

Questions from last week?

- Announcements
 - . TMP Keynote Lecture
 - Tim Westergren, Founder and CSO, Pandora
 - Friday, Oct. 9, ESB 1001
 - Details on class website
- Swine flu

Class 2: Healthcare Delivery in America



Prior to the 1930's, healthcare delivery was fairly straightforward...

- If you needed a physician, it was a cash business
- Few drugs to worry about
- Hospitals were for surgery and end-of-life care; many minor procedures done by the general practitioner in office
- Insurance was rare

With the recovery from the Great Depression, changes began to occur...

- New pharmacological agents began to be used (antibiotics, insulin, etc.)
- Shifts from treating at home to treating in the clinic (starting with the cities)
- Rise of Blue Cross insurance, to insure against catastrophic conditions
- Manufacturing employers began offering care

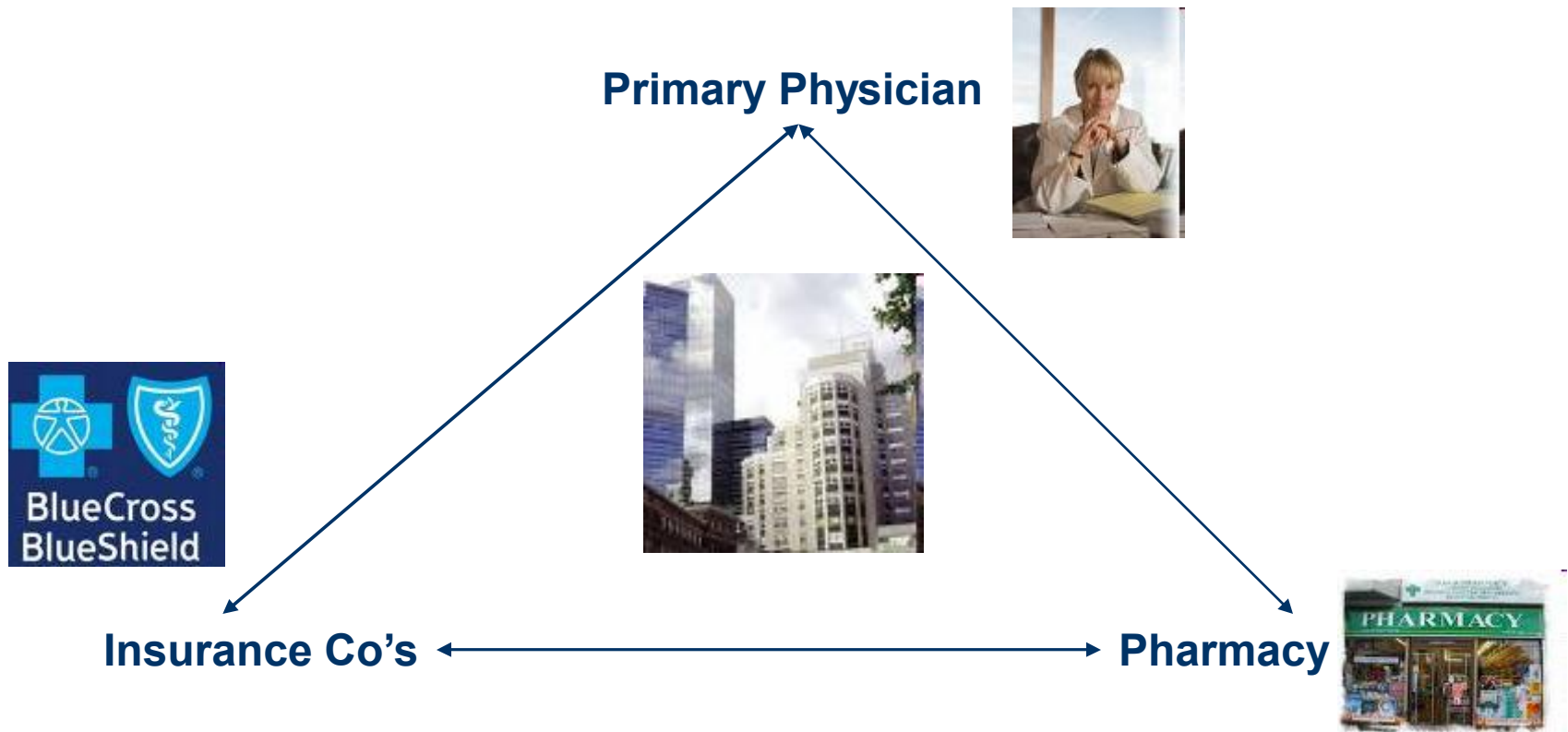
Post World War II, the economy (and babies) boomed...

