The burden of alcohol consumption and the role of dependence – with special reference to EU and Estonia

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7   Klinik & Poliklinik für Psychiatrie und Psychotherapie der Universität
       Regensburg, Germany
8   Fachhochschule Kärnten, Bereich Gesundheit & Soziales, Austria
Acknowledgements 2: Financial support

- Lundbeck A/S, Copenhagen, Denmark
- WHO European Region
- European Union (ALICE RAP)
- Ministry of Health and Long-Term Care, Ontario, Canada
- Global Burden of Disease Study


http://www.camh.ca/en/research/news_and_publications/reports_and_books/Pages/default.aspx
1. Alcohol consumption in Europe is high, more than twice the global average, and quite stable in the EU.

2. Patterns of drinking, i.e., how alcohol is consumed, vary, with more detrimental patterns in the East, North and the UK/Ireland.

3. The resulting health burden and social burden is high.

4. A marked proportion of this burden is via alcohol dependence, with heavy drinking one the pathways.

5. Reduction of heavy drinking in people with alcohol dependence will reduce the burden.
1. Alcohol consumption in Europe is high, more than twice the global average, and quite stable.

Recorded adult *per capita* consumption in EU in litres pure alcohol
But regional differences, also in patterns of consumption (2009)

- EU has high but stable consumption
- Regional differences:

<table>
<thead>
<tr>
<th>Region</th>
<th>Adult per capita consumption in litres of pure alcohol</th>
<th>Unrecorded per capita consumption in litres of pure alcohol</th>
<th>Hazardous drinking score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central-eastern and eastern Europe</td>
<td>14.5 (1.7)</td>
<td>2.5 (0.8)</td>
<td>2.9 (0.3)</td>
</tr>
<tr>
<td>Central-western and western Europe</td>
<td>12.4 (0.8)</td>
<td>1.0 (0.5)</td>
<td>1.5 (0.9)</td>
</tr>
<tr>
<td>Nordic countries</td>
<td>10.4 (1.9)</td>
<td>1.9 (0.3)</td>
<td>2.8 (0.4)</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>11.2 (1.7)</td>
<td>2.0 (0.5)</td>
<td>1.1 (0.3)</td>
</tr>
<tr>
<td>EU</td>
<td>12.4 (1.3)</td>
<td>1.6 (0.6)</td>
<td>1.9 (0.7)</td>
</tr>
</tbody>
</table>
And country differences
(see also Estonia in last presentation)
Total adult per capita alcohol consumption (recorded and unrecorded) in 2005

* Total refers to recorded+unrecorded
2005 refers to average 2003-2005 for recorded and 2005 for unrecorded

WHO, 2011
3. The resulting health and social burden is high

Percentage of disability-adjusted life years (DALYs) attributed to 19 leading risk factors, by country income level, 2004
GBD for the year 2010: sneak preview

- will be announced later this month
- Alcohol kept its high rank (third most important risk factor for global burden of disease); a sneak preview below
Alcohol-attributable disease and injury 2005
(green mainly protective)

Chronic and infectious disease:

**Cancer**: nasopharyngeal cancer, esophageal cancer, laryngeal cancer, liver cancer, colon/rectal cancer, female breast cancer

**Neuropsychiatric diseases**: alcohol use disorders (100% alcohol attributable), primary epilepsy

**Diabetes**

**Cardiovascular diseases**: hypertensive diseases, ischemic heart disease, ischemic stroke, hemorrhagic stroke, atrial fibrillation and flutter

**Gastrointestinal diseases**: Liver cirrhosis, pancreatitis

**Infectious diseases**: TB, effect of alcohol on course of HIV/AIDS, lower respiratory infections (pneumonia)

**Conditions arising during perinatal period**: Low birth weight, FAS (100% alcohol attributable)

Injury:

**Unintentional injury**: transport injuries, falls, drowning, fire, poisonings, exposure to forces of nature, other unintentional injuries

**Intentional injury**: Self-inflicted injuries, interpersonal violence, other intentional injuries
High exposure, high burden of mortality and disease

- For men between ages of 15 and 64, 1 in 7 deaths in 2004 were caused by alcohol (clearly premature deaths given the life expectancy in Europe)

- For women of the same age category, 1 in 13 deaths in 2004 were caused by alcohol
And for Europe II ....

