

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

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**St. Michael's**  
Inspired Care.  
Inspiring Science.



# 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**

# Worldwide no of substance users

**B=billions, M=millions**

<u>Substance</u>	<u>Users</u>	<u>Annual deaths</u>
Smoking	1.3 B *	~ 5 M
Drinking	2.0 B	~ 2 M
Illicit drugs	0.2 B	~ 0.2 M

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

**1 ton of tobacco=1 M sticks=1 death**

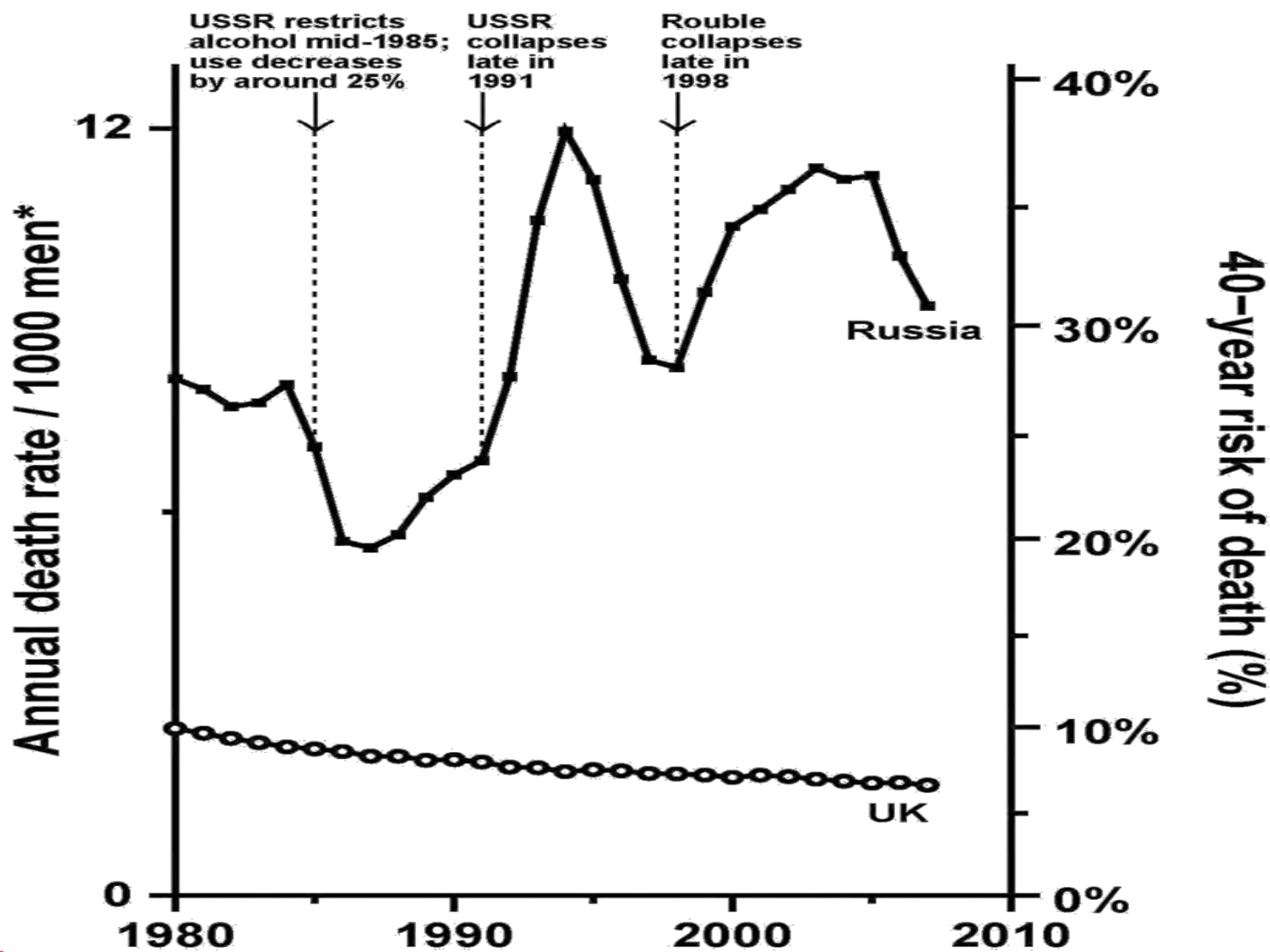
# 2010: Russian president Dmitry Medvedev spearheads new offensive against vodka, blamed for 500,000 deaths a year

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

Source: Lancet  
27 June 2009



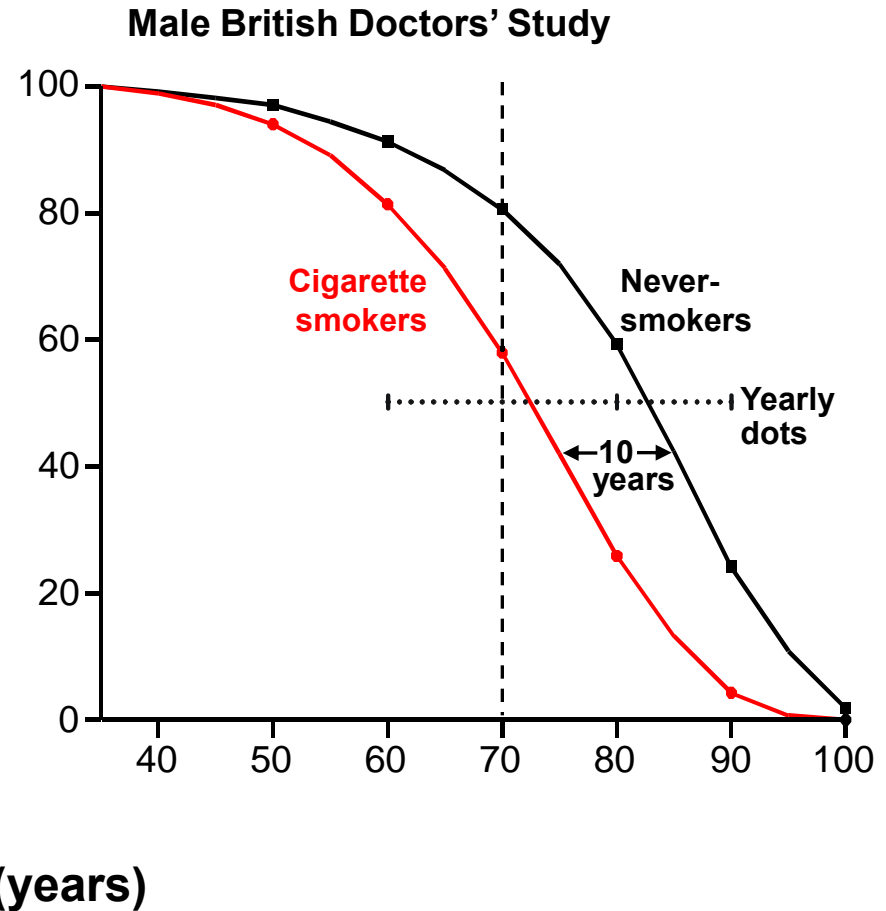
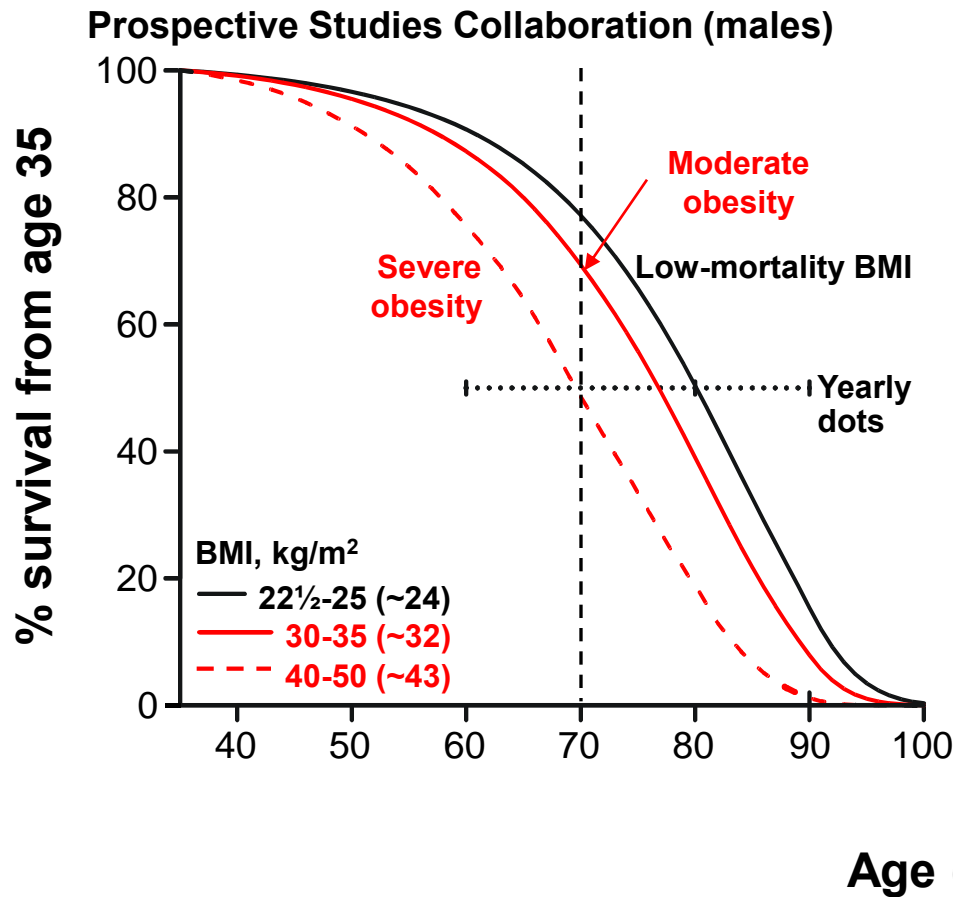
# Russian male death rate ratios

**~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**

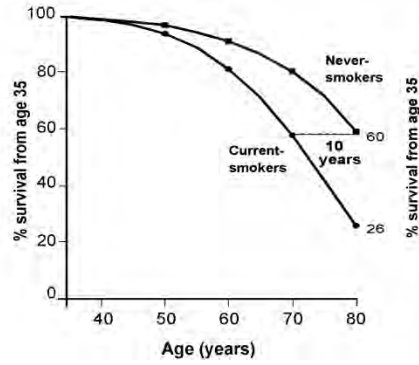
# Life expectancy loss of 3 years with moderate obesity and 10 years with smoking

