Price, Tobacco Control Policies and Youth and Young Adult Tobacco Use

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Objectives

• To build on existing information about the effectiveness of policies, environmental influences, and other factors in reducing youth substance use and abuse.

• To develop three databases -- one each for alcohol, tobacco, and illicit drugs -- for the 50 United States and District of Columbia, containing:
  – matrices of policies, environmental, social and institutional influences, and market mechanisms
  – measure of use, harms associated with use, and related outcomes

• To make the state-level data publicly available
Objectives

• To develop comparable, in-depth community-level information on policies, market mechanisms, and environmental, social and institutional influences on youth substance use.

• To merge community-level data with other Bridging the Gap data to examine effects of policies, programs and practices at the state, community and/or school levels on youth substance use.
ImpacTeen Data Collections

• Community Observations:
  • Retail outlets for tobacco and alcohol (product placement, pricing, promotions, advertising, counteradvertising, signage, and more)
  • Local alcohol, tobacco, other drug, and youth specific ordinances and regulations
  • General community observations (advertising, counteradvertising, social capital, and more)

• Key Informant Interviews:
  • Modular interviews, targeted and snowball approach
  • Detailed information on policy implementation and enforcement, wide range of other information

• Archival Data:
  • FDA data, population characteristics, and much more
YES! and ImpacTeen Data Collections

• State-level databases:
  • Separate databases for tobacco, alcohol and illicit drugs
  • State laws and regulations related to alcohol, tobacco, and other drug use and related outcomes
  • State level measures of alcohol, tobacco, and other drug use and the harms resulting from use
  • Wide variety of other state level information

• School-level information
  • Annual surveys of school administrators
    • Information on school alcohol, tobacco, and other drug related policies
    • Detailed information on school prevention curricula
    • Detailed information on other school programs targeting youth alcohol, tobacco and other drug use
  • School observations
Background

Trends in Cigarette Smoking Anytime in the Past 30 days* by Grade in School--United States, 1975-2000

Source: Institute for Social Research, University of Michigan, Monitoring the Future Surveys

*Smoking 1 or more cigarettes during the previous 30 days
### Background

Current* use among middle and high school students by type of tobacco product— National Youth Tobacco Survey, 1999

* Used tobacco on ≥ 1 of the 30 days preceding the survey.
† Use of cigarettes, smokeless, cigars, pipes, Bidis, or Kretexs.
Tobacco Use Data

• Monitoring the Future Surveys (8th, 10th & 12th grade students)
  • Conducted by the Institute for Social Research at the University of Michigan
  • Funded by the National Institute on Drug Abuse
  • Independent samples are drawn for each grade; samples are taken within the contiguous United States
  • Data from 1991-1998 were used for various studies
  • Multiple measures of youth tobacco use, including:
    – Indicator of past month smoking participation
    – Indicator of past month smokeless tobacco use
    – Average daily cigarette consumption
    – Frequency of past month smokeless tobacco use
    – Categorical measures of intensity of smoking and smokeless tobacco use
    – Index of smoking uptake
Tobacco Use Data

• **Longitudinal Monitoring the Future Surveys** (8th, 10th & 12th grade students)
  - Panels formed from 1976 through 1993 high school senior surveys
  - Follow-up surveys through 1995
    - select approximately 2,000 students from baseline surveys for biennial follow-up surveys
  - Up to eight observations on some individuals, mostly ages 18-32 years
  - Nearly 200,000 observations on about 50,000 persons

• Panels formed from 1991 through 1993 8th and 10th grade surveys
• Follow-up surveys through late 1990s (same process as for 12th graders)
• About 25,000 observations on nearly 10,000 persons
Tobacco Use Data

• 1993, 1997 and 1999 Harvard College Alcohol Surveys
  – 16,000+ students in each survey
  – 140 4-year colleges and universities (fewer in later years)
  – Measures of cigarette smoking:
    • Indicator of 30 day smoking participation
    • Categorical measure of intensity of cigarette smoking
    • Average daily cigarette consumption
  – Basic characteristics of each school
  – Information on campus tobacco-related policies:
    • Advertising restrictions, presence of smoke-free dorms, restrictions on smoking on campus and their enforcement, availability of tobacco products on campus
Tobacco Use Data

• 1996 Robert Wood Johnson Foundation/Audits&Surveys Worldwide Youth and Young Adult Tobacco Use Surveys
  – Five separate surveys:
    • In-school high school student survey
      – Approximately 17,000 students in 201 schools; nationally representative
    • On campus college student survey
      – Approximately 2,000 students at 50 universities; convenience sample
    • In-home survey of 14-25 year olds not in school
      – Approximately 2,400 persons in about 200 locations
    • School administrator survey
      – Detailed data on school policies and prevention curricula/programs
    • In-store environmental survey
      – Measures of cigarette prices and promotions, advertising, tobacco-related signage, product placement, and more
Tobacco Use Data

