How Can Cost Effectiveness Analysis Be Made More Relevant to U.S. Health Care?

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(Some slides were prepared by Paul Barnett for the last course)

Talk Overview

- Review of Cost Effectiveness Analysis (CEA)
- Background of CEA Use in the U.S.
- CEA Use in U.S. and elsewhere
- Barriers to CEA Use in the U.S.
- Challenges in Using CEA for Prioritization of Health Service

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Cost-effectiveness analysis (CEA)

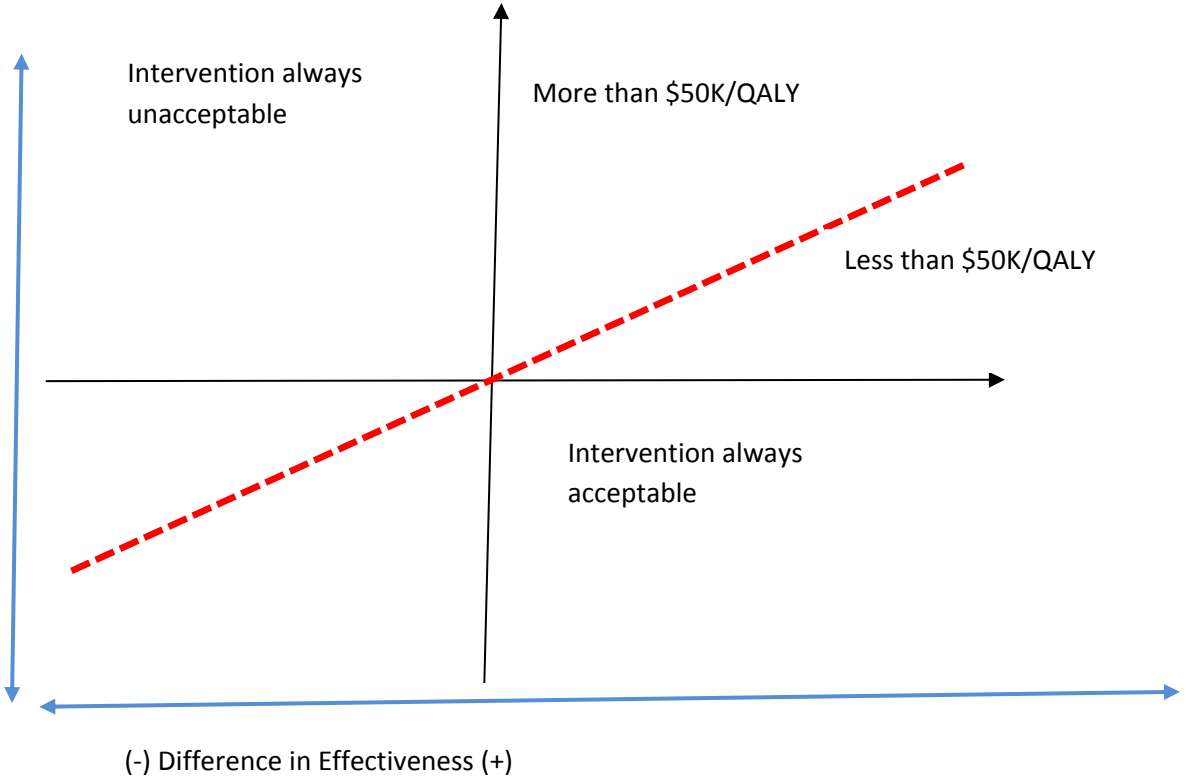
- Compare treatments, one of which is standard care
- Measure all costs (from societal perspective)
- Identify all outcomes
  - Express outcomes in Quality Adjusted Life Years
- Adopt long-term (life-time) horizon
- Discount cost and outcomes to reflect lower value associated with delay

Incremental Cost-Effectiveness Ratio (ICER)

$$\frac{Cost_{EXP} - Cost_{CONTROL}}{QALY_{EXP} - QALY_{CONTROL}}$$

- Decision maker compares ICER to "critical threshold" of what is considered cost-effective ($ per QALY)

CEA Plane Diagram



(Black, 1990)

Where can CEA be applied?