- Continued increase in employer offered health care and/or insurance
 - . Attracted and maintained employees
 - . Became a competitive advantage for companies
- More and more conditions could be managed medically
- Rise in %specialists+who treated complex conditions
- Infectious disease was displaced as the leading cause of death
 - . But more and more were dying of %old age+diseases

Today...

- Care provided in three major locales
 - . Primary care (physician offices and clinics, non specialized)
 - . Secondary care (specialty clinics and local hospitals)
 - . Tertiary care (large research-oriented medical centers, usually associated with medical schools)
- Other locations of care (nursing homes, hospice, rehabilitation facilities, trauma centers, etc.)
important but not discussed in depth for this course
- Health insurance is employer-based and comprehensive which contributes to higher cost (in the U.S.)

The “Big Three”



“I have a headache...”

- Diagnoses (Dx) and treatment plans (Tx) are determined as follows:
 - . Chief complaint
 - . Review of history
 - . Patient interview
 - . Physical exam
 - . Diagnostic testing (as warranted)
 - . Differential Dx
 - . Treatment plan
 - . Followup

Key to an exam is ruling out more serious condition

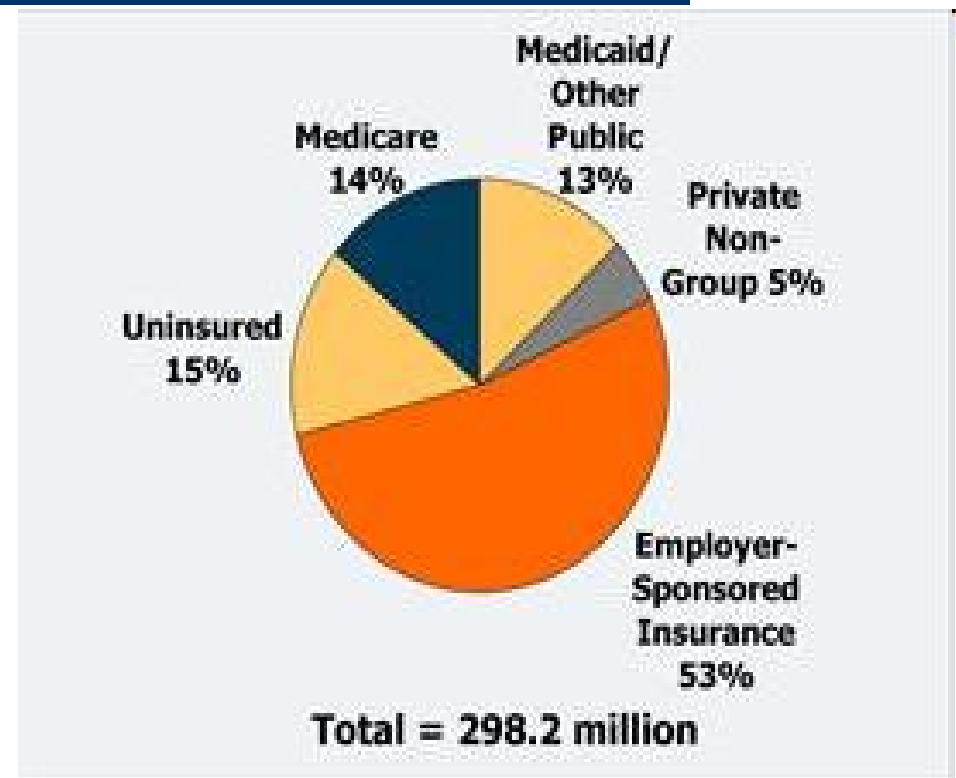
- Headache could be a symptom for:
 - . Migraine
 - . Trauma
 - . Aneurysm
 - . Stroke
 - . Sinus infection
 - . Tumor
 - . Allergies
 - . Eye strain
- Or, from the stress of being in ENGR 192/292A

Medicine is “playing the odds”

- The vast majority of times, headaches have benign, non-serious causes
- Training, medical judgment, and careful observation leads to the right Dx almost all the time
- ~~%~~When you hear hoofbeats, think ~~%~~horses+, not ~~%~~zebras++

In the United States...

