

# Tobacco Excise Taxes

Frank J. Chaloupka  
The Institute 2010  
Atlanta GA, October 5, 2010

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## Overview

- Revenue impact of tobacco tax increases
  - Overview of data sources and methods
  - Earmarked tobacco taxes
- Health impact of tobacco tax increases
  - Overview of data sources and methods

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## Revenue Impact of Tobacco Tax Increases

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## Taxes and Revenues

By *J Scott Moody*, 4/2/08, from an AP story:

AUGUSTA — "A coalition of health groups today urged lawmakers to increase the cigarette tax by a \$1 per pack, saying the increase will encourage more people to quit smoking and generate more money for health programs.

Translation: Fewer people smoking equals more cigarette tax revenue? Someone needs a math lesson."

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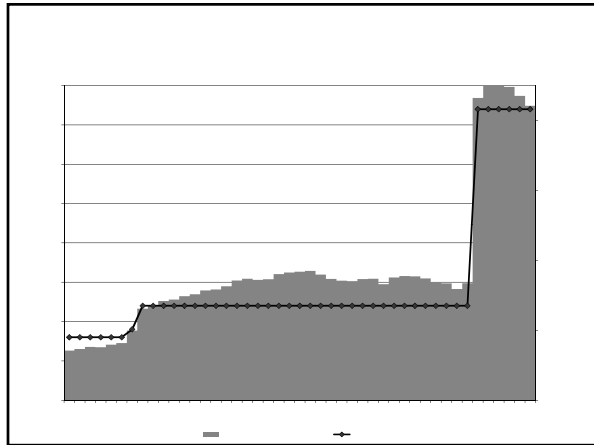
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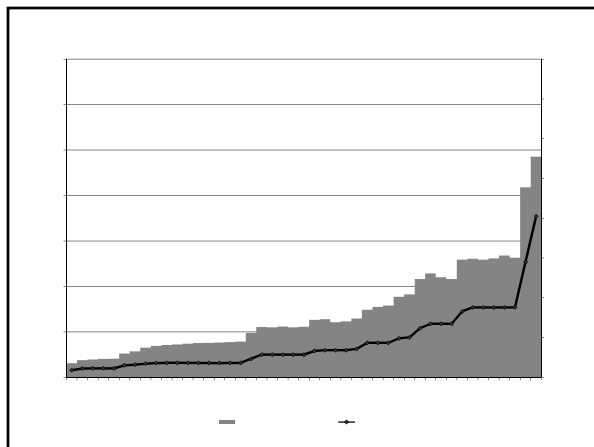
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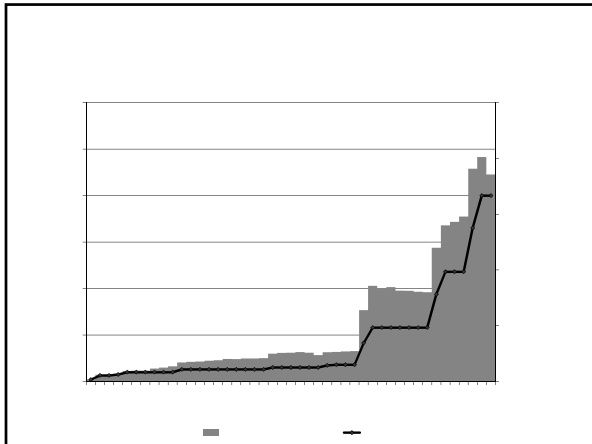
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**Positive Effect of Tax Increases on Revenues Results from:**

Low share of tax in price:

- In US, state taxes account for about 25% of price on average
- total taxes account for less than half of price, on average
- *Implies large tax increase has much smaller impact on price*

Less than proportionate decline in consumption:

- 10% price increase reduces consumption by 4%

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### Positive Effect of Tax Increases on Revenues

#### Example

- Price \$4.00, State tax \$1.00, Sales 500 million packs
  - Revenues: = \$500 million
  
- Doubling of tax to \$2.00 per pack raises price to \$5.00
  - 100% increase in tax; 25% increase in price
- 25% price increase reduces sales by 10%
  - new sales 450 million packs
  - *90% of original sales at double the tax increases revenues by 80%*
  - new revenues = \$900 million

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### Positive Effect of Tax Increases on Revenues

#### Example – with significant tax avoidance

- Price \$4.00, State tax \$1.00, Sales 500 million packs
  - Revenues: = \$500 million
  
- Doubling of tax to \$2.00 per pack raises price to \$5.00
  - 100% increase in tax; 25% increase in price
- 25% price increase reduces sales by 20% (reduced consumption plus equivalent tax avoidance)
  - new sales 400 million packs
  - *80% of original sales at double the tax increases revenues by 60%*
  - new revenues = \$800 million

