Evolution of Health Care Delivery & Technology
PHRM 831
Objectives

• Be familiar with
  – the association between the ability to provide effective health care and provider power.
  – The resulting impact on the status and income of providers

• Be aware of the major distortions in the US Health Care System

• Understand why/how State/Federal Government involvement in HC impacted overall costs.
Evolutionary Periods

- HC in the US (and most of the developed world) followed cyclical periods of advancement in understanding and the ability to provide care.
- The time periods could be divided and named almost arbitrarily; we will use some times and titles that are often seen in descriptions of the history of health care development.
- What is important is to see how the system changed and different forces emerged as our ability to provide efficacious care grew.
Time Periods

- Colonial (pre 1850)
- The Institutionalization Period (1850~1900)
- Emergence of Scientific Method of HC—roughly 1900 to 1945
- Logistics & planning—during/post WWII to the 1980s
- Cost containment—the emergence of managed care and emphasis on slowing cost growth. Started in 70’s, peaking 1990 to the new millennium
- The current…..whatever. The emergence & evolution of frank HC rationing—early/mid oughts forward
Pre-1850 medical models

- Galen’s four humors, (blood, phlegm, yellow & black bile) when imbalanced, caused disease. So let’s bleed some of it out of people.
- Or, the miasma theory that stated that diseases such as cholera and bubonic plague were caused a noxious form of "bad air"
- The OTHER explanation was that you were repellent to God, having somehow offended him by your moral choices, and therefore worthy of punishment- which may help explain the importance of religion at the time.
- No one really knew why you lived, and your twin died.
- Lots of interesting ideas- graham crackers, high colonics, homeopathy. Health, basically, was a crap shoot.
- Hobbes: life was “solitary, poor, nasty, brutish, and short”.
Pre-1850 (Colonial Period)

- A loose collection of un-related services of questionable efficacy, multiple schools of thought and practice
- HC provider was a part-time occupation, success came to skillful marketers- unrelated to actual ability to cure or mitigate disease
- Often had another job- Barber/Surgeon, Apothecary/MD, Midwife/Herbalist- or, most commonly, Mom.
- Learned by doing, as an apprentice- anyone could become a provider
- The provider came to the patient- “circuit rider”
- Lord Byron, George Washington, many others “bled” to death
- First school of Pharmacy, PCP&S, formed in 1821: 2 yr degree
Emergence of New Technologies of Care

- Several things happened-
- Cholera, tuberculosis, dysentery, diphtheria, typhoid, measles and smallpox were endemic to urban life & killed 1000’s in each city each year.
- Boing! Edward Jenner develop vaccination against smallpox early in the century
- Boing! Dr. John Snow (the father of epidemiology) identified that shutting off water from a contaminated pump ended a cholera epidemic in London -leading to the idea of sanitation and public health in general
More tech

• Boing! In 1846, an American dentist, William Morton, introduced ether as an anesthetic.
• Boing! In 1847, Dr. James Young Simpson from Scotland discovered the effects of chloroform.
• Boing! Dr. John Snow realized that there could be different levels of anesthetic used according to the procedure (yep. Same guy. Gave chloroform to Queen Victoria for her last two children’s births).
• SURGERY became at least possible.
• A Viennese doctor, Ignaz Semmelweis, explored germ theory and started keeping his surgery clean.
1850-1890 (The Institutionalization Period)

-Hospitals established in urban areas (Bellevue, Mass. General) as people moved to cities from the farm.
-Provided a place to die- but also a place where doctors came to know each other, to share ideas, and build networks.
-Eventually became the focus of the organization of health care-the first dispensaries.
The rich would disguise themselves to get the care given to the poor.
-Not much in the way of effective drugs
-A 1878 debate was held re: the touch of a menstruating woman turning ham rancid
-Purdue RX formed, 1884
1850-1890 Technology of Care Continues to Grow

