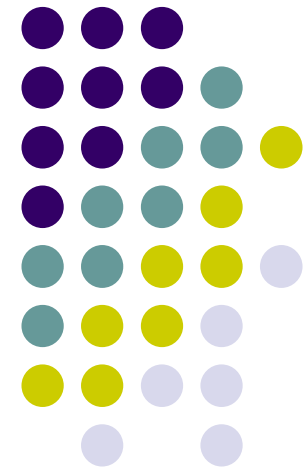


Forecasting Health Expenditures and Developing Policy Measures

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The World Bank
Prague Roundtable on Financial Sustainability
and Health Sector Reforms
Sept 21, 2007





Outline

- Forecasting
 - Projecting, Simulating, Explaining
- Historical and expected changes in health care expenditures
- Reasons for growth in health expenditures
- Short- and long-term measures to manage expenditure growth



Projection models

- Ideally
 - Incorporate all explanatory factors that influence health spending
 - Apply formulae that accounts for complexity in interaction of factors
- Generally, four different simplified methods tend to be used given limited data
 - (i) Econometric time-series analysis
 - (ii) Cross-section studies
 - (iii) Epidemiological models
 - (iv) Actuarial models

Macroeconomic econometric time-series analysis



- Econometric regression analysis to fit statistical models to time-series data of aggregate health expenditures
- Projected values of the critical explanatory variables serve to make projections on future expenditures
- Dependent variable
 - total health expenditures
- Explanatory factors:
 - GDP, population, inflation, binary variables to account for discrete policy or health system changes.
- Data requirement restricts model to OECD countries with sophisticated data sets

Source: Rannan-Eliya (2006): Global review of projecting health expenditures. IHP; Docteur E. (2003): Health care systems: Lessons from reform experience. OECD.

Macroeconomic cross-section studies



- Bivariate or multivariate regressions with total health expenditures as dependent variable
- Key results:
 - Income is main driving source
 - Little consensus on elasticity w.r.t p/cap h-exp
 - Population age structure is insignificant
 - Labor market variables insignificant
 - US show significance in R&D medical technology
 - Supply of doctors significant
 - Organization of GP sign (gatekeeper will lower costs)

Source: Docteur E. (2003): Health care systems: Lessons from reform experience. OECD.

Epidemiological models



- Forecasting model links current utilization and expenditure for medical services with specific diseases and/or morbidity conditions
- Expenditures are predicted on the basis of their current relationship with diseases
- Variables
 - Dependent: Health expenditures
 - Explanatory: Age structure, morbidity incidence, utilization of care
- Limit
 - Insufficient evidence on adequate methods or knowledge to accurately predict the future course of epidemiological trends

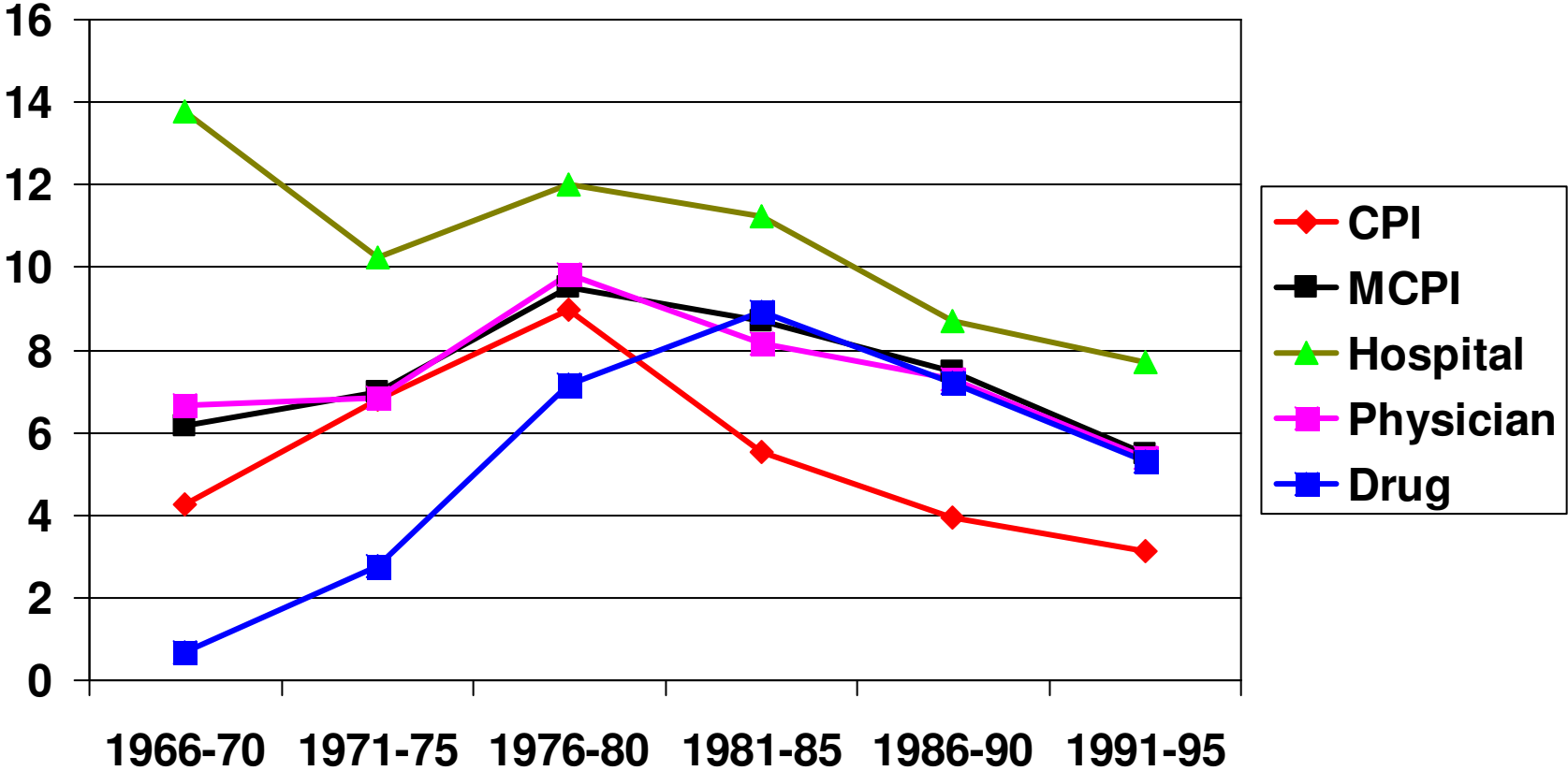
Source: Rannan-Eliya (2006): Global review of projecting health expenditures. IHP;

Actuarial models superior to other models



- Data
 - Historical claims data by service type
- $H\text{-exp} = F$ [number of people in specific age/gender group; historical average expenditure per person in each group and by type of service (hospital, outpatient, etc)]
- Use results to project future utilization, medical price inflation and expenditures

Medical consumer price index is higher than CPI



Source: Office of Prices and Living Conditions. Bureau of Labor Statistics, Washington; Annual % change based on US data

