Preventing Childhood Obesity Through State Policy
Predictors of Bill Enactment

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Background: To address the epidemic of childhood obesity, health professionals are examining policies that address obesogenic environments; however, there has been little systematic examination of state legislative efforts in childhood obesity prevention. Using a policy research framework, this study sought to identify factors that predict successful enactment of childhood obesity prevention in all 50 states.

Methods: A legislative scan of bills introduced during 2003–2005 in all 50 states identified 717 bills related to childhood obesity prevention. Multilevel logistic regression modeling was performed in 2006 to identify bill-level (procedure, composition, and content) and state-level (sociodemographic, political, economic, and industrial) factors associated with bill enactment.

Results: Seventeen percent of bills were enacted. Bill-level factors associated with increased likelihood of enactment included having more than one sponsor; bipartisan sponsorship; introduction in the state senate; budget proposals; and content areas related to safe routes to school, walking/biking trails, model school policies, statewide initiatives, and task forces and studies. State-level political factors, including 2-year legislative session and Democratic control of both chambers, increased enactment. An indicator of state socioeconomic status was inversely associated with bill enactment; economic and industrial variables were not significantly related to bill enactment.

Conclusions: In general, bill-level factors were more influential in their effect on policy enactment than state-level factors. This study provides policymakers, practitioners, and advocacy groups with strategies to develop more politically feasible childhood obesity prevention policies, including the identification of several modifiable bill characteristics that might improve bill enactment.
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Introduction

To address the epidemic of childhood obesity,[1] health professionals are examining the role of health policies that address obesogenic environments through healthy eating and increased physical activity.[2–6] In the U.S., individual states hold much of the authority over public health policy through legislative and regulatory powers; some authority is also granted by state constitutions to local governments.[7] In recent years, many states have introduced and adopted legislation (i.e., formal written codes such as bills and resolutions) that focuses on obesity prevention in youth, in both school and community set-

tings[8]; however, there has been little systematic examination of state policy efforts in childhood obesity prevention. To study this gap in the literature, a four-phase policy research framework, developed for physical activity, was applied: (1) identification of relevant policies, (2) determinants of establishing policy, (3) development and implementation of policy, and (4) examination of policy outcomes.[9]

Previous research focused on the first phase of the policy framework by identifying childhood obesity prevention legislation and summarizing patterns of introduction and adoption by time, geography, and topic area.[8] Study findings suggested that the topic areas addressed in a bill influenced the likelihood of its adoption (e.g., bills concerning farmers' markets and safe routes to school were more likely to pass than bills concerning nutrition, vending machines, and physical education). In addition, bill adoption varied across states, suggesting that state-level political, economic, and cultural factors might influence legislative activity. Thus, the likelihood of a childhood obesity prevention

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bill's being enacted might be affected by the bill's specific characteristics as well as by contextual influences that operate at a societal level. This theory can be examined using multilevel modeling techniques in which both microlevel and macrolevel variables are used to explain a microlevel outcome. For example, Luke et al.[10] used multilevel modeling to identify legislator and state characteristics that influence legislator voting behavior on tobacco-related bills introduced in the U.S. Congress.

The current study addressed Phase 2 of the policy research framework described by Schmid et al.[9] Using a database of state-level childhood obesity prevention legislation, this study used multilevel modeling to identify bill-level and state-level predictors of bill enactment by state legislatures.

Methods

Identification of Legislation

A legislative database created by NetScan's Health Policy Tracking Service (HPTS)[11] was used to identify state legislation introduced during 2003–2005 addressing nutrition, physical activity, and obesity prevention. HPTS conducted a legislative scan for 2003 and 2004 using the same search criteria that were previously developed for its 2005 report on state nutrition, activity, and obesity legislation.[12] Because HPTS performed separate searches on 24 specific topic areas (e.g., nutrition/vending standards, BMI reporting, and safe routes to school), a single bill could be listed in more than one topic area.

