Inequalities in European health systems - economics versus access

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First observation

• We spent a lot on health care,
  • globally ca. $1200 per capita
    = a total of $ 9,100,000,000,000 or 10% of GDP (in 2016) …
  • in Europe alone about one third of the sum

• This raises a range of questions:
  • Is the money well spent?
  • What to we mean by well-spent? … more than equitable and accessible* …
  • How can we access health system performance?

*Note: we will define this later
– it’s broader than the “[market] access” used by drug companies.
Second observation: richer countries spent more publicly, i.e. persons in low/ lower middle income countries face greater chances of unmet need and/ or catastrophic expenditure.
Third observation: government/ public health expenditure is unequally distributed

Source: worldmapper.org
Fourth observation: $1 in 9 is on pharmaceuticals

Source: IQVIA Market Prognosis, Sep 2018; IQVIA Institute, Dec 2018
Expenditure = volume (DDD) x price (here prescribed drugs in German SHI), driven by prices for patented drugs

- Expenditure = volume(DDD) x price(here prescribed drugs in German SHI), driven by prices for patented drugs.

- €0.9/DDD
- €0.8/DDD
- €0.5/DDD
- €0.4/DDD
- €0.3/DDD
- €0.2/DDD
- €0.1/DDD
- €0.0/DDD

- Total DDDs + 50%
- Generic DDDs + 125%
- Patented DDDs - 40%

Source: Busse et al., Lancet 2017
And prices for patented drugs are forecasted to further increase dramatically (here in USA; $180,000 annual = $500 per DDD)
OK, US prices are very high – no wonder that drug turnover in US
4x that of China, 6x of Japan, 9x of Germany and 14 x France or Italy

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
</tr>
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<tbody>
<tr>
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<td>Country</td>
<td>% of U.S.</td>
<td>Rank</td>
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<td>10</td>
<td>Canada</td>
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A quick guide to economic evaluation: the ICER (incremental cost-effectiveness ratio)

- **Dominated Quadrant NW**: (evaluated intervention is worse and more expensive than alternative)
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- **Quadrant NE**: (evaluated intervention is better but more expensive than alternative)
- **Quadrant SW**: (evaluated intervention is worse but less expensive than alternative)
- **Quadrant SE**: (evaluated intervention is better but less expensive than alternative)

\[ \Delta C \] (costs of intervention – costs of alternative)

