Chapter 1

Public Health: Science, Politics, and Prevention
HEALTH

• What is Health?
  • “A state of complete physical, mental, social and spiritual well-being and not merely the absence of disease” WHO definition

• Health represents a dynamic state with habits that promote health and lowering risk of any diseases
Dimensions of health:

- **Emotional health** - feel and express emotions, self-esteem,…
- **Intellectual health** - open mind and learn new things
- **Spiritual health** - meaning and direction in the life
- **Occupational health** - relates to place of employment
Dimensions of health:

• **Social health** - relationship, interaction with others
• **Physical health** - perform normal activities of daily life
• **Environmental health** - external factors that affect health, water, air, ..
Public Health:

HISTORY

Historical timeline:
1881 teaching of sanitary science begins at the University of Michigan

1897: first Master of Science in hygiene
1915: first Master of Science in Public Health
When you think about Public Health...

• When you think about Public Health, do you picture “only” someone giving a child vaccination at an inner-city clinic?????

• Think about specialist who work with community groups: Disease prevention, educate the public about nutrition and health, develop strategies to help to adopt healthier lifestyle, promote healthy behavior, create healthy environment.....
When you think about Public Health...

- Chronic diseases, toxic wastes, behavior-related disorders, hazardous chemicals and physical agents, new infectious diseases, aging population and their problems
- (normal versus typical aging), health of infants and mothers……
- natural disasters….
What is CFS?

- **Immune system compromised**
- **Marginal deficiencies:**
  - Folic acid
  - Vitamin B 12 and Vitamin B group
  - Vitamin C
  - Magnesium
  - Zinc
  - L-Tryptophan – serotonin
  - Essential fatty acids- omega-3 and ratio
  - Sodium
  - Water

- **Underlying health problems**
  - Depression
  - Cholestasis /impaired liver function .. (sat. fat, ref. sugar, low fiber diet, drugs)
  - Obesity
  - Diabetes
  - Medication/drugs/alcohol
  - Cancer
  - Constipation
  - Chronic stress – overuse
  - Chronic lack of sleep
  - Hypoglycemia
  - Chemical sensitivity
To Be Tired or Not To Be tired
is the Question................?Shakespeare

- Sleep: how many hours /day?
- Exercise: how many minutes/hours/day?
- Stress: how many minutes/day do you laugh?
- Coffee & caffeinated drinks: how many cups/day do you drink?
- Fruits & vegetables: do you like to eat?
What is Public Health?

• The fulfillment of society’s interest in assuring the conditions in which people can be healthy.
• Organized community efforts aimed at the prevention of disease and the promotion of health.

( for example: drinking water in US/other countries)
Core Functions of Public Health

- Assessment
- Policy Development
- Assurance (protect health and prevent disease)

- Compare with a medical doctor:
  - diagnostic process for health/disease,
  - strategic approach/treatment plan,
  - actual treatment- services available
Public Health vs. Medical Care

• In medicine the patient is the individual; in public health, the patient is the community
• Public health diagnoses the health of the community using public health sciences
• Treatment of the community involves new policies and interventions
• Goal of medicine is cure; goal of public health is prevention of disease and disability
Public Health: Science and Politics

• Science is how we understand threats to health, determine what interventions might work, and evaluate whether the interventions worked

• Politics is how we as a society make decisions about what policies to implement

• Example: tobacco- lung cancer/ policy of non-smoking area
Public Health Disciplines

- Epidemiology (epidemics/obesity, prostate cancer in western countries and Asia), new diseases
- Statistics (calculate risks, testing the new drug)
- Biomedical Sciences (AIDS, flu, Hanta virus, Cancer…)
- Environmental Health Science (new chemicals)
- Social and Behavioral Sciences (Latino paradox)
- Health Policy and Management
Epidemiology

- The basic science of public health
- The study of epidemics
- Aims to control spread of infectious diseases
- Seeks causes of chronic disease and ways to limit harmful exposures.
Statistics

• Collection of data on the population
• These numbers are diagnostic tools for the health of the community
• The science of statistics is used to calculate risks, benefits.
Biomedical Sciences

