Death and Poverty (Avoidable) and Taxes (Not Avoidable)

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Conclusions

• On current patterns: 1 Billion smoking deaths this century, or about 250 million deaths among those <35 years in just 16 countries

• Prolonged smokers lose about one decade of life

• Cessation by age 40 (and preferably earlier) avoids 90% of the excess risk of continued smoking

• Tripling of excise tax worldwide would reduce smoking by 1/3, avoid over 200 million premature deaths, and raise $100 B more in revenue

• Tobacco control does not hurt the poor

• Monitoring is needed: smoking and death status

Source: Jha and Peto, NEJM, Jan 2, 2014
## Worldwide no of substance users

_B=B=billions, M=millions_

<table>
<thead>
<tr>
<th>Substance</th>
<th>Users</th>
<th>Annual deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>1.3 B *</td>
<td>~ 5 M</td>
</tr>
<tr>
<td>Drinking</td>
<td>2.0 B</td>
<td>~ 2 M</td>
</tr>
<tr>
<td>Illicit drugs</td>
<td>0.2 B</td>
<td>~ 0.2 M</td>
</tr>
</tbody>
</table>

Global sales ~6,000 B sticks (vs 5,000 B in 1990)

1 ton of tobacco=1 M sticks=1 death

Source: WHO 2002
2010: Russian president Dmitry Medvedev spearheads new offensive against vodka, blamed for 500,000 deaths a year

Sensationalist adverts, steep price rises and bombastic rhetoric pull out all the stops

[guardian.co.uk](http://guardian.co.uk)  Monday 21 June 2010

Ice fishermen sip vodka at a lake in Moscow
All-cause mortality, males aged 15–54, in Russia and UK 1980–2007

* Mean of rates in component 5-year age groups (15–19 to 50–54 years)  
Source: WHO mortality & UN population estimates
Russian male death rate ratios

~1 bottle of vodka/day vs <0.5 bottles/week:

- 2 x any medical cause
- 4 x road traffic accident
- 6 x any other accident
- 8 x suicide
- 10 x murder

Source: Lancet 27 June 2009
Life expectancy loss of 3 years with moderate obesity and 10 years with smoking

2 kg/m² extra BMI (if overweight) or 10% smoking prevalence shortens life by ~1 yr

Source: Peto, Whitlock, Jha, NEJM, 2010
Survey US women and men & link them to the National Death Index “Facebook of death”

(Hazard ratios* current vs. never smokers, ages 25-79, by gender)

WOMEN WHO SMOKE:  3.0 times more likely to die
MEN WHO SMOKE :  2.8 times more likely to die

Source: Jha et al, NEJM, Jan 24, 2013
US Women, smoker: non-smoker risks over time

Source: Thun et al, NEJM, Jan 24, 2013
FEMALES: Survival probabilities between ages 25 and 80 years among current and never-smokers in the US

HR adjusted for age, education, alcohol, adiposity (BMI), scaled to 2004 national rates, but comparable results if only actual cohort used

Source: Jha et al, NEJM, Jan 24, 2013
MALES: Survival probabilities between ages 25 and 80 years among current and never-smokers in the US

HR adjusted for age, education, alcohol, adiposity (BMI), scaled to 2004 national rates, but comparable results if only actual cohort used

Source: Jha et al, NEJM, Jan 24, 2013
Years gained by quitting smoking by age

- 55-64: 4 years
- 45-54: 6 years
- 35-44: 9 years
- 25-34: 10 years

Source: Jha et al, NEJM, Jan 24, 2013
Reductions in risk by age stopped, UK Women (Million Women’s Study)

Source: Pirie et al, Lancet 2012
Current mortality risks for male smokers vs never smokers

UK/US/Japan
India-cig
Bangladesh-cig/bidi
South Africa-Coloureds
Agincourt-Black
South Africa-White
South Africa-Black

GATS1 (orange) in 14 countries, B,R,I,C, + 10 other LMICs
GATS+US+UK: 16 countries, 4B population, 2.3B age <35

Of 2.3B age<35, 0.5B either smoke, or will smoke by age 30
(at current 25-34 prevalences): 450M male, 50M female.

Source: Giovani, 2012
Delayed hazard: observed (1950, 1990) and predicted (2030) proportions of all deaths at ages 35-69 due to tobacco

**US (all adults)**
- 1950: 12%
- 1990: 33%

**China (men)**
- 1990: 12%
- 2030: 33%

Source: Peto et al, Nature Medicine, 2001
Annual Chinese cigarette production, 1952-2011

Yang G Tob Control 2014;23:167-172
INDIA: Years of life lost among 30 year old smokers* (MDS results)

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Men who smoke bidis</td>
<td>6 years</td>
</tr>
<tr>
<td>Women who smoke bidis</td>
<td>8 years</td>
</tr>
<tr>
<td>Men who smoke cigarettes</td>
<td>10 years</td>
</tr>
</tbody>
</table>

* At current risks of death versus non-smokers, adjusted for age, alcohol use and education (note that currently, few females smoke cigarettes)

Source: Jha et al, NEJM, Feb 2009
Which interventions help current smokers to quit?