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

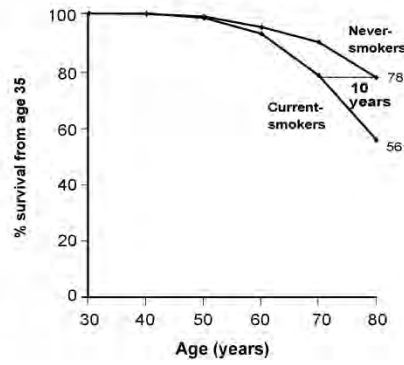


Source: Peto, Whitlock, Jha, NEJM, 2010

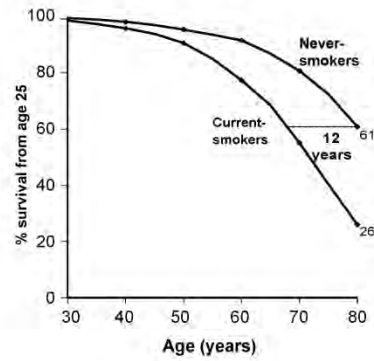
### UK Men



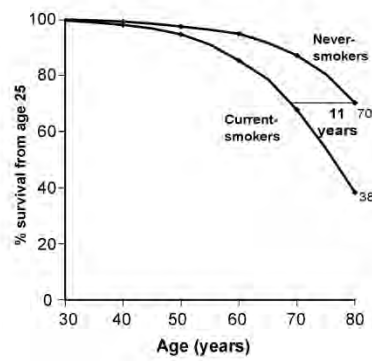
### UK Women



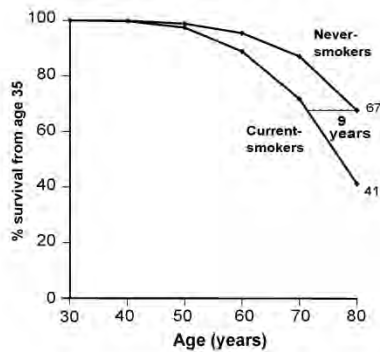
### US Men



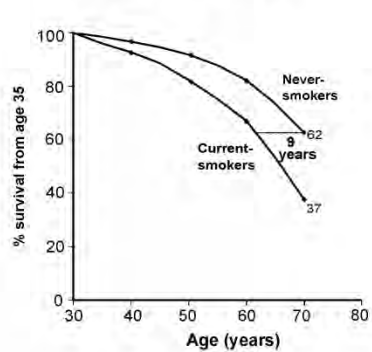
### US Women



### Japanese Men



### Indian Men







SLEEP  
DEPRIVED



# Survey US women and men & link them to the National Death Index *“Facebook of death”*

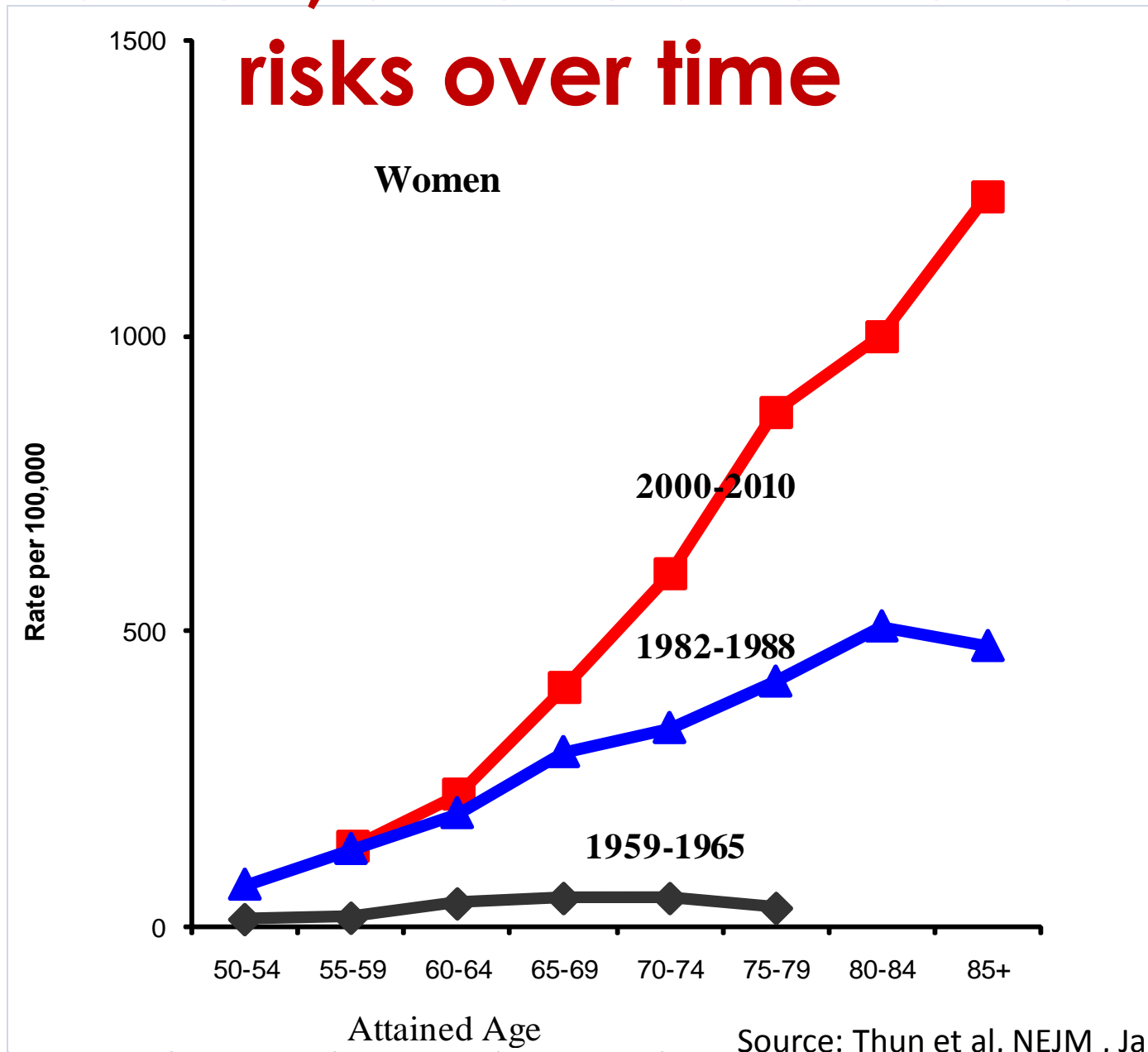
deathbook.

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

**WOMEN WHO SMOKE: 3.0 times more likely  
to die**

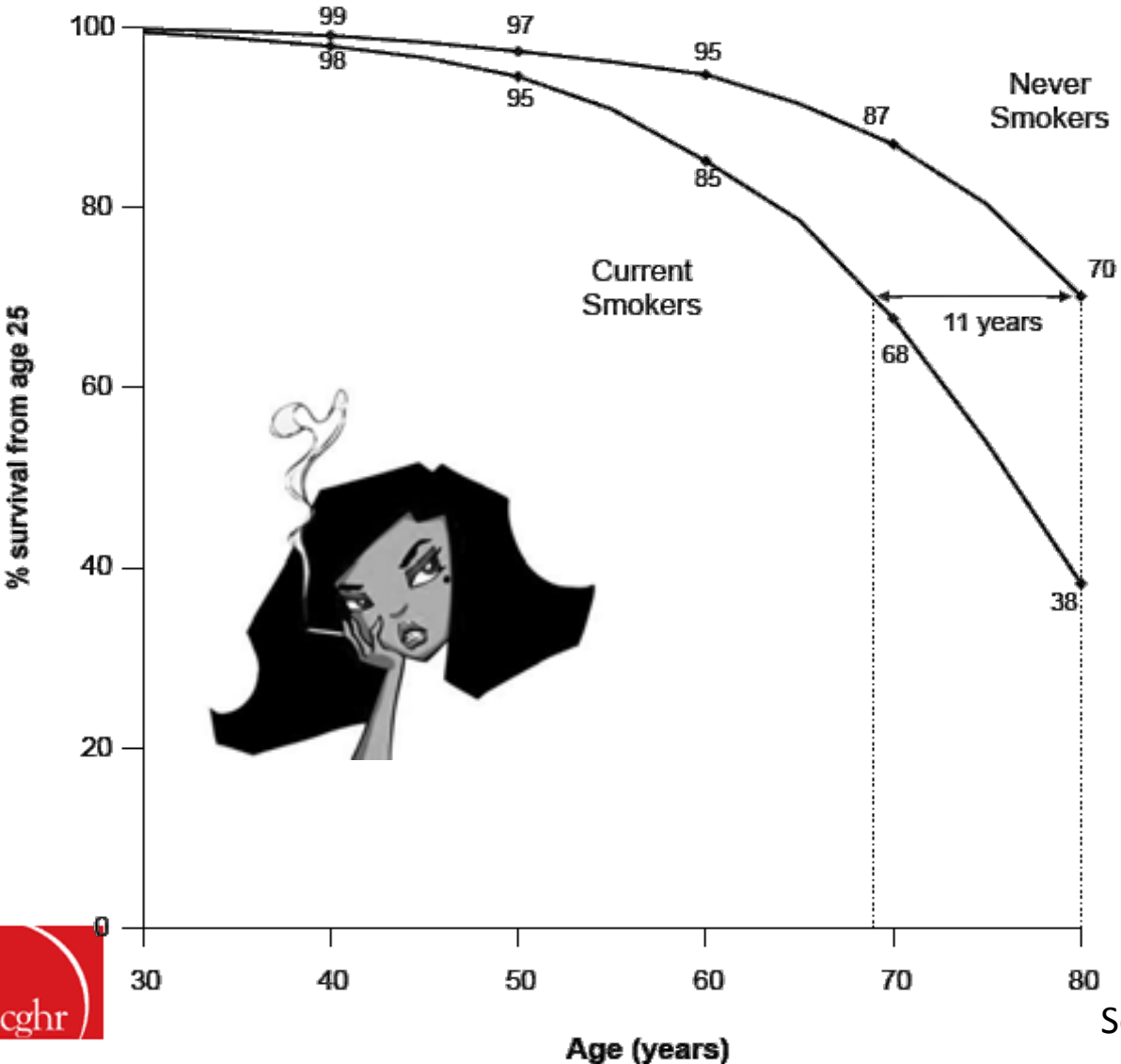
**MEN WHO SMOKE : 2.8 times more likely  
to die**

# US Women, smoker: non-smoker risks over time



# FEMALES: Survival probabilities

between ages 25 and 80 years among current and never-smokers in the US



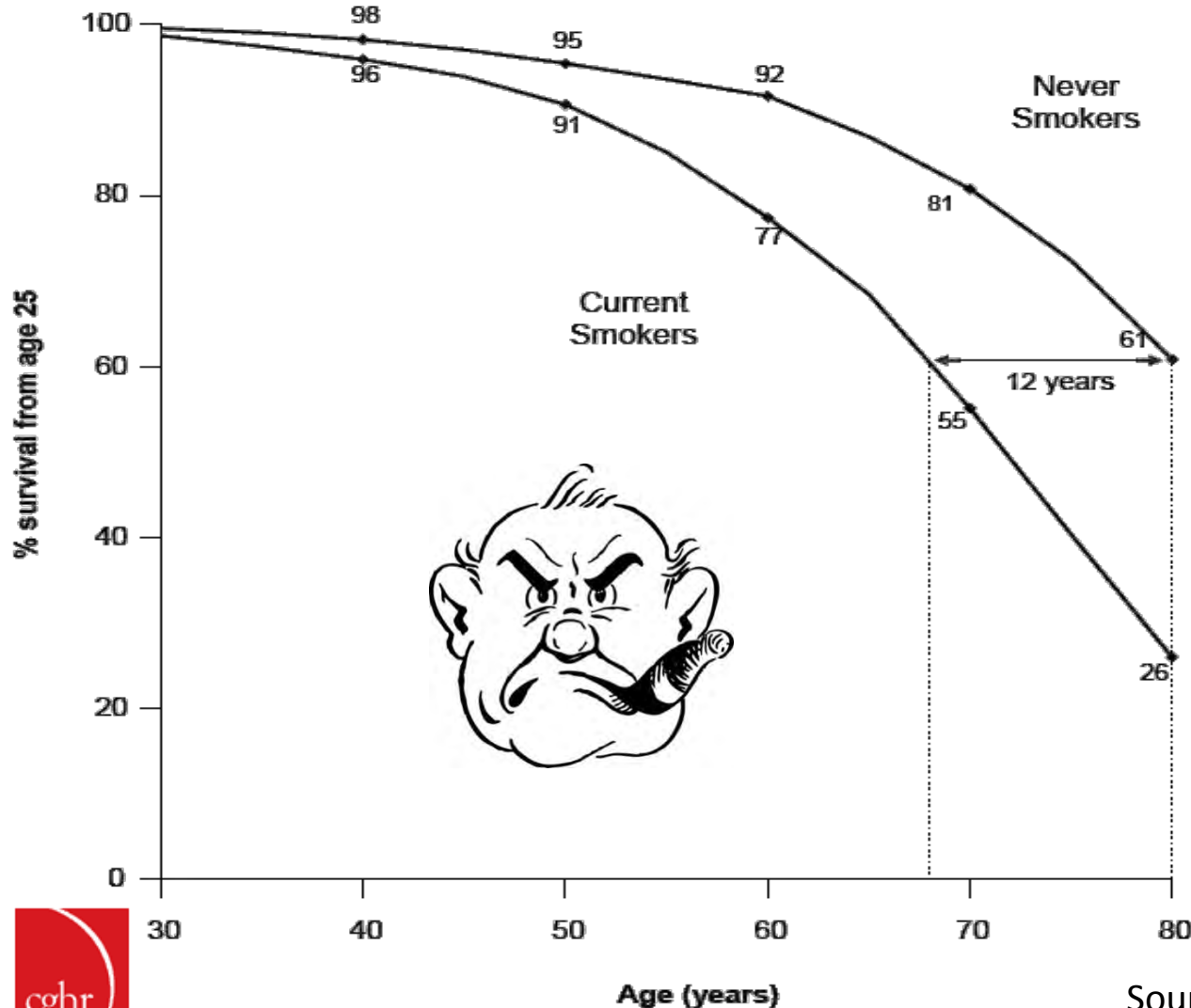
HR adjusted for age, education, alcohol, adiposity (BMI), scaled to 2004 national rates, but comparable results if only actual cohort used



