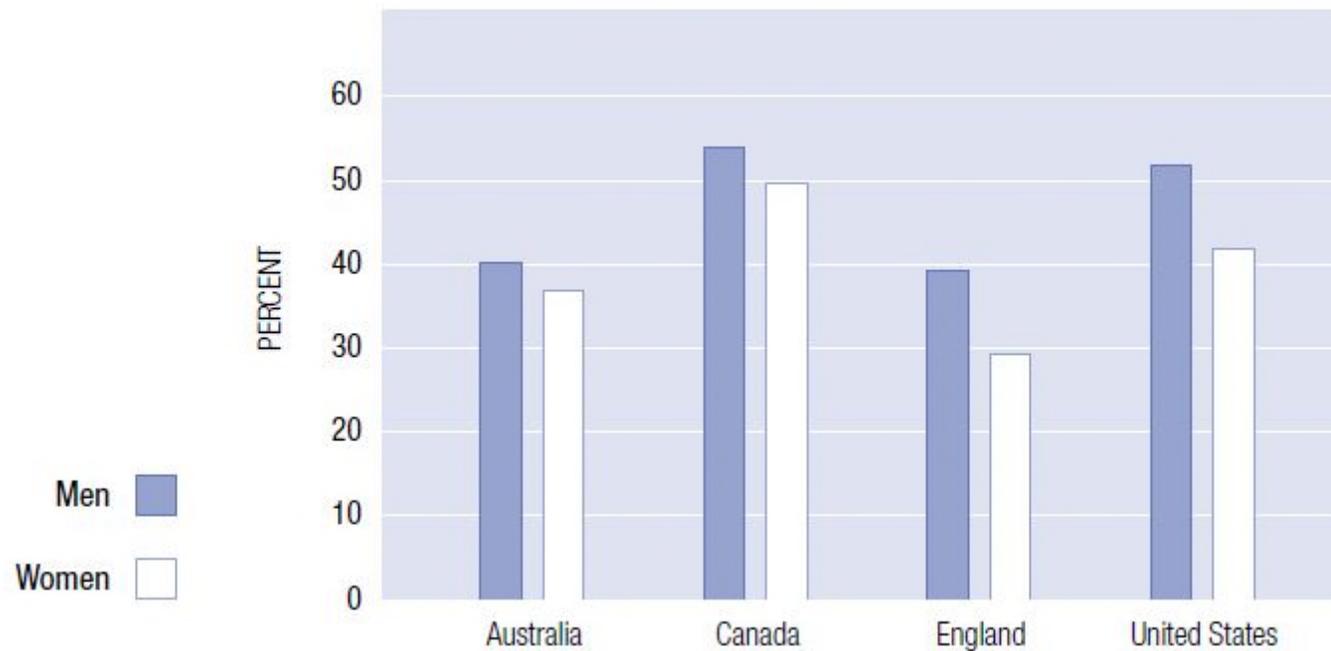
To what extent are individuals within a particular society physically active?

What physical activities are people most engaged in?

