

The Economics of Tobacco and Tobacco Control

Frank J. Chaloupka

University of Illinois at Chicago

International Tobacco Evidence Network

International Tobacco Control Policy Evaluation Project



Overview

- Background and related projects
- Brief discussion of tobacco use trends and health consequences, and role of government in tobacco markets
- Brief overview of the Framework Convention on Tobacco Control
- Overview of the evidence on the impact of price and tobacco control policies on tobacco use
- Myths and Facts about the “economic costs” of tobacco taxation and tobacco control

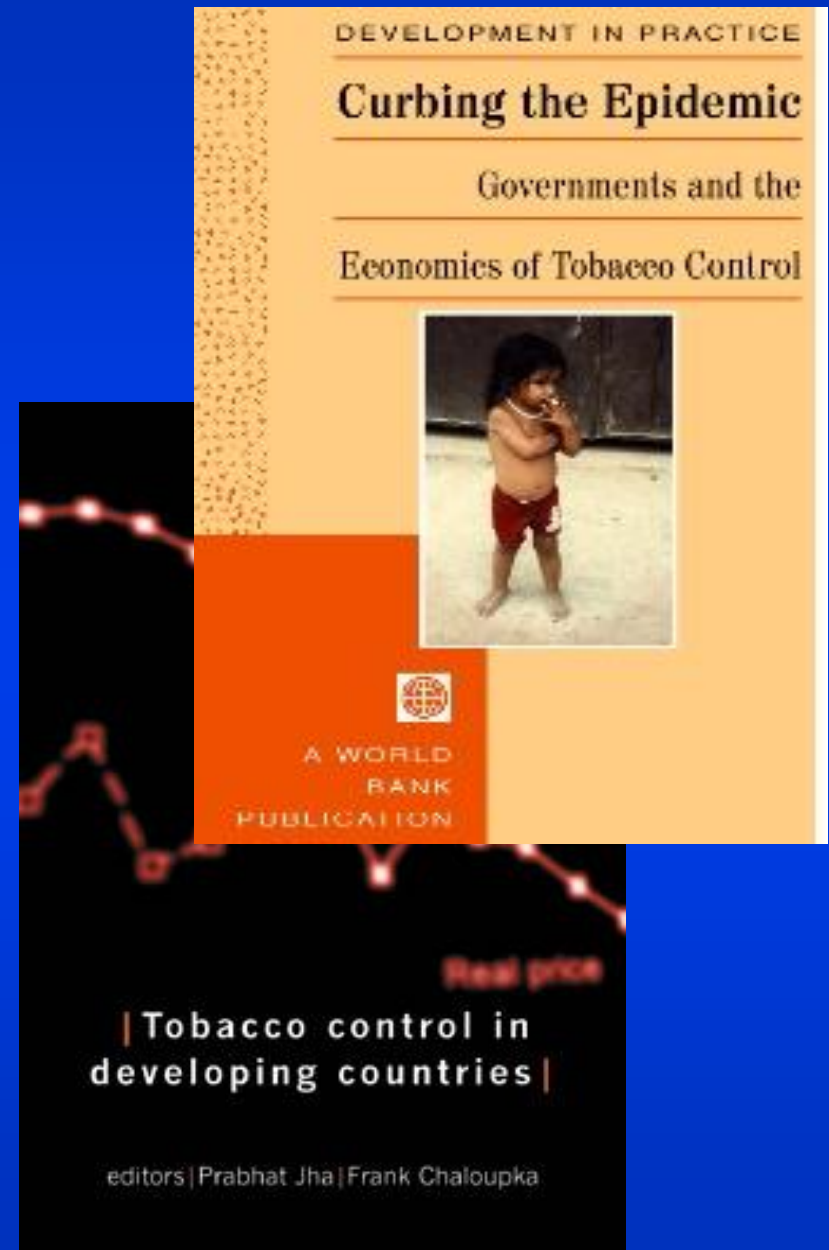
Prabhat Jha
University of Toronto
and
Frank Chaloupka
University of Illinois
at Chicago



The World Bank



WHO



International Tobacco Evidence Network

- ◆ **Chaloupka and Jha, Co-Directors; Hana Ross Deputy Director**
 - ☞ Numerous international collaborators
- ◆ **Continues network developed for World Bank policy report**
- ◆ **Supported by WHO, CDC, Rockefeller Foundation and Open Society Institute**
- ◆ **Technical assistance, dissemination, small grant support**
 - ☞ Funded projects in South Africa, Poland, Mexico
 - ☞ Support projects in Central/Eastern Europe and Southeast Asia
- ◆ **Briefings for policy-makers**
- ◆ **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)



ITC Project—Methods, Measures, and Design

- Led by Geoffrey T. Fong (U. of Waterloo) and Mike Cummings (Roswell Park Cancer Institute)
 - ◆ Large and growing team of international collaborators
- ITC Project: using best practices in evaluation research to build the evidence base for FCTC policies (and other future tobacco control policies)
- Evaluation measures:
 - ◆ validated measures from established surveys
 - ◆ standardized and consistent across countries
- Evaluation research design and methods:
 - ◆ identical/similar across countries
 - ◆ evaluation at the level of the individual

ITC Project—Four-Country Survey

- Representative national samples of adult smokers:
 - ◆ Canada (N=2,193)
 - ◆ United States (N=2,115)
 - ◆ United Kingdom (N=2,344)
 - ◆ Australia (N=2,271)
- Random-digit dialed telephone survey (45 min)
- Cohort survey:
 - ◆ 4 Waves to date
- Other countries added over time (Ireland, Malaysia, Thailand, Korea, China – France, India, and New Zealand in planning stages)

NCI & WHO Monograph 21

Frank J. Chaloupka
Geoffrey T. Fong
Cornel van Walbeek
Ayda Yurekli

*The Economics of
Tobacco Control*

Sept. 2007

NATIONAL
CANCER
INSTITUTE

National Cancer Institute

U.S. National Institutes of Health | www.cancer.gov



WHO



Large and growing number of deaths from smoking

Past and future tobacco deaths (in millions)

<u>Time</u>	<u>Millions of deaths</u>
1901-2000	100 (mostly in developed countries)
2001-2100	1,000 (mostly in developing countries)

- ◆ **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)*

Why should governments intervene?

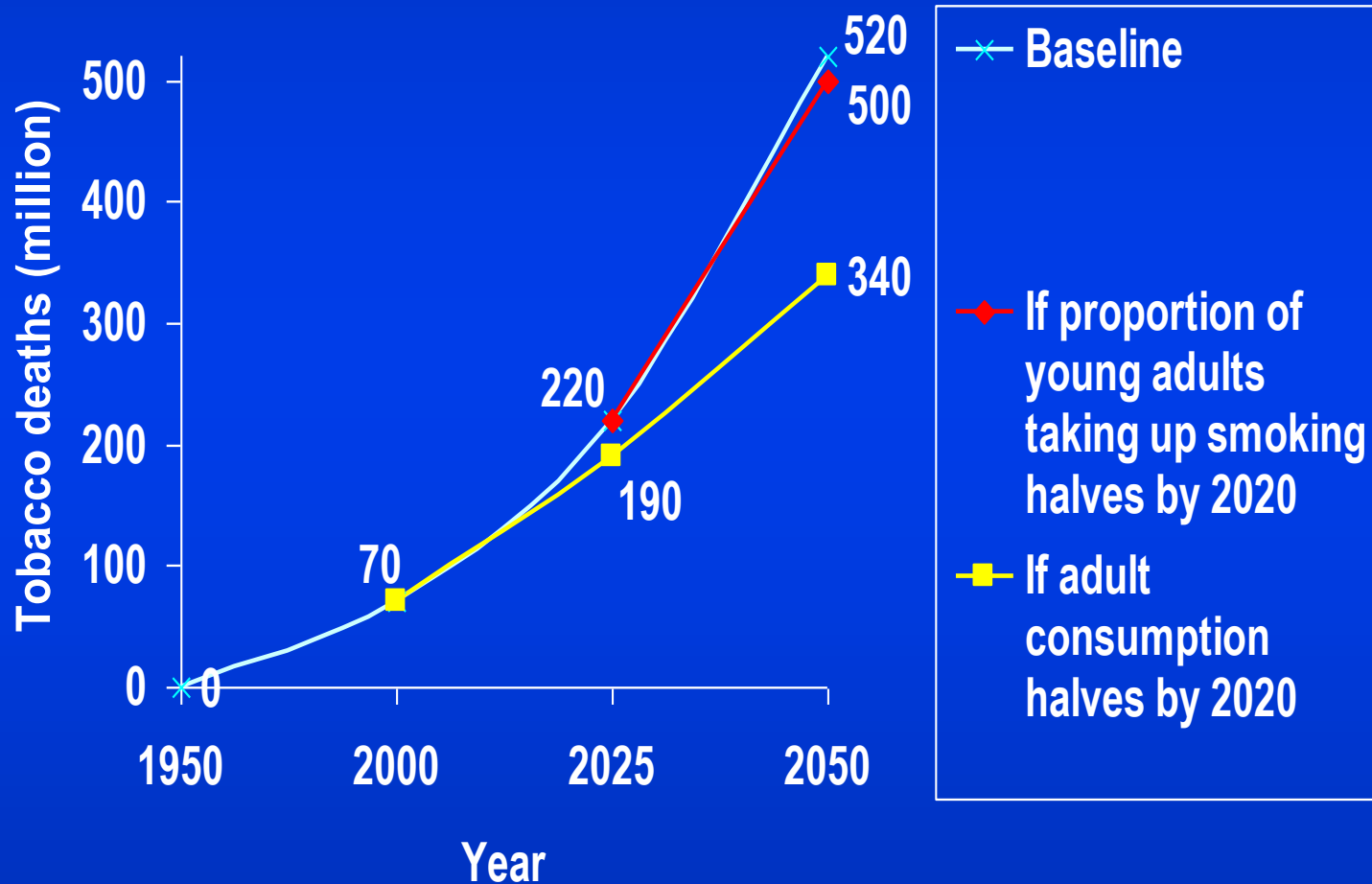
Economic rationale or “market failures”

- **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**
 - ◆ Costs of environmental tobacco smoke and health costs

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.***

Unless current smokers quit, smoking deaths will rise dramatically over the next 50 years



Source: Peto and Lopez, 2001

Framework Convention on Tobacco Control

- Multilateral treaty promoting coordinated, global response to tobacco use
 - ◆ Adopted in 2003 and entered into force in 2004
 - ◆ Requires countries that have signed and ratified treaty to adopt strong tobacco control policies by end of 2009
 - ◆ Policies based on evidence largely from high-income countries
 - ☞ Consistent with emerging evidence from low/middle-income countries

Framework Convention on Tobacco Control

■ Key Policy Provisions

- ◆ Increase tobacco taxes
- ◆ Enact comprehensive bans on advertising and promotion
- ◆ Protect citizens from exposure to tobacco smoke
- ◆ Disseminate information through access to comprehensive educational and public awareness programs
- ◆ Regulate packaging and labeling
- ◆ Regulate testing and disclosure of content/emissions of tobacco products
- ◆ Promote and implement programs promoting cessation
- ◆ Combat smuggling
- ◆ Prohibit sale of tobacco products to minors
- ◆ Implement policies promoting viable alternatives to tobacco farming

Taxation is highly effective policy

Industry clearly understands the impact of tobacco taxation

"With regard to taxation, it is clear that in the US, and in most countries in which we operate, tax is becoming a major threat to our existence."

"Of all the concerns, there is one - taxation - that alarms us the most. While marketing restrictions and public and passive smoking (restrictions) do depress volume, in our experience taxation depresses it much more severely. Our concern for taxation is, therefore, central to our thinking...."