The legislative scan identified 1000 unique bills introduced from January 1, 2003 through December 31, 2005. The following bill-inclusion criteria were used: (1) nonduplicate, (2) relevant obesity prevention topic area, (3) applicable to childhood obesity, and (4) non-negative health impact. Duplicate bills that were merged with or replaced by a similar bill that was subsequently enacted were excluded ($n=35$). Bills in four topic areas ($n=152$) were considered irrelevant to obesity prevention, including labeling of genetically modified food products, insurance coverage of gastric bypass surgery, Medicaid coverage of obesity-related treatments, and restrictions on civil liability lawsuits related to obesity and food consumption. Four members of the research team coded bill applicability and health impact independently. Among 80 bills coded in duplicate, inter-rater reliability was 89% for applicability and 94% for health impact. Seventy-eight bills coded as not applicable to childhood obesity (e.g., senior citizen farmers' market programs) and 18 bills with a negative health impact (e.g., exemptions for physical education) were excluded. The final sample size included 717 bills introduced in 49 states.

Outcome Variable

The researchers reviewed bill history and recorded the following five stages of bill progression through the legislative process: date of introduction, decision in the first chamber (House of Representatives or Senate), decision in the second chamber, concurrence of both chambers, and governor decision. Approx-imately 70% of bills failed in the first chamber; 13% had intermediate progress (e.g., failed in the second chamber, failed in concurrence, were vetoed by the governor); and 17% were enacted. Because of the small proportion of bills in the intermediate stages, a binary dependent variable was created to compare enacted (17%) with not enacted (83%).

Bill-Level Variables

Bill-level characteristics were grouped as procedure, composition, and content (Table 1). The procedure variables of number and political party of bill sponsors were combined into a three-level variable: one sponsor, multiple sponsors from one party, and multiple sponsors from both parties. Bill composition variables were coded by the research team as dichotomous yes/no indicators; inter-rater reliability was 100% for the variables "propose budget" and "generate revenue," 91% for "mandate," 87% for "appropriate money," and 73% for "new law." Bill content was based on the HPTS topic areas. The 20 relevant topic areas were reduced to 11 by combining similar categories and those with small sample size. Because a single bill could be listed in more than one topic area, dichotomous indicator variables were used rather than mutually exclusive categories.

State-Level Variables

State-level variables hypothesized to influence bill adoption were obtained from official state and federal sources and categorized as sociodemographic, political, economic, and industrial (Table 1). Correlations were examined between variables within a domain to identify variables that might be measuring the same construct (e.g., obesity prevalence and obesity cost).

Statistical Analysis

A two-level hierarchical logistic regression model was constructed to identify bill (Level-1) and state (Level-2) characteristics associated with bill enactment (1=enacted, 0=not enacted). Analyses were conducted in 2006 using HLM software for Windows version 6.04.

The multilevel model-building approach described by Hox was followed.[13] All models used full maximum likelihood estimation. First, a null model for the binary outcome was fit (assuming a continuous outcome) to calculate the intraclass correlation coefficients. Second, Level-1 predictors were added to the logistic regression model as fixed effects. Specifically, indicators within the procedure, composition, and content domains were entered consecutively as three separate blocks. The addition of each block of variables to the model fit was evaluated by the change in deviance (-2*log-likelihood) and the Akaike Information Criterion; the latter emphasizes parsimonious models by incorporating a penalty for greater number of parameters.

In the third step, Level-2 predictors were added as fixed effects to the model with the Level-1 indicators. The Level-2 indicators were added to the model one at a time within each domain and retained if the variable added significantly to the model (i.e., chi-square for change in deviance, $p<0.10$) or had a meaningful association with the dependent variable (i.e., $1.5>OR<0.67$). The entry order for state-level domains was arbitrarily designated as sociodemographic, political,

Table 1. Bill-level and state-level variables examined as predictors of enactment