# Guidelines for Physical Activity

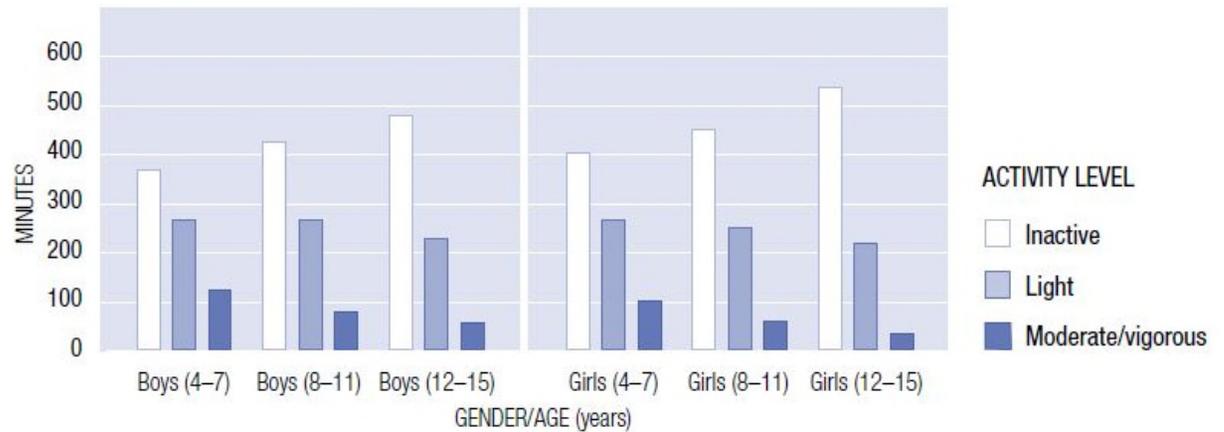
- ▶ Recommendations include training in the following areas:
  - Cardiovascular
  - Resistance
  - Flexibility
  - Neuromotor
- ▶ For more information, see:
  - [CDC](#)
  - [NIA](#)
  - [USDHHS](#)
  - [ACSM](#)
  - [Canadian Society for Exercise Physiology](#)

