Overview

- Background and related projects
- Economic rationale for government intervention
- Overview of the evidence on the impact of tax, price and tobacco control policies on tobacco use
- Myths and Facts about the “economic costs” of tobacco taxation and tobacco control
International Tobacco Evidence Network

- Chaloupka and Jha, Co-Directors; Hana Ross Deputy Director
- Continues network developed for World Bank policy report
- Supported by WHO, CDC, Rockefeller Foundation and Open Society Institute
- Technical assistance, dissemination, small grant support
- Briefings for policy-makers
- Country reports on the economics of tobacco and tobacco control in 6 BGI countries
- www.tobaccoevidence.net
International Tobacco Control Policy Evaluation Project
http://www.itcproject.org

Research Support

Core Support provided by the U.S. National Cancer Institute to the Roswell Park TTURC (P50 CA111236)
NCI & WHO Monograph 21

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The Economics of Tobacco Control

Sept. 2009
Why Economics?

Economic arguments around tobacco control are unclear and often debated

- **In 1996**, an Asian Health Minister stated “cigarette producers are making large contributions to our economy... we have to think about workers and tobacco farmers”

- **In 1997**, *The Economist* commented "most smokers (two-thirds or more) do not die of smoking-related disease. They gamble and win. Moreover, the years lost to smoking come from the end of life, when people are most likely to die of something else anyway”

Tobacco Use Rising Globally

- 1.1 billion adult smokers currently
  - projected to rise to 1.6 billion by 2025
- Cigarettes account for vast majority of tobacco use globally
- Use generally declining in high-income countries
  - More concentrated in lower income, less educated groups
- Use rising in many low/middle-income countries
  - particularly among women and children
Large and growing number of deaths from smoking

Past and future tobacco deaths (in millions)

<table>
<thead>
<tr>
<th>Time</th>
<th>Millions of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901-2000</td>
<td>100 (mostly in developed countries)</td>
</tr>
<tr>
<td>2001-2100</td>
<td>1,000 (mostly in developing countries)</td>
</tr>
</tbody>
</table>

- 500 M among people alive today
- 1 in 2 of long-term smokers killed by their addiction
- 1/2 of deaths in middle age (35-69)

Source: Peto and Lopez, 2000
Smoking accounts for much of the mortality gap between rich and poor
Risk of death of a 35 year old male before age 70, by education levels in Poland, 1996

Source: Bobak et al., 2000
Why should governments intervene? Economic rationale or “market failures”

- Smokers do not know their risks

Source: Jha et al., 2000
Underestimated risks of smoking

- 7 in 10 of Chinese smokers thought smoking does little or no harm.
- Risks not internalized: personal risks perceived lower than average risks.
- Risks of addiction downplayed: only 2 in 5 of US adolescents intending to quit actually do.
  - in high-income countries, 7 in 10 smokers wish they had not started.

Why should governments intervene? Economic rationale or “market failures”

- Smokers do not know their risks
- Addiction and youth onset of smoking
  - Lack of information and unwillingness to act on information
  - Regret starting later, but many addicted

Source: Jha et al., 2000
Tobacco addiction starts early in life

Every day 80,000 to 100,000 youths become regular smokers

Why should governments intervene?
Economic rationale or “market failures”

- Smokers do not know their risks
- Addiction and youth onset of smoking
  - Lack of information and unwillingness to act on information
  - Regret habit later, but many addicted
- Costs imposed on others (externalities)
  - Costs of environmental tobacco smoke and health costs

Source: Jha et al., 2000
Healthcare costs from smoking

- **Annual (gross) healthcare costs:**
  - 0.1-1.1% of GDP, or 6 -15% of total health costs in high-income countries
  - proportionally similar in lower-income countries

- **Net (lifetime) healthcare costs:**
  - Differences in lifetime costs are smaller than annual costs
  - Best studies do suggest there are net lifetime costs
  - Pension or “smokers pay their way” arguments are complex

Source: Lightwood *et al.*, 2000
Government roles in intervening

- To deter children from smoking
- To protect non-smokers from others’ smoke
- To provide adults with necessary information to make an informed choice

- *First-best instrument, such as youth restrictions, are usually ineffective. Thus, tax increases are justified, and are effective.*
- *Tax increases are blunt instruments.*

Source: Jha et al., 2000
Unless current smokers quit, smoking deaths will rise dramatically over the next 50 years.