Variable	Description	Data source
Bill-level variables		
Procedure		
Chamber of origin	Chamber in which bill was introduced (Senate versus House of Representatives) Note: NV bills were coded as Senate bills.	Coded by research team
Number of sponsors	Number of bill sponsors (one versus more than one)	Coded by research team
Political party of sponsor(s)	Political affiliation of bill sponsor(s) (Democrat, Republican, both)	State websites
Composition		
Propose budget	Proposes a fiscal-year budget (yes versus no)	Coded by research team
New law	Proposes a new law or statute (or section within an existing statute) (new law versus amendment)	Coded by research team
Mandate	Uses wording such as "shall" to imply a mandate or enforcement (mandate versus recommendation)	Coded by research team
Appropriate money	Appropriates money for a specific program or activity (includes budget bills) (yes versus no)	Coded by research team
Generate revenue	Generates revenue through taxes, fines, or fees (yes versus no)	Coded by research team
Content/topic areas		
Nutrition and vending standards	Addresses school nutrition standards and vending machine restrictions	HPTS category
Curriculum and course credit for health and physical education	Establishes requirements for physical education or health classes; promotes physical activity (recess); prohibits substitutions for health or physical education classes; proposes changes to state curriculum requirements for nutrition, health, or physical education	HPTS category
BMI reporting	Requires (or allows) schools to measure students' BMI	HPTS category
Safe routes to school	Allocates federal funds for safe routes to school projects	HPTS category
Local authority	Provides local school districts the authority to establish their policies related to nutrition, physical education, or obesity	HPTS category
Model school policies	Requires (or requests) state agencies or officials to develop model school policies related to nutrition and physical education	HPTS category
Initiative, studies, and task forces	Establishes a statewide initiative, commission/task force/council, or study to reduce the prevalence of obesity among state residents or students	HPTS category
Farmers' markets	Supports the development and expansion of farmers' markets; allows use of WIC coupons at farmers' markets	HPTS category
Walking and biking trails	Supports the development and expansion of walking and biking paths; promotes safety for pedestrians and bicyclists	HPTS category
Menu and product labeling	Requires restaurants to display nutritional content of menu items; requires additional nutritional content or serving size information	HPTS category
Snack and soda taxes	Adds additional taxes to soda and/or snack sales; removes taxes from bottled water	HPTS category
State-level variables		
Sociodemographic		
Poverty	Percentage of population below poverty in 1999	U.S. Census 2000
Race/ethnicity	Percentage of population of non-Hispanic white race/ethnicity	U.S. Census 2000
High school noncompletion	Percentage of 16–19-year-olds not enrolled in or graduates of high school	U.S. Census 2000
Adult obesity prevalence	Percentage of adult (aged 18+ years) population that was obese (BMI≥30) in 2004	BRFSS
Obesity cost	Medical cost of obesity ($100/capita)	Finkelstein et al.[24]
Political		
Session length	Length of legislative session (2-year versus 1-year)	NCSL
Term limit	Term limits for senators or representatives in the legislature (yes versus no)	NCSL
Partisan control	Dominant political party of state legislature during 2003–2005 (Democrats versus split; Republicans versus split)	NCSL
Governor's political party	Political party of governor (Democratic versus Republican)	NCSL
Restrictions on obesity lawsuits	Passed legislation protecting industry from civil liability lawsuits related to obesity (yes versus no)	HPTS, 2005 report

(*continued on next page*)

Table 1. Bill-level and state-level variables examined as predictors of enactment *(continued)*