- Infectious diseases – pathogens
- Chronic diseases
- Genetics
“IT IS MORE IMPORTANT TO KNOW WHAT SORT OF PATIENT HAS A DISEASE THAN WHAT SORT OF DISEASE A PATIENT HAS”

• --Sir William Osler, M.D. (1849-1919)
Environmental Health Science

• Health effects of environmental exposures
• Air Quality
• Water Quality
• Solid and hazardous wastes
• Safe food and drugs
• Global environmental change
Social and Behavioral Sciences

- Behavior is now the leading factor in affecting people’s health
- Theories of health behavior: social environment affects people’s behavior
- Major health threats: tobacco, poor diet and physical inactivity, injuries
- Maternal and child health – a social issue
Health Policy and Management

• Role of medical care in public health
• Cost of medical care in U.S. is out of control
• U.S. has a high percentage of population without health insurance – these people often lack access to medical care
• Quality of medical care can be measured, and is often questionable.
Public Health: Prevention and Intervention

- Primary prevention (prevent disease)
- Secondary prevention (minimize the severity of the illness)
- Tertiary prevention (minimize the disability, rehabilitations)
Public Health Approach

• Define the health problem
• Identify the risk factors associated with the problem
• Develop and test community-level interventions to control or prevent the cause of the problem
• Implement interventions to improve the health of the population.
• Monitor the interventions to assess their effectiveness.
Chain of Causation

- Agent
- Host
- Environment
- Interventions can focus on any of these targets.

- Malaria, West Nile virus, Hanta virus,
- High dietary fat/type of food/schools/education, cooking class (prevent obesity)…
Public Health and Terrorism

- Events of 9/11 and the anthrax letters highlighted the importance of public health.
- The public health response to disasters, both natural and man-made, helps to control the damage and prevent further harm to survivors and rescuers. (Katrina and Rita hurricane-problems)
- Bioterrorism is recognized primarily through classical public health measures similar to those used in natural epidemics.
Discussion Question 1

• Describe some actions that governments have taken to ensure that people are safer and healthier today than people were 100 years ago.
Discussion Question 2

• What are the three core functions of public health?
• How do these functions compare with the functions of medical care?
• How are the six disciplines of public health used to accomplish the core functions?
Answers:

• Assessment, policy development, assurance

• Diagnosis, treatment planning, therapy

• Slide # 16
• Video clip: vaccines
Chapter 2

Why Is Public Health Controversial?
Why Is Public Health Controversial?

The Value of Life?
Social Justice vs. Market Justice

- Public health should be a way of doing justice, a way of asserting the value and priority of all human life

- Public Health as a social justice
• Dream of public health: preventable death and disability should be minimized

• Political conservatives: limit public health to a technical enterprise, focused on controlling communicable disease, or safety net that provides medical care to the indigent

• This restrictive view of PH was encouraged by physicians, concerned about government encroachment on their economic and professional independence

• Limitations on federal funding to local public health departments 1930-1940
Social Justice vs. Market Justice

• The common good (the value and priority of human life)
• Individual responsibility
• Questions about the scope of public health
• Importance of economic factors for health – politically controversial
• People with higher incomes tend to be healthier for a variety of reasons……
Research on SES and Health
( slides from # 7-13 were developed by Katie Pine, PhD student))

• SES is such a powerful risk factor for negative health outcomes that it is almost always controlled for in research but is rarely studied itself

• There is evidence that a correlation between SES & health exists at every step of the social hierarchy, not simply for those at the bottom of the social ladder

(Adler et. Al., 1994)
Merriam-Webster’s Definition of Poverty

“The state of one who lacks a usual or socially acceptable amount of money or material possessions”
• Some Additional Research Findings
• HIV positive, low income blacks & Hispanics develop AIDS faster than whites
  – HIV positive people of higher SES have a greater chance of long term survivorship (Taylor, 2003)
• Heart Disease is more common in those of lower SES and their signs & symptoms of disease develop earlier (Gump, Matthews, & Raikkonen, 1999)
  – Low SES is also associated with poorer prospects for recovery (Ickovics, Viscoli, & Horwitz, 1999)
• Adolescents of lower SES status are more likely to smoke than those of higher SES (Adler et. Al., 1994)
• People with higher SES are less likely to have most medical and psychiatric disorders (Adler et. Al., 1994)
• Biological Factors that Contribute to Negative Health Outcomes

• Exposure to pathogens, carcinogens, & other substances
  – People with low SES more likely to smoke
  – more likely to live near sources of pollution
• Socioeconomic Status

• SES is “a composite measure that typically incorporates economic status, measured by income; social status, measured by education; and work status, measured by occupation”
• SES and Obesity cont.