\[ \Delta E \] (effects of intervention – effects of alternative)
<table>
<thead>
<tr>
<th>Article ID</th>
<th>Publication Year</th>
<th>US$/QALY *</th>
<th>Ratio Description</th>
<th>Impact</th>
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<tbody>
<tr>
<td>2017-01-25842</td>
<td>2017</td>
<td>400000</td>
<td>Paclitaxel + Ramucirumab Combination Therapy VERSUS Standard/Usual Care- Paclitaxel monotherapy IN Specific disease- Gastric cancer; Age- 41 to 64 years; Gender- Male; Country- Japan; Other- Weighing 65kg with a body surface area of 1.72m2, who had advanced gastric cancer progressing after first-line chemotherapy with S-1 + cisplatin for HER2-negative gastric cancer, and capecitabine + cisplatin and trastuzumab for HER2-positive gastric cancer.</td>
<td>NE</td>
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<tr>
<td>2017-01-25816</td>
<td>2017</td>
<td>170000</td>
<td>Vedolizumab VERSUS Infliximab IN Specific disease- Ulcerative colitis; Age- Adult; Gender- Both; Country- Spain.</td>
<td>NE</td>
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<tr>
<td>2017-01-25816</td>
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<td>3e+006</td>
<td>Golimumab VERSUS Adalimumab IN Specific disease- Ulcerative colitis; Age- Adult; Gender- Both; Country- Spain.</td>
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<tr>
<td>2017-01-25807</td>
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<td>Infliximab VERSUS Golimumab IN Specific disease- Ulcerative colitis; Age- Adult; Gender- Both; Country- Spain.</td>
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<tr>
<td>2017-01-25807</td>
<td>2017</td>
<td>4400</td>
<td>Bupivacaine VERSUS None IN Specific disease- Chronic Neck Pain; Age- Adult; Gender- Both; Country- United States of America (USA).</td>
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<tr>
<td>2017-01-25778</td>
<td>2017</td>
<td>34000</td>
<td>Idelalisib + rituximab (IR) VERSUS Standard/Usual Care- Rituximab alone IN Specific disease- Chronic lymphocytic leukaemia; Age- Adult; Gender- Both; Country- Spain; Other- Relapsed or refractory disease.</td>
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<td>2017-01-25775</td>
<td>2017</td>
<td>Cost-Saving</td>
<td>Indacaterol/glycopyrronium VERSUS Salmeterol/fluticasone IN Specific disease- Chronic obstructive pulmonary disease (COPD); Age- 19 to 40 years; Gender- Both; Country- Sweden.</td>
<td>SE</td>
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<tr>
<td>2017-01-25773</td>
<td>2017</td>
<td>350000</td>
<td>Interferon b1a (Avonex 30 mcg) VERSUS Interferon B1a (Rebif 44 mcg) IN Specific disease- Multiple sclerosis; Age- Adult; Gender- Both; Country- Saudi Arabia; Other- Relapsing-remitting subtype.</td>
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<tr>
<td>2017-01-25773</td>
<td>2017</td>
<td>360000</td>
<td>Fingolimod VERSUS Interferon b1a (Rebif 44 mcg) IN Specific disease- Multiple sclerosis; Age- Adult; Gender- Both; Country- Saudi Arabia; Other- Relapsing-remitting subtype.</td>
<td>NE</td>
</tr>
</tbody>
</table>

CEA Registry, Tufts University
A look at the ICER of all interventions
Beyond looking at individual technologies: how can we assess entire health systems?

World Health Report 2000:

• First attempt to rank performance of 191 national health systems

• Aimed at identifying and measuring performance of member states on ‘key health system objectives’

• Examined whether each health system is performing as well as it can, given existing resources
Further development at WHO (2007): inputs = “building blocks”, “intermediate goals/outcomes” and “overall goals/outcomes”

My combined performance framework
(incl. costs/ efficiency and relationship to WHO dimensions)

Both population health outcomes and responsiveness are the multiplicative effect of accessibility and quality:

High accessibility but bad quality as well as low accessibility but high quality lead, on the population level, to inferior outcomes (but pointing to the problem is important for deciding on reform need)
My combined performance framework
(incl. costs/efficiency and relationship to WHO dimensions)

Inputs (money and/or resources)

Efficiency
(value for money, i.e.
population health and/or
responsiveness per input unit)

Access(ibility)
(incl. Financial protection)

Quality
(for those who receive services)

Population health outcomes
(system-wide effectiveness,
level & distribution)

Responsiveness
(level & distribution)

Health system performance

"TRIPLE AIM":
Access ↑
Quality ↑
Costs ↓
The access(ibility) component
(denominator: population/ persons with need)

Need (by socio-economic status, ethnicity/ migration status etc.)

- coverage (financial issues)
- availability of care
- waiting, acceptability etc.

Unmet need

Realised access

x Quality = Outcomes (population health & responsiveness)
The three dimensions of decisions about the financing of services

Coverage (financial issues)

Free at the point of service

Comprehensive

Universal

Breadth: Who is insured?

Depth: Which benefits are covered?

Height: What proportion of the costs is covered?

