BIOE 301

Lecture Five

Review of Lecture Four

- Developing World
  1. Cardiovascular diseases,
  2. Cancer (malignant neoplasms),
  3. Unintentional injuries, and
  4. HIV/AIDS
- Developed World
  1. Cardiovascular diseases,
  2. Cancer (malignant neoplasms),
  3. Unintentional injuries, and
  4. Digestive Diseases

1. Heart Disease

- What is one of the most common first signs that a patient has ischemic heart disease?
- What are four treatments of ischemic heart disease?
- Drug eluting stents have been in the news lately. Why?
  - http://www.npr.org/templates/story/story.php?storyId=112264556

2. Cancer

- Name three common cancer screening tests.
- Why don’t we screen everyone with these tests?

Overview of Lecture 5

- Eight Americas
- Health Systems
  - What is a health system?
  - Goals of a health system
  - Functions of a health system
- Types of health systems
- Performance of Health Systems
- Examples of health systems

- How have health care costs changed over time?
- Health Care Reform in the US

Unit Two

Every nation, whether it has many healthcare resources or only a few, must make decisions about how to use those resources to best serve its population.

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PLOS MEDICINE

Eight Americas: Investigating Mortality Disparities across Races, Counties, and Race-Counties in the United States

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What is the difference in life expectancy between the America with the longest life expectancy and the America with the shortest life expectancy?

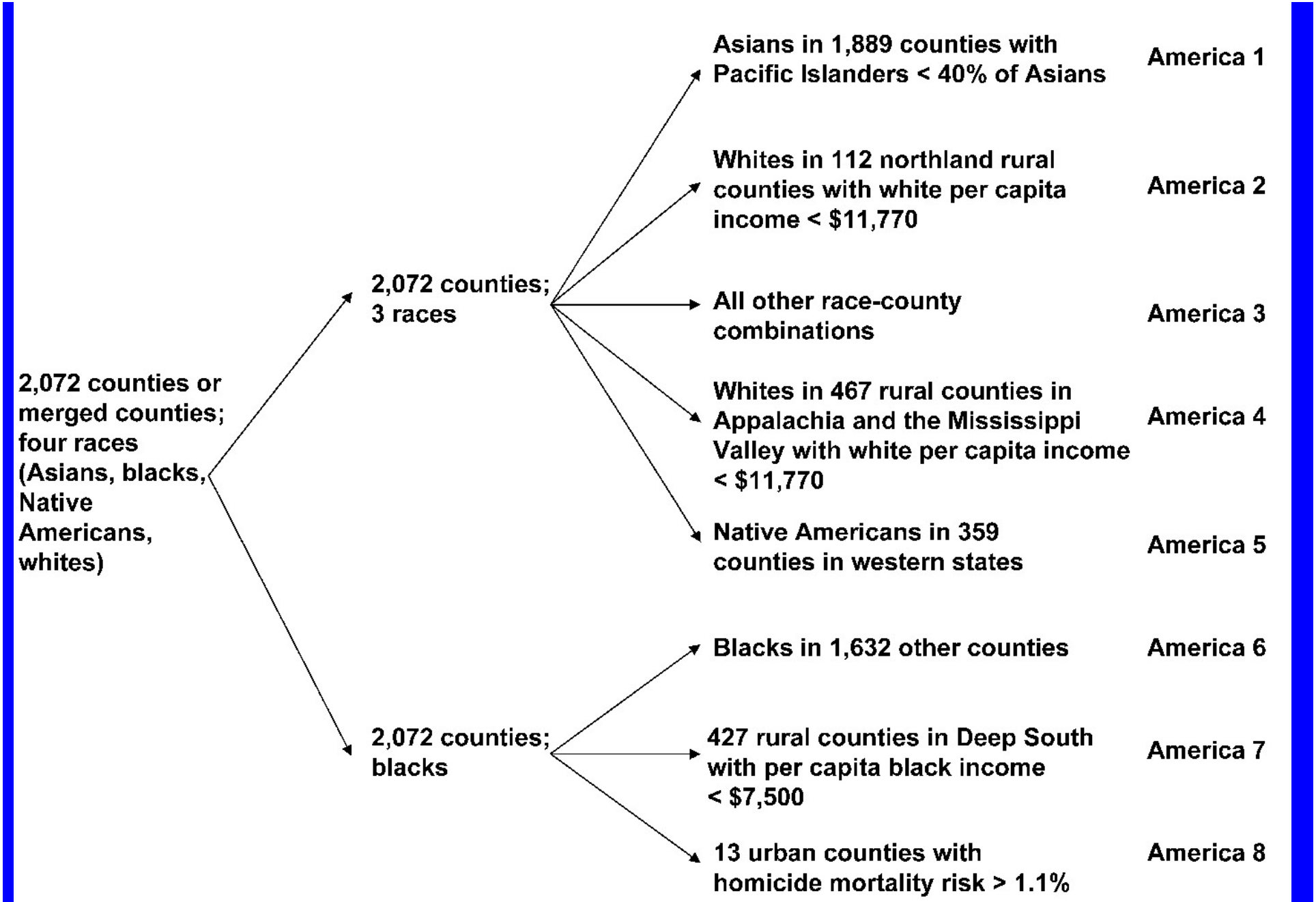


Figure 2. Construction of the Eight Americas from 8,288 Race-County Units

DOI: 10.1371/journal.pmed.0030260.g002

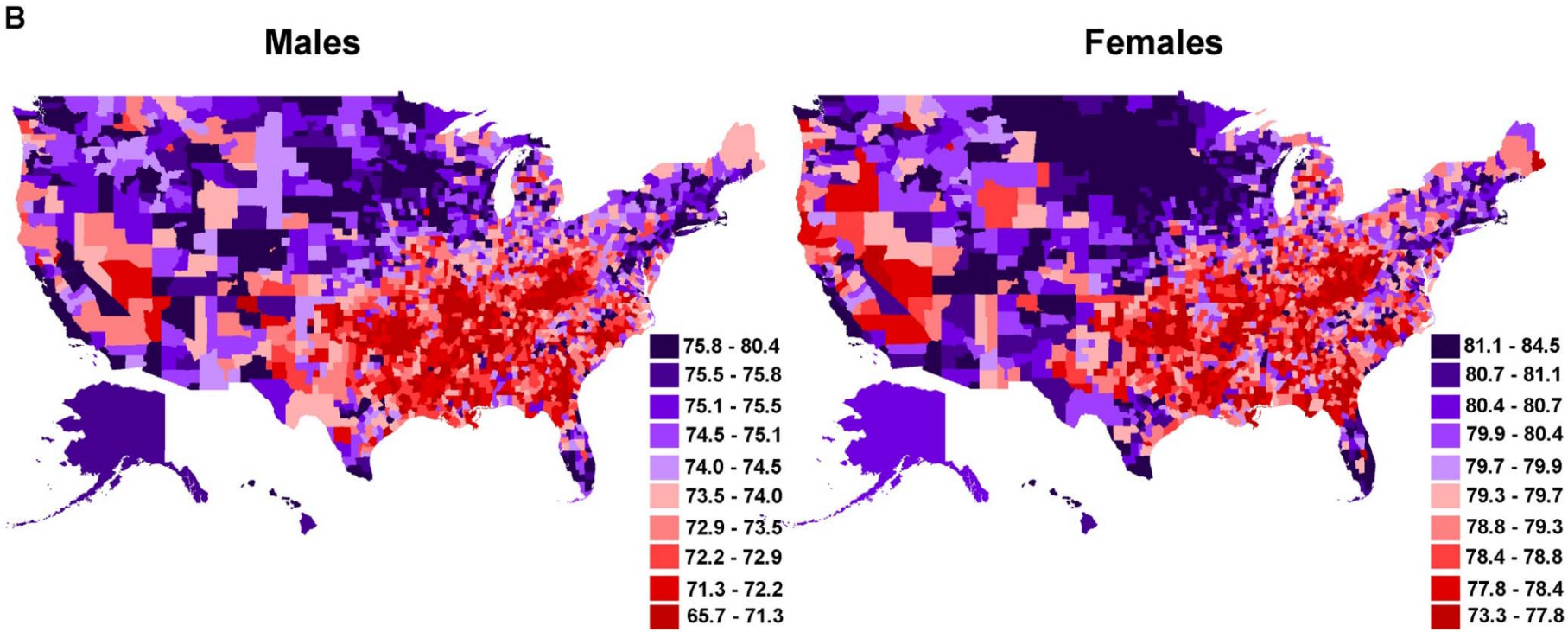


Figure 1. County Life Expectancies by Race

Deaths were averaged for 1997–2001 to reduce sensitivity to small numbers and outliers.

(A) Life expectancy at birth for black males and females. Only counties with more than five deaths for any 5-y age group (0–85) were mapped, to avoid unstable results.

(B) Life expectancy at birth for white males and females.

