

Health Care Expenditure : What do we know?

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Aim: What do we know about health care expenditure? What might we suppose about the future for China?

- What do we know is happening in the world?
 - ◆ What is happening in the richer countries?
- Implications for China

Outline of talk

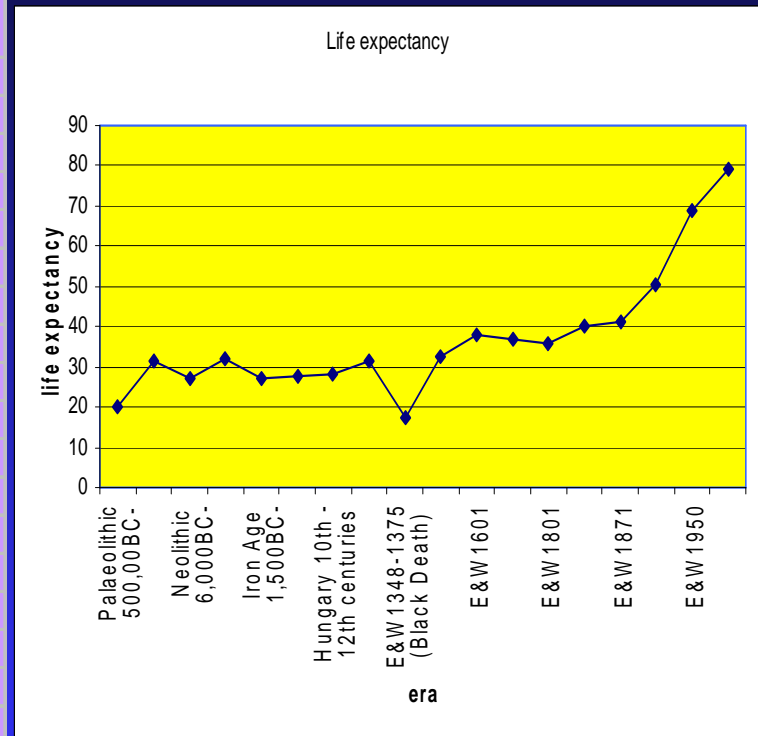
- ◆ Some background on health care expenditure trends
- ◆ Some relationships
- ◆ Some explanation of what's driving health care
- ◆ Some implications for China

China's growth

- China's GDP growth rate 7%
- China's population c1.3 billion
 - ◆ 11% growth since 1990
 - ◆ c1% per annum currently
- Health care >5% GDP per annum
 - ◆ Delivery of free hospital care to all
 - ◆ Extend urban insurance coverage to 100% by 2010
 - ◆ Matched central government funding to extend rural coverage to 80%

Increases in Welfare/Health

Time Period	Life Expectancy
Palaeolithic 500,00BC-8,000BC cave man	19.9
Mesolithic, 8000BC -2,500BC huntergatherers	31.4
Neolithic 6,000BC-1,500BC agricultural	26.9
Bronze Age 2,500BC-500BC, ancient Egypt & mesopotamia	32.1
Iron Age 1,500BC-500AD	27.3
Roman Empire, first to fourth centuries	27.8
Hungary 10th -12th centuries	28.1
England&Wales males 1276-1300	31.3
England & Wales 1348-1375 (Black Death)	17.3
England & Wales males 1426-1450	32.8
England & Walse 1601	38.1
England &Wales, 1701	37.1
England & Wales, 1801	35.9
England & Wales, 1841	40.3
England & Wales, 1871	41.3
England & Wales, 1900	50.4
England & Wales, 1950	68.9
England & Wales, 2000	78.9



Source, Usher, Political Economy, 2003

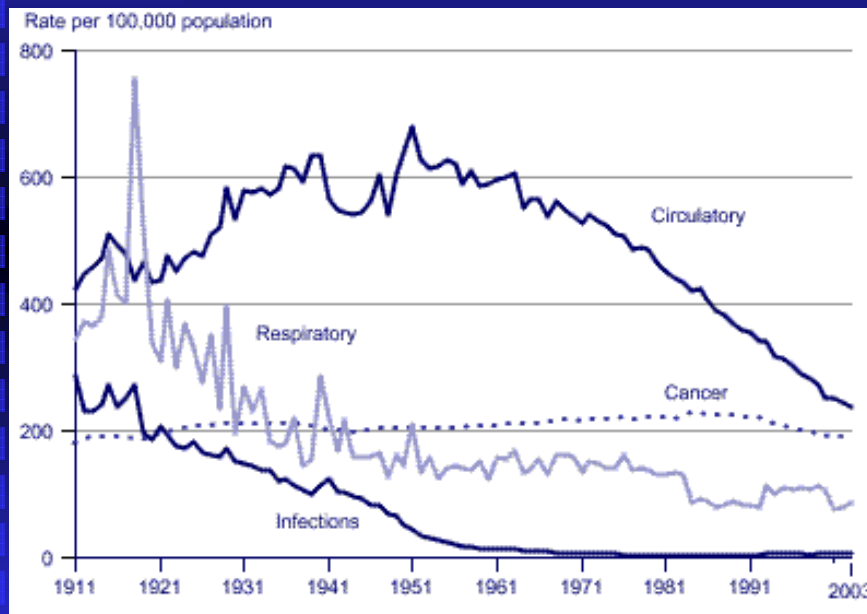
Decreases in Welfare/Health

Transition economies: Change in life expectancy	1989-1991		1991-1994		1994-1996	
	Male	Female	Male	Female	Male	Female
Czech republic	-0.6	0.3	2	0.9	0.9	0.7
Former GDR	-0.9	-0.1	1.3	1.6	-	-
Poland	-0.7	-0.2	1.4	0.8	0.6	0.5
Slovakia	-0.2	0	1.7	1.3	0.5	0.2
Bulgaria	-0.6	-0.4	-1.3	0.2	-0.2	-0.3
Hungary	-0.4	0	-0.2	0.4	1.3	0.5
Romania	0.1	0.7	-0.7	0.2	-0.6	-0.2
Estonia	-1.3	0.1	-3.3	-1.7	0.6	1.3
Latvia	-1.4	-0.4	-3.2	-1.9	2.6	2.8
Lithuania	-0.6	-0.2	-3.5	-1.2	2.2	1.2
Russia	-0.7	-0.2	-5.9	-3.1	2.3	0.7
Belarus	-0.3	-1.6	-3	-1.3	-0.4	0
Moldovia	-1.2	-1.3	-2.5	-1.3	0.6	0.6
Ukraine	0	0	-3.2	-1.8	-0.8	-0.2

