Today’s objectives

- The need for health system performance evaluation
- Major approaches, issues and challenges for evaluating health system performance at various levels
- Some principles for assessing “efficiency” of health production across countries
- Discuss how evaluation of efficiency and performance can help to improve health policy
Why worry about health system performance?

- Health expenditures have been increasing faster than the economic growth
  - not negative in principle if/when the benefits exceed the additional cost

- Concerns about fiscal sustainability of health systems financed publicly (increased coverage, population ageing ...)

- Great differences exist, between countries, both in the resources dedicated to health, in the financing and organization of these resources

---

Average annual growth in per capita health expenditure and GDP, 2003-16 (OECD average)

Health spending is correlated with the GDP, but there are large disparities at equal wealth.
Those spending the most are not necessarily the ones that get the best results

Why worry about health system performance?

- Health care markets are inefficient
  - Market failures (externalities & information asymmetries)

- Health care (merit good): a commodity which is judged that an individual or society should have on the basis of need, rather than ability and willingness to pay

... justify the high level of public intervention & funding in healthcare markets
• Evaluating the performance of health systems is a necessity
  ... to sustain publicly funded HC systems

Public spending as % of total health expenditure


Per capita spending on retail pharmaceuticals in USD PPP, 2013

Source: OECD Health Statistics 2015 (from Belloni et al. OECD Health Working Papers No. 87)
Some definitions

Performance
“the results obtained in carrying out a task or action”
“the degree of achieving objectives set”

Efficiency
the ratio of inputs (resources used) to “valued” outputs

- maximizing outputs for given set of inputs (technical efficiency)
- capacity of functioning at low cost without reducing desirable outcomes (cost efficiency)
- optimum combination of goods which corresponds with preferences (pareto-efficiency and allocative efficiency)

Goals and functions of health care systems (WHO)

Evaluating health care system performance covers:

- Comparing the degree of achieving defined objectives
  - What is achieved?
- Comparing efficiency with which health care resources are used (to achieve these objectives)
  - With what that is achieved?
- Comparing the functioning of the system
  - How it is achieved?

Cross-country comparison is a powerful tool for informing health policy

At macro-meso-micro level, system or provider level, disease specific …
Life expectancy at birth: the most commonly used indicator

Source: Health at a Glance 2015, OECD Indicators.

Note: Three-year averages. 95% confidence intervals for the latest year are represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.


Thirty-day mortality after admission to hospital for Acute myocardial infraction (heart attack)

2005 and 2015 or nearest years

Note: Three-year averages. 95% confidence intervals for the latest year are represented by grey areas. The EU average is unweighted and only includes countries with data covering the whole time period.

Patients' experiences with doctors in ambulatory care

Source: Health at a Glance Europe, 20018 with data from Commonwealth Fund International Health Policy Survey 2016 and other national sources.

Cost-Related Access Problems Among the Chronically Ill, in Eight Countries, 2008

Base: Adults with any chronic condition
Percent reported access problem due to cost in past two years*

* Due to cost, respondent did NOT: 1) Get test; 2) Visit doctor when felt a medical problem; 3) Get recommended test, treatment, or follow-up.

Data: The Commonwealth Fund International Health Policy Survey of Sick’ Adults (2008).
Estimating the overall efficiency of each country’s health care system

... is not straightforward

1. Requires to disentangle the “effect” of health care on health outcomes from the “effect” of all other health determinants

2. Need to define what is the “health care” system and measure its resource use (inputs)

3. No consensus on how to measure health outcomes in order to assess efficiency

Understanding the links between inputs and outcomes of the health care system

Source: Adopted from Or, 2009.
1. Measuring health inputs

- Medical care or healthcare
  - **Level of health care services** provided and consumed
    - Financial terms: total health expenditure (need for PPPs)
    - Physical terms: no of doctors, beds, etc.
  - **Financing/organisation mode** (public/private mix)