Total health expenditure

Cost sharing

Public expenditure on health

Uninsured

Other services

Source: Expanded from Busse, Schreyögg and Gericke 2007
1st dimension/ population coverage: the importance is known usually by U.S. data; here: access problems in 2012

- Experienced cost-related access problem: 63% Uninsured, 27% Insured all year
- Serious problems/unable to pay medical bills: 42% Uninsured, 15% Insured all year
- Spent $1,000 or more out-of-pocket: 39% Uninsured, 42% Insured all year

Source: 2013 Commonwealth Fund International Health Policy Survey in Eleven Countries.
Skipped Dental Care Because of Cost in Past Year

2nd dimension/ covered benefits also matter: e.g. gaps in dental care

Own elaboration based on data from 2016 Commonwealth Fund International Health Policy Survey in Eleven Countries.
Experienced cost-related access problem*

Spent US$1,000 or more out-of-pocket

* Had a medical problem but did not visit doctor; skipped medical test or treatment recommended by doctor; or did not fill prescription or skipped doses because of cost.

Source: modified from 2016 Commonwealth Fund International Health Policy Survey in Eleven Countries.

Source: modified from 2013 Commonwealth Fund International Health Policy Survey in Eleven Countries.
Public coverage = spending for pharmaceuticals varies greatly among countries!
Urban-rural discrepancies are vary drastically between countries – with definite scope to learn from another.

Waiting (here: >4 weeks for a specialist appointment) is a general problem, but some countries see improvements and others not

Own elaboration, data: Commonwealth Fund International Health Policy surveys, 2005-2013; in 2016, the respective question asked for >2 months
Unmet need in EU-28
(for costs, distance, waiting), 2010-2016

Own elaboration, data: EU-SILC, various years
Unmet need in EU-28 by income quintiles (for costs, distance, waiting), 2016

- Highest income (Fifth quintile)
- Average
- Lowest income (First quintile)

Compare Estonia & Greece: almost same average but very different in equity terms

Own elaboration, data: EU-SILC, various years
Unmet need: a closer look by age groups, education – and for different sectors

Fig. 3. Self-reported unmet need due to cost in Germany by age and educational status, 2014

Note: self-reported unmet need among people aged over 15 years reporting a need for care. Secondary or below: people with less than primary, primary and lower secondary education. Post-secondary: people with upper secondary and post-secondary non-tertiary education. Tertiary: people with tertiary education.

Source: Eurostat (2018a) based on EHIS data.
Inequity of physician visits by income (and equal need) in many countries (year = 2000) – and a real problem in certain ones with poor seeing GPs and rich seeing specialists

The quality component
(denominator: patients/patients receiving services)

Access(ibility)
incl. Financial protection

\[ \text{Quality} \]
(for those who receive services):
Q1. Effectiveness
Q2. Safety
Q3. Patient experience

Population health outcomes
(system-wide effectiveness, level & distribution)

Responsiveness
(level & distribution)

Health-service only performance dimensions – usually the focus when clinicians talk about the issue
What encompasses Responsiveness? An expanded version to the original WHO concept

Respect-for-Persons
- Respect for the dignity of a person
- Confidentiality of information
- Participation in decision-making (autonomy)
- Clear and understandable communication
- added*: trust

Client or patient orientation
- Choice of provider
- Prompt attention
- Quality of basic amenities
- Social support by networks (only inpatient care)
- added*: coordination and continuity of care

Sources: Valentine et al. (2008) and *Röttger, J, Blümel, M, Fuchs, S, Busse, R (2014)
6.2. Doctor providing easy-to-understand explanations, 2010 and 2016 (or nearest year)

Confidence Interval 2016  ○  2010  ●  2016

Age-sex standardised rate per 100 patients

<table>
<thead>
<tr>
<th>Country</th>
<th>2010</th>
<th>2016</th>
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<tbody>
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<td>Luxembourg</td>
<td>70.2</td>
<td>73.4</td>
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</table>

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.

1. National sources.
2. Data refer to patient experiences with regular doctor.

Source: Commonwealth Fund International Health Policy Survey 2016 and other national sources.

