Political Context, Policies and Health Behaviors: The Case of Tobacco

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Abstract

We assess how state political context affects the adoption of two tobacco related policies and subsequent declines in smoking rates using state-level panel data over a fifteen year period (1996-2011). The study draws on publicly available data from the Centers for Disease Control (CDC) to construct a longitudinal dataset of cigarette excise taxes, indoor smoking policies, state smoking prevalence and demographic characteristics from 1996 to 2011. Political context is measured in terms of state vote share for Republican or Democratic presidential candidates and a well validated measure of state political culture. Using repeat measure GEE, we assess the relationship between state political context and state smoking prevalence rates adjusting for demographic characteristics and state policies. We find that more conservative states have seen lower declines in smoking prevalence and that this relationship is only partly explained by state smoking policies.

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Extended Abstract

Background

So-called "red" states (Southern and Midwestern states that tend to vote Republican) generally have worse health than "blue" states (states in the Northeast and West Coast that tend to vote democratic). This disparity is generally explained with reference to differences in demographic characteristics with red states tending to be poorer than wealthier blue states. However, there may be a more direct relationship between state political climate and health behaviors. Health behaviors may be influenced by the ideological preferences of individuals in subtle ways, as some emerging evidence is beginning to reveal (e.g., Subaranian et al, 2009). State politics may affect health behaviors in another way, however, via state policy outputs. Conservative states may be less likely to adopt public health policies that could protect their citizens from public health threats to avoid appearing paternalistic as illustrated by the recent adoption in Mississippi of the so-called anti-Bloomberg bill that preempts local public health authorities from adopting regulations concerning what Mississippians eat and drink.

Most policy studies aim to minimize the effect of cross-state variation in political context to isolate the "true effect" of policy on outcomes. Studies that exploit cross-state variation in policies to isolate the effect of a policy on a given outcome have developed various methods to avoid the possible endogeniety of policies and outcomes (Besley & Case, 1994). Rather than treating state policy environment as a potential confounder in the relationship between policy and outcome, in this study we view state public health policies as a mediator between state

political context and health outcomes. We aim to understand the degree to which red state-blue state differences in health behaviors can be explained with reference to differences in their public health policies.

Anti-smoking policies are widely viewed as a public health success case. Smoking rates in the United States have reduced by more than half from 42.4% in 1965 to 18.9% in 2011.[1] Moreover, fewer youth are initiating smoking today than in the past. Cigarette excise taxes are viewed as having been widely effective in reducing smoking rates. According to the recent review of the evidence by Chaloupka, Yurekli and Fong (2012), various studies from high-income countries have estimated that a 1% increase in the price of cigarettes produces between 2-5% reductions is consumption, with most studies clustered around 4%. State excise taxes have been steadily increasing since the 1990s. In addition, a number of states have adopted state smoke free indoor air regulations since the mid-1990s. However, anti-smoking policies have been unevenly implemented across states. State excise taxes range from a low of $0.025 to $4.35 and states vary in terms of whether they have adopted any indoor air policies and how strict those policies are. People who live in states where these policies have not been strongly implemented will be less likely to benefit from them.

The red/blue classification of states as liberal and conservative has been criticized on a number of fronts and this distinction is not necessarily the most likely to have an impact on state policy making. For one, state policy is the output of state political processes. The way that the citizens of states vote in presidential elections is not necessarily reflective of how they vote in state and local politics or state and local legislative and gubernatorial composition. Many blue states have republican governors and red states have democratic governors, etc. For this reason, in addition to the gross distinction between red and blue states, we examine the impact of state political culture on state tobacco policies and smoking prevalence. To test the impact of state political culture, we employ Elazar's classical framework of state political cuture.21 Elazar (1984) defined three types of states with distinct political cultures related to how public policy is formulated in these states and characteristics of the state populace-Moralistic, Individualistic and traditionalistic states (Table B-Appendix). "Moralistic" states are those states where political positions are typically justified by appeals to the "public interest," rather than narrower interests, and public administration is strong. In "individualistic" states, in contrast, government tends to serve more specific interests. Parties are strong, each standing for coalitions of groups seeking advantages from government. Finally, in the "traditionalistic" culture, chiefly in the South, government is limited largely to defending traditional values (originally the racial caste system). Bureaucracy is underdeveloped and distrusted. These classifications have been validated in a several studies. 22,23.