• 1996 RWJF/A&SW Youth and Young Adult Tobacco Use Surveys (continued)
  – Very comprehensive, detailed information on tobacco use; multiple measures examined:
    • 30 day smoking participation
    • Number of days smoked
    • Average cigarettes consumed per smoking day
    • Past month cigarette consumption
    • Smoking uptake
    • Smoking cessation
    • Sources of tobacco products
    • Purchase experiences
    • Much more
Tobacco Use Data

• Youth Risk Behavior Surveillance System (YRBSS):
  – State-specific data on public high school students (approximate ages 14-18 years old).
  – Nationally representative surveys of high school students

• National Youth Tobacco Surveys (NYTS)
  – Nationally representative surveys of middle school and high school students

• National Household Surveys on Drug Abuse
  – Nationally and state representative surveys, 12-17, 18-24 and 25 and older populations

• State tax-paid cigarette sales
Tobacco Policy Data

• Tobacco Control Expenditure Data:  *Complied by CDC, NCI and the Research Triangle Institute*:
  - A composite measure of state-specific expenditures from various sources (e.g., ASSIST, IMPACT, Smokeless States, excise taxes, state funds).

• Price Data:  *The Tax Burden On Tobacco*
  - State-specific price estimates as of November 1st of each year:
  - Average price is constructed by weighting present year and past year prices, and then adding the average to the average of federal and state excise taxes for the current year.
  - Average cigarette tax (weighted average for relevant period)
  - Smokeless tobacco tax
Tobacco Policy Data

• Price Data:
  – American Chamber of Commerce Researchers’ Association
    • Quarterly, city-specific prices for a carton of king-sized Winston cigarettes for approximately 350 cities each quarter
  – Observational Data:
    • Prices per pack for leading cigarette brands
    • Price related promotions (cents-off specials, multi-pack discounts, gifts with purchase, in-store coupons, etc.)
  – Scanner Data:
    • UPC level data on prices for all cigarettes in 50 markets
    • Similar data for NRT products
  – Self-reported Data:
    • Now collected in several surveys, including RWJF/A&S, NYTS, and NHSDA

• Nearby prices to account for cross-border shopping
Tobacco Policy Data

Youth Smoking vs. Cigarette Prices Over Time

- Real Price of Cigarettes
  - 1980: 27.8
  - 1992: 36.5
  - 1997: 76.567
  - 2000: 178.524

HS Senior Smoking Rate

Graph shows the relationship between youth smoking rates and real cigarette prices over time.
Tobacco Policy Data

• **Clean Indoor Air Laws**
  – indicators of restrictions on cigarette smoking in private worksites, restaurants, government buildings, retail stores, and many other public places
  – index reflecting comprehensiveness of individual restrictions
  – indicators of home smoking policies
  – measures of enforcement of and compliance with smoking restrictions
  – Sources:
    • CDC’s State Tobacco Activities Tracking and Evaluation system and unpublished data
    • American Lung Association’s State Legislated Actions on Tobacco Issues
    • Americans for Nonsmokers’ Rights Foundation local tobacco ordinance database
    • On-site data collection
    • State law books
    • Key informant surveys
Tobacco Policy Data


Clean Indoor Air Index (Mean)

Year

Tobacco Policy Data

• Youth Access to Tobacco Products
  – indicators of restrictions on youth access to tobacco products, including minimum legal purchase age for cigarettes and other tobacco products, signage requirements, limits on vending machines, and others
  – indicators of prohibitions on youth purchase, possession, and use of tobacco
  – measures of enforcement of and compliance with youth access provisions
  – Sources:
    • CDC’s STATE system and unpublished data
    • ALA State Legislated Actions on Tobacco Issues
    • ANRF local tobacco ordinance database
    • SAMHSA Synar reports
    • FDA data
    • On-site data collection
    • Key informant surveys
    • Jonathan Gruber
Tobacco Policy Data

Mean Number of Purchase, Possession, and Use Laws per State* -- United States, 1988-1999

Year

Purchase, Possession, Use Index (Mean)

Tobacco Policy Data

Youth Access Index, 1987-1998
Other Key Variables

• Age, sex, race/ethnicity, father’s education, mother’s education, respondent’s earned income, respondent’s income from other sources, labor force status, mother’s work status, religiosity, and much more

• School-level information on school characteristics, policies, prevention curricula, and related-activities

• Demographic/SES and other state/community information
Statistical Analyses

• Probit and logit models for dichotomous outcomes
• Ordered probit/logit models for categorical frequency and intensity of use measures
• Poisson and negative binomial models for count data
• Least squares models for continuous data
• Threshold of change models for uptake analyses
• Discrete time hazard models for smoking cessation and smoking initiation
• Fixed effects models to control for state-specific unobservables
• Multiple model specifications/multiple subsamples
• Standard errors adjusted for clustering
Results - Price

• Consistent evidence that higher cigarette prices reduce cigarette smoking and other tobacco use
  
  – short-run price elasticity estimates for overall cigarette smoking cluster in the range from –0.25 to –0.40
    • About half of impact is on prevalence
    • Long-run estimates about double the short-run estimates