- Most healthcare through employers
- Employer sponsored plans are %non-portable+



The United Kingdom



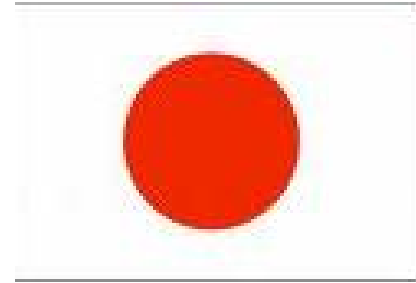
- All UK citizens covered by National Health Service
 - . Private insurance DOES exist (supplementary care)
- Management of costs:
 - . Direct rationing
 - . NICE (National Institute for Health and Clinical Excellence) decides on which new therapies it will pay for
- Result:
 - . Primary care is good
 - . Lags behind many others in cancer mortality
 - . Healthcare is about 8% of GDP
 - . Healthcare spending is \$2,300 per capita

Canada



- **Universal and equal access+**
 - . Federal mandate, provincial administration
 - . Healthcare providers are private practitioners
 - . Does NOT cover prescription drugs
 - Private insurance available, but not for physician services
- **Management of costs**
 - . Capitated budgets
 - . Indirect rationing (restricted access to specialist providers and technologies)
- **Result:**
 - . Primary care is good
 - . U.S. is **safety valve+**
 - . Healthcare is about 10% of GDP
 - . Healthcare spending is \$3,000 per capita

Japan



- Two systems: Employee or National Health Insurance
 - . Compulsory to be in one or the other
- Freedom of choice
- Management of costs
 - . Indirect
- Result:
 - . Long life expectancy (>80)
 - . Healthcare about 8% of GDP
 - . Healthcare spending is about \$2,250 per capita
 - . Expenditures expected to grow rapidly due to aging population

What makes the U.S. different, then?

- No single-payer system, and no guarantees for health insurance
 - Not compulsory
- Most care-givers are % independent contractors+
- Malpractice awards are the highest in the world (and some would say, the easiest to get)
 - Leads to % defensive+ medicine
- Market-driven system, but incentives and controls are not the same as for most market economies (more about this later)

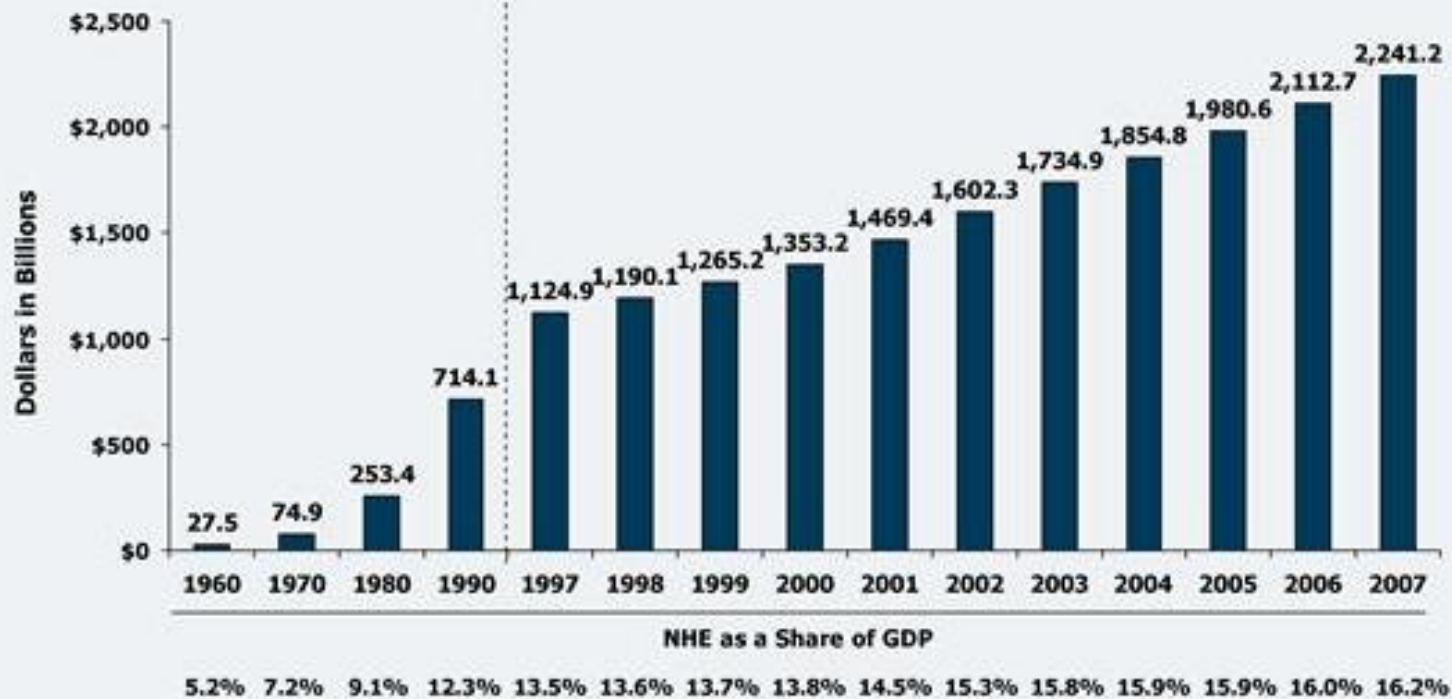
The uniqueness of the U.S. system creates interesting challenges:

- Largest uninsured population in the developed world (indirect rationing)
- Highest healthcare expenditures/per capita
- Greatest number of medical innovations
 - . Our market economy rewards risks
 - . Most new drugs and devices come out of U.S. R&D

The rising cost of healthcare threatens the overall economy...

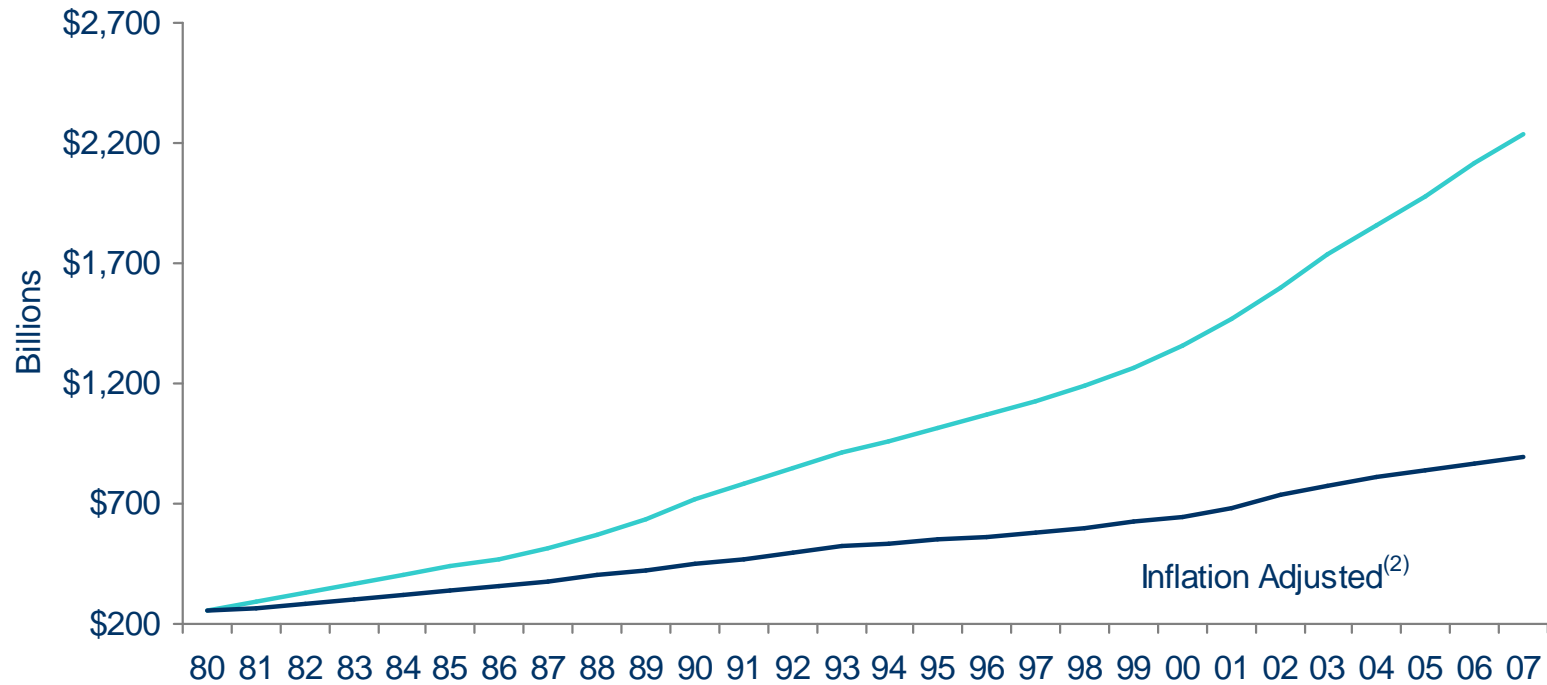
- Growth in HC spending rising faster than the overall economy
- Rate of Medicare cost increases will crowd out all other U.S. gov't spending, except defense, in 20 years
- Increasing healthcare benefits costs will make U.S. companies uncompetitive in global markets
- Most gov'ts (city, state, and federal) have a huge liability of commitments to healthcare benefits for retirees (which will lead to the need for higher tax revenues)