Source: Cornia and Panizza, 2000



Decline of major killers



Source: UK ONS, 2006

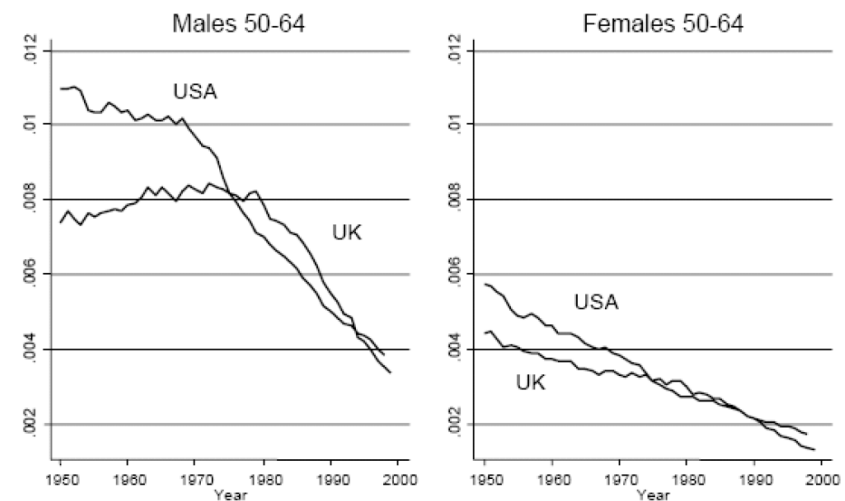
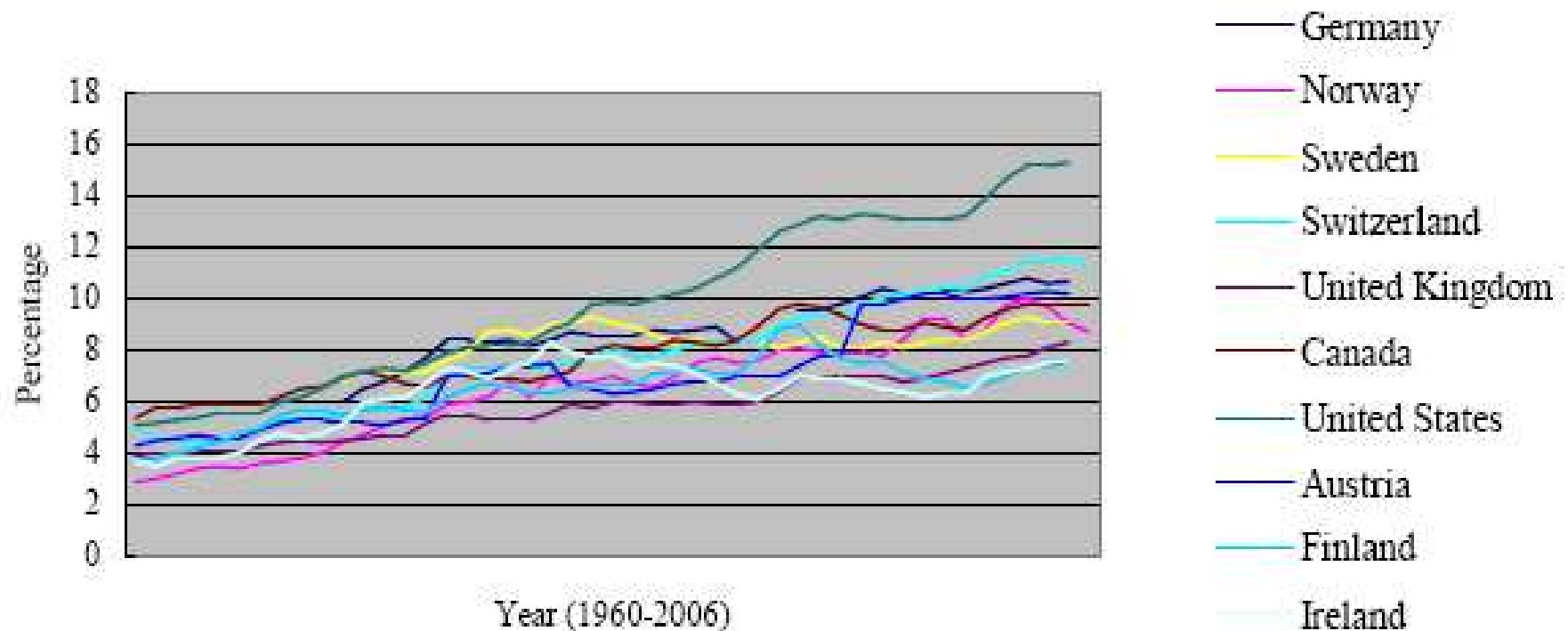


Figure 5: Age-adjusted mortality rates from cardiovascular disease, US and UK, 1950–2000
Source: Author's calculations based on WHO mortality database.

Source: Deaton, 2004

Levels of Health Care Expenditure



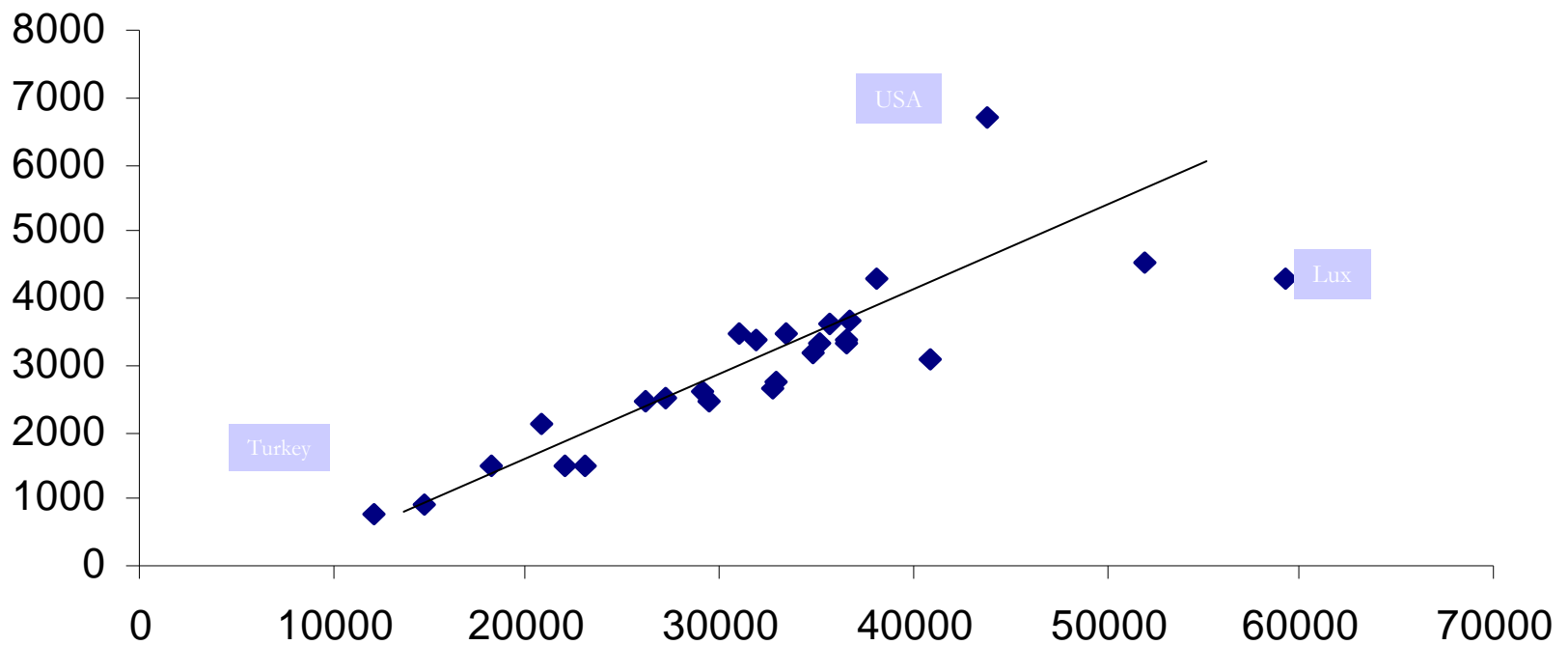
Source OECD, 2007

GDP vs Health Care Levels: 2006

2006: $R^2=0.83$

Health exp
Per capita
\$US PPPs

Health Expenditure vs GDP



GDP per capita \$US PPPs

Proportionate change in health care expenditure as income rises:

$$\varepsilon_Y = \frac{\partial Q}{\partial Y} \cdot \frac{Y}{Q} = \frac{\partial Q/Q}{\partial Y/Y}$$

as income rises by 10% health expenditure increases by 13% (Newhouse)