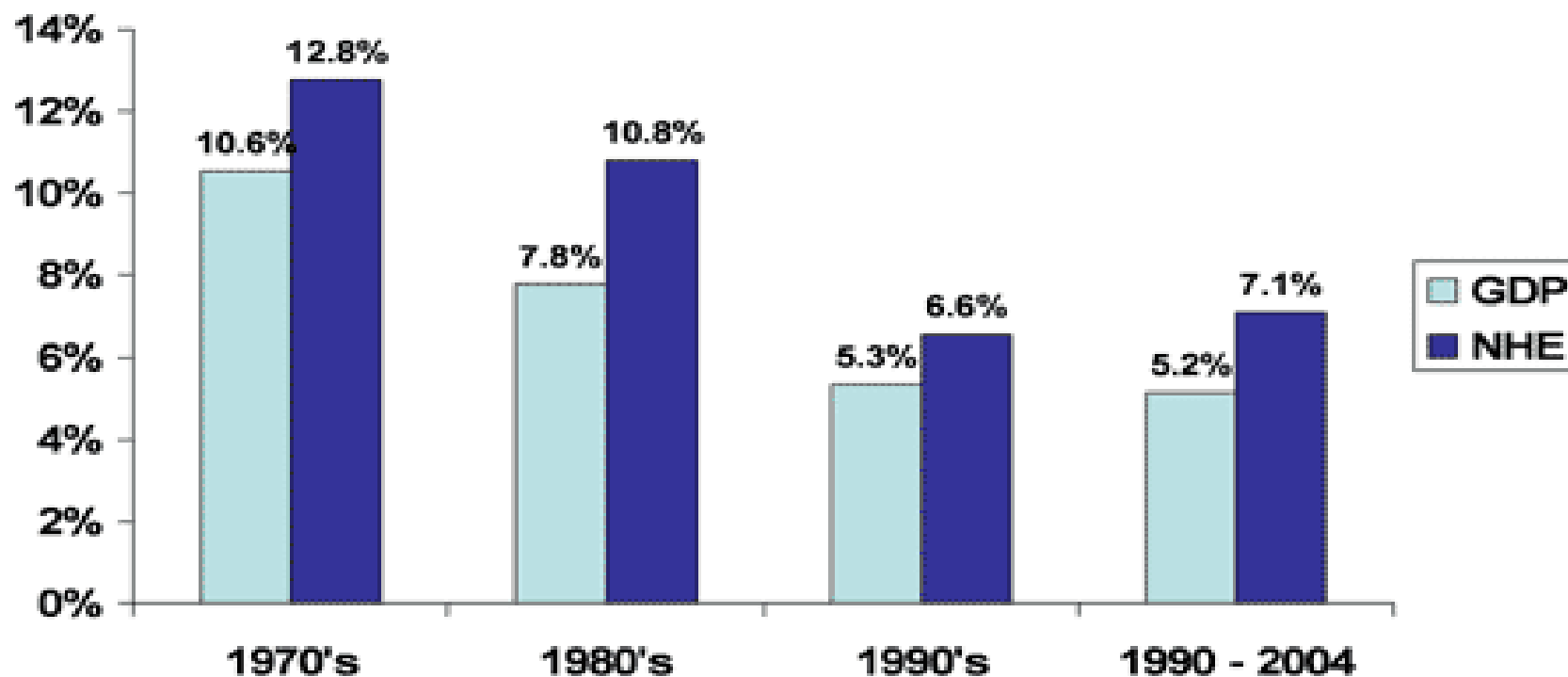


***Historical and expected changes
in health care expenditures
Factors influencing expenditure
growth***



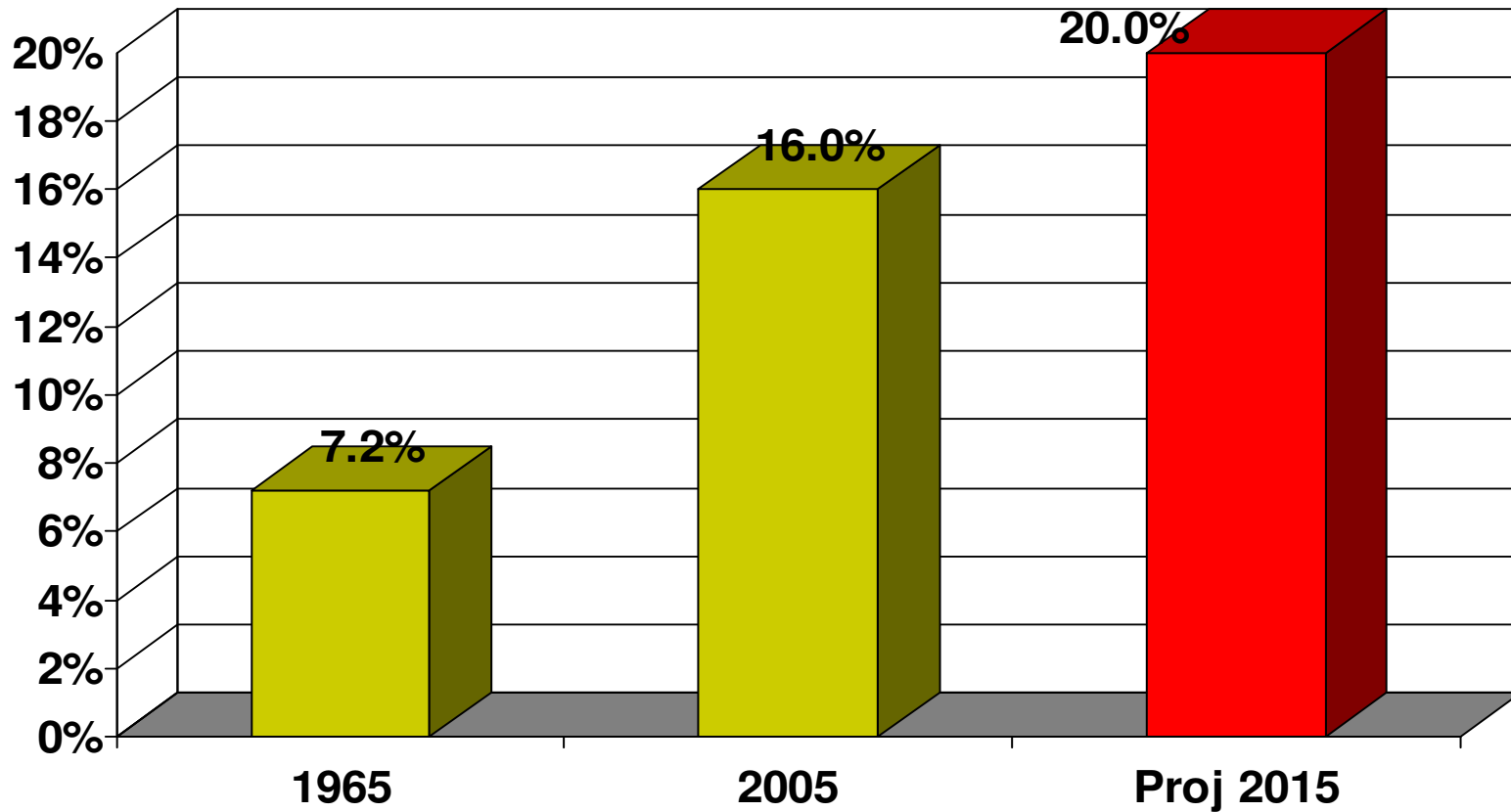
In the US health spending increases annually 2.5 percentage points faster than economy

Figure 1
Average Annual Growth Rates for Nominal NHE and GDP
for Select Time Periods



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 1960-2004; file nheqdp04.zip).

