

State-level tobacco control policies and cigarette smoking status among youth

Presented by:
Maria Botello-Harbaum, Ed.D, M.S.
November 7, 2007

PREVENTION RESEARCH BRANCH * DESPR * NICHD * NIH * DHHS



Acknowledgements

- Denise Haynie, Ph.D., M.P.H.
- Ronald J. Iannotti, Ph.D.
- Kantahyanee Murray, Ph.D.
- Lauren Gase, B.S.
- Bruce Simons-Morton, Ed.D., M.P.H.



Overview

- Major public health concern
- Ever smoked cigarettes:
 - 25.9% of 8th-graders,
 - 38.9% of 10th-graders, and
 - 50.0% of 12th-graders
- 74% of stores sold tobacco
- Over \$1 billion in illegal sales

(Monitoring the Future Survey, 2005)



Youth Access Restrictions

- **Age for legal purchase**
- **Compliance by vendors**
- **Vending machine use**
- **Sales of single cigarettes**



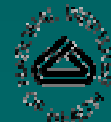
Tobacco use banned or restricted

- Restaurants
- Government and private worksites
- Schools



AIM

To examine the effect of youth access restrictions and clean indoor-air provisions on the cigarette smoking status of school-aged children



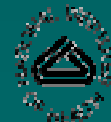
Hypothesis

A youth living in a state with stricter smoking policies will be less likely to smoke compared with a youth living in state with less strict policies



Methods

- US Health Behavior in School-Aged Children (2001 HBSC)
- US nationally representative sample
- Thirty-nine states
- 14,818 children living in the United States
- Analytical sample of 13,339 students



Measures

- “How often do you smoke tobacco at present?”
- Smoking categorization:
 - Daily: smoke once a day or more
 - Experimenters: smoke less than once a week
 - Never: do not smoke



Youth access restrictions

- **Minimum age**
- **Packaging**
- **Clerk intervention**
- **Photo identification**
- **Vending machines**
- **Free distribution**
- **Graduated penalties**
- **Random inspections**
- **Statewide enforcement**

NIH/NCI/State Cancer Legislative Database (SCLD)
(Aciati et al., 1998; Chriqui et al. 2002)

PREVENTION RESEARCH BRANCH * DESPR * NICHD * NIH * DHHS

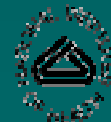


Clean indoor-air provisions

- Government worksites
- Private worksites
- Schools
- Childcare facilities
- Restaurants
- Retail stores
- Recreational and cultural facilities
- Penalties
- Enforcement

NIH/NCI/State Cancer Legislative Database (SCLD)
(Alciati et al., 1998; Chriqui et al. 2002)

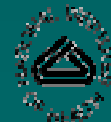
PREVENTION RESEARCH BRANCH * DESPR * NICHD * NIH * DHHS



Rating Score (0 – 5)

- based on how closely legislation meets targeted public health objectives
 - 5= outstanding, exceeds the target
 - 4= excellent, meets the target
 - 3= good, meets ~75% of target
 - 2= fair, meets ~50% of target
 - 1= minimal, meets ~25% of target
 - 0= none, no effective item

NIH/NCI/State Cancer Legislative Database (SCLD)
(Alciati et al., 1998; Chriqui et al., 2002)



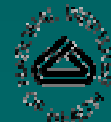
Covariates

- **Gender (male\female)**
- **Grade level (high school\middle school)**
- **Parent educational attainment**
- **Family affluence scale**
- **Race/ethnicity**
- **Price of cigarettes**



Statistical Analyses

1. Descriptive analyses
2. Spearman correlations
3. Chi-Square test
4. Multiple logistic regression
 - Adjusted odd ratios (AORs):
 - **Socio-demographic characteristics**
 - Socio-demographic characteristics and cigarette price (*)



Results

Table 1. Sample characteristics and cigarette smoking status N (%)

	Sample N = 13,339	Daily (5%)	Experimenter (10%)	Never (85%)
Gender***				
Boys	6,257 (58)	364 (6)	665 (11)	5,223 (83)
Girls	7,087 (42)	252 (4)	608 (9)	6,227(87)
Grade***				
Middle School	8,429 (61)	203 (7)	635 (22)	7,591 (71)
High School	4,910 (39)	413 (19)	638 (27)	3,859 (54)
Race/ethnicity**				
White	6,892 (64)	392 (6)	609 (9)	5,891 (85)
Black	2,583 (15)	81 (4)	243 (9)	2, 259 (87)
Hispanic	2,560 (13)	92 (4)	286 (12)	2,182 (84)
Other	1,1666 (8)	46 (5)	123 (11)	997 (84)

Table 1. Sample characteristics and cigarette smoking status N (%)