6.3. Doctor involving patient in decisions about care and treatment, 2010 and 2016 (or nearest year)

Confidence Interval 2016  ○  2010  ●  2016

Age-sex standardised rate per 100 patients

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Source: OECD, Health at a glance 2017, Data: Commonwealth Fund International Health Policy Survey 2016 and other national sources. http://dx.doi.org/10.1787/888933603374
How can we assess the effectiveness of ambulatory care?
A major patient-relevant outcome:
Not being hospitalised in case of chronic conditions ("avoidable hospital admissions") – here: diabetes

7x rate in Italy
How can we assess the effectiveness of inpatient care?
AMI letality of inpatients ... during hospitalisation only

To get a sense of dimensions: DE has 180.000 AMI cases / year → 7.000 more deaths compared to NO

... and including the more relevant first 30 days

Not measured

+4.0% +2.1% +4.0% +3.5%

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas.
1. Three-year average.

Not measured

+4.0%
Extending the time horizon to 5 years for cancer patients

10.9% die within 5 years

26.5% die within 5 years

Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. Expected updates in the data may reduce the survival estimate for Costa Rica.

1. Data with 100% coverage of the national population.

Source: CONCORD programme, London School of Hygiene and Tropical Medicine.
Inputs (money and/or resources) \[ \times \]

Access(ibility) incl. Financial protection

Quality (for those who receive services)

Population health outcomes (system-wide effectiveness, level & distribution)

Responsiveness (level & distribution)

(Allocative) Efficiency (value for money, i.e. population health and/or responsiveness per input unit)

The population/system-wide outcomes

The area with the least agreement but highest political relevance
How can we calculate the health system contribution to health?

Environment

Lifestyle

Socio-economic status/ education etc.

Health care

Mortality/
(healthy) life expectancy

Avoidable mortality (amenable to health care)

Medical errors
The concept of avoidable mortality (AVM; also “amenable to health care”)

• Deaths from certain causes that should not occur in the presence of timely and effective health care

• Introduced by David Rutstein in the 1970s (originally for quality assurance purposes)

• Walter Holland published European Community Atlas of ‘Avoidable Deaths’ in 1988; intends to provide warning signals of potential shortcomings in health care delivery

• Mackenbach et al. argue that associations between AVM and health care services are rather weak and inconsistent. Most health care measures only reflect quantity and not quality. Many studies use insufficient set of covariates.

• Nolte and McKee (2002) reviewed list of amenable causes of death
Mortality “amenable to health care”: latest European data (with major contributing diseases)
Applying the concept longitudinally...

Decrease in avoidable mortality per 100,000 persons aged 0-74, 2000-2011/14:

- Austria -54 (-42%)
- Denmark -55 (-40%)
- France -30 (-33%)
- Germany -49 (-37%)
- Netherlands -50 (-41%)
- United Kingdom -60 (-41%)
- Canada -32 (-29%)

Calculations by Observatory and author; Source: Busse et al., Lancet 2017
... and adding expenditure (→ efficiency) ...

Incremental cost-effectiveness (death rate decrease per $1000 spent more):
- Austria 25
- Denmark 25
- France 17
- Germany 19
- Netherlands 16
- United Kingdom 30
- Canada 18

Calculations by Observatory and author; Source: Busse et al., Lancet 2017
... and now including the U.S.

-37/ 100,000 persons (-25%)

-8/ $1000 spent more

Calculations by Observatory and author; Source: Busse et al., Lancet 2017
Take home messages:

1. We spend a lot on health care and thus need to ensure that it is well spent.

2. Beyond evaluating the cost-effectiveness of individual interventions (such as drugs), we need to assess overall health systems’ performance; this should include what patients (and the rest of the population) value most: accessibility, quality, population-wide outcomes and efficiency (value-for-money).

3. There is a wide range of data available (more than many think) – but to use them improve performance requires (1) that we look at the data, (2) acknowledge scope for improvement, and (3) willingness to learn from others.