- Individual decisions of physician and patient
- System decisions
  - Coverage decision
  - Practice guidelines

Poll - 1

- Have you been involved in CEA study?
  1. No
  2. Yes
  3. To some extent (Project manager, Data analyst, etc.)

Poll - 2

- Have you been involved in decision making to adopt an evidence-based intervention?
  1. No
  2. Yes
  3. To some extent

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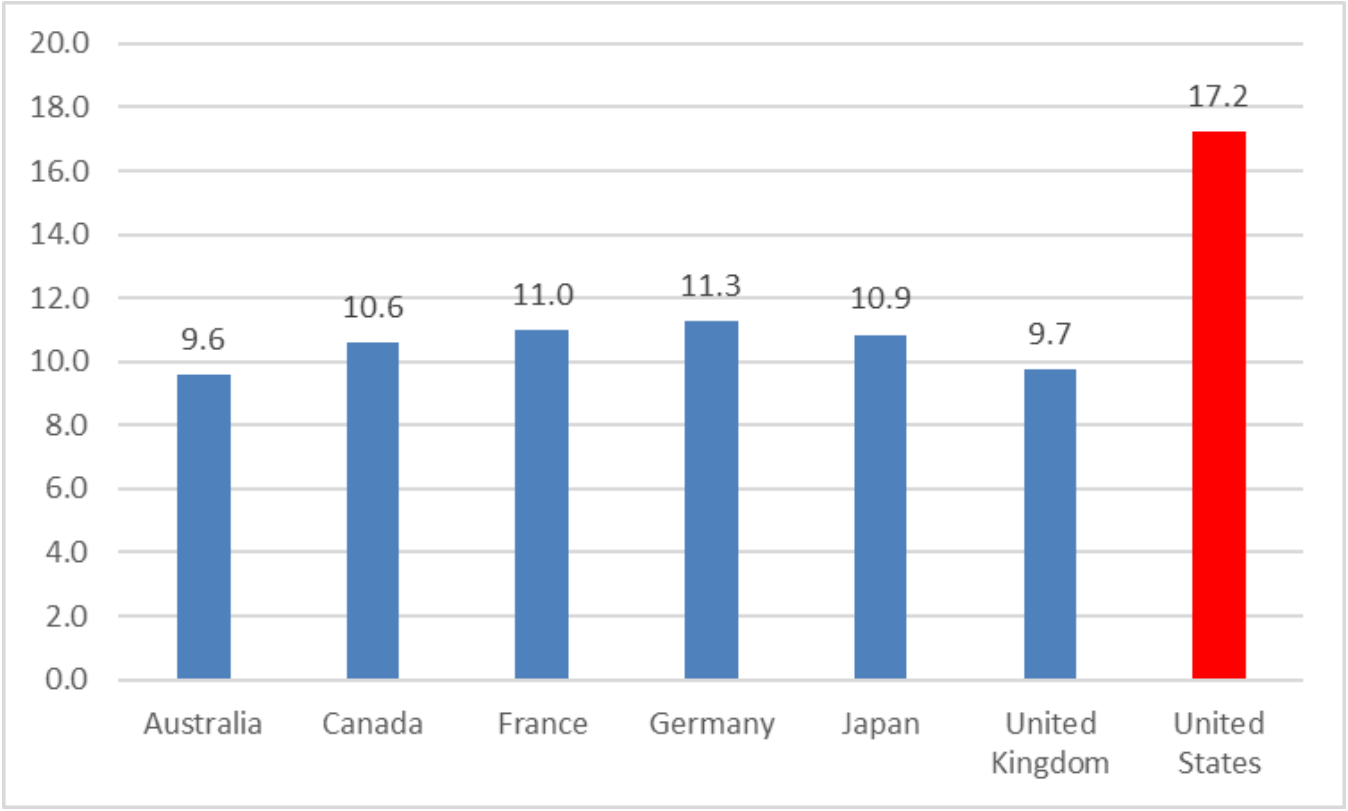
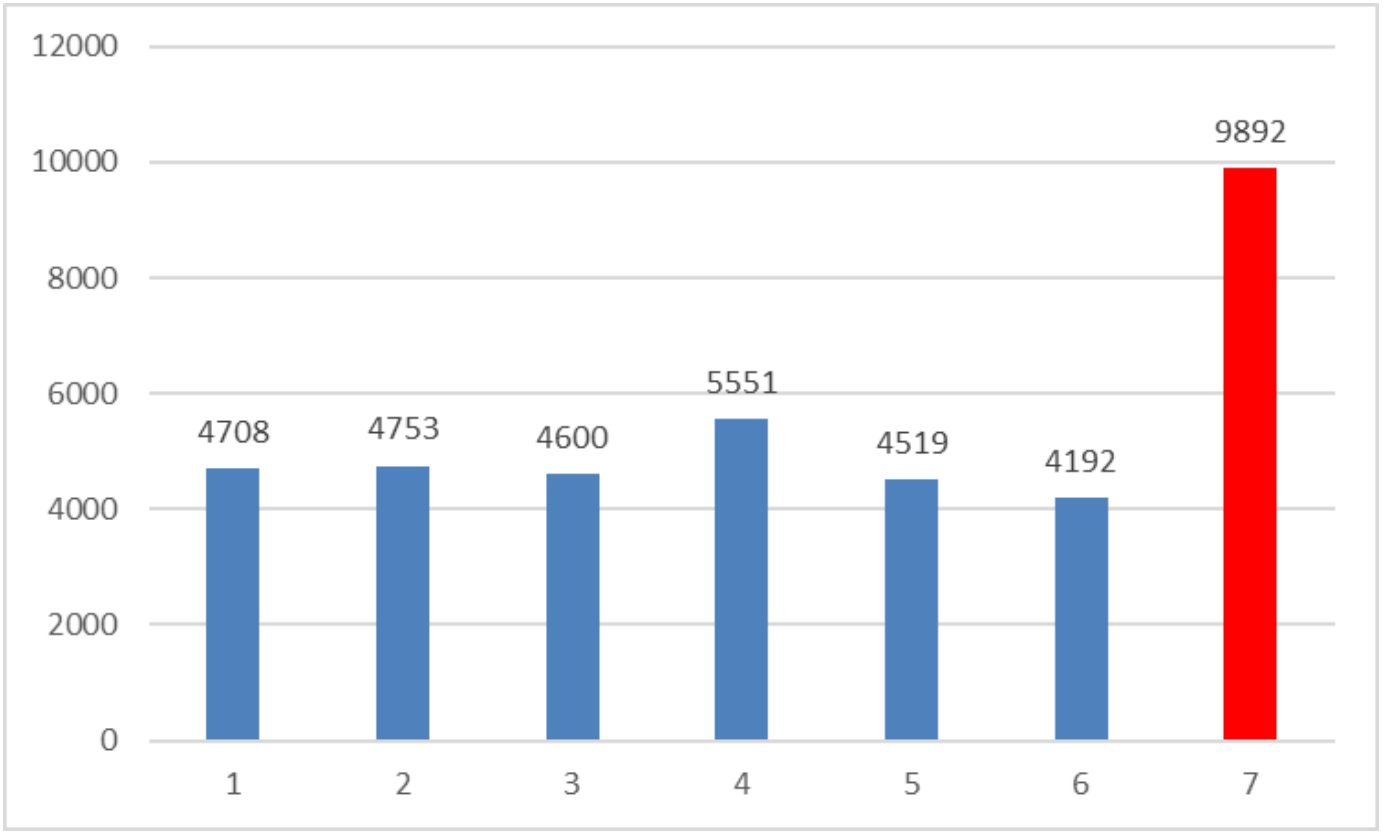
Current Expenditure on Health
% of GDP, 2016