We aimed to investigate the following questions:

1. Do liberal/conservative states differ in the degree to which they have adopted different tobacco control policies over time?

2. Do tobacco policies and state political context each have a direct effect on smoking behavior over time? Is the relationship explained by differences in state policy adoption, net of demographic differences across states?
3. Does state political context modify the relationship between policy and smoking behaviors?

METHODS

Study design/Data. This study uses a longitudinal data analysis of secondary data, publicly available through the CDC and the United States Census Bureau. A state-level, longitudinal dataset containing yearly information on fifty states plus the District of Columbia (Puerto-Rico is omitted) from 1995 to 2012 was constructed. The unit of analysis is the state, which also includes the District of Columbia.

The primary sources of data for our analysis are from the Center for Disease Control's (CDC) Behavioral Risk Factors Surveillance System (BRFSS) and CDC's Office of Smoking and Health. These are publicly available unrestricted data, which the CDC has compiled at a state level for ease of use.

- Statewise adult cigarette smoking Prevalence from the year 1996 to 2012-CDC's Behavioral Risk Factors Surveillance System (BRFSS)
- Statewise excise tax per pack in dollars from 1995 to 2011.- CDC's OSH data (Office of Smoking and Health) .

Data for demographic factors such as median household income, education (Bachelor's degree holder), race (percentage of African-American) and poverty (percentage below poverty line) comes from the United States Census Bureau.

Measures. Smoking prevalence is collected as a self-reported measure on the Behavioral Risk Factor Surveillance System and represents all adults aged ≥18 years who report having smoked at least 100 cigarettes in their lifetime and who now smoke every day or some days. Though the prevalence of adult cigarette smoking is a continuous variable, due to the skewed distribution (ranges from 9.1 to 32.6), the log of prevalence was used to increase interpretability of the results.

Classification according to the state political culture was based on Daniel Elazar's theory. Moralistic states are assigned "1",individualistic states "2" and traditionalistic states are assigned "3". In addition, we divided states into red, blue and purple states based on whether they the state was carried by the Democratic candidate or the Republican candidate in the last four presidential elections (2000, 2004, 2008, and 2012 presidential elections). States that carried by each party twice in the four elections or where average margins of victory in the five presidential elections from 1992 to 2008 was small (R <3 to D <3), were coded as purple states.

Excise tax is measured as the tax in dollars per pack of cigarettes (20 cigarettes). Excise tax rates for the 50 states and District of Colombia have been collected and compiled by the CDC for the period of 1995 to the present. Information on state smoke free indoor air regulations were also accounted for in the analysis. State smoke free indoor air regulations were measured as legislation pertaining to smoke free indoor air at 1. private worksites, 2. restaurants and 3. bars. We defined an ordinal variable where "0" was assigned to states with no provisions in any of the above mentioned three places, and "1," "2" and "3" respectively were applied to states with indoor air policies in place for the various sites listed above. These data comes from CDC's Office of Smoking and Health.

We also controlled for a series of state demographic characteristics that may act as confounders. These included state education levels (percentage of the population with a bachelor's degree or higher), state racial composition (percentage of the population that is African-American), state poverty (percentage below poverty line), and median household income. We used Bachelor's degree as a cut off for the education but most of the studies use high school level and so we intent to include high school plus as another category in our future studies. We also intend to run the analysis for high school plus in our future studies. Race was measured as the percent of state population that is African-American. Median household income has been categorized into low(<$40,000), medium ($40,000 to $49,999)and high household income (>$50,000)according to the individual household income within a state. Poverty is measured as the percentage of the population below the poverty line.