DOI: 10.1371/journal.pmed.0030260.g001

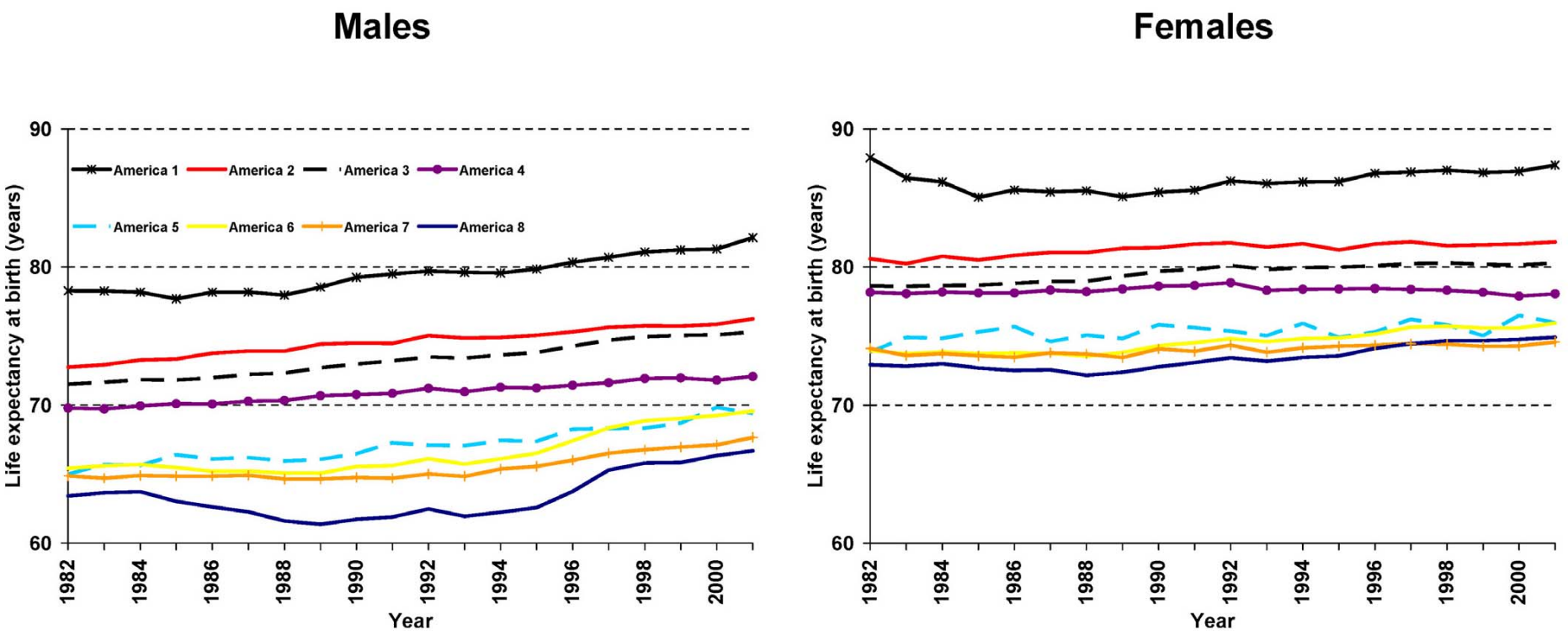
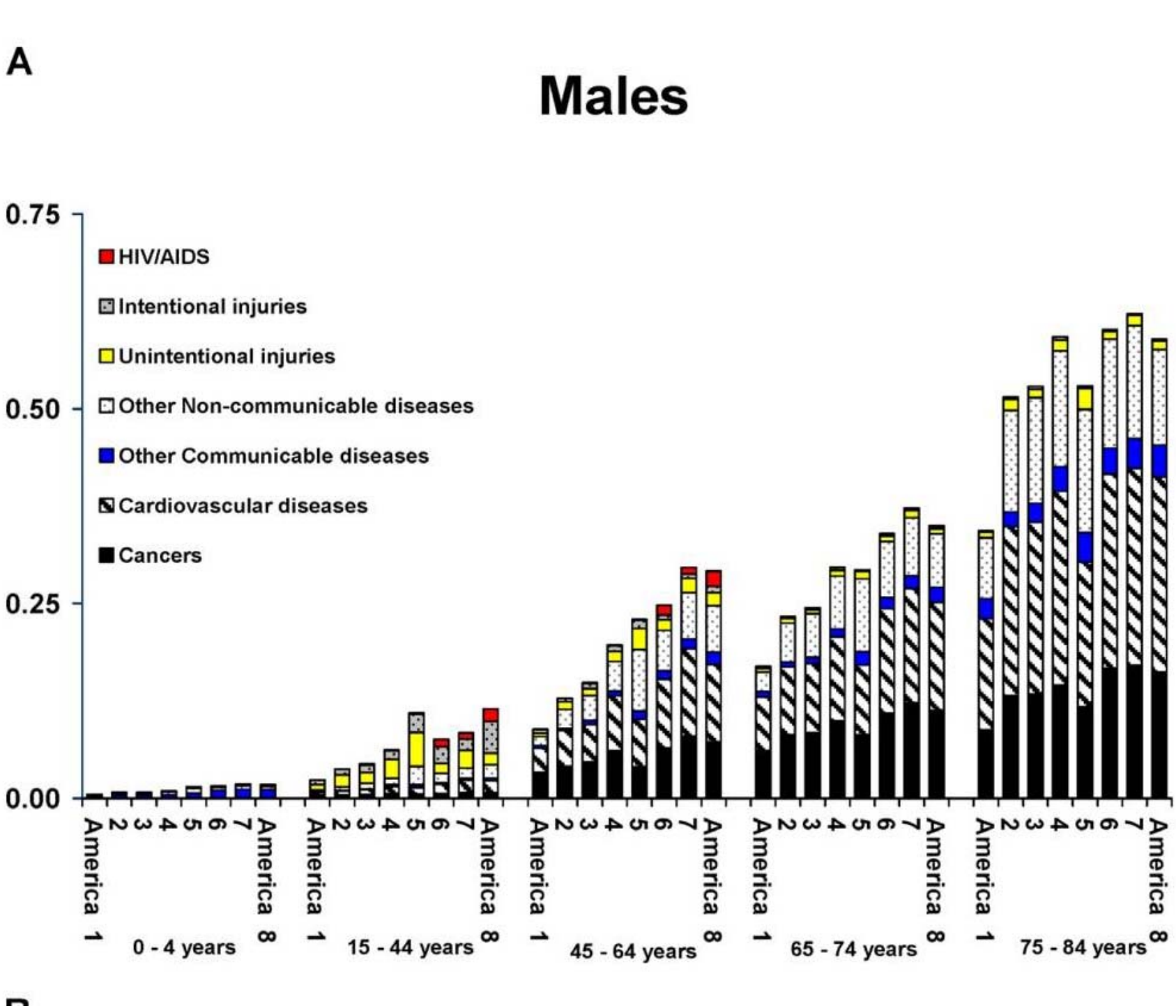


Figure 3. Life Expectancy at Birth in the Eight Americas (1982–2001)

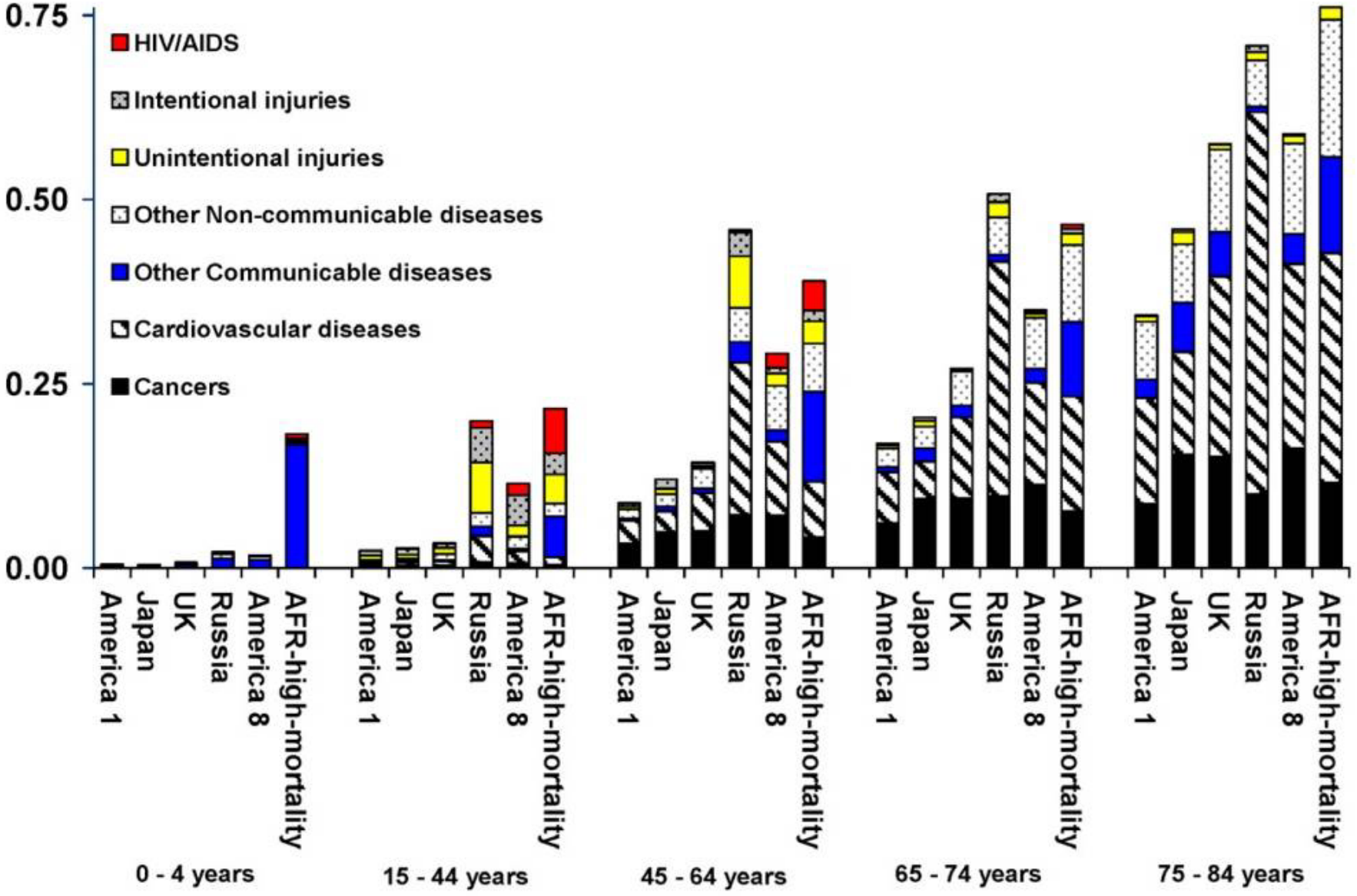
Estimates for Americas 1 and 3 have been adjusted for differential underestimation of population and mortality among Asians (see Methods).

