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Obesity prevention across the US: A review of state-level policies from 2009 to 2019

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Abstract

Objective: Uniquely, state legislators may enact obesity prevention policies tailored to each state's needs and take diverse policy approaches to address obesity prevalence. The objective of this study was to identify and describe state-level obesity-related policies between 2009 and 2019.

Methods: Using a database of legislation covering 2009–2019, researchers categorized obesity-related legislation by status (proposed/enacted), topic, and environment impacted. Researchers determined the number of policies proposed; enacted, by political party control; obesity prevalence, by states over time.

Results: 3256 obesity-related policies were proposed among 50 states and Washington DC between 2009 and 2019. Collectively, 18% (593) of policies were enacted; California (96), New and Jersey (57) enacted the most. Across environment and topics, the most enacted policies categorized in school environment (226) and school nutrition (150) topic area. Most policies were proposed (496) and enacted (77) in 2011. On average, Democrat-controlled states had higher enactment rates than Republican-controlled states, as did states with lower (vs. higher) obesity prevalence.

Conclusions: States have actively pursued obesity-related legislation across multiple topics and environments from 2009 to 2019, with mixed enactment rates. Evaluating the impact of these policies, alone and in combination, will be important to determine whether these state-level efforts reduce obesity.

KEYWORDS
health policy, nutrition, obesity

1 | INTRODUCTION

In the United States, obesity rates have more than tripled since the 1960s. In 2017–2018, 42% of U.S. adults and 19% of children had obesity.[1,2] Obesity increases the risk for a number of other diseases, including type 2 diabetes, coronary heart disease, hypertension, and premature mortality. These burdens are inequitably distributed, with higher rates of obesity among those of non-white race/ethnicity and lower income or education.[3]

While causes of obesity are complex, early efforts to address obesity have focused on behavioral change rather than addressing structural or environmental factors, placing the responsibility to

engage in health-promoting activities on the individual.[4] More recently, obesity prevention efforts have shifted to a systems approach that aims to address obesogenic environments,[5,6] and many obesity policies aim to improve these environments including school, community, media, and retail food.[7,8]

State-level obesity prevention policies are an important component of these efforts. While federal policies can affect the entire US population, state-level policies can be tailored to address the unique needs in the state, by focusing on specific societal challenges such as inadequate access to healthy foods, barriers to physical activity, and obesogenic food environments.[9] Moreover, in some cases, state policymakers trying to enact laws may face less organized opposition than federal policymakers.[10,11] Several state policies have demonstrated efficacy in improving health. For example, implementation of strong competitive food policies in schools have been shown to be associated with lower rates of childhood obesity.[12–14]

Despite the potential importance of state-level policies in addressing obesity, and the diverse approaches taken by states, few studies have examined state-level obesity prevention policies in detail.[15–19] To address this gap, the study team comprehensively examined state obesity-related policy legislation from 2009 to 2019, and categorized each by policy topic area and environment impacted as well as whether they were enacted.

2 | METHODS

2.1 | Data

To identify obesity-related legislation, the research team captured information on legislation from a database curated by the University of Connecticut's Rudd Center for Food Policy and Health.[20] From 2009 to 2018, the Rudd Center conducted a weekly search of the Thomas Reuters Westlaw legal research database.[21] In 2021, the study team updated this database by repeating the Westlaw search to capture the most recent status of all bills and included bills introduced in 2019 (Figure S1). In total, these searches identified 71,331 bills.[21] The team excluded duplicate legislation (46,694; Figure S1) that appeared more than once (such as being introduced in both legislative branches) as well as all legislation that did not address healthy eating, increased physical activity, or prevention of obesity or obesity-related chronic disease (19,746).