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### Positive Effect of Tax Increases on Revenues

#### Example – with even more tax avoidance

- Price \$4.00, State tax \$1.00, Sales 500 million packs
  - Revenues: = \$500 million
  
- Doubling of tax to \$2.00 per pack raises price to \$5.00
  - 100% increase in tax; 25% increase in price
- 25% price increase reduces sales by 40% (reduced consumption plus 3x as much tax avoidance)
  - new sales 300 million packs
  - *60% of original sales at double the tax increases revenues by 20%*
  - new revenues = \$600 million

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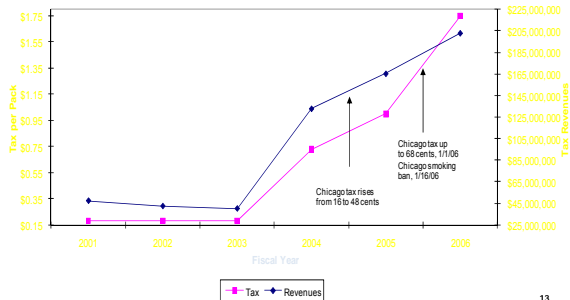
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## Tax Increases and Tax Avoidance

Cook County Cigarette Tax and Tax Revenues - FY01-FY06




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## Sustainability of Cigarette Tax Revenues

Some suggest increases in revenues won't be sustained over time

- Looked at significant state tax increases over past 20 years where increase was maintained for at least 5 years
  - Separately for states with major tobacco control programs

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## Sustainability of Cigarette Tax Revenues

### •Conclusions:

- All significant state tax increases resulted in significant increases in state tax revenues
  - Nominal increases in revenues sustained over time in states without tobacco control programs
  - Nominal revenues decline in states with tobacco control programs, but are significantly higher than before tax increase
  - Tobacco tax revenues more predictable than other revenues

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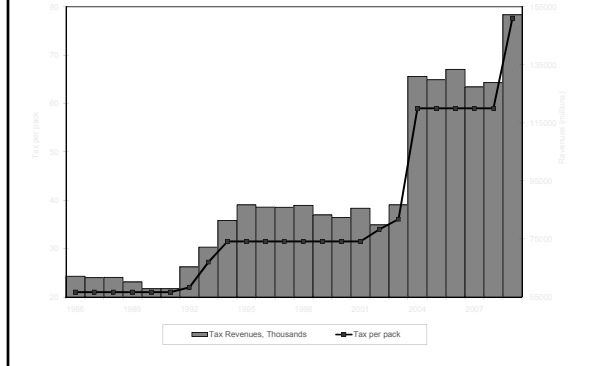
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Cigarette Tax and Tax Revenues, Arkansas, 1986-2009




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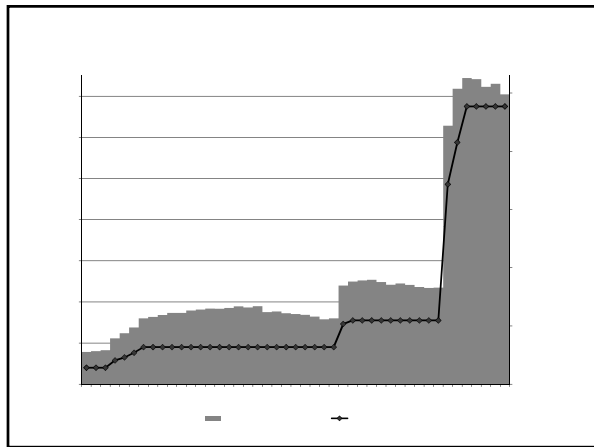
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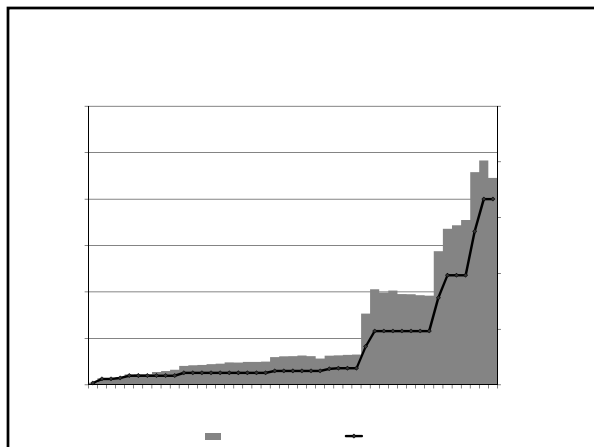
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**Earmarked Tobacco Taxes**