National Health Expenditures and Their Share of Gross Domestic Product, 1960-2007



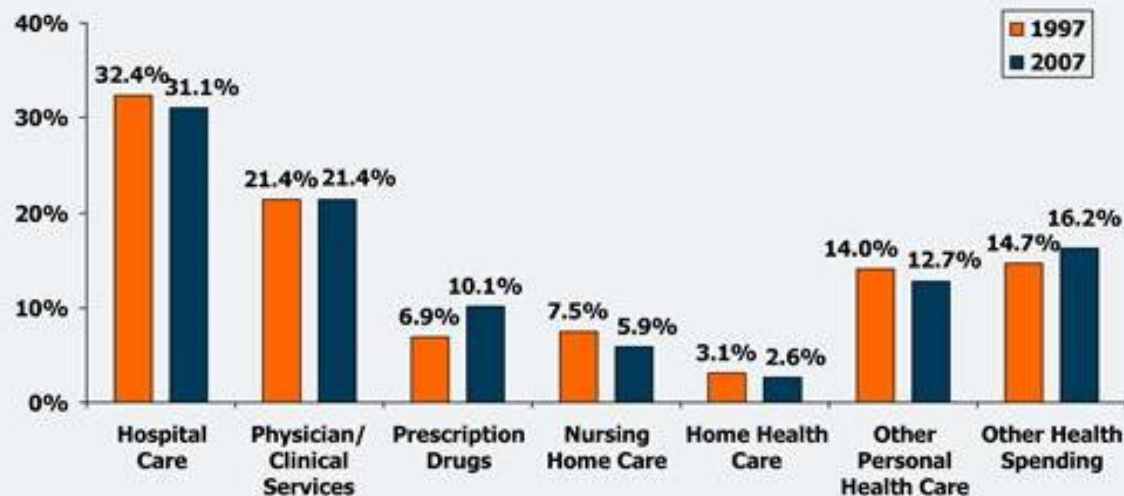
Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group, at <http://www.cms.hhs.gov/NationalHealthExpendData/> (see Historical; NHE summary including share of GDP, CY 1960-2007; file nhegdp07.zip).

Total Healthcare Costs are Rising Faster than Inflation



Hospital and Physician Care utilize the bulk of healthcare dollars...

