Role of Taxes and Subsidies in Addressing NCDs: The Case of Tobacco

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• Tobacco as a risk factor for NCDs
• Tobacco taxation: standard story
• Augmented story
  – Behavioral economics
  – Broad welfare measure
• Subsidies for tobacco cessation – HIC experience
• Conclusions on tobacco
• Application to alcohol
• Application to diet
• Final thoughts
Tobacco’s Shifting Burden: From the Rich to the Poor

More and more people in developing countries are taking up smoking, while people in developed nations are giving up the habit. This means tobacco-related deaths are shifting to low- and middle-income countries.

GLOBAL TOBACCO-RELATED DEATHS
20th Century

- 70% High-income countries
- 30% Low- and middle-income countries

100 MILLION

21st Century

- 30% High-income countries
- 70% Low- and middle-income countries

1 BILLION (projected)

Where do most of the world’s smokers live?

50%

More than 50% of all smokers live in just five low- and middle-income countries.*

Sources: R. Peto (Oxford Univ.), CGHR, WHO 2009

Find out more at theworld.org/cancer

* Brazil, China, India, Indonesia, Russia
Tobacco as a risk factor

<table>
<thead>
<tr>
<th>1990 Mean rank (95% UI)</th>
<th>2010 Mean rank (95% UI)</th>
<th>Median % change (95% UI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 (1-2) Childhood underweight</td>
<td>1.0 (1-1) Dietary risks</td>
<td>52% (43 to 57)</td>
</tr>
<tr>
<td>2.0 (1-2) Household air pollution</td>
<td>2.2 (2-3) High blood pressure</td>
<td>54% (42 to 66)</td>
</tr>
<tr>
<td>3.6 (3-5) Dietary risks</td>
<td>3.2 (2-4) Smoking</td>
<td>11% (-2 to 21)</td>
</tr>
<tr>
<td>4.0 (3-6) Suboptimal breastfeeding</td>
<td>4.5 (3-5) Smoking</td>
<td>-36% (-43 to -28)</td>
</tr>
<tr>
<td>5.9 (5-6) High blood pressure</td>
<td>5.2 (5-7) Childhood underweight</td>
<td>-61% (-66 to -55)</td>
</tr>
<tr>
<td>7.1 (7-8) Ambient PM pollution</td>
<td>6.4 (5-9) High fasting plasma glucose</td>
<td>80% (61 to 99)</td>
</tr>
<tr>
<td>9.0 (7-12) Iron deficiency</td>
<td>7.2 (5-10) Ambient PM pollution</td>
<td>3% (-6 to 13)</td>
</tr>
<tr>
<td>9.3 (8-12) Occupational risks</td>
<td>8.0 (6-10) Alcohol use</td>
<td>42% (22 to 61)</td>
</tr>
<tr>
<td>9.9 (8-12) Alcohol use</td>
<td>9.7 (6-13) Occupational risks</td>
<td>18% (1 to 39)</td>
</tr>
<tr>
<td>11.7 (10-14) High fasting plasma glucose</td>
<td>9.8 (7-12) High body-mass index</td>
<td>160% (133 to 197)</td>
</tr>
<tr>
<td>14.8 (12-17) High body-mass index</td>
<td>11.3 (7-13) Suboptimal breastfeeding</td>
<td>-57% (-63 to -51)</td>
</tr>
<tr>
<td></td>
<td>11.7 (8-13) Iron deficiency</td>
<td>-7% (-11 to -3)</td>
</tr>
</tbody>
</table>
Tobacco-related deaths, 2002-2030

Tobacco use is a risk factor for six of the eight leading causes of death in the world.

- Ischaemic heart disease: 6,704 million deaths (2005)
- Cerebrovascular disease: 5,280 million deaths (2005)
- Lower respiratory infections: 3,532 million deaths (2005)
- Chronic obstructive pulmonary disease: 1,761 million deaths (2005)
- Diarrhoeal diseases: 1,682 million deaths (2005)
- Tuberculosis: 1,270 million deaths (2005)
- Trachea, bronchus, lung cancers: 952 million deaths (2005)
- Other tobacco-caused diseases*: 1,544 million deaths (2005)

Total deaths: 5,395 million deaths (2005)

Source: WHO Report 2008
SHARE OF THE WORLD POPULATION COVERED BY SELECTED TOBACCO CONTROL POLICIES, 2010

Note: The tobacco control policies depicted here correspond to the highest level of achievement at the national level; for the definitions of these highest categories refer to Technical Note I.
Tobacco Taxation: Standard Story

- Cigarette Consumption
- Smoking Prevalence
- Disease Incidence
- Treatment demand
- Consumer Price of Cigarettes
- Revenue
- Treatment Expenditure

Externality
Mortality
Morbidity
Tobacco taxation

Inflation Adjusted Cigarette Prices and Cigarette Consumption, South Africa, 1960-2003

Source: Van Walbeek, 2003
Tobacco
Taxation: Issues

• Concerns: tax will disproportionately harm the poor, encourage smuggling, create efficiency loss (DWL), cause switching to more harmful products.

