# Price, Tobacco Control Policies and Youth Smoking

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## Cigarette Prices and Adult Smoking

- **Overall Cigarette Demand Responsive to Changes in Cigarette Taxes and Prices:**
    - **Price Elasticity of Demand: the percentage change in consumption resulting from a one percent increase in price**
    - **Estimated Price Elasticity of Cigarette Demand:**

| | |
|---|---|
| **Short Run:** | **-0.3 to -0.5** |
| **Prevalence:** | **-0.1 to -0.2** |
| **Long Run:** | **-0.7 to -0.8** |

    - **10 percent increase in price reduces duration of smoking by 10 percent**
- **Estimates imply that large cigarette excise tax increases would lead to significant reductions in overall cigarette demand and would lead to sizable increases in cigarette tax revenues**

## Youth Smoking and Cigarette Prices

- **Economic theory suggests that youth will be more responsive to changes in price than adults:**
    - **Proportion of disposable income youth spends on cigarettes likely to exceed corresponding portion of adult's income**
    - **Peer influences much more important for young smokers than for adult smokers**
    - **Young smokers less addicted than adult smokers**
    - **Young people tend to discount the future more heavily than adults**

## Past Research on Youth/Young Adults

- **Lewit and Coate (1982); Lewit, Coate and Grossman (1981); and Grossman et al. (1983):**
    - **samples of youth (12-17) and young adults (18-25)**
        - **Youth elasticities:**
            - **prevalence: -1.20**
            - **consumption: -0.25**
            - **total: -1.44**
        - **Young adults:**
            - **prevalence: -0.74**
            - **consumption: -0.15**
            - **overall: -0.89**
- **Wasserman et al. (1991)**
    - **youth, ages 12-17**
    - **no significant effects of price on youth smoking; not statistically different from adult demand**
- **Chaloupka (1991)**
    - **young adults, ages 17-24**
    - **no significant effects of price on young adult demand; very myopic behavior**

## DATA

- **1992, 1993, 1994 Monitoring the Future Surveys of 8th, 10th, and 12th grade students**
    - **110,717 students, mostly ages 12-18 years**
    - **cigarette smoking:**
        - **indicator for smoking in past 30 days**
        - **average daily cigarette consumption for smokers**
    - **smokeless tobacco use:**
        - **indicator for smokeless tobacco use**
        - **frequency of past month use**
    - **wide variety of socioeconomic and demographic information**
- **Longitudinal data from MTF**
    - **Panels formed from 1976-1993 high school senior surveys**
    - **Followups through 1995**
    - **up to 8 observations on some individuals**
    - **nearly 200,000 observations/almost 50,000 persons**
    - **mostly ages 18-32 years**
- **1993 Harvard College Alcohol Survey**
    - **16,000+ students in 140 4-year colleges and universities**
    - **cigarette smoking:**
        - **indicator of smoking in past 30 days**
        - **average daily cigarette consumption by smokers**
    - **wide variety of socioeconomic and demographic data**
    - **some information on school characteristics**

## DATA

- **Tobacco Prices and Taxes**
    - **Tobacco Institute**
        - **state-level weighted average price per pack of 20 cigarettes**
        - **state cigarette and smokeless tobacco tax rates**
    - **American Chamber of Commerce Researchers' Association**
        - **city-level price per carton for Winston king-sized**
- **Tobacco Control Policies**
    - **Coalition on Smoking OR Health**
        - **variety of state tobacco related policies**
    - **NCI/ANR**
        - **local tobacco control policies**

## DATA

- **Downey and Gardiner (1996) - 1994 only**
    - **State implementation of Synar amendment**
        - **indicator of preemption**
        - **indicator of statewide vs. local activity**
        - **indicator of stings vs. observation**
        - **indicators of vending machine policy/enforcement**
        - **over the counter compliance rates**
        - **vending machine compliance rates**

## ESTIMATION

- **Cragg's Two-Part Model:**
    - **Probit estimates of smoking/smokeless tobacco use prevalence equations**
    - **Least squares estimates of conditional cigarette demand and frequency of smokeless tobacco use**
- **Ordered probit estimates for categorical measures of use**
- **Multiple model specifications**
    - **multicollinearity vs. omitted variables bias**
- **Full vs. Restricted Samples to account for potential cross-border shopping**
- **Subsamples defined by race and gender**
- **Longitudinal analysis:**
    - **individual, state, and year fixed effects models**