- In 1865, Lister discovered the benefit of using carbolic acid to sterilize surgical equipment. Surgery became survivable.
- In the same year, Louis Pasteur developed pasteurization and proved the malign effects of microbes.
- In the 1870s, Koch identified causative agents for anthrax and septicemia.
- We now knew **WHY** people died.
- And thus it became **theoretically** possible to save lives through direct, purposeful action.
1890-1930’s (Emergence of Scientific Method)

- 1900 Johns Hopkins Medical School opens
- Evolution of the science of disease; pathology, physiology, pharmacology
- Medicine as SCIENCE
- Significant progress in ability to treat disease
- With the ability to actually DO something for patients, we begin to see an immense increase in the power of doctors
Technological breakthroughs continue

- 1909- Paul Ehrlich discovered the anti-syphilitic activity of salvarsan (compound 606)
- The 1918 flu pandemic killed at least 50 million people around the world and became an important case study in epidemiology.
- 1928- Fleming and penicillin
A strange thing happened on the way to a HC system……

• You can see a divergence of approaches to medicine.
• In Europe, where people lived in large groups, close together, emphasis was on managing the health of populations- “PUBLIC Health”, financed through the government.
• In the US, a capitalistic democracy with a dispersed population, emphasis was on “Personal Health”-the individual doctor treating each patient- who paid for the service.(which was actually starting to be worth something)
• That basic pattern persists to this day.
Medicine takes over—one cause of US uniqueness

- Doctors now had the ability to save lives.
- With this came money, power, and autonomy.
- But, in the ecology, lots of other providers & treatments existed, and the large numbers of choices eroded medical income & influence.
- Medicine worked very diligently to eliminate competition, until only a REAL doctor would do, through the American Medical Association.
- See the reading by Donald Light.
METHODS OF PAYMENT

• There’s a fascinating pattern that corresponds to the advancement of medicine and the structure of our health care system.
• When MD’s couldn’t do much, they didn’t get much- money OR respect.
• Over time, they began to understand the rudiments of disease, and certain individuals were very well regarded.
• Once the ability to CURE became commonplace, MDs developed ever greater power, autonomy, and financial success.
• The “priesthood” of medicine. A new profession was born.
• 1st, priests. 2nd- attorneys. 3rd- physicians 3&1/2: Pharmacy 4:Nursing
Evolution of payment methods

- Pre-1850- might get ducks and grain, might not get paid at all
- 1850-1890 success for a few prominent individuals
- 1890-1945- development of the concept of health insurance, to ensure MDs and hospitals got paid. Care as a money maker
- 1945-1970- vast expansion of HC system, building of thousands of community hospitals. Federal government subsidizes this, as well as forming Medicare & Medicaid to pay for “bad” patients (bad= high cost, low ability to pay)
- The development of the medical-industrial complex
Payment Methods to lower costs, reduce MD power

• 1970-1980s- health planning to ensure resources used efficiently, but still based on Fee for Service.

• 1990s- recognition of out of control costs- regulations written to cause fierce competition, hope for free market to lower costs

• The new millennium- growing public subsidy of the cost of health care, along with greater control.

• Government involvement required so it is possible for someone to say NO to treatment

• And PPAAC to make sure we have enough to pay for it all?
INSURANCE

• PRIVATE Insurance for health care is almost unique to the United States - the “great accident” of the health care system
• Very early programs started as a way to keep income up for hospitals.
• Then the big BLUES (Blue Cross, Blue Shield) were formed to ensure doctors and hospitals could get money for services provided
BOING!!!!!!!!!! WORLD WAR II

• Probably the KEY issue in evolution of US health care.

• The war brought of lot of people together and taught them the science of logistics, which led them to believe with adequate planning, anything could be accomplished-

• 20 Sherman Tanks (Ronsons) to every Panzer.