  – Price elasticity greater in the younger age groups:
    • Youth about 3 times more sensitive to price
      – Prevalence elasticity estimates cluster in –0.50 to –0.70 range
    • Young adults about twice as sensitive to price
      – Prevalence estimates cluster in –0.3 to –0.6 range

  – Similar estimates for impact of price on smokeless tobacco use
Results - Price

• Evaluation of the Impact of the March 1, 2000 55-cent Increase in the New York State Cigarette Excise Tax:

• Initial efforts focus on schools participating in both 1999 and 2000 MTF surveys at 8th and 10th grade levels

• Preliminary Findings:
  • Cigarette price increases:
    • NY: Marlboro - $1.00 (30.7%); Newport - $1.00 (31.0%)
    • US: Marlboro - 33 cents (11.5%); Newport 31 cents (10.2%)
  • Smoking Prevalence (NY matched schools, after 4/1; US all schools after 4/1):
    • 8th Grade - NY: -17.8%; US: -11.2%
    • 10th Grade - NY: -18.9%; US: -1.0%
Results - Price

• Strong evidence that higher cigarette prices increase the probability of smoking cessation among young adults
  – elasticity of smoking cessation estimates in range from 0.27 to 0.47

• Strong evidence that higher prices reduce the probability of smoking initiation among youth
  – elasticity of youth smoking initiation estimates range from –0.30 (any smoking) to –1.00 (heavy daily smoking)

• Strong evidence that higher prices significantly reduce youth smoking uptake
  – larger impact of price on transitions into more regular smoking

• Strong evidence that higher prices significantly reduce the frequency and intensity of youth and young adult smoking
  – impact of price increases as intensity of consumption increases
Results - Price

• Estimates indicate that young males and young African-Americans are more sensitive to price than young women and young whites

• No evidence that higher cigarette prices lead youth/young adults to substitute to other substances
  – if anything, cigarettes appear to be complements to other substances, including marijuana and alcohol

• Evidence from econometric analyses consistent with qualitative evidence from focus groups of young smokers conducted by the CDC’s Network of Prevention Research Centers

• Evidence from econometric analyses consistent with self-reported anticipated responses to alternative cigarette price increases from the A&S surveys
Results – Smoking Restrictions

• Generally consistent evidence that restrictions on smoking in workplaces and public places significantly reduce youth, young adult, and adult cigarette smoking
  – More comprehensive restrictions lead to largest reductions
  – Reduce both prevalence and consumption among smokers

• Strong evidence that comprehensive restrictions on smoking in private worksites increase the probability of smoking cessation among young adults

• Strong evidence that restrictions on smoking at home significantly reduce the probability of youth smoking, smoking uptake, and youth cigarette consumption
Results – Youth Access Restrictions

• Generally little evidence that restrictions on youth access to tobacco products reduce youth smoking
  – likely due to the generally poor enforcement of these laws

• Relatively strong evidence that increased retailer compliance with limits on youth access (resulting from stronger enforcement) leads to significant reductions in youth smoking prevalence and consumption
  – little impact on youth experimentation
  – impact increases as youth progress to more regular smoking

• Some weak evidence that combination of policies prohibiting youth purchase, possession and use of tobacco products lead to significant reductions in youth smoking
  – effect appears largest on lowest risk youth
Results – Other Tobacco Related Policies

• Strong evidence that expenditures on comprehensive tobacco control programs and tobacco control coalitions lead to significant reductions in overall cigarette smoking, youth cigarette smoking
  – impact of mass-media counteradvertising campaigns most significant

• Consistent evidence that state preemption of stronger local tobacco control policies increases youth smoking prevalence and consumption

• Some evidence that smoker protection laws create favorable environment for tobacco use and lead to increased cigarette consumption
Results – Tobacco Marketing Practices

• Evidence that MSA ban on billboard advertising by cigarette companies increased advertising and promotional activities at the point of purchase
  – multipack discounts, gifts with purchase, cents off coupons more likely after billboard ban
  – exterior and interior store advertising more pervasive after billboard ban
  – functional objects more frequent after billboard ban
  – consistent with recent studies of impact of other advertising bans
Results – Tobacco Marketing Practices

• Find that tobacco company marketing efforts vary with respect to key community characteristics
  – Marlboro prices significantly lower in neighborhoods with greater youth and young adult populations
  – cigarettes more likely to be available for self service in neighborhoods with larger youth population
  – more interior and exterior cigarette advertising in low-income neighborhoods

• Evidence that pro-tobacco marketing efforts at the retail level are stronger in states with comprehensive tobacco control programs
  – greater likelihood of gift-with-purchase and other promotions
  – more extensive cigarette advertising on storefronts and in stores
Next Steps

• Continue to refine and improve analyses of the impact of school, community, state, and federal policies, regulations, and environmental factors on youth and young adult smoking

• Examine the impact of televised counteradvertising and other tobacco-related messages on youth knowledge, attitudes and beliefs about smoking and on their smoking behavior

• Examine the effects of newspaper coverage of tobacco issues on youth smoking related outcomes

• Continue to study tobacco company marketing strategies and their impact on youth smoking related outcomes

• and much more……