OECD data: http://www.oecd.org/els/health-systems/health-data.htm

Current Expenditure on Health Per Capita, US$ by PPP, 2016



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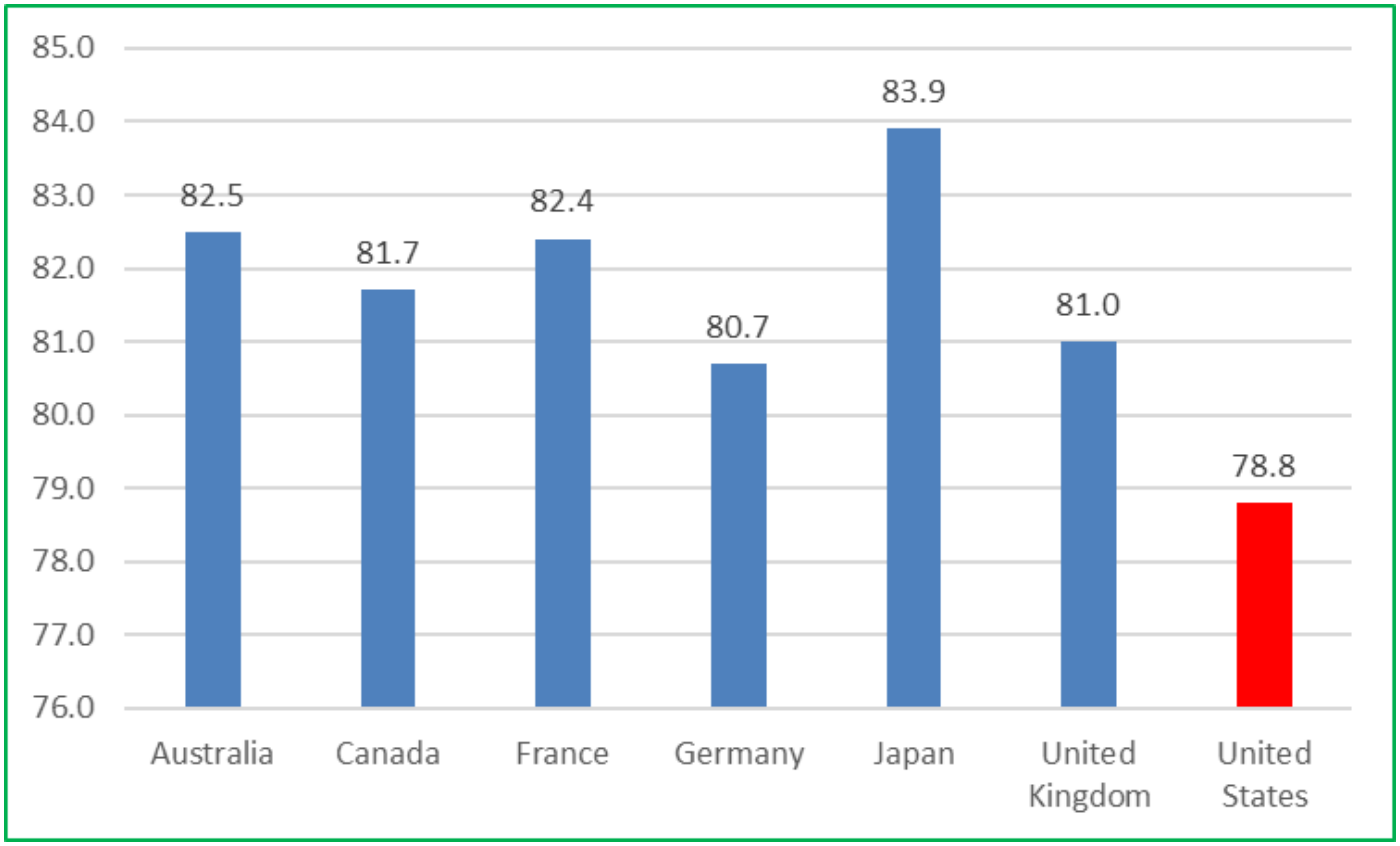
Life Expectancy at Birth

