CHAPTER 4 LECTURE OUTLINE

GEOGRAPHY OF HEALTH & DISEASE
Chapter 4 Modules

• 4A Health and Geography
• 4B Human Ecology of Disease
• 4C Disease Basics
• 4D HIV/AIDS
• 4E Common Diseases
• 4F Snapshot of Global Health
• 4G Geography of Health Care
Medical Geography

• The application of geographic ideas, information, and theories to the study of disease, health, and health care.
• Also called Health Geography
4A: Health and Geography

• Approaches:
  • Human-Environment relationships
    • Poor environments can negatively affect health
    • Pollution and other human-made problems
  • Culture
    • Religious or other cultural attitudes/practices can affect how diseases or other ailments are dealt with
  • Movement
    • Diffusion of diseases
SARS 2002-2003

Figure 4A.3

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Reto Stockli, NASA Earth Observatory
4B: Human Ecology of Disease

- Human Ecology:
  - the interconnections between human populations and the physical world

- Triangle of Human Ecology:
  - Population
  - Behavior
  - Habitat

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Insults and Stimuli on Health

- Chemical Insults:
  - Drugs, exposure to chemicals or gases

- Physical Insults:
  - Trauma from accidents, radiation, shock

- Psychosocial Insults:
  - Crowding, anxiety, love, sense of belonging

- Infectious Stimuli:
  - Viruses, bacteria, protozoa
4C: Disease Basics 1

- **Endemic:**
  - A disease that’s always present in a population

- **Epidemic**
  - A disease that occurs in larger #s than normal

- **Pandemic**
  - A worldwide epidemic
4C: Disease Basics 2

• **Agent:**
  • The organism that causes a disease
    • Bacteria, viruses, protozoa, tiny worms (flukes)

• **Host:**
  • The life form, animal or human, that has the disease caused by an agent

• **Vector:**
  • The means by which the agent is transmitted to the host
    • Such as mosquitoes, flies, ticks, bats, or fleas (blood feeders)
Schistosomiasis
SCHISTOSOMIASIS

• **Where**: Southern Hemisphere, tropics
• **Environment**: fresh, muddy water
• **Result to host**: internal scarring, anemia, learning disabilities
• **Agent**: fluke (worm)
• **Vector**: snails
HIV/AIDS

To calculate the adult HIV prevalence rate, we divided the estimated number of adults (15–49) living with HIV in 2009 by the 2009 population aged 15–49.
Guinea Worm

Agent: parasite

Host: humans and warm blooded animals

Environment: muddy water
Water filters effective prevention
HIV/AIDS IN AFRICA

Figure 4D.2

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HIV/AIDS

• **Where:** world, worst in Southern Africa
• **Environment:** doesn’t matter
• **Agent:** *Human Immunodeficiency Virus* (HIV) is the virus that causes *Acquired Immune Deficiency Syndrome* (AIDS.)
• **Host:** primates
• **Vector:** bodily fluids
4D: HIV/AIDS

- Pandemic:
  - Over 25 million deaths since 1981
- Different geographies around the world
- Prevention measures:
  - Sex education
  - Retroviral drugs
  - Free syringes in high drug-use areas
  - Affordable testing
DISTRIBUTION OF MALARIA

Figure 4E.1

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MALARIA

• **Where:** more in tropics
• **Environment:** standing water (tends to follow agriculture, especially irrigation)
• **Agent:** *Plasmodium* parasites
• **Host:** humans (warm blooded animals get a different type)
• **Vector:** female Anopheles mosquitoes
• Tuberculosis (TB)
  • Pulmonary disease
  • 9 million new cases a year
  • 1/3 of the world’s population has been exposed
  • Hard to control because it is transmitted person-to-person
    • Single sneeze can release 40,000 droplets of infected spit
YELLOW FEVER

Figure 4E.3
INFLUENZA in the U.S., 1918-1920

Figure 4E.5

Approximate dates of onset
- Before Sept. 14
- Between Sept. 14 and Sept. 21
- Between Sept. 21 and Sept. 28
- Between Sept. 28 and Oct. 5

Library of Congress, Prints & Photographs Division, LC-USZ62-138117
• **Yellow Fever**
  - Mosquito-transmitted *viral* disease
  - Endemic in Africa & Latin America
  - 200,000 cases & 30,000 deaths a year

• **Diarrhea**—may have different causes
  - A leading killer worldwide
  - Kills 2 million children under 5 each year

• **Influenza**— virus
  - Killed 100 million people during 1916-1918
  - Continues to be a major health concern
Figure 4E.2

DISTRIBUTION OF TB

Estimated TB incidence rate (per 100,000 population), 2006

- ≥300
- 100–299
- 50–99
- 25–49
- 0–24
- No estimate
TUBERCULOSIS

ENVIRONMENT  Crowded

AGENT  Mycobacterium *tuberculosis*.

HOST  humans and cattle (and other mammals)

VECTOR  breath
WHITE PLAGUE

KENTUCKY

6,802
KILLED IN BATTLE
DIED OF WOUNDS OR DISEASE

7,997
KILLED BY TUBERCULOSIS

2nd WORLD'S WAR
DURING WAR PERIOD
56 MONTHS
56 MONTHS
Figure 3A.2

BLACK PLAGUE

Spread of the Black Death
- 1346
- 1347
- 1348
- 1349
- 1350
- 1351 and later

General route of the Black Death

Map showing the spread of the Black Death across Europe from 1346 to 1351, highlighting key cities and the Atlantic Ocean and Mediterranean Sea.
Bubonic, pneumonic, septicemic plague

**HOME:** cold deserts—Mongolia, New Mexico

**AGENT:** *Yersinia pestis* a bacterium

**HOST:** rodents, humans, warm blooded animals

**VECTOR:** fleas
Access to health care can be limited by:

- Functional factors
  - Absence or presence of health care resources
- Geographic factors
  - Proximity to resources
- Social factors
  - Racism, sexism
- Financial factors
  - Limited access to the poor in some areas
Figure 4F.1

PHYSICIANS / 10,000 PEOPLE

Source: World Health Statistics 2010. © WHO 2010. All rights reserved. http://www.who.int/whosis/whostat/EN_WHS10_Full.pdf (Fig. 12, p. 114)
SAFE DRINKING WATER

Figure 4F.2

Share of population with access to improved drinking water
- 85% or more
- 70–85
- 55–70
- 40–55
- Less than 40%
- No data
PROPER SANITATION

Figure 4F.3

Use of improved sanitation
- 91–100%
- 76–90%
- 50–75%
- <50%
- No or insufficient data
UNDERNOURISHED POPULATION

Figure 4F.4
Figure 4G.1

PUBLIC HEALTH EXPENDITURES

Per capita total expenditure on health (int.$)

- 0–100
- 101–300
- 301–700
- 701–2,000
- 2,001–4,000
- > 4,000
DOCTORS PER CAPITA

Figure 4G.2