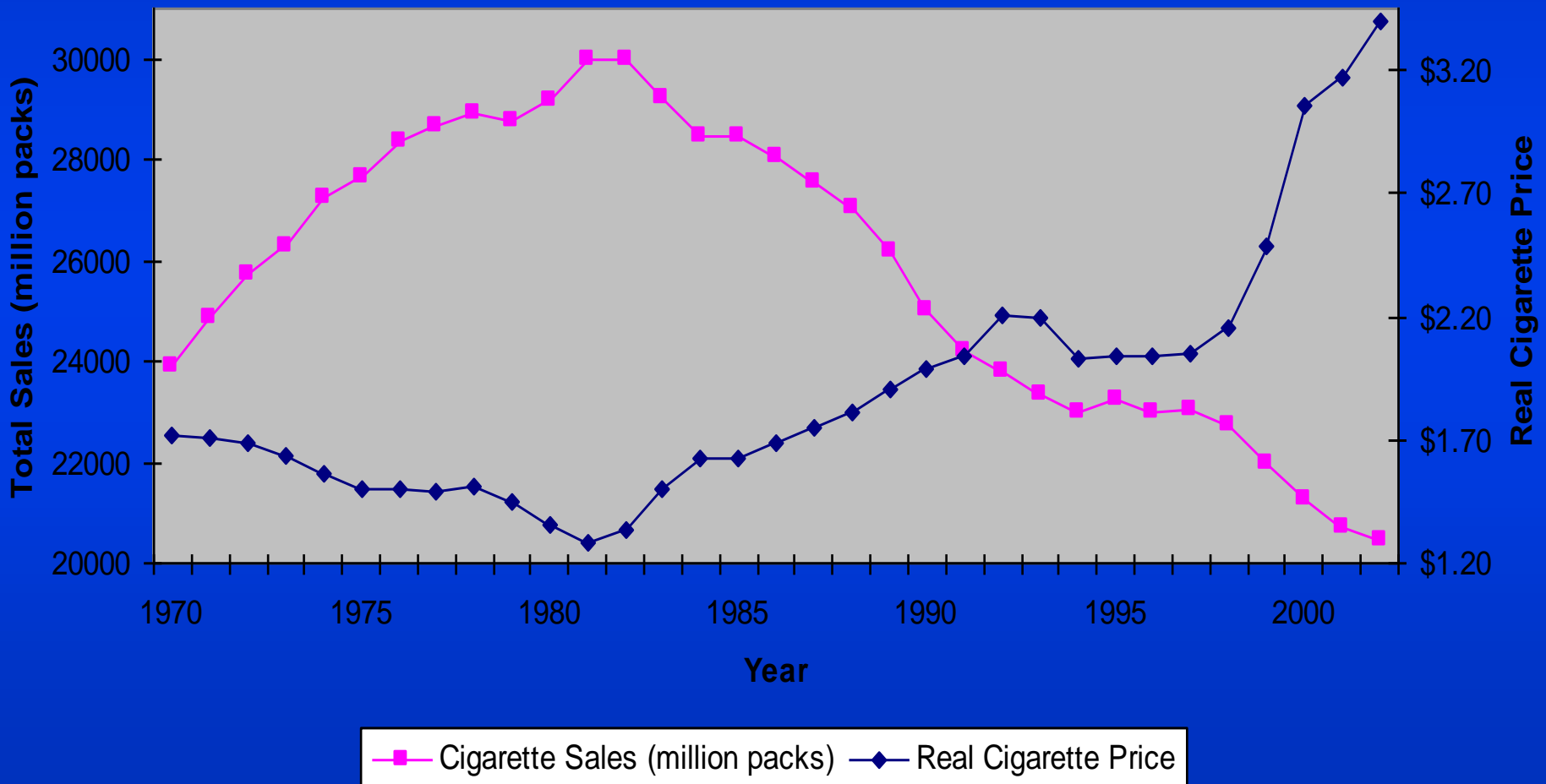
Impact of Taxation on Tobacco Use

- Higher taxes 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

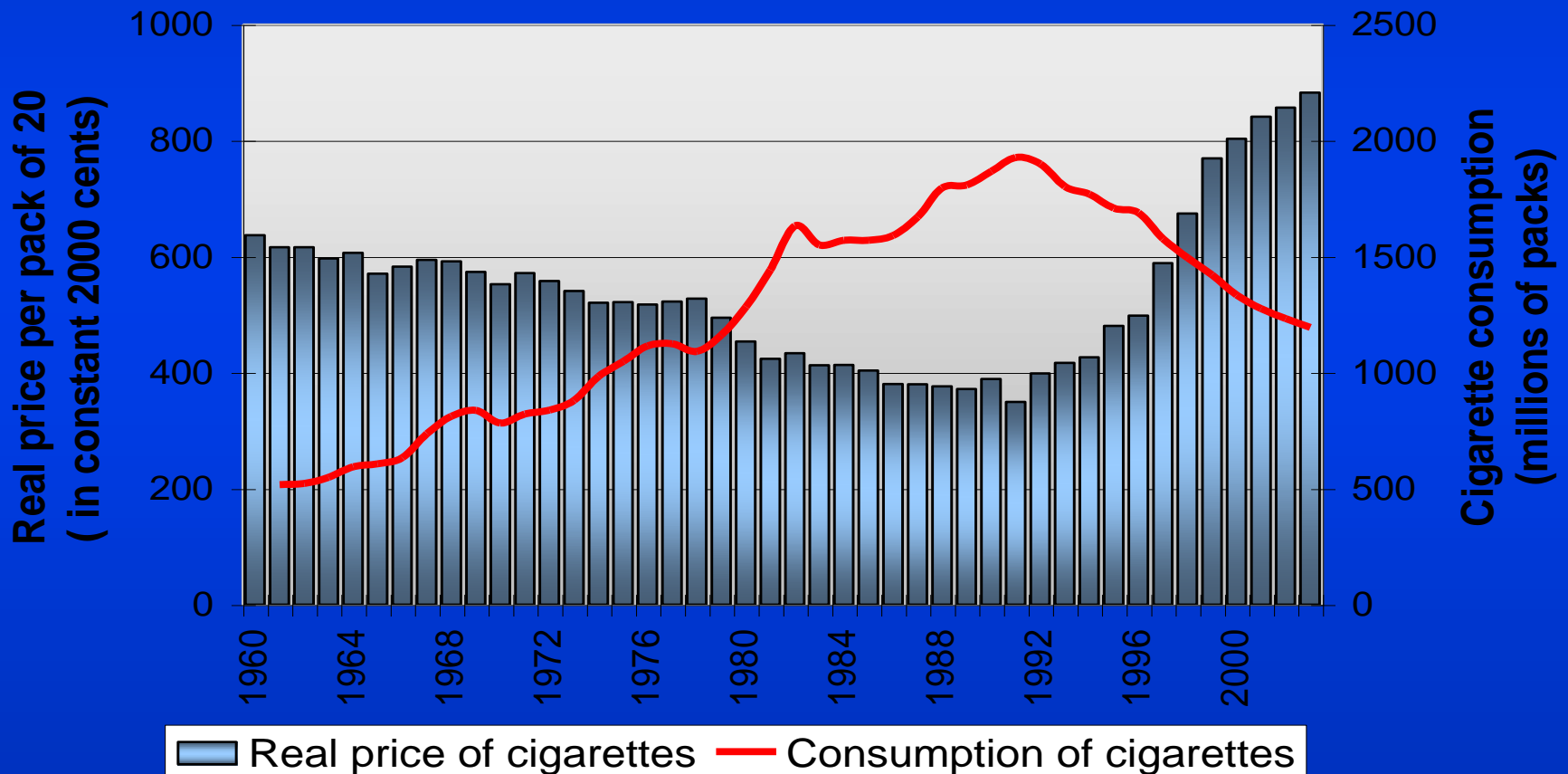
United States, Total Cigarette Sales and Cigarette Prices, 1970-2002



Source: ImpacTeen, 2003

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

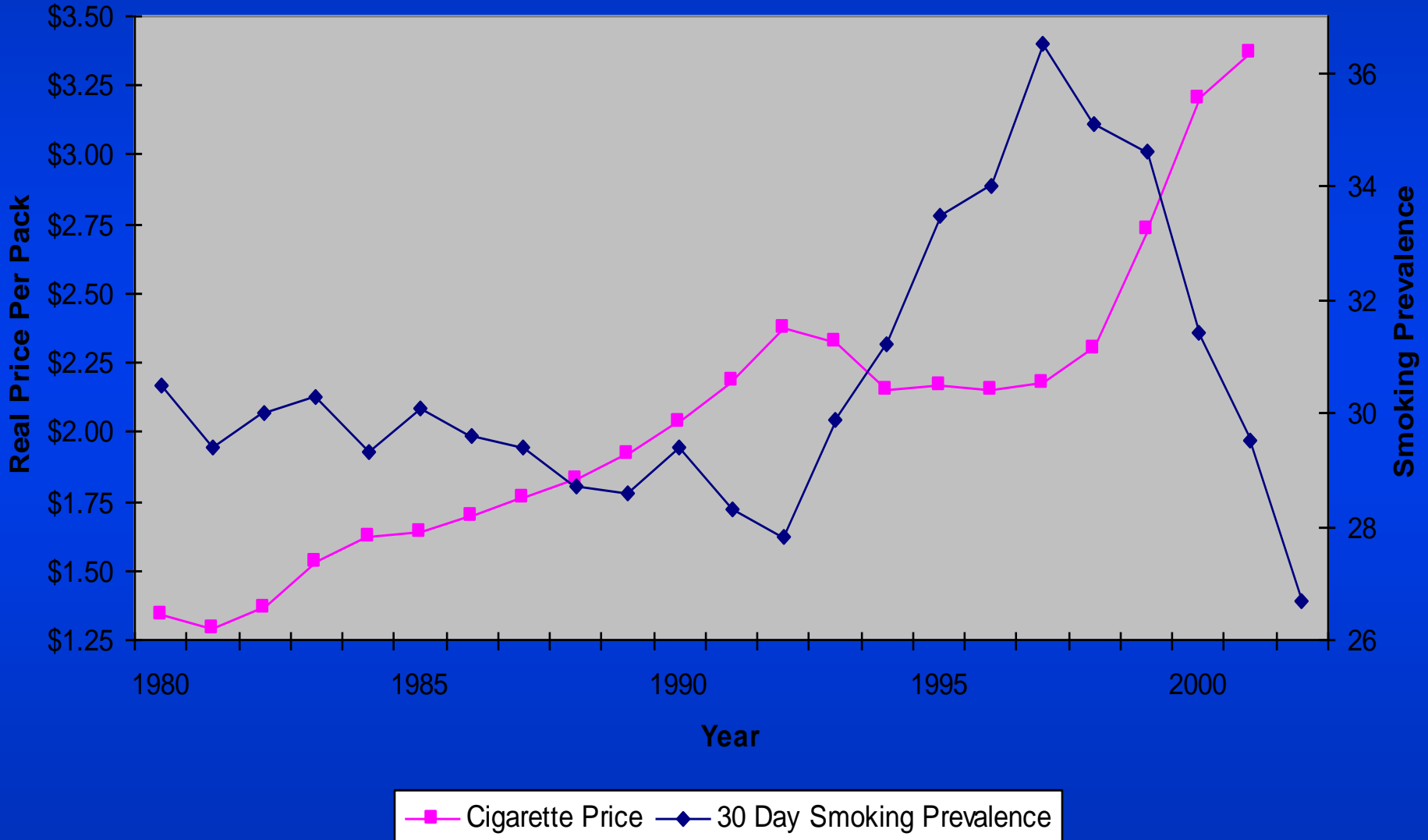
Youth More Responsive to Price Increases

- **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, in press

Cigarette price and youth smoking

Real price of cigarettes and youth smoking prevalence, US, 1975-2002



Source: ImpacTeen, 2003

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, in press

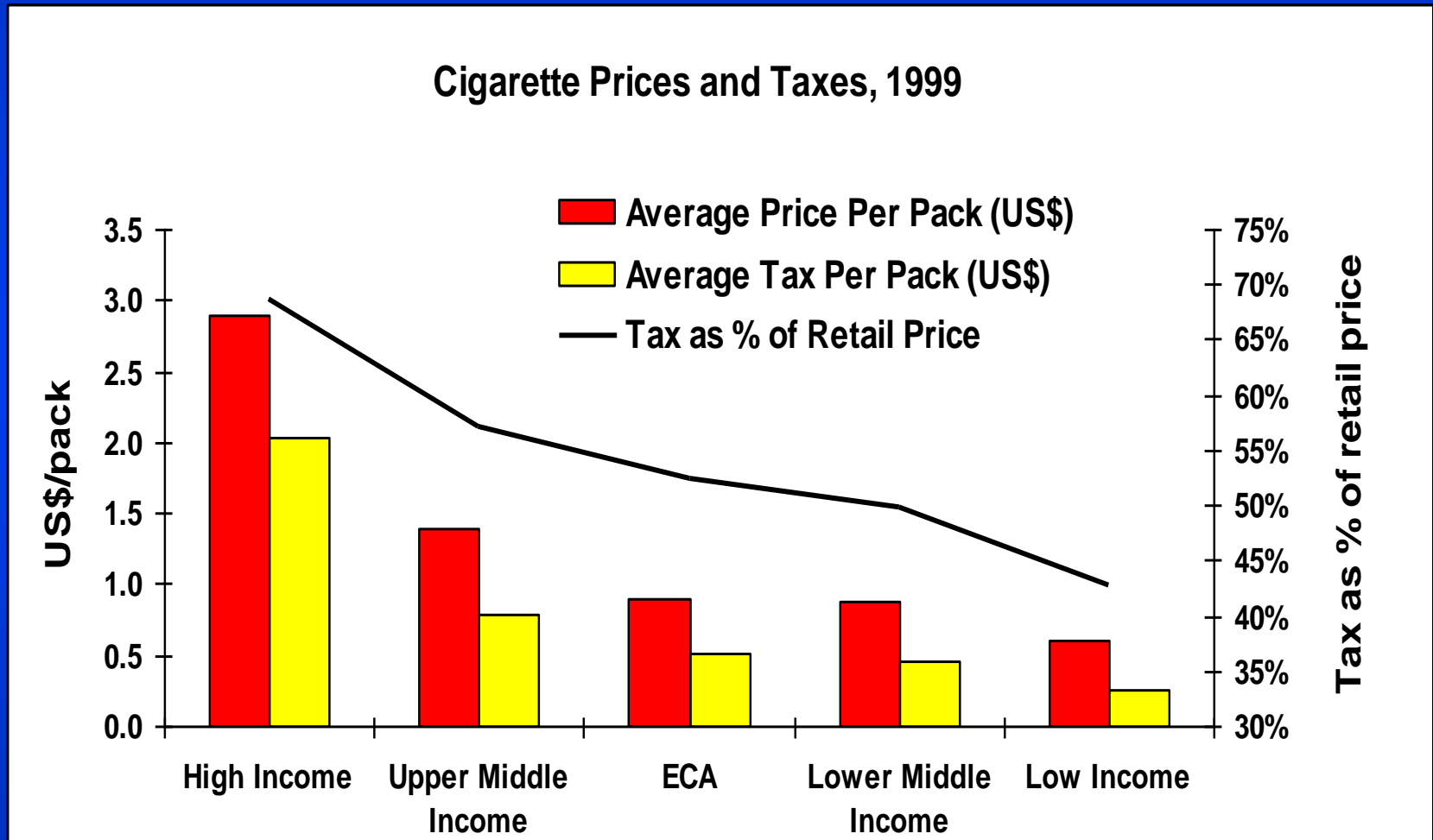
What is the “right” level of tax?