*Projected increase in US health spending by 2015
raises concerns about financial sustainability*



Source: Centers for Medicare and Medicaid Services, Office of the Actuary.
Total health expenditures in % of GDP

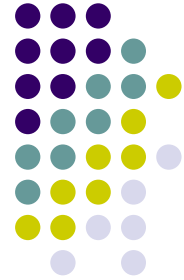
New medical technology is responsible for more than half of expenditure growth



- New medical and surgical procedures (e.g. angioplasty)
- Drugs (e.g. biologic agent)
- Medical devices (eg. CT, MRI)
- New support systems (e.g. telemedicine)

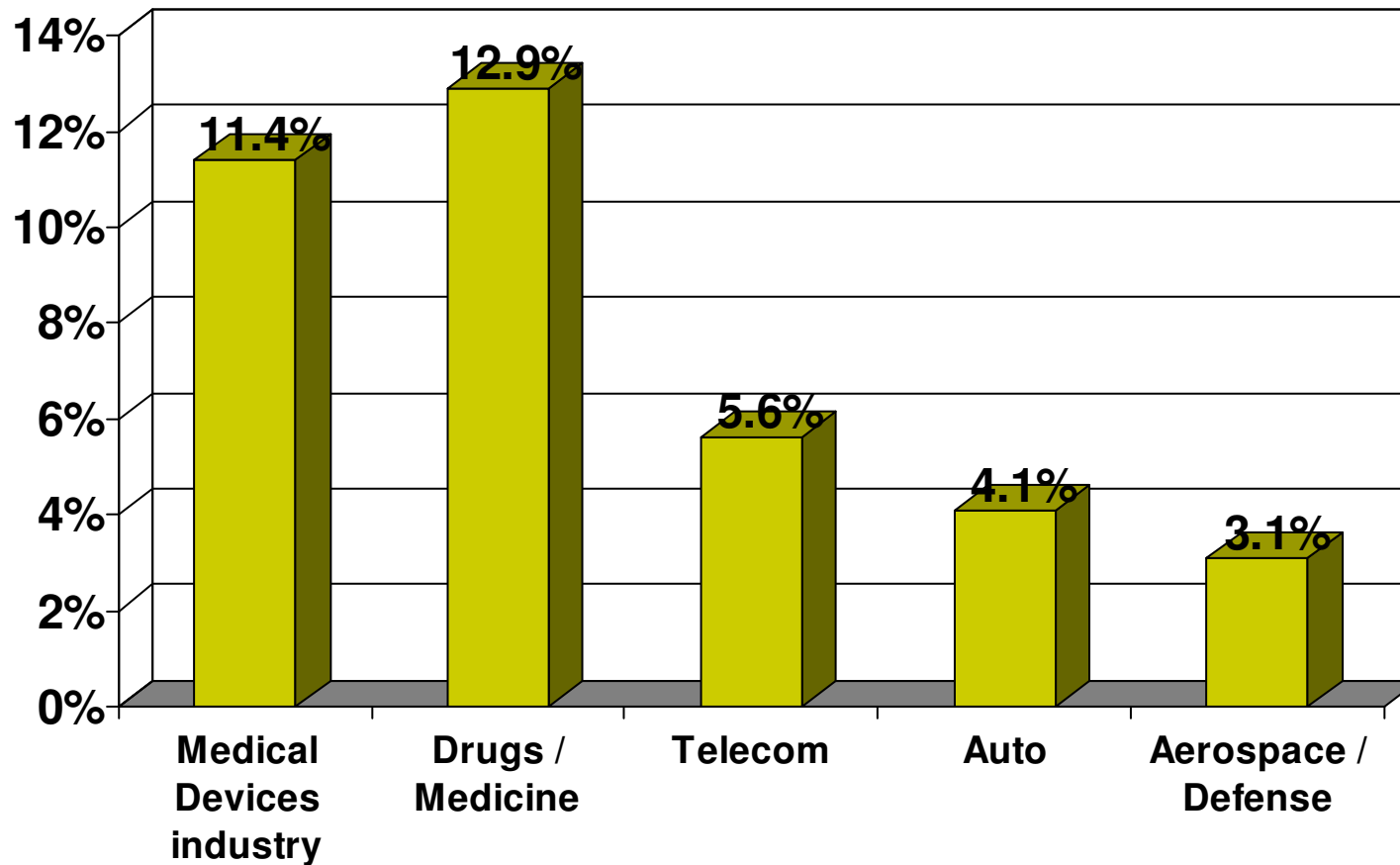
Source: Newhouse, JP. "Medical care costs: how much welfare loss?" *J of Econ Perspectives*, 1992; Vol 6 (3): 3-21 Cutler, DM. "Technology, health costs, and the NIH", 1995

Price and quantity of medical technology affect medical expenditure growth



- Cost per patient
 - Impact on the cost of treating individual patient, including use or cost of other health care services (e.g. hospital days or physician office visits)
- Level of use of new technology
 - Total number of patients treated may increase
- Health system-wide costs may increase
 - E.g. better anesthetic agents reduced burden of surgery and cost per patient, resulting in more surgeries including on high-risk patients -> total cost increase

*There will be more MT in the future:
Medical technology industries spent greater
shares of R&D as a % of sales in 2002*

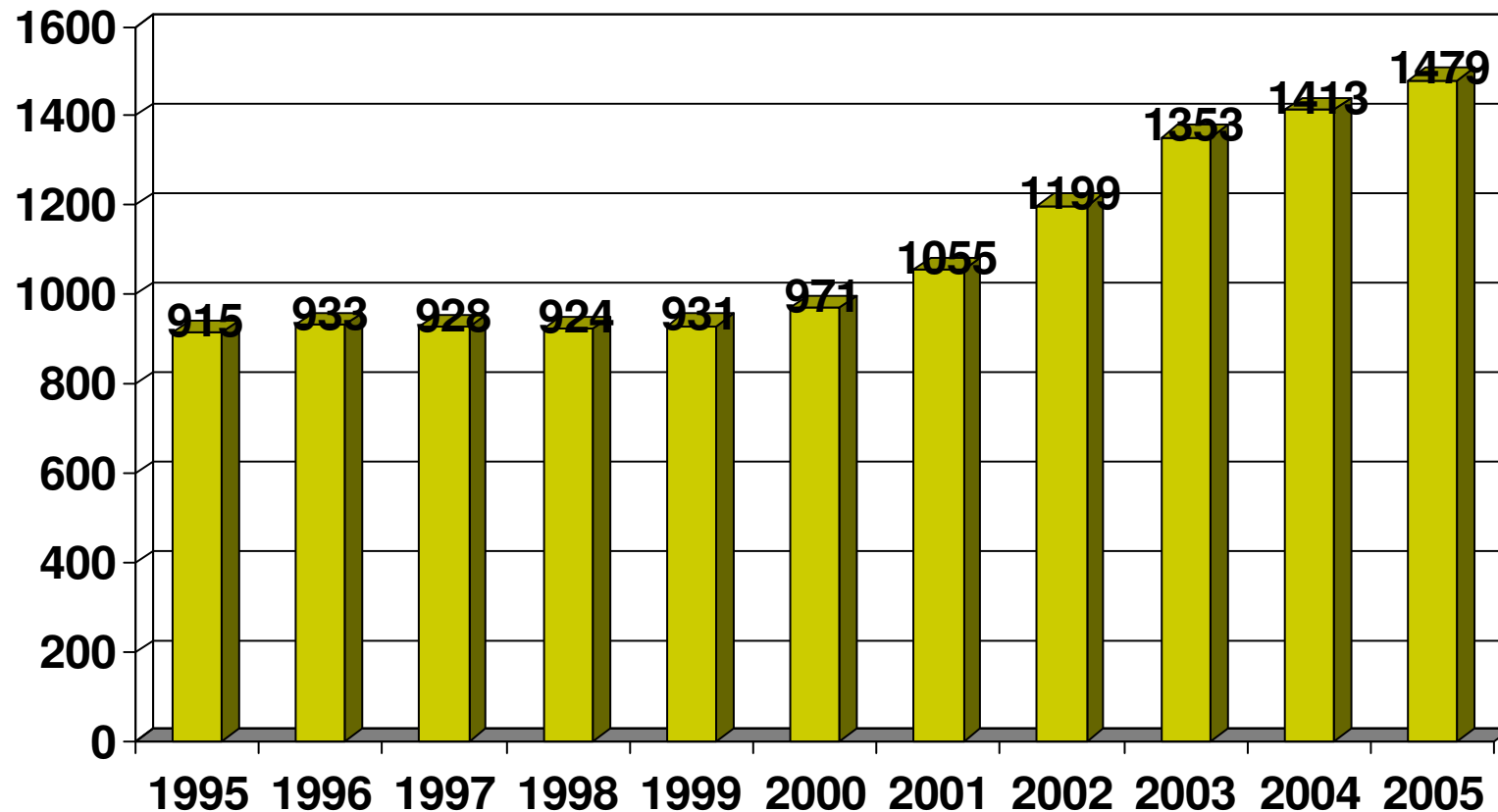


Source: AdvaMed, *The Medical Technology Industry at a Glance* (Sept. 7, 2004): 14, Chart 3.2, <http://www.advamed.org/newsroom/chartbook.pdf>