• Higher cigarette/bidi taxes: 100% higher price means 20% of CURRENT SMOKERS WILL QUIT
  — Greater effects on the poor and in youth

• Non-price measures: big, local packet warnings labels with tax stamp (to counter smuggling), absolute ad and promo ban, complete ban on public smoking, monitor and report smoking mortality, counter smuggling

• Increased access to nicotine replacement and other cessation therapies

Source: Jha et al, 2013, DCP3
Price elasticity in monkeys (various addictive goods)

Source: Hursh and Winger, 1995
Cigarette prices tripled, consumption halved, tax revenue doubled: FRANCE
Cigarette prices tripled, consumption halved, tax revenue doubled: SOUTH AFRICA

B South Africa

Consumption (cigarettes/adult/day)

Price

Inflation-Adjusted Price (% of price in 1990)


0 100 200 300

0 1 2 3 4 5 6
UK & France, lung cancer mortality trends (35-44) to 1997, but not beyond

UNITED KINGDOM
Lung cancer mortality at ages 35–44

FRANCE
Lung cancer mortality at ages 35–44

*Mean of annual rates in the two component 5-year age groups
Source: WHO mortality & UN population estimates

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Source: WHO mortality & UN population estimates
UK & France, lung cancer mortality trends (35-44) after 1997

Source: Peto, 2012
Low Specific Excise taxes in LMICs

Tripling excise would:
1. Double street price
2. Raise $100 B more in revenue

Source: Jha and Peto, NEJM 2014,
Bidi and cigarettes are more affordable in India.
Plain packaging (Australia) and pictorial warning labels (Canada)
Objections to higher tobacco taxes

- **Job losses:** In most economies, no net impact (money not spent on tobacco is spent on other goods and services)
- **Revenue loss:** “Laffer curve” - revenue declines not seen in practice nearly anywhere
- **Hurts the poor:** Poor more price responsive, and gain more of the health benefits than the rich
- **Smuggling:** Legitimate concern but consumption falls, revenue increases even with smuggling, and can counter with labels with tax stamp, smart labels, and coordination
Social inequalities in male mortality in 1996 from smoking (shaded) and any cause

% risk of dying at ages 35–69

Poland

USA

<table>
<thead>
<tr>
<th>Education level</th>
<th>High &gt;12yr</th>
<th>Mid 12yr</th>
<th>Low &lt;12yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>26%</td>
<td>32%</td>
<td>50%</td>
</tr>
<tr>
<td>Poland</td>
<td>20%</td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td>USA</td>
<td>36%</td>
<td>37%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Jha et al, Lancet, July 2006
Tobacco deaths (% of total), MEN, Canada, 1986-2006, by income

Source: Jha et al, CMAJ submitted
People’s Republic of China
Distribution of marginal taxes and health benefits by SES group

Low SES group:
Pays 6.4% of increased taxes but receives 32.1% of health benefits: hence, health/tax ratio: 5.02
% of income: Net gain for lowest 2 quintiles, net loss for highest 3 quintiles

Source: ADB 2013, Verguet 2013
United States

Distribution of marginal taxes and health benefits by SES group

Low SES group:
- Pays **12.4%** of increased taxes
- Receives **34.0%** of health benefits
- Health/tax ratio: **2.74**
Global smuggling estimates

Source: http://faostat.fao.org
Canada Sharply Reduced Taxes in 1993

Tax reduced in an attempt to counter smuggling.

Impact of 50 cent tax hike on cigarettes in the United States

A further 50 cents per pack hike in the federal excise tax on cigarettes (from $1.01 to $1.51) would:

• Reduce federal budget deficits by $42 billion through 2021
• Raise $38 billion more in revenue by 2021
• Improved health would boost labor earnings and add roughly another $3 billion
• No net impact on Medicaid or Medicare versus Social Security spending

Source: CBO, 2012
Mexico: 7 peso (25%) tax rise, 2010

GOAL: 10 peso hike

- Good epidemiologic analyses
  - Mexico: ~11 M smokers so 4-6 M will die from smoking unless they quit
  - Price elasticities and poverty analyses
  - Immediate follow up numbers to show increasing revenue, decreasing consumption, no major smuggling

- International seminar with MoF:
  - Political visibility
    - Senator Saro
    - Organized NGO protests on steps of MoF
    - Slogan: 10 pesos for 1 million lives saved

- Linked to financing development:
  - “soft earmarking”- more money focused on poverty reduction
National: Epi + economic evidence to raise tax
Local: Randomize politicians to enforce laws

DESH Random intervention:
Local information to leaders on (A) general health; (B) tobacco

Target: MPs, MLAs, doctors, health workers and technocrats in 600 districts

Outcome:
Quit rates

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>No A</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>No B</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

Outcome: Service use & healthcare spending
Marginal costs for maximal child survival are falling

“Critical” incomes is real $ needed to achieve ½ of maximal survival (in that year) from 1970 to 2007

Source: Hum et al, eLife 2012
Marginal costs for maximal adult survival are rising.

"Critical" incomes is real $ needed to achieve ½ of maximal survival (in that year) from 1970 to 2007; note higher adult costs due in part to HIV and tobacco.

Source: Hum et al, eLife 2012
Three “hundreds” by 2030

1. 100 countries/large populations with reliable representative data on causes of death
2. 100 million current smokers quit smoking
3. 100 million existing vascular disease patients on low-cost generic risk pills
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Source: Jha and Peto, NEJM, Jan 2, 2014
www.cghr.org/tobacco
(Don’t buy my books)

@countthedead
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.