Source: Jha et al, NEJM, Jan 24, 2013

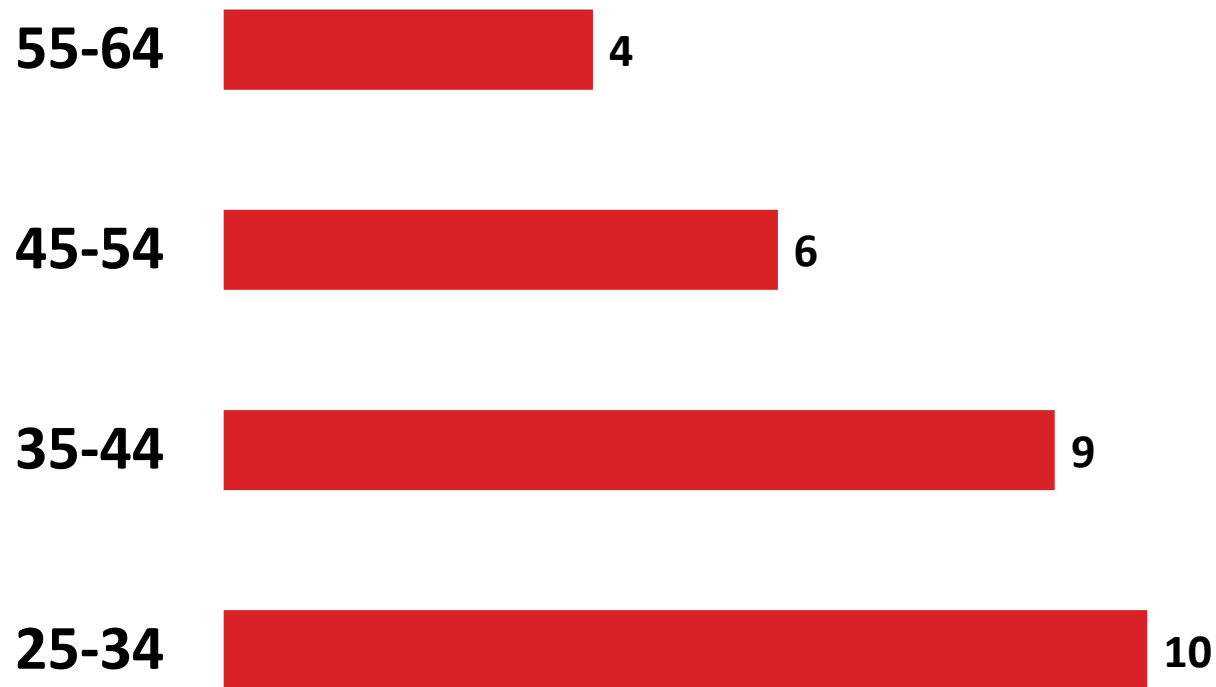
# MALES: Survival probabilities

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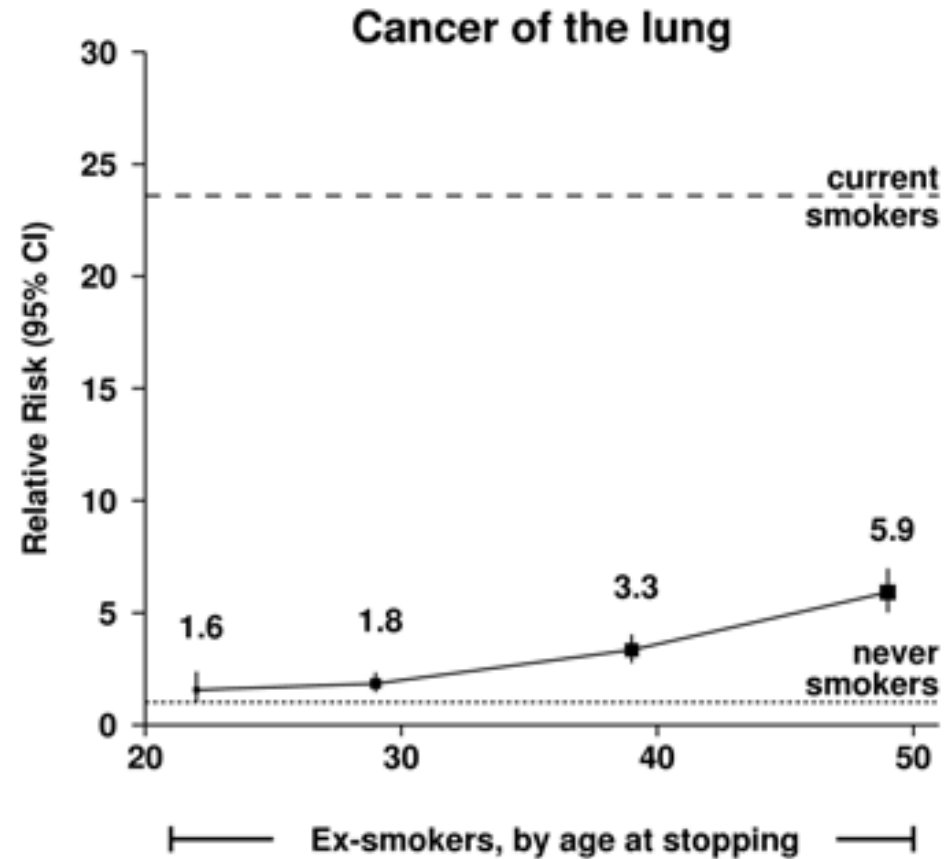
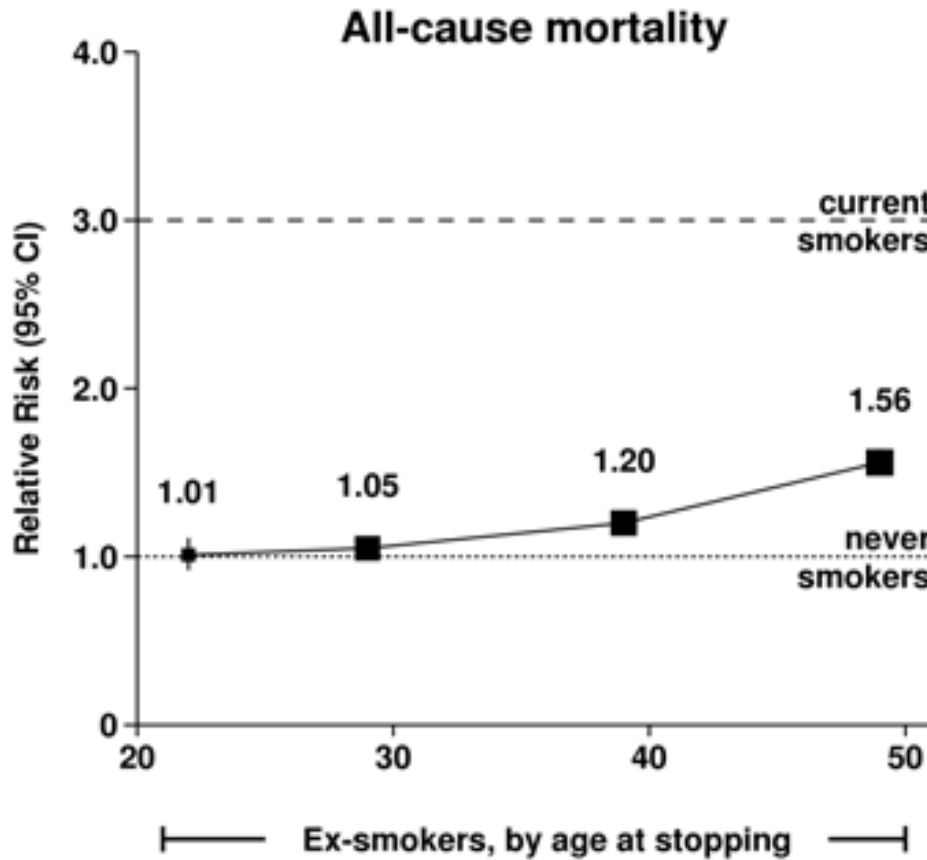


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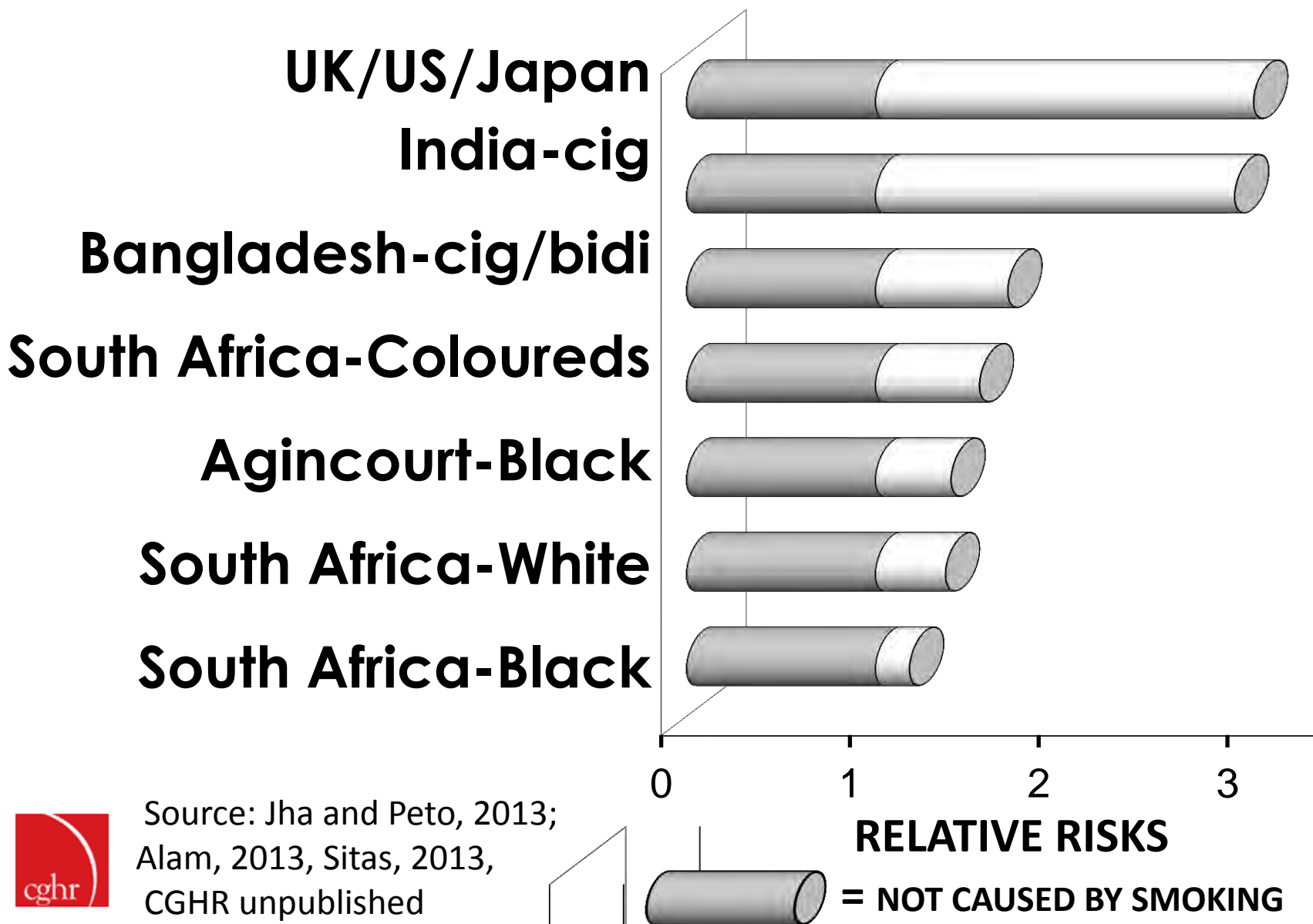
# Years gained by quitting smoking by age



# Reductions in risk by age stopped, UK Women (Million Women's Study)



# Current mortality risks for male smokers vs never smokers



Source: Jha and Peto, 2013;  
Alam, 2013, Sitas, 2013,  
CGHR unpublished



**RELATIVE RISKS**



**= NOT CAUSED BY SMOKING**



**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.**

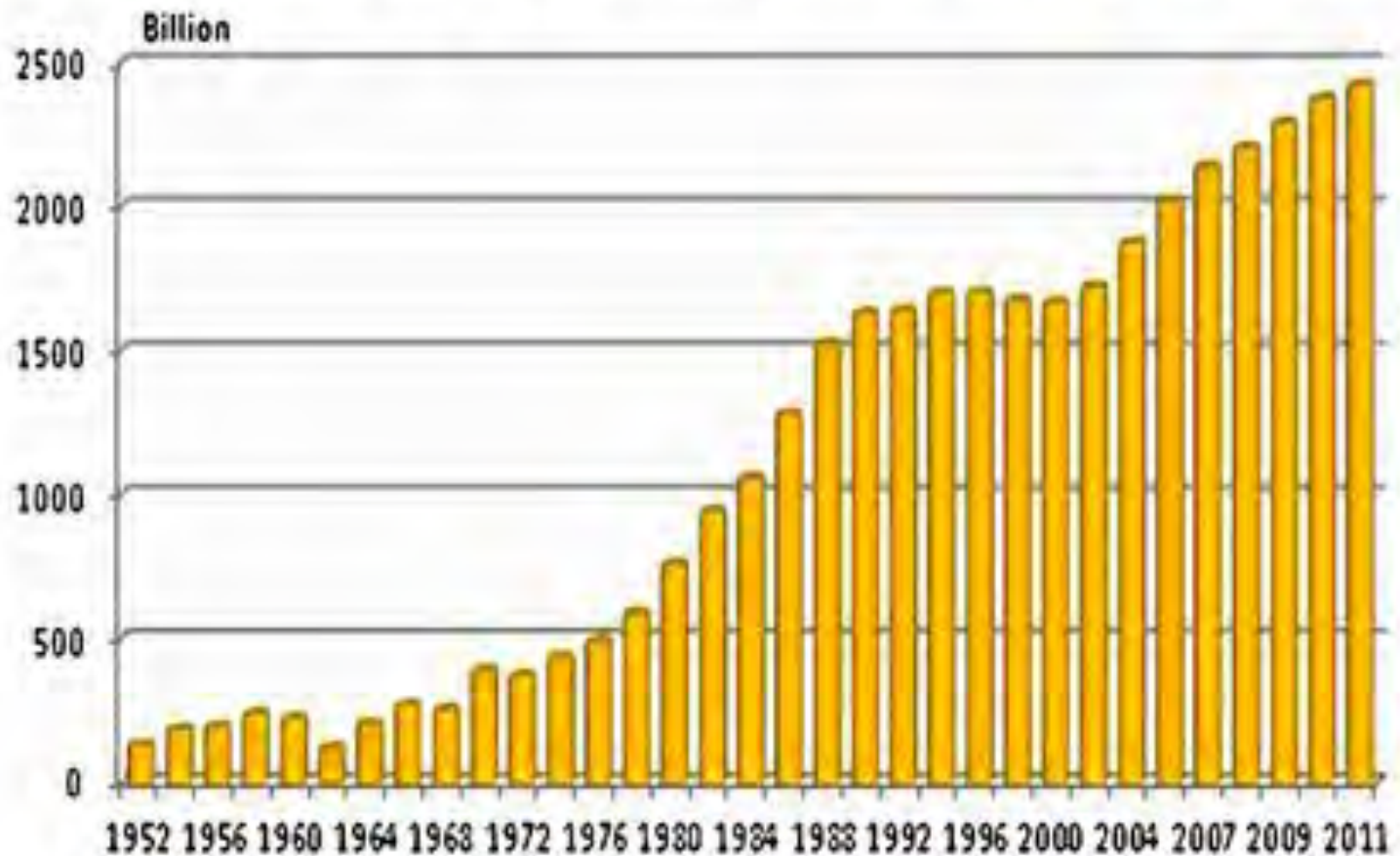


# Chinese cigarette increase 40 years after US increase

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

US (all adults)		China (men)	
1950	12%	1990	12%
1990	33%	2030	33%

# 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)



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<b>Men who smoke bidis</b>	<b>6</b> years
<b>Women who smoke bidis</b>	<b>8</b> years
<b>Men who smoke cigarettes</b>	<b>10</b> years

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

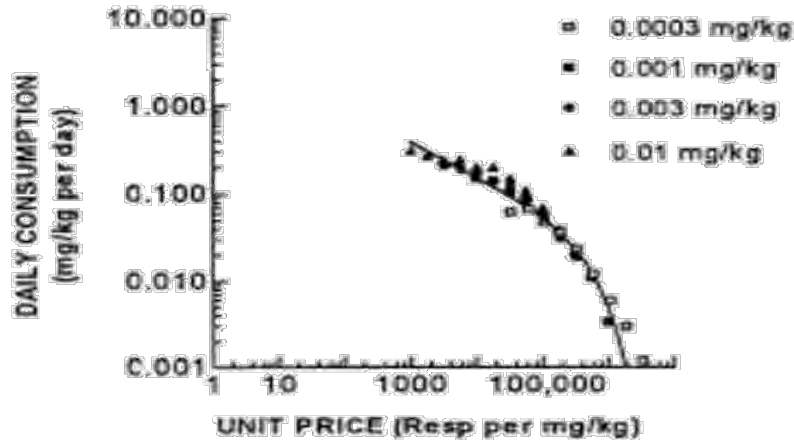
# Which interventions help current smokers to quit?