Income elasticities: the empirical evidence

Individual (micro)	Income elasticity
<i>Insured</i>	
Newhouse and Phelps (1976)	≤ 0.1
Hahn and Lefkowitz (1992)	≤ 0
<i>less insured/uninsured</i>	
Falk et al (1933)	0.7
Andersen and Benham (1970) - dental	1.2
AHCPR (1997) - dental	1.1
Regions (intermediate)	
Fuchs and Kramer (1972) – 33 states, 1966	0.9
Di Matteo and Di Matteo (1998) – 10 Canadian provinces, 1965-91	0.8
Freeman (2003) – US states, 1966-98	0.8
Nations (macro)	
Newhouse (1977) – 13 countries, 1972	1.3
Getzen (1990) – US, 1966-87	1.6
Schieber (1990) – seven countries, 1960-87	1.2
Gerdtham and Löthgren (2000, 2002) - 25 OECD countries, 1960-97	Co-integrated
Dreger and Reimers (2005) – 21 OECD countries	Unitary elasticity not rejected

Source: OECD, 2004

Luxury item

Health expenditure growth versus GDP Growth

Total health expenditure per capita(US\$ PPP)Compound annual rate of growth							
	1970-1975	1975-1980	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005
France	13.5	12.4	9.3	7.2	6.6	3.8	6.3
Germany	16.2	11.2	7.7	4.7	5.2	3.4	4.5
UK	12.9	9.8	8.1	6.8	6.9	6.1	7.9
USA	11	12.6	10.6	9.2	5.9	4.6	7
Canada	9.8	10.2	10.1	6.6	3.4	4.1	6.6
GDP per capita (US\$ PPP) Compound annual rate of growth							
	1970-1975	1975-1980	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005
France	9.7	10.2	6.5	6.3	3.2	4.3	3.2
Germany	8.8	11	6.9	5.9	1.1	3	3.8
UK	8.6	9.1	7.2	6.3	3.9	5.2	5.2
USA	8.5	10.1	7.6	5.6	3.6	4.6	3.9
Canada	9.5	10.0	7.0	4.7	3.0	4.5	4.3

Health care expenditure growth > GDP growth in *ALL* OECD; except Finland

Health expenditure as a share of GDP

Chart 1. Change in health expenditure as a share of GDP, OECD countries, 1990 and 2004