---

**Frontiers of health care system**

- HM
- Personal medical (Curative)
  - + preventive
  - + Inter-sectoral actions

Other actions impacting health
2. Measuring health/system outcomes

- Ideally: health gains
- In practice:
  - Mortality based indicators (premature mortality, infant mortality, etc.)
    - Readily available, objective, comparable
  - Composite indicators (aggregating different dimensions of quality and longevity)

  *Metrics should be useful for policy analysis (trusted data, actionable..)*

3. Isolating the impact of health care system

- To establish efficiency it is necessary to separate the part of variations in outcome that results from efficiency in use of health resources from the part due to all other determinants

- Multivariable modelling of health outcomes
  - Health production function

- Needs longitudinal data
Potential life years lost: trends from 1970 to 2005

Health production function

(1) \( y_{it} = \beta_{0i} + \beta_{1i}m_{it} + \gamma_{p}x_{pit} + e_{it} \)

where:
- \( i, t \) refer to country (i=1...21) and time (t=1970...1998), respectively
- \( y \) = indicator of health outcome
- \( m \) = health care resources (doctors per capita)
- \( x_{p} \) = set of \( p \) explanatory variables (income, education, alcohol and tobacco consumption, public health expenditure)

and:
- (a) \( \beta_{0i} = \tau_{0i} + \mu_{0i} \)
- (b) \( \beta_{1i} = \tau_{1i} + \mu_{1i} \)

At country level: (c) \( \beta_{1i} = \tau_{1i} + \alpha_{k}z_{ki} + \omega_{1i} \)

Estimating health system efficiency (1)

• The choice of an appropriate model is an important methodological issue
• Different approaches have advantages and disadvantages and the choice of the method should depend on the questions asked and data quality
• Most commonly used
  – Non-parametric techniques DEA (Data Envelopment Analysis) or 2-stage DEA (flexible form)
  – Panel data techniques can provide more information, for understanding what happens across countries, changes over time

  ➢ Hollingsworth (2003; 2008)

Estimating health system efficiency (2)

• Different approaches to efficiency

  ➢ Health system level
  ➢ Sub-sector based analysis (hospitals, primary care)
  ➢ Disease based approaches using patient level data
  ➢ Population groups (high need patients) using patient level linked data

  ➢ to get a fuller picture
  ➢ identify better practices
  ➢ help improving policy
Whatever the approach you choose

• The reliability of the results is subject to the quality of underlying data

• In cross country analysis using aggregate data
  – Compare the comparable (homogeneous set of countries)
  – Clarify your hypothesis (model specification)

• The efficiency scores (or league tables) by themselves have limited use

A ranking exercise: 2000 World Health Report

• First attempt to rank performance of 191 national health systems
• Examined whether each health system is performing as well as it can, given existing resources
• Against ‘key health system objectives’
• Panel data methods for estimating efficiency (Murray & Frank, 2000)
... created a lot of debate, because of:

data quality, methodology in collecting data, calculating indicators, model specification ...

Remember

- There are considerable differences across countries in the efficiency with which the medical care supplied
- Applied research needs to be placed in a policy context
  - What is your underlying question/hypothesis
  - Involve (talked to) people concerned by your results
- Presentation of the results matters (need a narrative)
- Important to understand the factors explaining estimated differences in technical efficiency
  - Support your results with qualitative information on health system functions
Conclusion

• The objective of performance evaluation is not simply to rank health care systems
• Measuring and evaluating health system performance is a useful diagnostic tool to improve the health reform process
• Comparing the performance of systems in different domains is necessary to understand the weaknesses and strengths and to identify priorities
• ... to improve health care system performance

Useful links

• European Observatory
  http://www.euro.who.int/observatory
• OECD Health Working Papers
  http://www.oecd.org/document/13/
• OECD Health Data
  https://data.oecd.org/healthstat/
• IRDES Documentation Center (for French speakers)
  http://www.irdes.fr/EspaceDoc/
Further reading


Further reading

- Smith P. et al. (2008), Performance measurement for health system improvement: experiences, challenges and prospects, World Health Organization, Copenhagen.