Variable	Description	Data source
Economic		
Population health	State expenditures on population health from all sources (FY03)	NASBO
	$100 per capita; percentage of total expenditures	
Chronic disease	State expenditures on chronic diseases and health behaviors from all sources (FY03)	NASBO
	$1 per capita; percentage of population health	
Education	State expenditures on elementary and secondary education from all sources (FY03)	NASBO
	$100 per capita, percentage of total expenditures	
GSP	Average GSP from all industries (2000–2004)	Bureau of Economic Analysis
	$1000 per capita	
CDC obesity-related funding	States received CDC funding through one of three programs: School Health, Nutrition and Physical Activity, or Steps to a Healthier U.S. (yes versus no)	Trust for America's Health
CDC total funding	Total funding received from CDC (FY04) $ per capita	Trust for America's Health
Industrial		
Agricultural employment	Percentage of adult population employed in agricultural industry	U.S. Census 2000
Industry campaign contributions	Total campaign contributions (2000–2004) given to state legislators and governors from five industry groups: beverage/vending, agriculture/farming, recreation/fitness centers, food stores/processors, fruit/vegetable/nut/dairy	The Institute on Money in State Politics
	Total in thousands, $1000 per legislator	
GSP by industry	Gross state product (average 2000–2004) from 3 industries: agriculture, education, healthcare	Bureau of Economic Analysis
	$100 per capita, percentage of total GSP	
Industry sales	Annual sales/receipts from six industries: convenience stores, vending machines, limited-service eating places, grocery, fitness and recreation centers, sporting goods stores	U.S. Census Bureau, 2002 Economic Census
	$1000 per capita	

BRFSS, Behavioral Risk Factor Surveillance System; FY, fiscal year; GSP, gross state product; HPTS, Health Policy Tracking Service; NASBO, National Association of State Budget Officers; NCSL, National Conference of State Legislatures; NV, Nevada; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

economic, and industrial. All continuous state-level variables were centered around the grand-mean.

In the fourth step, random coefficient models were created on a variable-by-variable basis to determine whether any of the slopes for bill-level explanatory variables had a significant variance component. No random slopes were statistically significant or large enough to retain in the final model; therefore, the fifth step (adding cross-level interactions) was not performed.

Results

Overall, 123 (17% of 717) childhood obesity prevention bills were enacted in 38 states. Table 2 shows a high degree of variability in bill enactment across states. The percentage of bills enacted was highest in Colorado (75%), Louisiana (60%), and Georgia (56%), however, California and Illinois enacted the most bills (10 per state). Twelve states enacted no bills during the study period. The number of bills introduced was highest in New York, Illinois, New Mexico, and Massachusetts.

Table 3 shows the number of bills introduced and the percentage of bills enacted by bill procedure, composition, and content characteristics. More than 50% of introduced bills had one sponsor, introduced new legislation, and included a mandate clause. Although few budget bills were introduced, they were far more likely to be enacted than other bills. Some content areas had a higher percentage of enactment (i.e., safe routes to schools, model school policies, farmers' markets, walking/biking trails) than other content areas (i.e., nutrition/vending standards, curriculum/course credit for health, nutrition, and physical education), while some topic areas had no enacted bills (i.e., snack/soda taxes and menu/product labeling).

Multilevel Modeling

The final multilevel model is presented in Table 4. The null model with no predictors indicated that 3% of the variability in bill enactment was accounted for by state-to-state differences. The intercept coefficient in the final model indicates that the proportion of bills enacted was 3.7% when all binary variables equaled 0 and all continuous variables equaled their mean. The small value of the Level-2 variance component (U_o=0.01) suggests that the

Table 2. Number of bills introduced and enacted and percent enacted by state, 2003–2005

State	Introduced n	Enacted n	%	State	Introduced n	Enacted n	%
IL	49	10	20.4	IA	9	2	22.2
CA	38	10	26.3	VA	9	2	22.2
NM	46	8	17.4	SC	6	2	33.3
NY	51	7	13.7	AZ	5	2	40.0
WA	23	6	26.1	HI	33	1	3.0
LA	10	6	60.0	KY	12	1	8.3
TX	24	5	20.8	OR	12	1	8.3
OK	16	5	31.3	ME	9	1	11.1
AR	14	5	35.7	VT	9	1	11.1
GA	9	5	55.6	AL	5	1	20.0
MA	42	4	9.5	KS	5	1	20.0
TN	23	4	17.4	NH	4	1	25.0
PA	15	4	26.7	NV	2	1	50.0
WV	12	3	25.0	MN	21	0	0
NJ	9	3	33.3	MO	12	0	0
CO	4	3	75.0	DE	5	0	0
CT	29	2	6.9	IN	4	0	0
MS	19	2	10.5	NE	4	0	0
NC	18	2	11.1	ID	3	0	0
RI	18	2	11.1	MT	3	0	0
MD	17	2	11.8	ND	2	0	0
MI	16	2	12.5	UT	2	0	0
OH	14	2	14.3	WI	2	0	0
AL	11	2	18.2	SD	1	0	0
FL	11	2	18.2	WY	0	0	0

final model does a good job of explaining interstate variability in bill enactment.