- 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

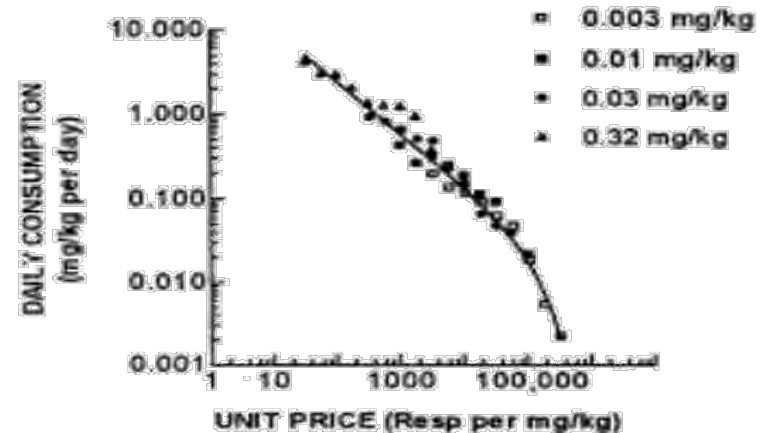


# Price elasticity in monkeys (various addictive goods)

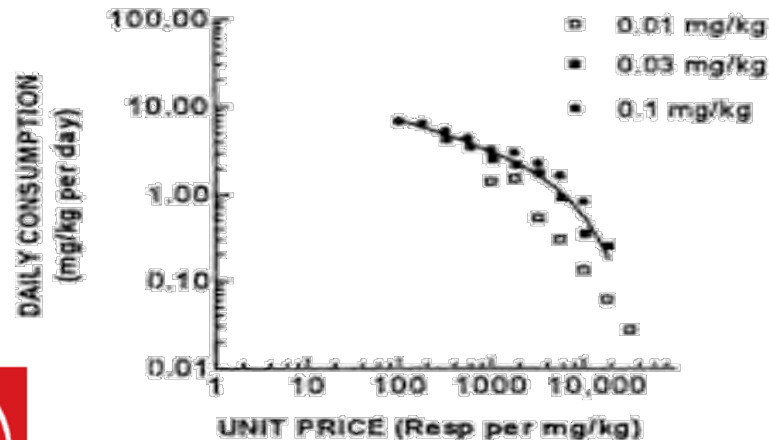
ALFENTANIL



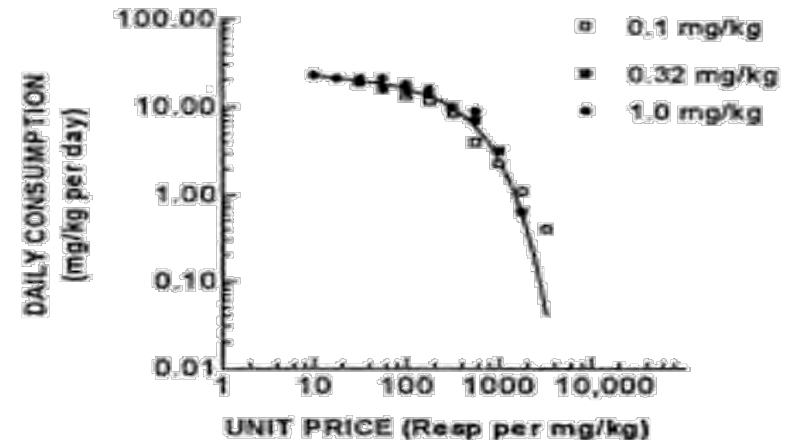
NALBUPHINE



COCAINE

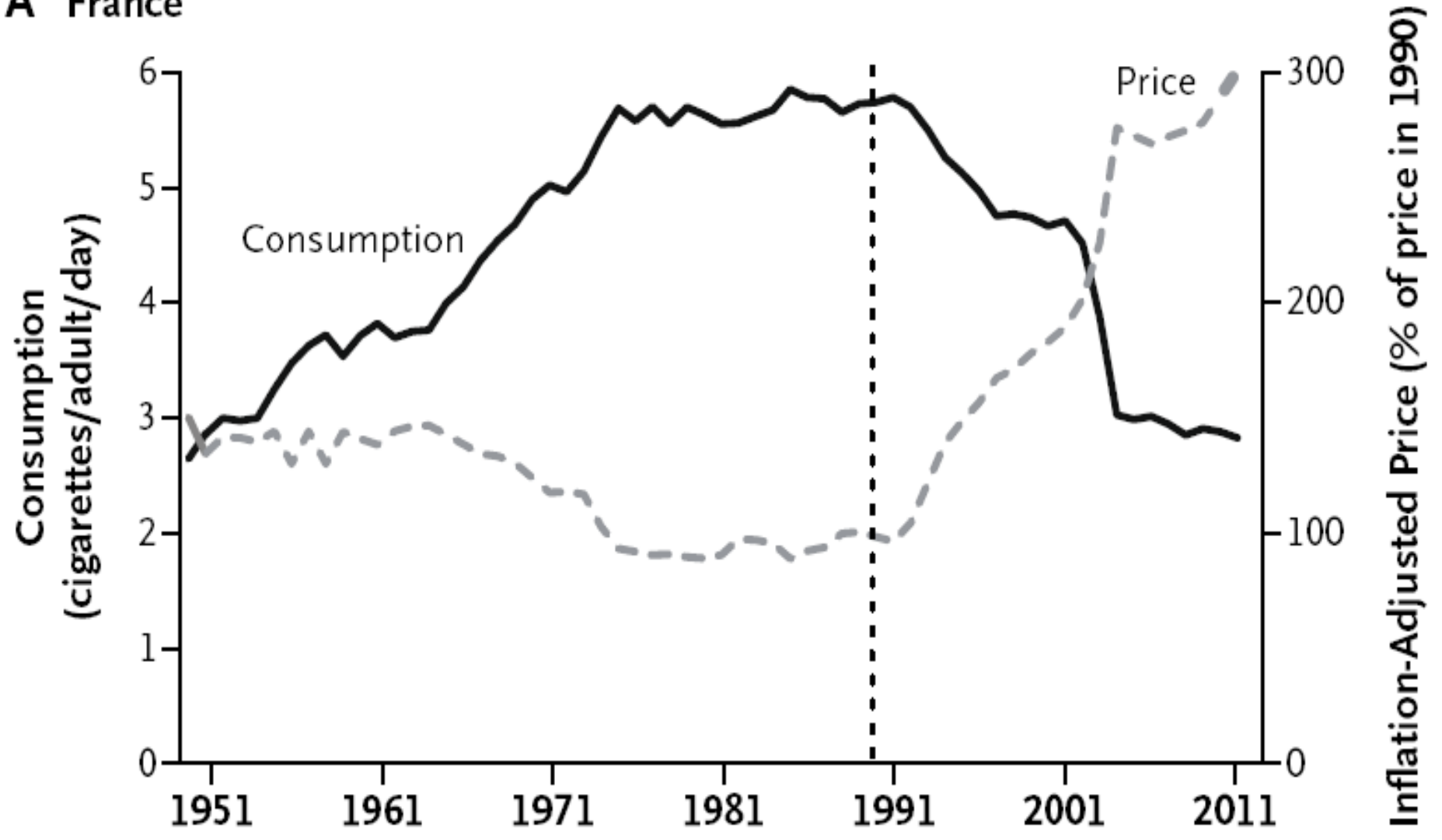


METHOHEXITAL



# Cigarette prices tripled, consumption halved, tax revenue doubled: FRANCE

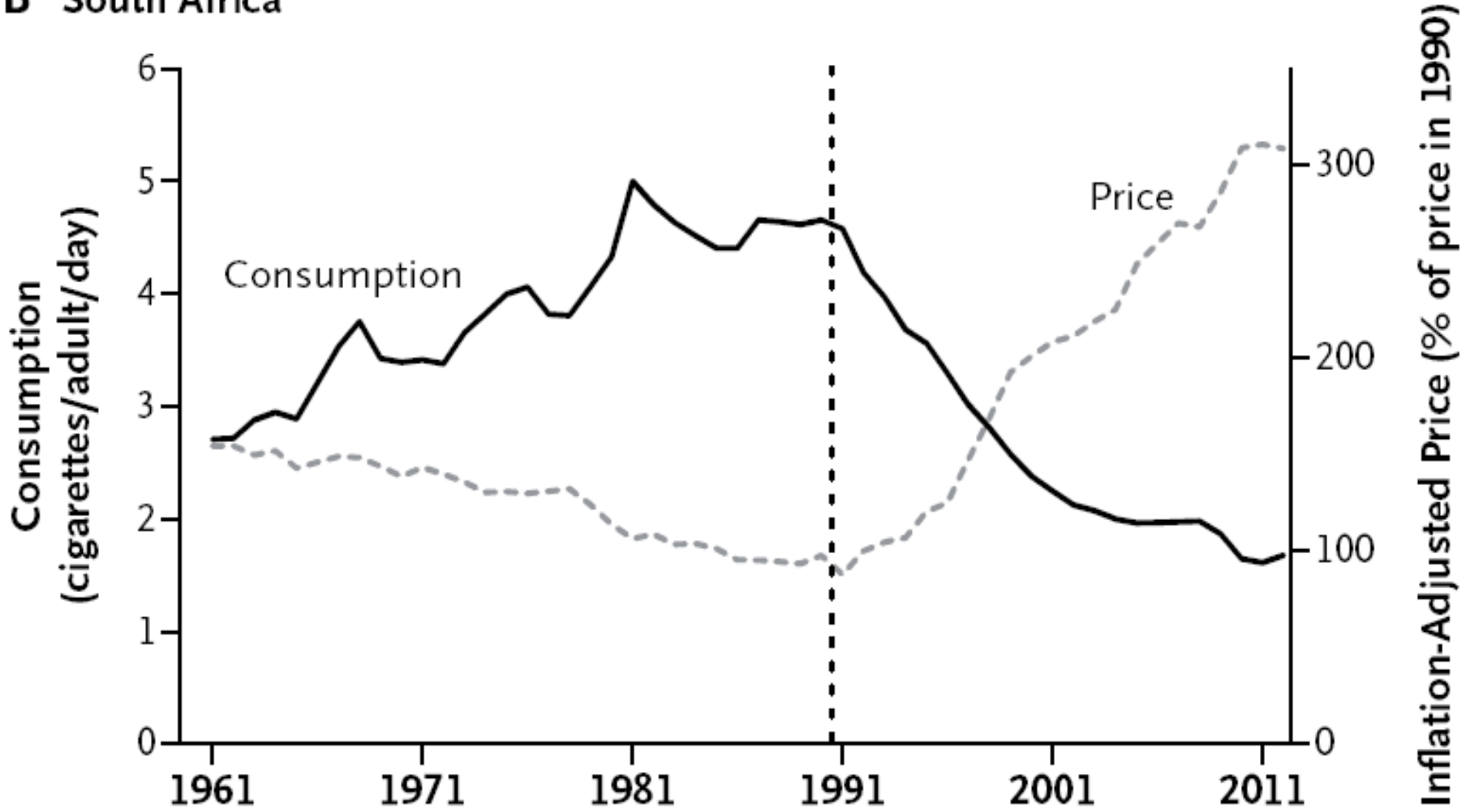
A France





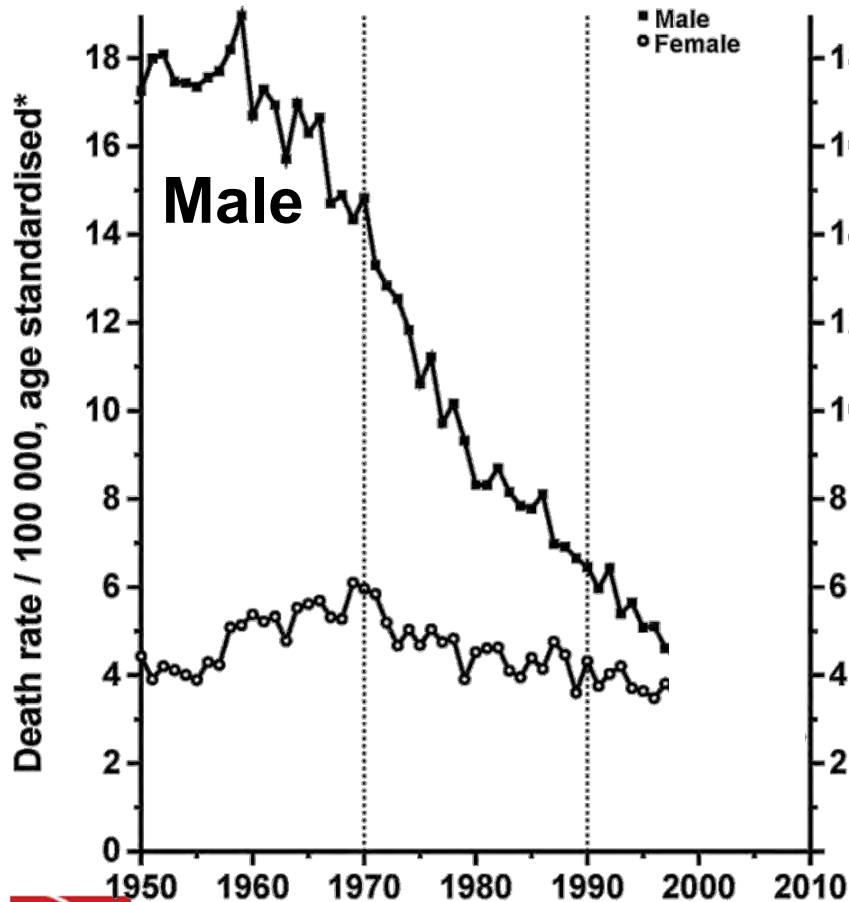
# Cigarette prices tripled, consumption halved, tax revenue doubled: SOUTH AFRICA

