State Tobacco Control Spending and Youth Smoking

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Comprehensive State Tobacco Control Programs

- Excise Tax Funded Programs
  - Ballot Initiatives
    - California 1988, Proposition 99, $0.25 excise tax increase
    - Massachusetts 1992, Question 1, $0.25 excise tax increase
    - Arizona 1995, Proposition 200, $0.40 excise tax increase
    - Oregon 1996, Measure 44, $0.30 excise tax increase
  - Legislative Initiatives
    - Washington 2001, $0.60 excise tax increase
    - Maine 1997, $0.37 excise tax increase

State Support from Federal and Private Programs

- **Americans' Stop Smoking Intervention Study (ASSIST)**
  - NCI and ACS funded 17 states between 1991 and 1998
  - Change tobacco control policies through state based coalitions
- **Initiatives to Mobilize for the Prevention and Control of Tobacco Use (IMPACT)**
  - CDC funded remaining states (excluding CA) between 1991 and 1998
- **National Tobacco Control Program (CDC funded)**
  - In 1999 it replaced ASSIST and IMPACT
  - Currently fund all 50 states, DC, and 7 territories
- **SmokeLess States Program**
  - In 1994 RWJF began funding tobacco coalitions in 19 states.
  - RWJF currently funds coalitions in 42 states
- **American Legacy Foundation**
  - Created in 1999 as part of the MSA has funded several states.

Total State Investment in Tobacco Control

- $861.9 million ($3.16 per capita) in 2002
- Marketing expenditures from 5 largest tobacco producers in the United States totaled $9.57 Billion in 2000 ($26.2 million/day).
- *CDC's Best Practices* recommends a minimum of $5.98 per capita
- As of 2002, only 6 states had reached the minimum level of funding

Previous Studies

- **Numerous state specific reports have been conducted**
  - Generally find large reductions in smoking occur after comprehensive programs are adopted
  - All but 2, by Hu and Colleagues, use univariate trend analyses
- **Two studies have used national data to look at state level expenditures on smoking**
  - Farrelly, Chaloupka, and Pechacek (2001)
    - Aggregate state level data
    - State spending on TC inversely related to per-capita cigarette sales
  - Farrelly, Nimsch, and Bray (2001)
    - 1991, 1993, 1995, 1997, and 1999 YRBS
    - State spending on tobacco control has no impact on youth smoking prevalence
    - State spending has some impact on average number of cigarettes smoked
    - Contained very small # of youths from Massachusetts, Arizona, or Oregon. All three states had comprehensive programs in place at the time of the surveys.

Data

- 1991 – 2001 Monitoring the Future Surveys of 8th, 10th, and 12th grade students
- 503,143 students, mostly between 12-18 years old .
- 120,300 of which were current smokers

Cigarette Smoking

- Indicator for smoking in the past 30 days
- Average daily cigarette consumption for smokers

Data

Wide variety of socioeconomic and demographic information

- Race/ethnicity
- Gender
- Age
- Age Squared
- Education
- Parental education
- Earned income
- Income from other sources
- Time Fixed effects

Unobserved Smoking Sentiment Controls

- Tobacco Producing State
  - Regional Fixed Effects
    - State Fixed Effects

State Tobacco Control Expenditures

- **Total state-level per capita tobacco control expenditures**
  - Derived by aggregating the expenditures from the following programs:
    - Excise tax funding and other state funds earmarked for tobacco control
    - National programs
      - ASSIST
      - IMPACT
      - SmokeLess States
      - ASTHO
    - Other non-governmental state funds

Cigarette Prices

- Tobacco Institute
  - State-level weighted average price per pack of 20 cigarettes
  - Deflated by the Consumer Price Index (1982-1984=100)

Clean Indoor Air Index

- Private worksites
- Restaurants
- Recreational Facilities
- Shopping malls
- Health Facilities
- Public transit facilities
- Cultural Facilities
- Public Schools
- Private Schools

•Each of the above restriction takes on a value of between 0-5 depending on strength of the restriction

• Adding up the restriction ratings of the nine restriction placing a weight of two on the following restrictions: restaurants, recreation facilities, shopping malls, cultural facilities, public schools, and private schools

•Subtracting 20% for preemption

Youth Access Laws

Index Variable

- Minimum purchase age
- Packaging
- Clerk intervention
- Photo identification
- Vending machine availability
- Free distribution of samples
- Graduated penalties
- Random inspections
- Statewide enforcement

• Each restriction takes on a value of between 0-5 depending on strength of the restriction

• The index adds up the equally weighted restriction ratings of the 9 aforementioned restrictions

Purchase, Use, Possession Index

- Simple tally of the number of purchase, use, and possession laws each state enforces.

Estimation

- Cragg's Two Part Model:
  - Probit methods for smoking prevalence
  - Least squares estimates of conditional cigarette demand

Tobacco Control Expenditure Results

Tobacco Control Expenditures are found to have a negative and significant impact on the propensity and intensity of youth and young adult smoking.

	Tobacco Producing State Indicator	U.S. Census Division Indicators	State Fixed Effects
Predicted Probabilities of Smoking			
Predicted Probability - No State-Level Spending	24.28	24.26	23.96
Mean Predicted Probability	23.87	23.84	23.86
Predicted Probability at CDC Minimum Recommendation	21.80	21.74	23.33
Predicted Probability at CDC Maximum Recommendation	18.00	17.91	22.30
Percentage Point Changes in Predicted Probabilities			
No Funding ? Mean	-0.41	-0.42	-0.10
No Funding ? CDC Min.	-2.48	-2.52	-0.63
No Funding ? CDC Max.	-6.28	-6.35	-1.66
Mean ? CDC Min.	-2.07	-2.10	-0.53
Mean ? CDC Max.	-5.87	-5.93	-1.56
Percentage Changes in Predicted Probabilities			
No Funding ? Mean	-1.69	-1.73	-0.42
No Funding ? CDC Min.	-10.21	-10.39	-2.63
No Funding ? CDC Max.	-25.86	-26.17	-6.93
Mean ? CDC Min.	-8.67	-8.81	-2.22
Mean ? CDC Max.	-24.60	-24.87	-6.54

Other Results

- Cigarette prices have a negative impact on both prevalence and average consumption.
  - Price elasticity of smoking participation -0.261
  - Price elasticity of conditional demand –0.164
- Clean indoor air laws, youth access laws, and PUP laws have a negative and significant impact on smoking prevalence.
- Youth access and PUP laws are found to decrease average smoking by smokers

Discussion

- Increased spending on tobacco control decreases both the propensity and intensity of youth smoking.
- If states would have spent the CDC recommended minimum expenditure to sustain a comprehensive program, youth prevalence would have been approximately 6.57% lower than what was observed.
- Other policies that were found to decrease smoking among 8^{th}, 10^{th}, and 12^{th} graders:
  - Higher cigarette prices
  - Stronger clean indoor air restrictions
  - Stronger youth access restrictions
  - Stronger purchase possession and use laws