The three blocks of bill-level indicators (entered sequentially as procedure, composition, and content) all contributed to the previous logistic regression model as shown by a significant decrease in deviance; however, the block of nine content indicator variables did not contribute to the model according to the Akaike Information Criterion statistic, which includes a correction for a high number of parameters. Three procedural variables (i.e., origination in the Senate, multiple sponsors from one party, and multiple sponsors from both parties) were positively associated with enactment. In terms of composition, budget bills were more likely to be enacted, whereas new laws and those that generate revenue were less likely to be enacted. Four content variables (i.e., walking/biking trails; safe routes to school; model school policies; and statewide initiatives, studies, and task forces) were positively associated with enactment.

Level-2 variables were retained in the model based on a priori criteria described in the methods. Within the sociodemographic domain, the high school non-completion rate was inversely associated with bill enactment and significantly reduced the deviance score; however, race, poverty, and adult obesity prevalence were not related to bill enactment. Within the political domain, session length and partisan control were associated with bill enactment, but did not improve the model fit; the governor's political party and restrictions on obesity lawsuits were not associated with enactment. The term-limit variable was positively associated with enactment in the unadjusted analysis, but was not retained in the multilevel analysis because the model was unstable. Economic indicators retained in the final model included population health ($100 per capita) and the proportion of population health spent on chronic disease control and promotion of healthy behaviors. Other economic variables (i.e., education expenditures, gross state product [GSP], CDC funding) were not related to bill enactment. Lastly, none of the industrial variables (i.e., agricultural employment, campaign contributions, GSP, and sales) was independently associated with bill enactment after accounting for other political and economic variables.

Discussion

This study examined state-level childhood obesity prevention legislation introduced in all 50 states over a 3-year period. Innovative multilevel modeling techniques were used to identify microlevel and macrolevel predictors of policy enactment. The 17% enactment of childhood obesity bills in this study is equal to the overall bill enactment in state legislatures during 2003–2005 (K. Schmidt, State Net, personal communication, 2007). The findings of this study demonstrate that bill-level factors are more influential on bill enactment than state-level factors. Although there was little between-state variability in bill enactment, each state

Table 3. Number and percent of bills introduced and enacted by bill-level characteristics, 2003–2005

	Introduced		Enacted	
	n	% of total bills	n	% of introduced
Overall	**717**		**123**	**17.2**
Procedure				
1 sponsor	406	56.6	56	13.8
>1 sponsor, single party	141	19.7	26	18.4
>1 sponsor, both parties	129	23.7	41	24.1
Originate in Senate	308	43.0	62	20.1
Composition				
Propose budget	49	6.8	36	73.5
Appropriate money	151	21.1	49	32.5
New law	479	66.8	80	16.7
Mandate	653	91.1	109	16.7
Generate revenue	52	7.3	1	1.9
Content				
Walking/biking trails	46	6.4	17	37.0
Farmers' markets	87	12.7	31	35.6
Model school policies	14	2.0	4	28.6
Safe routes to school	43	6.0	12	27.9
BMI reporting	37	5.2	8	21.6
Initiatives, studies, and task forces	100	13.9	21	21.0
Local authority	58	8.1	12	20.7
Physical/health education curriculum and course credit	216	30.0	30	13.9
Nutrition/vending standards	213	29.7	27	12.7
Menu/product labeling	20	2.8	0	0.0
Snack/soda taxes	10	1.4	0	0.0

has a unique blend of policy and political factors,[14–16] so results should be applied in the context of the state-level environment.