Women 14 to 65 years of age
Proportion of deaths attributable to alcohol consumption

Men 14 to 65 years of age
Proportion of deaths attributable to alcohol consumption
Alcohol-attributable deaths in Europe by broad disease categories, for people 15 to 64 years of age, 2004

<table>
<thead>
<tr>
<th>Detrimental effects</th>
<th>Men</th>
<th>Women</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>17,358</td>
<td>8,668</td>
<td>15.9%</td>
<td>30.7%</td>
</tr>
<tr>
<td>CVD other than IHD</td>
<td>7,914</td>
<td>3,127</td>
<td>7.2%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Mental and neurological disorders</td>
<td>10,868</td>
<td>2,330</td>
<td>9.9%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Liver cirrhosis</td>
<td>28,449</td>
<td>10,508</td>
<td>26.0%</td>
<td>37.2%</td>
</tr>
<tr>
<td>Unintentional injury</td>
<td>24,912</td>
<td>1,795</td>
<td>22.8%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Intentional injury</td>
<td>16,562</td>
<td>1,167</td>
<td>15.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Other detrimental</td>
<td>3,455</td>
<td>637</td>
<td>3.2%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Total detrimental</td>
<td>109,517</td>
<td>28,232</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Beneficial effects</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IHD</td>
<td>14,736</td>
<td>1,800</td>
<td>97.8%</td>
<td>61.1%</td>
</tr>
<tr>
<td>Other beneficial</td>
<td>330</td>
<td>1,147</td>
<td>2.2%</td>
<td>38.9%</td>
</tr>
<tr>
<td>Total beneficial</td>
<td>15,065</td>
<td>2,947</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Women 14 to 65 years of age
Proportion of DALYs attributable to alcohol consumption

Men 14 to 65 years of age
Proportion of DALYs attributable to alcohol consumption
Alcohol dependence in Europe (prevalence in %) for
EU men: 5.4% women: 1.5%

<table>
<thead>
<tr>
<th></th>
<th>women</th>
<th>men</th>
<th></th>
<th>women</th>
<th>men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>2.5</td>
<td>7.5</td>
<td>Latvia</td>
<td>1.6</td>
<td>8.4</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.9</td>
<td>5.4</td>
<td>Lithuania</td>
<td>1.9</td>
<td>9.9</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1.4</td>
<td>7.3</td>
<td>Luxembourg</td>
<td>1.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Cyprus</td>
<td>1.6</td>
<td>5.3</td>
<td>Malta</td>
<td>0.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>0.8</td>
<td>5.0</td>
<td>Netherlands</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.9</td>
<td>4.8</td>
<td>Norway</td>
<td>3.5</td>
<td>10.5</td>
</tr>
<tr>
<td>Estonia</td>
<td>2.1</td>
<td>11.0</td>
<td>Poland</td>
<td>1.6</td>
<td>8.4</td>
</tr>
<tr>
<td>Finland</td>
<td>1.9</td>
<td>7.2</td>
<td>Portugal</td>
<td>1.7</td>
<td>5.6</td>
</tr>
<tr>
<td>France</td>
<td>1.5</td>
<td>5.3</td>
<td>Romania</td>
<td>0.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Germany</td>
<td>1.3</td>
<td>5.4</td>
<td>Slovakia</td>
<td>1.1</td>
<td>10.2</td>
</tr>
<tr>
<td>Greece</td>
<td>1.5</td>
<td>4.8</td>
<td>Slovenia</td>
<td>2.0</td>
<td>10.5</td>
</tr>
<tr>
<td>Hungary</td>
<td>3.4</td>
<td>18.3</td>
<td>Spain</td>
<td>0.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Iceland</td>
<td>1</td>
<td>3.3</td>
<td>Sweden</td>
<td>3.3</td>
<td>7.7</td>
</tr>
<tr>
<td>Ireland</td>
<td>2.0</td>
<td>6.4</td>
<td>Switzerland</td>
<td>1.6</td>
<td>8.1</td>
</tr>
<tr>
<td>Italy</td>
<td>0.5</td>
<td>0.8</td>
<td>UK (England only)</td>
<td>3.6</td>
<td>9.3</td>
</tr>
</tbody>
</table>
## Burden of persistent alcohol dependence after 3-5 years

<table>
<thead>
<tr>
<th></th>
<th>Individual</th>
<th>Family</th>
<th>Work</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health burden</strong></td>
<td>morbidity from diseases caused or worsened by AD and associated premature mortality</td>
<td>injury; stress-related problems for other family members; FASD; interpersonal violence</td>
<td>injury</td>
<td>acute care hospitalizations for health problems caused by alcohol; injuries; infectious diseases; FASD</td>
</tr>
<tr>
<td><strong>Social burden</strong></td>
<td>decreases in functionality associated with AD (blackouts, hours of drunkenness); decrease in social role; loss of friendships; stigma</td>
<td>problems with parental roles, partnership roles, and roles as caregiver in general (e.g. to parents)</td>
<td>team problems; others having to compensate for lack of productivity</td>
<td>social costs of alcohol; vandalism</td>
</tr>
<tr>
<td><strong>Economic burden</strong></td>
<td>dependent on society and on SES of person with AD; often cost of alcohol plus cost of possible job loss or absenteeism; possible social drift downwards</td>
<td>financial problems resulting from health and social consequences of alcohol impacting on family budget and household expenses</td>
<td>absenteeism and other productivity costs (mainly suboptimal performance when working and disability, short- and long-term); replacement costs in case of premature mortality or long-term disability</td>
<td>productivity losses; health care costs; costs in the legal sector (police, court, prisons)</td>
</tr>
</tbody>
</table>
Social costs of alcohol

Anderson & Baumberg, Alcohol in Europe, 2006: total tangible costs to the EU €125 billion (CI: €79 bn - €220 bn) in 2003, equivalent to 1.3% of GDP (CI: 0.9% - 2.4%)
4. A marked proportion of this burden is via alcohol dependence, with heavy drinking one the pathways.