Psychological Factors:

• Low SES populations tend to consume more potatoes and soft drinks and less fruits and vegetables than high SES populations (Hulshof et. al., 2003)

• Low SES populations favor foods with a high calorie per dollar ratio

• Social norms for attractiveness are accepted and internalized to a lesser extent by women of low SES (Sobal & Stunkard, 1989)
• SES and Obesity cont.

Environmental:

• High rates of crime in low SES communities can discourage physical activity

• A dose-response relationship can be observed between income category of a community and the number of fast food outlets nearby (Reidpath et. al., 2002)
Sources of Controversy

- Economic impact
- Individual liberty
- Moral and religious concerns
- Politics vs. science
Economic Impact

• Businesses often resist public health measures because they affect profits
• Those who must pay may not be the ones who benefit
• Costs may be short-term, while benefits may be long-term
• Costs easier to calculate than benefits
Economic Impact

• Milk producers resisted pasteurization
• Landlords resisted building codes,
• Automobile manufactures resisted design changes to improve safety
• Cigarette sales also are a significant income for small businesses
• Owners of bars and restaurants fought laws restricting smoking on their premises, fearing that they would lose patronage of smokers
Economic Impact

• In times of economic difficulty, people are often unwilling to pay short-term cost in order to obtain a benefit in the long term.

• Fishing & lumber industry – sources depleted – risk of killing all fish, cutting down all the timber
Examples

• Companies resist tough pollution control
• Mad cow outbreak, (USA no testing, American beef banned in many countries)
• Smog in LA: to calculate the cost of reduction - easy, how to calculate whether this benefit is worth the coast - difficult, also timeline problem
Individual Liberty

• Government should provide maximum health and safety for the community as a whole

• Agreement: to restrict an individual’s freedom to behave in such a way as to cause direct harm to others
Tragedy of the Commons

- Exemplified in many environmental laws
- “Freedom to pollute”
- Behavior on indirect harm: tragedy of the commons
- In industrial world “commons” is air, water ….
- A ban on a gas-driven lawn movers (1 versus many)
- Elimination of drive-through windows in bank and fast food restaurants (cut pollution from idling car engines)…. 1 versus many
- Example in Europe: stop car engine – no idling car engines
When Can Government Restrict Individual Freedom?

- To prevent harm to others – generally acceptable
- Helmets – “tyranny of health”, “health police” but risks for other drivers
- Paternalism – acceptable for children
- To protect individuals from their own actions? (opposed by libertarians), only to prevent harm to others (banned smoking indoor, smoking itself cannot be regulated in adults)
Moral and Religious Opposition

- Sex and reproduction
- PH approach: sex education, provision of contraceptives services, especially condoms
- Opposition by certain groups: they believe that it promotes immoral behavior
Moral and Religious Opposition

• Alcohol and drugs

• Clean needles to drug addicts – effective to reduce the spread of the virus versus the believe of moralists- they believe it condones the use of iv drugs
Politics vs. Science

• There is always the possibility of tension
• Current conservative control of federal government intensifies the conflict
• Criticism of Bush administration for going too far in misrepresenting science to support its policies.
• 2004 USC (Union of Concerned Scientist): more than 60 leading scientists & 20 Nobel-Prize Winners…signed a report:

• “administration’s misrepresentation or suppression of scientific information to obscure the fact that policy decisions are based on its political agenda….”
Examples

- PRESSURE ON: Center for Control Disease and Prevention (CDC): to promote abstinence – only program for preventing teen pregnancy

- 2003: National Cancer Institute’s web – information suggesting that having abortion increased a women’s risk of breast cancer