	Sample N = 13,339	Daily (5%)	Experimenter (10%)	Never (85%)
Parents Education***				
< High School	558 (5)	117 (13)	163 (15)	884 (72)
High School	1,113 (10)	125 (6)	253 (10)	2,060 (84)
> High School	11,245 (85)	128 (6)	276 (12)	2,026 (82)
Affluence***				
Low	4,065 (28)	239 (7)	412 (11)	3,414 (82)
Moderate	6,603 (52)	265 (4)	632 (10)	5,706 (86)
High	2,506 (20)	99 (4)	207 (8)	2,200 (88)
Price**				
'Lo' < \$2.70	6,892 (57)	404 (6)	723 (10)	5,765 (83)
'Hi' ≥ \$2.70	6,447 (43)	212 (3)	550 (9)	5,685 (88)

**Table 2. Daily versus never with youth access:
High school**

Restrictions		(AORs; 95% CI)
Packaging	(0 vs. 4)	1.65 (1.08 – 2.52)
Vending machines (*)	(0 vs. 3)	2.02 (1.20 – 3.40)
Free distribution	(0 vs. 2)	2.22 (1.11 - 4.42)

**Table 3. Daily versus never with clean indoor-air:
High school**

Provisions		(AORs; 95% CI)
Government Worksites (*)	(0 vs. 3)	2.67 (1.47 – 4.83)
	(1 vs. 3)	2.67 (1.55 – 4.61)
Private worksites (*)	(0 vs. 3)	3.93 (1.91-8.07)
	(1 vs. 4)	4.58 (2.19 – 9.56)

**Table 3. Daily versus never with clean indoor-air:
High school**

Provisions		(AORs; 95% CI)
Restaurants (*)	(0 vs. 3)	4.97 (2.29-10.77)
	(1 vs. 3)	5.18 (2.39-11.22)
Retail stores (*)	(0 vs. 3)	4.53 (2.20-9.34)
	(1 vs. 3)	3.81 (1.84-7.87)

**Table 3. Daily versus never with clean indoor-air:
High school**

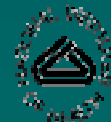
Provisions		(AORs; 95% CI)
	(0 vs. 2)	5.08 (2.36 – 10.94)
Recreational facilities (*)	(1 vs. 2)	4.04 (1.98 – 8.22)
Penalties	(1 vs. 4)	.53 (.30 - .94)
School (*)	(2 vs. 5)	.24 (.11 - .53)

Discussion

- Minimum restrictions or provisions
- Higher effect size for high school students
 - Clean indoor-air laws
- Protective effect

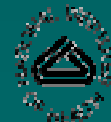
Discussion

- Stricter laws were associated with never smoked status among high school students
- Clean indoor-air provisions as social norms



Limitations

- Based on the provisions of those regulations not in actual enforcement and/or compliance
- Smoking initiation
- Youth access family level variables



Conclusions

- Eliminate tobacco sales to minors
- Advocate for law enforcement
- Merchant compliance
- More prevention intervention for high school students



Thanks!

PREVENTION RESEARCH BRANCH * **DESPR** * **NICHD** * **NIH** * **DHHS**



Appendices

Table 2. Cigarette smoking status with youth access: High school

Law (Score)	Daily versus Never		Experimenter versus Never		Daily versus Experimenter	
	AOR ^a (95% CI)	AOR ^b (95% CI)	AOR ^a (95% CI)	AOR ^b (95% CI)	AOR ^a (95% CI)	AOR ^b (95% CI)
1. Packaging						
No provision (0) vs. prohibits all sales; FDA requirements (4)	1.65 (1.08-2.52)	NS	NS	-	1.65 (1.03-2.65)	1.53 (1.01-2.32)
2. Vending Machines						
No provision (0) vs. adult locations only; machines be placed at least 20 feet (2,3)	2.02 (1.20-3.40)	1.77 (1.05-2.99)	NS	-	1.85 (1.01-3.35)	1.79 (1.08-2.98)
3. Free Distribution						
No restrictions (0) vs. total ban on distribution (2)	2.22 (1.11-4.42)	NS	2.16 (1.45-3.22)	2.04 (1.32-3.14)	NS	-
Selected location restrictions (1) vs. total ban on distribution (2)	NS	-	1.95 (1.04-3.65)	-	NS	-

Table 3. Cigarette smoking status with Clean Indoor-Air provisions: Middle School

Law (Score)	Daily versus Never		Experimenter versus Never	
	AOR ^a (95% CI)	AOR ^b (95% CI)	AOR ^a (95% CI)	AOR ^b (95% CI)
1. Government worksites				
No restrictions (0) vs. restrictions in all worksite types (2;3;4)	2.57 (1.38-4.78)	2.49 (1.18-5.25)	1.54 (1.04-2.27)	NS
Designated areas for some types of worksites (1) vs. restrictions in all worksite types (2;3;4)	2.12 (1.19-3.79)	NS	NS	-
2. Private worksites				
No restrictions (0) vs. restrictions in all worksite types (2;4)	2.10 (1.12-3.94)	NS	NS	-
Designated areas for some types of worksites (1) vs. restrictions in all worksite types (2;4)	2.02 (1.04-3.90)	NS	NS	-
3. Schools				
Smoking restricted to designated areas (2) vs. no smoking while activities are being conducted or at any time (4;5)	.37 (.16-.83)	.40 (.16-.76)	NS	-
No smoking during school hours (3) vs. no smoking while activities are being conducted or at any time (4;5)	.32 (.11-.93)	.28 (.10-.76)	.35 (.21-.60)	.30 (.16-.54)

