

# ENFORCEMENT OF TOBACCO PUP LAWS IN RELATION TO YOUTH SMOKING BEHAVIOR

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## Introduction

### PUP Laws:

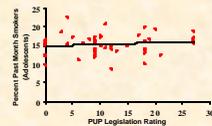
- Possession, use, and purchase (PUP) laws are youth access tobacco control policies that penalize minors, themselves, for possessing, using, and/or purchasing tobacco products
- There are state PUP laws and local PUP ordinances
- Recent trends indicate an increase in the number of state PUP laws and local PUP ordinances, with little empirical data on their effectiveness

Mean Number of PUP Laws Per State\* -- United States, 1988-2003\*\*

\*Includes the District of Columbia; Theoretical Range = 0-3; Includes 1<sup>st</sup> quarter of 2003 only.  
 \*\*Sources: ALA's SLATI, CDC's STATE system, and Roswell Park Cancer Institute

Previous analyses have not suggested a relationship between the presence of state PUP laws and adolescent smoking behavior

Cigarette Smoking Among Youth by the Historical PUP Legislation Rating in 50 States and the District of Columbia, 1999-2000\*



\*Source: Giovino et al. Cigarette Smoking Among Adolescents and Adults in US States and the District of Columbia in 1997 and 1999 - What Explains the Relationship? American Society of Preventive Oncology Meeting; poster presented March 12, 2001.

### PUP Laws have been controversial:

- ✓ Arguments in favor of PUP laws (i.e. they add a cost to youth for tobacco use, promote youth accountability, and de-normalize tobacco use among youth)
- ✓ Arguments against PUP laws (i.e. they divert attention from other tobacco control efforts, including merchant responsibility, enforcement costs and difficulty can be high; kids rebel and want to smoke even more)

Jason et al., and other researchers, have studied the effects of youth access enforcement on youth smoking and have found positive effects of strong local community enforcement efforts (Jason et al., 2002; Jason et al., 1999; Langer et al., 2000; Livingood et al., 2001)

Preliminary analyses and other PUP research efforts suggested that additional studies to assess the relationship of PUP laws and adolescent smoking behavior should include:

### MEASURES OF PUP ENFORCEMENT

\*\*\* at STATE and LOCAL levels

## Methods

### MEASURES: Dependent variables:

- ✓ Current smoking (past month smoking, yes/no); n=28,832
- ✓ Smoking intensity (past month smoking among current smokers: < 1 cigarette/day, 1-5 cigarettes/day, and ≥ 1/2 pack/day); n=5,441
- ✓ Smoking has great risk of harm (How much do you think people risk burning themselves (physically or in other ways) if they smoke one or more packs of cigarettes per day?); n=27,875
- ✓ Smoking reflects poor judgment (Do you agree or disagree...I think that becoming a smoker reflects poor judgment?); n=11,621

### MEASURES: Independent variables:

- ✓ Existence of state PUP laws
- ✓ Existence of local PUP ordinances
- ✓ SEI for state PUP laws
- ✓ LEI for local possession ordinances

### MEASURES: Control variables:

- ✓ State-level tobacco control policy variables (cigarette price, tobacco control expenditures, strength of Smoke-free air (SFA) laws, strength of STM laws)
- ✓ Student-level demographic variables (gender, race, age, risk status, parent education, total student income)

### DATA COLLECTION: Dependent variables:

- Monitoring the Future (MTF) Surveys - 8<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup> graders
- ✓ Funded by NIDA - conducted at school sites by the Institute for Social Research at University of Michigan (2000, 2001)
- ✓ Response rate > 80% for all grades (2000, 2001) and samples were independent for each grade within the U.S.
- ✓ Annual surveys include different forms with standard questions for all students and modules with rotating questions

### DATA COLLECTION: Independent variables:

- Existence of state PUP laws:
  - ✓ Developed by RPCI for the Impact Teen State-Level Tobacco Control Policy database
- Existence of local PUP ordinances:
  - ✓ From RPCI and UIC for the Impact Teen Youth Access PUP database
- SEI for state PUP laws:
  - ✓ From SEI measures for state tobacco control enforcement interviews
- LEI for local possession laws:
  - ✓ From LEI measures for community Tobacco Possession key informant interviews