# Percentage of Population Engaging in Physical Activity—by Gender/Country

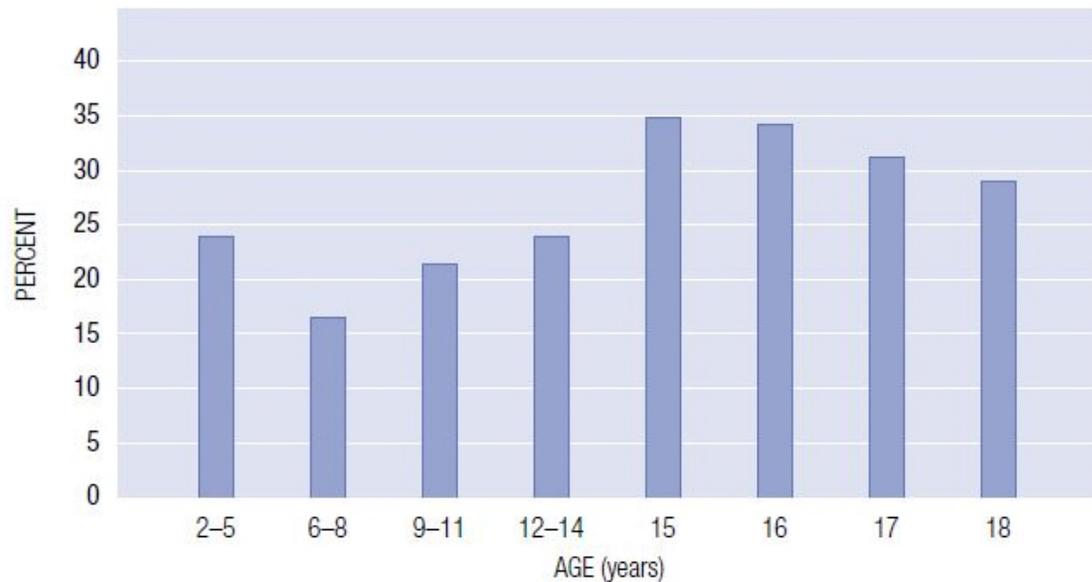


# Physical Activity Levels of Children

English children



U.S. children who view TV/videos more than 2 hours/day, by age

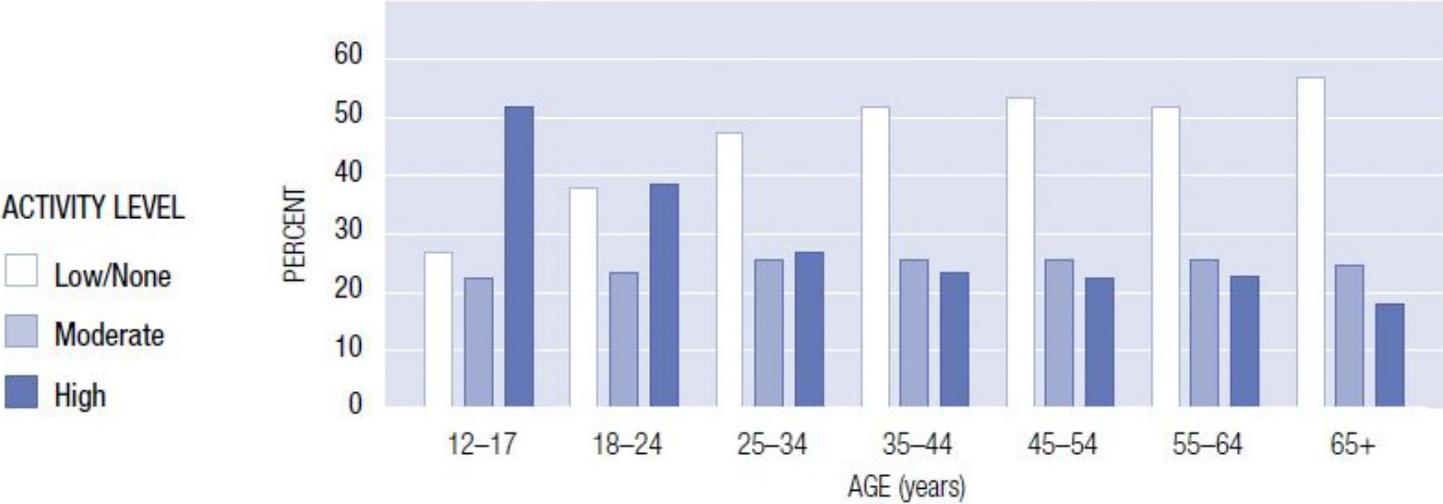


# Your Way of Thinking



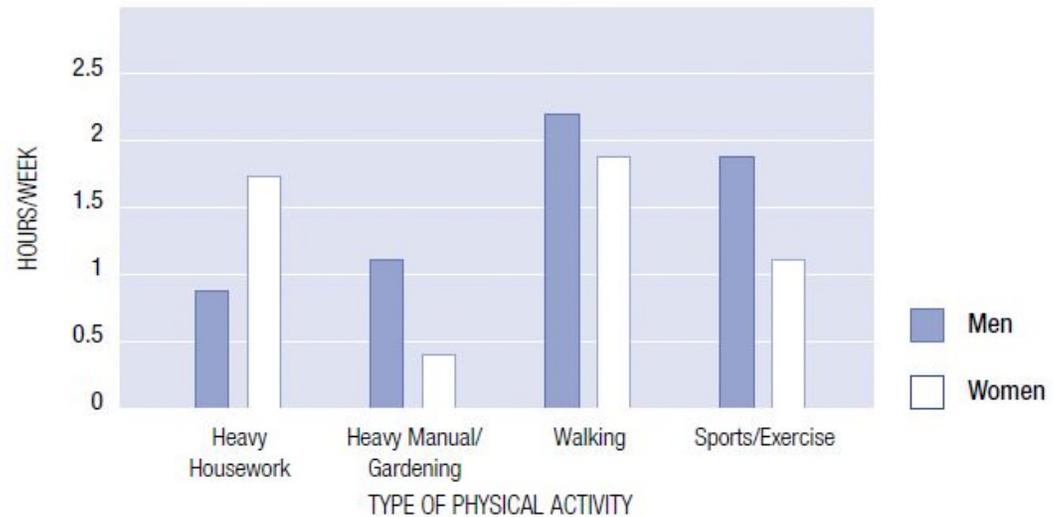
How can we transfer children's enjoyment of sports and play into lifetime physical activities?

