Macroeconomic Analysis of Differences in Health Care Expenditure

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The Beginning: Newhouse (1977)

- Correlation between health care expenditure and GDP per capita
- 13 OECD countries in 1971
- Income explains 92% of the variation
- Other variables insignificant
  - Out-of-pocket payments
  - Reimbursement of doctors or hospitals
Health Expenditure and GDP per Capita in 1998. PPP USD

\[ R^2 = 0.77 \]
A controversial interpretation

- Health care is a “luxury” good
  - Income elasticity over unity
- Inconsistent with micro data
  - Lower share of individual expenditure for health care at higher incomes
- Questions asked
  - What is higher expenditures buying?
  - Quality of care rather that cure?
20 years of econometric studies

- Cross-section studies
  - Bivariate regressions
    - Conversion factor instability?
  - Multivariate regressions
    - Impact of financing and organisation

- Panel data studies
  - Fixed and/or random effect models
  - Effects of institutional variables, OECD 1970-91
  - Unit root and cointegration analysis
Main results

• Conversion factor instability
  – Results hold for health care expenditure deflated with health care specific PPPs
  – Relative price has a strong rationing effect on quantity

• Multiple regression analysis
  – GDP the most significant determinant with a positive income elasticity above unity
Public choice hypothesis

- Higher public/private ratio in finance and provision increase expenditure
  - Confirmed in Leus study
  - Rejected in a later study
- Open-ended financing arrangements
  - Fee for service increase costs
  - Logarithmic transformation the preferred functional form
Panel data analysis

- **Demand variables**
  - Income highly significant; at or above unity
  - Effect of population age structure insignificant

- **Institutional variables that reduce expenditure**
  - “Gatekeepers” -18%
  - Reimbursement model -9%
  - Capitation -17-21 %
  - Public provision (?)

- **Institutional variables that increase expenditures**
  - High share for in-patient care (?)
  - Budget ceilings (?)
Table II. Regression results. Dependent variable: Health expenditure per capita.

<table>
<thead>
<tr>
<th>Variable</th>
<th>General model</th>
<th>Reduced model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t-value</td>
</tr>
<tr>
<td>Constant</td>
<td>- 3.643\textsuperscript{a}</td>
<td>- 3.388</td>
</tr>
<tr>
<td>GDP</td>
<td>1.217\textsuperscript{a}</td>
<td>13.631</td>
</tr>
<tr>
<td>PHE</td>
<td>- 0.463\textsuperscript{b}</td>
<td>- 2.471</td>
</tr>
<tr>
<td>Age65</td>
<td>0.341\textsuperscript{b}</td>
<td>2.698</td>
</tr>
<tr>
<td>Beds</td>
<td>2.742E-02</td>
<td>0.405</td>
</tr>
<tr>
<td>Gatekeeper</td>
<td>- 1.209E-02</td>
<td>- 0.189</td>
</tr>
<tr>
<td>df</td>
<td>23</td>
<td>-</td>
</tr>
<tr>
<td>$R^2$ (Adj $R^2$)</td>
<td>0.947 (0.936)</td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a,b,c} represent 1%, 5% and 10% levels of significance, respectively.
Results from 1998

- Income elasticity above unity: 1.2
- Higher share for public financing reduce expenditure
- Share of population over 65 increase expenditure
- “Gatekeeper” and number of hospital beds insignificant
Age-specific health and elderly care costs and age-specific mortality are strongly correlated.

<table>
<thead>
<tr>
<th>Age</th>
<th>00-19</th>
<th>20-34</th>
<th>35-49</th>
<th>50-64</th>
<th>65-74</th>
<th>75-84</th>
<th>85+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of care (SEK)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health care</td>
<td>5 914</td>
<td>7 529</td>
<td>9 652</td>
<td>13 623</td>
<td>20 395</td>
<td>26 732</td>
<td>27 601</td>
</tr>
<tr>
<td>Elderly care</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7 186</td>
<td>44 690</td>
<td>146 510</td>
</tr>
<tr>
<td>Mortality rate per 1000</td>
<td>0.356</td>
<td>0.578</td>
<td>1.627</td>
<td>6.012</td>
<td>20.982</td>
<td>57.268</td>
<td>153.670</td>
</tr>
</tbody>
</table>

The age-specific cost of care (SEK) and the age specific mortality (per 1000)
Health care costs and ageing

- Time to death rather than age drives costs
- Costs for nursing home care and social services has a steeper age gradient than health care costs
- Health care and social care a “joint product” at older ages; 25/75 relation?
- Difficult to separate in international comparisons
Limitations of macroeconomic expenditure studies

- They do not directly address issues of efficiency and equity - focus on policies for cost containment
- They ignore the contribution of health care to living standards through improvements in health
Issues for future research

- Do we see new patterns of expenditure during the 1990s?
  - Are the previous results stable?
- Omitted explanatory variables
  - Budget deficits, subsidies to private insurance and introduction of new technology
- Prices versus quantities
- Modelling the interrelation between health care expenditure, health and economic development