### DATA COLLECTION: Control variables:

- State-level tobacco control policy variables:
  - ✓ Cigarette price - Tax Burden on Tobacco
  - ✓ Tobacco control expenditures - per capita (in dollars) from CDC
  - ✓ Strength of SFA laws - RPCI researchers incorporating strength of protection and preemption
  - ✓ Strength of STM Laws - STM index developed by NCI, CDC, and other tobacco researchers
- Demographic student-level tobacco control variables:
  - ✓ Gender, race, age, parent education, risk, total student income from MTF student-level data for 2000-2001

### ANALYSES:

- Logit analyses were conducted using STATA 8.0:
  - ✓ State-level PUP analyses controlled for state clustering, and local-level possession analyses controlled for community site clustering
  - ✓ Standard errors were corrected for possible correlation by having multiple observations within a single state
  - ✓ Dependent variables were dichotomous except for smoking intensity, which had 3 responses, and used ordered logit analyses
  - ✓ State-level data were linked by community sites
  - ✓ Analyses controlled for state-level tobacco control policy variables and student-level demographic variables
  - ✓ Analyses were conducted with minors ('minor' = student whose age is < minimum age for legal sale of cigarettes in each state)
  - ✓ Dummy variables were coded to combine the existence and enforcement of state and local PUP laws

### LOGIT ANALYSES OF THE ASSOCIATION BETWEEN STATE-LEVEL PUP LAWS AND YOUTH SMOKING BEHAVIOR AND ATTITUDES, UNITED STATES, 2000-2001

| Dependent Variable:            | Possess                     |                             | Use                         |                             | Purchase |  |
|--------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------|--|
|                                | Odds Ratio (95% CI) P-value |          |  |
| Current Smoking                | .658 (715-1.033) .016       | 1.124 (953-1.326) .166      | .711 (621-.813) .000        |                             |          |  |
| Smoking Intensity              | .894 (735-1.087) .260       | 1.021 (852-1.224) .320      | .837 (672-1.043) .113       |                             |          |  |
| Smoking has great risk of harm | 1.018 (919-1.127) .736      | .906 (829-.991) .331        | 1.062 (944-1.194) .320      |                             |          |  |
| Smoking reflects poor judgment | .932 (835-1.041) .214       | .963 (871-1.064) .458       | .935 (810-1.089) .360       |                             |          |  |

\* P-value is significant at p<0.050. Note: Analyses are adjusted for demographics and state tobacco control policy variables. N ranges from 5,441 - 26,932.

### LOGIT ANALYSES OF THE ASSOCIATION BETWEEN LOCAL-LEVEL PUP LAWS AND YOUTH SMOKING BEHAVIOR AND ATTITUDES, U.S., 2000-2001

| Dependent Variable:            | Possess                     |                             | Use                         |                             | Purchase |  |
|--------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------|--|
|                                | Odds Ratio (95% CI) P-value |          |  |
| Current Smoking                | .725 (584-.901) .004        | 1.061 (935-1.205) .359      | .761 (556-1.042) .068       |                             |          |  |
| Smoking Intensity              | .917 (724-1.160) .469       | .766 (583-1.007) .056       | .890 (634-1.248) .496       |                             |          |  |
| Smoking has great risk of harm | 1.066 (947-1.203) .262      | .993 (816-1.209) .947       | 1.093 (958-1.251) .194      |                             |          |  |
| Smoking reflects poor judgment | .952 (815-1.113) .531       | 1.040 (865-1.251) .531      | .932 (782-1.114) .496       |                             |          |  |

\* P-value is significant at p<0.050. Note: Analyses are adjusted for demographics and state tobacco control policy variables. N ranges from 5,345 - 26,936.