2015 or nearest year



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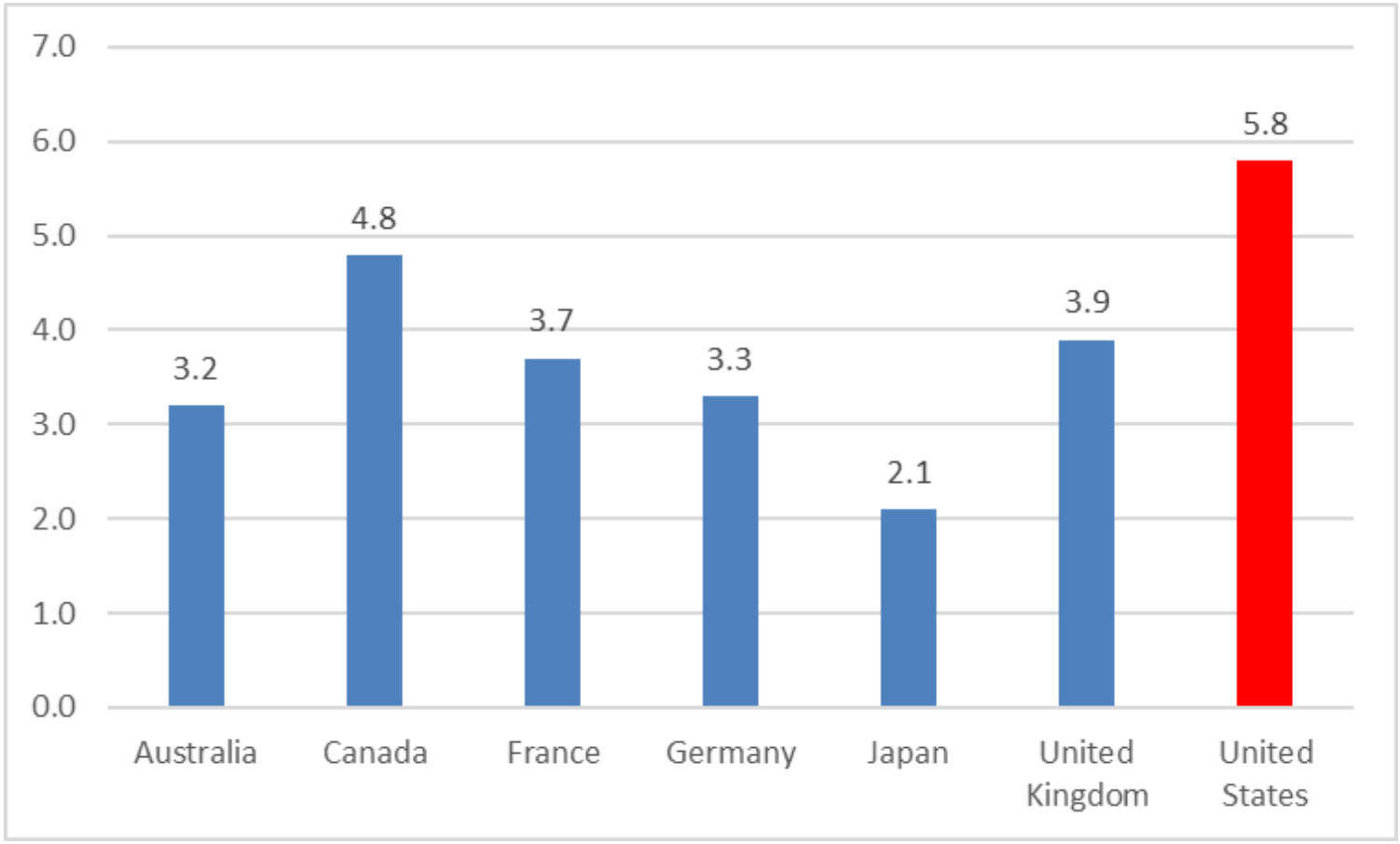
Infant Mortality, per 1000 Live Birth
2015 or nearest year