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**Comprehensive Programs**

- **General aims:**
  - Prevent initiation of tobacco use among young
    - Increased prices, reduced access
    - Increased antitobacco messages, reduced protobacco
  - Promote cessation among young adults, adults
    - Better access to cessation services
    - Increased prices and strong smoke-free policies
    - Increased antitobacco messages, reduced protobacco
  - Eliminate exposure to secondhand smoke
    - Strong smoke-free policies
    - Strengthened anti-smoking norms
  - Identify and eliminate disparities
    - Intertwined with others; need for targeted approaches

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Source: USDHHS, 2000; CDC 2007

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**Comprehensive Programs**

- **Components of a comprehensive program:**
  - State and community interventions
    - Support for policy development and implementation
    - Efforts to strengthen norms against tobacco
    - Targeted efforts to reduce youth tobacco use, disparities
  - Health communication interventions
    - Mass-media countermarketing campaigns
    - Efforts to replace tobacco industry sponsorship/promotion
    - Targeted messaging/delivery
  - Cessation interventions
    - Array of policy, health system, and population-based measures
  - Surveillance and Evaluation
  - Administration and Management

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Source: USDHHS, 2000; CDC 2007

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## Comprehensive Programs

- State specific programs
  - California Tobacco Control Program
    - Proposition 99 – Tobacco Tax and Health Protection Act easily approved by CA voters in Nov. 1988
    - 25 cent increase in cigarette tax (to 35 cents per pack)
    - 20% of revenues earmarked for tobacco-related education efforts
      - Countermarketing, community programs, support for cessation, and more
      - Broad focus
      - Strong industry denormalization approach
    - 5% for tobacco-related research
    - Additional 50 cent per pack tax increase approved in Nov. 1998
      - Helped restore program funding

Source: Tobacco Control, 2010

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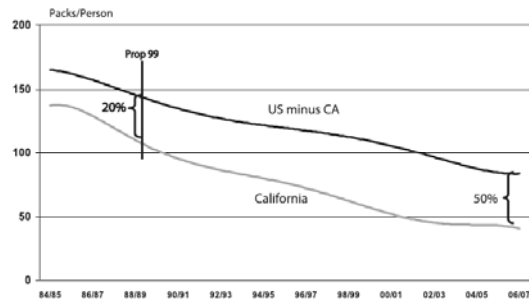
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## Comprehensive Programs



Source: California State Board of Equalization (packs sold) and California Department of Finance (population); U.S. Census, Tax Burden on Tobacco; and USDA. Note that data is by fiscal year (July 1-June 30).

Prepared by: California Department of Health Services, Tobacco Control Section, November 2007.

Source: Tobacco Control, 2010

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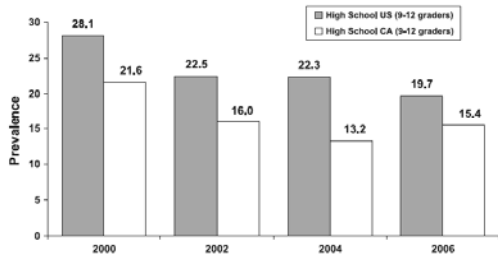
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## Comprehensive Programs

30-day smoking prevalence for California and U.S. high school (9th-12th grade) students, 2000-2006



Source: The U.S. data is from the National Youth Tobacco Survey collected by the American Legacy Foundation, which used passive parental consent. The 2002, 2004 and 2006 data is from the California Student Tobacco Survey. The 2002 and 2004 data collection used active parental consent while the 2006 used a mixed parental consent procedure. Prepared by: California Department of Public Health, Tobacco Control Section, July 2007.

Source: Tobacco Control, 2010

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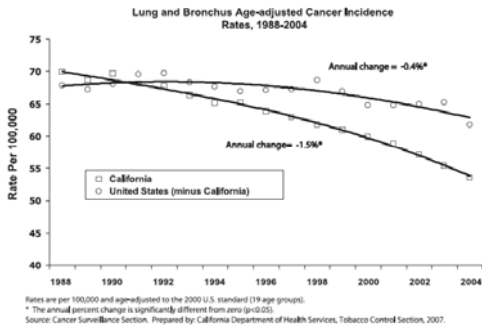
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## Comprehensive Programs



Source: Tobacco Control, 2010

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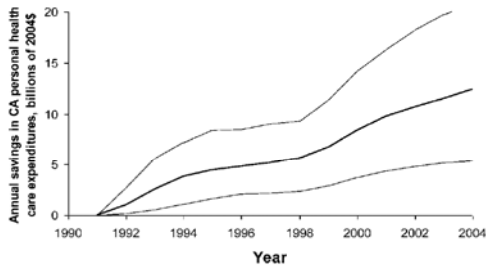
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## Comprehensive Programs



**Figure 3. Savings in Personal Health Care Expenditures**  
The estimated annual personal health care expenditures savings associated with the CTCP began to appear shortly after the program began and grew over time. (Lighter lines indicate the 95% CI for the annual savings.)