This study identified specific characteristics of bills that either improve or impede the likelihood of enactment. The types of bills that were most likely to be enacted were introduced in the state Senate; had more than one sponsor; proposed a state budget; amended an existing law; and addressed walking/biking trails, safe routes to school, model school policies, and statewide initiatives/studies/task forces. On the other hand, bills that were least likely to be enacted were introduced in the state House of Representatives, had only one sponsor, proposed a new law, generated revenue, and addressed snack/soda taxes and menu/product labeling. Some of these bill-level characteristics are modifiable, or under the control of legislators.

Modifiable procedural variables include the number and political party of bill sponsors and the chamber (House of Representatives or Senate) of bill introduction. The likelihood of bill enactment increased if there was more than one sponsor and further increased if

there was bipartisan sponsorship, a finding that makes intuitive sense and has been shown previously.[17,18] Additionally, bills introduced in the Senate were more likely to be enacted. The smaller size of the Senate might make it easier to secure a majority in support of obesity legislation as compared to the larger number of legislators in the House of Representatives.[19]

The compositional characteristics of bills might also be modifiable. For example, budget bills were much more likely to be enacted because every state must pass a budget.[20] The budget bills in this study usually included line items for farmers' markets or walking/biking trails; incorporating such expenditures into the state budget will support healthy eating and active living. Bills that introduced new laws or statutes were less likely to be enacted; therefore, trying to improve existing laws through amendments and additions might be a more effective approach. Bills designed to generate revenue for states or school districts, through snack/soda taxes or fines for violating vending machine regulations, were also less likely to be enacted. Potentially desirable bill characteristics such as the appropriation of money for programs and activities (not including budget proposals) and mandate or enforcement clauses were not associated with enactment.

Although the content of a bill might not be easily modifiable, certain topic areas were more likely to be enacted than others. For example, safe-routes-to-school bills had the highest percentage of enactment, possibly because most of these bills specified the use and distribution of federal Department of Transportation funds. Bills related to walking and biking trails (which include construction of new trails and maintenance of existing trails) also had a higher proportion of enactment; many of these bills were also categorized as state budget bills. Two other categories of bills with higher percentages of enactment (i.e., developing model school policies and establishing statewide initiatives, studies, and task forces) represent minimal policy interventions with relatively low expense that might indicate a first step toward more comprehensive policies. Topic areas comprising more extensive school-based interventions such as nutrition/vending standards, BMI reporting, and curriculum for physical and health education courses were not associated with enactment.

State-level political variables were associated with bill enactment in the expected direction. Compared with states with different dominant political parties in the Senate and House of Representatives, states with a single dominant political party were more likely to enact bills; furthermore, states with Democratic control of both chambers were most likely to enact bills related to childhood obesity prevention.[21] States with 2-year legislative sessions were more likely to enact legislation than states with 1-year sessions, possibly because legislators have more time to garner support from colleagues and push a bill through committees.