OECD data: http://www.oecd.org/els/health-systems/health-data.htm

EXHIBIT ES-1. OVERALL RANKING

COUNTRY RANKINGS

Top 2*
Middle
Bottom 2*

	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
OVERALL RANKING (2013)	4	10	9	5	5	7	7	3	2	1	11
Quality Care	2	9	8	7	5	4	11	10	3	1	5
Effective Care	4	7	9	6	5	2	11	10	8	1	3
Safe Care	3	10	2	6	7	9	11	5	4	1	7
Coordinated Care	4	8	9	10	5	2	7	11	3	1	6
Patient-Centered Care	5	8	10	7	3	6	11	9	2	1	4
Access	8	9	11	2	4	7	6	4	2	1	9
Cost-Related Problem	9	5	10	4	8	6	3	1	7	1	11
Timeliness of Care	6	11	10	4	2	7	8	9	1	3	5
Efficiency	4	10	8	9	7	3	4	2	6	1	11
Equity	5	9	7	4	8	10	6	1	2	2	11
Healthy Lives	4	8	1	7	5	9	6	2	3	10	11
Health Expenditures/Capita, 2011**	$3,800	$4,522	$4,118	$4,495	$5,099	$3,182	$5,669	$3,925	$5,643	$3,405	$8,508

Notes: * Includes ties. ** Expenditures shown in $US PPP (purchasing power parity); Australian $ data are from 2010.
Source: Calculated by The Commonwealth Fund based on 2011 International Health Policy Survey of Sicker Adults; 2012 International Health Policy Survey of Primary Care Physicians; 2013 International Health Policy Survey; Commonwealth Fund *National Scorecard 2011*; World Health Organization; and Organization for Economic Cooperation and Development, *OECD Health Data, 2013* (Paris: OECD, Nov. 2013).

http://www.commonwealthfund.org/publications/fund-reports/2014/jun/mirror-mirror

Summary and Implications

- Among rich countries, U.S. healthcare system is at bottom on efficiency, equity, access and healthy lives.
- High costs of medical care and administration, large disparities in access and insurance coverage are major factors of the poor performance.

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Use of CEA in U. S.

- Medicare
  - Pneumococcal vaccination – the first preventive service covered by Medicare (Pub. Law No. 960611, 94 Stat. 3566 [1980])
  - Colorectal cancer screening (Balanced Budget Act of 1997, Pub. Law No. 105-33 11 Stat. 251 [1997])

(Chambers, 2015)

Use of CEA in U. S.(cont.)

- Oregon Medicaid
  - Attempted to restrict expensive treatments of low benefit
  - Negative political consequence
  - May not have been a real test of acceptance of CEA
  - Oregon continues to prioritize Medicaid services (Saha 2010; Oregon Report 2017)

Use of CEA in U. S. (cont.)

- Center for Disease Control
  - Guidance for the CEA of prevention interventions for HIV infection and AIDS.

  (https://www.cdc.gov/hiv/programresources/guidance/costeffectiveness/index.html)

Use of cost-effectiveness in other countries

- Canada
  - Canadian Agency for Drugs and Technologies in Health
  - Established 1989 to evaluate health technologies
  - Provincial organizations also study cost-effectiveness
- United Kingdom
  - National Institute of Clinical Effectiveness (NICE)
  - Established 1999 to provide advice to National Health Service

Use of CEA in other countries (cont.)