Source: Lightwood et al., 2008

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## Comprehensive Programs

- State specific programs
  - Massachusetts Tobacco Control Program
    - Question 1 –approved by MA voters in Nov. 1992
    - 25 cent increase in cigarette tax (to 51 cents per pack); 25% rise in OTP taxes
    - Earmarking not allowed by state constitution, but measure included language strongly encouraging funds to be set aside for tobacco control (soft earmarking)
      - Countermarketing, community programs (particularly targeting SFA policies), support for cessation, and more
      - More targeted efforts, including at youth/young adults and pregnant women; cessation
    - Additional 25 cent per pack tax increase in Oct. 1996
      - Also infusion of MSA funds helped restore program funding

Source: USDHHS 2000

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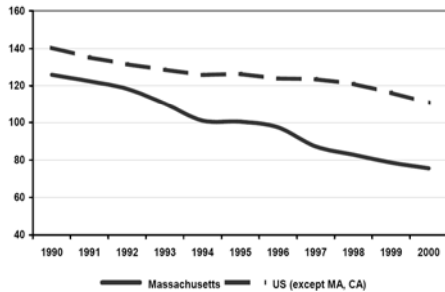
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## Comprehensive Programs

Packs of cigarettes purchased annually per adult (age 18+)



Source: Abt, 2001

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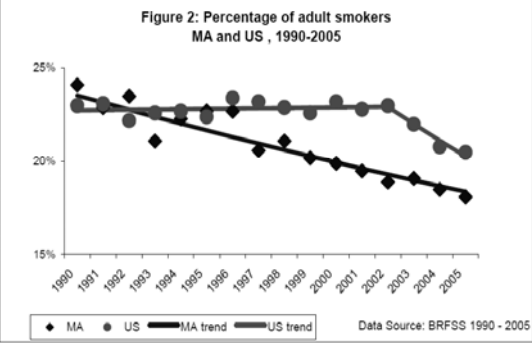
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## Comprehensive Programs

Figure 2: Percentage of adult smokers MA and US, 1990-2005



Source: MA Department of Public Health 2007

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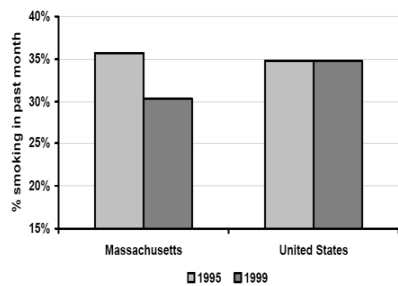
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## Comprehensive Programs

Prevalence of current smoking among high school students



Source: Abt, 2001

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## Comprehensive Programs

- State specific programs
  - Arizona Tobacco Control Program
    - Tobacco Tax and Health Care Act approved by AZ voters in Nov. 1994
      - 60 cents more in 2002; 82 cents more in 2006 (to \$2.00 per pack)
  - Oregon Tobacco Control Program
    - Measure 44, November 1996 raised cigarette tax by 30 cents per pack and OTP taxes from 35% to 65% of wholesale prices
  - Several other states adopt earmarked taxes in late 1990s
  - Many more states fund programs with MSA funds starting in 1999

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Source: Chaloupka 2010; ImpacTeen 2009

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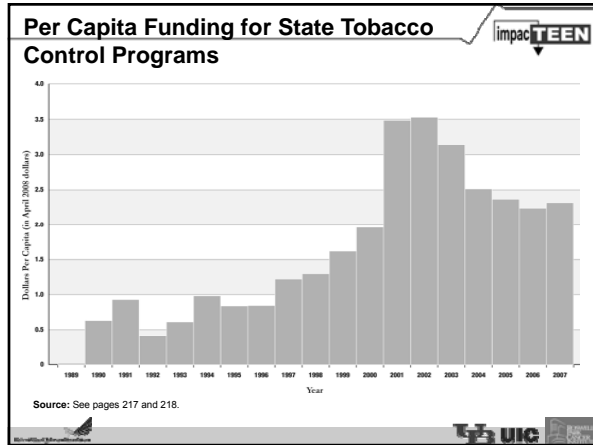
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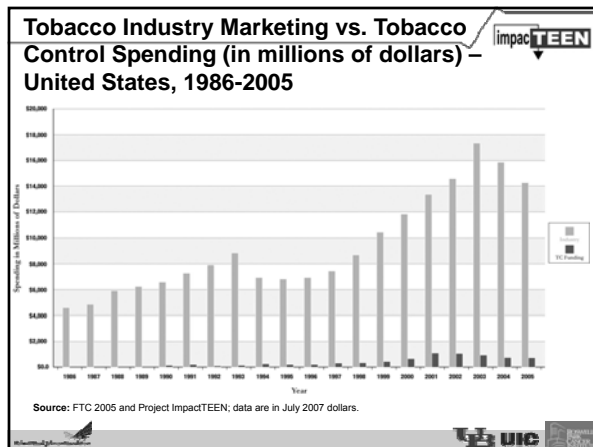
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## Comprehensive Programs