The study team read bill summaries and full legislation text to capture information on the central objectives of policies. Researchers coded policies by whether they were intended to promote or limt obesity prevention efforts. Bills limiting obesity prevention efforts, such as bills exempting chain restaurants from labeling nutrition on menus, were excluded (416). Because resolutions are typically ceremonial in nature and not associated with policy change these bills (1,219) were also excluded from the final database of legislation, including those related to obesity prevention. Finally, researchers excluded legislation supporting only transient or neutral change, including breastfeeding policies related to exemption from jury duty or administrative changes to food assistance programs.[22]

2.2 | Measures

The research team developed a codebook describing the rules used to code each of the measures included in this study, including whether a policy was enacted, the topic covered by the bill, and the environment it addressed. The study team met regularly to discuss difficult-to-categorize policies; final categorizations for these policies were arrived at by consensus across the research team.

Researchers coded the legislation as enacted or proposed, considering a policy enacted if it was enacted in both chambers, was signed by the governor, and was not vetoed, similar to methods of Eyler et al. 2012.[15] When a bill was present in multiple iterations in a given legislative session, only the latest version of the bill during that session was included in the final dataset.

Topics were adapted from those originally developed by The Rudd Center's research team to identify the key area addressed in each piece of legislation. For the present study, the research team synthesized The Rudd Center's topics into ten umbrella topic areas (Table 1). Researchers assigned legislation to the topic addressed following the codebook guidelines. When legislation could be considered in two topic areas, the research team selected the topic that was most central to the purpose of the legislation. For example, a bill promoting farm-to-school programming was included in 'school nutrition' and not in 'farms and gardens,' and, a policy supporting federal nutrition programs inclusion of discounts at farmer's markets were included in 'food assistance' and not in 'farms and gardens.'

Additionally, researchers categorized legislation by the environment impacted by the policy using the categories defined in the 2012 Institute of Medicine report on Accelerating Progress in Obesity Prevention (Table 2).[7] Specifically, policies were categorized as impacting the 'food and beverage,' 'school,' 'messaging,' 'physical activity,' or the 'health care and work' environments based on the content analysis of bill text by the research team, following the codebook guidelines.

States were categorized based on their partisan composition and obesity prevalence. The team identified state legislative political party control (Democrat; Republican; Mixed or other party) using legislative partisan composition data from the National Conference of State Legislatures (NCSL) for the years 2010 through 2019, and combined this data into 2-year cycles to reflect political terms for state legislatures.[23] Researchers did not examine partisan data for 2008–2009 because state political control data was not available from NCSL. State obesity prevalence categories were defined as lower (<30%) and higher (≥ 30%) obesity prevalence using data from the Behavioral Risk Factor Surveillance System.[24]

2.3 | Outcomes and analysis

Outcomes included number of policies enacted, enactment rate overall, and enactment rate by state, year, environment impacted, topic, state political party control, and state obesity prevalence. Enactment rate was calculated as the number of policies enacted divided by the number of policies proposed in that year. Analyses were conducted in Stata MP version 17 (StataCorp LLC, College Station, TX) in 2021.

TABLE 1 State-level obesity-related policy topic definitions and examples

Topics	Definition and example policies
Breastfeeding	Policies regarding rights and infrastructure for breastfeeding mothers. Creating or improving infrastructure for breastfeeding mothers to nurse or pump breastmilk.
Farms and gardens	Policies that provide support for farms, particularly local farms.
Food access	Policies that increase access to healthy foods, such as fruits and vegetables, across different communities or geographic settings.
Food assistance	Policies that support food assistance programs such as supplemental nutrition program (SNAP) and women, infants, and children (WIC).
Labeling, sales and taxes	Policies that require food or nutrition labels, such as policies requiring calories to be labeled in chain restaurants on menu boards and menus. Policies that require taxes on or ban sales of unhealthy foods, including sugar-sweetened beverages and candy.
Marketing/Advertising to children	Policies that ban marketing to children, for example, on outdoor public property or that restrict marketing to children in restaurants or other retail establishments.
Obesity, general	Policies addressing treatment or healthcare coverage for obesity treatment or state councils/taskforces/funding opportunities regarding obesity or obesity-related chronic diseases, such as diabetes.
Physical activity and built environment	Policies related to increasing physical activity opportunities or improving the built environment such as authorizing use of school property for recreational activities, developing community-based physical activities programming, or safe routes to school.
School, nutrition	Policies related to nutrition in schools, such as farm to school programs, increasing participation and access to school breakfast, summer food service programs and school lunch assistance, establishing nutrition education or other; creating policies limiting competitive foods.
Schools, physical activity and other initiatives	Policies pertaining to physical activity and other obesity-related policies in schools such as those that increase minimum requirements for physical activity in schools, increasing access to playground equipment or tracking body measurements in schools (ex. BMI). Policies expanding health programs in schools to support healthy living or focusing on decreasing weight bias in schools.