B South Africa



# UK & France, lung cancer mortality trends (35-44) to 1997, but not beyond

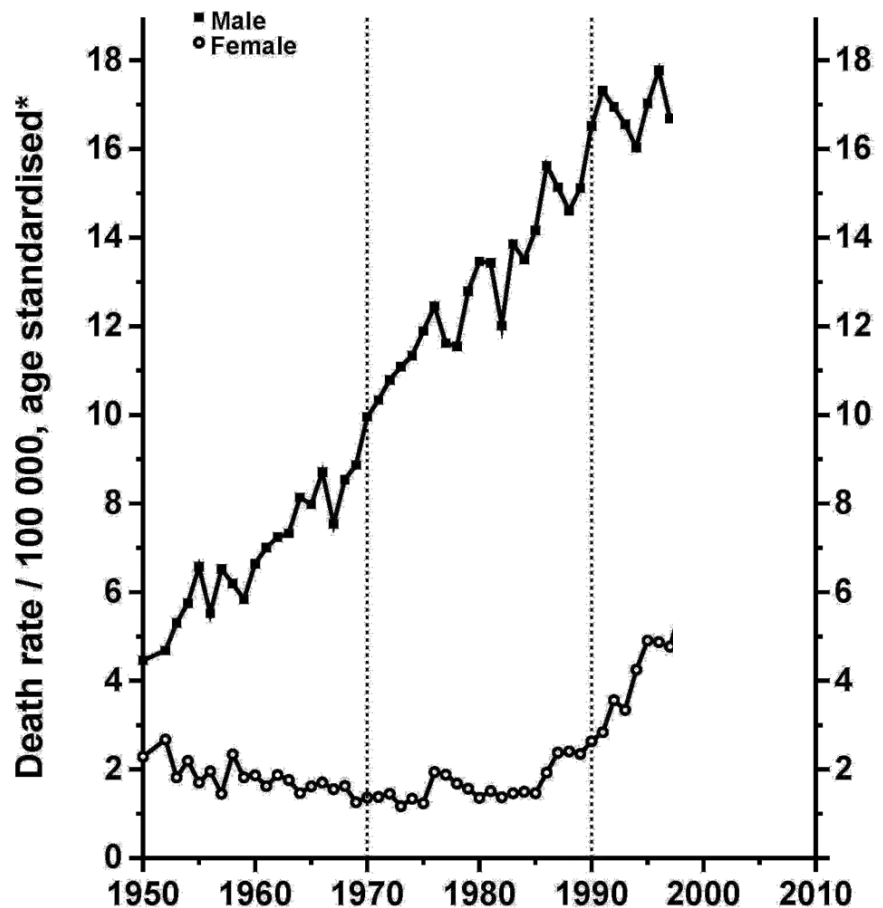
**UNITED KINGDOM**  
Lung cancer mortality at ages 35-44



\*Mean of annual rates in the two component 5-year age groups

Source: WHO mortality & UN population estimates

**FRANCE**  
Lung cancer mortality at ages 35-44

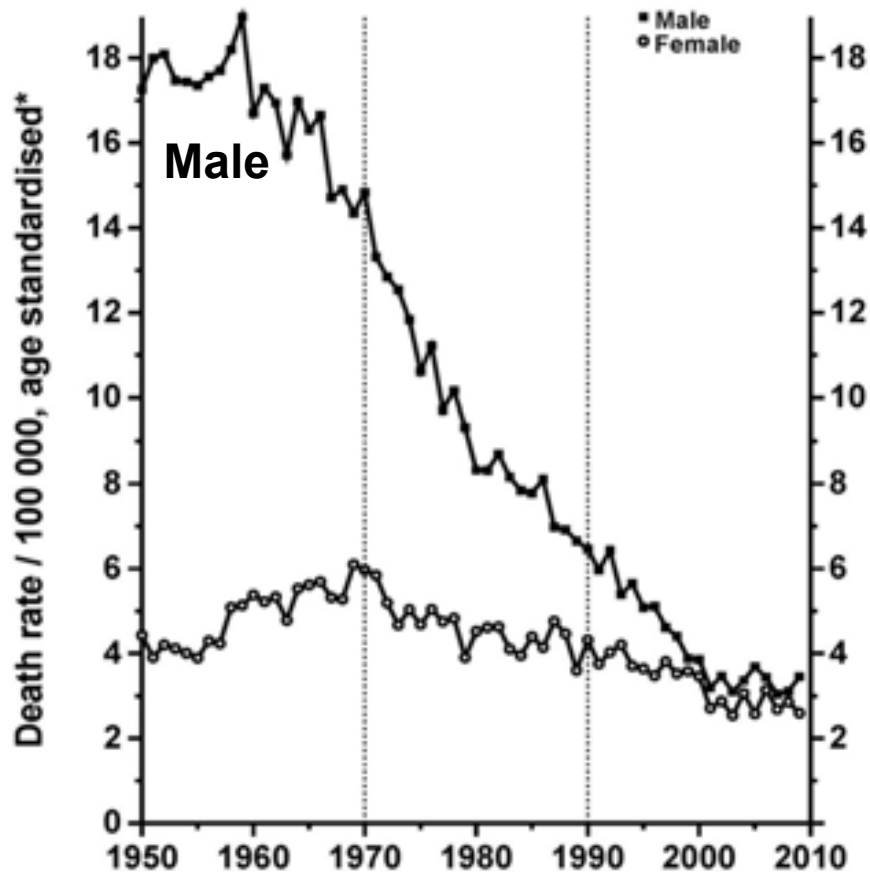


\*Mean of annual rates in the two component 5-year age groups

Source: WHO mortality & UN population estimates

# UK & France, lung cancer mortality trends (35-44) after 1997

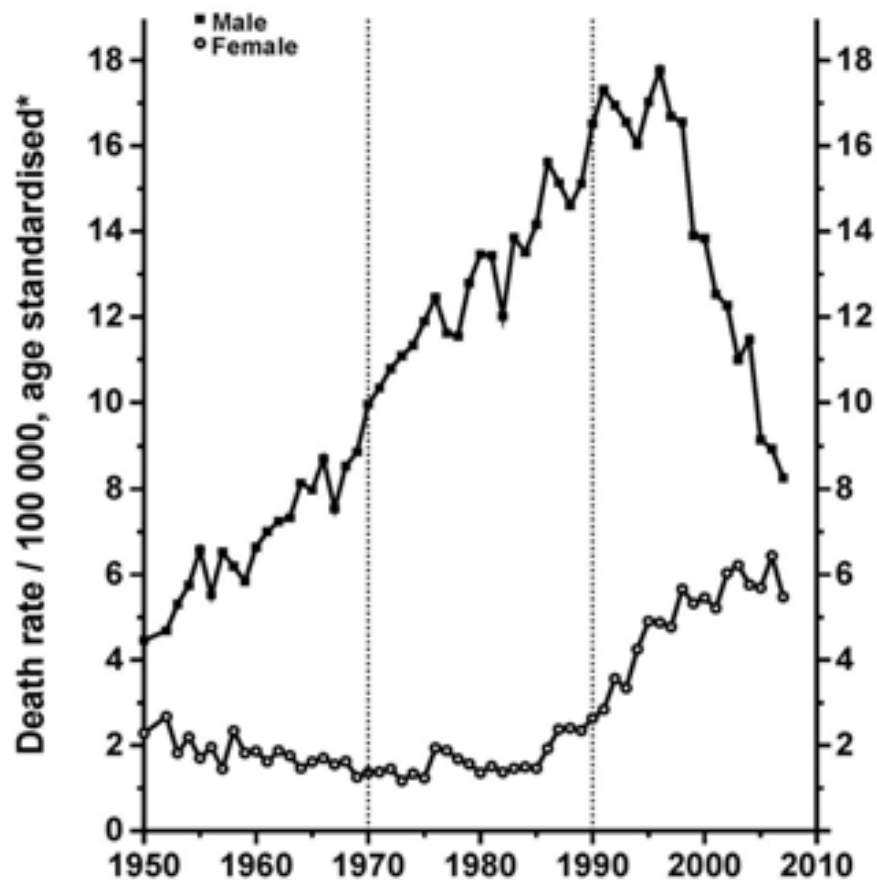
UNITED KINGDOM 1950-2009: Males & Females  
Lung cancer mortality at ages 35-44



\*Mean of annual rates in the two component 5-year age groups

Source: WHO mortality & UN population estimates

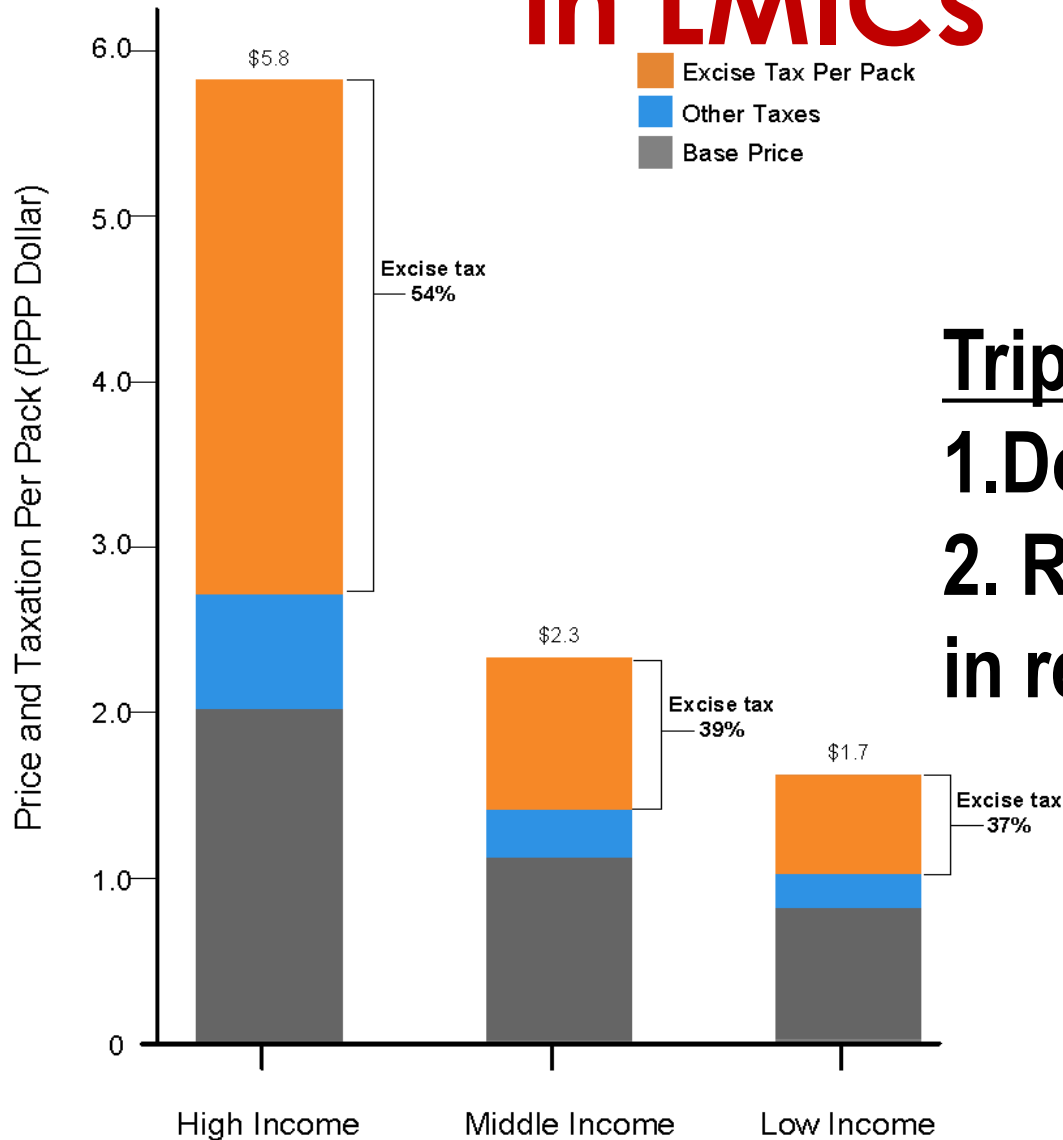
FRANCE 1950-2007: Males & Females  
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Source: WHO mortality & UN population estimates