DOI: 10.1371/journal.pmed.0030260.g003


A
Males
0.75
0.50
0.25
0.00
HIV/AIDS
Intentional injuries
Unintentional injuries
Other Non-communicable diseases
Other Communicable diseases
Cardiovascular diseases
Cancers
America 1
2
3
4
5
6
7
America 8
0 - 4 years
15 - 44 years
45 - 64 years
65 - 74 years
75 - 84 years

B

Males


0.75
0.50
0.25
0.00
HIV/AIDS
Intentional injuries
Unintentional injuries
Other Non-communicable diseases
Other Communicable diseases
Cardiovascular diseases
Cancers
America 1
Japan
UK
Russia
America 8
AFR-high-mortality
0 - 4 years
15 - 44 years
45 - 64 years
65 - 74 years
75 - 84 years

Summary of County Life Expectancy Patterns

- Male life expectancy rising faster than female life expectancy
- Best counties have life expectancies higher than the country with the highest life expectancy (Japan)
- Worst counties demonstrate little or no progress in 20 years
- Gap between best and worst is widening

Dr. Chris Murray, Institute Director, Institute for Health Metrics and Evaluation

How Many $ to Gain a Year of Life?

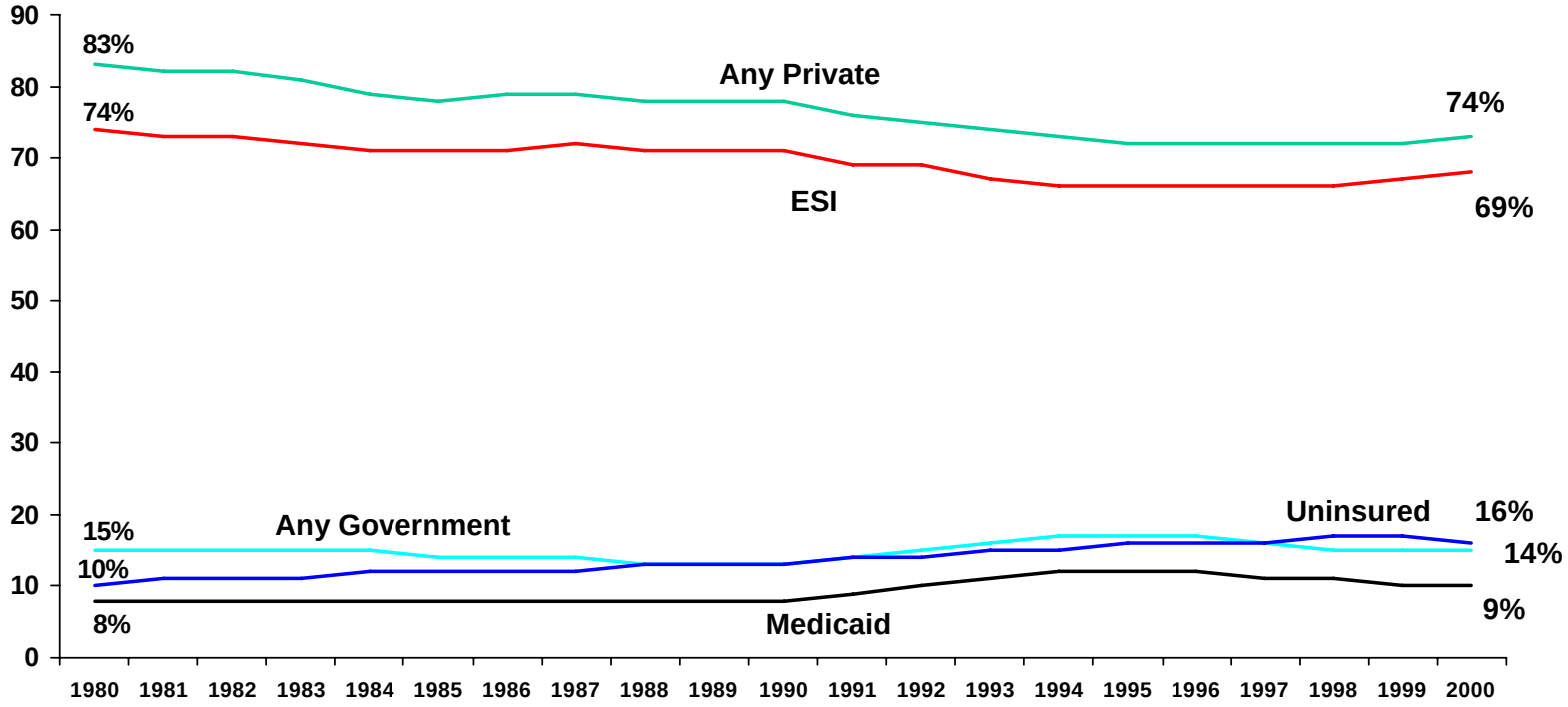
- Need a way to quantify health benefits
  - How much bang do you get for your buck?
  - Ratio
    - Numerator = Cost
    - Denominator = Health Benefit
  - Several examples
    - $$/year of life gained
    - $$/quality adjusted year of life gained (QALY)
    - $$/disability-adjusted year of life (DALY)
  - Can we use this to make decisions about what we pay for?

League Table

Therapy	Cost per QALY
Motorcycle helmets, Seat belts, Immunizations	Cost-saving
Anti-depressants for people with major depression	$1,000
Hypertension treatment in older men and women	$1,000-$3,000
Pap smear screening every 4 years (vs none)	$16,000
Driver's side air bag (vs none)	$27,000
Chemo in 75 yo women with breast CA (vs none)	$58,000
Dialysis in seriously ill patients hospitalized with renal failure (vs none)	$140,000
Screening and treatment for HIV in low risk populations	$1,500,000

Table 1.4
Sources of Health Insurance Coverage for the Under 65 Population, 1980-2000

Over the last two decades, private coverage has declined, public coverage has stayed about the same, and the uninsured have grown.

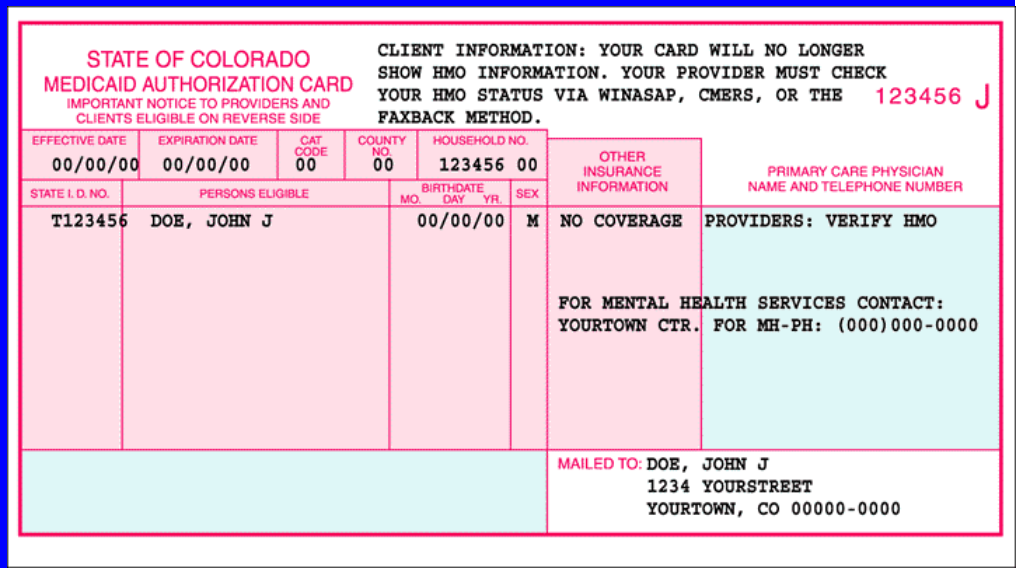


Notes: ESI - Employer Sponsored Insurance. Any Private includes ESI and individually purchased insurance. Any government includes Medicare for the disabled population.

Source: Tabulations of the March Current Population Survey files by Actuarial Research Corporation, incorporating their historical adjustments.

What Happens When You Don't Have Health Insurance?

- United States
  - If you meet certain income guidelines, you are eligible for Medicaid
    - Texas: TANF (welfare) recipients, SSI recipients
  - Eligibility rules and coverage vary by state
  - State pays a portion of the costs, federal govt. matches the rest



STATE OF COLORADO
MEDICAID AUTHORIZATION CARD
IMPORTANT NOTICE TO PROVIDERS AND CLIENTS ELIGIBLE ON REVERSE SIDE

CLIENT INFORMATION: YOUR CARD WILL NO LONGER SHOW HMO INFORMATION. YOUR PROVIDER MUST CHECK YOUR HMO STATUS VIA WINASAP, CMERS, OR THE FAXBACK METHOD.