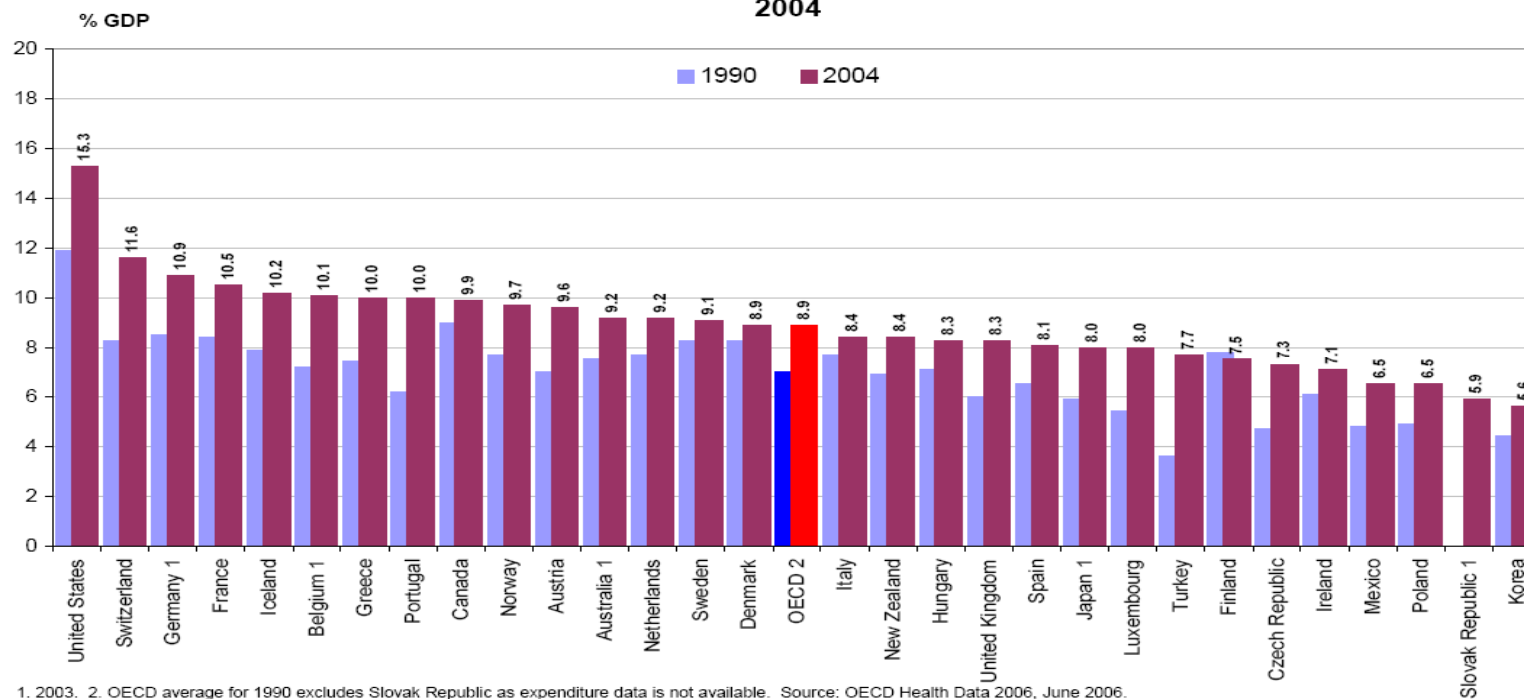
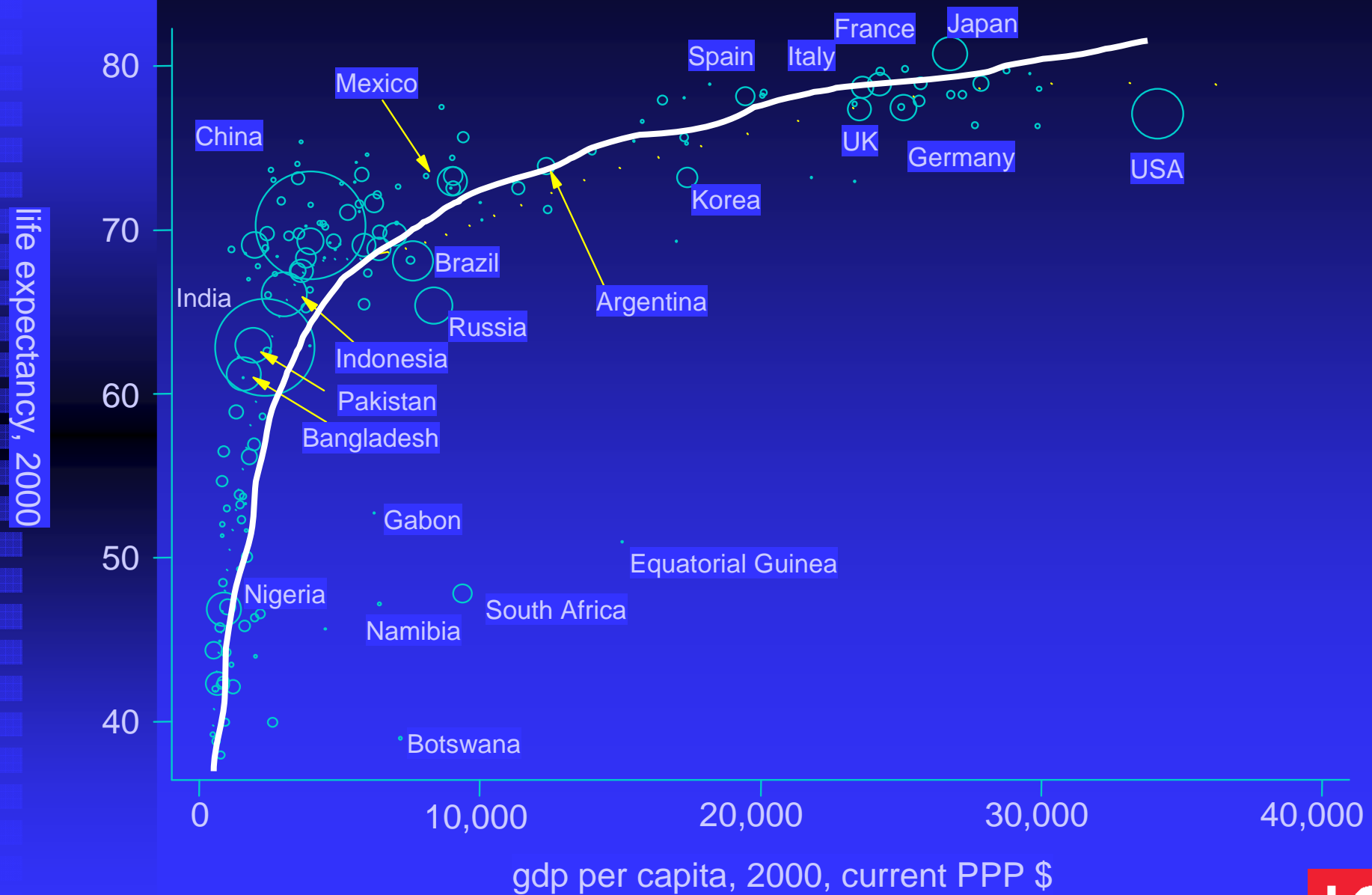
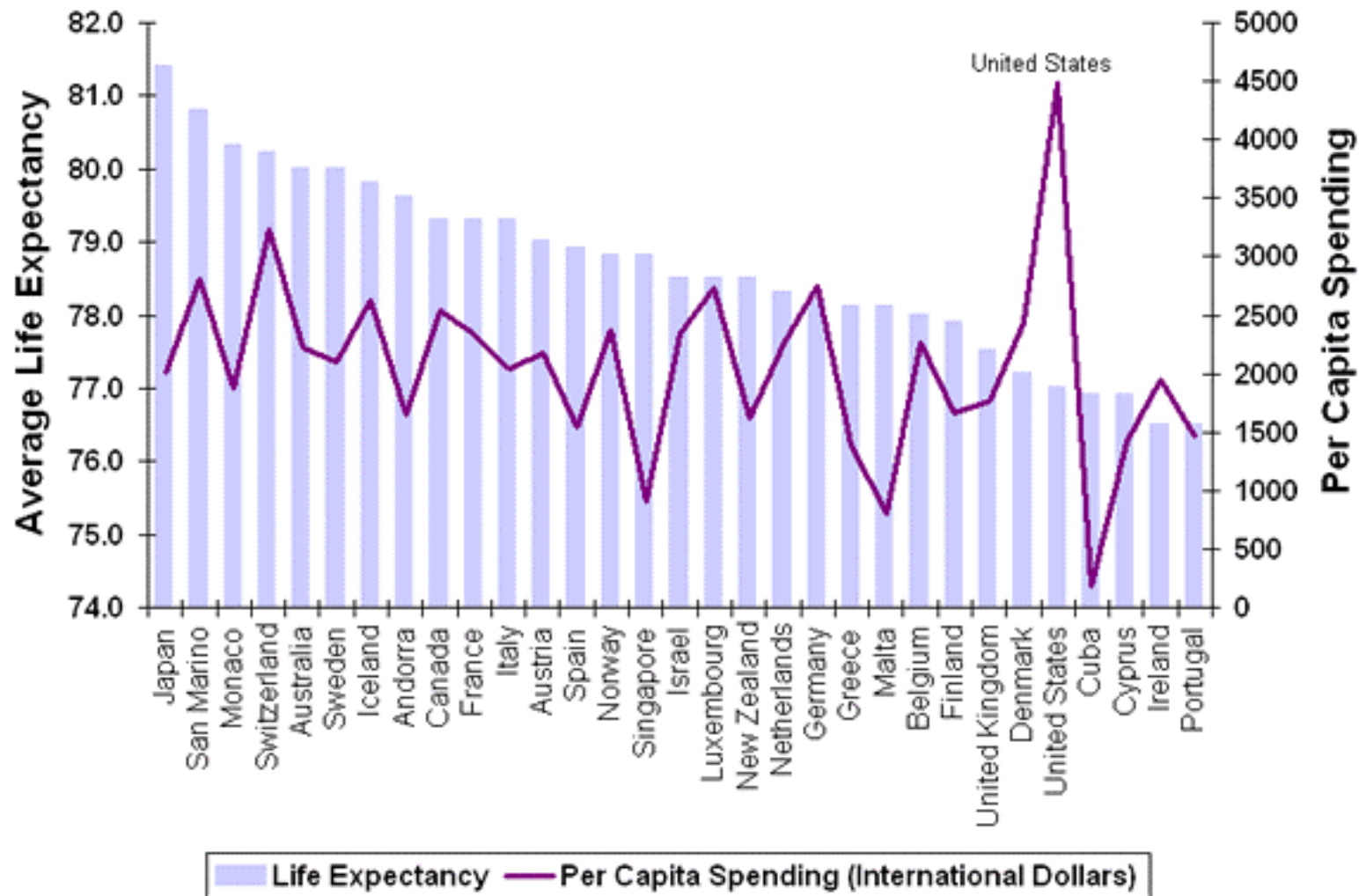


