Epidemiological Transition

• Decline in mortality over time
• Changes in causes of death
• Major camps on mortality decline:
  – Nutrition
  – Health care
  – Sanitation

Phases of Western mortality decline
(1)

• End of epidemics, crisis mortality, and famine (through 1875)
  – Major causes of death are flu, pneumonia, smallpox, TB
  – Life expectancy is 20-40 years
  – Distal factors:
    • Government intervention since Middle Ages
    • Cooler climate (effect unclear)
    • Nutritional improvement, from 18th century
  – Unevenly distributed
Nutrition

Effect of nutrition on mortality tends to be indirect. Better nutrition makes people stronger and more likely to withstand disease.

Life expectancy at birth

Source: Fogel 2004
Daily Caloric Supply

- France
- Gr. Brit.

Epidemics

- Bubonic plague
- Cholera
- Typhoid
- Influenza
- Smallpox
Smallpox in the New World

Phases of Western mortality decline
(2)

- Reduction in endemic infectious disease (1875-1930)
  - Life expectancy rises to 30-50 years
  - Distal factors: Better sanitation, standard of living, public health
  - Uneven decline, affecting babies and children first.
Early cities – high mortality

Crowding
Informally … bone-pickers, rag-gatherers, pure-finders, sewer-hunters, chimney sweeps, and night-soil men.

Minimal disposal of human waste

In 19th century, Edo (Tokyo) was cleaner than European cities:

- Waste was valuable
- Water intakes were high and unpolluted
- Streets were cleaner
Other Environmental Toxins

External influences

• Role of government and public health
  – Ensuring food distribution
  – *Cordons sanitaires*

Typhoid Mary
Hygiene

- Germ theory
- Washing of hands
- Education, especially of women

Western health care:
Not a linear advance

- Professionalization of medicine – very slow advances until 20th century
Better health knowledge

Source: Reuters

Hygiene

Source: Reuters
Rise of epidemiology as a field

Paradigm shift in disease etiology
Vaccines

Antibiotics

WWII-1960s: Golden age of antibiotics

Resistance rising:
• Over usage of antibiotics in people and animals.
• Enormous cost to bring a new antibiotic to market
Phases of Western mortality decline (3)

- Era of degenerative diseases (from 1930-?)
  - Life expectancy rises to 70+
  - Major causes of death are heart disease, cancer, and stroke
  - Distal factor: Rise of antibiotics
- “Hybridistic” mortality, influenced by behavior and lifestyle choices (see text)
  - More deaths from accidents, alcoholism, suicide and homicide

Change in causes of death

Figure 9. Trends in Death Rates from Major Causes

Preston and Haines, 1981
Epidemiological transition: Unfinished

World Distribution of Dengue - 2000

Epidemics

Impure water

Inadequate sanitation

More access to medical care
Malnutrition persists

ABC News

Sanitation

- Accessing clean water for drinking
- Learning to purify water
- Getting toilets