- Impact of state program funding
  - Tauras et al. (2005)
    - Monitoring the Future youth smoking prevalence, conditional demand 1991-2000
    - Funding for state tobacco control programs
      - ASSIST, IMPACT, SLS, earmarked taxes, other
      - Contemporaneous funding
      - Controlled for prices, other tobacco control policies, fixed effects models
    - Significant impact of funding on youth smoking
      - Simulated effects of funding at CDC recommended minimum by state; estimate that youth prevalence would have been 3.3%-13.5% lower
      - Estimated up to 2% drop in prevalence from actual funding

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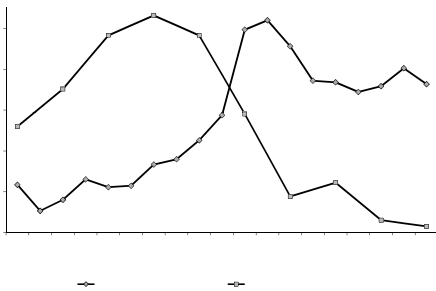
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Source: ImpactTeen Project, UIC, YRBS

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## Comprehensive Programs

- Impact of state program funding
  - Farrelly et al. (2008)
    - TUS-CPS, 1985-2003, adult smoking prevalence
    - Funding for state tobacco control programs
      - ASSIST, IMPACT, SLS, earmarked taxes, other
      - Alternative cumulative funding measures
      - Controlled for prices, fixed effects models
    - Significant impact of funding on adult prevalence
      - Simulated effects of funding at CDC recommended minimum, maximum by state; estimate that adult prevalence would have been 5.4%-17.4% lower (2.2 to 7.1 million smokers)
      - Greater impact for measures that assume slower depreciation of program funding effects

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## Comprehensive Programs

- Impact of state program funding
  - Other findings
    - Marginal impact of funding greater in states with higher cigarette consumption
    - Greater impact of funding for programs targeting policy change (ASSIST, SLS) than for other programs
    - Significant impact of funding for policy-focused programs on cigarette taxes and smoke-free policies
    - Larger impact of program funding on earlier stages of youth smoking uptake
    - Significant impact of program funding on youth perceptions of risks from smoking and various measures of anti-smoking norms

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## WHO's Best Practices in Tobacco Taxation

- Use a portion of tobacco tax revenues to support other tobacco control and/or health promotion efforts
  - Growing number of governments use hard earmark for tobacco control and/or health promotion efforts; others use soft earmark
  - General opposition to earmarking amount MoF officials, economists
  - Maximize the impact of the tax increases on public health
    - But reduce revenue impact

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Source: WHO 2010

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## Health Impact of Tobacco Taxes

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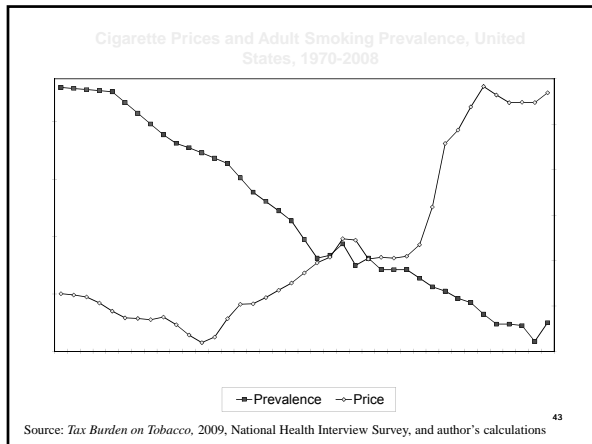
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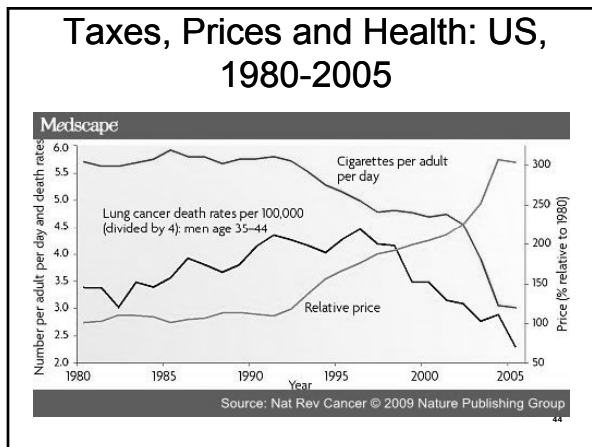
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**Health Impact of Tax Increases**