Figure 1: The Millennium Preston Curve

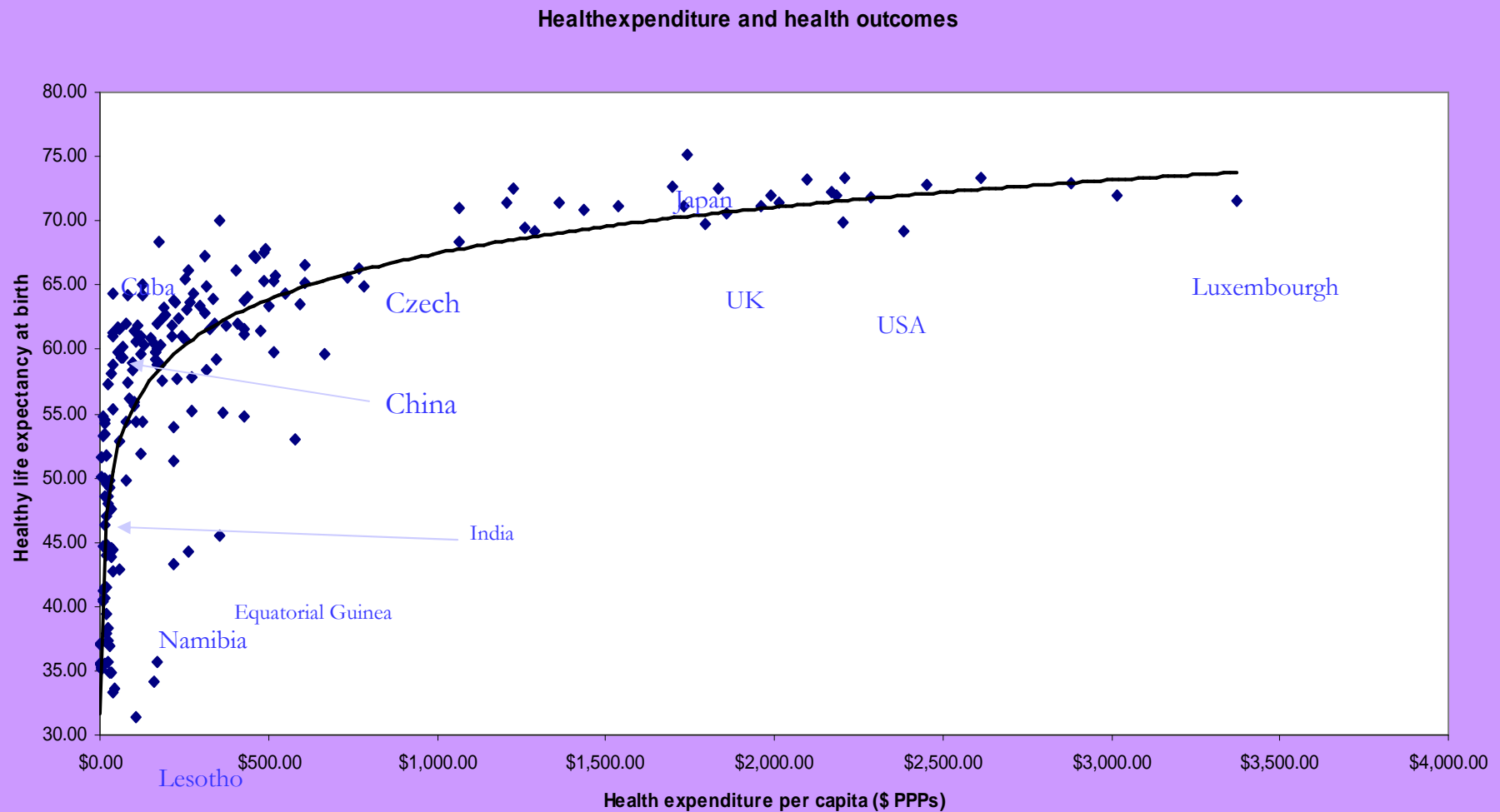


Source: Deaton 2004

The Cost of a Long Life



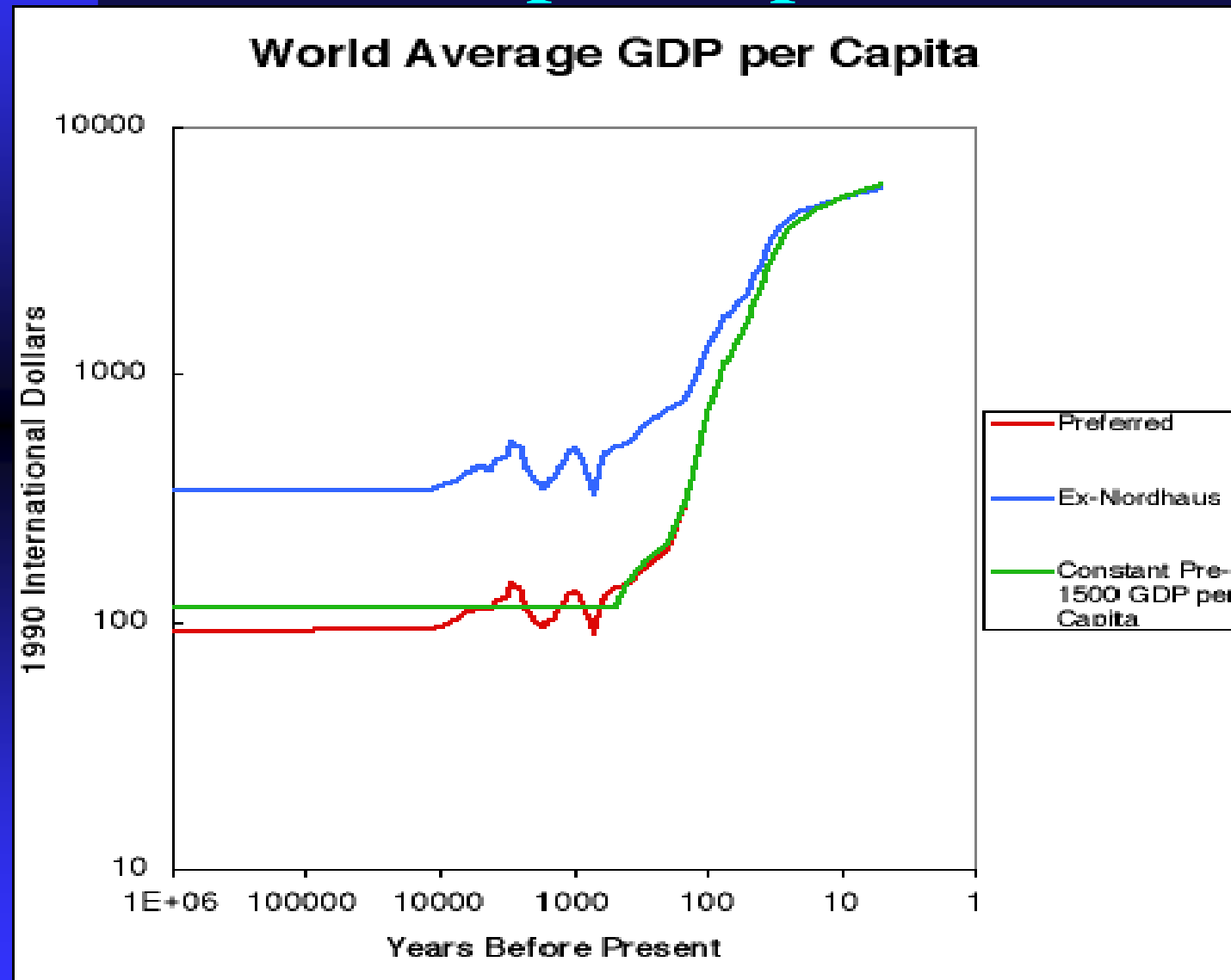
Diminishing returns to expenditure?