TABLE 2 **Policy environments**[7]

Policy environments	Description
Messaging environment	Marketing to the population or subgroups about obesity prevention, physical activity, or nutrition: Food and nutrition labeling, limits on marketing unhealthy foods to children, and nutrition education programs for SNAP, WIC, and other federal programs.
School environments	Impacting schools through increasing physical activity, requiring nutrition standards for school and competitive foods, and providing nutrition education.
Food and beverage environments	Impacting retail food and beverages including implementation of strategies to decrease sugar-sweetened beverage consumption, improvement of healthy food access through incentives/tax credits, support of farm programs such as farmer's markets credits, support of healthy food options at restaurants for children.
Physical activity environments	Increasing access and safety in communities for physical activity including safe routes to schools and requiring physical activity in childcare settings.
Health care and work environments	Incentivizing health care providers, employers, and insurance providers to provide more services to prevent obesity, including screening and treatment; workplace wellness initiatives; and pregnancy and breastfeeding support.

3 | RESULTS

The final dataset included 3256 obesity prevention policies proposed across all 50 states, and Washington DC, between 2009 and 2019. During that period, the most policies were proposed (496) in 2011 and 2019 (406) (Figure 1). 2016 was the least active year for proposed legislation (200). Overall, 18% (593) of bills were enacted into law, with an average of 54 obesity prevention bills enacted per year. The year with the most enacted policies (77) was 2011 and the year with the least was 2012 (27 enacted).

The most common topics among proposed legislation were school nutrition (699 bills proposed) followed by labeling, sales and taxes

(522), and food assistance (486) (Figure 2B). The least common topics among proposed bills were marketing and advertising to children (68) and physical activity and the built environment (98). The most common topics among enacted policies were school nutrition (150 bills enacted, an average of 14 per year, with 2010 and 2018 as the most active years), food assistance (91 total; 8 per year) and food access (68 total; 6 per year) (Table S3). Bills focused on labeling, sales and taxes had the lowest enactment rate (23/522; 5%) across topics, while bills focused on farms and gardens had the highest (56/394; 44%).

Across environments, the food and beverage environment (1,324) and the school environment (1,167) had the most proposed policies and physical activity and built environment had the least proposed (106) (Figure 2A). Most enacted policies addressed the school environment (226) with an average of 20.5 enacted per year (Table S2), with the most bills in the years 2015 and 2017–2018 (26 each). Food and beverage environment had the second most policies enacted (220; on average 20 bills per year). There were fewer enacted policies for the health care and work environment (73), messaging environment (47), and physical activity and built environment (25). Bill enactment rates varied by policy environment with messaging environment policies having the lowest enactment rate (15%) and those addressing the physical activity and built environment having the highest (24%).

Among states, New York (490), New Jersey (239), and California (209) had the highest number of proposed bills during the study period (Table S1). California (96), New Jersey (57), and Washington DC (32) enacted the most policies (Figure 3; Table S1). Colorado (76%), Idaho (75%) and Louisiana (60%) had the highest enactment rates, although Idaho proposed only four policies. Although New York had the most proposed policies, their enactment rate was only 6%. Iowa and Pennsylvania both had 5% or lower enactment rates. All states proposed obesity prevention bills during the study period, but three states, Kansas, Montana, and Wyoming enacted zero of their proposed policies.