• More recent evidence from LMICs...

• Need to understand effectiveness of tax policy, incidence, admin and compliance costs, and revenue stability to make appropriate policy recommendations.
Welfare effects: Elasticities

- Efficiency and fiscal effects depend on elasticity and price of cigarettes.
  - Participation elasticity:
    - How much being a smoker responds to a change in price.
  - Intensity elasticity:
    - How much the number of cigarettes a smoker smokes per day responds to a change in price.

<table>
<thead>
<tr>
<th>Income Quintile</th>
<th>Participation Elasticity</th>
<th>Intensity Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income Quintile I</td>
<td>-0.5</td>
<td>-0.9</td>
</tr>
<tr>
<td>Income Quintile II</td>
<td>-0.5</td>
<td>-0.9</td>
</tr>
<tr>
<td>Income Quintile III</td>
<td>-0.4</td>
<td>-0.7</td>
</tr>
<tr>
<td>Income Quintile IV</td>
<td>-0.3</td>
<td>-0.4</td>
</tr>
<tr>
<td>Income Quintile V</td>
<td>-0.2</td>
<td>-0.3</td>
</tr>
</tbody>
</table>
Behavioral issues

• Deviations from “rational addiction” may arise due to:
  – Time inconsistent preferences
  – Poor predictive abilities about the future

• Behavioral model (Gruber and Koszegi, 2001) suggests the need to account for “internalities,” which greatly exceed external costs. Greater efficiency is still achieved with a tax, but optimal tax is derived differently.
  – Observe differentiated behaviors regarding addiction: sophisticated and naïve agents.
  – The former can benefit from commitment devices if they work (and therefore smaller optimal tax). The latter is a special class of hyperbolic discounters who don’t predict their future behavior well. They require a much higher tax.
- Addresses concerns that poor will pay disproportionately more.
- Marginal effects may not be regressive. With a tax increase, poor reduce smoking more, gain more health, spend less on health care.
- Full benefit measure suggests far greater benefit from taxation

<table>
<thead>
<tr>
<th>Priority Area</th>
<th>Indicative Benefit-Cost Ratio</th>
<th>Annual Costs ($ billions)</th>
<th>Annual Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cancer, heart disease, other: tobacco taxation</td>
<td>40:1</td>
<td>0.5</td>
<td>1 million deaths averted or 20 million DALYs</td>
</tr>
</tbody>
</table>

Jha et al, Copenhagen Consensus 2012
Low SES group:
Pays 6.4% of increased taxes
Receives 32.1% of health benefits
Health/tax ratio: 5.02
Subsidies for tobacco cessation

• Incentive programs, largely through employer-based insurance
  – MassHealth: smoking rates dropped 26%, CVD events dropped 46% in 2 years

• Likely to be high infra-marginal effects. Smokers with intent to quit are more likely to do so with incentives. (Hammar, 2005)
Conclusions

• Tax increases should be large
• Country context is important, especially for political economy of tobacco tax, FCTC implementation.
• Consider financial transfers to hold harmless tobacco industry, farmers
Application to alcohol

• Standard public finance taxation applies: consumers are price responsive, differentially by beverage and by consumer characteristics

• Special issues: drunk driving penalty preferred to general alcohol tax ...
  – “Normal” vs. binge drinking – different from tobacco (not all drinking is harmful)
  – Regressivity concern – similar to tobacco (tax increase not necessarily regressive with full benefit measure)

• ... unless fiscal component is large
  – Then tax is efficient and may be preferred to drunk driving penalties (Perry, West, Laxminarayan, 2009)
Application to F&B

• The “internalities” notion of the basic behavioral model applies:
  – Time inconsistent preferences
  – Poor predictive ability
• Externalities may exist as well
  – Network effects of obesity
  – Poor knowledge of harmful behaviors (ingredients, portion size
• Special issues:
  – “Harm” is relative, not absolute
  – Many highly substitutable products
  – Basic public finance tells us to tax the “bad” as directly as possible. Danish “fat” tax ignored that advice. Important for sugar taxes too.
• First, do no harm
  • Don’t tax what’s not bad (except for fiscal reasons)
  • Be sure the changes you get are the changes you want

– Subsidies are likely to work better, but need to be large
  • Even the playing field (vis a vis less healthy commodities)
  • Better targeting of a broad group of foods
  • No natural opposition
• Re externality as a justification for taxation, it doesn’t work as well for F&B as for alcohol, and doesn’t work as well for alcohol as for tobacco. But in all these cases, the majority of harm is to the individual, so the “internalities” become very important to understand in determining optimal taxation.

• Can strengthen arguments for the other justifications to (carefully) extend the use of pricing policies: revenue generation (properly used), equity (espec. Tobacco and F&B), and public health in LMICs.