# Physical Activity Levels by Age (Canadians)



# Physical Activity Levels—by Gender

English adults—  
hours spent on various  
activities

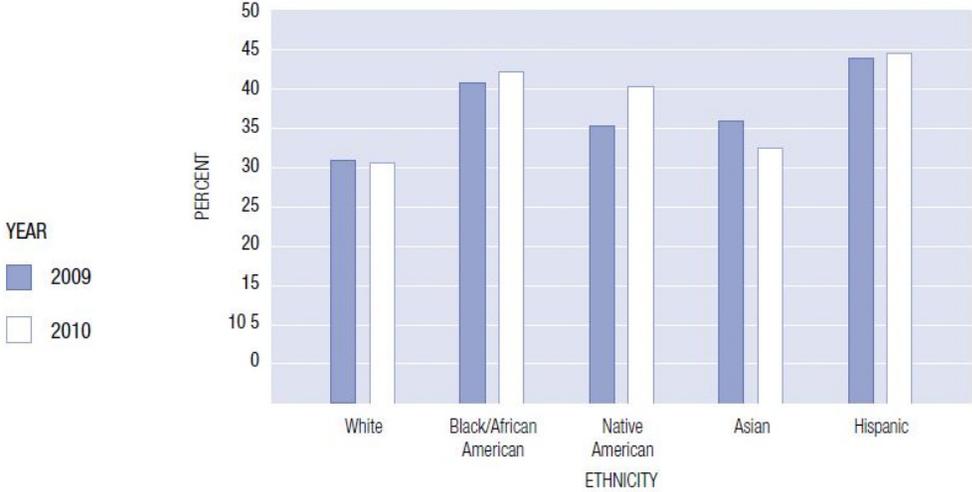


Popular activities for  
Canadian adults

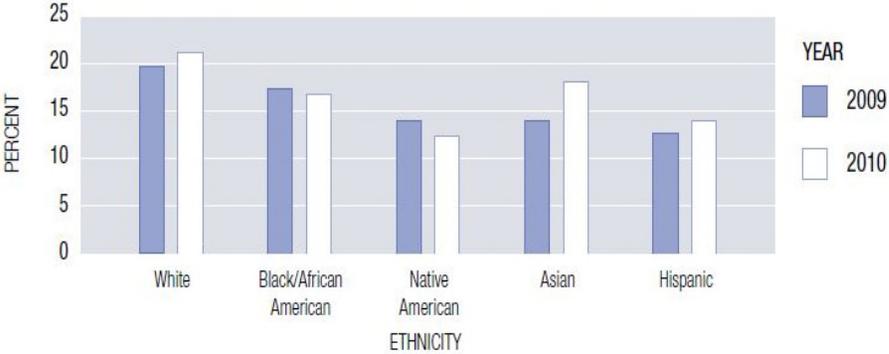
MEN	WOMEN
Walking	Walking
Home Exercises	Home Exercises
Weight Training	Weight Training
Aerobic Exercise Class	Jogging
Jogging	Aerobic Exercise Class
Bicycling	Gardening
Gardening	Bicycling
Hockey	Swimming
Basketball	Hockey
Swimming	Basketball