- **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.**

There is still ample room, especially in lower-income countries, to raise cigarette taxes



Source: World Bank, 2002

Non-price measures to reduce demand

- Comprehensive ban on advertising and promotion
- Restrictions on smoking in public and work places
- Increase consumer information:
dissemination of research findings, warning labels, counter-advertising
- Increase access to nicotine-replacement therapies (NRT)

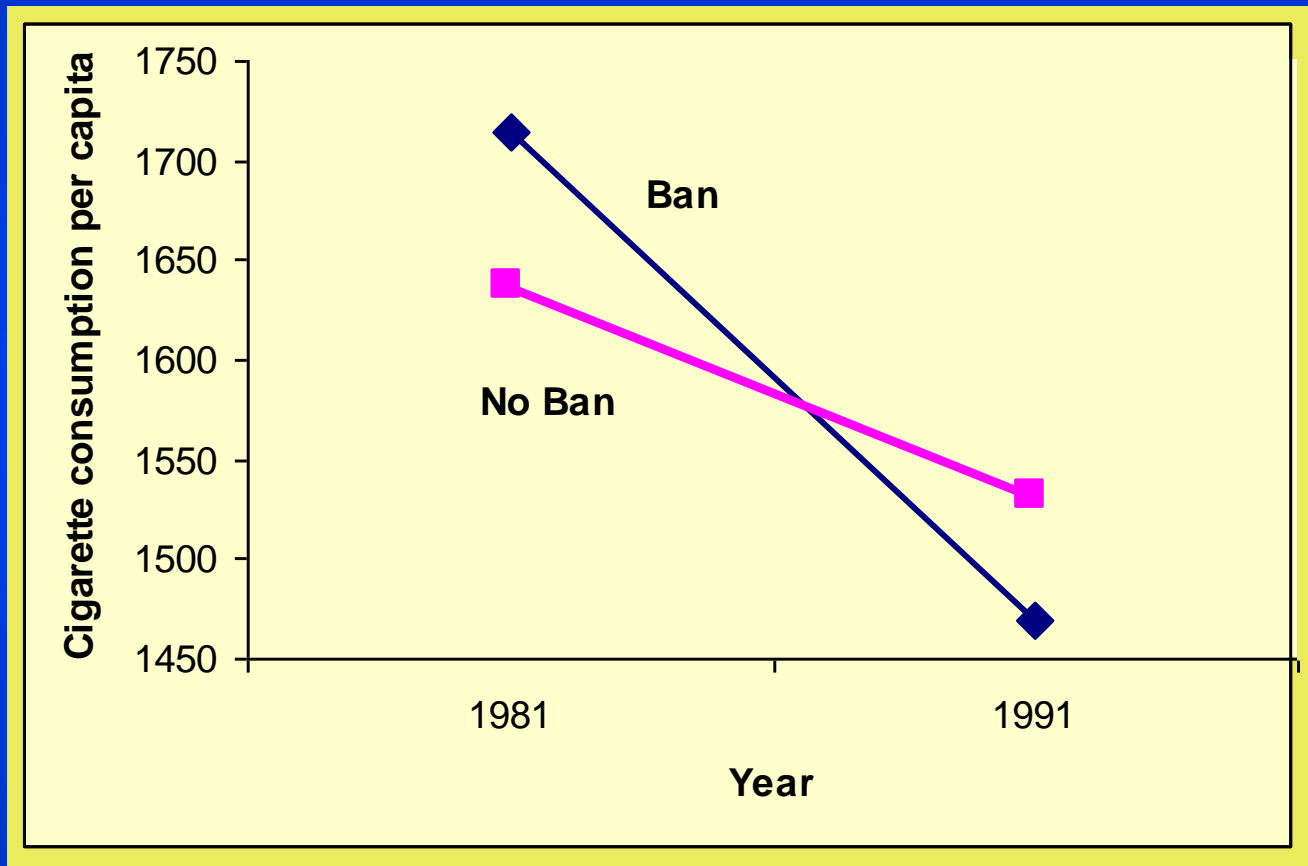
Effect of advertising and promotion bans

- 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

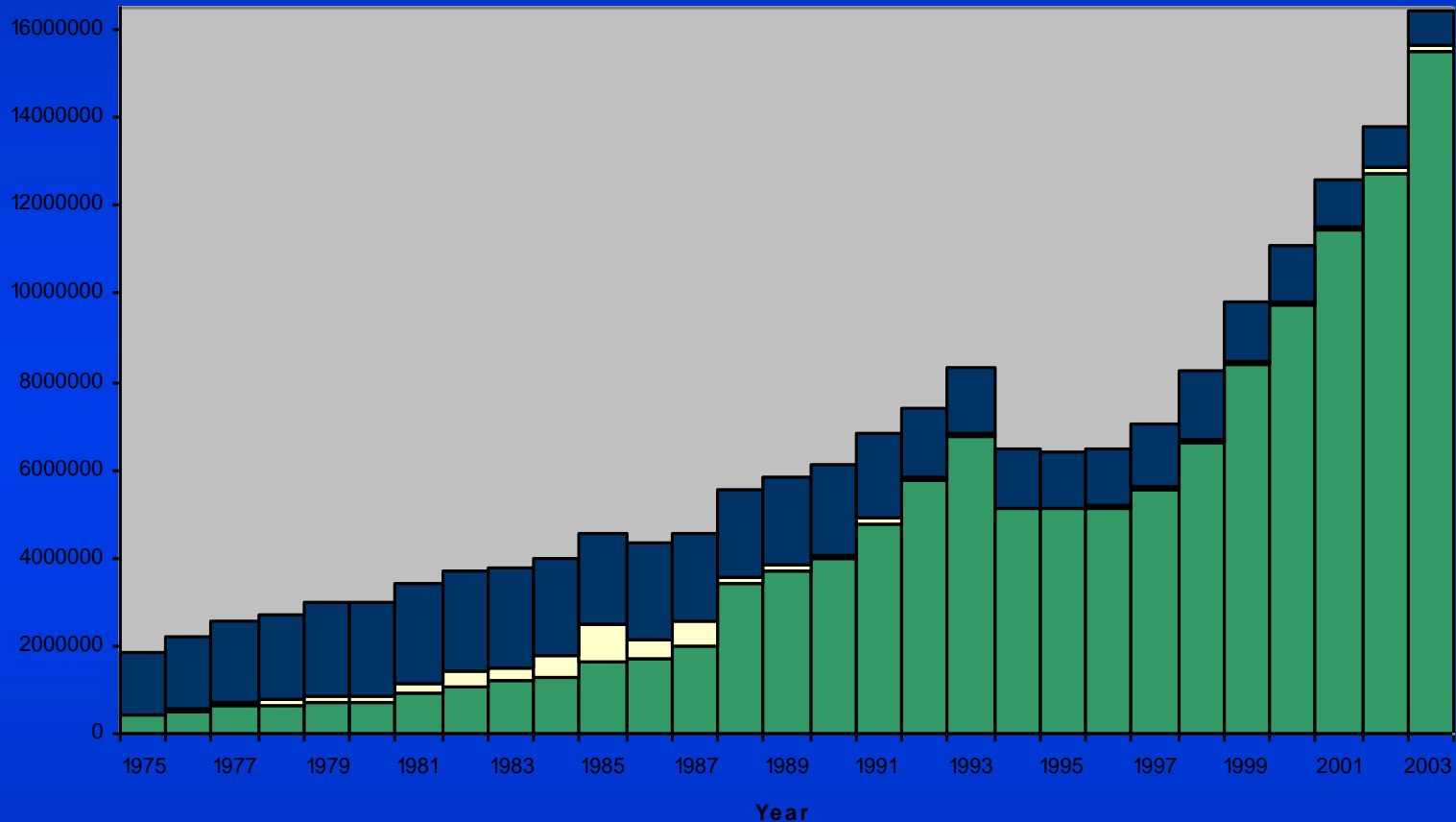
Consumption trends in countries with such bans vs. those with no bans
(n=102 countries)



Source: Saffer, 2000

Partial bans induce increases in other marketing efforts

US cigarette marketing expenditures, 1975-2003



■ Price-Related

■ Other

Source: Tauras, Peck and Chaloupka, in press

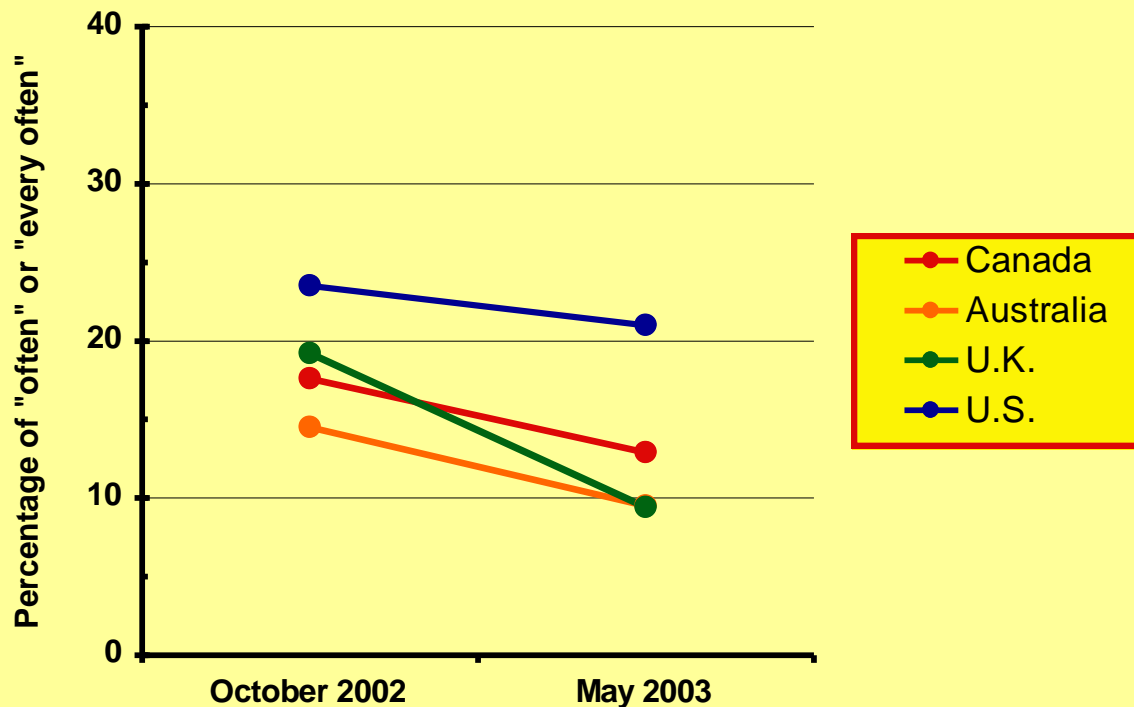
ITC Evaluation of Comprehensive Ban on Advertising and Promotion in the U.K.

On February 14, 2003, these forms of advertising and promotion were prohibited:

- Billboards
- Magazines and Newspapers
- Direct Mail
- Domestic Sponsorship (May 2003)
- Website Advertising and Promotions
- Exterior Signs in Store Windows

General Salience of Advertising/Promotion

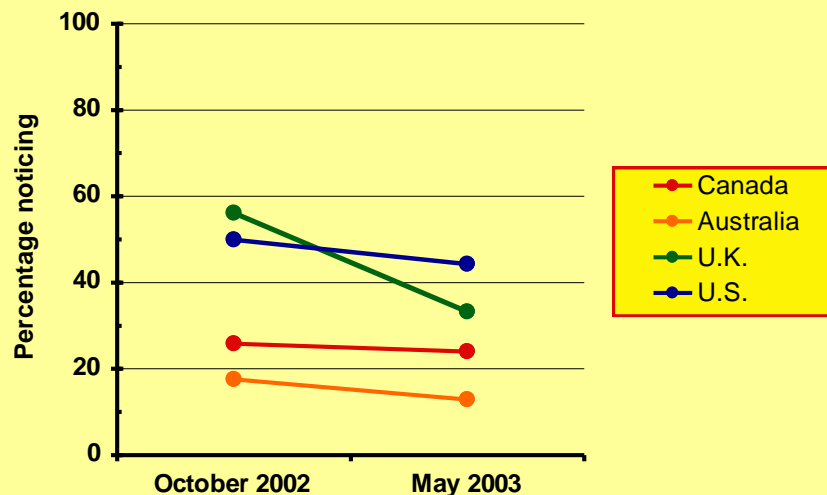
Thinking about everything that happens around you, in the last 6 months, how often have you noticed things that promote smoking?"



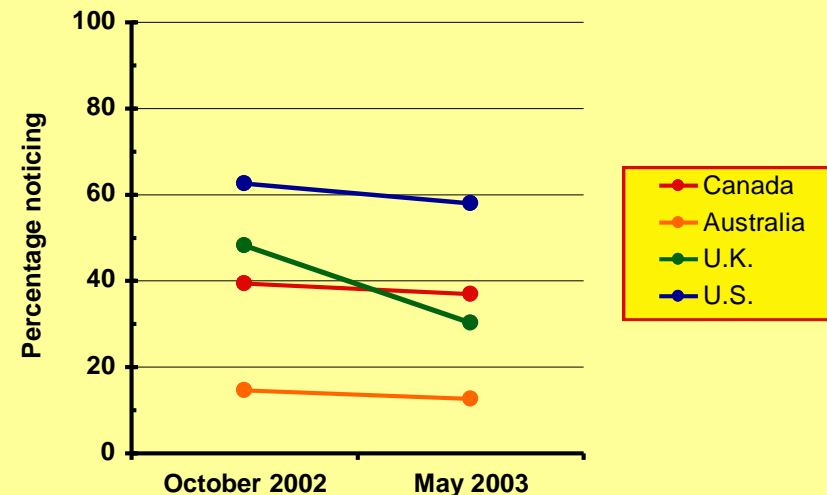
Significantly greater decline in salience of tobacco messages in the U.K. relative to the other three countries.