123456 J

EFFECTIVE DATE	EXPIRATION DATE	CAT CODE	COUNTY NO.	HOUSEHOLD NO.
00/00/00	00/00/00	00	00	123456 00

STATE I. D. NO.	PERSONS ELIGIBLE	BIRTHDATE MO. DAY YR.	SEX	OTHER INSURANCE INFORMATION	PRIMARY CARE PHYSICIAN NAME AND TELEPHONE NUMBER
T123456	DOE, JOHN J	00/00/00	M	NO COVERAGE	PROVIDERS: VERIFY HMO

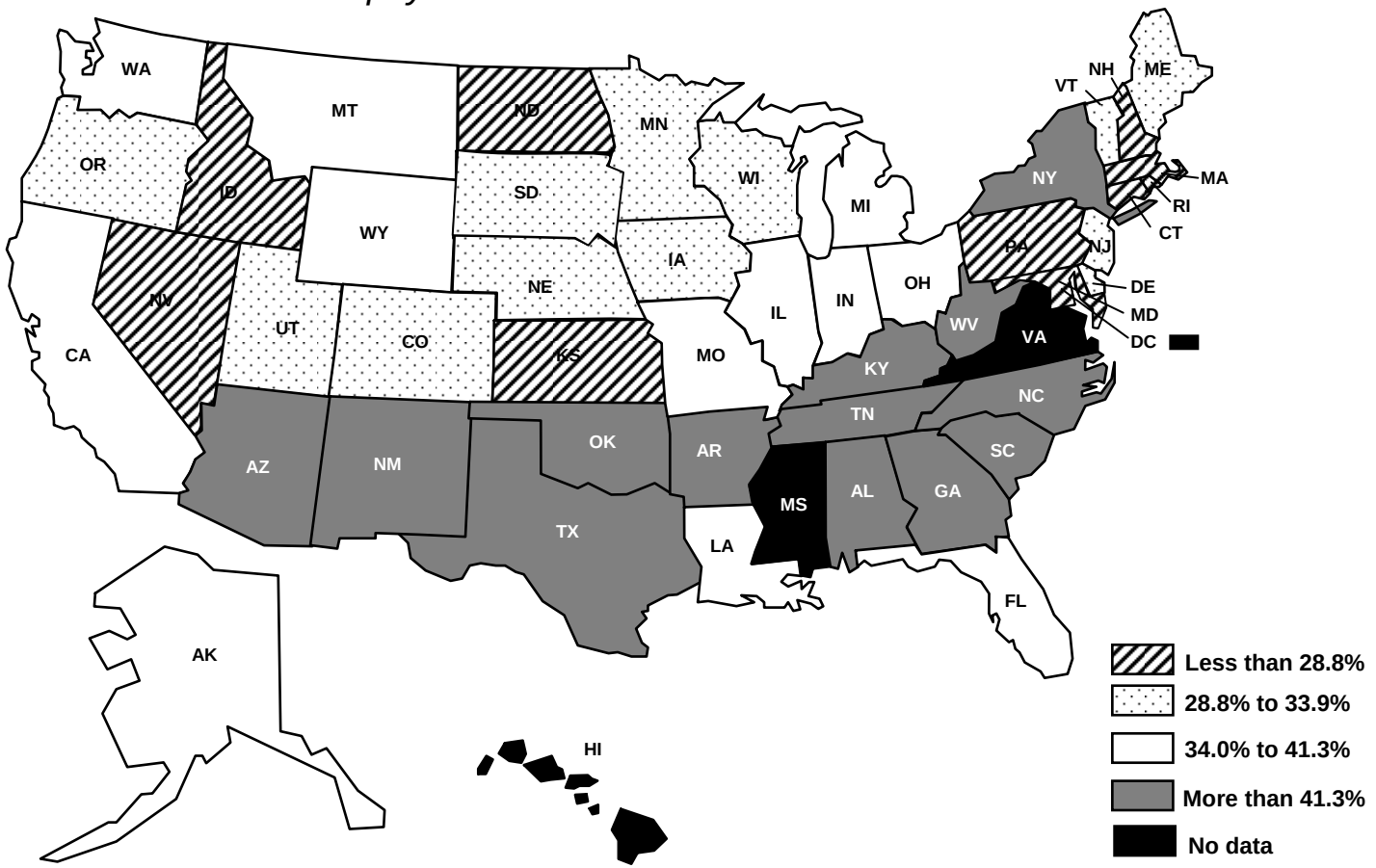
FOR MENTAL HEALTH SERVICES CONTACT:
YOURTOWN CTR. FOR MH-PH: (000)000-0000

MAILED TO: DOE, JOHN J
1234 YOURSTREET
YOURTOWN, CO 00000-0000

http://www.coaccess.com/images/mcdCard.gif

Table 3.30
Births Financed by Medicaid as a Percent of Total Births by State, 1998

Medicaid pays for about 1 in 3 of the nation's births.



Note: CO, GA 1997 data; KY, NJ, VT 1996 data.

Source: Maternal and Child Health (MCH) Update: States Have Expanded Eligibility and Increased Access to Health Care for Pregnant Women and Children, National Governors Association, February, 2001, Table 23, at http://www.nga.org.

What Happens When Medicaid Doesn't Cover a Service?

- Oregon – July, 1987
  - Oregon state constitution required a balanced state budget, surplus returned to taxpayers
  - Voted to end Medicaid coverage of transplants
    - Typically 10 transplants performed per year
    - $100,000-$200,000 per transplant
    - $1.1 M cost to state (federal govt. pays the rest)
  - Voted to fund Medicaid coverage of prenatal care
    - Would save 25 infants who die from poor prenatal care

A Tale of Two Children

- Oregon – August, 1987
  - Coby Howard
    - 7 year old boy
    - Developed leukemia
    - Required a bone marrow transplant
    - Was denied coverage
    - Mom appealed to legislature, denied coverage
    - Mom began media campaign to raise $$
    - Raised $70k ($30k short of goal)
    - Coby died in December, 1987
  - Coby was “forced to spend the last days of his life acting cute” before the cameras
    - Ira Zarov, attorney for patient in similar circumstances

A Tale of Two Children

- Oregon, 1987
  - David Holliday
    - 2 year old boy
    - Developed leukemia
    - Moved to Washington state, lived in car
    - Washington state
      - Medicaid covered transplants
      - No minimum residency requirement

Health Systems Face Difficult Choices

- Primary goal of a health system:
  - Provide and manage resources to improve the health of the population
- Secondary goal of a health system:
  - Ensure that good health is achieved in a fair manner
  - Protect citizens against unpredictable and high financial costs of illness
  - In many of the world's poorest countries, people pay for care out of their own pockets, often when they can least afford it
  - Illness is frequently a *cause* of poverty
  - Prepayment, through health insurance, leads to greater fairness

Health Systems

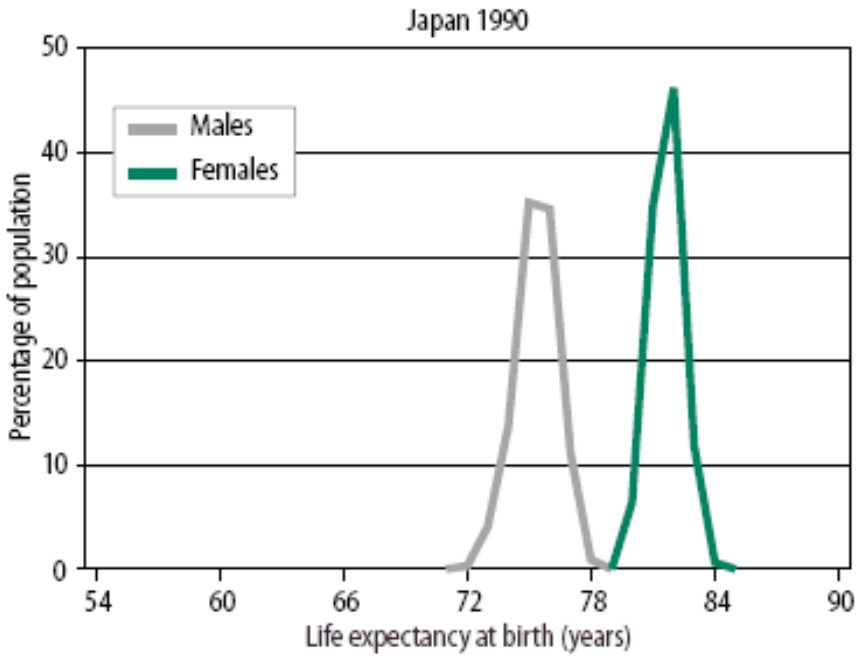
- Reflects historical trends in:
  - Economic development
  - Political ideology
- Provide four important functions:
  1. Generate human resources, physical infrastructure & knowledge base to provide health care
  2. Provide health care services
     - Primary clinics, hospitals, and tertiary care centers
     - Operated by combination of government agencies and private providers
  3. Raise & pool economic resources to pay for healthcare
     - Sources include: taxes, mandatory social insurance, voluntary private insurance, charity, personal household income and foreign aid
  4. Provide stewardship for the healthcare system, setting and enforcing rules which patients, providers and payers must follow
     - Ultimate responsibility for stewardship lies with the government