<table>
<thead>
<tr>
<th>Category</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol-attributable</td>
<td>8.5%</td>
<td>16.1%</td>
<td>13.6%</td>
</tr>
<tr>
<td>Alcohol-attributable (net)</td>
<td>7.7%</td>
<td>13.9%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Heavy drinking</td>
<td>5.3%</td>
<td>11.0%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Alcohol dependence</td>
<td>3.7%</td>
<td>10.3%</td>
<td>8.1%</td>
</tr>
</tbody>
</table>
What does this mean?

• Most of the burden of alcohol is stems from heavy drinkers (about 77% of the net burden, 67% of the overall burden), i.e., women drinking more than 40 g/day and men drinking more than 60 g/day.

• Alcohol dependence makes up of 69% of the net burden and 60% of all alcohol-attributable burden.
5. Reduction of heavy drinking in people with alcohol dependence will reduce the burden.
Simulations: what burden could be prevented by increasing treatment rates?

• Most conservative estimate: mortality burden!
• Approach bottom up: estimates for each country and then aggregated
• Approach was selected as current treatment rates are lowest for all mental disorders: under 10% in the EU!
• Effectiveness of treatment was based on Cochrane reviews
• Five scenarios selected

Rehm et al., 2012 Alcohol consumption, alcohol dependence, and attributable burden of disease
Number of deaths avoided over one year in men by treatment for AD in the EU in 2004 by five different treatment modalities

Rehm et al., 2012 Alcohol consumption, alcohol dependence, and attributable burden of disease
Number of deaths avoided over one year in women by treatment for AD in the EU in 2004 by five different treatment modalities

<table>
<thead>
<tr>
<th>Treatment Modality</th>
<th>Proportion of people with AD treated 10%</th>
<th>Proportion of people with AD treated 20%</th>
<th>Proportion of people with AD treated 30%</th>
<th>Proportion of people with AD treated 40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacological treatment</td>
<td>416</td>
<td>838</td>
<td>1,269</td>
<td>1,704</td>
</tr>
<tr>
<td>MI/CBT</td>
<td>284</td>
<td>573</td>
<td>857</td>
<td>1,148</td>
</tr>
<tr>
<td>MI/CBT higher effectiveness</td>
<td>324</td>
<td>651</td>
<td>985</td>
<td>1,315</td>
</tr>
<tr>
<td>BI hospital</td>
<td>266</td>
<td>540</td>
<td>813</td>
<td>1,080</td>
</tr>
<tr>
<td>BI hospital 2</td>
<td>369</td>
<td>739</td>
<td>1,111</td>
<td>1,492</td>
</tr>
</tbody>
</table>

Rehm et al., 2012 Alcohol consumption, alcohol dependence, and attributable burden of disease
Why is alcohol dependence treatment successful?

It reduces level of consumption either to abstinence or by sizable reduction of heavy drinking.

Typical risk curve for alcohol (e.g., liver cirrhosis mortality)

Reducing from 14 to 11 drinks per day reduces the mortality risk about 10 times as much as reducing from 3 to 0 drinks/day
And for Estonia: men

Estonia lives saved as proportion of alcohol attributable deaths: Men

- Pharmacological treatment: 9.0%
- MI/CBT: 6.6%
- MI/CBT higher effectiveness: 8.1%
- BI hospital 1: 6.4%
- BI hospital 2: 8.9%

Legend:
- Blue: proportion of people with AD treated 10%
- Red: proportion of people with AD treated 20%
- Green: proportion of people with AD treated 30%
- Purple: proportion of people with AD treated 40%
Estonia lives saved as proportion of alcohol attributable deaths: Women

- Pharmacological treatment: 4.5%, 6.8%
- MI/CBT: 2.3%, 2.9%
- MI/CBT higher effectiveness: 1.7%, 3.2%
- BI hospital 1: 1.4%, 4.1%
- BI hospital 2: 2.0%, 3.9%

- MI/CBT higher effectiveness proportion of people with AD treated:
  - 10%: 6.7%
  - 20%: 5.0%
  - 30%: 4.1%
  - 40%: 3.9%

Legend:
- Blue: proportion of people with AD treated 10%
- Red: proportion of people with AD treated 20%
- Green: proportion of people with AD treated 30%
- Purple: proportion of people with AD treated 40%
Conclusions for public health
Alcohol policy should be supplemented by increasing treatment rates

• Current alcohol policy recommendations by WHO and public health authorities are dominated by prevention (WHO best buys: taxation increases, availability restrictions, marketing ban)

• Alcohol policy should additionally comprise changes to increase treatment rates
  – For ethical reasons, but
  – also for public health reasons!