• Including ensuring health for all. (G.I. effect)
WORLD WAR II’s stealthy, hidden impact

• The other effect was more insidious
• With few workers at home, and government rules freezing wages, corporations invented new ways to compete for employees.
• One of these was health care benefits
• And so, a HC system based on employer-purchased HC insurance was born.
• The distortions of that accident resound to this day
BOING!! ANOTHER impact of WWII

• Another huge distortion then occurred.
• Employer provision of health insurance was challenged as being a form of income; should be taxed—went to the supreme court
• The court ruled HC benefits were NOT taxable income.
• For all intents and purposes, employer provided HC insurance became free to the employee.
Post WWII impact

- Federal support for medical research
- Concept of HC as a right; governmental responsibility to monitor and organize HC for everyone- extension of the G.I. experience
- Hospital construction paid by federal funds (Hill-Burton Act)
- Medicare and Medicaid come into being in the 1960’s
- These programs took care of the poor and the old (= expensive) patients, so that employer insurance didn’t have to carry them.
- The quality of care available to people began to diverge, according to how good a job they had.
1970-1980 (Health Planning Period)

- Characterized by a short-lived attempt by Federal and State regulators to control quality
- Premise of coordination of the number and types of hospitals/equipment
- The “Certificate of Need” for new construction
- Started with the Comprehensive Health Planning and Public Service Amendments of 1966, which authorized funds for state and area Comprehensive Health Planning Agencies (failed because law had no teeth)
- 1974 saw the National Health Planning and Resources Development Act, which did include significant penalties and power
- Also saw the launch of managed care with the Health Maintenance Organization Act of 1973
1980s & 90’s
(De-regulation, Competition and Cost Containment)

- The Regan white house decided consumers would make the best choices, and rolled back regulation
- Thought was that economic competition for HC services would make system efficient
- For profit health care (Hospitals and HMO’s)
- Marketing of Health Care providers and services
- Limited resources and soaring costs
- Containment pressures from government and employers who pay for insurance
- Substantial growth of managed care
The New Millennium

- federalization, cost-shifting, rationing of HC
- Increasing involvement of the federal government in health care.
- New strategies to spread costs - e.g. required enrollment in Medicare part D for healthy elders
- Rationing/limitations to access
- Continued attempts to prevent health care system crash

PPAAC as a law to reform the insurance industry
II. Explain the major trends in development of health care in the United States for each of these areas:

(a) predominant health problems
(b) Technology
(c) social organization.
To Review….
1850-1900

- Predominant Health problems - Epidemics of acute infections such as Plague, smallpox, TB, Typhoid, pneumonia
- Technology - virtually none. Unproven treatments and good intent, no effective drugs
- Social organization for use of technology non-existent. Individuals left to their own resources or charity, which was primarily religious charity
1900 to World War II

-Predominant health problems- Acute events, trauma, or infections of individuals (not groups)

-Technology- beginning and rapid growth of basic medical sciences & technology, diagnostics, surgery.

-Social Org.-Beginning of societal and government efforts to care for those who could not care for themselves

-The great Depression and the emergence of the welfare state
World War II to 1990’s

-Predominant Health problems- Chronic, life-style disease such as heart disease, cancer, stroke
-Technology- explosive growth of medical science; technology captures the HC system
-Cat Scans, radiation treatments, “targeted” drugs
-Social org.- Concept of HC as a right; governmental responsibility to monitor and organize HC for everyone
-Medicaid & Medicare become single biggest consumers of HC resources
Death Rate 1900 top 15