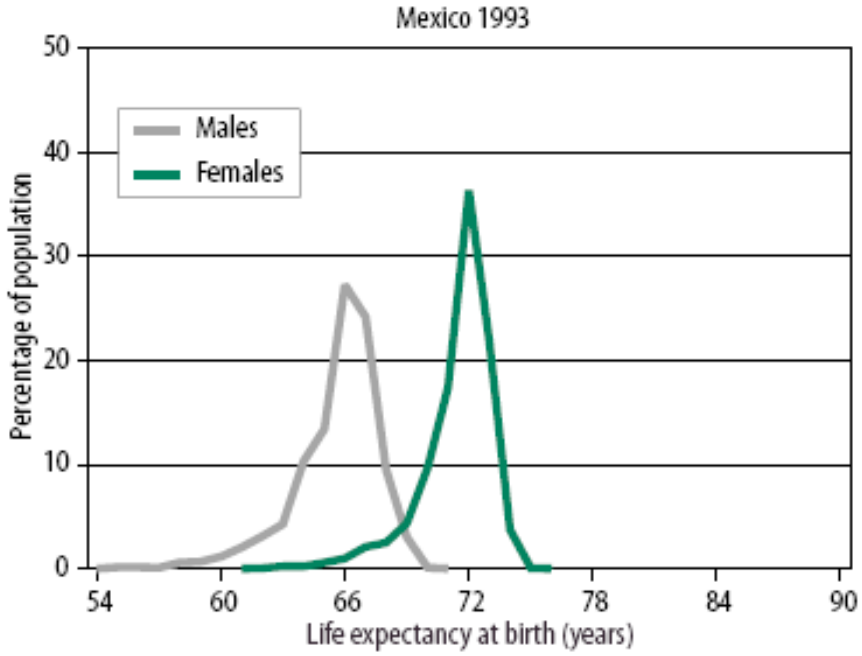
Types of Health Systems

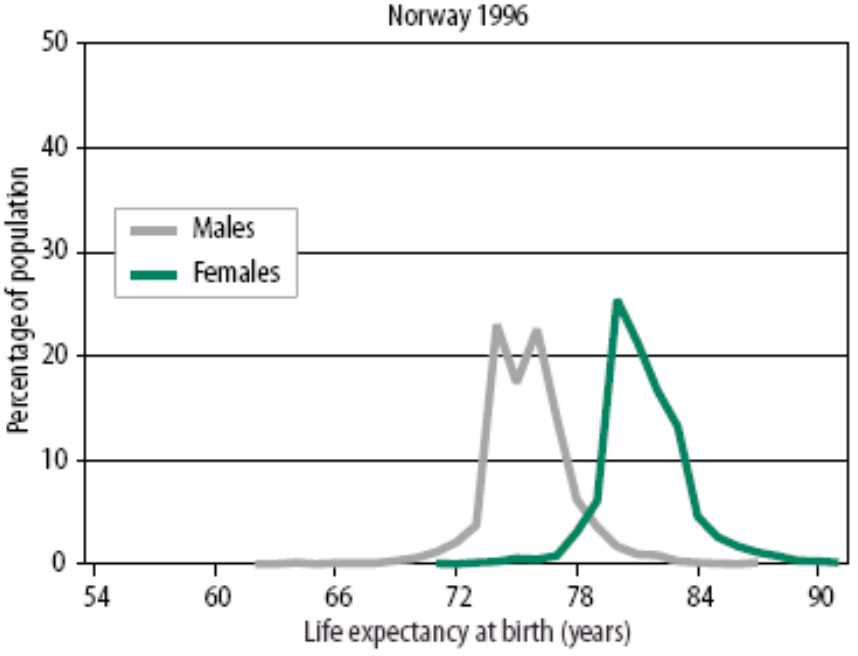
- Economic Classification
- Political Classification:
  - Entrepreneurial
    - Strongly influenced by market forces, some government intervention
  - Welfare-oriented
    - Government mandates health insurance for all workers, often through intermediary private insurance agencies
  - Comprehensive
    - Provide complete coverage to 100% of population almost completely through tax revenues
  - Socialist
    - Health services are operated by the government, and theoretically, are free to everyone

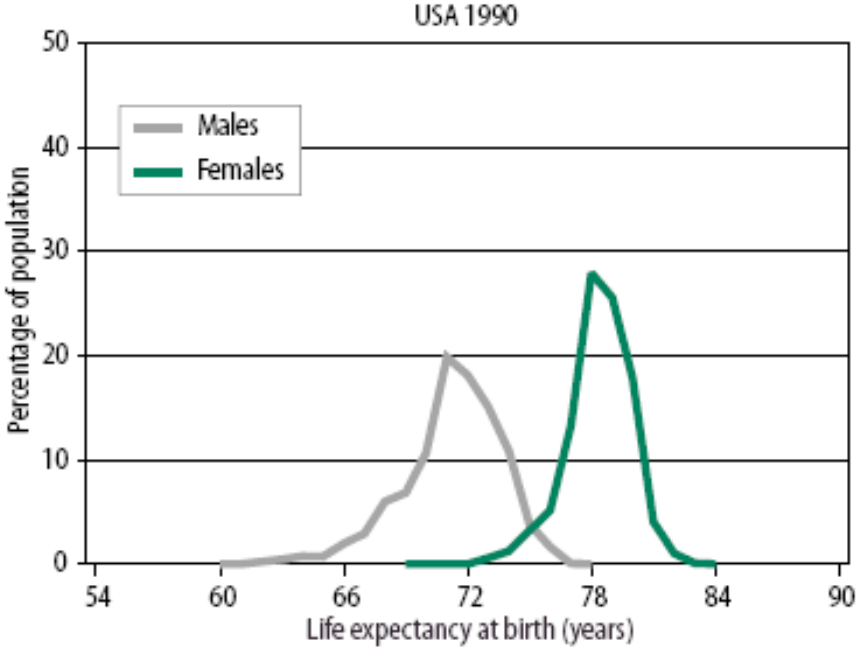
Types of Health Systems

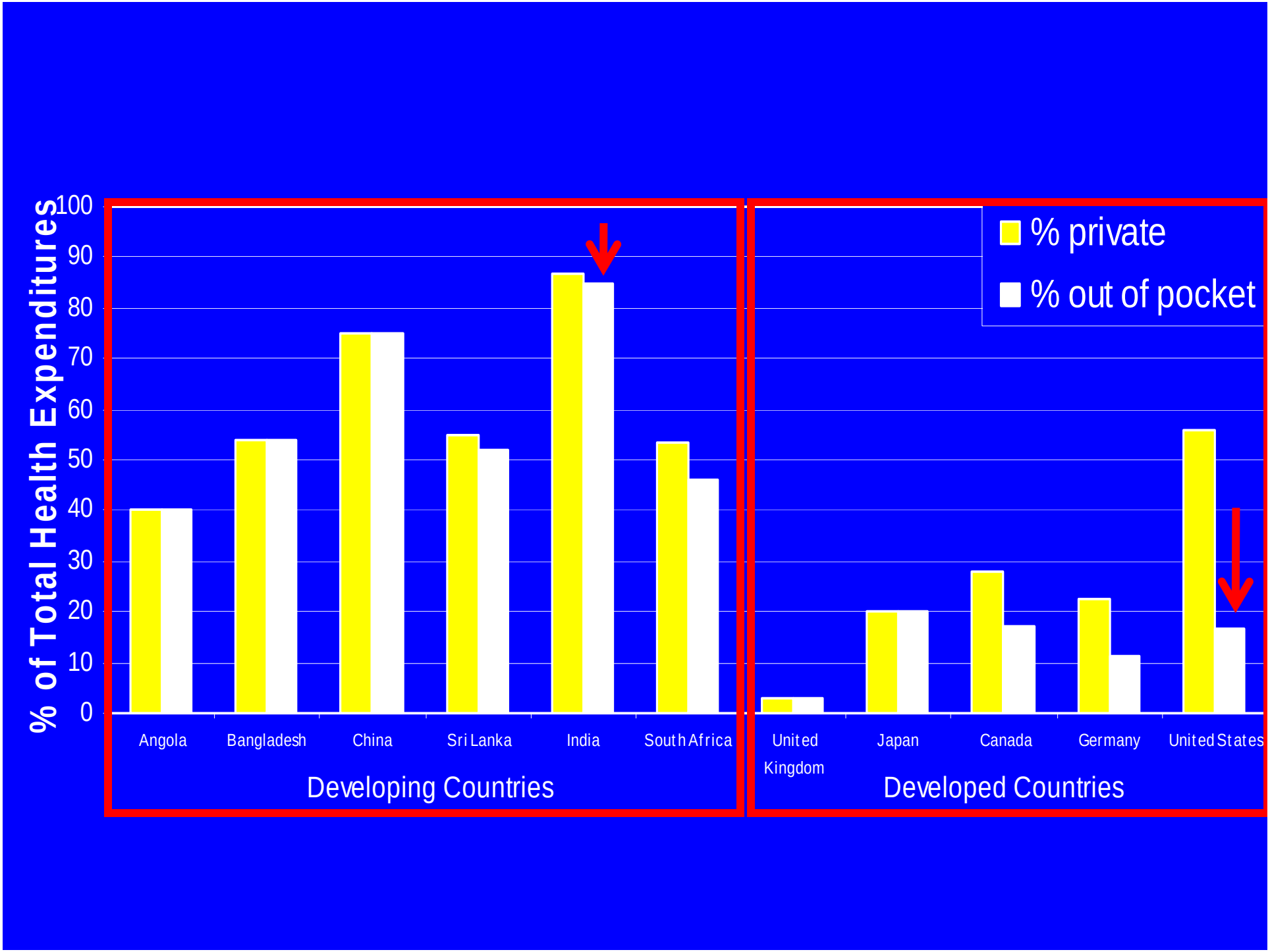
	Entrepreneurial	**Welfare Oriented**	**Comprehensive**	**Socialist**
High Income Developed	United States	Canada Germany Japan Australia	United Kingdom Spain Greece	Soviet Union
Middle Income Developing	Philippines Thailand South Africa	Peru Brazil Egypt Malaysia	Costa Rica Israel	Cuba North Korea
Low Income Developing	Kenya Bangladesh India	Burma	Sri Lanka Tanzania	China Vietnam


Japan 1990
Males
Females
Percentage of population
0
10
20
30
40
50
54
60
66
72
78
84
90
Life expectancy at birth (years)


Mexico 1993
Males
Females
Percentage of population
0
10
20
30
40
50
54
60
66
72
78
84
90
Life expectancy at birth (years)


Norway 1996
Males
Females
Percentage of population
0
10
20
30
40
50
54
60
66
72
78
84
90
Life expectancy at birth (years)


