Cigarette Excise Taxes, Clean Indoor Air Laws, and Use of Smoking Cessation Treatments: A Mediation Analysis

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Introduction

- Cigarette smoking remains a public health challenge¹
- The mechanisms by which tobacco control policies impact the use of smoking cessation treatments (e.g., pharmacotherapy or behavioral counseling) are poorly understood
- This study evaluates the extent to which the association of state and local cigarette excise taxes and clean indoor air laws with recent smoking cessation is mediated by use of smoking cessation treatments

Methods

- Two linked data sources:
 - American Nonsmokers' Rights Foundation (ANRF), for information about state and local cigarette excise taxes and clean indoor air laws²
 - 2003 and 2010/2011 Current Population Survey-Tobacco Use Supplement (CPS-TUS), for individual-level data on smoking behavior and use of cessation treatments³
- Sample was limited to past-year adult smokers aged 18 and older (n=34,842 in 2003 and n=27,323 in 2010-2011)
- <u>Exposures</u> \rightarrow (1) clean indoor air laws and (2) cigarette excise taxes ascertained one year prior to the CPS-TUS interview
- Outcome → recent smoking cessation (answer "not at all," to the question "Do you now smoke cigarettes every day, some days, or not at all?")
- <u>Mediators</u> → use of cessation treatments (nicotine replacement treatment [NRT] [nicotine gum, lozenge, patch, inhaler, or nasal spray]; prescription medication [Bupropion; Varenicline was added in 2010-2011]; telephone help line or quitline; one-on-one counseling, stop smoking clinic, class, or support group; and internet-based resources)
- Logistic regression analyses tested the association of clean indoor air laws and cigarette excise taxes with smoking cessation in 2003 and 2010-2011; significant associations were followed with structural equation modelling to test for mediation by smoking cessation treatments⁴

Results

- The majority of participants in both time periods were male (53.7% in 2003 and 54.1% in 2010-2011), non-Hispanic white (75.7% and 74.4%), US born (91.2% and 90.9%), had at least high school diploma or GED (80.3% and 82.7%), and were employed (66.0% and 58.6%)
- The average age of the participants was 41.4 years in 2003 and 42.7 years in 2010-2011
- There were significant increases between 2003 and 2010-2011 in the coverage of clean air laws and the amount of excise taxes
- The proportion of past-year smokers using each type of smoking cessation treatment in 2003 and 2010-2011 is displayed in Table 1
- 7.3% of past-year smokers in 2003 and 7.8% in 2010-2011 quit smoking
- Clean indoor air laws were associated with recent smoking cessation both in 2003 and 2010-2011; whereas, taxes were associated with recent smoking cessation only in 2010-2011
- Smoking cessation treatments explained between 29% to 39% of the
- effect of clean indoor air laws and taxes on recent smoking cessation • See Figures 1, 2, and 3

Discussion

- Smoking cessation treatments mediated some of the association of tobacco control policies with recent smoking cessation
- These policies are often cost-neutral or revenue-generating, and yet many states have been slow to adopt them⁵
- The effect of improved access to cessation services through expanded health insurance coverage may be enhanced through the synergistic effects of clean indoor air laws and increased excise taxes⁶

References

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The association of clean indoor air laws and excise taxes with smoking cessation is partially mediated by use of smoking cessation treatments.



Table 1: Smoking cessation treatments used in past-year smokers who quitted smokingin the past year in the Current Population Survey–Tobacco Supplements 2003 and 2010-2011.

	2003 surveys		2010-2011 surveys			
					Comparison	
Methods	Ν	%	Ν	%	OR	95% CI
Nicotine replacement therapy						
Nicotine gum/lozenge	185	6.8	193	8.5	1.26	1.07-1.50
Nicotine patch	388	14.6	319	13.8	0.93	0.81-1.07
Nicotine inhaler/nasal spray	39	1.7	24	0.9	0.54	0.33-0.87
Any replacement therapy	519	19.5	447	19.3	0.98	0.87-1.11
Prescription medications						
Bupropion	215	7.5	72	2.9	0.37	0.29-0.48
Varenicline	0 ^a	0.0 ^a	248	10.2	a	a
Any prescription medications	215	7.5	292	12.1	1.54	1.45-1.63
Other treatments						
Telephone help line or quit line	31	0.9	71	2.4	2.76	2.02-3.77
Stop smoking clinic, class, or						
support group, counseling	90	2.8	103	4.0	1.43	1.15-1.78
Internet	28	1.1	42	1.9	1.79	1.15-2.78

^a Questions about Varenicline were asked only in the 2010-2011 surveys.

Structural Equation Models of Mediation by Smoking Cessation Treatment

Figure 1: Clean indoor air laws (2003) \rightarrow Smoking cessation







Figure 3: Clean indoor air laws (2010-2011) → Smoking cessation



Funding

This work was supported by the National Institutes of Health (R01DA042738). Ms. Riehm was supported by the National Institute of Mental Health (NIMH) Psychiatric Epidemiology Training Program (5T32MH014592-39) and by a Doctoral Foreign Study Award from the Canadian Institutes of Health Research.

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