# Physical Activity Levels —by Ethnicity (U.S. Adults in 2009 and 2010)

Defined as sedentary

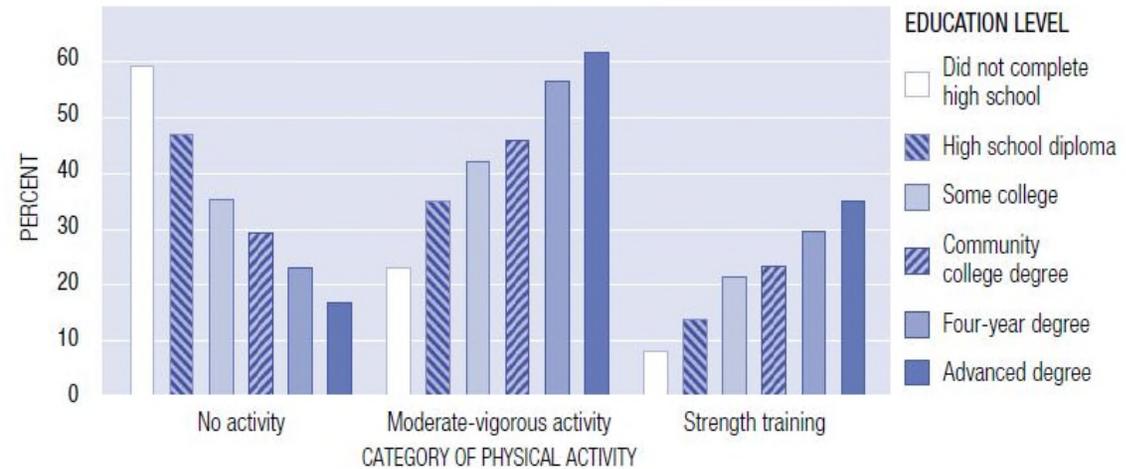


Met objectives for aerobic and muscle-strengthening activities

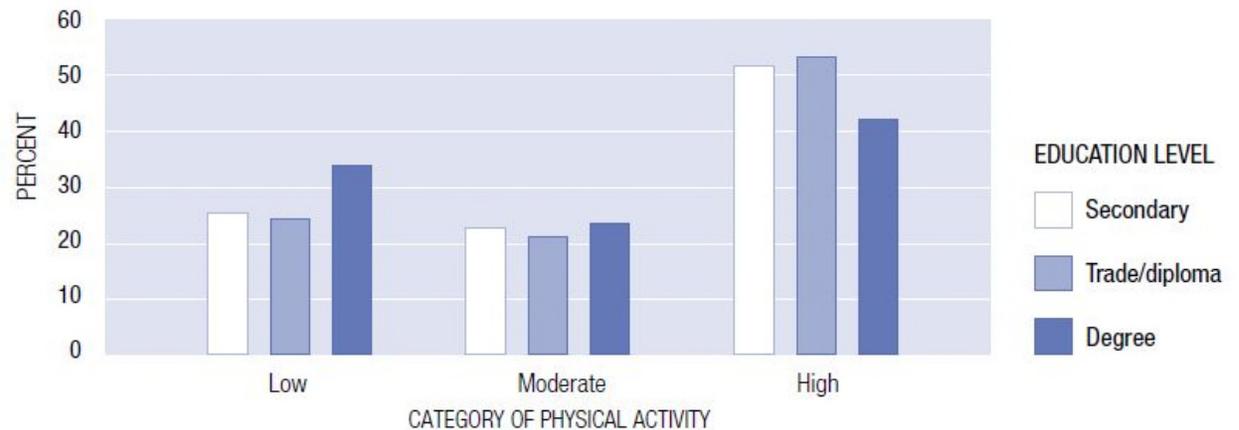


# Physical Activity Levels—by Education

% of U.S. population



% of South African population



# Summary of Participation Patterns

- ▶ Number of people worldwide who exercise at a minimal level is extremely low.
- ▶ Amount of time engaged in physical activity declines with age.
- ▶ Men are more likely to engage in *vigorous* exercise, but women engage in as much, if not more, *moderate* activity.