Table 4. Bill-level and state-level predictors of bill enactment, 2003–2005

	OR[a] (95% CI)	% enacted[b]	p value
Intercept		3.7	
Bill-level			
Procedure			
>1 sponsor, single party	1.9 (1.2–3.2)	7.0	0.01
>1 sponsor, both parties	2.9 (1.5–5.5)	1.0	<0.01
Originate in Senate	1.9 (1.2–3.0)	6.9	0.01
Composition			
Propose budget	58.0 (14.5–231.0)	69.1	<0.01
Appropriate money	1.0 (0.5–1.9)	3.6	0.90
New law	0.5 (0.3–0.9)	2.0	0.02
Mandate	0.5 (0.2–1.5)	2.0	0.23
Generate revenue	0.2 (0.03–0.8)	0.6	0.02
Content			
Walking/biking trails	3.5 (1.6–7.6)	12.0	<0.01
Farmers' markets	0.8 (0.2–3.0)	3.1	0.76
Model school policies	3.4 (1.01–11.7)	11.7	<0.05
Safe routes to school	4.2 (1.8–9.8)	13.9	<0.01
BMI reporting	2.0 (0.6–6.4)	7.0	0.27
Initiatives, studies, and task forces	2.3 (1.2–4.4)	8.3	0.01
Local authority	1.7 (0.7–4.1)	6.0	0.27
Nutrition/vending standards	1.1 (0.6–2.0)	4.2	0.65
Physical/health education curriculum and course credit	1.3 (0.8–2.0)	4.7	0.31
State-level			
Sociodemographic			
High school noncompletion (%)	1.3 (1.2–1.5)	4.9	<0.01
Political			
2-year legislative session	1.9 (1.1–3.2)	6.7	0.02
Democratic control of both chambers	2.0 (1.01–4.0)	7.2	<0.05
Republican control of both chambers	1.4 (0.6–3.0)	5.1	0.41
Economic			
Population health expenditures ($100 per capita)	0.7 (0.4–1.1)	2.5	0.11
Chronic disease expenditures (% of population health)	1.01 (0.99–1.03)	3.8	0.11
Variance component (U_o)	0.01		0.30

[a]OR adjusted for all bill-level and state-level variables.
[b]When all dichotomous variables equal 0 and all continuous variables equal the mean value.

The association between state sociodemographic and economic variables and bill enactment was contrary to expectations. The authors found that states with higher high school noncompletion rates were more likely to enact legislation. Likewise, greater per capita spending on population health reduced the likelihood of enactment; however, this effect was slightly attenuated in states that spent a larger proportion of their population health dollars on chronic disease prevention and the promotion of healthy behaviors. Therefore, states with lower socioeconomic status and less spending on public health initiatives seem to constitute a legislative environment that is more receptive to obesity prevention initiatives.

Indicators of industrial influence did not have an independent effect on bill enactment after adjustment for other variables in the final model. In the unadjusted analyses, campaign contributions from various physical activity and nutrition industries were all positively correlated with enactment, regardless of the type of industry making the contribution. For example, a larger contribution from the beverage and vending machine industries increased the likelihood of enacting child-

hood obesity prevention legislation; however, the analysis was not conducted for vending machine legislation only.

This study is subject to several limitations. First, several states had a small number of introduced and enacted bills, which might have limited the researchers' ability to identify state-level predictors of enactment. Second, a large number of variables were examined in the analysis, so there is a possibility that some findings might be due to chance. Third, there was considerable diversity in the types of bills included in the analysis, but the sample size was not large enough to stratify the analysis into groups that were more homogeneous. Fourth, potential miscoding (nondifferential misclassification) of bill-level characteristics might have biased the results toward the null.

Conclusion

This study provides policymakers, staffers, practitioners, and community advocacy groups with strategies for increased success in addressing childhood obesity through state policies. Those who wish to develop a

comprehensive policy approach to prevent childhood obesity must consider multiple substantive and contextual factors to optimize enactment. For example, it might be advisable to select modifiable bill characteristics (e.g., number and party of sponsors) and topic areas (e.g., walking and biking trails) with a greater likelihood of enactment and to attach childhood obesity legislation to budget bills because they are more likely to pass.

Although research to identify and understand evidence-based policies to prevent childhood obesity has begun,[1] prospective studies are still needed to determine which types of bills and content areas are most likely to have an impact on health status (e.g., BMI) when successfully implemented (Phases 3 and 4 of the policy research framework).[9] Policy enactment is often a blend of science, economics, community organizing, timing, and some luck. Previous public health policy movements (such as tobacco control and seatbelt use) consistently show that one or more "spark plug" leaders are needed to stimulate action.[22] As childhood obesity continues to receive greater attention in the media, scientific literature, and public opinion, policymakers will be motivated to introduce more legislation and to build on other states' success in passing obesity prevention policies. Continued research into predictors of bill enactment should lead to a more efficient legislative process and to more effective policies to address the epidemic of childhood obesity.[23]

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