- Sweden, Australia, Netherlands
  - Requires manufacturer to submit evidence of cost-effectiveness to add new drugs to health system formulary
- Germany
  - Institute for Quality and Efficiency in the Health Care Sector (IQWiG)
- France
  - Unique periodic reviews of previously approved pharmaceuticals

Summary of CEA Use in U.S. and other countries

- Health plans of most developed countries consider cost-effectiveness
- Used for coverage decisions
  - Especially for new drugs and technologies
  - Cost-effectiveness findings not always followed
  - Few cases of outright rejection based on cost
- CEA is mostly used is for preventive care in the U.S.

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Reasons for Resistance to CEA Use in the U.S.

- Culture of the Society
- Political System
- Splintered Healthcare System

(Neumann, 2004, 2005)

CEA in Medicare Coverage

- In 1989, Medicare proposed four criteria for covering new technologies (Fed Register 1989; 54(30)):
  - Safety and effectiveness
  - Experimental or investigational
  - Appropriateness
  - Cost-effectiveness

CEA in Medicare Coverage (cont.)

- 10 years later, Medicare formally withdrew the the 1989 proposed rule and proposed two criteria for new technology coverage. (Fed Register 2000; 65(95)):
  - Demonstrate medical benefit
  - Add value to Medicare Population

Challenges to Establish Criteria for Coverage Decisions in Medicare

- The Statute that enacted Medicare:
  - Reasonable and Necessary, no cost
- Reaching common consensus by stakeholders
- Discomfort with clinical decisions influenced by an entity other than the patient and the patient's clinician

Challenges to Establish Criteria for Coverage Decisions in Medicare (cont.)

- Potential impact on innovation
- CEA vs reasonable and necessary

Lung-Volume-Reduction Surgery

- Medicare stopped the coverage in 1995
- A randomized trial showed that:
  - A small improvement in exercise tolerance
  - Significant improvement in exercise tolerance after excluding patients to be high risk of death
- Medicare determined to cover the surgery for the subgroup patients identified in the study
- Estimated cost: $600 million to $1.2 billion
- (Gillick 2004)

Implantable Cardioverter-Defibrillators

- The Manufacturer request to expand coverage to include population identified in a new study
- The Medicare Coverage Advisory Committee unanimously supported the request.
- Additional data showed that much of the benefit is for a subgroup of patients
- Medicare expanded the coverage of defibrillators, only for the subgroup patients
- Cost impact: $350 million to $3billion
- (Gillick 2004)

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Common Challenges in CEA Use

- Complex of CEA Method
- Affordability
- Health Care Input Constraints

Uncertainty of CEA Outcomes

- Societal Perspective
- Lifetime analytical period
- Correlation among health status
- Data accuracy

Affordability

- Short time budget impact vs long time cost effects
- Fixed budget – Crowd out higher effective services within a health system
- Additional funding – Crowd out other public services and consumptions

(Pearson, 2018; Towse, 2018)

Health Care Input Constraints

- CEA assumption: Budget constraint
- Common input constraints: Skilled labor
- VA QUERI Programs

Poll - 3

- Is CEA an effective tool to control health care expenditure and improve efficiency in the U.S.?
  1. Yes
  2. No
  3. To some extent

Drivers of U.S. Health Care Expenditure

- Compared with other high-income counties, the U.S. healthcare cost per capita is significantly high in:
  - Pharmaceutical expenditure
  - High-margin procedures (price and volume)
  - Imaging (price and volume)
  - Administrative cost

  (Emanuel 2018)

Concluding Comments

- We must control the growth of health care expenditure. We have passed the optimal point of resource allocation between health care and other goods in general, but not specific cohorts.
- Using CEA alone is unlikely to be able to control the expenditure growth in the U.S. effectively, because CEA does not control the volume and price of health services.

Concluding Comments (cont.)

- Information technology and value-based purchasing may stop the unsustainable growth of health care expenditure in the U.S.

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