USA 1990
Males
Females
Percentage of population
0
10
20
30
40
50
54
60
66
72
78
84
90
Life expectancy at birth (years)


% of Total Health Expenditures
100
90
80
70
60
50
40
30
20
10
0
% private
% out of pocket
Angola
Bangladesh
China
Sri Lanka
India
South Africa
Developing Countries
United Kingdom
Japan
Canada
Germany
United States
Developed Countries

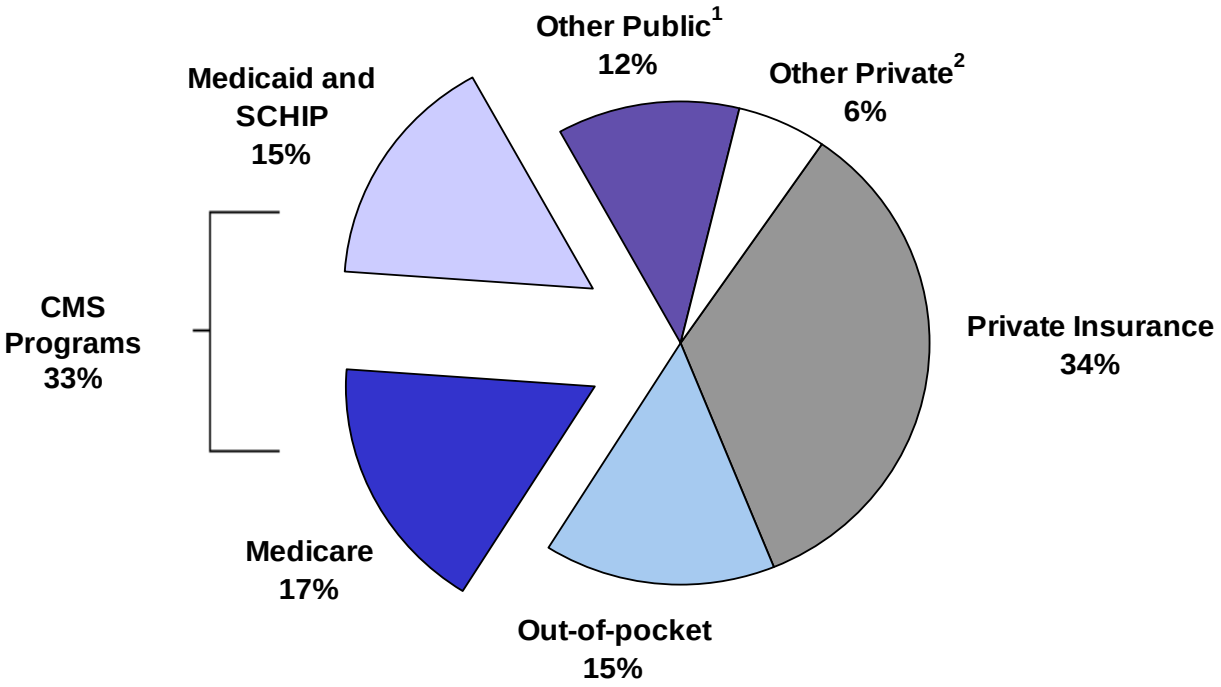
Country	Healthcare system	Total healthcare expenditure as % of GDP*	Health expenditure capita per (US $)*	Life expectancy at birth (years)([0–9])†	Infant mortality rate (per 1000 live births)([0–9])†
Angola	A fragmented and unstable public healthcare system with limited resources that relies heavily on international aid. Privatized care is available to high-income sector.	1.9	$26	40	154
China	Few, but improving, options for public health insurance in rural and urban areas, with programs suffering from financial limitations and accommodating migrating workers.	4.7	$70	73	23
India	Limited public healthcare is funded by tax revenue, community financing and out-of-pocket sources. Private insurance covers only 10% of population.	5.0	$31	63	56
Japan	Dual system in which workers enroll in insurance programs through jobs, and all others join national health insurance plan.	7.8	$2823	83	3
United Kingdom	Publicly funded National Health Service provides free care, with option of private insurance for those wanting treatment outside the state system.	8.1	$2900	79	5
Canada	Limited, but universal, coverage through the provincial government, which acts as the sole insurer. Supplemental private insurance can cover dental services, drug plans, etc.	9.8	$3038	81	5
France	Universal care funded through mandatory health insurance provided by Social Security, with private supplemental coverage filling gaps.	10.5	$3464	80	4
Germany	Universal government approved health insurance plans partly financed by employer and employee contributions, although high income workers may buy private insurance instead.	10.6	$3521	79	4
United States	Federal and state governments pay most of the cost of care for seniors and poor, with employer or personal financed insurance available for others. About 45 million people lack coverage.	15.4	$6096	78	7

Entrepreneurial US Health Care System

- Private Insurance
  - Conventional
  - Managed Care: HMOs, PPOs, POS
- Government
  - Medicare
  - Medicaid
  - SCHIP
- Uninsured

The Nation's Health Dollar, CY 2000

Medicare, Medicaid, and SCHIP account for one-third of national health spending.



Total National Health Spending = $1.3 Trillion

[1] Other public includes programs such as workers' compensation, public health activity, Department of Defense, Department of Veterans Affairs, Indian Health Service, and State and local hospital subsidies and school health.
[2] Other private includes industrial in-plant, privately funded construction, and non-patient revenues, including philanthropy.

Note: Numbers shown may not sum due to rounding.

Source: CMS, Office of the Actuary, National Health Statistics Group.

WHERE does the money come from?

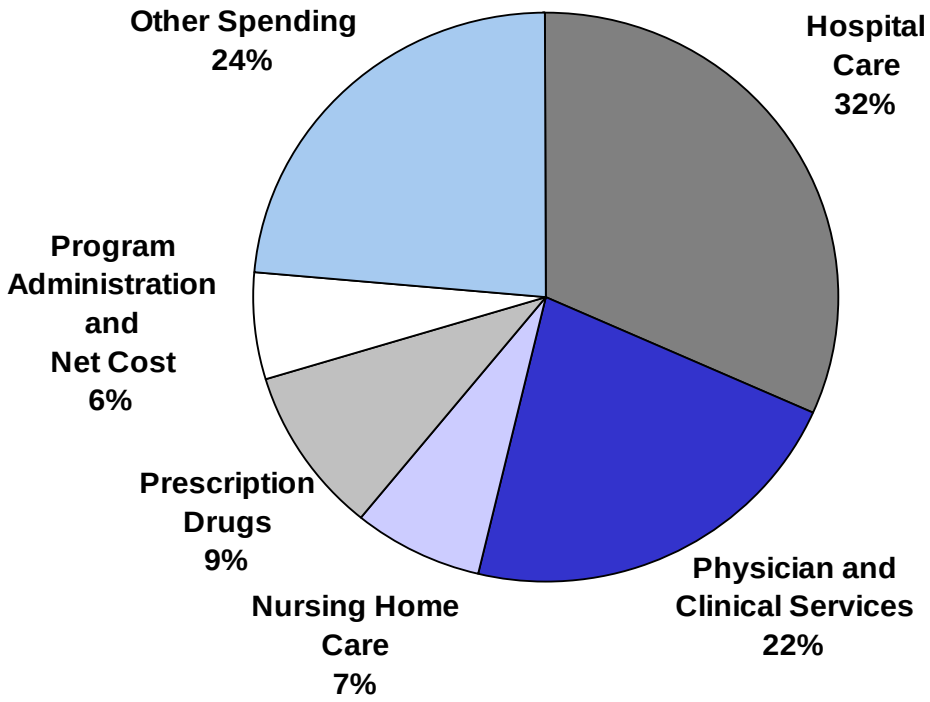
45% GOVERNMENT

40% PRIVATE SOURCES

15% OUT OF POCKET

The Nation's Health Dollar, CY 2000

Hospital and physician spending accounts for more than half of all health spending.



Total Health Spending = $1.3 Trillion

Note: Other spending includes dentist services, other professional services, home health, durable medical products, over-the-counter medicines and sundries, public health, research and construction.

Source: CMS, Office of the Actuary, National Health Statistics Group.

WHERE
does the money go?

1/3 HOSPITAL CARE

1/5 DOCTOR'S FEES

1/10 PRESCRIPTION DRUGS

Spending concentrated on a small # of sick people

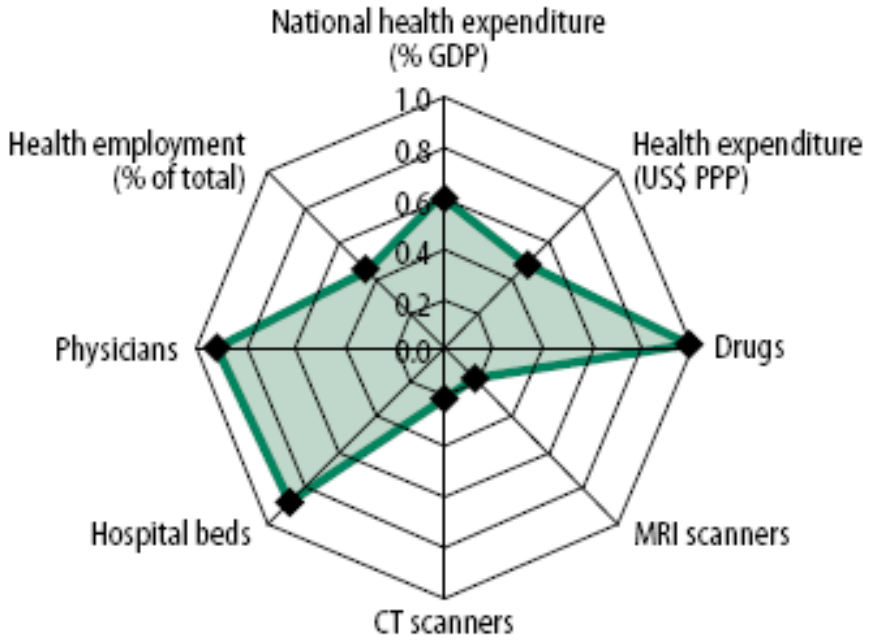
Do we spend MORE in the US?