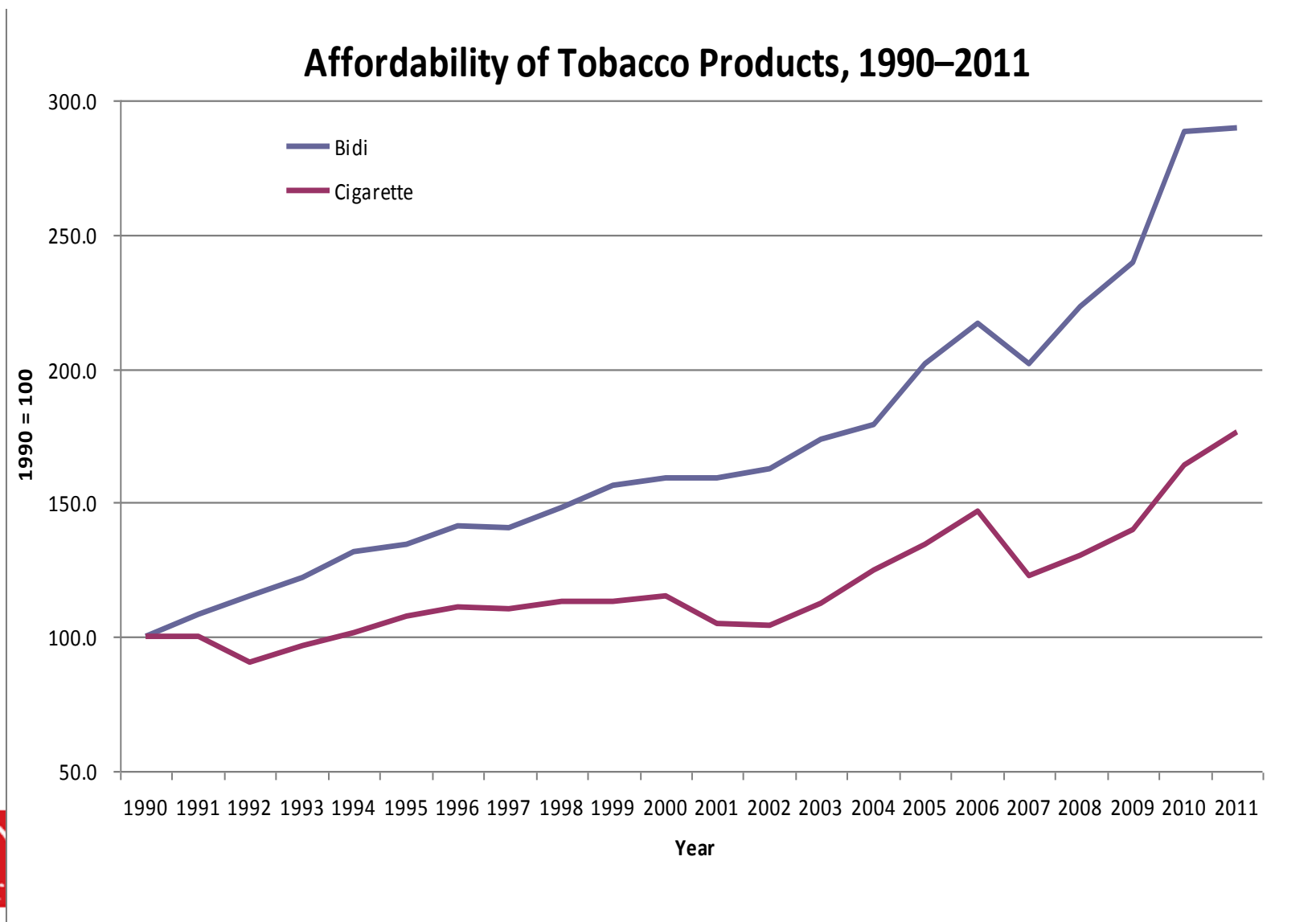
# Low Specific Excise taxes in LMICs



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)



**WARNING**  
**TOBACCO USE**  
**CAN MAKE YOU**  
**IMPOTENT**

Cigarettes may cause sexual impotence due to decreased blood flow to the penis. This can prevent you from having an erection.

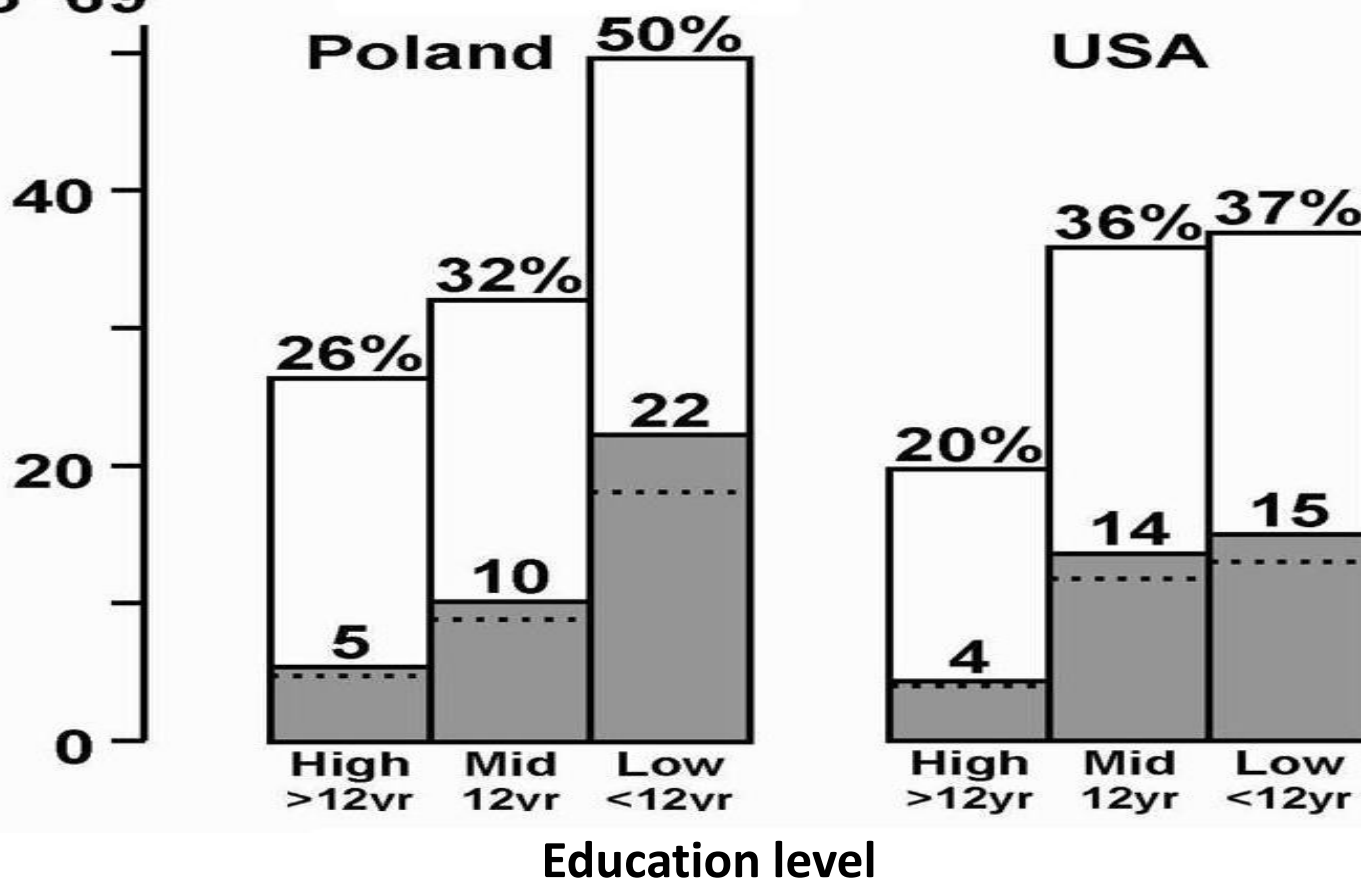
Health Canada

# 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*

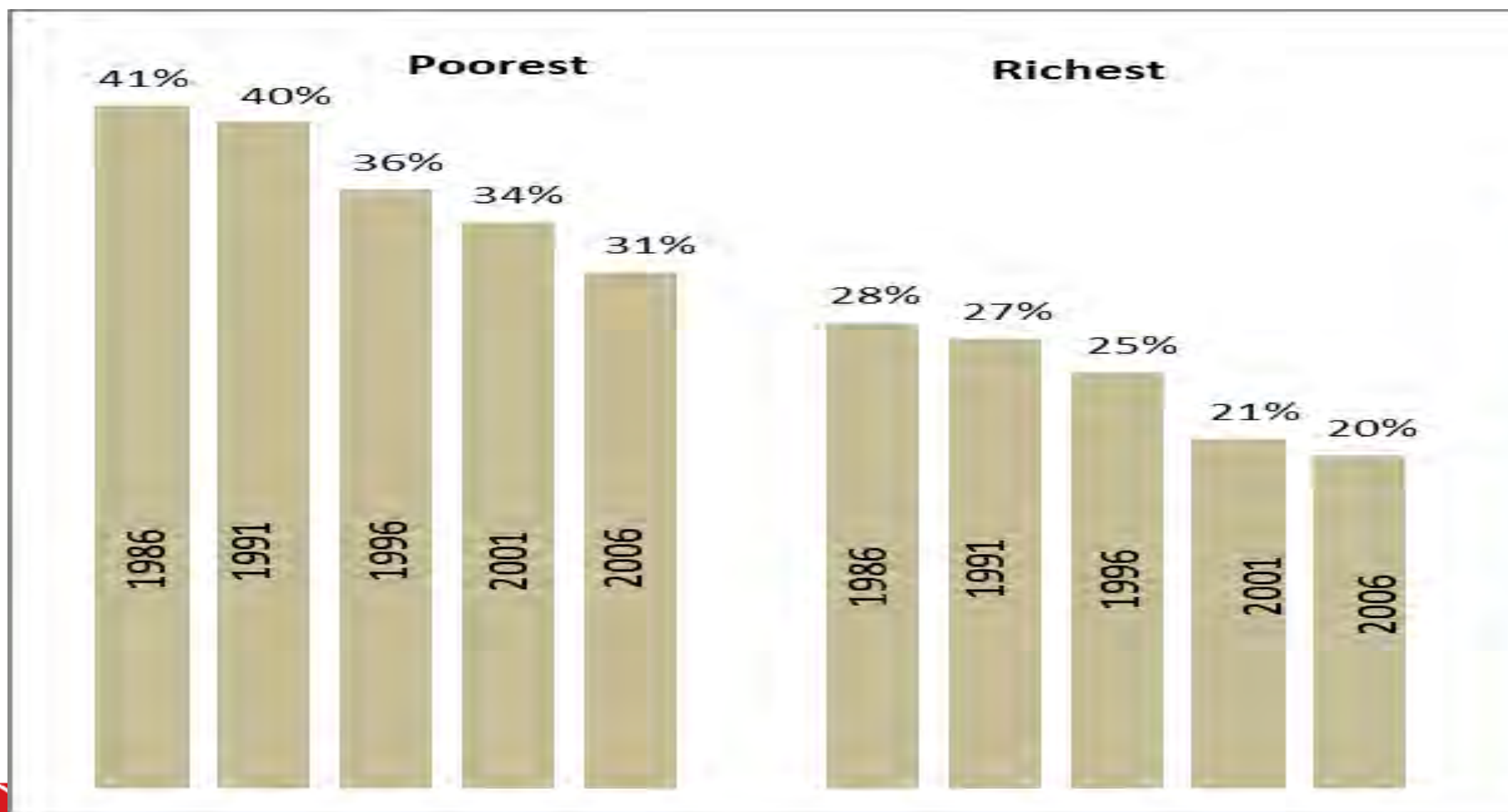
# Social inequalities in male mortality in 1996 from smoking (shaded) and any cause

% risk of dying at ages 35-69





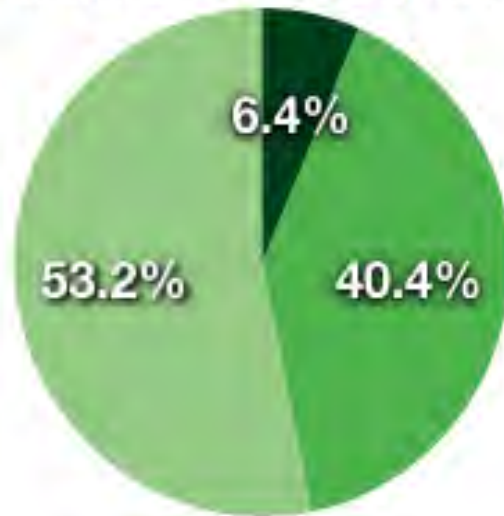
# Tobacco deaths (% of total), MEN, Canada, 1986-2006, by income