Result from:

- Increased cessation following tax increase
  - strong evidence that cessation improves health outcomes
- Deterred initiation resulting from tax increase
  - avoids all health consequences caused by tobacco use
- Additional benefits from reduced health care spending on tobacco-caused diseases

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### Health Impact of Tax Increases

Example:

- Adult prevalence elasticity estimates: -0.2
  - 18+ population: 10 million
  - Smoking prevalence: 25%
  - 2.5 million adult smokers
  - tax doubles from \$1.00 to \$2.00 per pack; price rises from \$4.00 to \$5.00 per pack (25% price rise)
  
- Prevalence falls by 5% ( $-0.2 * 25\%$ )
- New prevalence 23.75% ( $.95 * 25\%$ )
- 2.375 million smokers → 125,000 quitters

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### Health Impact of Tax Increases

Example: 125,000 quitters

- 32 - 50% of regular smokers will die prematurely from disease caused by smoking
  - 40,000 - 62,500 of quitters would have otherwise died prematurely
  - Reduced risk from cessation: ~70%
  - 28,000 – 43,750 premature deaths averted among current smokers by tax increase

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### Health Impact of Tax Increases

Example:

- Youth prevalence elasticity estimates: -0.65
  - 0-17 population: 3 million
  - Expected smoking prevalence: 25%
  - 750,000 "future" smokers
  - tax doubles from \$1.00 to \$2.00 per pack; price rises from \$4.00 to \$5.00 per pack (25% price rise)
  
- Prevalence falls by 16.25% ( $-0.65 * 25\%$ )
- New prevalence 20.9375% ( $.8375 * 25\%$ )
- 628,125 million future smokers → 121,875 youth deterred from starting

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## Health Impact of Tax Increases

Example: 121,875 deterred starters

- 32 - 50% of regular smokers will die prematurely from disease caused by smoking
  - 39,000 – 60,938 would have otherwise died prematurely
  - All smoking-attributable health consequences prevented
  - 39,000 – 60,938 premature deaths averted among current youth by tax increase

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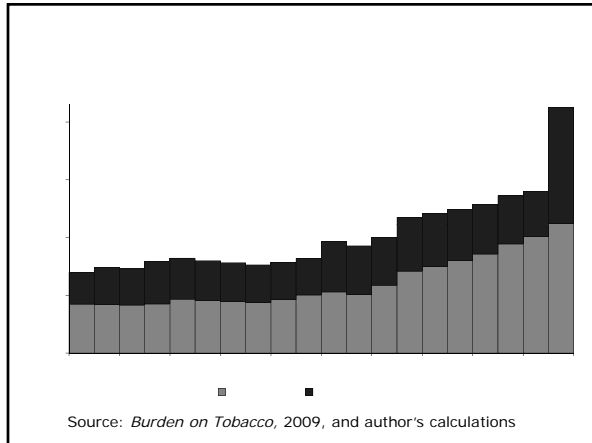
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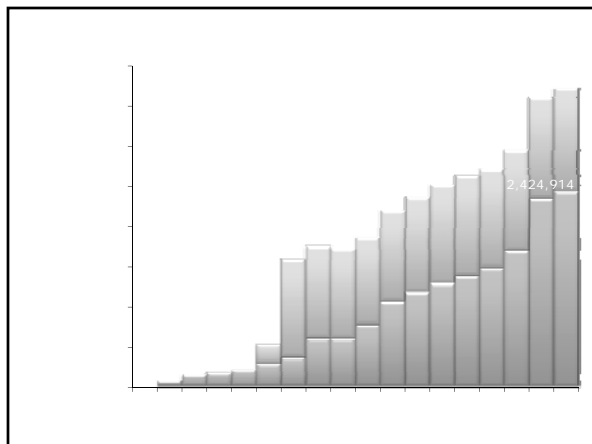
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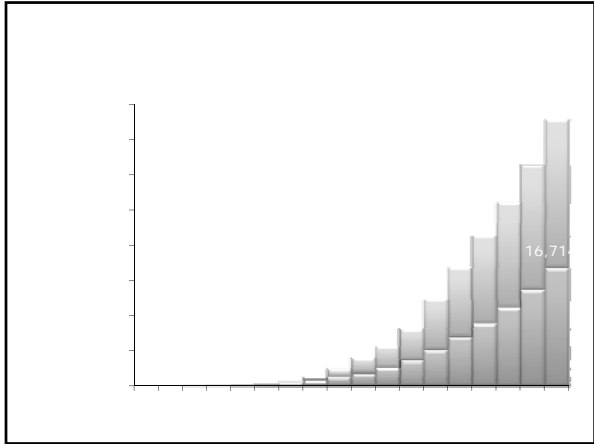
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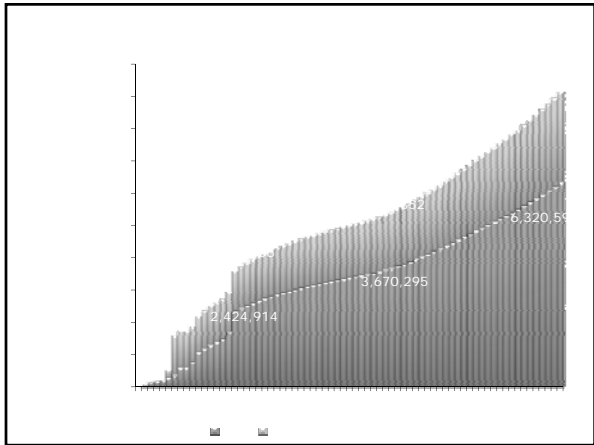
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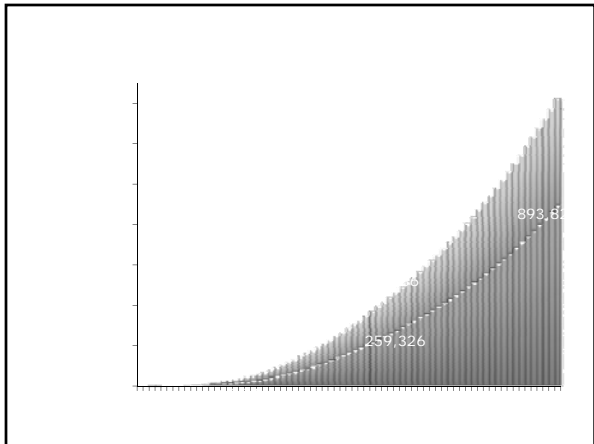
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## Health Impact of Tax Increases