YES

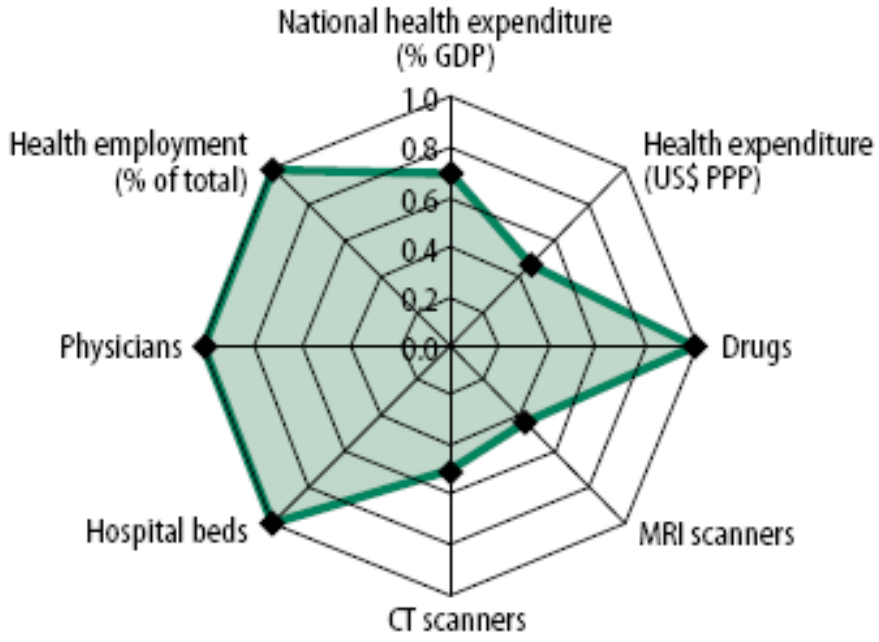
By % of GDP

By absolute amount

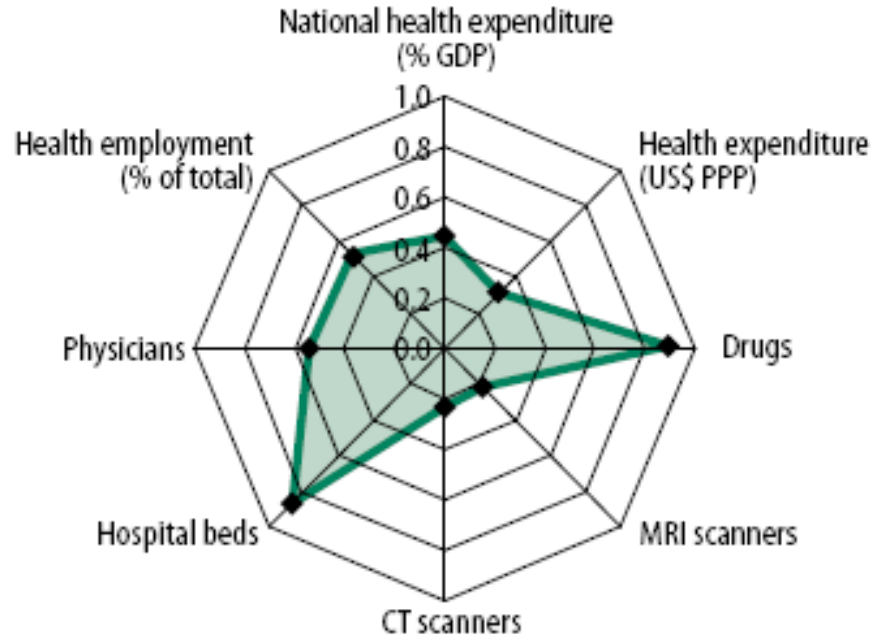
Denmark



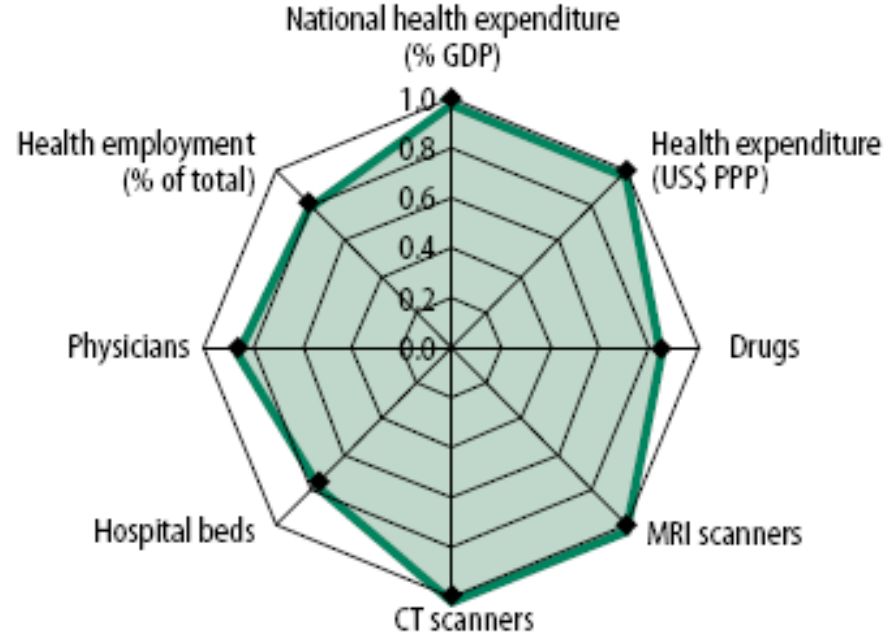
Sweden



United Kingdom



United States of America



Welfare-Oriented Canadian Health Care System

- Five Principles
  - Comprehensiveness, Universality, Portability, Accessibility, Public administration
- Features
  - All 10 provinces have different systems (local control)
  - One insurer - the Provincial government
    - costs shared by federal & provincial govts
  - Patients can choose their own doctors
  - Doctors work on a fee for service basis, fees are capped

http://www.globalsecurity.org/intell/world/canada/images/canada-flag.gif

Canadian Health Care - History

- Before 1946
  - Canadian system much like current US system
- 1946
  - Tommy Douglass, premier of Saskatchewan, crafted North America's first universal hospital insurance plan
- 1949
  - BC and Alberta followed
- 1957
  - Federal govt adopted Hospital Insurance and Diagnostic Services Act
  - Once a majority of provinces adopted universal hospital insurance plan, feds would pay half costs
- 1961
  - All provinces had hospital insurance plans

Canadian Health Care - History

- 1962
  - Saskatchewan introduced full-blown universal medical coverage
- 1965
  - Federal govt offers cost-sharing for meeting criteria of comprehensiveness, portability, public administration and universality
- 1971
  - All Canadians guaranteed access to essential medical services
- 1970-1980s
  - Rising medical costs, low fees to doctors
  - Doctors began to bill patients themselves

Canadian Health Care - History

- 1984
  - Canadian Health Act outlawed “extra billing”
  - “One-tiered service”
  - Some provinces capped physician incomes
  - Ontario physicians went on strike
- 1998
  - Federal government cut contributions to social programs from $18.5 billion to $12.5 billion Canadian
  - Today, fed govt pays only about 20% of medical care costs on average

Canadian Health Care – Comparisons to US System

- Costs
  - Canada spends 9% of GDP on health care
  - US spends 14% of GDP on health care
- Popular?
  - 96% of Canadians prefer their system to that of US
- Simplicity
  - Canadian medicare – 8 pages long
  - US Medicare – 35,000 pages long

Canadian Health Care – Comparisons to US System

- Life Expectancy
  - Canadians have 2nd longest expectancy of all countries
  - US ranks 25th
- Infant Mortality Rates
  - Canada – 5.6 deaths per 1000 live births
  - US – 7.8 deaths per 1000 live births
- Average physician income
  - Canada - $120,000
  - US - $165,000

Canadian Health Care - Problems

- Portability
  - Quebec and a few others will only pay doctors in other provinces up to its set fees
  - Many clinics post signs “Quebec medicare not accepted”
- Coverage of services
  - Some provinces charge health insurance premiums (many employers pay, subsidized for low income)
  - Few provinces offer drug plans (97% of Canadians are covered, private insurance)
  - Routine dentistry and optical care not covered by any province

Canadian Health Care - Problems

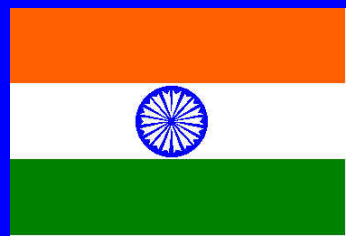
- Waiting times
  - 12% of Canadians waited >4 months for non-emergency surgery
  - Canadians wait average of 5 months for a cranial MRI
  - Americans wait an average of 3 days

Canadian Health Care - Problems

- Emergence of for-profit care
  - In exchange for an extra fee, facilities offer quicker access to medicare-insured services
  - Movement toward a two-tiered system like US
- Poor Availability of Advanced Technology
  - No way to fund new medical equipment
  - Waiting times high for ultrasound, MRI

Indian Health Care System

- Health system is at a crossroads
  - Fewer people are dying
  - Fertility is decreasing
  - Communicable diseases of childhood being replaced by degenerative diseases in older age
- Reliance on private spending on health in India is among the highest in the world
  - More than 40% of Indians need to borrow money or sell assets when hospitalized