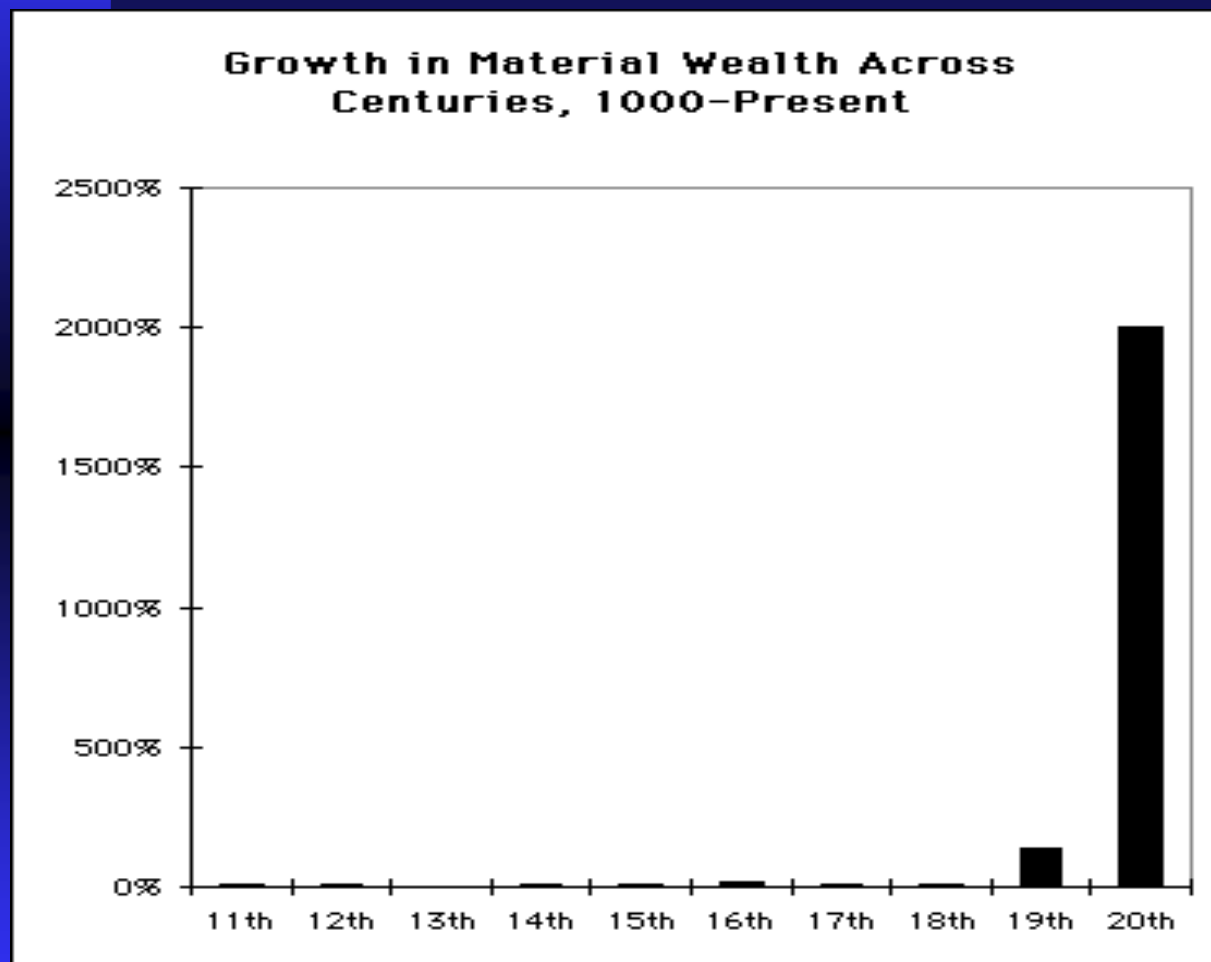
Where are we?

- Health care expenditure is linearly related to GDP and with population
- Health care expenditure at a faster rate than GDP
- Income (and population) growth is in Asia
- Lower income countries have a large potential gain from health care