Missing data were addressed in the following ways:

- 2004 Smoking prevalence data for the state of Hawaii was missing, so the average of 2003 and 2005 was used.
- Education data for 1995,1996 and 1997 were missing so we used the average of 1990 and 1998.
- Race data for 1995,1996,1997,1998,1999,2001,2002,2003 and 2005 were missing so the average of 2000,2006,2007,2008,2009and 2010 were used for the missing years for all states.

Statistical analysis. We first model separately the relationship between the state political context and tobacco policy and the relationship between tobacco policies and smoking prevalence to examine whether they are related over time. Next we examine the relationship between state political context and smoking prevalence controlling for state demographic characteristics. We then add state policies to assess whether the impact of state political context diminishes with their inclusion. Finally, we also test the possibility that state political context moderates the relationship between tobacco policies and smoking prevalence. Residents of states with a more conservative political climate may be more resistant to behavior change regardless of price increases and restrictions and defiant of increased taxes compared with residents of more liberal states. Residents of more liberal states, by contrast, may be more likely to accept the premise of the tax increase and may even be grateful for the added self-control as demonstrated by Gruber & Mullainathan (2002). All models were run using the xtgee command in Stata version 12 with robust standard errors.

Results

We find that state political climate predicts both cigarette excise taxes and indoor smoking restrictions, though the red state- blue state distinction is a more robust indicator than political culture. Specifically, purple and red states have seen lower increases in tax rates and weaker restrictions compared with blue states. The same is the case for traditionalistic versus moralistic states, though individualistic states do not differ from moralistic. Purple and red states (marginally) each have higher state smoking prevalence rates than blue states, as do individualistic and traditionalistic states compared with moralistic.

We find that for every $1 increase in state excise tax, there is reduction of 3.6% in smoking prevalence, but we find no relationship between smoking prevalence and indoor air restrictions. Introducing the policies into the models, we find that that the effect of being an individualistic and traditionalistic state on smoking prevalence does not decline, nor does living in a purple state compared with a blue state. However, red states no longer have higher smoking prevalence after adjusting for the effect of policies. Stratifying by state political culture reveals that the effect of tax on smoking prevalence is primarily driven by individualistic states.

References

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Table 1: Descriptives

	Total **%(N)**	***1995*** **%(N)**	***2000*** **%(N)**	***2005*** **%(N)**	***2010*** **%(N)**
VARIABLES					
Smoking Prevalence (Mean)	21.54%	23.8%(1996)	22.8%	20.98%	17.91%
State Excise Tax					
Tax, continuous (mean)	$0.813	$0.326	$0.419	$0.917	$1.44
Tax <$0.50 (%, N)	40.8%, 396	82.4%, 42	62.7%, 32	27.5%, 14	15.7%, 8
Tax $0.50-$0.99 (%, N)	26.1%, 253	17.6%, 9	31.4%, 16	33.3%17	25.5%, 13
Tax $1.00-$1.49 (%, N)	11.8%, 114	0,0	5.9%, 3	19.6,10	15.7%, 8
Tax $1.50-$1.99 (%, N)	6.1%, 59	0,0	0,0	9.8%, 5	13.7%, 7
Tax $2.00 -$2.49 (%, N)	5.6%, 54	0,0	0,0	19.8%, 5	11.8%, 6
Tax $2.50-$2.99 (%, N)	2.6%, 25	0,0	0,0	0,0	7.8%, 4
Tax $3.00-$3.49 (%, N)	1.3%, 13	0,0	0,0	0,0	7.8%, 4
Tax $3.50+ (%, N)	0.4%, 4	0,0	0,0	0,0	2%, 1
Median Household Income					
Median Household income <$40,000 (%, N)	31.4%, 304	86.3%, 44	41.2%, 21	19.6%, 10	7.8%, 4
Median Household income $40,000-$49, 999 (%, N)	37.5%, 363	13.7%, 7	43.1%, 22	51%, 26	45.1%, 23
Median Household income $50,000+(%, N)	20.6%, 200	0%, 0	5.9%, 3	29.4%, 15	47.1%, 24
Race(Black) (%, N)	25.49%	22.01%	25.19%	27.35%	27.59%
Education (college degree +)	26.6%, 258	37.3%, 19	37.3%, 19	27.5%, 14	13.7%, 7
Regulation					
LAW(no regulations)					
LAW(at least 1 smoke free indoor air regulation) (%, N)	17.2%, 167	25.5%, 13	25.5%, 13	19.6%, 10	3.9%, 2
LAW(2 smoke fee indoor air regulations) (%, N)	29.8%, 289	33.3%, 17	31.4%, 16	29.4%, 15	23.5%, 12
LAW(3/all smoke free indoor air regulations) (%, N)	26.3%, 255	3.9%, 2	5.9%, 3	23.5%12	58.8%, 30
Political Culture					
Moralistic political culture (%, N)	33.3%, 17	33.3%, 17	33.3%, 17	33.3%, 17	33.3%, 17
Individualistic political culture (%, N)	35.3%, 18	35.3%, 18	35.3%, 18	35.3%, 18	35.3%, 18
Traditionalistic political culture (%, N)	31.4%, 16	31.4%, 16	31.4%, 16	31.4%, 16	31.4%, 16