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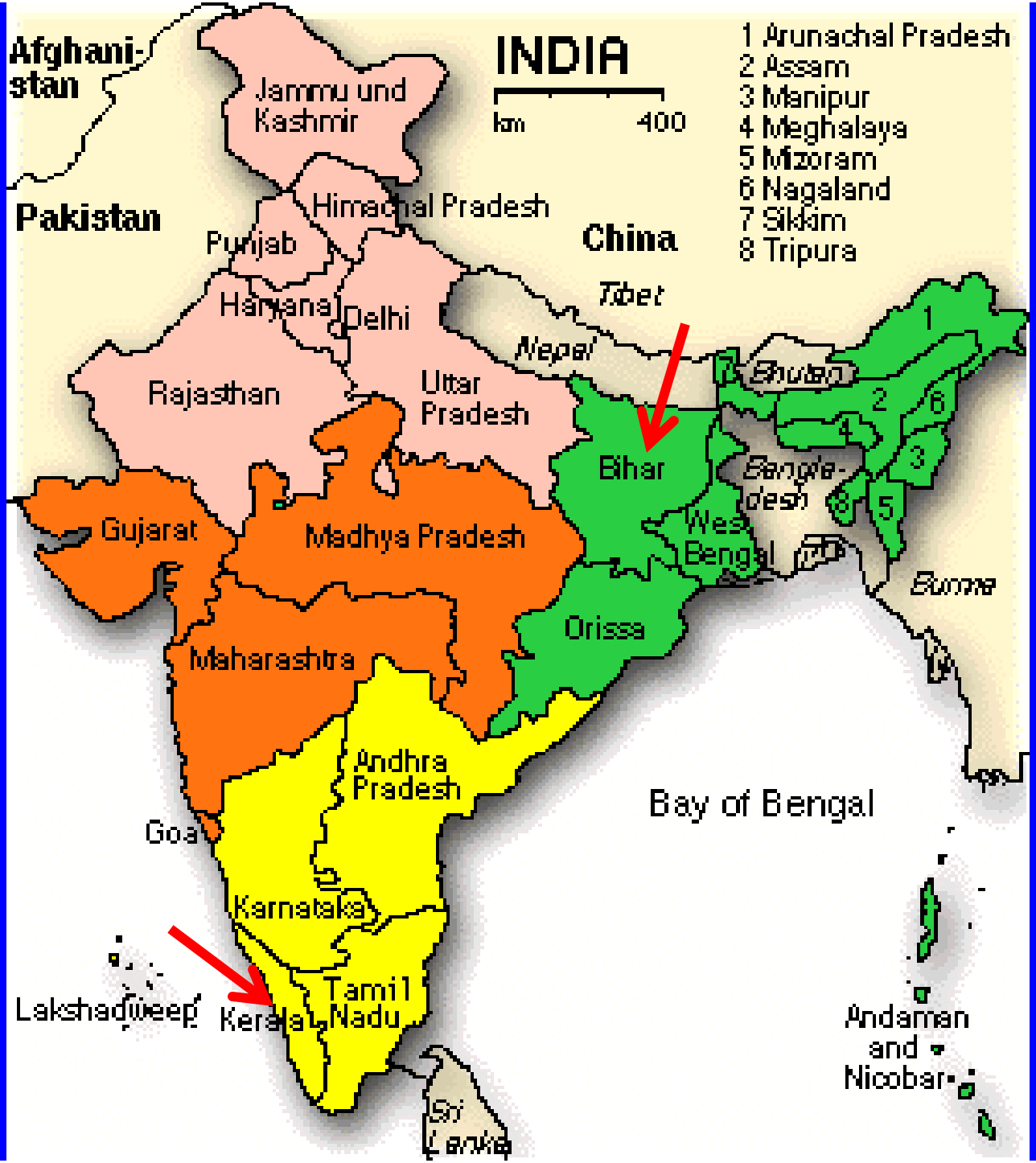
Indian Health Care System

- Geographic disparities in health spending and health outcomes
  - Southern and western states have better health outcomes, higher spending on health, greater use of health services, more equitable distribution of services



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Indian Health Care System

State	Prenatal Care	Institutional Deliveries	Immunization Rates
India	28% (2-95%)	34% (5-100%)	54% (3-100%)
Kerala	85%	97%	84%
Gujarat	36%	46%	58%
Bihar	10%	15%	22%

Indian Health Care System: Goals

- How to work with private health providers
- Test new health financing systems
- Analyze pharmaceutical policies
  - New international trade regimes
  - Emergence of new infectious diseases
  - How to make HIV drugs affordable in India
- Develop strategies to increase number of trained health care workers
- Maximize benefits from health research and technology development

http://discover.npr.org/features/feature.jhtml?wfId=1144226

Angolan Health Care System

- UN World Food Programme
  - Provides food to an average of 1.7 million people per month
  - 740,000 people receive rations through food-for-work program
- Infrastructure Needs
  - 500 roads need reconstruction
  - Many key bridges are unstable
  - Millions of landmines scatter the countryside
- Corruption
  - Angola produces 900,000 barrels of oil per day
  - Massive corruption has undermined donor confidence

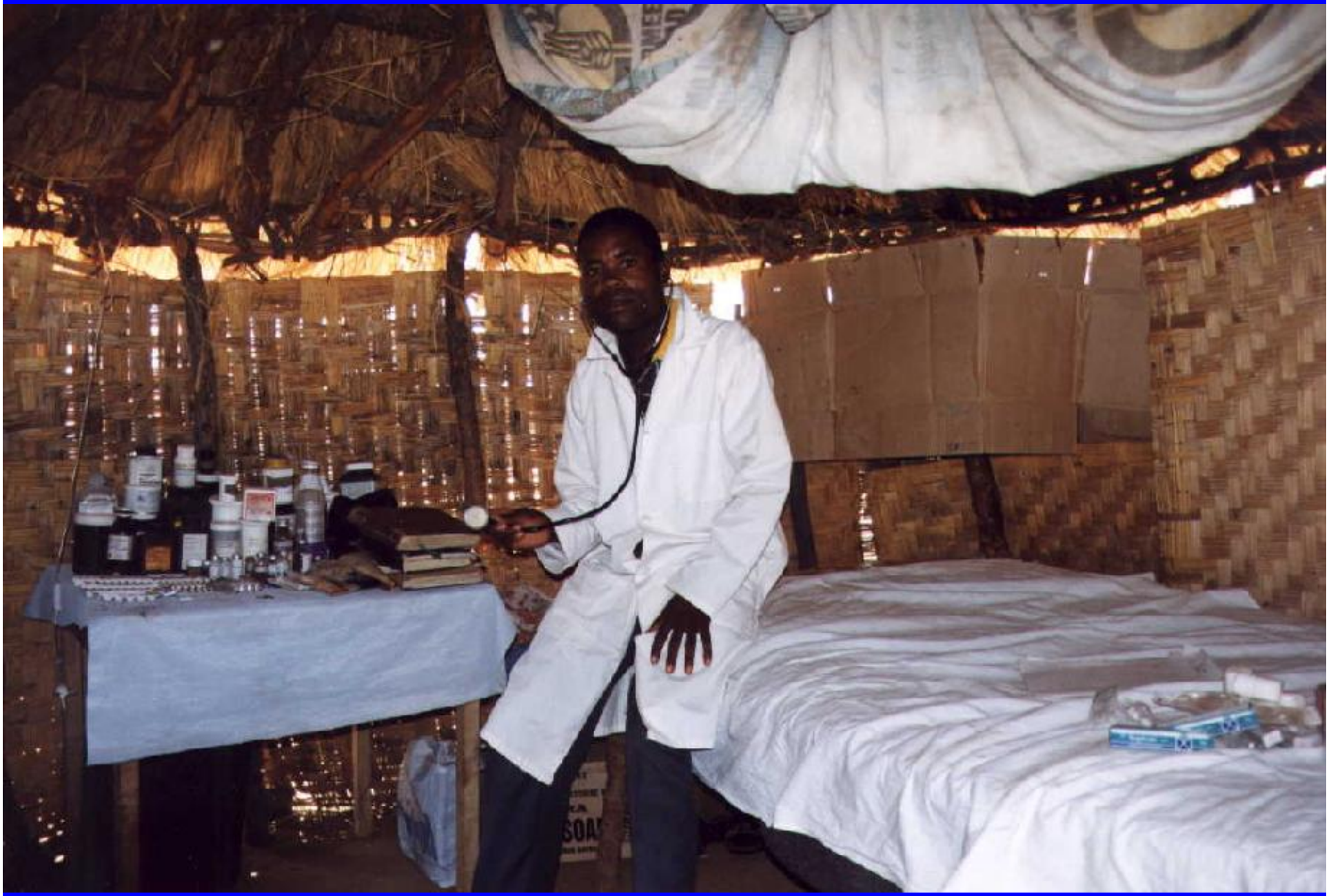
Angolan Health Care System

- Overall public health situation is critical
  - One in four children dies before age 5
  - Measles – claims 10,000 children per year
- UN Agencies conducted vaccination campaigns – National Immunization Days
  - 7 million children vaccinated for measles
  - 5 million children vaccinated against polio
  - Working to implement routine immunization programs

Overview of Lecture 5

- Health Systems
  - What is a health system?
  - Goals of a health system
  - Functions of a health system
- Types of health systems
- Performance of Health Systems
- Examples of health systems

- How have health care costs changed over time?
- What drives increases in health care costs?
- Health care reform
  - http://www.npr.org/templates/story/story.php?storyId=126909902



http://www.c-kemp.de/angola/einheimische_Praxis.jpg

The Role of Technology?

- http://www.npr.org/templates/story/story.php?storyId=112522353&ft=1&f=94427042

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JUNE 1, 2009