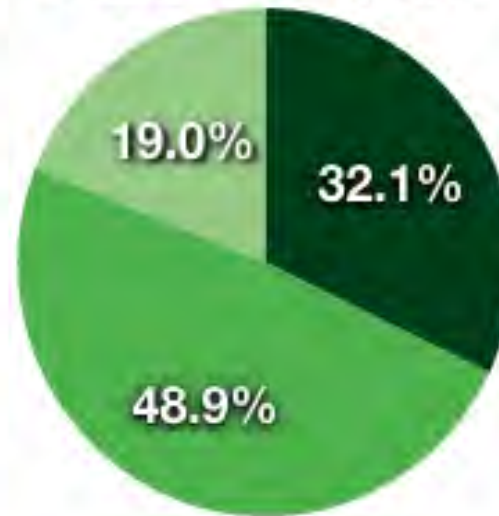
# People's Republic of China

## Distribution of marginal taxes and health benefits by SES group

Marginal taxes paid by SES



Deaths averted by SES



● Low ● Middle ● High

### Low SES group:

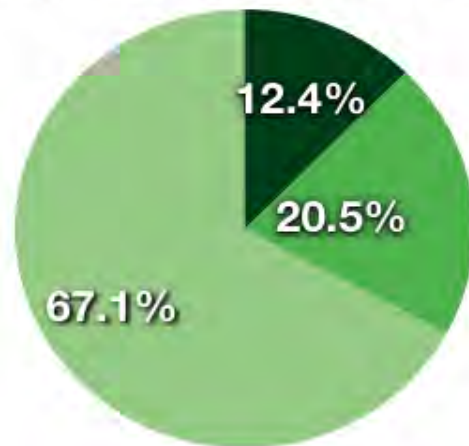
Pays **6.4%** of increased taxes but receives **32.1%** of health benefits: hence, health/tax ratio: **5.02**

**% of income:** Net gain for lowest 2 quintiles, net loss for highest 3 quintiles

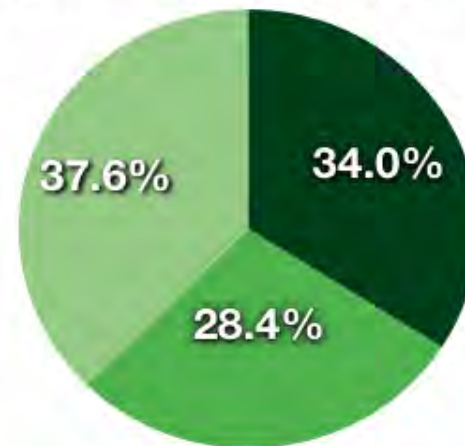
# United States

## Distribution of marginal taxes and health benefits by SES group

Marginal taxes paid by SES



Deaths averted by SES



● <poverty   ● 1-2\* poverty   ● >2\* poverty

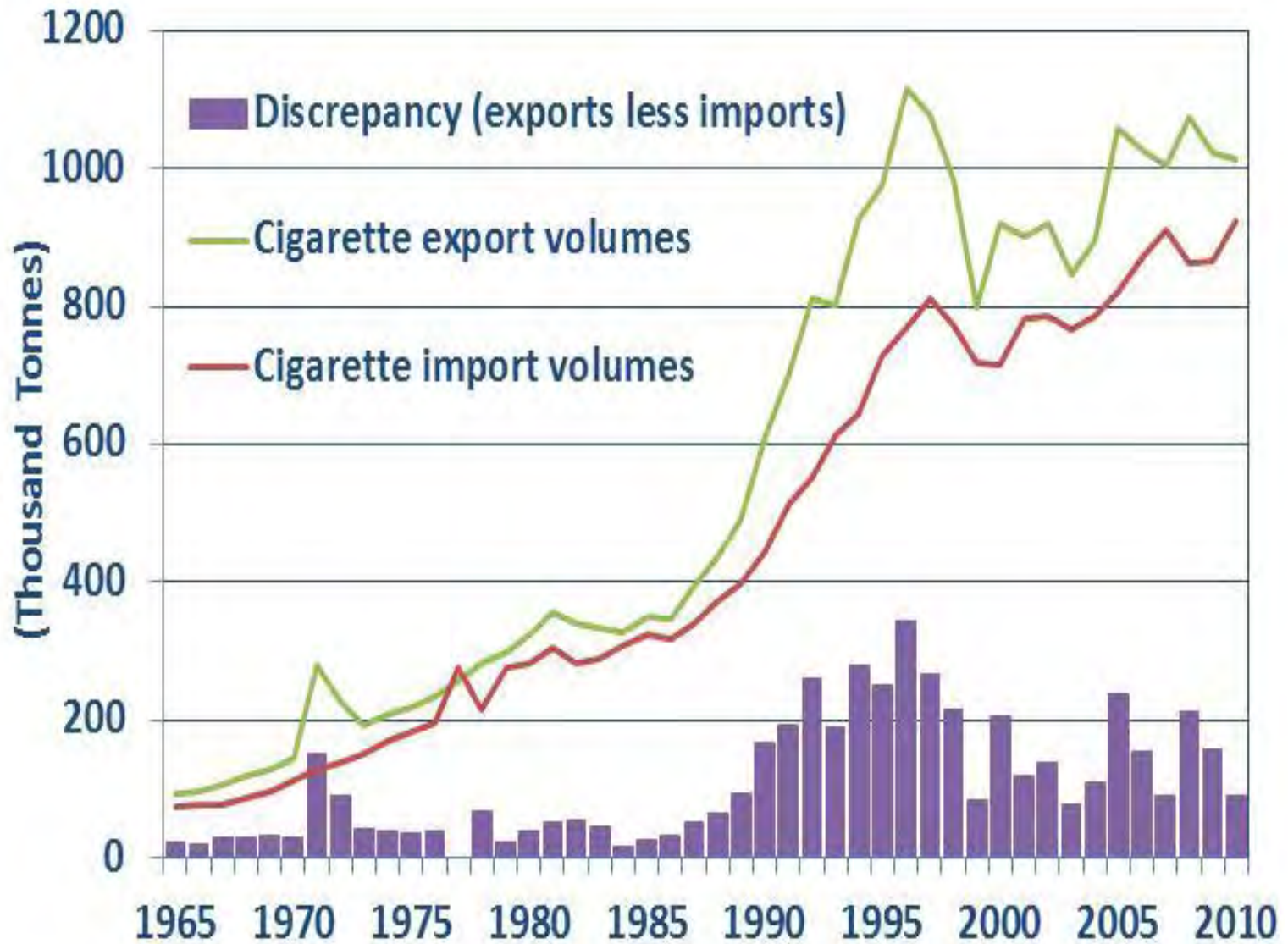
### Low SES group:

Pays **12.4%** of increased taxes

Receives **34.0%** of health benefits

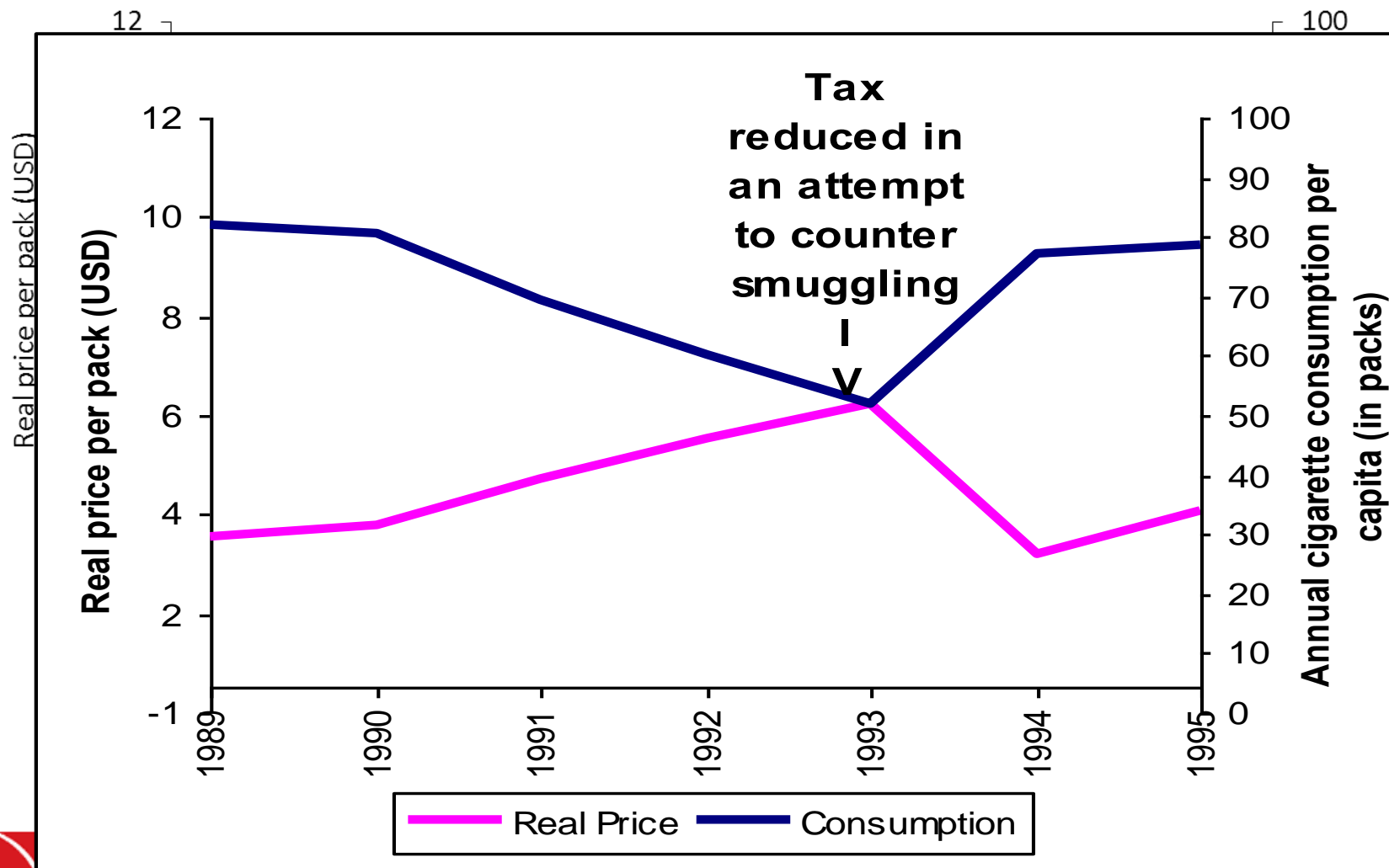
Health/tax ratio: **2.74**

# Global smuggling estimates



Source: <http://faostat.fao.org>

# Canada Sharply Reduced Taxes in 1993



# 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

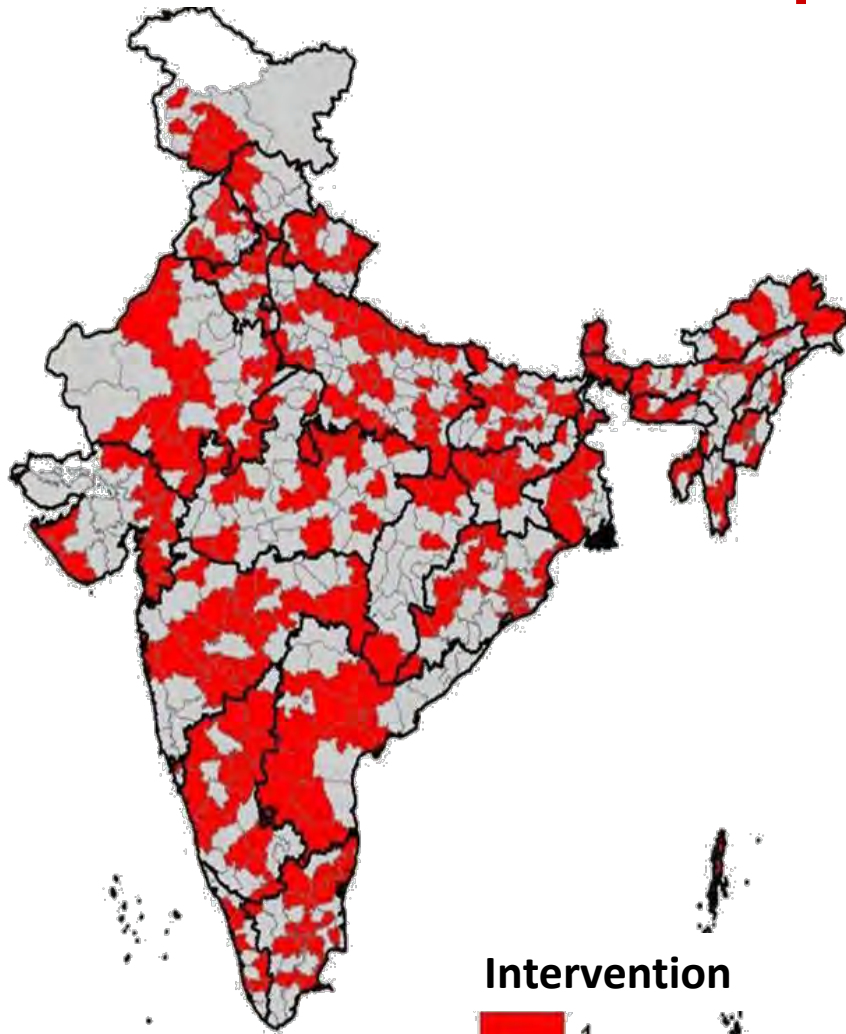
# Mexico: 7 peso (25%) tax rise, 2010

**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



Intervention



1



0

Control

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

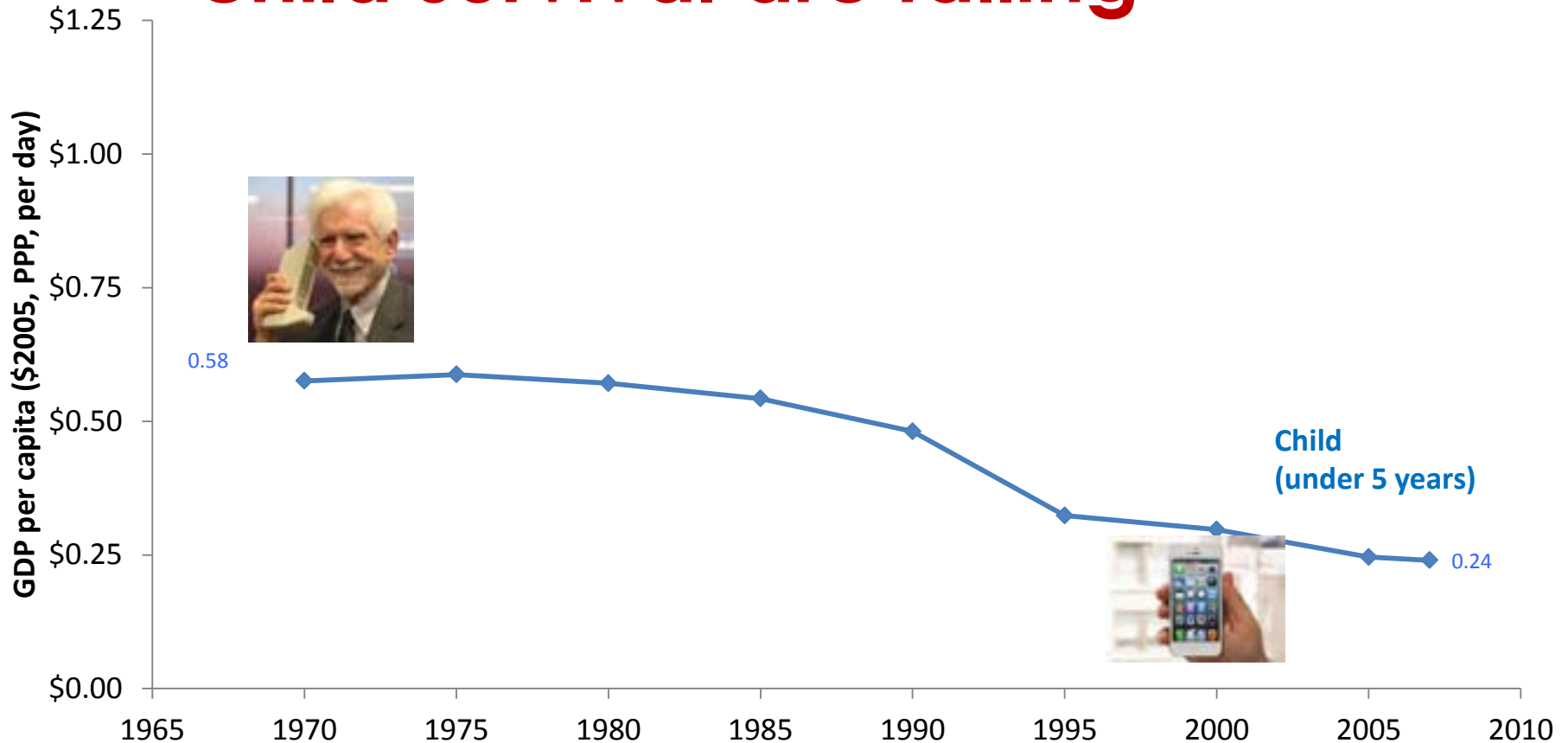
Target: MPs, MLAs, doctors, health  
workers and technocrats in 600  
districts

	A	No A	
B	150	150	} Outcome: Quit rates
No B	150	150	

Outcome:  
Service use &  
healthcare  
spending

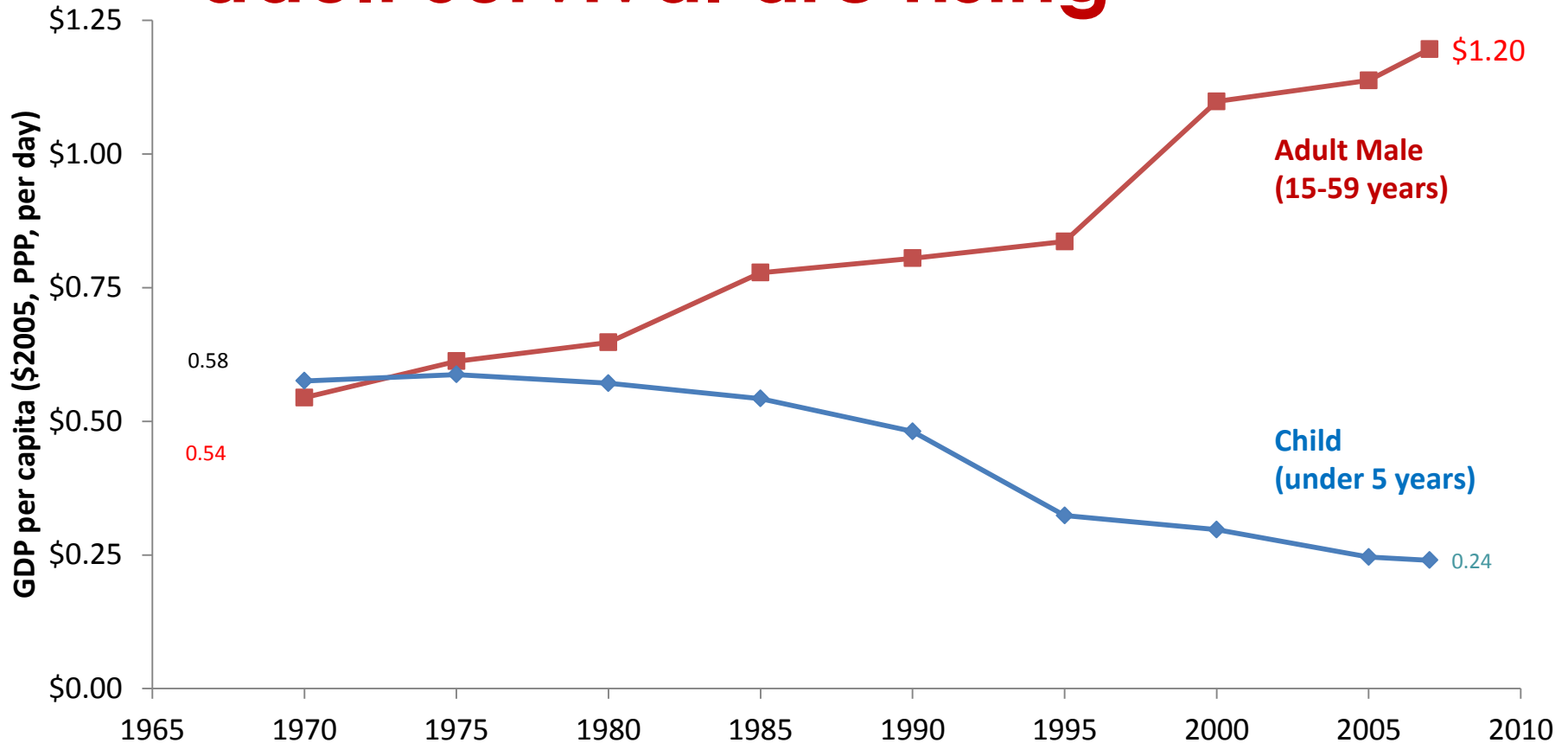


# Marginal costs for maximal child survival are falling



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

# 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**

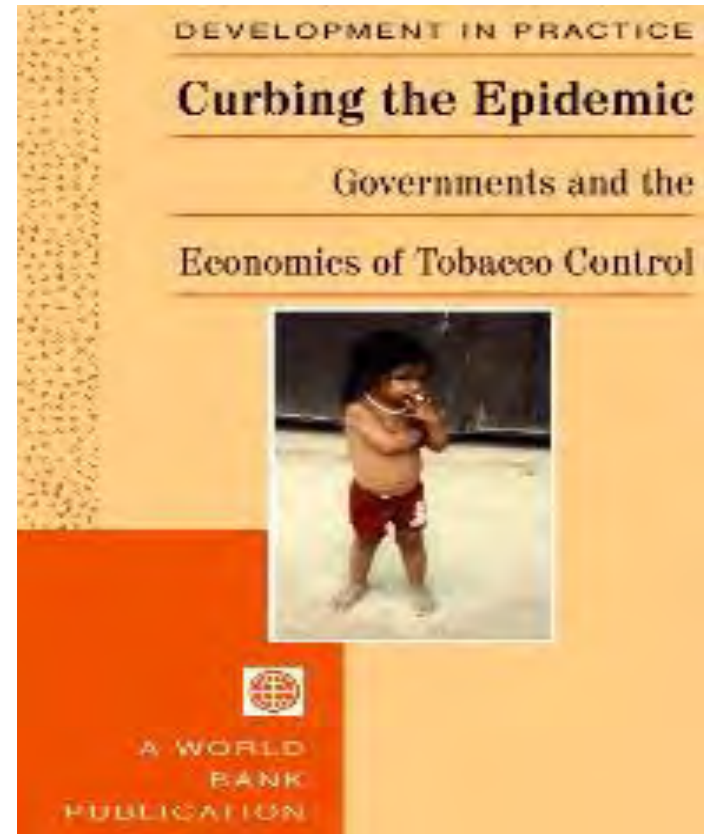
# Three “hundreds” by 2030

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**

# Conclusions

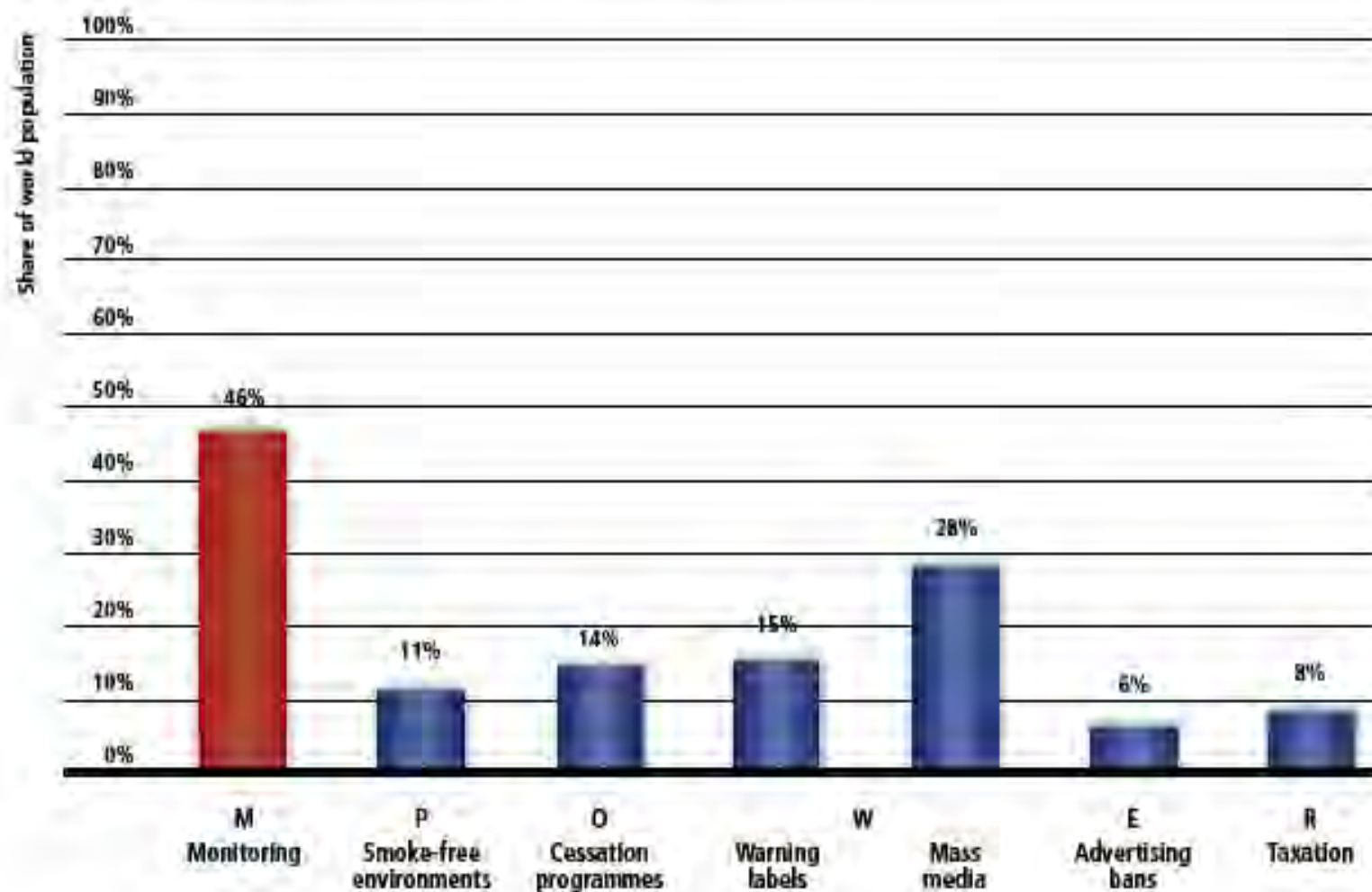
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- **Tripling of excise tax worldwide would reduce smoking by 1/3, avoid over 200 million premature deaths, and raise \$100 B more in revenue**
- **Tobacco control does not hurt the poor**
- **Monitoring is needed: smoking and death status**

# [www.cghr.org/tobacco](http://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.