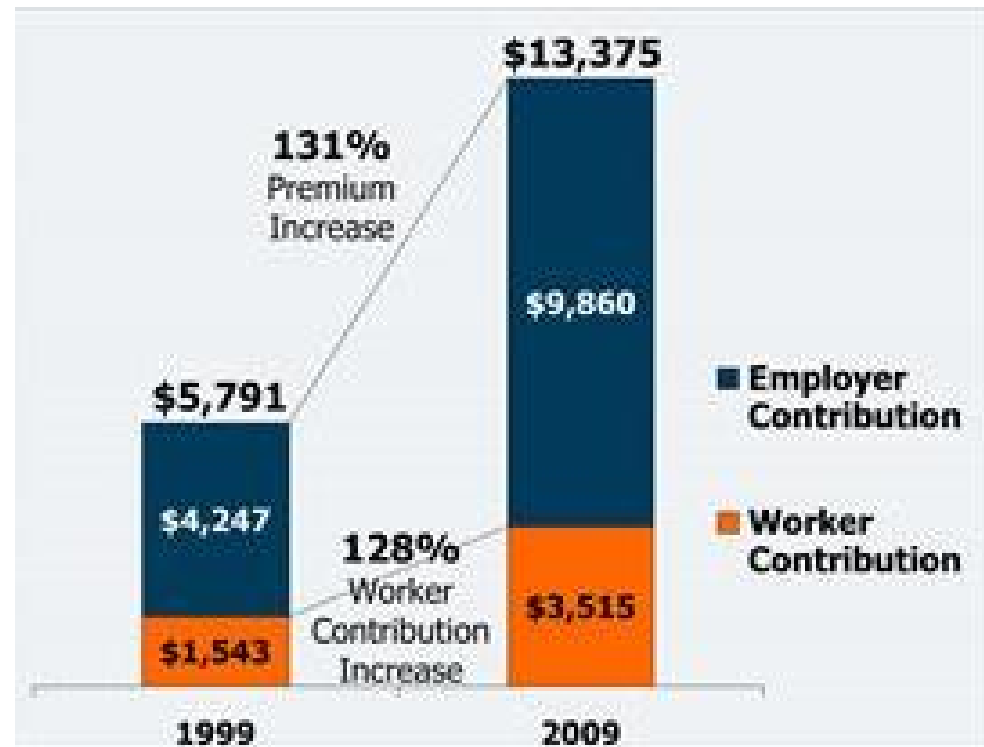
Distribution of National Health Expenditures, by Type of Service, 1997 and 2007



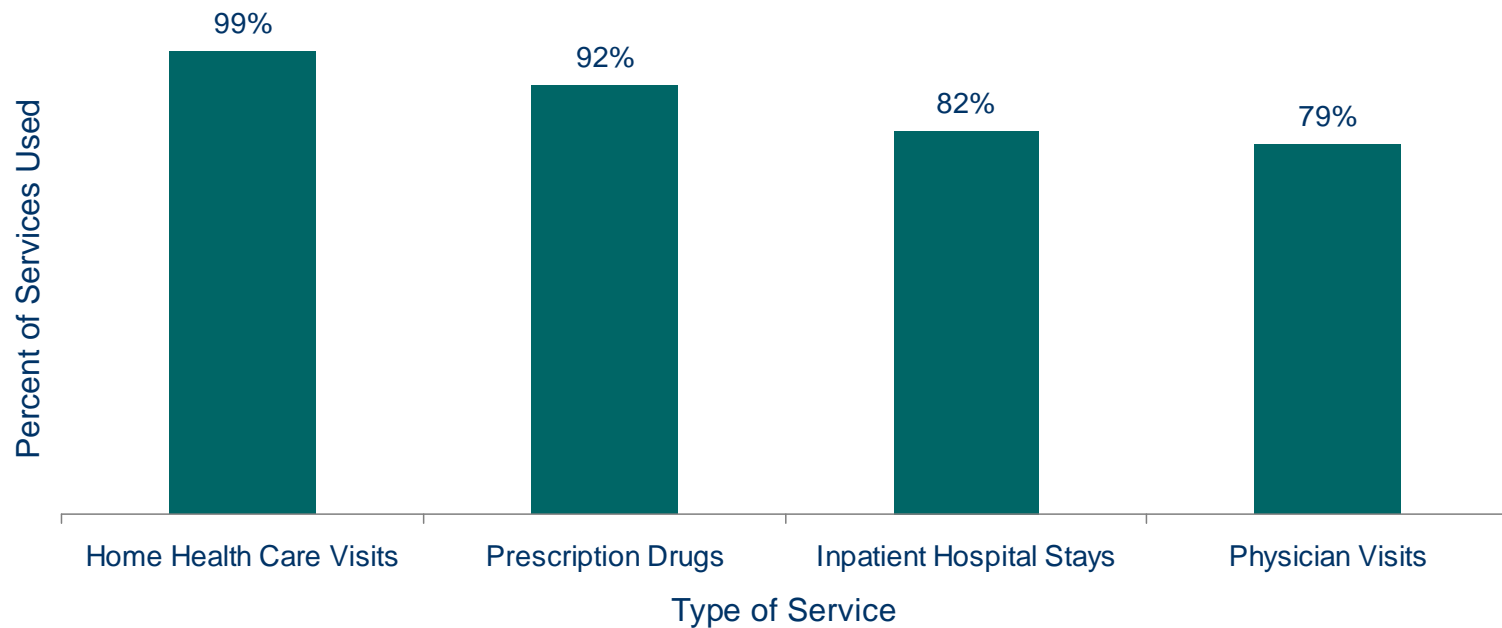
Notes: Percentages may not total 100% due to rounding. Other Personal Health Care includes, for example, dental and other professional health services, durable medical equipment, etc. Other Health Spending includes, for example, administration and net cost of private health insurance, public health activity, research, and structures and equipment, etc.