### Additional health benefits

- Improved birth outcomes from reductions in smoking among pregnant women
  - about 3 times more price sensitive
  - higher birthweight, fewer premature births, etc.
  - significant short term cost savings
- Reduced exposure to secondhand smoke
  - reduction in respiratory and cardiovascular diseases, cancers

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## Tobacco Taxes and the Poor

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## Tobacco Taxes & Equity

- Concerns about “fairness” of tobacco taxes
  - Horizontal equity: equals should be treated equally (e.g. those with the same incomes should pay the same tax)
  - Vertical equity: those with greater ability to pay should be taxed more heavily (e.g. those with higher incomes should pay greater share of income)
    - Equal disutility of tax when diminishing marginal utility of wealth
  - Benefit principle: those who get the greatest benefit from government activities should pay greater share of taxes

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## Tobacco Taxes & Equity

- Relates to tax incidence/distributional impact
  - Progressive taxes – tax rate rises as tax base increases
    - Burden of tax falls more heavily on higher income populations
  - Proportional taxes – tax rate fixed as tax base changes
    - Burden of tax shared equally by all populations
  - Regressive taxes – tax rate rises as tax base falls
    - Burden of tax greater on lower income populations
- Incidence depends on measures used
  - e.g. income vs. expenditures

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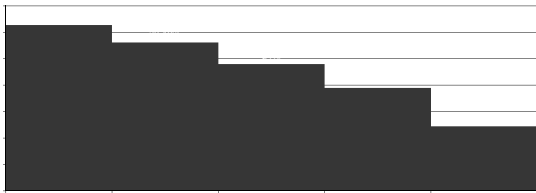
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## Tobacco Taxes & Equity

- Tobacco taxes
  - Existing taxes clearly regressive
    - greater smoking prevalence in lower income populations



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## Tobacco Taxes & Equity

- Tobacco tax increases
  - Can be “progressive” even where tax is regressive
    - Based on greater reductions in tobacco use among the poor in response to higher taxes and prices

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## Tobacco Taxes & Equity

- Distribution of health consequences from tobacco
  - Generally "regressive" with greater share of burden of tobacco caused disease falling on lower income populations
    - Greater use of tobacco among low income
    - Less access to health care to treat diseases caused by tobacco use
  - Tobacco use accounts for much of the health gap between the rich and the poor