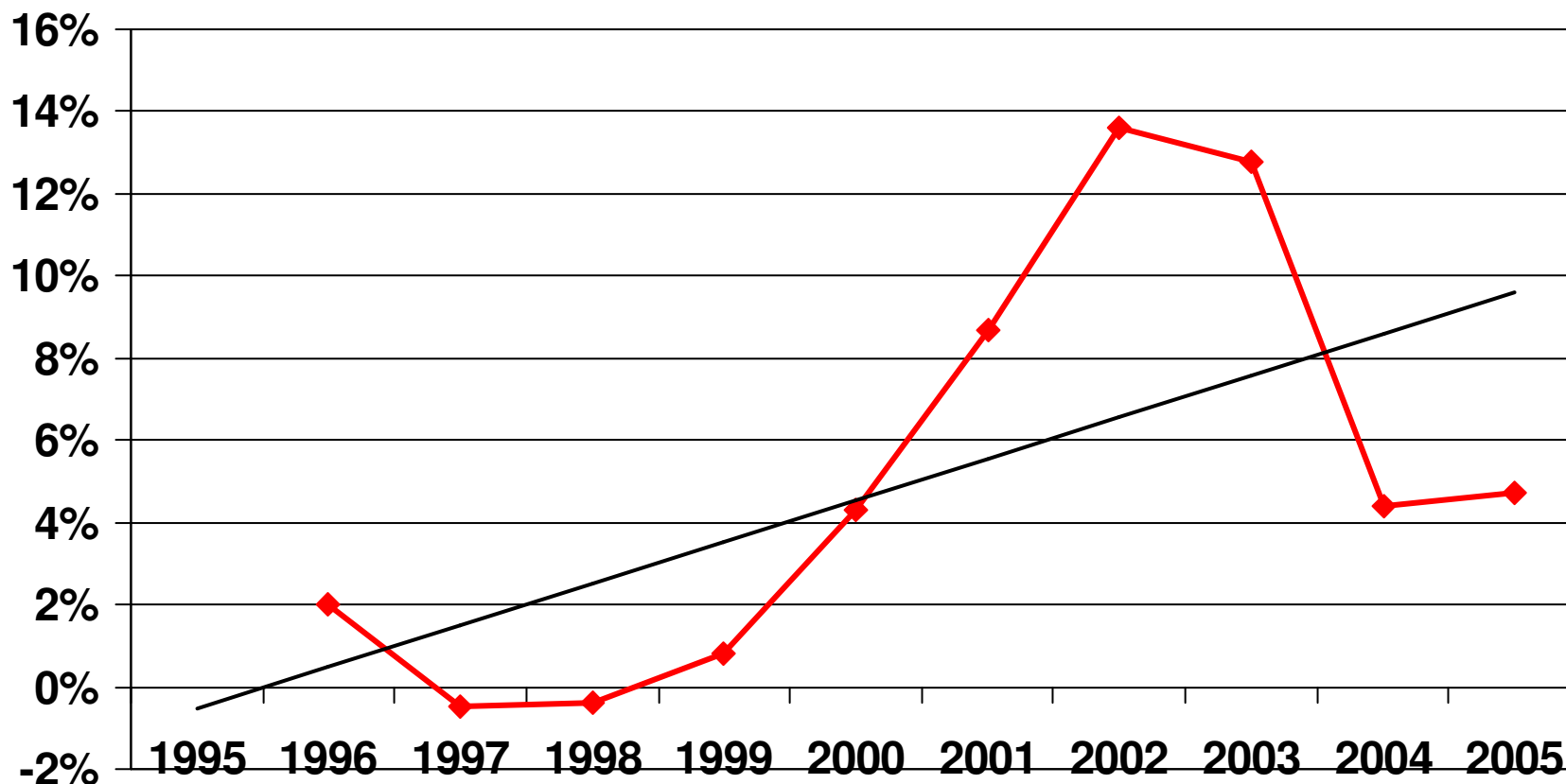
Implications for forecasting expenditures in Czech Republic

Czech total health expenditure per capita increase steadily since 2000



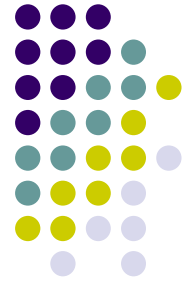
Source: OECD health data 2007. www.oecd.org. US\$ purchasing power parity

From 2000 – 2005 Czech reports an average annual growth rate of 8% in total health expenditures



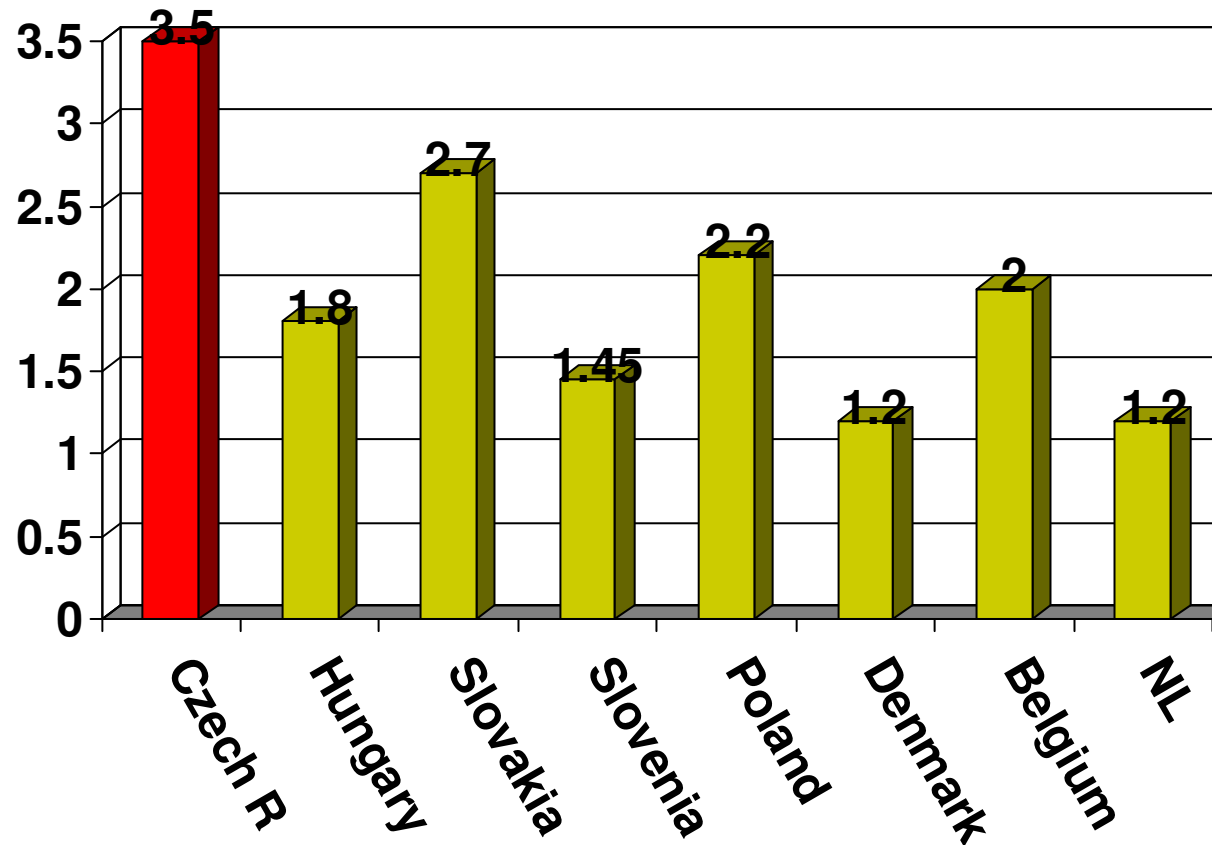
Source: OECD health data 2007. www.oecd.org. Growth rate based on US\$ PPP adjusted total health expenditures per capita