1169 deaths per 100K/yr/top 15 causes

Table 1. U.S. death rate per 100,000 population for leading causes, 1900. For source of data, see Note 4.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Rate</th>
<th>Mode of Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Major Cardiovascular Disease</td>
<td>345</td>
<td>[N.A.]</td>
</tr>
<tr>
<td>2. Influenza, Pneumonia</td>
<td>202</td>
<td>Inhalation, Intimate Contact</td>
</tr>
<tr>
<td>3. Tuberculosis</td>
<td>194</td>
<td>Inhalation, Intimate Contact</td>
</tr>
<tr>
<td>4. Gastritis, Colitis, Enteritis, and Duodenitis</td>
<td>142</td>
<td>Contaminated Water and Food</td>
</tr>
<tr>
<td>5. All Accidents</td>
<td>72</td>
<td>[Behavioral]</td>
</tr>
<tr>
<td>6. Malignant Neoplasms</td>
<td>64</td>
<td>[N.A.]</td>
</tr>
<tr>
<td>7. Diphtheria</td>
<td>40</td>
<td>Inhalation</td>
</tr>
<tr>
<td>8. Typhoid and Paratyphoid Fever</td>
<td>31</td>
<td>Contaminated Water</td>
</tr>
<tr>
<td>9. Measles</td>
<td>13</td>
<td>Inhalation, Intimate Contact</td>
</tr>
<tr>
<td>10. Cirrhosis</td>
<td>12</td>
<td>[Behavioral]</td>
</tr>
<tr>
<td>11. Whooping Cough</td>
<td>12</td>
<td>Inhalation, Intimate Contact</td>
</tr>
<tr>
<td>12. Syphilis and Its Sequelae</td>
<td>12</td>
<td>Sexual Contact</td>
</tr>
<tr>
<td>13. Diabetes Mellitus</td>
<td>11</td>
<td>[N.A.]</td>
</tr>
<tr>
<td>14. Suicide</td>
<td>10</td>
<td>[Behavioral]</td>
</tr>
<tr>
<td>15. Scarlet Fever and Streptococcal Sore Throat</td>
<td>9</td>
<td>Inhalation, Intimate Contact</td>
</tr>
</tbody>
</table>
General Improvement in Death Rates

![Graph showing the general improvement in death rates over time. The graph plots death rates per 100,000 persons against years from 1900 to 2000.]
Public Health Model-Reduction in Deaths

INFLUENZA AND PNEUMONIA
Deaths per 100,000

TUBERCULOSIS
Deaths per 100,000

SYPHILIS
Deaths per 100,000

DIPHTHERIA
Deaths per 100,000

PERTUSSIS (WHOOPING COUGH)
Deaths per 100,000

MEASLES
Deaths per 100,000

POLIOMYELITIS
Deaths per 100,000

Impact of Vaccines on Incidence of Diseases

- **Measles**
  - Cases per 100,000
  - Graph showing a decline in cases from 1960 to 1980

- **Poliomyelitis**
  - Cases per 100,000
  - Graph showing a decline in cases from 1960 to 1980

- **Mumps**
  - Cases per 100,000
  - Graph showing a decline in cases from 1960 to 1980

- **Rubella (German Measles)**
  - Cases per 100,000
  - Graph showing a decline in cases from 1960 to 1980

- **Whooping Cough**
  - Cases per 100,000
  - Graph showing a decline in cases from 1960 to 1980

- **Diphtheria**
  - Cases per 100,000
  - Graph showing a decline in cases from 1960 to 1980
Figure 5. Deaths from Aquatically Transmitted Diseases as a Fraction of All Deaths: U.S. 1900-1967. Superimposed is the percentage of homes with water and sewage service (right scale). Source of data: Note 4.
Reduction in Contagious Diseases Death Rates

How much is public health, vs medical care
The inset shows the same mortality curve (blue line) with the fitted regression lines for 2 (1900-1937 and 1953-1980) of 4 segments. The boundaries between the segments are indicated by the vertical dotted lines.

Figure Legend
From: Trends in Infectious Disease Mortality in the United States During the 20th Century

FIGURE 1. Crude death rate* for infectious diseases — United States, 1900–1996†

*Per 100,000 population per year.
Increase in Chronic Disease/Life-style Deaths

Flu

Cardio-Vascular

Neoplastic

Aids
Figure 1. Decline in Deaths from Cardiovascular Disease in Relation to Scientific Advances.