Source: Peto and Lopez, 2001
Which interventions are effective?

Measures to reduce demand

- Higher cigarette taxes
- Non-price measures:
  - consumer information, research, cigarette advertising and promotion bans, warning labels and restrictions on public smoking
- Increased access to nicotine replacement (NRT) and other cessation therapies
Why Tax Tobacco?

- **To generate revenues**
  - primary reason historically
- **To improve public health by reducing tobacco use**
  - increasingly common goal
- **To cover the external costs of tobacco use**
  - infrequently used argument

Source: Chaloupka et al., 2000
Taxes and Tobacco Product Prices

Inflation Adjusted Cigarette Taxes and Prices

Source: Van Walbeek, 2003
Taxes and Tobacco Product Prices

State Cigarette Taxes and Prices, November 1, 2006

\[ y = 1.2013x + 2.9658 \]

\[ R^2 = 0.9256 \]
Taxes and Tobacco Product Prices

- Tax levels and, as a result prices, vary widely across countries

Price and Tax by Region, 2004-05

Source: Yurekli and Onder, 2006
Impact of Tax and Price on Tobacco Use

- Higher taxes and prices induce quitting, reduce consumption and prevent starting

- A 10% price increase reduces demand by:
  - 4% in high-income countries
  - Up to 8% in low or middle-income countries

- Potential substitution among tobacco products in response to changes in relative prices
  - Particularly important issue where non-manufactured tobacco products widely available

Source: Chaloupka et al., 2000
Cigarette price and consumption show opposite trends

Cigarette Prices and Cigarette Sales
United States, 1970-2007

Source: ImpacTeen project, 2008
Cigarette price and consumption show opposite trends

Real price of cigarettes and annual per adult cigarette consumption in South Africa 1960-2002

Source: van Walbeek, 2003
Impact of Tobacco Taxation

- Impact on prevalence about half of impact on overall cigarette consumption
  - A 10% price increase reduces prevalence by about 2% in high-income countries
    - Likely larger in low/middle-income countries
  - Most of impact on prevalence results from adult cessation
    - 10% price increase increases quit attempts by 10-12%, about 1 in 5 successful in long run
  - Addiction implies a larger long-run response to permanent price increases
    - Estimates imply long run impact up to twice as large as short run impact

Sources: Chaloupka et al., 2000; Tauras and Chaloupka, 2001; Tauras, 2004
Youth More Responsive to Price Increases

**Economic Theory Suggests Several Reasons**

- Greater importance of peer influences for youth
  - Accounts for about 1/3 of overall impact
- Low Incomes
- Shorter smoking histories imply less addicted
- More present-oriented than adults
- Other spillover effects
  - For example, through parental smoking

Sources: Chaloupka 2003; Powell and Chaloupka, 2005; Powell et al. 2005
Youth More Responsive to Price Increases

- **High Income Countries (largely US):**
  - Impact of price on youth smoking 2-3 times as large as on adult smoking
    - 10% increase in price reduces youth prevalence by 6-7%; comparable reductions in number of cigarettes consumed by continuing youth smokers
  - Impact of price on youth smoking largely result of deterred initiation of regular smoking
    - 10% price increase reduces any initiation by 2-3%, but reduces initiation of daily smoking by 9-10%

- **Similar evidence emerging from a number of low and middle-income countries**
  - 10% increase in price reduces initiation by 12% in Vietnam

Sources: Chaloupka, et al. 2000; Tauras et al. 2001; Ross and Chaloupka, 2006
Price Sensitivity and Income

- Economic theory implies smoking among lower-income populations more responsive to price
- Consistent with empirical evidence from high income countries:
  - UK: 10% price increase reduces smoking by about 10% in lowest socioeconomic group but has little impact on highest socioeconomic group
- Similar evidence emerging from a number of low and middle-income countries
  - Bulgaria – reductions in smoking among low/middle-income groups nearly three times greater than among high income group in response to price increase

Sources: Chaloupka, et al. 2000; Ross and Chaloupka, 2006
What is the “right” level of tax?

- **Complex question**
  - Depends on various factors, such as degree to which society wishes to protect children, revenue considerations, etc.

