Smoking-, alcohol- and obesity-attributable mortality trends in Europe

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Introduction

› Smoking, excessive alcohol consumption, and overweight and obesity => the most significant preventable risk factors in the EU (WHO 2009).
› They have unexpectedly surged to unprecedented levels across countries in recent years => “epidemics”
› Large role in premature mortality => “actual causes of death”
› Unhealthy lifestyles of youth are of particular concern and are likely to have longlasting effects on future e0
Important role of smoking

- Largest preventable cause of death EU (WHO, 2009)
- Most important determinant mortality levels, trends, differences between countries, sexes, cohorts
- Smoking epidemic => Non-linear pattern + still imprint

Descriptive model smoking epidemic

Lopez et al. 1994
Important role of alcohol

Excessive alcohol consumption
➢ Third preventable cause of death EU (WHO, 2009), and first risk factor for the burden of disease in Eastern Europe (Lim et al. 2012).
➢ Esp adult men Eastern Europe
➢ Partly responsible for decline in Eastern Europe (e.g. Russia)
➢ Increasing among youth in Western Europe

Vallin & Meslé (2004)
Overweight & obesity =>
› New epidemic
› “Over 50% of the adult population in the EU are overweight or obese. Obesity prevalence has tripled in the last two decades.” (WHO, 2009)
› Sex differences; important differences therein within Europe

Trends in age-standardised mean BMI

Finucane et al. 2011
Previous research

› In academics: mostly focus on one country or a couple of them
› Mostly not time trends
› Differences in estimation methodology
› No formal analysis of the importance of birth cohort effects
Particularly interesting

› European wide overview of levels and trends using comparable estimates
› The potential role of birth cohort
› Their importance of smoking, alcohol and obesity in life expectancy (trends)
Objective

› To study indepth the past trends in smoking-, alcohol- and obesity attributable mortality
  • Cohort effects
  • Contribution to $e_0$
Data

- Lifestyle-attributable mortality
  - Smoking => indirect method (Peto et al. 1992): lung cancer mortality as proxy of past smoking x RR of dying from smoking
  - Alcohol => Liver-cirrhosis mortality, and GBD estimates (Forouzanfar et al. 2015)
  - Obesity => Comparative Risk Assessment methodology (WHO 2004) (RR from Flegal et al. 2013)
Methods & Results

› Mapping lifestyle-attributable mortality fractions
› Trends over time
› Examining the contribution of birth cohorts (APC analyses, Clayton and Schifflers (1987) approach)
  • Drift: shared linearity between period and birth cohort

Effect on all-cause mortality trends and differences by eliminating life-style-attributable mortality (smoking), and by estimating PGLE (alcohol)
MAPS
% smoking-attributable mortality in 2010

Source: Own elaboration based on GBD Study 2010
% alcohol-attributable mortality in 2010

Source: Own elaboration based on GBD Study 2010
% high-BMI-attributable mortality in 2010

Source: Own elaboration based on GBD Study 2010
## Lifestyle-attributable mortality

<table>
<thead>
<tr>
<th>Lifestyle Factor</th>
<th>Netherlands</th>
<th>Germany</th>
<th>Western Europe</th>
<th>Eastern Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Smoking</td>
<td>26</td>
<td>13</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>10</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>High BMI</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>16</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Excessive alcohol consumption</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>

Source: IHME (2014)
TIME-TRENDS
Age-standardized smoking-attributable mortality rates (35-79)
Age-standardized liver cirrhosis mortality rates (15-94)

Source: Trias-Llimós et al. submitted
Age-standardized obesity-attributable mortality rates (20-79)

Source: Vidra et al. *in preparation*
Obesity-Attributable Fractions

Source: Vidra et al. *in preparation*
RELEVANCE OF BIRTH COHORT
Contribution to the deviance reduction: smoking

Men

Women

- Non-linear birth cohort
- Non-linear period
- Drift

Country: FIN, SWE, AUT, NLD, ITA, ESP, HUN
Contribution to the deviance reduction: liver cirrhosis

Source: Trias-Llimós et al. submitted
Contribution to the deviance reduction: obesity

Source: Vidra et al. *in preparation*
Effect on all-cause mortality trends and differences
Role of smoking in mortality trends: Denmark
Role of smoking in e\textsubscript{o} trends

All-cause mortality

Non-smoking-related mortality
Life expectancy in Europe

Source: Own elaboration based on HMD data
PGLE by eliminating alcohol-attributable mortality

Trias-Llimós, S., A.E. Kunst & F. Janssen (in preparation), The role of alcohol in life expectancy differentials in Europe
Obesity

- Increase in prevalence & PAF, but decline in mortality

Non-linear cohort effects UK

Source: Vidra et al. *in preparation*
To conclude

- Clear variations between countries in the level of smoking-, alcohol- and obesity-attributable mortality. Smoking-attributable mortality most important.
- Substantial **differences across countries and between sexes** in the trends of the smoking, alcohol and obesity epidemics => different timing of epidemics.
- The **birth cohort dimension** proved essential when studying these epidemics.
- Importance for all-cause mortality
  - Time trends => more linear
    - Country and sex differences
References

- Trias-Llimós, S., M. Bijlsma & F. Janssen (under review), The role of birth cohort in long-term trends of liver cirrhosis mortality in Europe.
- Vidra, N., & F. Janssen (in preparation), The role of obesity in life expectancy differentials in Europe.
Thank you