Future availability of new medical technology is affected by several factors



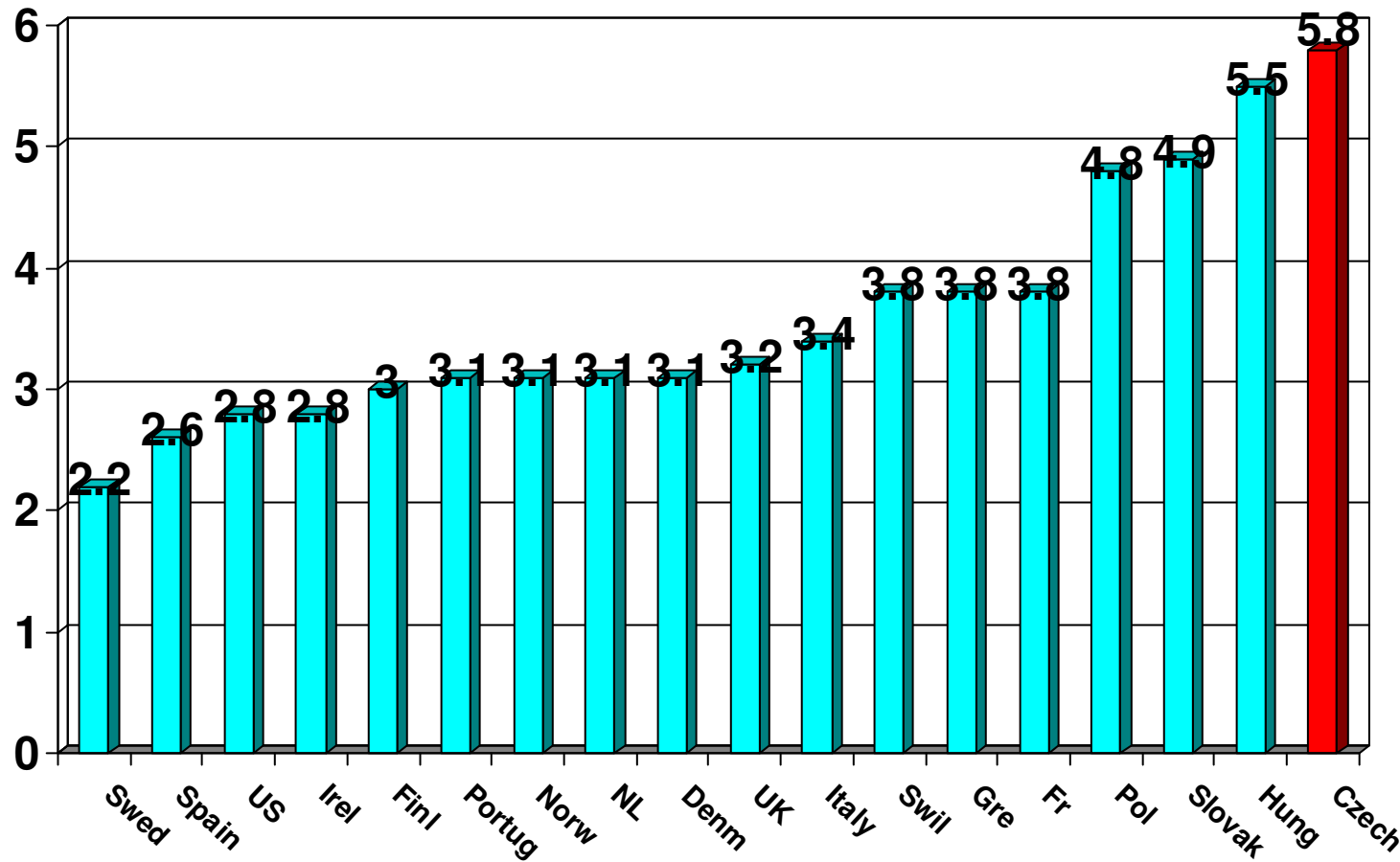
- Health insurance
 - Assurance to suppliers that patients will have resources to pay for new medical products, thus encouraging R&D
 - Assurance of deficit financing, thus insurers have no incentive to manage care and lower provider costs, e.g. through selective contracting and pricing
 - Ineffective cost-management: No provider performance data to conduct quality control and case-managements and compare performance across providers
- Increasing per capita income
 - Use of medical care rises with income
- Public awareness (media, internet) affects consumer demand

*Supplier induced demand:
Czech's overcapacity in hospitals attracts more
patients and investment, but could be decreased*



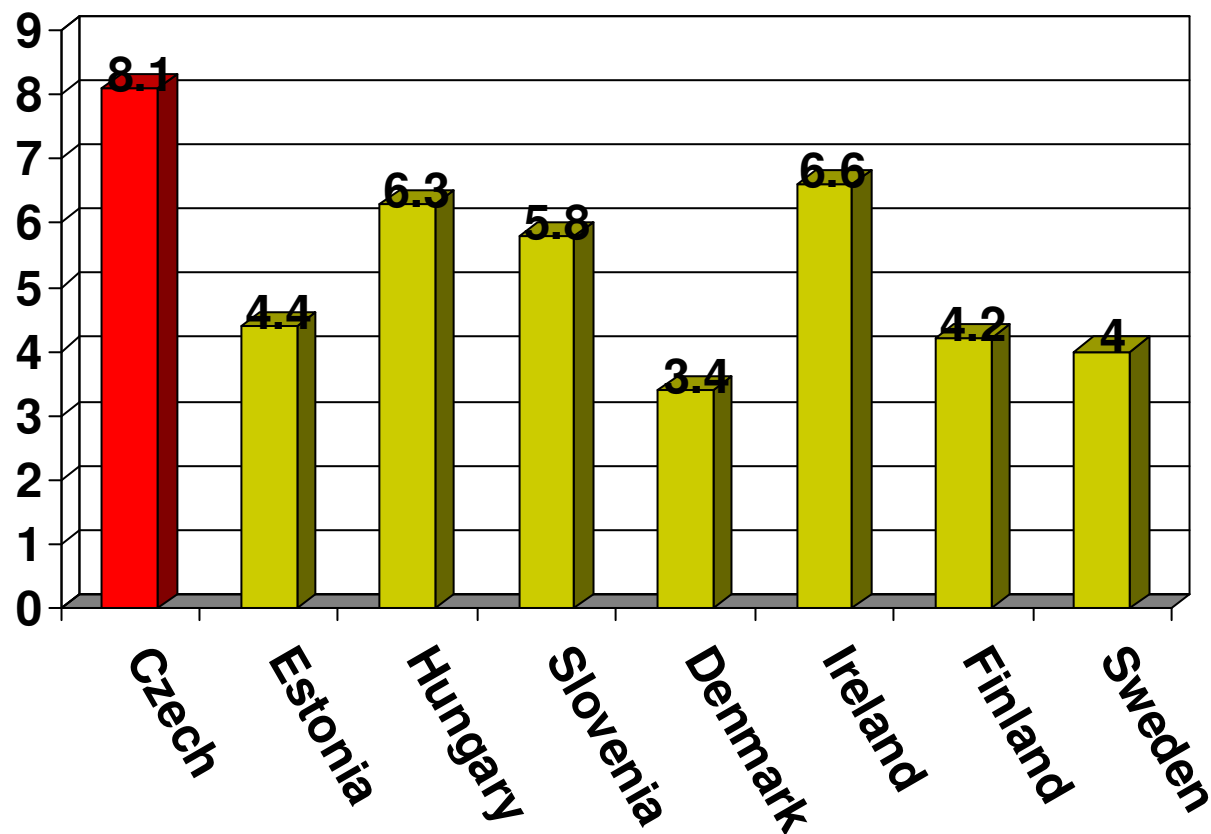
Source: WHO 2005 or most recent year. Hospitals per 100,000 population

