Past trends of obesity-attributable mortality in the Netherlands; an application of Age-Period-Cohort analysis

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Background

• Obesity has dramatically increased over time and constitutes a major health burden.
• The health burden of obesity can be estimated by obesity-attributable mortality.
• Previous studies on obesity-attributable mortality did not account for the multiple dimensions of the obesity epidemic: age, period and birth cohort.
• Next to age and period, a birth cohort effect is likely.
• An effect of birth cohort was previously reported in obesity prevalence in the United States.
• The observed extended exposure to obesity among younger birth cohorts is likely to also occur in Europe and to affect mortality.

Data & Methods

Data (by age and sex):
• Obesity prevalence (P) (Statistics Netherlands)
• Relative Risks (RR) of dying from obesity from meta-analysis by Wang (2015)4
• All-cause mortality (HMD)

Methods:
• Obesity-attributable mortality:
Population Attributable Fraction (PAF) (based on P and RR) × All-cause mortality
• Age-Period-Cohort analysis: Clayton and Schifflers approach5

Objective

To better capture the complexity of the obesity epidemic and its impact on mortality by assessing age, period and birth cohort effects and patterns in the Netherlands, in the period 1981 to 2010.

Results

Obesity-attributable mortality in the Netherlands, 1981-2010

I. Age pattern

II. Period pattern

III. Birth cohorts pattern

• Obesity-attributable mortality doubled in the Netherlands between 1981 and 2010.
• In men, the fraction of mortality due to obesity rose from 0.7 % to 1.3 %.
• In women, from 1.0 to 2.0 %.
• In the 1990s the obesity epidemic started to increase substantially (II).
• Patterns for men and women are very similar for age and period but not for birth cohort (I, II, III).
• For women born after 1941-1945, obesity-attributable mortality is increasing with every next generation (III).
• The added effect of birth cohort is larger among women as compared to men, and for women even more important that the effect of period (IV).

IV. Contribution to the deviance reduction

<table>
<thead>
<tr>
<th>Percentage reduction</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drift</td>
<td>35.50%</td>
<td>76.0%</td>
</tr>
<tr>
<td>Period</td>
<td>11.60%</td>
<td>14.4%</td>
</tr>
<tr>
<td>Cohort</td>
<td>52.80%</td>
<td>9.5%</td>
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</tbody>
</table>

Drift: Loglinear change shared between period and birth cohort

Conclusions

Next to age and period a substantial effect of birth cohort on obesity-attributable mortality was shown, especially in women.
Future studies on obesity-attributable mortality should not ignore the multiple dimensions of obesity.

References