Advertising—Billboards/Posters and Newspapers and Magazines

Noticing Cigarettes or Tobacco Products on Billboards or Posters in Last 6 Months



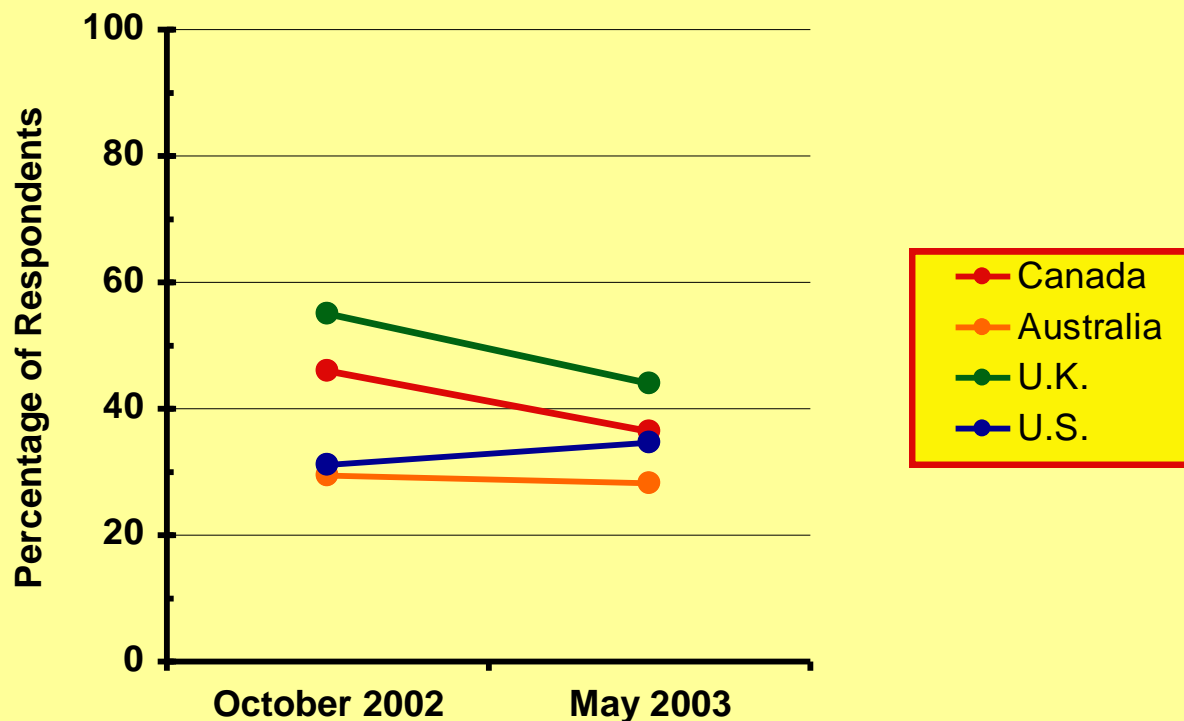
Noticing Advertising in Newspapers and Magazines in Last 6 Months



Significantly greater decline in salience of tobacco messages in the U.K. relative to the other three countries in these venues.

Promotion/Sponsorship: Sport/Sporting Event

Noticed Sports Sponsored By or Connected With Cigarette BRANDS in Past 6 Months



Decline in U.K. and also in Canada—because of its own imminent sponsorship ban (Oct 2003)

ITC Evaluation of U.K. Advert/Promo Ban: Summary of Findings

- ◆ The comprehensive ban in the U.K. appears to be working: reductions in awareness of tobacco advertising and promotions were found just months after the ban was implemented
- ◆ **Supports the call for comprehensive bans in the FCTC**

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

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:

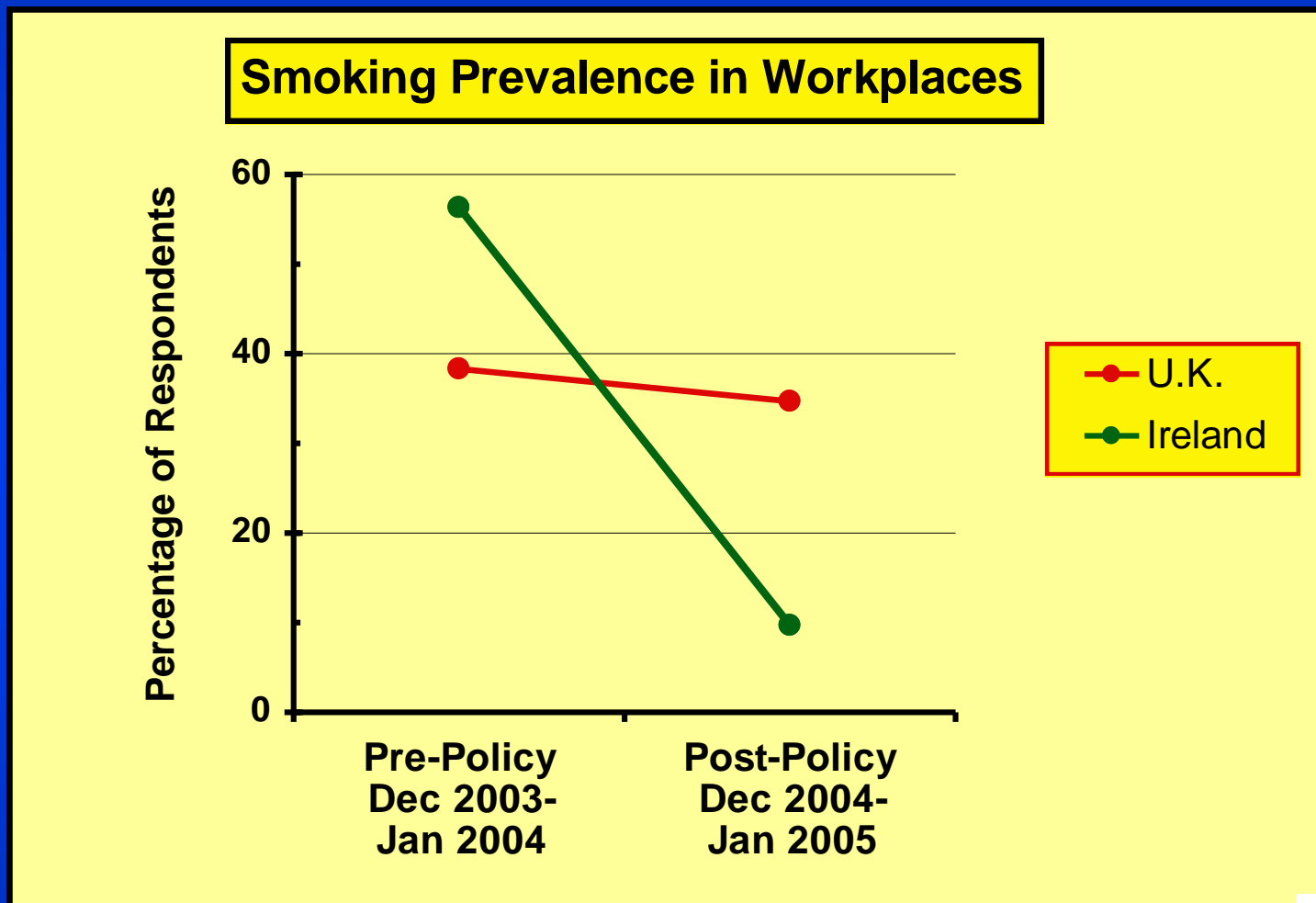
Wave 1: Dec 2003–Jan 2004

Workplace Ban: Mar 29, 2004

Wave 2: Dec 2004–Jan 2005

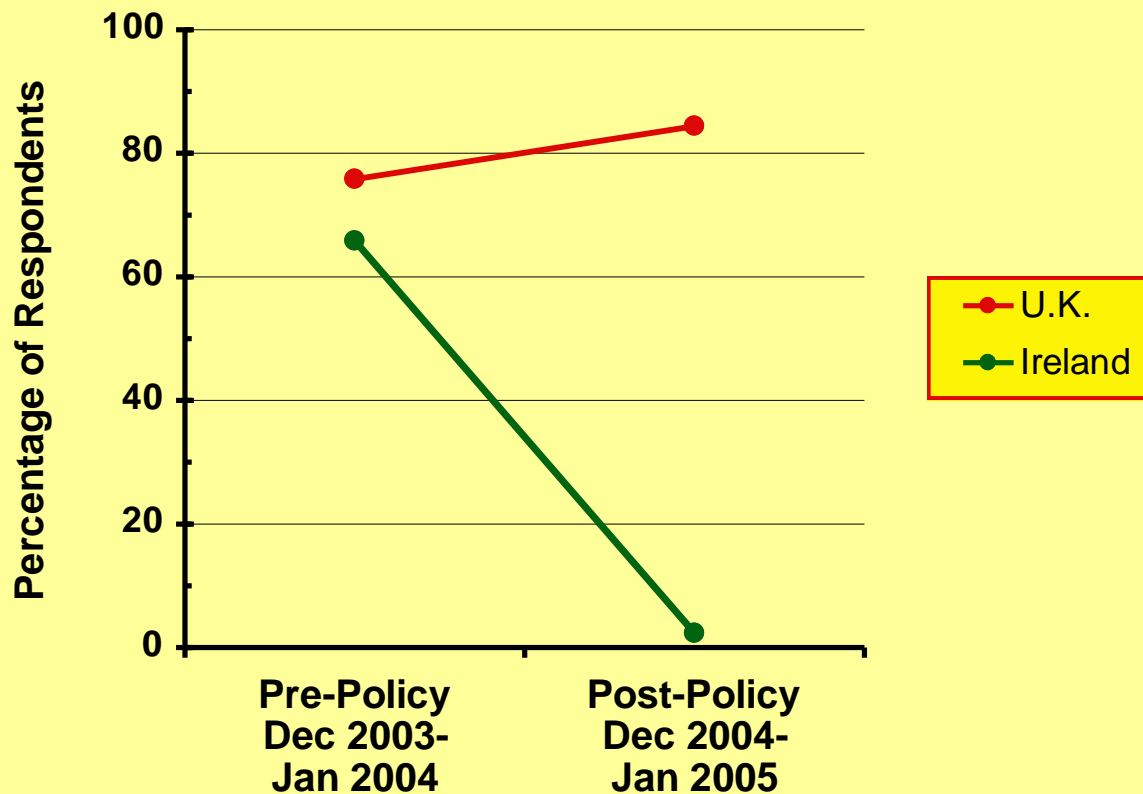
- ## ◆ Survey identical to 4-country survey; adds more extensive set of evaluation measures relating to smoke-free laws