- The President’s Council on Bioethics: was created to consider research on embryonic stem cells. Early 2004 two members, scientists who were supporters of the research, were dismissed

- Advisory committee on Childhood lead poisoning prevention act: recommend strict federal standards for exposure to lead, the highly qualified scientist replaced with members who had financial ties to the industry
Discussion Question 1

• Do you agree that the philosophy of social justice is preferable to the philosophy of market justice? Which is likely to lead to greater improvements in public health?
Discussion Question 2

• Give an example of a measure that would benefit public health but might be expensive to implement. Who would benefit? Who would pay the cost?
• Video clip: West Nile virus
Chapter 3

Powers and Responsibilities of Government
Federal vs. State

- U.S. Constitution: To promote the general welfare
- Reserve clause: since health is not mentioned in the Constitution, primary responsibility belongs to the states
- Interstate commerce clause justifies federal role in some cases
- Power to tax and spend is widely used by federal government to control public health policy
Branches of Government (federal, state, local)

- Legislative – passes statutes
- Executive – public health agencies carry out the law; may issue regulations consistent with statutes
- Judicial – laws and regulations can be challenged in court
Local Public Health Agencies

- County and city health departments
- Day-to-day responsibility
- Core public health functions
- Often also have responsibility for providing medical care for the poor
- Funding sources are variable; city or county legislatures may not understand importance of core functions.
- Mandates may be funded from state or federal governments.
State Health Departments

- Coordinate activities of local health agencies and provide funding
- Collect and analyze data
- Laboratory services
- Manage Medicaid
- License and certify medical personnel, facilities, and services
- Environment, mental health, social services, and aging may be handled by separate agencies
Federal Agencies

- Department of Health and Human Services (HHS) (www.hhs.gov)
  - Centers for Disease Control and Prevention (CDC) (www.cdc.gov)
  - National Institutes of Health (NIH) (www.nih.gov)
  - Food and Drug Administration (FDA) (www.fda.gov)
  - Centers for Medicare & Medicaid Services (CMS) (www.cms.gov)
  - Agency for Healthcare Research and Quality (AHRQ) (www.ahrq.gov)
Federal Agencies (ctd.)

- Environmental Protection Agency (EPA) (www.epa.gov)
- Occupational Safety and Health Administration (OSHA) (www.osha.gov)
- Department of Agriculture (USDA) (www.usda.gov)
Centers for Disease Control and Prevention

• Main epidemiologic and assessment agency for the nation
• Publishes Morbidity and Mortality Weekly Report (MMWR)
• Center for Health Statistics – collects data on U.S. population concerning all aspects of health
• Centers on infectious diseases, chronic disease, injury prevention, and others
National Institutes of Health

• Biomedical research agency
• Institutes on cancer, heart and lung disease, diabetes, aging, child health and human development, and others.
• National Library of Medicine
• Has laboratories in Bethesda, MD and provides grant funding to researchers in universities and research centers.
• Clinical Center where medical researchers test experimental therapies
Nongovernmental Public Health Organizations

• American Cancer Society, American Heart Association, American Diabetes Association, Alzheimer’s Disease and Related Disorders Association, and others

• American Medical Association, American Nurses Association, American Public Health Association, and others

• Consumer groups
Philanthropic Foundations

• Rockefeller Foundation
• Robert Wood Johnson Foundation
• Pew Charitable Trusts
• Kaiser Family Foundation
• Commonwealth Fund
• Bill and Melinda Gates Foundation
Discussion Question 1

• Choose a specific health problem. How might federal, state, and local levels of government divide responsibility for addressing it?

• Example: Lung cancer etc...
Discussion Question 2

• Choose a federal public health agency and visit its Web site. Identify an issue it is currently dealing with and describe reasons for current concern. Discuss any controversies that may be involved in actions the agency may have taken or need to take.

• www.epa.gov
Discussion Question 3

• Why is it important for nongovernmental organizations to be involved in public health activities?
• http://www.diabetes.org/
Discussion Question 4

• Find the Web site of one of the philanthropic foundations listed in slide 11 and visit the site to learn more about the foundation’s activities.

• http://www.gatesfoundation.org/Pages/home.aspx