*Supplier induced demand:
Czech's overcapacity in acute care beds attracts
patients*



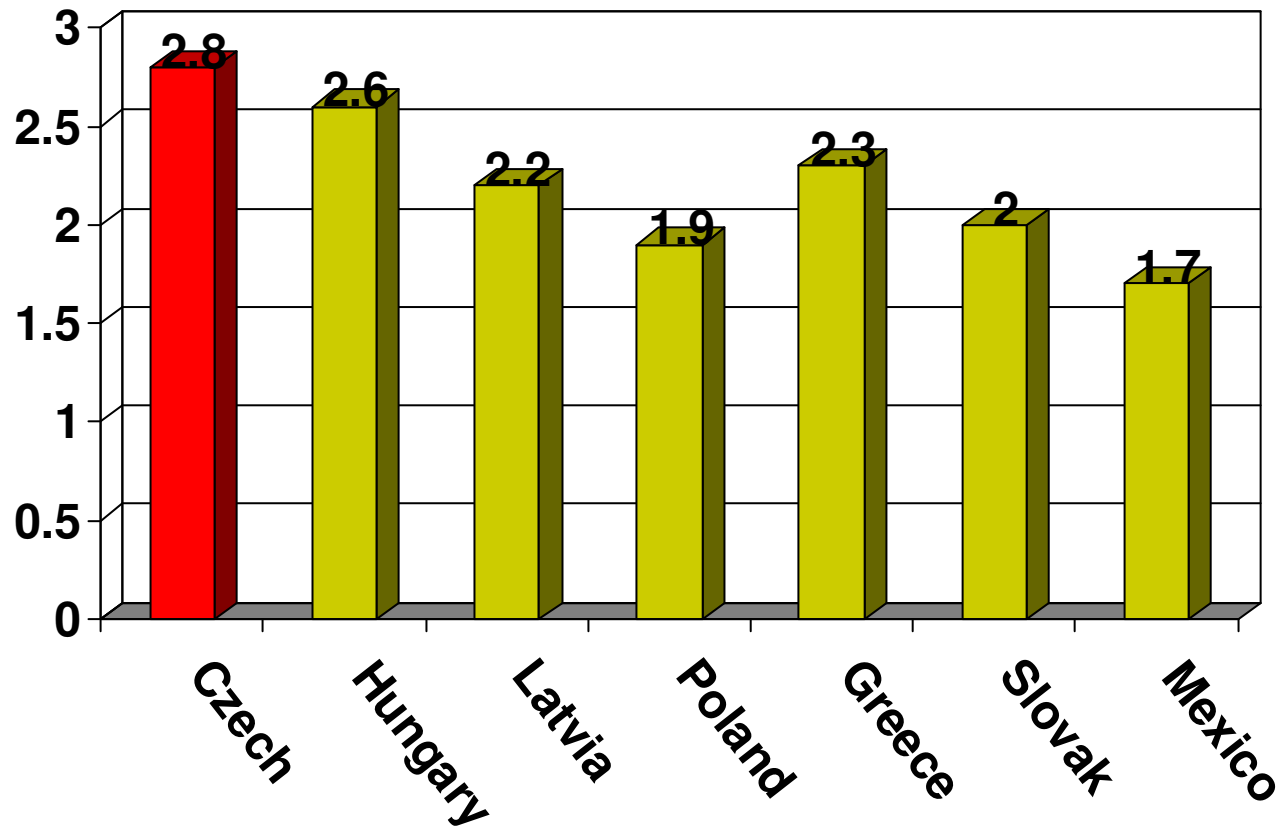
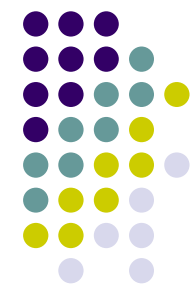
Source: OECD health data 2007. www.oecd.org. Acute care bed per 1000 pop

Bed capacity is maintained with high average length of stay pointing to inefficiency that could be addressed with DRG payment



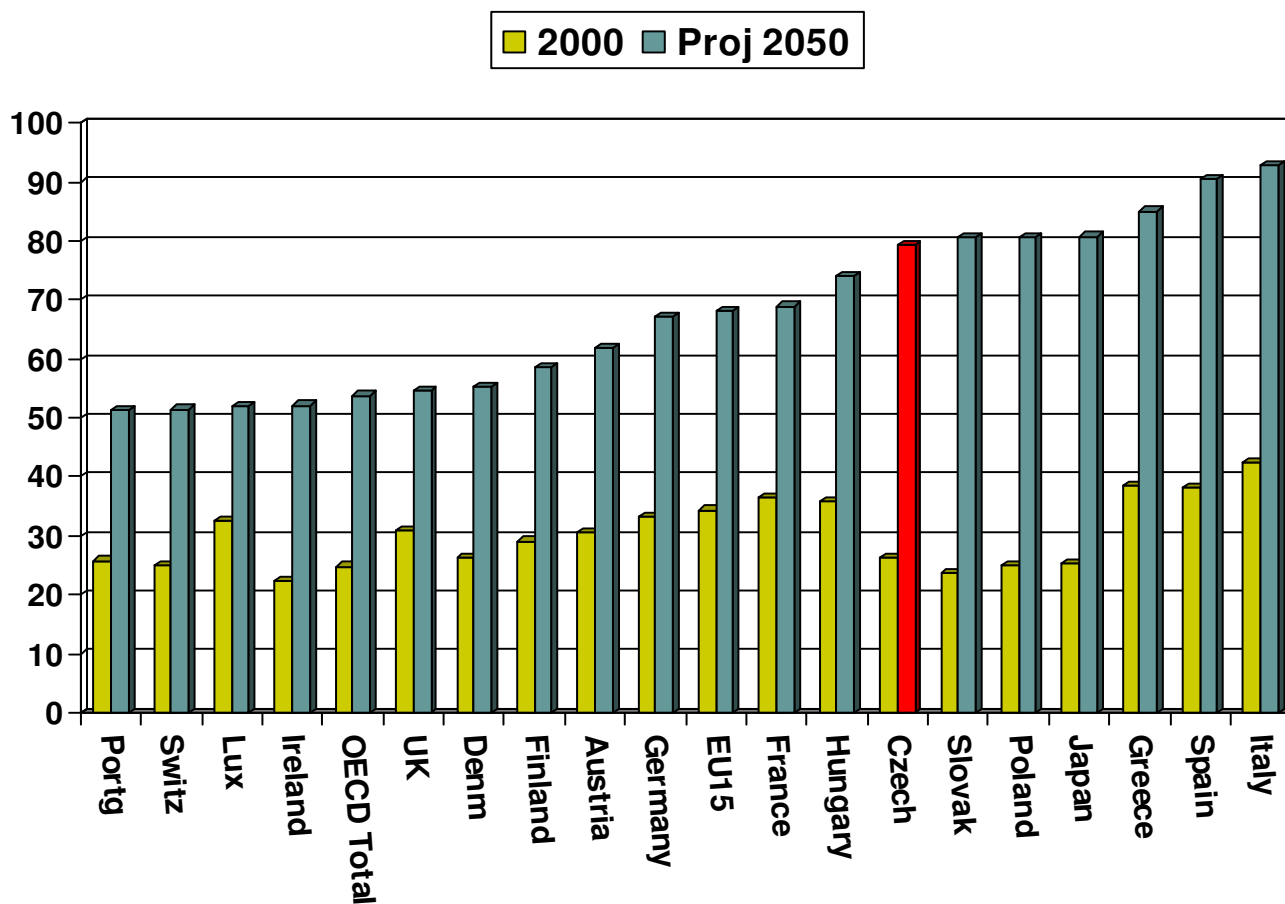
Source: WHO 2005 or most recent year. Average length of stay in acute care