### LOGIT ANALYSES: ASSOCIATION BETWEEN ENFORCEMENT OF EXISTING LOCAL-LEVEL POSSESSION LAWS AND YOUTH SMOKING BEHAVIOR AND ATTITUDES, U.S., 2000-2001

| Dependent Variable:            | Existing Local Possession Law |                             |
|--------------------------------|-------------------------------|-----------------------------|
|                                | Odds Ratio (95% CI) P-value   | Odds Ratio (95% CI) P-value |
| Current Smoking                | 1.009 (953-1.067) .767        |                             |
| Smoking Intensity              | .986 (935-1.041) .517         |                             |
| Smoking has great risk of harm | 1.003 (924-1.024) .791        |                             |
| Smoking reflects poor judgment | .987 (951-1.024) .481         |                             |

\* P-value is significant at p<0.050. Note: Analyses are adjusted for demographics and tobacco control variables. N (Weighted) for each age state strata ranges from 75,562 - 152,549.

### LOGIT ANALYSES: ASSOCIATION BETWEEN ENFORCEMENT OF EXISTING LOCAL-LEVEL POSSESSION LAWS AND YOUTH SMOKING BEHAVIOR AND ATTITUDES, U.S., 2000-2001

| Independent Variable:                      | CURRENT SMOKING      |                                  |                                       |                                   |
|--|----------------------|----------------------------------|---------------------------------------|-----------------------------------|
|  | REFERENCE            | State Possession Low Enforcement | State Possession Moderate Enforcement | State Possession High Enforcement |
| Local Possession NO LAW EXISTS (reference) | 1.0                  | 1.402 (1.047-1.877) .023         | 1.208 (964-1.529) .116                | 1.176 (846-1.636) .334            |
| Local Possession Low Enforcement           | .895 (563-.828) .000 | .779 (638-.953) .015             | .860 (694-1.066) .169                 | .771 (618-.962) .021              |
| Local Possession Moderate Enforcement      | .599 (449-.720) .000 | .668 (504-.739) .000             | .641 (482-.853) .002                  | .726 (462-1.141) .165             |
| Local Possession High Enforcement          | .779 (608-.987) .047 | .887 (727-1.083) .240            | .849 (711-1.014) .072                 | 1.000 (583-1.717) .999            |

\* P-value is significant at p<0.050. Note: Analyses are adjusted for demographics and tobacco control variables. N (Weighted) for each age state strata ranges from 75,562 - 152,549.

## Discussion

- State purchase laws were associated with lower odds of youth smoking
  - ✓ No plausible support for this finding, which may be confounded by other state and local tobacco control efforts (i.e. SFA laws in CA, media campaigns in CA and FL)
- In the absence of local possession laws, state possession laws were associated with increased odds of youth smoking
- There was no dose-response relationship between enforcement level and youth smoking for state or local possession laws
- Local possession ordinances were associated with lower odds of youth smoking
  - ✓ The association was especially observed in the absence of state possession laws, for all levels of local enforcement
  - ✓ These results are somewhat consistent with previous studies in highly mobilized communities (Jason et al., Livingood et al., Langer et al.)

Caution about enacting local possession laws is encouraged since they provide a youth-only focus AND no evidence of long-term lower smoking rates among youth and young adults

## Limitations

- More comprehensive local enforcement data are needed - enforcement data were not available for local use or purchase ordinances
- The available youth smoking behavior data are cross-sectional, rather than longitudinal
- State and local enforcement measures used different scales with different maximum point values to develop enforcement indices
- Local tobacco control policy data were not available
- PUP laws exist within a complex framework of other state and local tobacco control policies and anti-tobacco efforts

## Conclusion

- Comprehensive tobacco control policies and programs, focusing on BOTH youth and adults are important:
  - ✓ To de-normalize smoking in society
  - ✓ To prevent youth tobacco use and encourage smoking cessation
  - ✓ To maximize increasingly limited money and resources
  - ✓ To consistently show long-term effects on youth and adult smoking behavior

A COMPREHENSIVE TOBACCO CONTROL APPROACH CAN ACHIEVE THE MAXIMUM BENEFIT FOR THE ENTIRE POPULATION