Table 1: State Political Culture and Smoking Prevalence (log)

VARIABLES	(1) Smoking Prevalence	(2) Smoking Prevalence	(3) Smoking Prevalence
Moralistic State	0	0	0
Individualistic State	0.095**	0.110**	0.120**
	(0.047)	(0.049)	(0.048)
Traditionalistic State	0.176***	0.184***	0.177***
	(0.045)	(0.060)	(0.060)
Tax			-0.037***
			(0.009)
No smoke free indoor air restrictions			0
1 smoke free indoor air restriction			0.027
			(0.020)
2 smoke free indoor air restrictions			0.023
			(0.018)
3 smoke free indoor air restrictions			-0.011
			(0.016)
Median Income(<$40,000)		0	0
Median Income($40,000-$49,999)		-0.005	-0.009
		(0.009)	(0.008)
Median Income($50,000+)		-0.057***	-0.048***
		(0.020)	(0.016)
Race (% Black)		-0.001	-0.001
		(0.002)	(0.002)
Poverty (% below)		-0.001	-0.002
		(0.002)	(0.002)
Constant	3.077***	3.101***	3.101***
	(0.034)	(0.038)	(0.043)
Observations	800	750	750
Number of id	50	50	50

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Year not shown

Table 2: Red States, Blue States and Smoking Prevalence (log)

VARIABLES	(1) Smoking Prevalence	(2) Smoking Prevalence	(3) Smoking Prevalence
Blue States (ref)	0	0	0
Purple States	0.149***	0.154***	0.133***
	(0.042)	(0.040)	(0.040)
Red States	0.089**	0.067	0.046
	(0.042)	(0.041)	(0.043)
Cigarette Tax			-0.036***
			(0.008)
No smoke free indoor air restrictions			0
1 smoke free indoor air restriction			0.025
			(0.020)
2 smoke free indoor air restrictions			0.020
			(0.018)
3 smoke free indoor air restrictions			-0.014
			(0.016)
Median Income(<$40,000)		0	0
Median Income($40,000-$49,999)		-0.004	-0.007
		(0.009)	(0.008)
Median Income($50,000+)		-0.057***	-0.046***
		(0.019)	(0.016)
Race (% Black)		0.002	0.002
		(0.002)	(0.002)
Poverty (% below)		-0.001	-0.002
		(0.002)	(0.002)
Constant	3.099***	3.098***	3.118***
	(0.021)	(0.029)	(0.035)
Observations	816	765	765
Number of id	51	51	51