Prevalence of Smoking in Key Venues

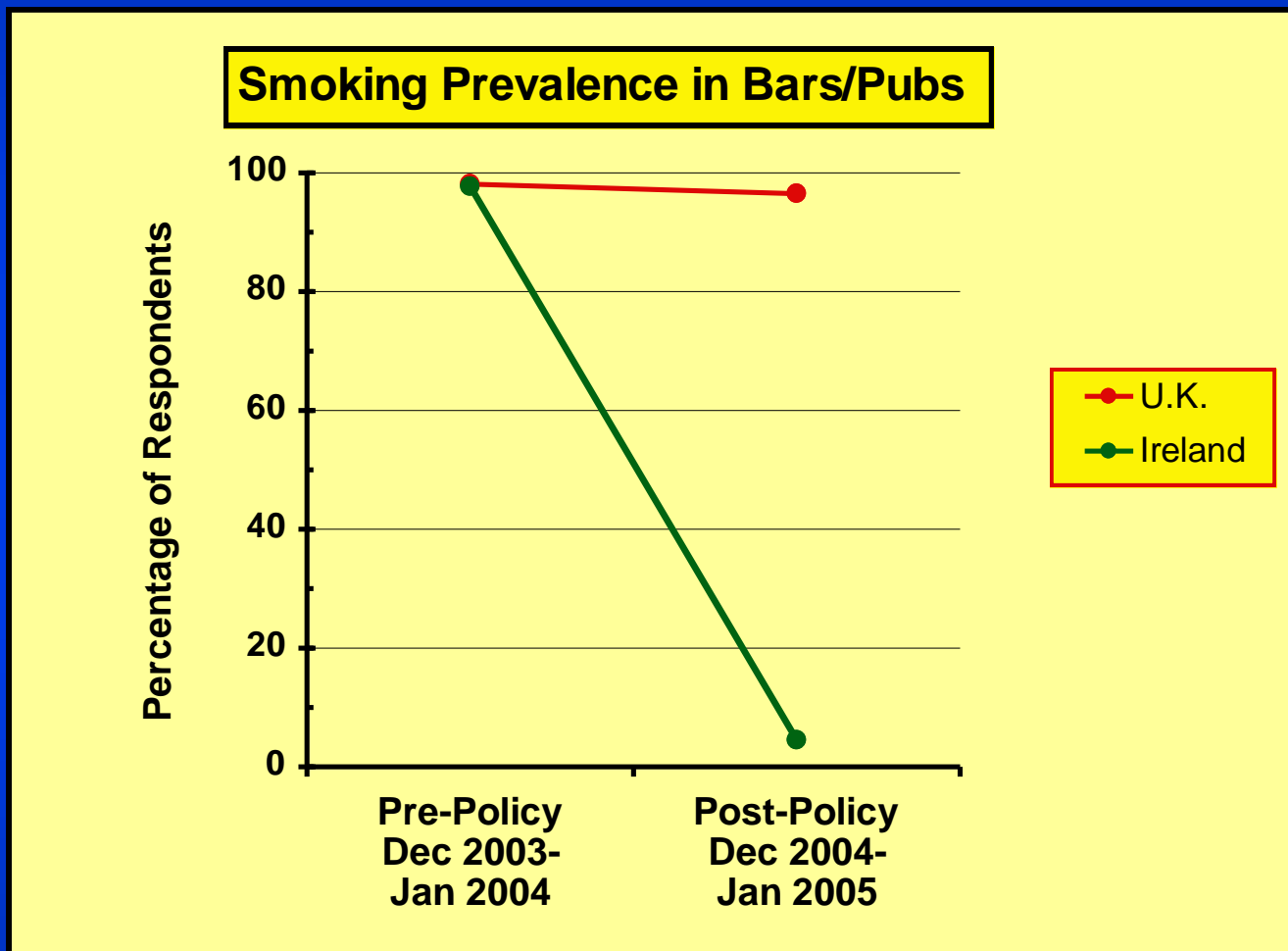


Prevalence of Smoking in Key Venues

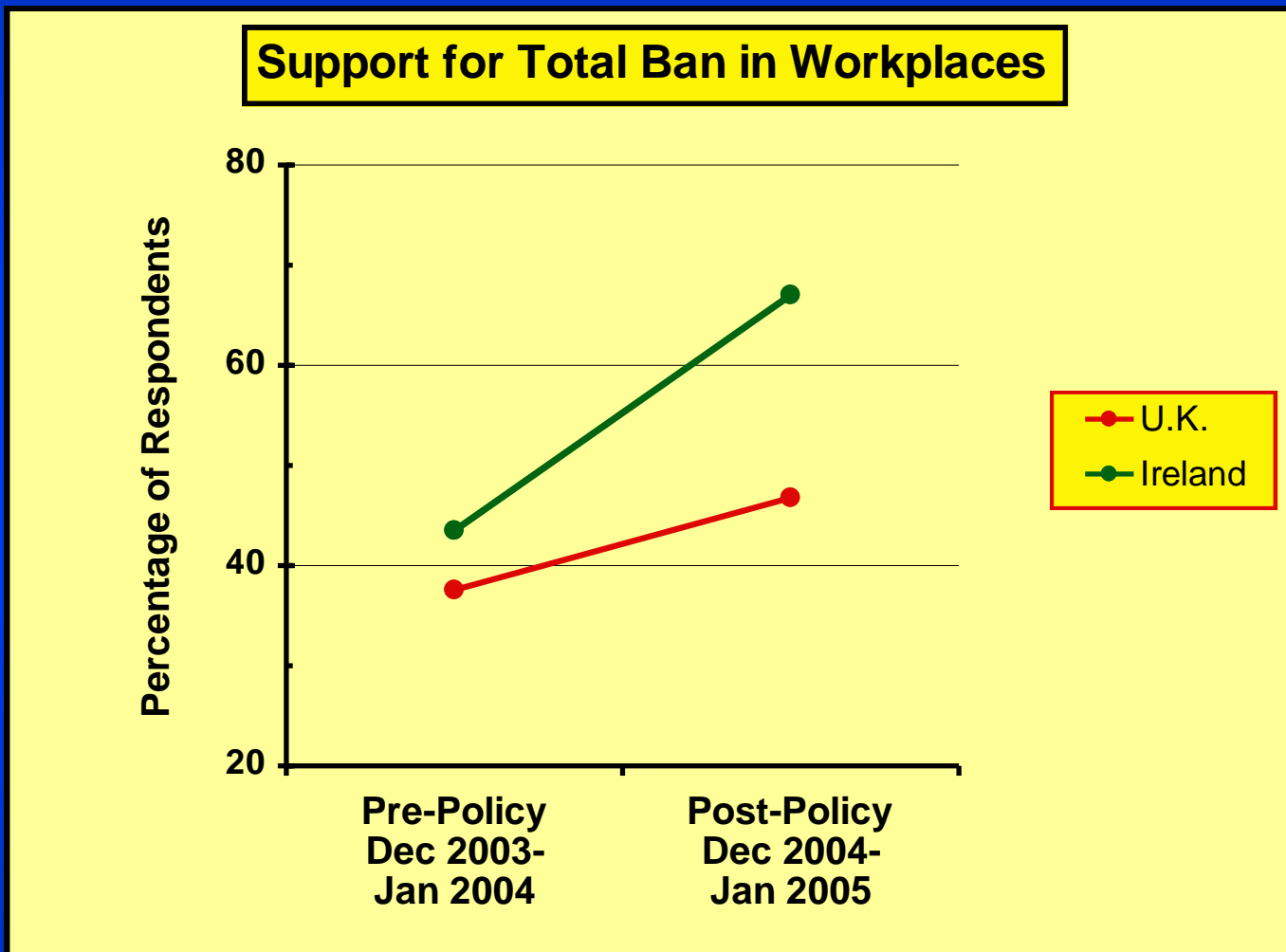
Smoking Prevalence in Restaurants



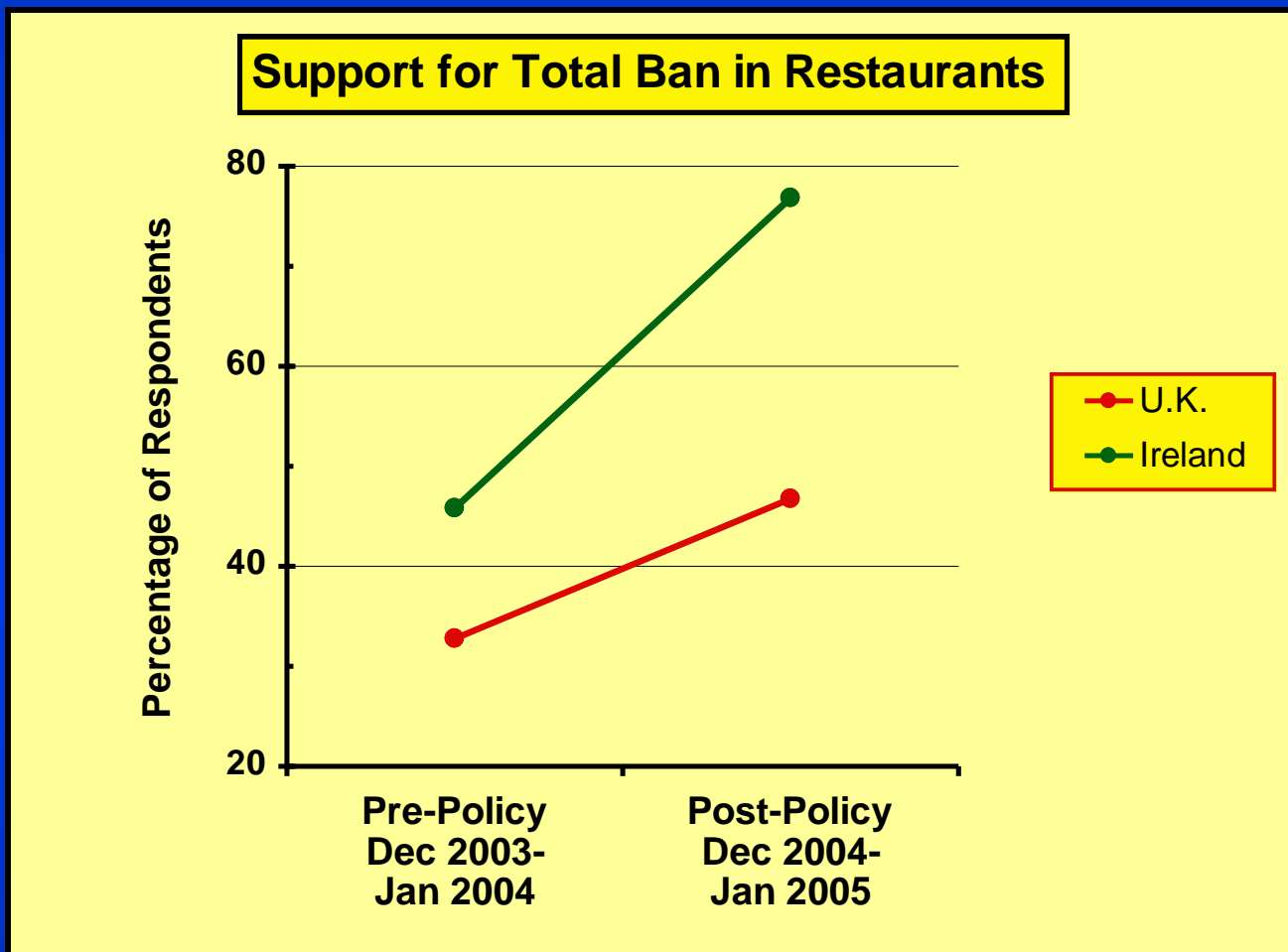
Prevalence of Smoking in Key Venues



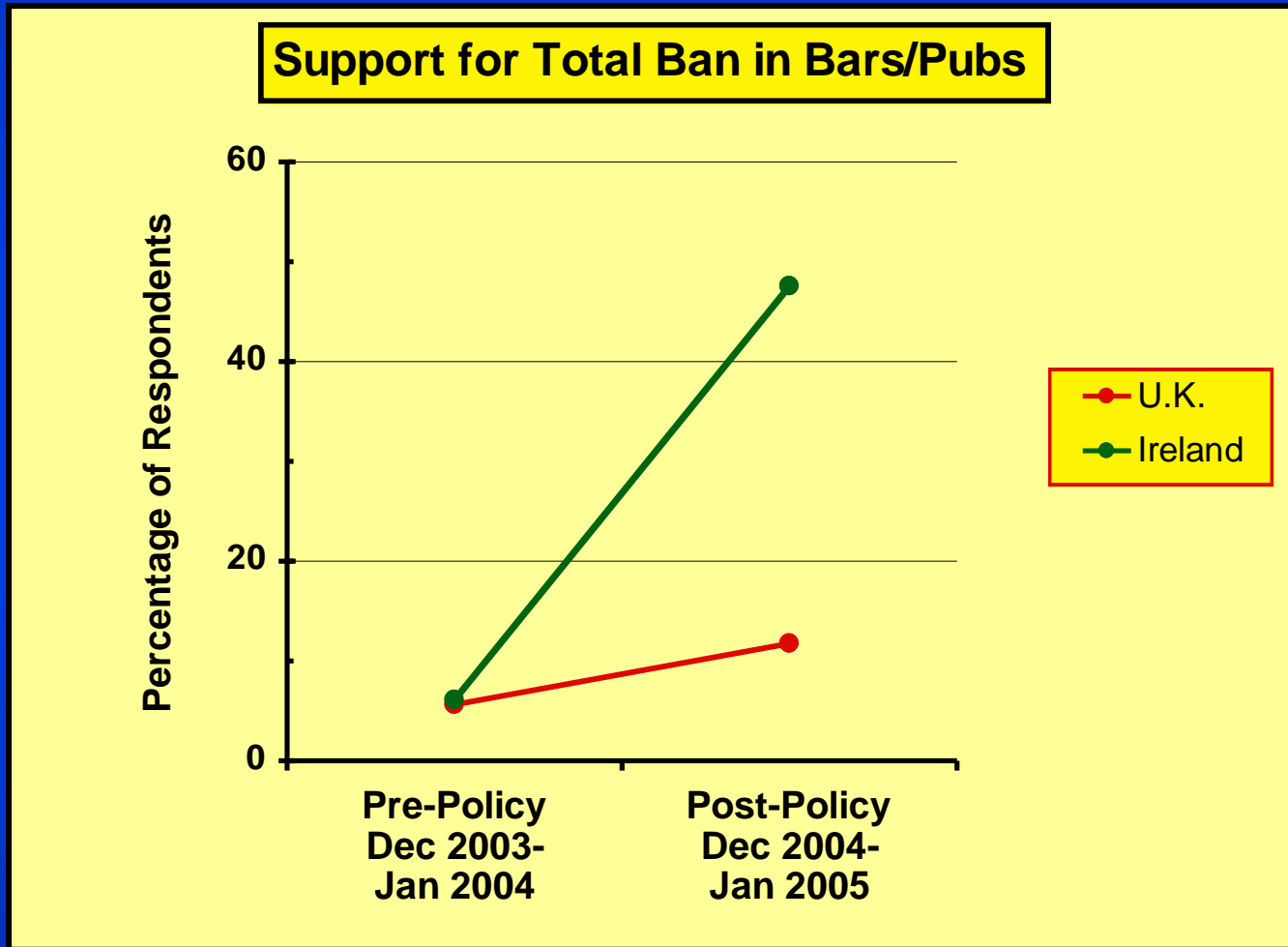
Support for Total Ban in Workplaces



Support for Total Ban in Restaurants



Support for Total Ban in Bars/Pubs



Other reactions to the Ireland Policy

- ◆ 62% of Irish smokers support the total ban on smoking in pubs; 26% of UK smokers would support a total ban in pubs
- ◆ 79% of Irish smokers who reported quitting at Wave 2 say that the smoke-free law made them more likely to quit; 89% stated that the law helped them stay quit
- ◆ 46% of Irish smokers who reported still smoking at Wave 2 say that the law made them more likely to quit
- ◆ 59% of Irish smokers say that the law made them cut down on the number of cigarettes they smoked
- ◆ 81% of smokers say that law has been a “good” or “very good” thing