The timeline shows the steady decline in cardiovascular deaths over the late 20th and early 21st centuries, along with major advances in cardiovascular science and medicine. ALLHAT denotes Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial, CASS Coronary Artery Surgery Study, GISSI Italian Group for the Study of Streptokinase in Myocardial Infarction, HMG-CoA 1-hydroxy-3-methylglutaryl coenzyme A, ISIS-2 Second International Study of Infarct Survival, MI myocardial infarction, NCEP National Cholesterol Education Program, NHBPEP National High Blood Pressure Education Program, PCI percutaneous coronary intervention, SAVE Survival and Ventricular Enlargement, and TIMI 1 Thrombolysis in Myocardial Infarction 1.
Present/future

-Predominant Health problems- Chronic Dis., especially emotional & behaviorally related conditions (depression, psychiatric, Alzheimers)

-Technology- continued growth & expansion, with attempts to repersonalize the technology, Biotechnologies, human genome

-Social- greater centralization and control in federal government, national health plan/insurance, cost-control

-Growing concern with cost and patient responsibility for health, emergence of rationing
The BIG THREE

- We have looked at this process of HC system evolution as an interweaving of three critical aspects of health care.
- The ability to provide care
- The people who receive care
- The way to pay for care
<table>
<thead>
<tr>
<th>Ability</th>
<th>Population</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>None- the blood letters and leeching of foul humors</td>
<td>Everyone had an equal opportunity to die</td>
<td>Mom was your doc- and who pays mom? A few “doctors” for the wealthy, but you might be paid in ducks, not bucks</td>
</tr>
<tr>
<td>Public Health Era</td>
<td>Cities over towns, towns over villages, but almost every member benefits from improved water and sewage</td>
<td>Mostly infrastructure improvements via government, individuals still like above</td>
</tr>
<tr>
<td>Medicine as science</td>
<td>Suddenly, medicine could actually make a difference in life or death. Life went mostly to those who could afford to pay the most</td>
<td>At first, the wealthy, but with employer insurance, basically the productive members of society</td>
</tr>
<tr>
<td>HC as a right</td>
<td>Supposedly everyone, but significant differences in quality of care</td>
<td>Primarily insurance, with lower shelf care through government agencies for the less able</td>
</tr>
<tr>
<td>HC out of control, chronic issues, end of life issues</td>
<td>Emergence of health care rationing, HCS failure</td>
<td>Growing governmental role, higher costs for those who don’t care for selves.</td>
</tr>
</tbody>
</table>
The Present

-If cost containment and competition are the defining characteristics of health care from 1980 to the present, then what comes next?

-Certainly, more government involvement, at the least some form of national health insurance (Medicare Part D, PPAAC)

-But perhaps something larger is happening, something that perhaps is already here- already occurring-

-I would argue we are entering the era of health care rationing

-Government involvement in HC is a requirement, because we need someone or something that can say NO convincingly.
Rationing?

- Medicaid, in particular, shows signs of deliberate limitation on access to care
- Some state programs restrict the # of Rxes per month
- Amount of time spent in program
- Limits on procedures available
- Commercial insurance is limiting coverage as well
- Different than higher costs for smokers, obese or high risk patients.
- Care cannot be obtained - period.
- NICE in the United Kingdom
Equity

• At the same time that less is being made available to individuals (rationing), costs to those with insurance are going up.

• But at the same time, the % of the population with some sort of insurance, even if it is not all that good, is also going up.

• Perhaps more widely available, lesser quality care is part of the future.
The Future

• I’ve come to this in my own mind.
• If you’ve actually read everything I’ve assigned to you, you should see a reoccurring theme over the history of the U.S. health care “scene”.
• It is, and always has, been about profit.
• But the restrictions for any one occupational group having control (say, doctors) is past.
THE VALUE ARGUMENT

• We saw this first in pharmaceuticals.
• Drug companies now have to make the “value argument” for their product.
• Why is this a good buy for the price, compared to the competitors out there?
• I think we are now going to see the same kind of competition- across corporations-
• AND- occupational groups.
HARDBALL

• Just one example- prescribing
• Docs, NPs, PAs, some Rphs can prescribe.
• I think we will see more of this, and in more specialized settings.
• Who does the BEST job at the lowest price for managing blood pressure? Or diabetes? Or cholesterol?
• THAT group will get the business
Questions?