- **Useful yardstick:** where comprehensive programs used, tax is at least 2/3 to 4/5 of retail price.

Source: Jha and Chaloupka, 1999
There is still ample room, especially in lower-income countries, to raise cigarette taxes.
Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
Effect of advertising and promotion bans

- **High Income Countries:**
  - Comprehensive ban on tobacco advertising and promotion reduces consumption by about 6%
  - Partial bans have little impact given potential to substitute to non-banned media

Source: Saffer and Chaloupka, 2000
Comprehensive advertising bans reduce cigarette consumption

Consumption trends in countries with such bans vs. those with no bans
(n=102 countries)

Source: Saffer, 2000
Partial bans induce increases in other marketing efforts

US cigarette marketing expenditures, 1975-2003

Source: Tauras, Peck and Chaloupka, 2007
Effect of advertising and promotion bans

- High Income Countries:
  - Comprehensive ban reduces consumption by about 6%
  - Partial bans have little impact

- Low & Middle Income Countries:
  - Larger reductions in tobacco use from comprehensive ban
    - nearly 25% drop in consumption
  - Partial bans have significant impact on consumption
    - Over 13% reduction

Source: Saffer and Chaloupka, 2000; Blecher, in press
Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Bans on smoking in public places and all work places
Smoke-Free Air Laws and Cigarette Smoking

- **Smoke-free air laws:**
  - reduce cigarette consumption and promote cessation
  - protect non-smokers from exposure to harmful tobacco smoke
  - can be self-enforcing
  - work best with social consensus against smoking
  - Can strengthen anti-smoking norms
  - Do not have an adverse economic impact on businesses covered by the policies

Source: Woolery et al., 2000; IARC, in press
International Tobacco Control Policy Survey Expansion—Ireland Project

◆ Quasi-experimental design:
  - Ireland: 1,000 randomly selected adult smokers
  - U.K.: 600 randomly selected adult smokers
  - Cohort design:
    Wave 1: Dec 2003–Jan 2004
    **Workplace Ban: Mar 29, 2004**
    Wave 2: Dec 2004–Jan 2005

◆ Survey identical to 4-country survey; adds more extensive set of evaluation measures relating to smoke-free laws
Prevalence of Smoking in Key Venues

Smoking Prevalence in Workplaces

- **U.K.**
- **Ireland**

![Graph showing smoking prevalence in workplaces in the U.K. and Ireland before and after a policy change.]
Prevalence of Smoking in Key Venues

Smoking Prevalence in Bars/Pubs

Percentage of Respondents

U.K.  Ireland

Pre-Policy
Dec 2003-Jan 2004

Post-Policy
Dec 2004-Jan 2005

Prevalence of Smoking in Key Venues
Support for Total Ban in Workplaces

Percentage of Respondents

Pre-Policy Dec 2003-Jan 2004
Post-Policy Dec 2004-Jan 2005

U.K.
Ireland

Support for Total Ban in Workplaces

International Tobacco Control
Policy Evaluation Project
Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Bans on smoking in public and work places
- Increased consumer information: dissemination of research findings, warning labels, counter-advertising
# Health information reduces the demand for cigarettes

<table>
<thead>
<tr>
<th>Country</th>
<th>Time</th>
<th>Event</th>
<th>Immediate reduction in cigarette consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>The US</td>
<td>1964</td>
<td>Surgeon General Report</td>
<td>1-2%</td>
</tr>
<tr>
<td>UK</td>
<td>1962</td>
<td>1st report of the Royal College of Physicians</td>
<td>5%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1966</td>
<td>An anti-smoking campaign</td>
<td>11%</td>
</tr>
<tr>
<td>Turkey</td>
<td>1982</td>
<td>Implementation of health warning labels</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: Kenkel and Chen, 2000
Between Wave 1 and Wave 2, two information policies implemented in the U.K.:


— **Sep 2003**: Ban on “light” “mild” and other descriptors per EU Directive 2001/37/EC

Consistent with FCTC provisions
The enhancement of warning labels in the U.K. had a huge impact on labels salience/noticing, way above even Canada. But this is a measure of noticing, where mere novelty alone would be expected to have a huge effect.
Label Stopped You From Smoking

Still a significant increase in U.K. compared to the other countries, but not above Canada at W2.