Table 3. Cigarette smoking status with Clean Indoor-Air provisions: Middle School (continued)

Law (Score)	Daily versus Never		Experimenter versus Never	
	AOR ^a (95% CI)	AOR ^b (95% CI)	AOR ^a (95% CI)	AOR ^b (95% CI)
4. Restaurants				
No restrictions (0) vs. Enclosed and ventilated areas (2;4)	2.00 (1.04-3.83)	NS	1.76 (1.05-2.95)	NS
5. Retail stores				
No restrictions (0) vs. restricted area or 100% smoke free (2;4)	2.35 (1.32-4.17)	2.45 (1.16-5.20)	1.55 (1.01-2.39)	NS
6. Recreational facilities				
No restrictions (0) vs. restricted areas or 100% smoke free (2)	2.34 (1.24-4.42)	2.13 (1.04-4.36)	NS	-
Designated areas; applied to some types (1) vs. restricted areas or 100% smoke free (2)	1.94 (1.09-3.44)	NS	NS	-

Table 4. Cigarette smoking status with Clean Indoor-Air provisions: High School

Law (Score)	Daily versus Never		Experimenter versus Never	
	AOR ^a (95% CI)	AOR ^b (95% CI)	AOR ^a (95% CI)	AOR ^b (95% CI)
1. Government worksites				
No restrictions (0) vs. restrictions in all worksite types (2;3;4)	2.67 (1.47-4.83)	2.33 (1.15-4.69)	1.85 (1.10-3.11)	NS
Designated areas for some types of worksites (1) vs. restrictions in all worksite types (2;3;4)	2.67 (1.55-4.61)	2.27 (1.21-4.27)	2.23 (1.38-3.62)	2.05 (1.21-3.49)
2. Private worksites				
No restrictions (0) vs. restrictions in all worksite types (2;4)	3.93 (1.91-8.07)	3.45 (1.56-7.63)	2.37 (1.34-4.18)	2.16 (1.19-3.92)
Designated areas for some types of worksites (1) vs. restrictions in all worksite types (2;4)	4.58 (2.19-9.56)	4.04 (1.85-8.77)	2.18 (1.24-3.83)	1.99 (1.09-3.63)
3. Schools				
Smoking restricted to designated areas (2) vs. no smoking while activities are being conducted or at any time (4;5)	.24 (.11-.53)	.26 (.12-.57)	.44 (.21-.95)	NS

Table 4. Cigarette smoking status with Clean Indoor-Air provisions: High School (Continued)

Law (Score)	Daily versus Never		Experimenter versus Never	
	AOR ^a (95% CI)	AOR ^b (95% CI)	AOR ^a (95% CI)	AOR ^b (95% CI)
4. Restaurants				
No restrictions (0) vs. enclosed and ventilated areas (2;4)	4.97 (2.29-10.77)	4.37 (1.91-9.99)	2.80 (1.41-5.56)	2.54 (1.25-5.14)
Designated areas; restrictions apply to some restaurants (1) vs. enclosed and ventilated areas (2;4)	5.18 (2.39-11.22)	4.51 (2.06-10.20)	2.35 (1.18-4.65)	2.11 (1.05-4.26)
5. Retail stores				
No restrictions (0) vs. restricted area or 100% smoke free (2;4)	4.53 (2.20-9.34)	4.04 (1.86-9.09)	2.57 (1.47-4.47)	2.42 (1.33-4.41)
Designated areas (1) vs. restricted areas or 100% smoke free (2;4)	3.81 (1.84-7.87)	3.52 (1.64-7.56)	1.95 (1.10-3.47)	1.88 (1.04-3.39)
6. Recreational facilities				
No restrictions (0) vs. restricted areas or 100% smoke-free (2)	5.08 (2.36-10.94)	4.47 (1.92-10.37)	2.57 (1.39-4.73)	2.32 (1.22-4.41)
Designated areas; applied to some types (1) vs. restricted areas or 100% smoke-free (2)	4.04 (1.98-8.22)	3.61 (1.68 -7.74)	2.24 (1.29-3.90)	2.06 (1.15-3.70)
7. Penalties				
No provisions vs. graduated penalties for violations (3;4;5)	NS	-	.68 (.48-.97)	.68 (.48-.97)
Applicable to a limited number of provisions (1) vs. graduated penalties for violations (3;4;5)	.53 (.30-.94)	NS	.58 (.37-.92)	NS