Restrictive vs Non-Restrictive drug reimbursement systems: evidence from European countries

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High level comments

• **Key message**: “it can be claimed that having a more restrictive drug reimbursement system is not associated with worse outcomes in terms of healthy life years and cancer mortality rates”...“a more restrictive system is not synonymous with poorer health outcomes”
  - Strong and political sensitive message! Careful...

• **Very nice flow of papers**
  - Understand differences in decisions first...
  - ...then, explore impact of those decisions

• **Measure of “outcome/longevity”**
  - Links between aggregate cancer rates and specific drugs?
    - Could you look at cancer-specific mortality rates?
    - What about “overall survival” as a measure of longevity?
  - Changes in ‘Longevity’ over study period not significant enough?
    - Would like to see how the three variables have changed over time, and across countries
  - Impact of cancer drugs on overall survival – months rather than years (hence difficult to show impact on life expectancy?)
  - Are the “old” SoC drugs available when rejections?

• **Rate of acceptance not necessarily linked to uptake**
  - Ideally, use of drugs should be measured, correct?
  - Placing results within literature (e.g. ‘diseconomies of scale’ in health expen)
The Data

• Time period: 2002 to 2014

• Geographic coverage: nine European countries

• 161 Drug-indications: where does list come from? EMA?
  • How many “drugs”?    
  • How many drugs with 2, 3, 4...indications?

• Classifying decisions:
  • Are decisions exactly for the same indication? Eg 3rd vs 2nd line; different subpopulations...
  • Alternatively: yes/no for sub-indications (Dakin et al.)
II Methods

• Table II
  • ‘Non assessment’ depends on type of system
  • Is there a pattern about drugs not assessed? E.g. some drugs are not assessed by anyone, or there is a mix?
  • All accepted in Germany? German numbers need a bit more explanation (cf 2016 article)
  • Sweden ‘non assessment rate’ seems very high

• England CDF: how many drugs in the sample were reimbursed by the CDF? Only started April 2011 and first year uptake was not very good, I think

• What is “price referencing”? Not external, correct? (we could actually have a system that uses both “negotiation” and “reference pricing” (e.g. Germany post-AMNOG) or “set by manufacturer” and “reference pricing” (e.g. Germany pre-AMNOG)
Econometric results

Table V Life Expectancy (male and female)

• “higher unemployment rates and higher levels of education in the population are associated with an increase in life expectancy at birth”
  • OK with education
  • but higher unemployment rate increase in LE? (cf explanation about Spain)

• higher health expenditure (%GDP) is related with a negative effect on life expectancy: “diseconomies of scale” in health expn? (literature?)
Econometric results

Table VI Healthy Life Years (male and female)

• “there are some differences between male and female models. The male model shows, with a confidence of 90%, that there is a positive relationship between the rate of rejection and HLYM, whereas the female model shows a positive relationship between the restriction rate and HYLF.”

• “For male and female outcomes, a greater share of the population with the highest level of education is negatively related to HLY”: explanation? What about intermediate levels of education?

• “Regarding the female model, health expenditure (% GDP) and the percentage of people with a long-standing illness are negatively associated with HLYF” – again, diseconomies of scale of health expn?”
Econometric results

Table VII *Cancer Mortality rate*

- “higher rate of rejection is related with a lower mortality rate” / “higher rejection rates are associated with fewer deaths for females”
- “Regarding the cancer mortality rate for males, the results show that a higher unemployment rate, a greater share of the population with the highest education level and a greater share of the population over the age of 65 are all associated with an *increase in mortality rates*”
- “However, for both, male and female models, the EE requirement for some drugs is negatively related with this variable (mortality rates)” : so what does this mean? [Finally, for cancer mortality rates, higher rejection rates are associated with fewer deaths for females (lower mortality rates)]. If EE required, lower mortality rate? (and EE => higher rejection?)
The Data: System-level variables per country.
Appendix 1

- “Simulations” with different numbers?

England
- Body Independence: 1 (vs 2)? NICE makes recommendations, doesn’t decide (although need to have funding available for positives within 3 months)
- Decision level: 1 (vs 0)? (same as Scotland?) NB see comment above about positive recommendations

France
- Initiator: 3 (vs 1)? France appraises everything
- Transparency: 2 (vs 1)? AMR/ASMR reports published?

Spain
- Agency: AEMPS?
- Evidence: 0 (vs 1). Done internally?
- Decision level: 0 or 1 (vs 3)? some freedom for regions, yes, but in theory no inequalities
- Initiator: 3 (vs 0)? AEMPS/MoH appraises everything?
- Transparency: 0 (vs 1): certainly situation has changed with publication of IPTs. But I would argue French system is more transparent, and France gets a ‘1’

Sweden:
- Initiator: 3 (vs 1)? TLV appraises everything?
Econometrics – ignore (!)

• Are series stationary? Does taking ‘In’ solve the issue?
• Other regression methods?
• How good are the $R^2$?
• Same impact across countries?
Abstract

• The results show that the rate of adoption of new drugs into a national health system does not have any significant effect on life expectancy: careful. Is adoption = uptake?
Some ideas for future research

• Timelines on decisions: does it differ across countries?
  • Example: NICE decisions before or after? Not clear from analysis

• Impact of uptake on outcomes. Tricky, for 2 reasons:
  • Data expensive
  • Attribution effect: how much can use of meds impact outcome measures?
    (the attribution issue applies to analysis)

• What drives differences in relative effectiveness? *See next slide*

• Some country-specific analysis
What drives differences in relative effectiveness?

## Table III. Secondary data variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Life expectancy at birth (male and female)</td>
<td>Indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Period: 2002-2014. Country data plus regional data for Scotland and England (weighted average based on population). Source: Eurostat.</td>
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<tr>
<td>Population, total</td>
<td>Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. Country data plus regional data for Scotland and England (a total of 9 regions). Period: 2002-2014. Source: Eurostat.</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>The unemployment rate is the number of people unemployed as a percentage of the labour force. Eurostat defines an unemployed person as someone aged between 15 and 74 without work during the reference week who is available to start work within the next two weeks and who has actively sought employment at some time during the last four weeks. Period: 2002-2014. Country data plus regional data for Scotland and England (weighted average based on active population). Source: Eurostat.</td>
</tr>
</tbody>
</table>
| Education attainment level (%)                | Percentage of population (25-64 years old) by education attainment level:  
- Less than primary, primary and lower secondary education (levels 0-2)  
- Upper secondary and post-secondary non-tertiary education (levels 3 and 4)  
- Tertiary education (levels 5-8)  
| Patents (per million inhabitants)             | Number of patent applications to the European Patent Office (EPO) by priority year per million inhabitants. Country data plus regional data for Scotland and England (weighted average based on population). Source: Eurostat. |