Source: Kaiser Family Foundation calculations using NHE data from Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group, at <http://www.cms.hhs.gov/NationalHealthExpendData/> (see Historical; National Health Expenditures by type of service and source of funds, CY 1960-2007; file nhe2007.zip).

Premiums for Family Health Coverage have Doubled since 1999...



Chronic disease uses most of the healthcare dollars (2004)



Health insurance as a benefit is becoming too expensive for many companies...



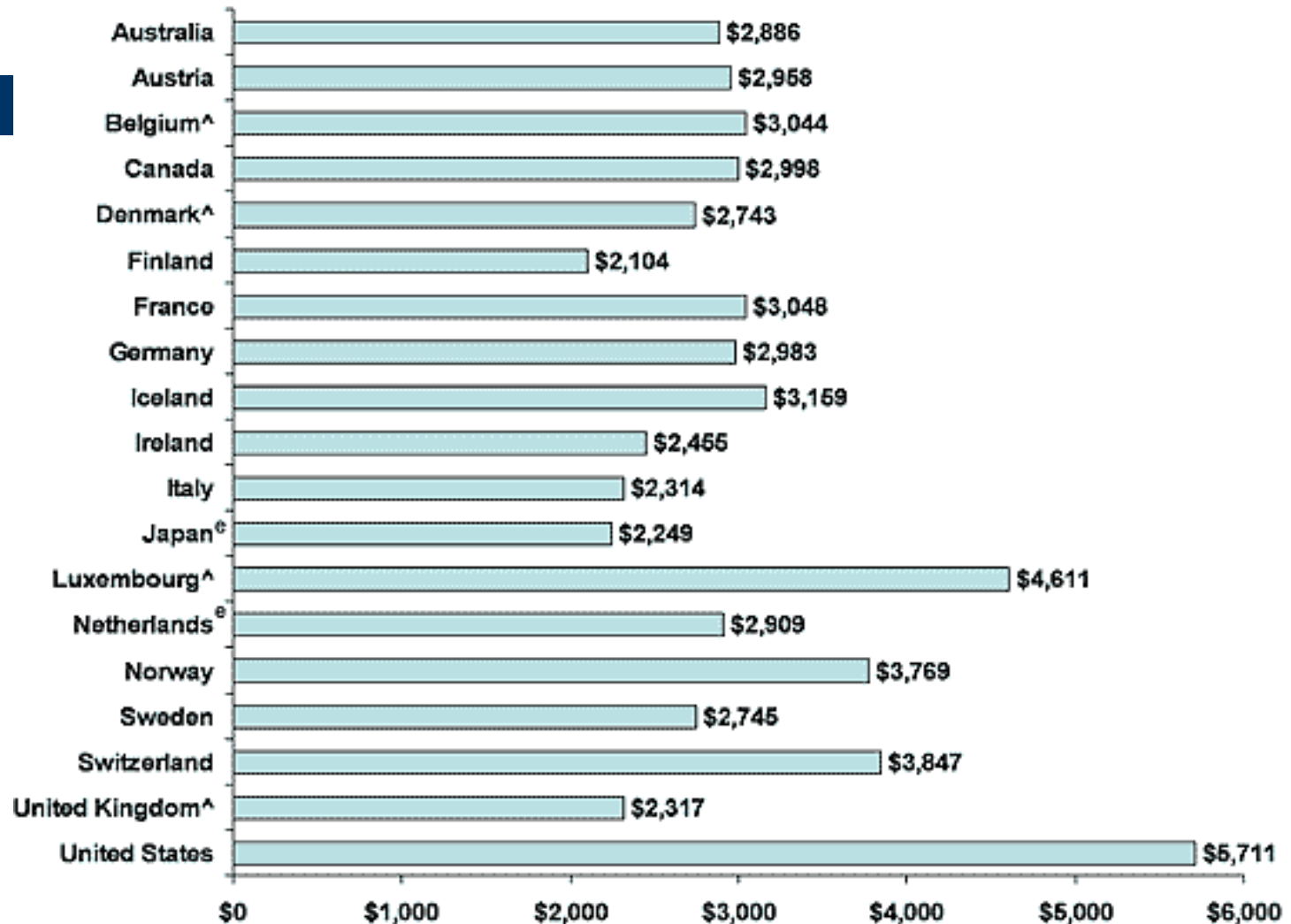
Lack of compulsory insurance leads to vicious cycle...