Evidence for limitation of effect of mere text/size enhancements relative to graphic elements.
Smokers who report that the labels make them more likely to think about risks of smoking were:

- more likely to attempt to quit (OR = 1.14)
- more likely to successfully quit (OR = 1.89)

Thus, there is a connection between warning labels and quit attempts/successful quit attempts.
Labels may have greater impact in low- and middle-income countries

<table>
<thead>
<tr>
<th>How often in the last 6 months have...</th>
<th>% Often or Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITC-SE Asia</strong></td>
<td><strong>ITC 4-Country</strong></td>
</tr>
</tbody>
</table>
| 1. you noticed the health warnings on cigarette packages? | Malaysia = 53%  
Thailand = 62% | Canada = 60%, Australia = 52%  
United Kingdom = 44%  
United States = 30% |
| 2. you read or looked closely at the health warnings on cigarette packages? | Malaysia = 38%  
Thailand = 44% | Canada = 33%, Australia = 26%  
United Kingdom = 22%  
United States = 16% |
| 3. the warnings stopped you from having a cigarette when you were about to smoke one? | Malaysia = 28%  
Thailand = 36% | Canada = 19%, Australia = 12%  
United Kingdom = 9%  
United States = 14% |

SE Asia: Higher levels of salience than even Canada. Labels may have greater impact in low/middle income countries (few other information sources).
Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Bans on smoking in public and workplaces
- Increased consumer information
- Increased access to cessation services and products (e.g. NRT)
Increased access to smoking cessation

- Increased NRT availability significantly increases NRT use and reduces cigarette demand
- Lower NRT prices increase use of NRT
  - Higher cigarette prices raise NRT demand
- Lower NRT prices reduce cigarette demand
- More extensive advertising of NRT raises NRT demand

Source: Tauras and Chaloupka, 2003, 2005; Chaloupka and Tauras, 2004
NRT and cessation therapies

- NRTs double the effectiveness of cessation efforts and reduce individuals’ withdrawal costs.
- NRTs often unavailable or expensive in many countries.
  - Particularly low and middle-income countries
- Governments may widen access to NRT and other cessation therapies by:
  - Reducing regulation
  - Conducting more studies on cost-effectiveness (especially in low/middle income countries)
  - Considering NRT subsidies for poorest smokers

Source: Novotny et al., 2000
Potential impact of price increase, increased access to NRT, and set of non-price measures

Source: Jha, Chaloupka, et al., 2007
How cost-effective is tobacco control?

US dollars (2002) per healthy year life gained

<table>
<thead>
<tr>
<th>Region</th>
<th>Price increases of 33%</th>
<th>Non-price measures with effectiveness of 2-10%</th>
<th>NRT with effectiveness of 1-5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low / middle income</td>
<td>3 to 42</td>
<td>54 to 674</td>
<td>55 to 761</td>
</tr>
<tr>
<td>High Income</td>
<td>85 to 1,773</td>
<td>1,166 to 14,572</td>
<td>175 to 3,781</td>
</tr>
</tbody>
</table>

Compares favorably to cost-effectiveness of other public health interventions

Source: Jha, Chaloupka, et al., 2007
Which interventions are ineffective at reducing consumption?

- Prohibition
- Trade restrictions
- Youth access restrictions
  - May be important for political purposes
  - Impact in low/middle-income countries less clear
- Crop substitution
  - Potentially important in aiding transition of tobacco farmers
- Control of smuggling is the only exception and it is the key supply-side measure

Source: Jacobs et al., 2000; Woolery et al., 2000; Taylor et al., 2000
Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
Costs to Individuals

**Myth:** Governments should not raise cigarette taxes because such increases will harm low income smokers.

**Facts:**

- Tobacco use concentrated in lowest income populations.
- Low income populations most harmed by tobacco use.
- Lowest income smokers most responsive to price changes.

*Implies tax increases can be progressive*
Tobacco Spending and Income

Cambodia

Median % Share of Tobacco in Income (All Smoking Households)

Source: Ross, 2005
Myths and Facts about the “costs” of tobacco control?