## RESULTS

- **Cigarette Prices:**
    - **Negative and significant effects in nearly all equations for youth and young adult samples**
    - **Estimated price elasticities of demand:**
        - **Youth:**
            - **Smoking prevalence: -0.675**
            - **Conditional demand: -0.638**
            - **Total: -1.313**
        - **Young Adults (college students):**
            - **Smoking prevalence: -0.53**
            - **Conditional demand: -0.58**
            - **Total: -1.11**
        - **Longitudinal sample:**
            - **Smoking prevalence: -0.122**
            - **Conditional demand: -0.661**
            - **Total: -0.783**
        - **Some evidence of border crossing in response to interstate price differentials**
        - **Significant differences by race and gender**
        - **Young males smokeless tobacco demand also responsive to price of smokeless tobacco products**

## ESTIMATES

- **Simulated effects of proposed price increases on youth smoking prevalence and on premature smoking-related mortality for current 0-17 cohort:**
  - **CDC estimated that over 16 million youth in the 0-17 cohort in 1995 would become regular smokers and that 32% would die prematurely from smoking related illnesses (over 5.3 million)**
  - **Alternative price increases:**
    - **63 cent industry initiated price increase (original settlement agreement)**
      - **12 percent reduction in overall demand**
      - **20 percent reduction in youth smoking prevalence**
      - **1.1m fewer premature deaths in 0-17 cohort**
      - **$650m decline in federal revenues**
    - **McCain - $1.10 over five years**
      - **20 percent reduction in overall demand**
      - **about 1/3 reduction in youth prevalence**
      - **1.7m fewer premature deaths**
      - **$19.5b increase in federal revenues**
    - **Kennedy, Conrad, Harkin and others - $1.50 over 2-3 years**
      - **30 percent reduction in overall demand**
      - **about 50 percent reduction in youth prevalence**
      - **2.5m fewer premature deaths**
      - **$22.5b increase in federal revenues**
    - **IOM, public health groups - $2.00 immediately**
      - **40 percent reduction in overall demand**
      - **about 2/3 reduction in youth prevalence**
      - **3.6m fewer premature deaths**
      - **$25b increase in federal revenues**

## RESULTS:

- **Smoking Restrictions:**
    - **Strong limits on smoking in public places/private worksites significantly reduce the probability of youth and young adult smoking**
    - **Daily cigarette consumption by youth smokers reduced by restrictions on smoking in schools**
    - **Daily cigarette consumption by college students also reduced by restrictions on smoking in other public places (i.e. shopping malls...)**
    - **For youth, estimate that strong comprehensive restrictions would lead to about a 3-4 percent reduction in youth smoking prevalence**

## RESULTS

- **Limits on Youth Access to Tobacco:**
    - **generally insignificant effects of:**
        - **minimum legal purchase ages**
        - **signage requirements**
        - **restrictions on vending machine sales**
        - **limits on distribution of free samples**
        - **tobacco licensing requirements**
    - **some weak evidence that comprehensive approach to limiting youth access (combination of policies above) reduces youth smoking**
    - **likely due to weak enforcement**
- **Enforcement of Limits on Youth Access:**
    - **Some evidence that comprehensive statewide approach that's aggressively enforced and that achieves high compliance rates significantly reduces youth smoking prevalence**
    - **Estimate that an ideal implementation of Synar amendment could reduce youth smoking prevalence by about 18 percent**
    - **based on very early data; more recent/better data needed for more careful analysis**

## RESULTS

- **Other Tobacco Related Policies:**
    - **Cigarette Tax Earmarking:**
        - **Strong negative and significant impact on both smoking prevalence and cigarette consumption by smokers**
    - **Smoker protection legislation:**
        - **little impact on youth smoking prevalence**
        - **positive effect on cigarette consumption by young smokers**
    - **Preemption:**
        - **significant, positive impact on both measures of youth smoking**
- **Tobacco Control and Other Substance Use**
    - **Consistent evidence of complementary relationship between cigarette smoking and marijuana use; higher cigarette prices reduce both cigarette smoking and marijuana use**

## SUMMARY

- **Youth and young adult smoking very sensitive to price**
    - **Large price increases single most effective policy in reducing youth smoking**
    - **Consistent with new qualitative evidence from CDC's network of prevention research centers**
- **Other tobacco control policies significantly reduce youth smoking, although magnitude of effects is relatively small**
- **Plans for further research**