World GDP per capita

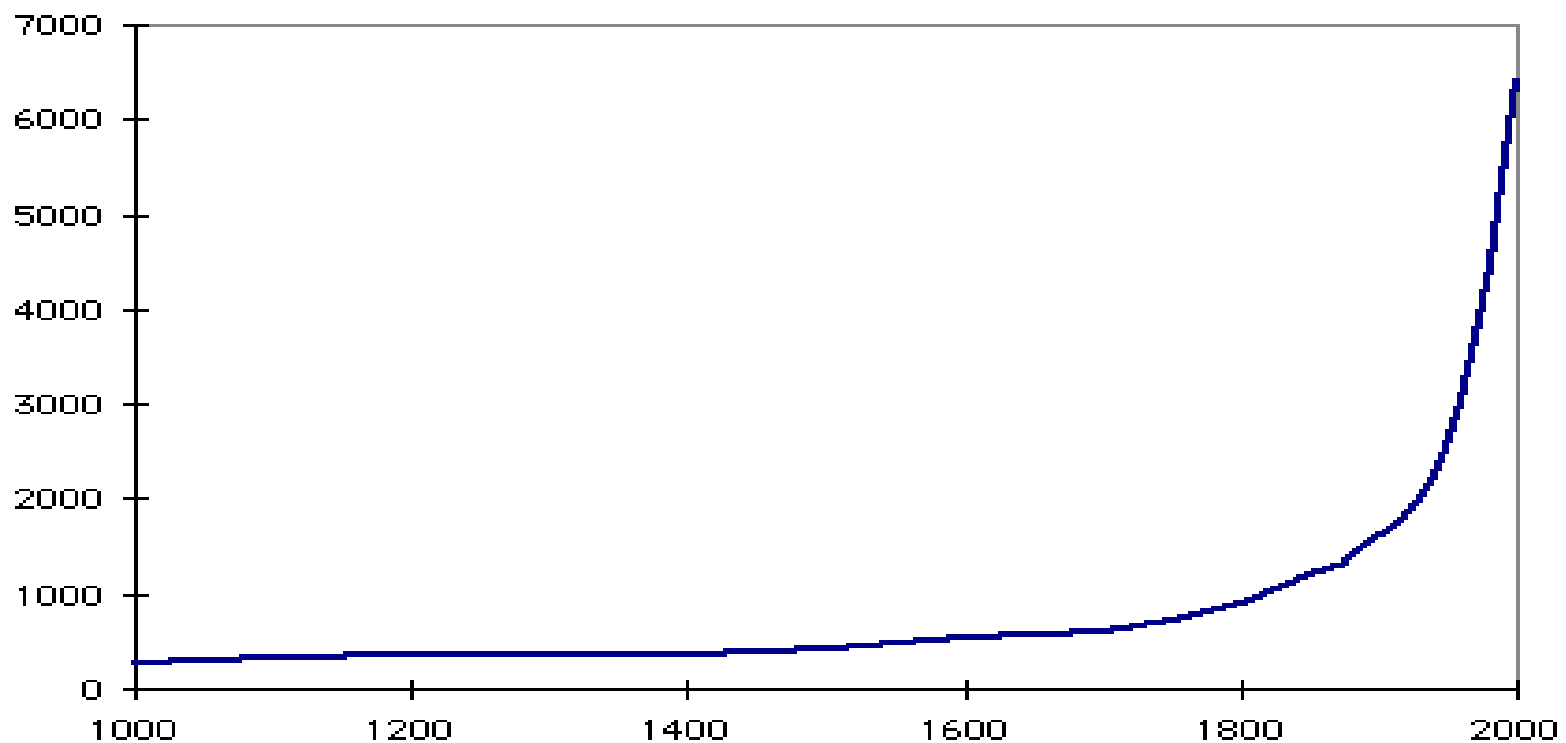


Growth in GDP per capita



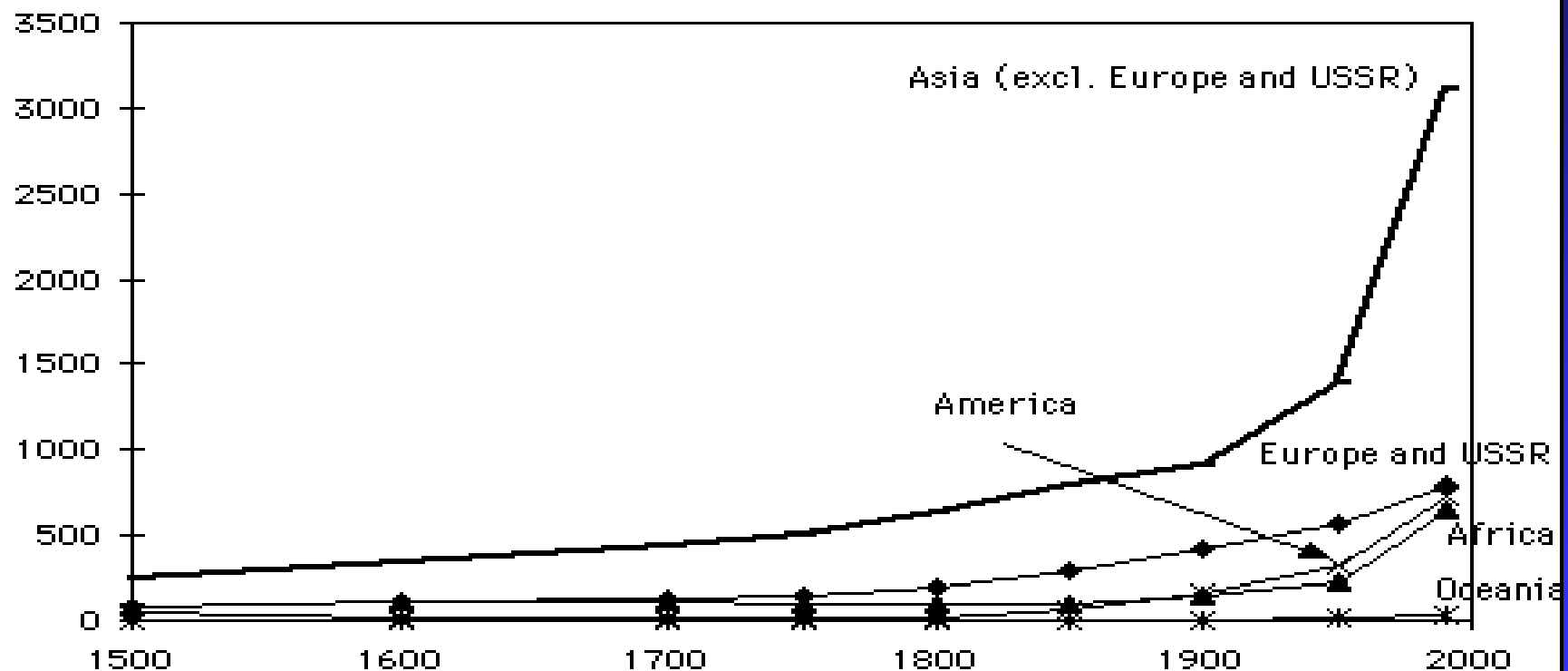
Population Growth

Human Populations, 1000 A.D.–Present



Population Growth: Where?

**Population by Continent, 1500-Present
(Millions)**



Linear relationship between poverty and health

- Global inequity of health

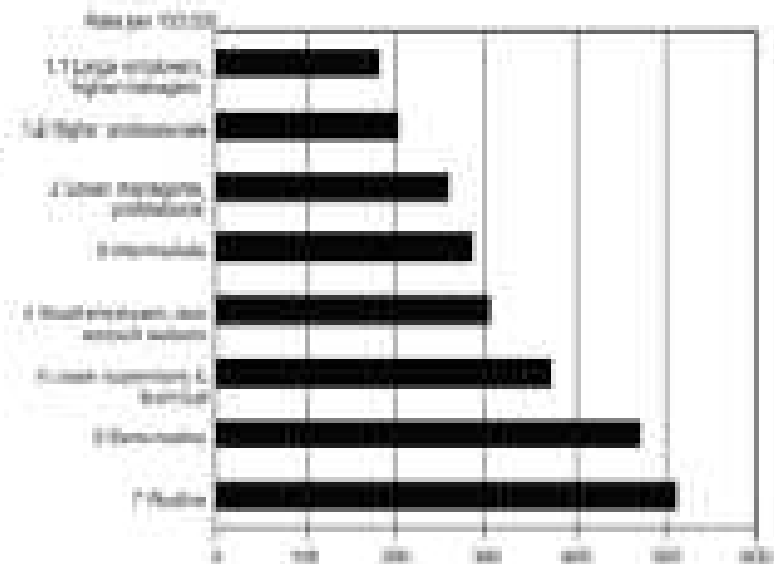
- UK 58m IMR 7 per 1000; MMR 9 per 100,000
- India 982m IMR 72 per 1,000; MMR 407 per 100,000

