21st Century Global Hazards of Smoking

Prabhat Jha

Centre for Global Health Research (CGHR)
Li Ka Shing Knowledge Institute
St. Michael’s Hospital, Dalla Lana School of Public Health,
University of Toronto

Support: Bill and Melinda Gates Foundation, NIH

prabhat.jha@utoronto.ca
Twitter @cghr_org
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 is the best strategy to reduce smoking deaths

• Monitoring is needed: smoking on death certificates

Source: Jha and Peto, in preparation
A billion tobacco deaths in the 21st century on current smoking patterns

Source: Peto et al 2001; Jha, 2009
## Worldwide no of substance users

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
Smoking versus other risks (alcohol, fast driving)

- Risk of addiction is greater for smoking
- No “learning” from youthful excesses
- Risk of death from smoking is much higher: of 1000 males smokers aged 20
  - 250 die from smoking in middle-age
  - 20 die from road accidents or violence (30 from all alcohol-related conditions)

Source: Jha et al., 2000
All-cause mortality, males aged 15–54, in Russia and UK 1980–2007

USSR restricts alcohol mid-1985; use decreases by around 25%
USSR collapses late in 1991
Rouble collapses late in 1998

Annual death rate / 1000 men

Russia

UK

* Mean of rates in component 5-year age groups (15–19 to 50–54 years)

Source: WHO mortality & UN population estimates

Source: Lancet
27 June 2009
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
Lose 3 years with moderate obesity/10 years with smoking
2 kg/m² extra BMI (if overweight) or 10% smoking prevalence shortens life by ~1 yr

Prospective Studies Collaboration (males)

Male British Doctors’ Study

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
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
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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
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.
### Chinese cigarette increase 40 years after US increase

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

<table>
<thead>
<tr>
<th></th>
<th>US (all adults)</th>
<th>China (men)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>12%</td>
<td>1990</td>
</tr>
<tr>
<td>1990</td>
<td>33%</td>
<td>2030</td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td>33%</td>
</tr>
</tbody>
</table>

Source: Peto et al, Nature Medicine, 2001
INDIA: 1 million tobacco deaths per year during the 2010s

Jha et al, NEJM 2008
INDIA: Years of life lost among 30 year old smokers* (MDS results)

- Men who smoke bidis: 6 years
- Women who smoke bidis: 8 years
- Men who smoke cigarettes: 10 years

* 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
Cumulative risk of death, Bangladeshi men age 25-69, smokers vs. nonsmokers

*adjusted for age, alcohol use and education

Source: Alam et al, 2012
Which interventions help current smokers to quit?

• Higher cigarette/bidi taxes: 50% 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
10% higher price = 2-4% current smokers quit = 2-4% kids don’t start

Source: Chaloupka et al, 2008
Price elasticity in monkeys (various addictive goods)

Source: Hursh and Winger, 1995
Cigarette prices tripled, consumption halved, tax revenue doubled: SOUTH AFRICA
Cigarette prices tripled, consumption halved, tax revenue doubled: FRANCE
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
Excise taxes underused in LMICs
Tobacco deaths in Canadian men by income

<table>
<thead>
<tr>
<th>Year</th>
<th>Poorest (%)</th>
<th>Richest (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>46%</td>
<td>30%</td>
</tr>
<tr>
<td>1991</td>
<td>45%</td>
<td>30%</td>
</tr>
<tr>
<td>1996</td>
<td>40%</td>
<td>27%</td>
</tr>
<tr>
<td>2001</td>
<td>39%</td>
<td>24%</td>
</tr>
<tr>
<td>2006</td>
<td>37%</td>
<td>22%</td>
</tr>
</tbody>
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Plain packaging (Australia) and pictorial warning labels (Canada)
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