A relatively high number of MRIs creates demand for diagnostics at relatively high unit costs



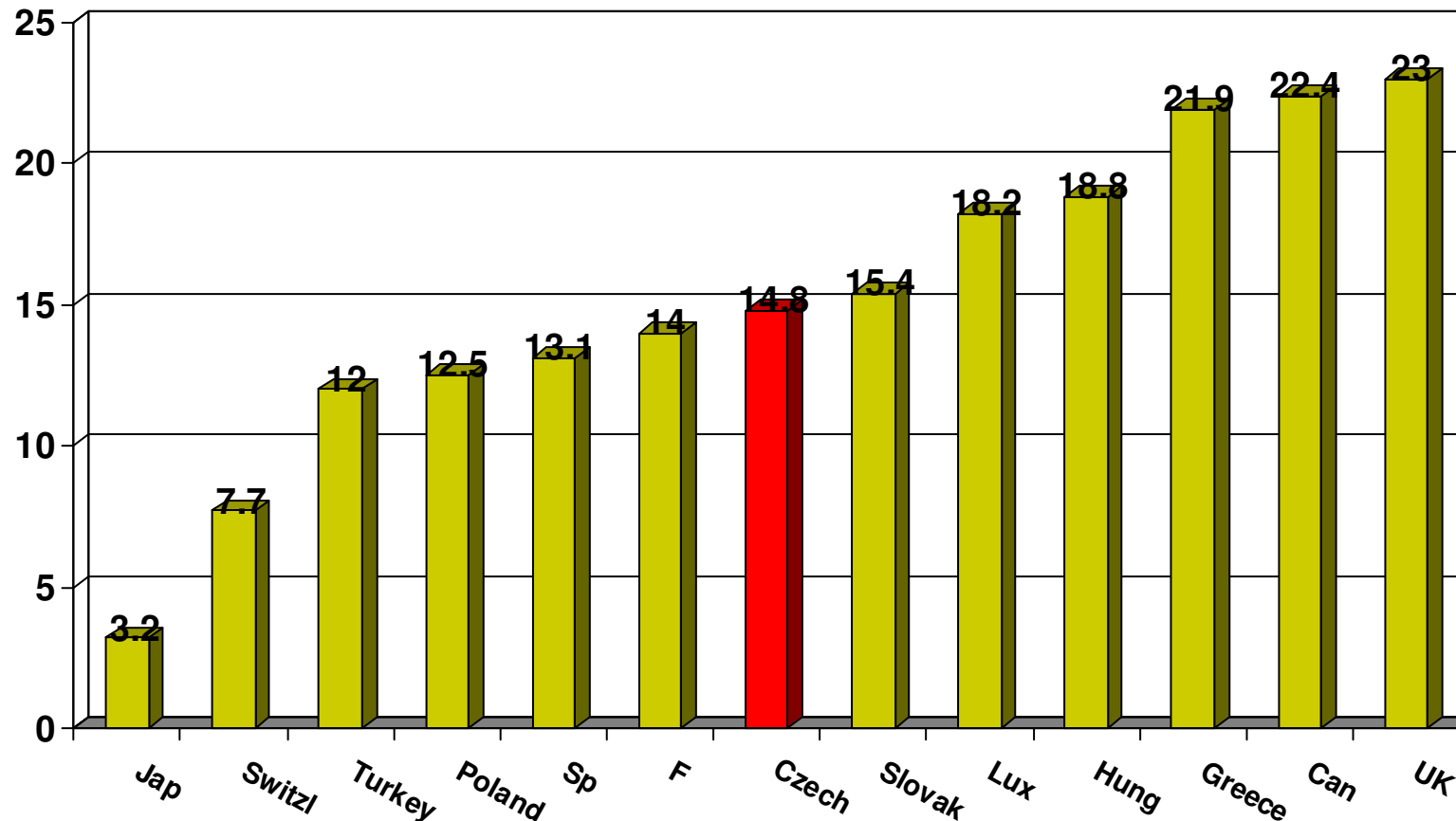
Source: OECD 2006. MRI units per 1 million population.
www.oecd.org/health/healthdata/

An aging population will ask for more and better health services including long term care and prevention for healthy aging



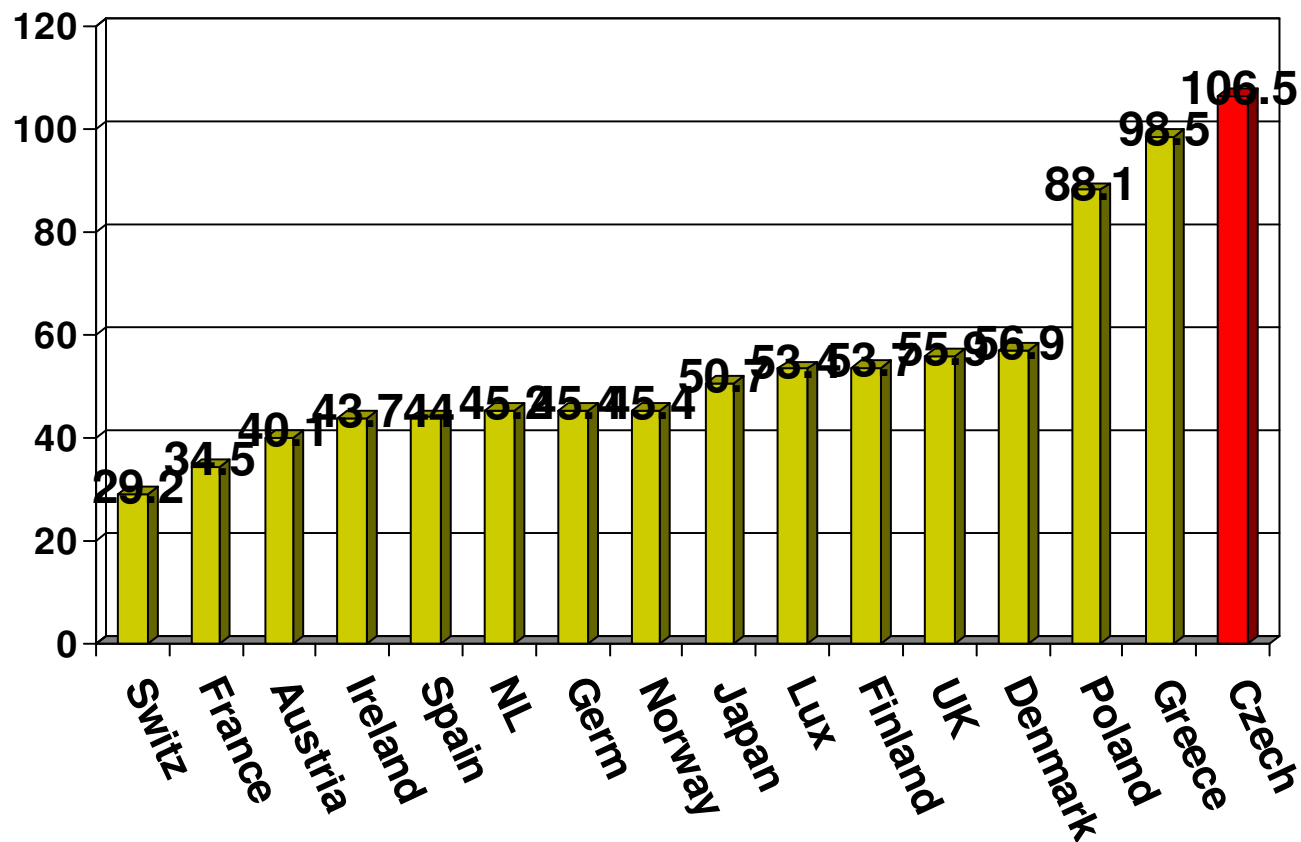
Source: OECD health data 2007. www.oecd.org. Ratio of 65+ over labor force