Life expectancy

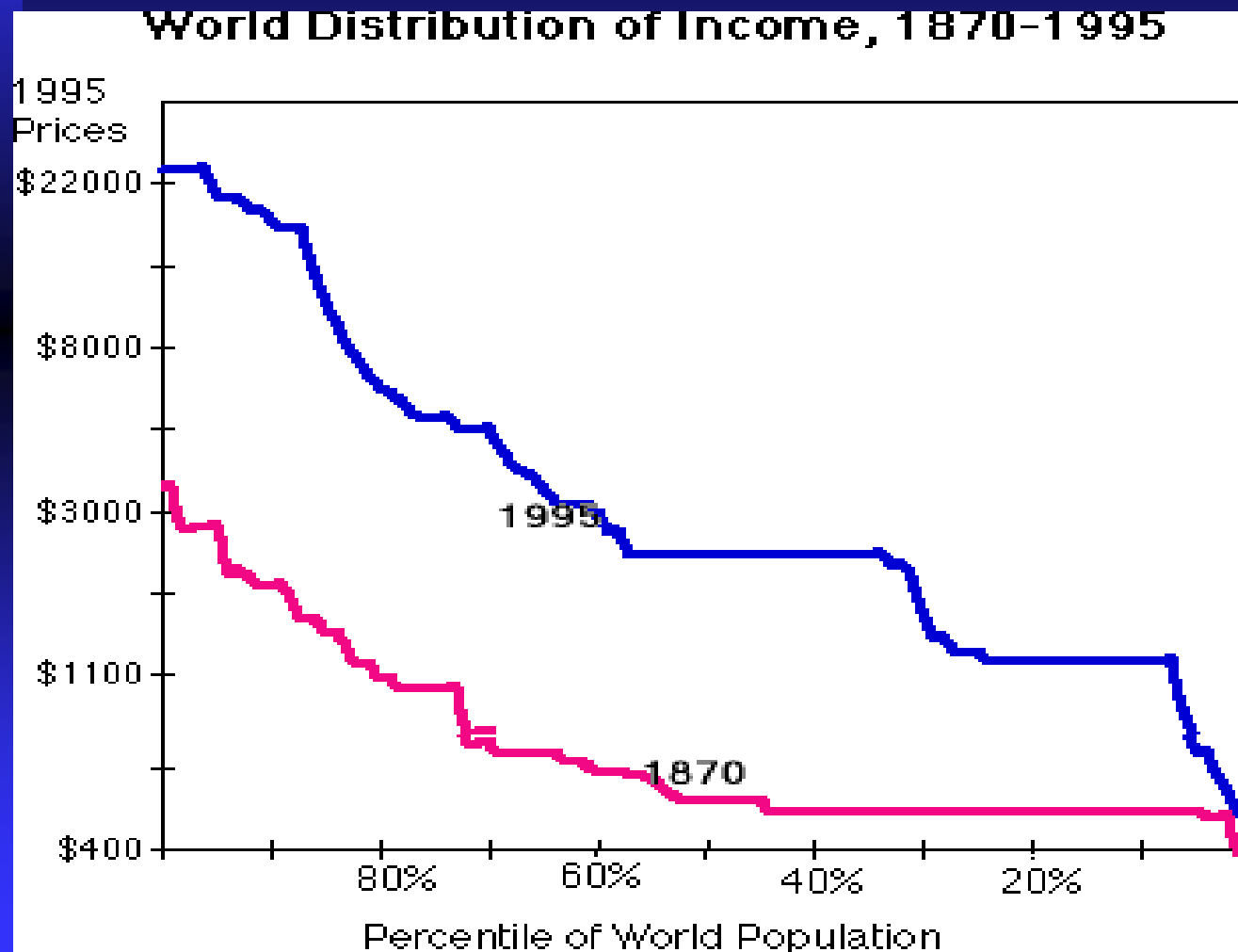
Japan 82 years

Sierra Leone 34 years

- UK; but linear relationship holds over time and across many countries



Poor are doing relatively better



What is happening?

- (National) income growth increases ability to fund health care insurance
- Health care insurance better able to fund health care technology
- Technology increases expenditure
- Amplified feedback loop

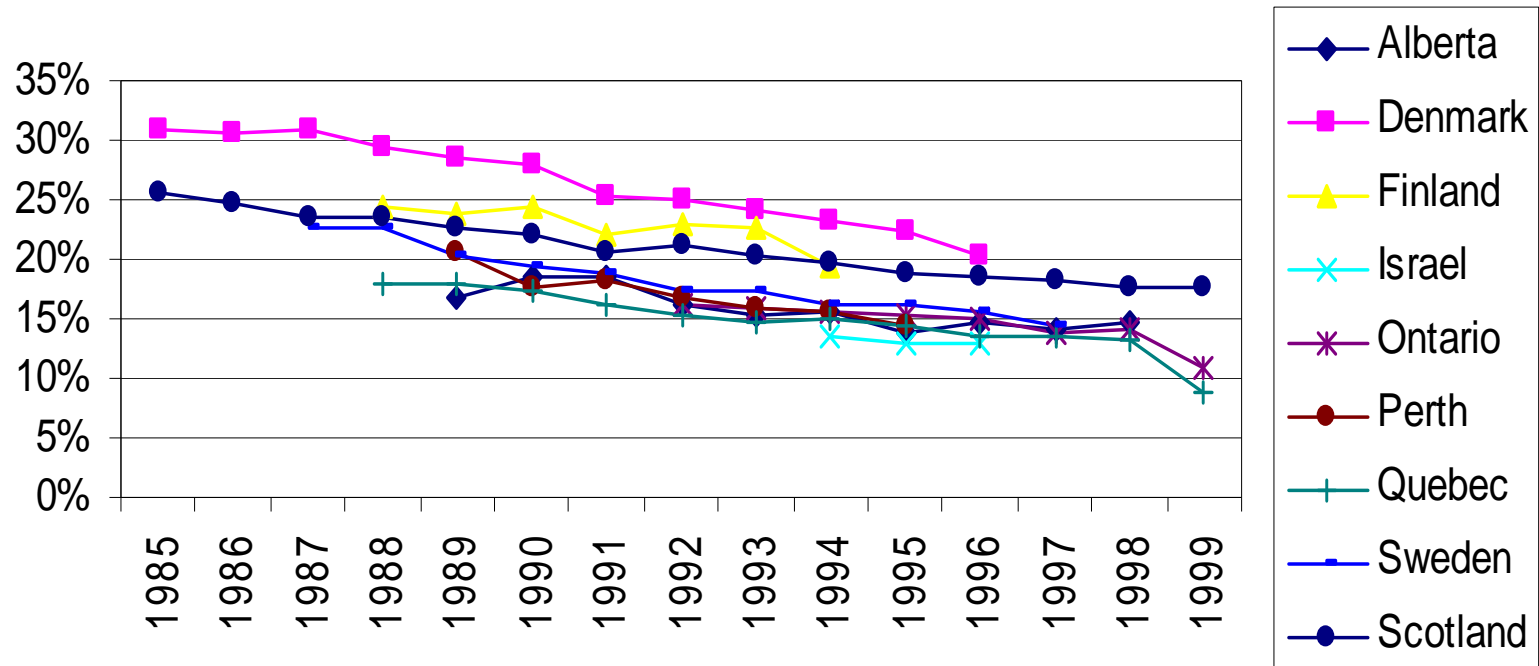
Technology and health care expenditure: Literature

■ Weisbrod (JEL, 1991)

- ◆ Hypothesised a two-way causal relationship between health care technology and health care insurance
 - ◆ Health insurance moved away from “costs-incurred” reimbursement to average treatment cost of case type
 - ◆ Cost-increasing technology gives consumer incentive to broaden insurance coverage as it results in average cost of treatment increasing and/or the variance of the cost of certain treatments increasing

Technological intervention does have an impact

**Percentage of Heart Attack Patients who Die within 30 Days
of Heart Attack, 8 countries 1985-1999**



Source: TECH Investigators, 2002

Technology and health care expenditure: Literature

- 50% of health care growth attributable to introduction of new technologies over 5 year period in USA & Australia (Newhouse, 1992; Aus Productivity Commission, 2005)
- Barros (HE, 1998) dispersion in the variation of level of health expenditure across countries fell between the 1960s - 1970s and constant since (convergence)

Case study: CABG versus PTCA

- Cutler and Huckman (JHE,2003) show mechanism of technology diffusion for PTCA and CABG in USA
 - ◆ PTCA substitutes for CABG with better outcomes
 - ◆ PTCA substitutes for medical management to shift productivity outward
- Does this hold for other systems? (UK slow and late up-take rates)
 - ◆ Replicated for UK (McGuire, Raikou & Windmeijer)
PTCA does substitute for CABG
- PTCA lowers unit costs but increases potential patient pool and therefore increases total expenditure
 - ◆ 25%-35% of PTCA procedures substitute for CABG
 - ◆ 75%-65% are additional at the margin increasing health care costs

Conclusions

- Health care c10% of world resources
- Health care expenditure grows with population and (faster than) GDP
- Most global income and population growth in middle- and low-income countries
- Health care insurance and technology drives health care growth (supported by preferences)
- China's health expenditure is liable to large in the future

China's growth

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- Health care >5% GDP per annum
 - ◆ Delivery of free hospital care to all
 - ◆ Extend urban insurance coverage to 100% by 2010
 - ◆ Matched central government funding to extend rural coverage to 80%
- Technology
 - ◆ Convergence
 - ◆ Endogenous growth