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Year not shown

Table 3: Tobacco Tax and Indoor Smoking Restrictions by State Political Culture

VARIABLES	(1) Tax	(2) Restrictions
Moralistic(ref)	0	0
Individualistic	0.175	-0.129
	(0.155)	(0.288)
Traditionalistic	-0.315*	-1.289***
	(0.170)	(0.312)
Median Income <40,000 (ref)	0	0
Median Income($40,000-$49,999)	-0.036	-0.005
	(0.057)	(0.095)
Median Income ($50,000+)	0.094	0.076
	(0.100)	(0.166)
Race (% Black)	-0.006	0.010
	(0.006)	(0.013)
Poverty (% below)	-0.005	-0.006
	(0.011)	(0.021)
Constant	0.500***	1.443***
	(0.143)	(0.305)
Observations	750	750
Number of id	50	50

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Year not shown

Table 4: Tobacco Tax and Indoor Smoking Restrictions by State Political Orientation

VARIABLES	(1) Tax	(2) Restrictions
Blue States	0	0
Purple States	-0.579***	-0.532*
	(0.113)	(0.311)
Red States	-0.646***	-1.046***
	(0.096)	(0.230)
Median Income <40,000 (ref)	0	0
Median Income($40,000-$49,999)	-0.033	-0.008
	(0.055)	(0.096)
Median Income ($50,000+)	0.106	0.072
	(0.097)	(0.167)
Race (% Black)	-0.008**	-0.006
	(0.003)	(0.009)
Poverty (% below)	-0.007	-0.012
	(0.010)	(0.020)
Constant	0.894***	1.815***
	(0.121)	(0.257)
Observations	765	765
Number of id	51	51

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Year not shown

Table 5: Tax and Smoking Prevalence (log) Stratified by State Political Culture

VARIABLES	*All states*	*Moralistic*	*Individualistic*	*Traditionalistic*
1.Tax<$0.50(ref)	0	0	0	0
2.Tax($0,50-$0.99)	-0.009	-0.003	-0.018	0.006
	(0.009)	(0.014)	(0.013)	(0.016)
3.Tax($1.00-$1.49)	-0.021	-0.004	-0.040*	-0.001
	(0.014)	(0.013)	(0.022)	(0.032)
4.Tax($1.50-$1.99)	-0.036**	-0.003	-0.057***	0.024
	(0.018)	(0.029)	(0.021)	(0.024)
5.Tax($2.00-$2.49)	-0.068***	-0.025	-0.094***	-0.062***
	(0.015)	(0.020)	(0.019)	(0.024)
6.Tax($2.50-$2.99)	-0.044*	0.064***	-0.097***	
	(0.025)	(0.024)	(0.021)	
7.Tax($2.00-$3.49)	-0.120***	-0.014	-0.153***	
	(0.025)	(0.024)	(0.031)	
8.Tax($3.50+)	-0.154***		-0.167***	
	(0.020)		(0.025)	
1.Median Household Income(,$40,000)-ref	0	0	0	0
2.Median Household Income($40,000-$49,999)	-0.007	0.006	0.001	-0.025*
	(0.008)	(0.010)	(0.013)	(0.014)
3.Median Household Income($50,000+)	-0.046***	-0.012	-0.017	-0.117***
	(0.016)	(0.023)	(0.019)	(0.023)
Race(Black alone)	-0.001	0.009	-0.003	-0.001
	(0.002)	(0.009)	(0.003)	(0.002)
0 LAW (no smoke free indoor air regulations)	0	0	0	0
1.LAW(1 smoke free indoor air regulation)	0.028	-0.043*	-0.001	0.031
	(0.020)	(0.023)	(0.030)	(0.028)
2.LAW(2 smoke free indoor air regulations)	0.025	-0.015	0.008	0.032
	(0.017)	(0.022)	(0.023)	(0.031)
3.LAW(3/all smoke free indoor air regulations)	-0.009	-0.021	-0.018	-0.028
	(0.015)	(0.025)	(0.022)	(0.018)
Observations	750	255	255	240
Number of id	50	17	17	16

Robust standard errors in parentheses ; *** p<0.01, ** p<0.05, * p<0.1