High obesity rate will increase diseases with high treatment cost (e.g. diabetes, cardiac etc), that are preventable



Source: OECD health data 2007. www.oecd.org. % of population aged 15 and above

High cerebrovascular diseases mortality rates requires prevention and investing in modern treatment



Source: OECD health data 2007. www.oecd.org. Deaths per 100 000 population



***Short-term and long-term cost
containment strategies and impact
on expenditure growth***

Countries have tried several cost containment and quality improvement initiatives (1)



- Insurers:
 - Improving medical information technology
 - Disease management
 - Identification and management of high-cost and chronically ill patients
 - Wellness programs
 - Incentives, incl. Pay for performance to reduce inappropriate treatments
 - Reduce price paid to providers
 - Increase cost-sharing with patients



.... Cost containment initiatives ... (2)

- Consumers
 - Increased out-of-pocket responsibility to influence demand for care
 - Tax incentives
 - Better information on care alternatives to encourage cost conscience behavior



...*Current cost containment initiatives (3)*

- Providers
 - Invest in medical technology
 - Reduce medical errors
 - Reward efficiency and quality
 - Certificate of Needs

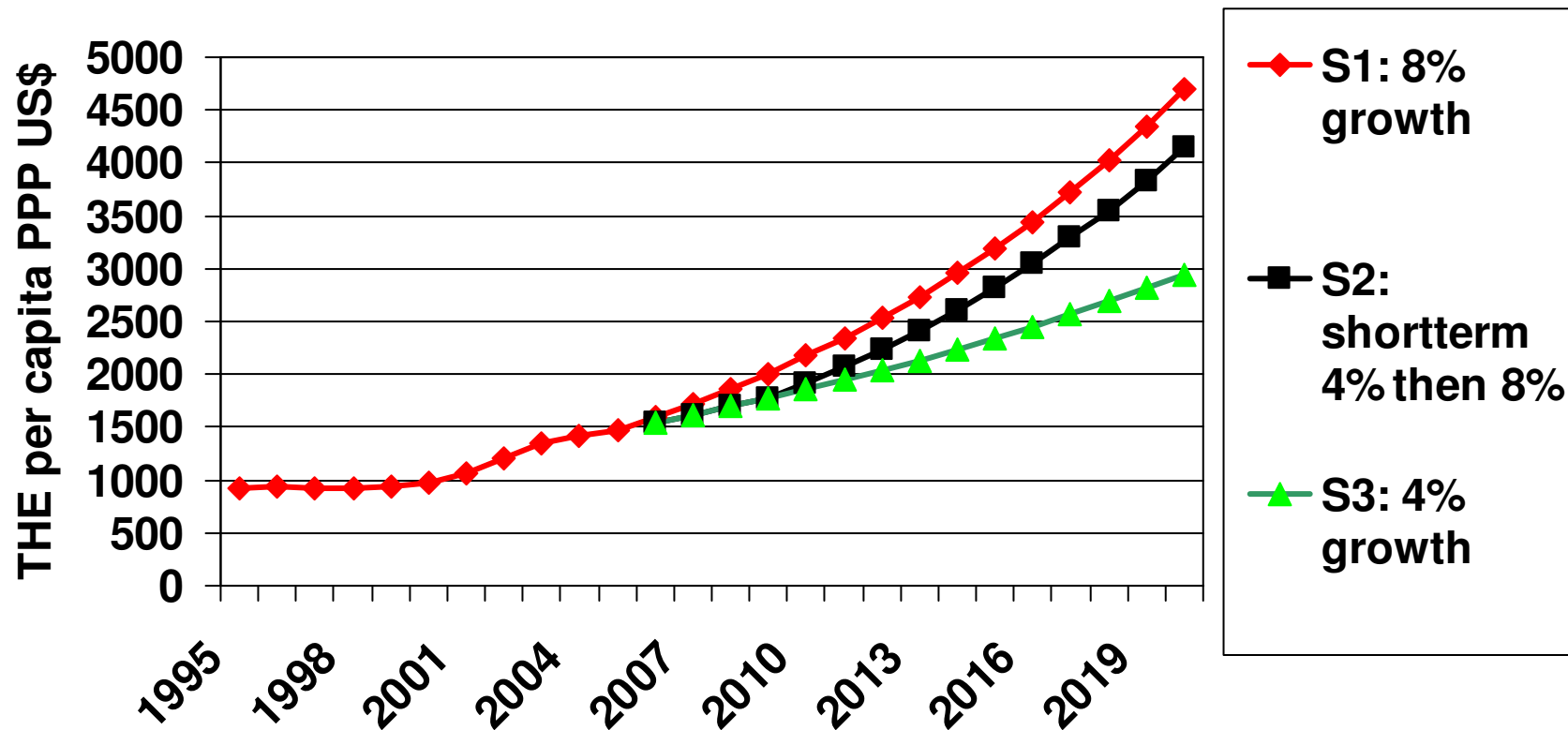
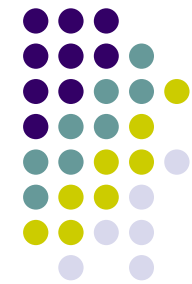
Source: Newhouse, JP. "Medical care costs: how much welfare loss?" *J of Econ Perspectives*, 1992; Vol 6 (3): 3-21; Swartz, WB. "The inevitable failure of cost containment strategies," *JAMA*, January 9, 1987; Vol 257 (2): 220-24



What was the impact on cost?

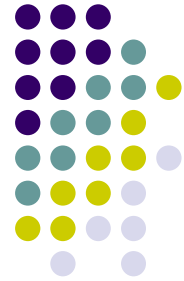
- ***Short-term actions may lower current spending***
 - *See Scenario 2*
- ***But, none of these measures is expected to have any meaningful impact on overall future cost picture***
- ***New measures needed to slow annual growth in health cost by half***
 - *See Scenario 3*

Impact on projected future per capita health expenditures of short-term and long-term measures compared to same rate growth



Note: Projected growth rates based on OECD health data 2007.
www.oecd.org. US\$ PPP adjusted total health expenditures per capita

Long-term solutions are needed to affect main cost drivers



- Limit introduction of new medical technologies:
 - Set cost sharing at levels that put price of many new goods and services out of the reach of a meaningful part of the population
 - Ensure equity in access to care
 - Implement systemic limits on what to pay for (or allow to be provided to patients)
 - Coordinate public intervention in health spending decisions
 - Cooperation among insurers to limit coverage



Measures with long-term impact

- Cost-effectiveness analysis:
 - Ensure we are getting value for the money we spend on services covered
- Centralized regulation of price, volume, availability and payment of new market entry products and pharmaceuticals
 - e.g. NICE (UK National Institute for Clinical Excellence)
- Rationing
 - explicit and ranking based on cost-effectiveness analysis
- Exclude inappropriate technology from coverage and reimbursement