Economic impact of oral health inequalities

Stefan Listl
1. costs = costs = costs?

2. Economic impacts of oral health & inequalities
   → direct costs
   → indirect costs
   → intangible costs

3. Conclusions
costs = costs = costs?

Costs of health care: total expenditure spent (per specialty)

Cost-of-illness (COI): costs attributable to illness
→ treatment costs
→ productivity losses
→ intangible costs

Cost of health inequalities: excess costs due to rich-poor differences
→ Counterfactual: cost-of-illness if everyone is on equal terms as those better off

Question is not how to reduce/contain costs
Rather: how to optimize population wellbeing given available resources?
→ opportunity costs: could resources be spent better?
Direct costs

Dental care in industrialized countries: about 5% of total health expenditure (OECD 2013)
Worldwide dental expenditures in 2010: ca. US-$ 300 billion (own estimate)

Treatment costs
- preventive
- restorative
- periodontal
- endodontic
- orthodontic
- prosthodontic
- surgical

Costs attributable to inequalities
- non-trivial
  (limited data, non-harmonized reporting across countries etc.)

Pragmatic approach: simplifying assumptions → approximate estimates [lower bound]
Baseline: current expenditure level (ca. US-$ 300 billion; own estimate)

Three steps:
(1) estimate current expenditure shares by SES
(2) adjust for disproportionate dental care use (expenditure ~ morbidity)
(3) assume all have same morbidity as high SES

Data source: Survey of Health, Ageing and Retirement in Europe (SHARE)

→ wave 5 (collected in 2013)
→ 20 European countries
→ compare high SES [ISCED 5-6] vs. low/middle SES [ISCED 0-4]

<table>
<thead>
<tr>
<th></th>
<th>high SES</th>
<th>low/middle SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of population</td>
<td>21 %</td>
<td>79 %</td>
</tr>
<tr>
<td>dental care use p.a.</td>
<td>72 %</td>
<td>50 %</td>
</tr>
<tr>
<td>any missing teeth</td>
<td>67 %</td>
<td>80 %</td>
</tr>
</tbody>
</table>
(1) current expenditure shares by SES:
[inverse care law; Hart 1971]

(2) dental expenditure ~ morbidity:
[vertical equity; Wagstaff 2000]

(3) all have morbidity of high SES:
[horizontal equity; Wagstaff 2000]

World: US-$ 300 billion for dental care (2010); US-$ 39 billion due to inequalities
Indirect costs

- usually estimated as productivity losses due to illness (Berger et al. 2001)

- Glied & Neidell (2010): children who grow up in US communities with fluoridated water earn approximately 2% more in adulthood; effect mainly attributable to reduced morbidity amongst low SES, particularly women (natural experiment → causal effect!)

- two common approaches:
  (1) lost wages approach (neoclassical approach, human capital theory)
  (2) friction costs approach (Koopmanschap et al. 1995)

  → approximate estimate: ca. US-$ 140 billion (own estimate)
Economic loss from top 15 global causes of death

[Economic value of DALYs lost in US-$ billions in 2008]

1. Cancer [895.2]
2. Heart diseases [753.2]
3. Cerebrovascular disease [298.2]
4. Diabetes mellitus [204.4]
5. Road traffic accidents [204.4]
6. Chronic obstructive pulmonary disease [203.1]
7. HIV/AIDS [193.3]
8. Perinatal conditions [192.8]
9. Suicides [140.8]
10. Lower respiratory infections [125.8]
11. Cirrhosis of the liver [92.8]
12. Diarrhoeal diseases [70.1]
13. Tuberculosis [45.4]
14. Malaria [24.8]
15. Measles [8.1]

source: http://www.cancer.org

Oral diseases (2010)
-15 million DALYs lost (Marcenes et al. 2013)
-loss: US-$ 140 billion

~ US-$ 18 billion due to SES excess morbidity
[SHARE reference case]
Intangible costs

- impacts of oral diseases on quality of life; effects on leisure time; impacts on family & friends; marriage & dating market...

- those worse off are less likely to receive treatment if ill, i.e. suffer more than the better off → amplified burden of illness

- captured by (health) outcomes other than monetary costs [generic & disease-specific QoL, e.g. EQ5D, OHIP, OIDP, ECOHIS]
Conclusions

Substantial economic burden of oral diseases:
→ worldwide (2010): ca. US-$ 440 billion (treatment costs & productivity losses)
→ thereof: ca. US-$ 57 billion yearly due to inequalities [lower bound estimate]

Ultimate challenge: implement policies that yield the best possible balance of equity and efficiency in patient-centred oral health care given available resources

Health economic target points

- **Efficiency**
  - maximize health outcome (population average) given available resources

- **Equity**
  - reduce social disparities in health and health care

→ focus on patient-centred wellbeing (QoL) as endpoint
→ address common risk factors (*economies of scale & scope*)
→ research, debates, and policies fall short if people don’t feel like changing...
“If you think education is expensive try ignorance!“

“Bok’s Law” (1978)
Questions?

stefan.listl@med.uni-heidelberg.de