- Young and low income often opt out+
- Older and sicker workers raise the risks for insurance companies
- Costs of care continue to rise (partly due to fee-for-service incentives)
- Result: Insurance premiums climb, making it more expensive for young and low income workers

The Result?

- 47 million uninsured in the U.S. (about 15% of the population)
- Most medically innovative country, but still lags in key parameters
 - . Infant mortality
 - . Life expectancy
 - . Rationing is indirect (uninsured have reduced choices for care)
- Healthcare is approx. 16% of GDP
 - . \$5,700 per capita

Most developed countries spend only about half as much per capita as the U.S.



The Challenges to Reform:

- Provide affordable, durable insurance to everyone
 - Assure that it does NOT lead to %coverage without care+
- Reduce/slow the costs of care
- Maintain %freedom of choice+for patients
- Compensate providers based on outcomes, not activities
- Assure continued rewards for healthcare providers, innovators and entrepreneurs



BUSINESS MODELS IN HEALTHCARE

All businesses follow one of three models...

- Solution shops
 - . Understand and provide solutions to unstructured problems
 - Delivering value heavily dependent on experts
 - Each client is different, so each solution is often unique
 - Compensation is fee-for-service, rarely contingent on outcome

Models continued...

- Value-adding Process Businesses
 - . Transform inputs into higher-value outputs
 - Many businesses fit this definition (restaurants, retailing, manufacturing, etc.).
 - Not nearly as dependent on %experts+, processes and inputs much more dependable and repetitive
 - Payment is for results or outcomes (often %guaranteed+)

Models continued...

- Facilitated Network Businesses
 - . Institutions that operate systems where customers buy and sell, or deliver and receive things, from other participants
 - Many Internet businesses fall into this category
 - But so does banking, casinos, telecommunications, and mutual insurance companies
 - . FNBs typically make money by memberships or through transaction fees

Each business model has unique business processes...

- Most successful businesses are very focused on one business model
- Businesses that mix business models under one roof, are usually less competitive and have higher cost structures

Medicine as a business is evolving

- Medicine was almost entirely %intuitive+
 - . Hypothesis on cause of disease, treatment tried, if disease got better, hypothesis correct
 - . High cost process, almost completely a Solution Shop business
- As diagnostic procedures become more precise, or as %best practices+become common, less intuitive, more empirical
 - . Higher probability that certain treatments will lead to certain outcomes in diagnosed conditions
 - . More efficient, lower cost
 - . Has led to more specialty hospitals and clinics that are Value-added Process businesses
- Medicine is moving into the realm of %precision+
 - . Since 1940s, the ability to precisely Dx and treat most infectious diseases has led to an overall DROP in the cost of treatment
 - . Many diseases can be treated on a %rules-based+way. Ex. Walk-in clinics, Lasix surgery centers, etc.

Conclusion:

- The more that Dx and Tx can be rules-based:
 - . Many treatments can be given by less-skilled (lower cost) caregivers
 - . Many treatments can become value-added processes+(eye surgery, angioplasty, etc.)

Where does it come together?

- The need for reform will lead to fundamental changes in healthcare delivery
- The evolution of medical knowledge will create new opportunities to deliver or support care in more efficient (lower cost) ways
- The cost of treating chronic diseases will lead to an increased emphasis on %wellness+ (prevention) vs. sickness (treatment)

Next week:

- Basics of innovation and entrepreneurship
- First take-home exam posted after class
 - . Based on first three weeks of class
 - . Introduction through Chapter 2 of Christensen