Health information reduces the demand for cigarettes

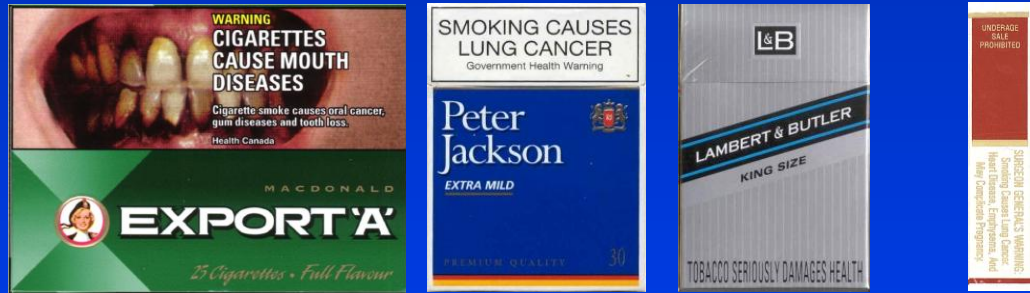
Country	Time	Event	Immediate reduction in cigarette consumption
The US	1964	Surgeon General Report	1-2%
UK	1962	1 st report of the Royal College of Physicians	5%
Switzerland	1966	An anti-smoking campaign	11%
Turkey	1982	Implementation of health warning labels	8%

Source: Kenkel and Chen, 2000

ITC Evaluation of UK Information-Related Policies (2003)

- ◆ Between Wave 1 and Wave 2, two information policies implemented in the U.K.:
 - **Jan 2003:** Enhancement of warning labels per EU Directive 2001/37/EC
 - **Sep 2003:** Ban on “light” “mild” and other descriptors per EU Directive 2001/37/EC
- ◆ Consistent with FCTC provisions

Label variables at Baseline (Oct-Dec 2002)



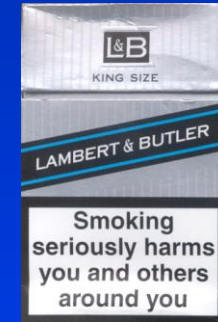
	Canada	Aust.	U.K.	U.S.
Noticing labels often/very often	60	52	44	30
Reading labels often/very often	33	26	22	16
Labels are a motivation to quit	45	31	28	29
Labels have stopped you from having a cigarette	19	12	9	14

Pattern of results at baseline as would be expected from visual inspection of the labels—Canada is the leader

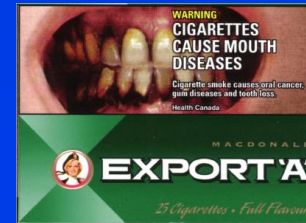
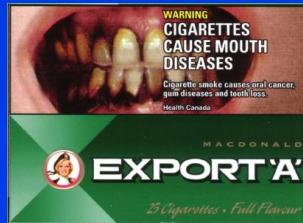
October 2002

May 2003

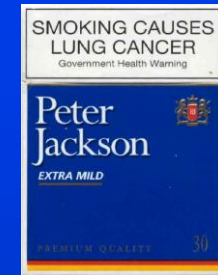
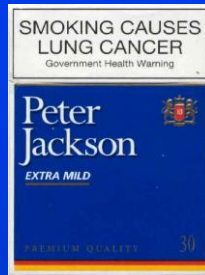
U.K.



Canada



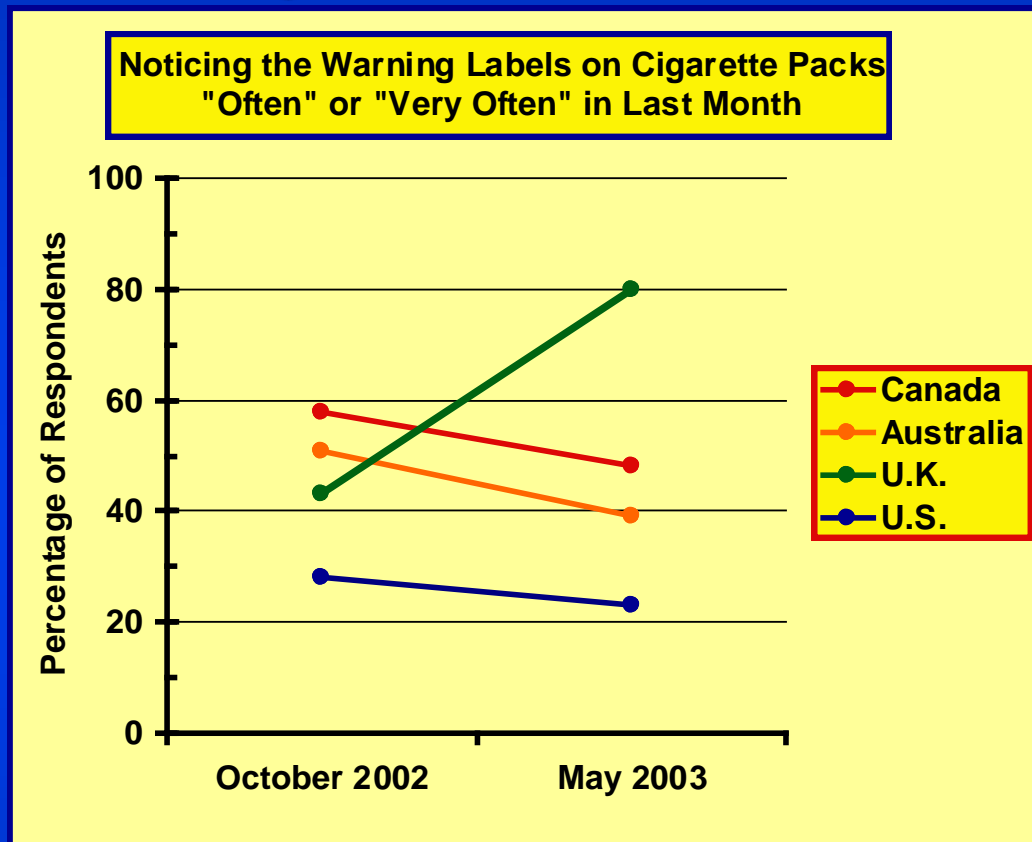
Australia



U.S.

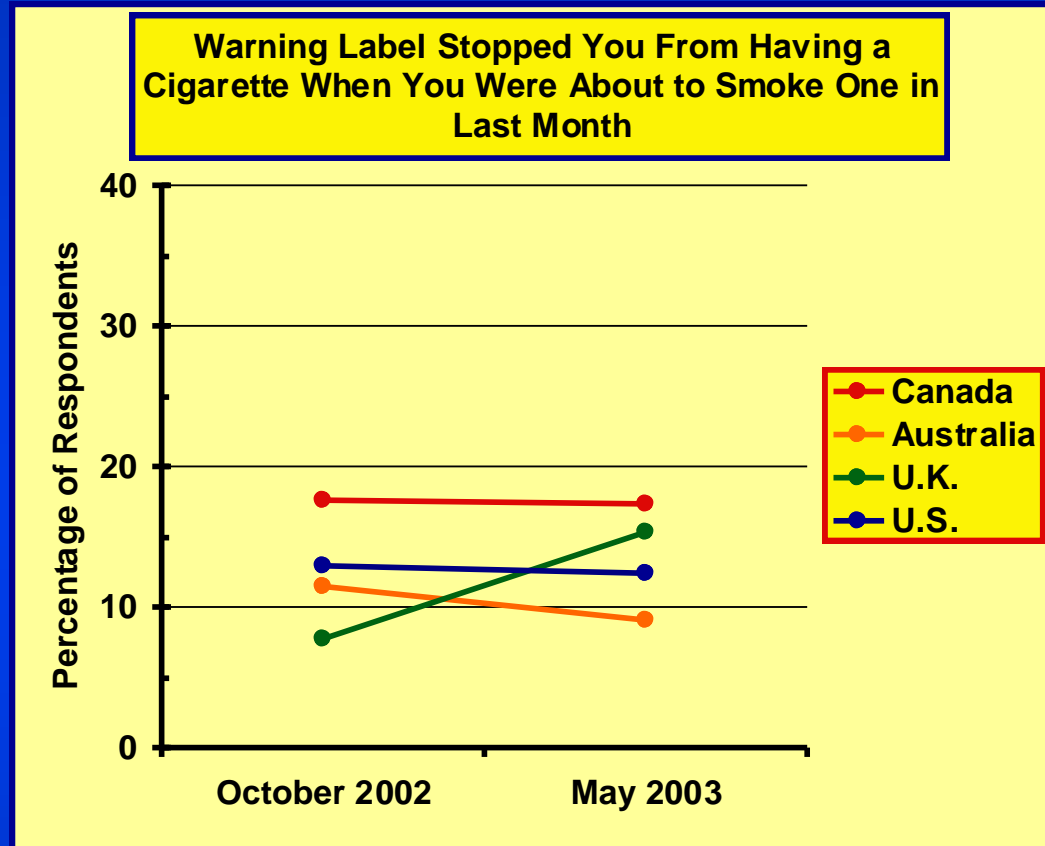


Noticed/Read or Looked Closely at the Warning Labels in Last Month



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.

Labels Make you Think About the Health Risks of Smoking

How often, if at all, have the warning labels made you think about the health risks of smoking?

	Canada	Australia	U.K.	U.S.
Somewhat / A Lot	47%	33%	45%	33%

Same pattern here for this question, asked only at W2: U.K. is significantly higher than Australia and U.S., but not quite as high as Canada.

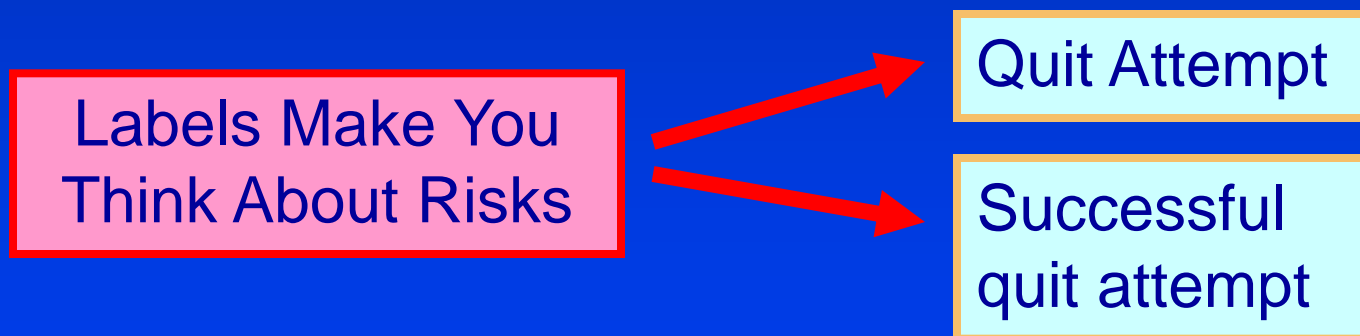
Labels Make You More Likely to Quit Smoking

To what extent, if at all, have the warning labels make you more likely to quit smoking?

	Canada	Australia	U.K.	U.S.
Somewhat or A lot	29%	18%	27%	22%

Same pattern here for this question, asked only at W2: U.K. is significantly higher than Australia and U.S., but not quite as high as Canada.

Relationship between label-specific variables and quitting



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

How often in the last 6 months have...	% Often or Very Often	
	ITC-SE Asia	ITC 4-Country
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).