*(continued)*

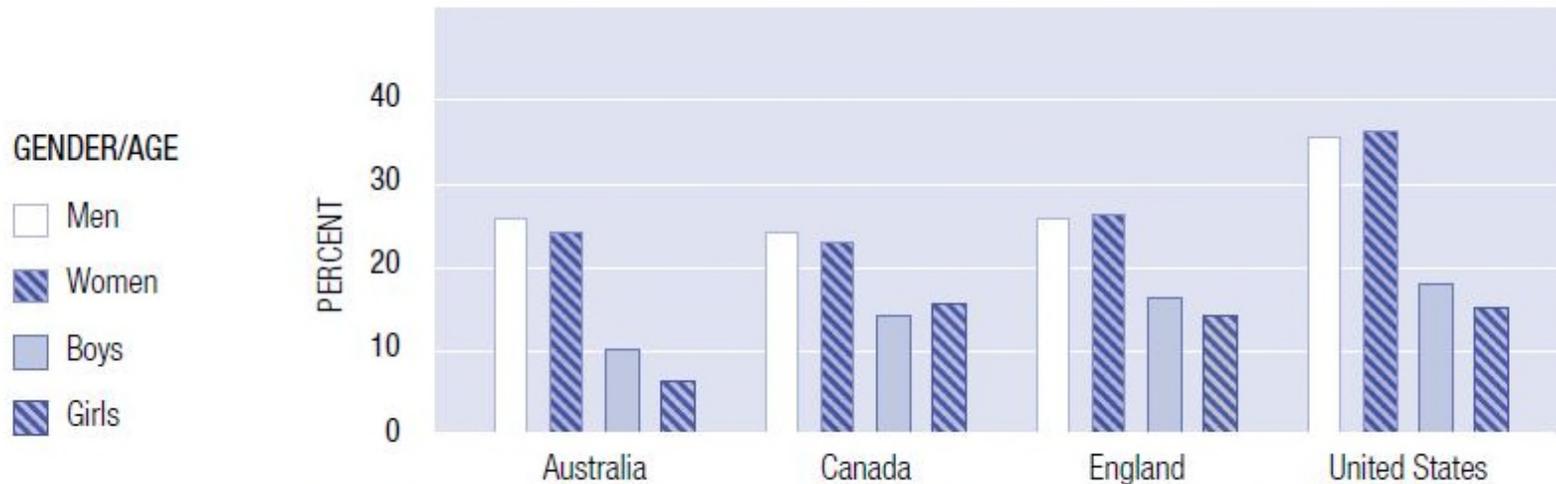
## Summary of Participation Patterns, continued

- ▶ Low income groups and ethnic minorities tend to participate in less physical activity than the rest of the population.
- ▶ Education level is directly related to physical activity levels; the more education, the greater the physical activity.

# Consequences of Physical Activity and Inactivity

- ▶ Physically active people have lower overall all-cause mortality rates.
- ▶ Many conditions can be directly and positively impacted by adoption of a physically active lifestyle.
  - Coronary heart disease, heart attacks, diabetes, high blood pressure, obesity

# Obesity by Gender, Age, and Country



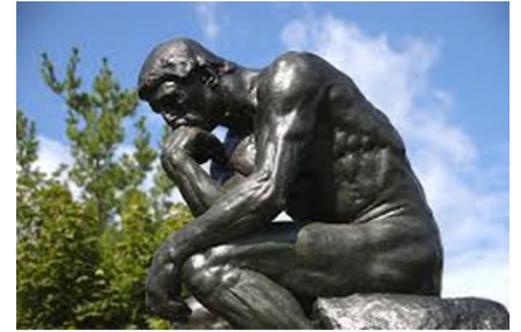
Note: Boys and girls under 18 years of age, men and women 18 years or older.

# Focus on Special Populations

- ▶ Misconception:
  - People with a disability or chronic disease are insufficiently healthy to participate in exercise.
- ▶ As a result, these populations:
  - are far less active than the general population.
  - are at increased risk for secondary physical and psychological health problems.

Clearly, we need to rethink the potential value of exercise for these populations.

# Your Way of Thinking



## Issue for Debate

- ❑ The rise in technology is to blame for the widespread reduction in physical activity participation.
- ❑ But, new technologies (electronic trackers, mobile devices, apps, and social media) can be used to track and measure physical activity, and to offer social support—thus increasing participation.
- ❑ Which argument regarding technology and its effect on physical activity do you think is more accurate?