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Source: Jha et al, 2006

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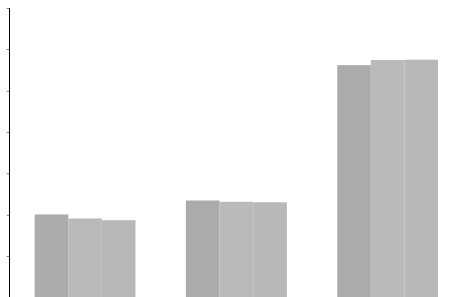
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## Distributional Impact of Federal Tax Increase, US, 2009



Source: Chaloupka et al., in progress

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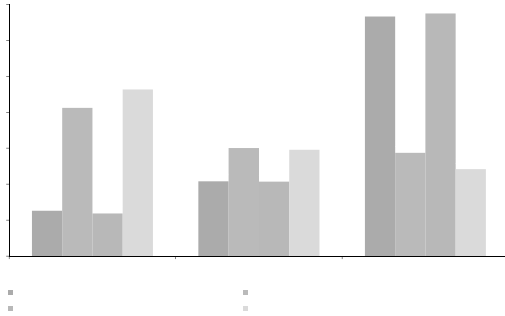
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## Distributional Impact of Federal Tax Increase, US, 2009



Source: Chaloupka et al., in progress

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## Tobacco & Poverty

- Spending on tobacco crowds out other household spending
  - Growing body of evidence from LMICs; few studies for HICs
  - Spending on tobacco reduces household spending on food, housing, education, health care, clothing, and more
    - Greater impact on lower income households
    - Causes other health consequences for women, children

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## Tobacco & Poverty

- Busch et al. (2004) - US CES data

Table III. Average annual expenditure share for smoking and nonsmoking households, by income, from Consumer Expenditure Survey<sup>1995-2001</sup><sup>a,b</sup>

|                                   | All income <sup>c</sup> |                    | Low income <sup>d</sup> |             |                    |                       |
|-----------------------------------|-------------------------|--------------------|-------------------------|-------------|--------------------|-----------------------|
|                                   | full sample             | smoking households | nonsmoking households   | full sample | smoking households | nonsmoking households |
| N (%)                             | 91 486                  | 29 704 (32.5)      | 61 782 (67.5)           | 24 748      | 8811 (35.6)        | 15 937 (64.4)         |
| <b>Expenditure categories (%)</b> |                         |                    |                         |             |                    |                       |
| Tobacco                           | 1.26                    | 3.77               | 0                       | 1.8         | 5.1                | 0                     |
| Food                              | 16.8                    | 17.1               | 16.3**                  | 22.1        | 21.5               | 22.3**                |
| Alcohol                           | 0.95                    | 1.37               | 0.73**                  | 0.7         | 1.2                | 0.5**                 |
| Housing                           | 35.4                    | 33.6               | 36.3**                  | 38.9        | 36.2               | 40.4**                |
| Apparel                           | 4.3                     | 4.2                | 4.4**                   | 4.8         | 4.5                | 5.0**                 |
| Transportation                    | 15.2                    | 15.4               | 15.1*                   | 13.8        | 14.1               | 13.6**                |
| Healthcare                        | 4.3                     | 4.2                | 4.4**                   | 3.4         | 3.8                | 4.1                   |
| All other goods                   | 21.7                    | 20.4               | 22.4**                  | 13.9        | 13.7               | 14.1                  |
| Total expenditure share           | 100                     | 100                | 100                     | 100         | 100                | 100                   |

a. Because total expenditures differ among households, the sum of a category's expenditures for all households divided by the sum of spending over all households does not equal the average of individual households' expenditure share.  
 b. Sample excludes households with more than one consumer unit and households with household head not between ages 18 and 65 years.  
 c. Quarterly expenditures are multiplied by four to report annual expenditures.  
 d. Sample includes households in the highest 5th percentile and the lowest 5th percentile of expenditures.  
 e. Low income is defined as an income <200% of the federal poverty line.  
 \* p < 0.05, \*\* p < 0.01, smokers vs nonsmokers.

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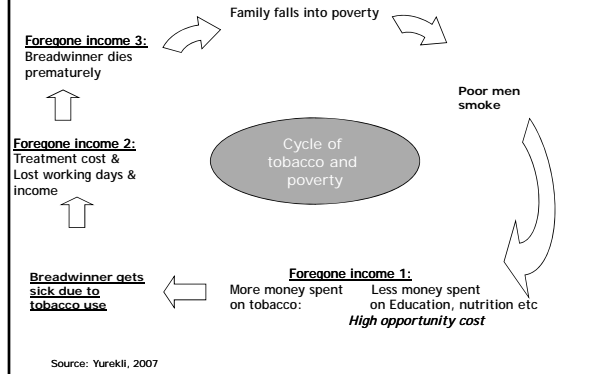
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# Tobacco & Poverty



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