- **Cost to individuals, especially the poor**
  - greatest reductions in tobacco use in response to tax & price increases
  - use of revenues to help low-income smokers quit and/or support other programs targeting poorest can offset any negative impact
Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
- Job losses
Job Losses

**Myth:** Governments should not raise cigarette taxes or engage in other tobacco control efforts because this will lead to significant job losses

**Facts:**

- Tobacco-related employment falling in most countries as result of industry activities
- Presence of tobacco growing and manufacturing does not imply dependence on growing/manufacturing
Tobacco Taxes and Jobs

Number of Employees in the Tobacco Manufacturing Industry in Hungary, 1975-1999

Source: Yurekli, 2001
Tobacco Taxes and Jobs


Source: Yurekli, 2001
Tobacco Taxes and Jobs

Tobacco Industry Employment and Share Of Manufacturing Employment, Mexico, 1994-2005

Source: Sáenz de Miera Juárez, et al., 2007 (draft)
Studies on the employment effects of dramatically reduced or eliminated tobacco consumption

<table>
<thead>
<tr>
<th>Type of country</th>
<th>Name and year</th>
<th>Net change as % of economy in base year given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Exporters</td>
<td>US (1993)</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>UK (1990)</td>
<td>+0.5%</td>
</tr>
<tr>
<td></td>
<td>Zimbabwe (1980)</td>
<td>-12.4%</td>
</tr>
<tr>
<td>Balanced Tobacco</td>
<td>South Africa (1995)</td>
<td>+0.4%</td>
</tr>
<tr>
<td>Economies</td>
<td>Scotland (1989)</td>
<td>+0.3%</td>
</tr>
<tr>
<td>Net Importers</td>
<td>Bangladesh (1994)</td>
<td>+18.7%</td>
</tr>
</tbody>
</table>

Source: Buck and others, 1995; Irvine and Sims, 1997; McNicoll and Boyle 1992, van der Merwe and others, background paper; Warner and others 1996
Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
- Job losses
- Revenue losses
Revenue Losses

**Myth:** Governments should not raise cigarette taxes because reduced consumption and increased tax avoidance/smuggling will result in lost revenues

**Facts:**
- Revenues rise when tobacco taxes rise even as consumption falls
- Revenues rise even if tax avoidance and smuggling increase
Tobacco Taxes and Revenues

Federal Cigarette Tax and Tax Revenues, Inflation Adjusted, United States, 1970-2005

Source: Tax Burden on Tobacco, 2006, and author’s calculations

Source: Van Walbeek, 2003
Myths and Facts about the “costs” of tobacco control?

- Cost to individuals, especially the poor
- Job losses
- Revenue losses
- Smuggling
Smuggling

**Myth:** Governments should not raise cigarette taxes because higher taxes will result in significant tax avoidance and smuggling

**Facts:**

- Other factors as or more important than tax levels
- Benefits of higher taxes exist despite smuggling
- Effective options exist for curbing smuggling
Smuggling of Cigarettes

- Industry has economic incentive to smuggle
  - Increase market share and decrease tax rates
- Estimated 6 to 8.5% of total consumption
- Non-price variables important
  - Perceived level of corruption more important than cigarette prices
- Tax increase will lead to revenue increase, even in the event of increased smuggling

Tobacco smuggling tends to rise in line with the degree of corruption

Smuggling as a function of transparency index

\[ y = -0.02x + 0.2174 \]
\[ R^2 = 0.2723 \]

Source: Merriman et al., 2000
Canada Sharply Reduced Taxes in 1993

Tax reduced in an attempt to counter smuggling

Sweden Reduced Cigarette Taxes by 17% in 1998


Control of Smuggling

- Countries need not make a choice between higher cigarette tax revenues and lower cigarette consumption
  - Higher tax rates can achieve both

- Effective control measures of smuggling exist
  - Tax stamps, particularly high tech stamps
  - Focus on large container smuggling
  - Prominent local language warnings and other pack markings
  - Increase penalties and strengthen enforcement
  - Licensing of all involved in tobacco product distribution

- Multilateral tax increases help combat smuggling

Summary

- Tobacco deaths worldwide are large and growing
- Specific market failures provide economic rationale for government intervention
- Tax increases are highly effective in reducing tobacco use
- Other demand reducing tobacco control policies called for in FCTC are very effective in reducing tobacco use
- Economic arguments about the costs of tobacco taxation and tobacco control are misleading and often false