Evaluation of the EU Ban on “Light/Mild”

- ◆ Ban went into effect on September 30, 2003 (with industry activity in the months prior)
- ◆ Wave 1 to Wave 3: Significant reductions in misconceptions about “light” cigarettes in the U.K. compared to the other three countries:
 - “Light cigarettes are less harmful than regular cigarettes” **UK decline = 15%** vs. average of 3% in the other three countries
 - “Smokers of light cigarettes take in less tar than smokers of regular cigarettes.” **UK decline = 18%** vs. average of 6% in the other three countries

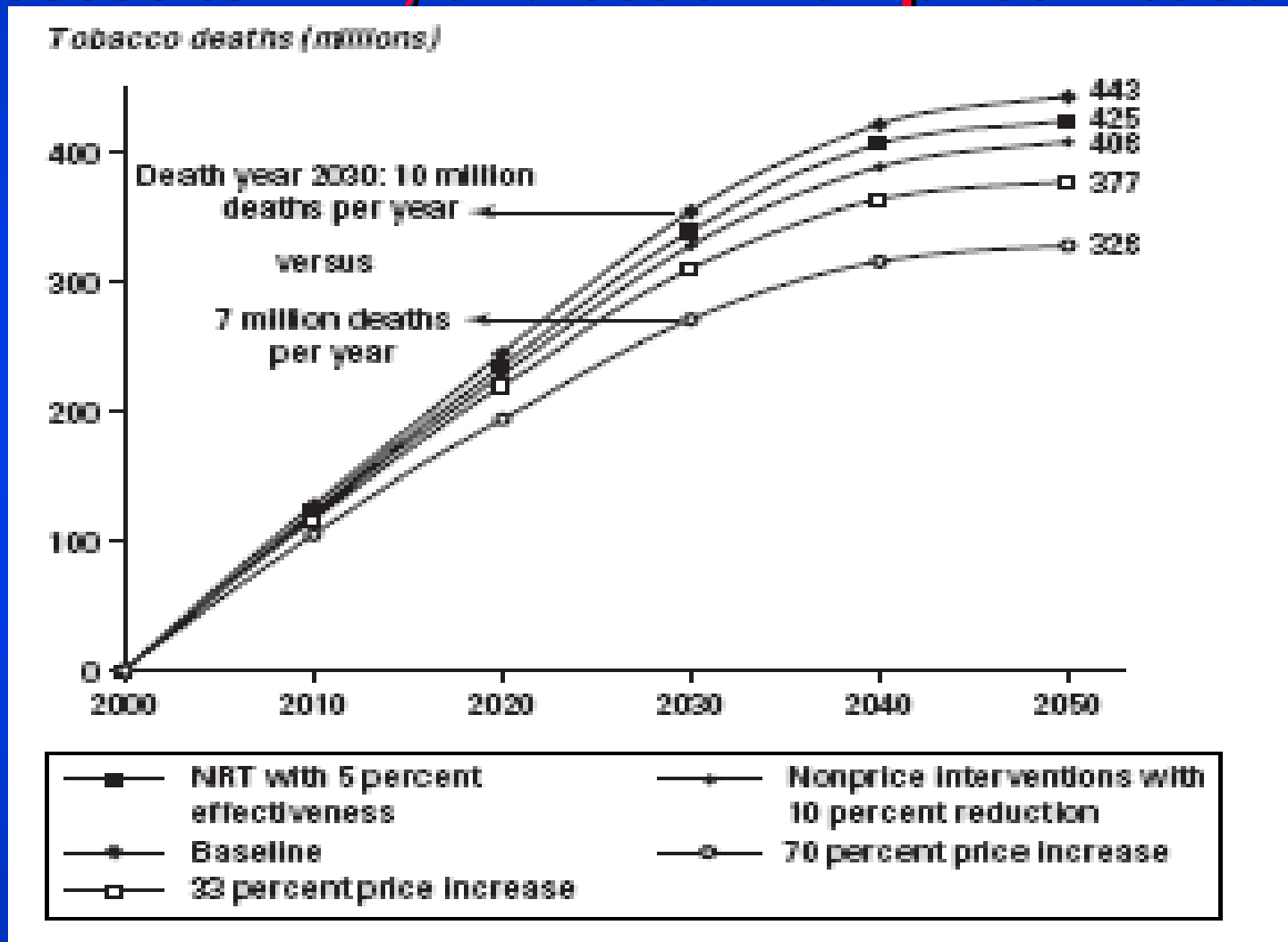
NRT and cessation therapies

- **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**

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

Potential impact of price increase, increased access to NRT, and set of non-price measures



Source: Jha, Chaloupka, et al., in press

How cost-effective is tobacco control?

US dollars (2002) per healthy year life gained

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

Compares favorably to cost-effectiveness of other public health interventions

Source: Jha, Chaloupka, et al., in press

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*

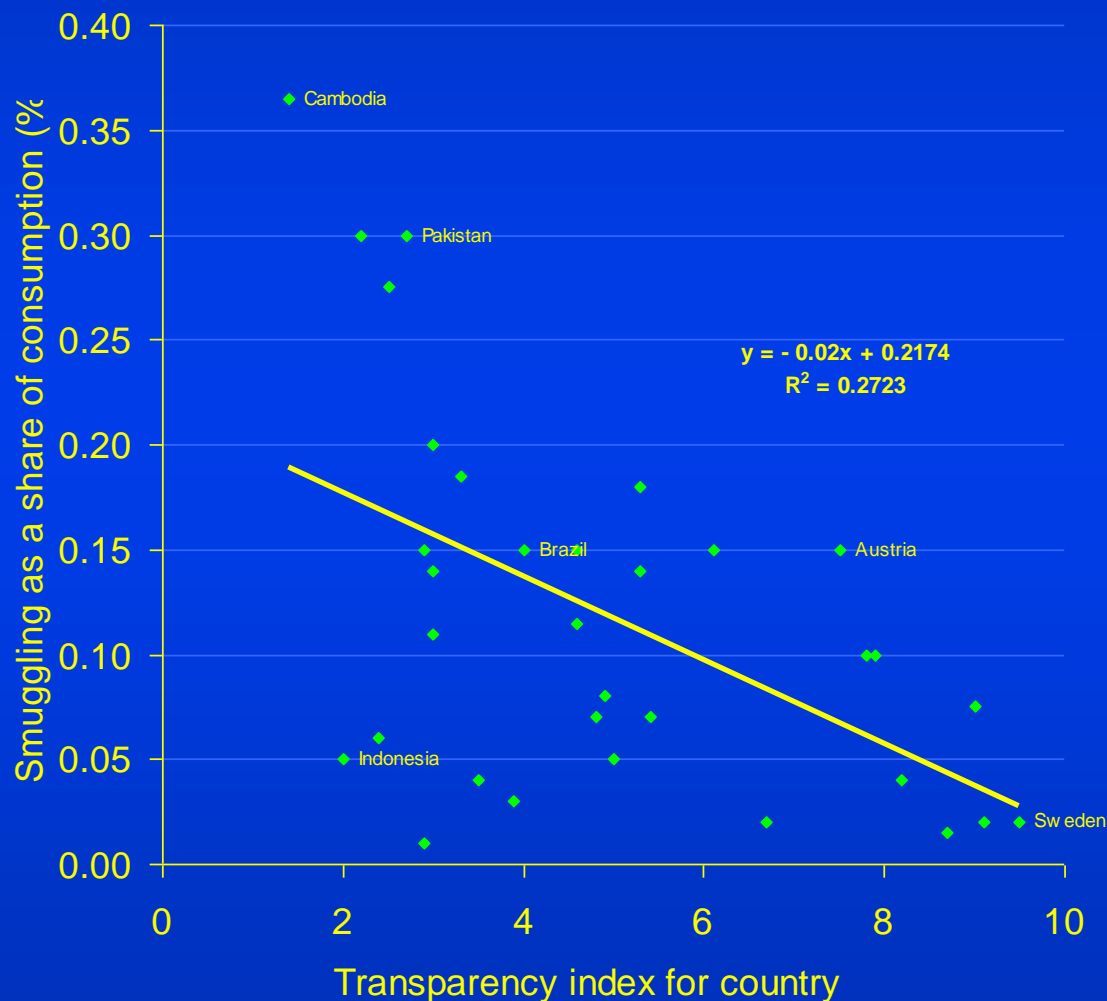
Smuggling of Cigarettes

- **Industry has economic incentive to smuggle**
 - ◆ Increase market share and decrease tax rates
- **Best estimate: 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**

Source: Merriman *et al.* 2000; Joosens, 2000; BAT, 1998

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

Smuggling as a function of transparency index



Source: Merriman *et al.*, 2000

Myths and Facts about the “costs” of tobacco control?

- **Cost to individuals, especially the poor:** partially offset by lower consumption
- **Job loss:** temporary, minimal, and gradual
- **Revenue loss:** likely to have revenue gains
 - ◆ a 10% tax increase would raise revenue by 7%
- **Possible smuggling:** crack down on criminal activity, not lower taxes

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

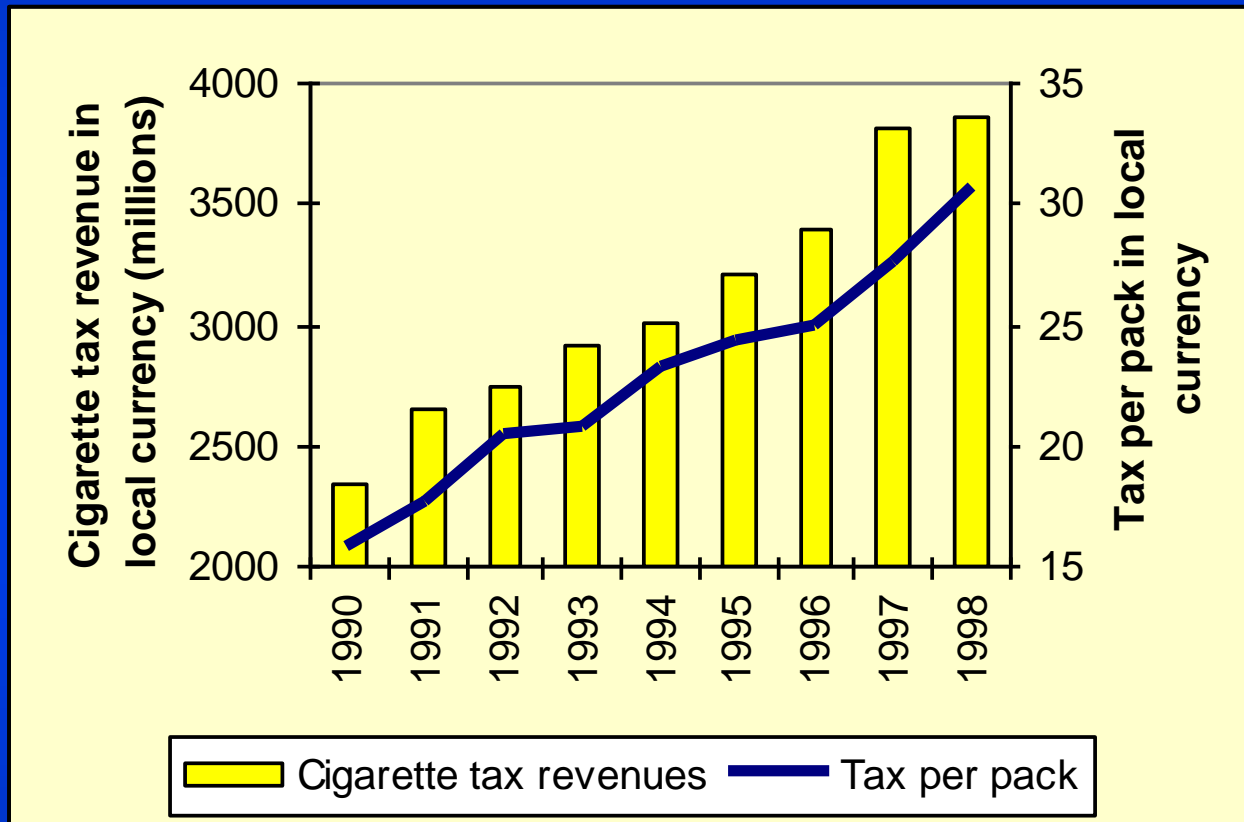
Studies on the employment effects of dramatically reduced or eliminated tobacco consumption

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

Source: Buck and others, 1995; Irvine and Sims, 1997; McNicoll and Boyle 1992, van der Merwe and others, background paper; Warner and others 1996

As cigarette tax rises, revenues increase

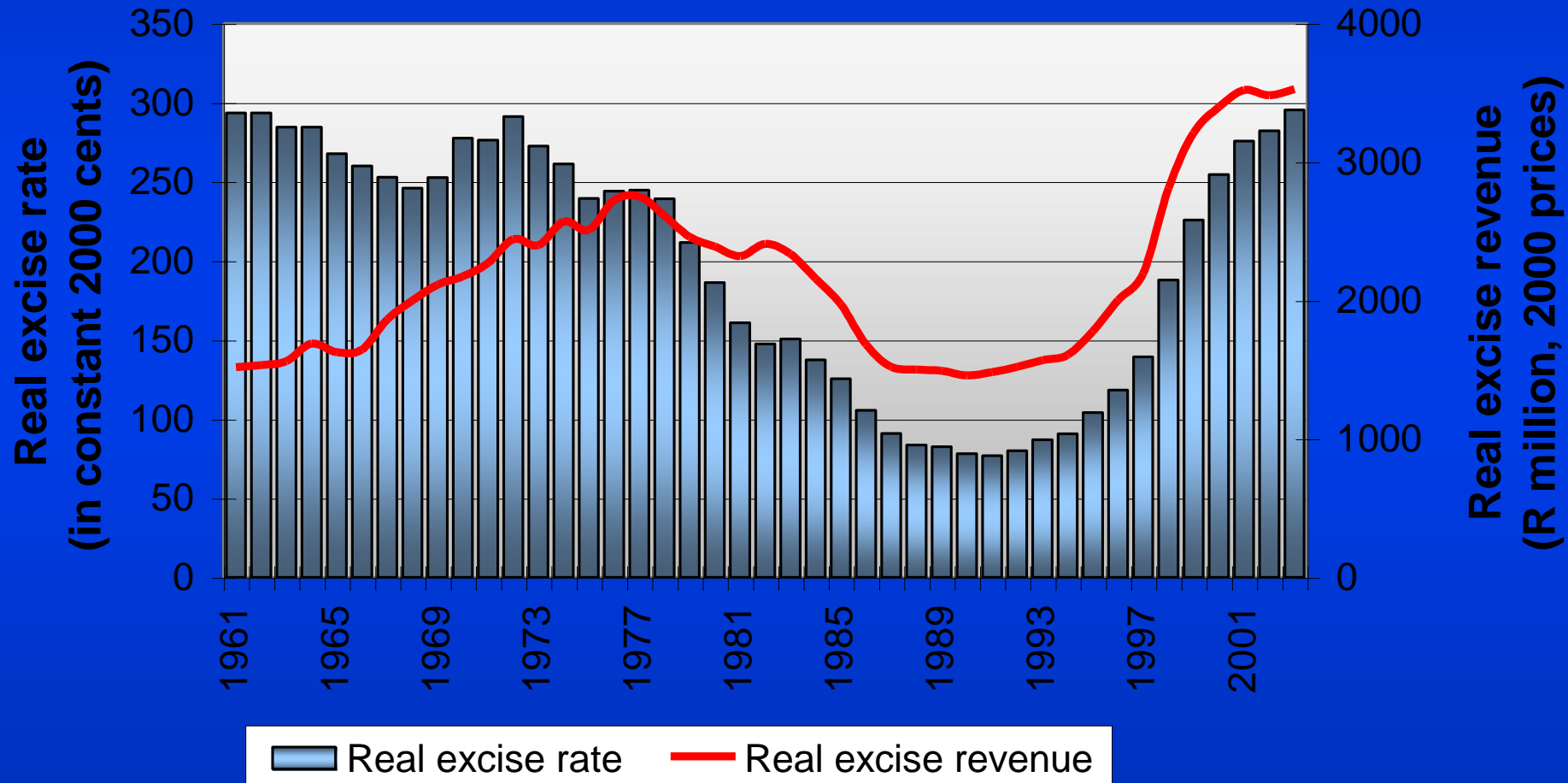
Tax per pack and cigarette tax revenues in Norway, 1990-1998



Source: World bank 1999

Cigarette tax increases result in higher tax revenues

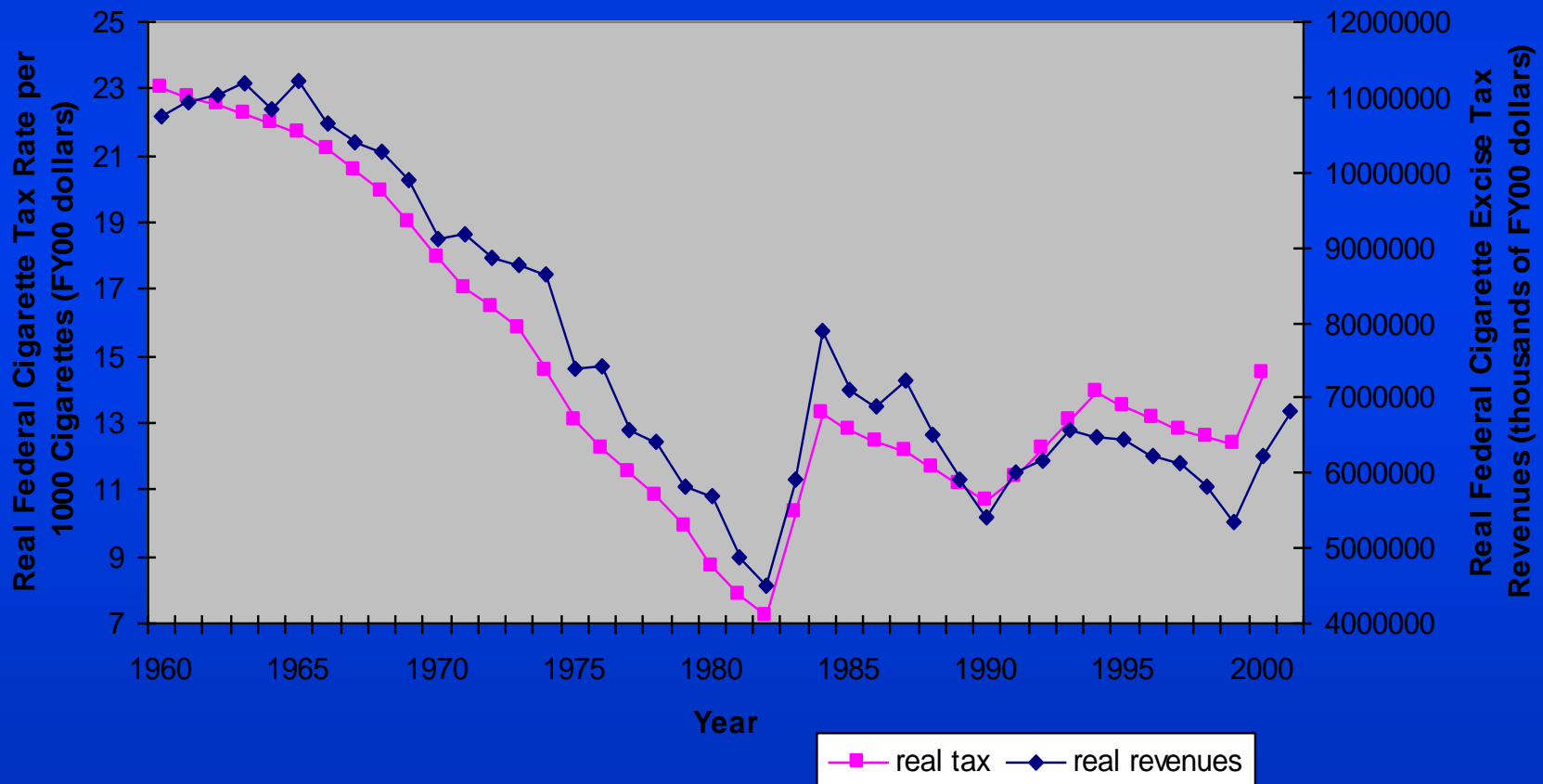
Real cigarette tax rate and real cigarette tax revenue in South Africa 1960-2002



Cigarette tax increases result in higher tax revenues

Real Federal cigarette tax rate and real cigarette tax

revenue in the US 1960-2001



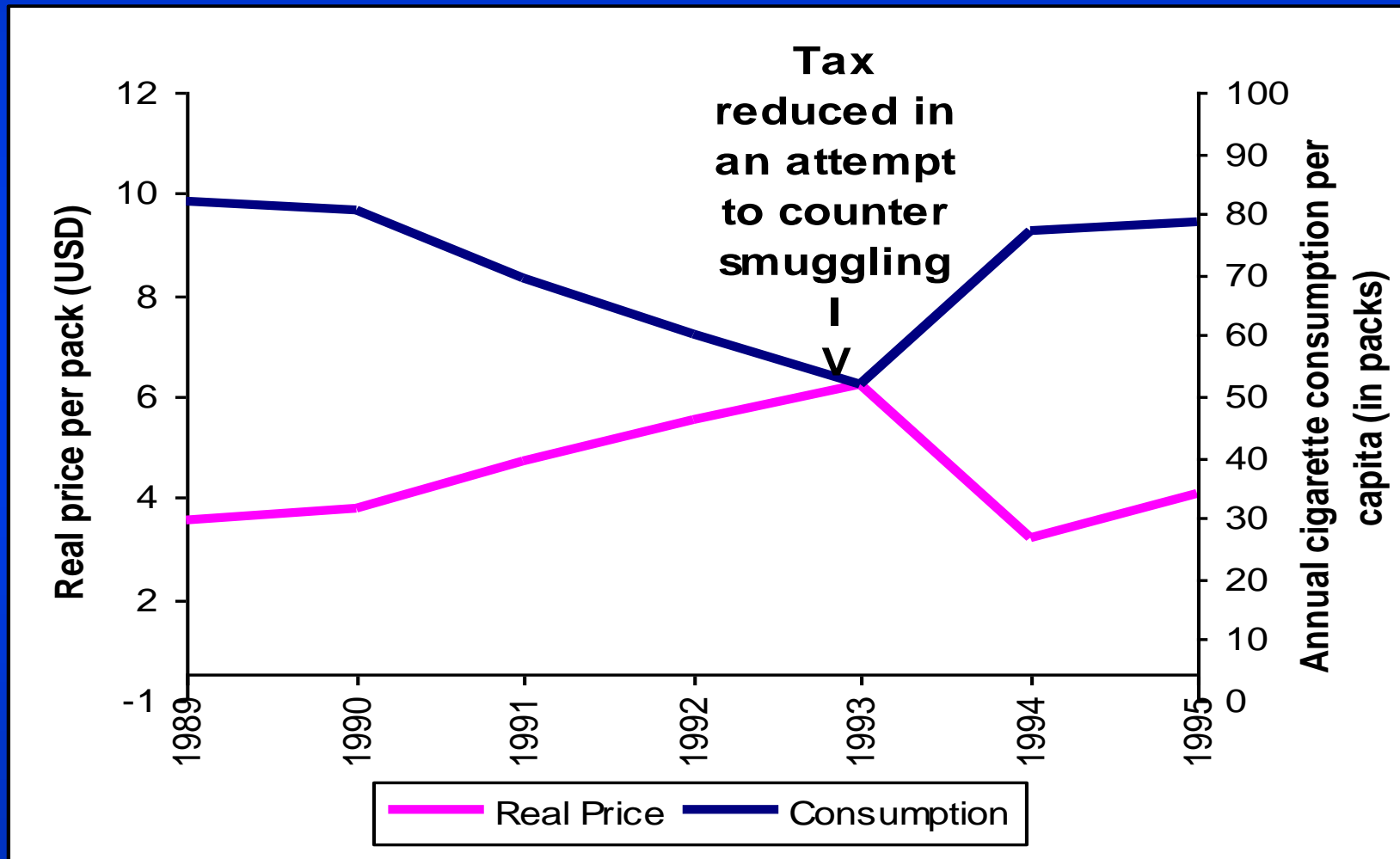
Source: ImpacTeen, 2002

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**
 - ◆ Focus on large container smuggling
 - ◆ Prominent local language warnings and tax stamps
 - ◆ Increase penalties
 - ◆ Licensing and tracking of containers
 - ◆ Increase export duties or bonds
 - ◆ Include final destination markings on packs
- **Multilateral tax increases help combat smuggling**

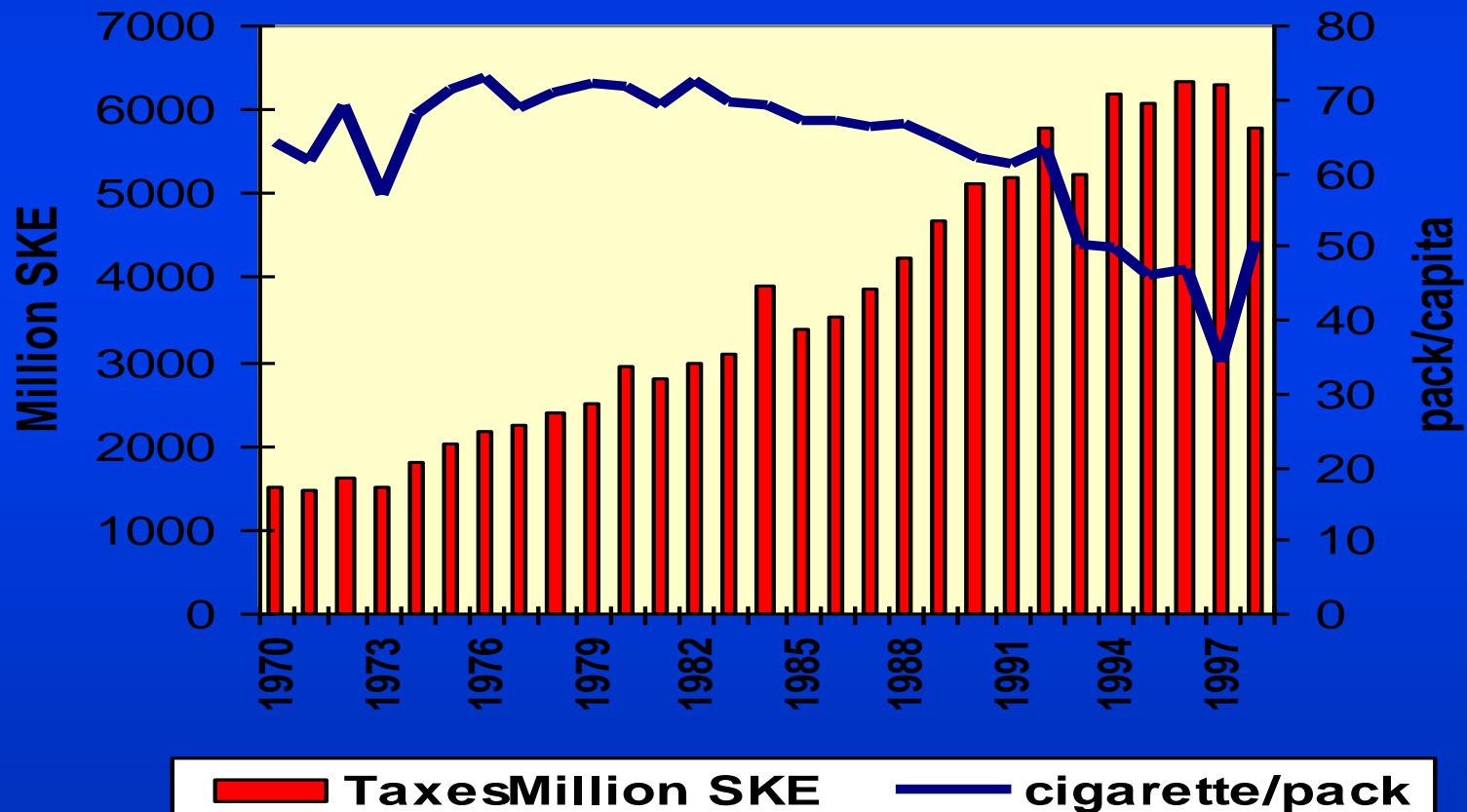
Source: Merriman *et al.* 2000; Joosens, 2000; BAT, 1998

Canada Sharply Reduced Taxes in 1993



Sweden Reduced Cigarette Taxes by 17% in 1998

Cigarette Tax Revenue and Consumption in Sweden, 1970-1998



Summary

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



www.tobaccoevidence.net

www.itcproject.org