Enactment rates of state obesity prevention policies varied by state political party control (Table S4). Democrat-controlled states consistently enacted more proposed policies than Republican-controlled states, with 2018–2019 showing the largest partisan difference in enactment rates (26% enactment in Democrat-controlled states and 12% in Republican-controlled states). The enactment rates of mixed or other party control states fluctuated and exceeded the enactment rate of Democrat-controlled states in 2010–2011 and 2014–2015 but was lower than the enactment rate of Republican-controlled states in 2012–2013 and 2016–2017.

Democrat-controlled states had higher enactment rates compared to Republican- and mixed party-controlled states for policies addressing the school environment (46% vs. 35% and 32%) and for policies focused on the topics of school nutrition (29% vs. 19% and 24%, respectively) (Table S5). Republican-controlled states were more likely to enact policies regarding the health care and work environment (22% vs. 11% and 8%) compared to Democrat and mixed-control states, and more likely to enact policies focused on food access (19% vs. 13% and 17%) and general obesity prevention (18% vs. 10% and 9%). Finally, compared to states controlled by Democrats and Republicans, mixed-control states had greater enactment of policies addressing the food and beverage environment (47% vs. 31% and 32%) or focused on farms and gardens (15% vs. 10% and 5%) and physical activity and built environment (14% vs. 8% and 7%).

Between 2011 and 2019, states classified as having higher obesity prevalence (≥30%) had lower obesity-related policy enactment rates each year with the exception of 2012, when states of

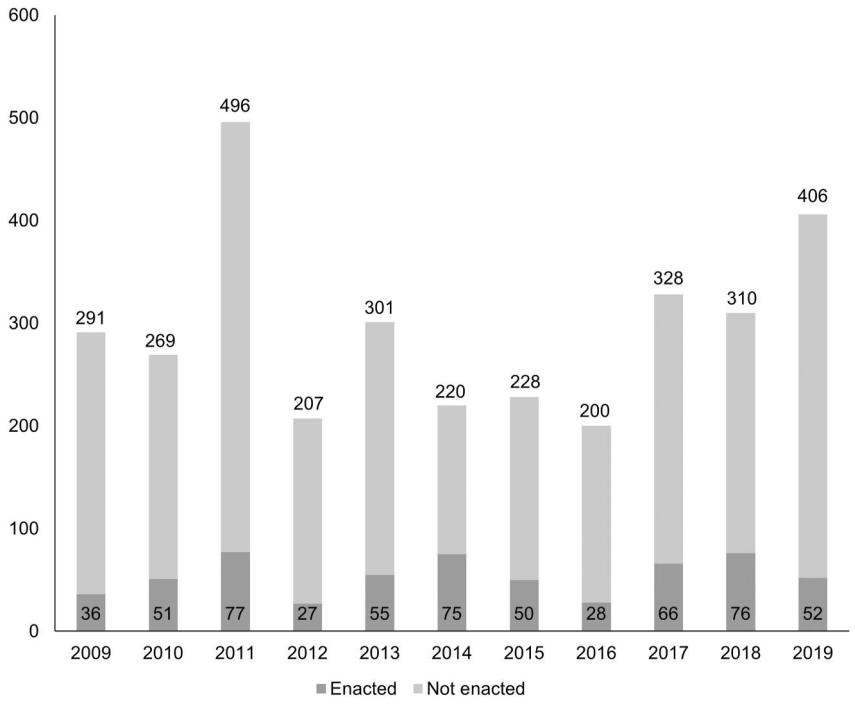

FIGURE 1 Number of state-level obesity-related bills introduced and enacted, 2009–2019

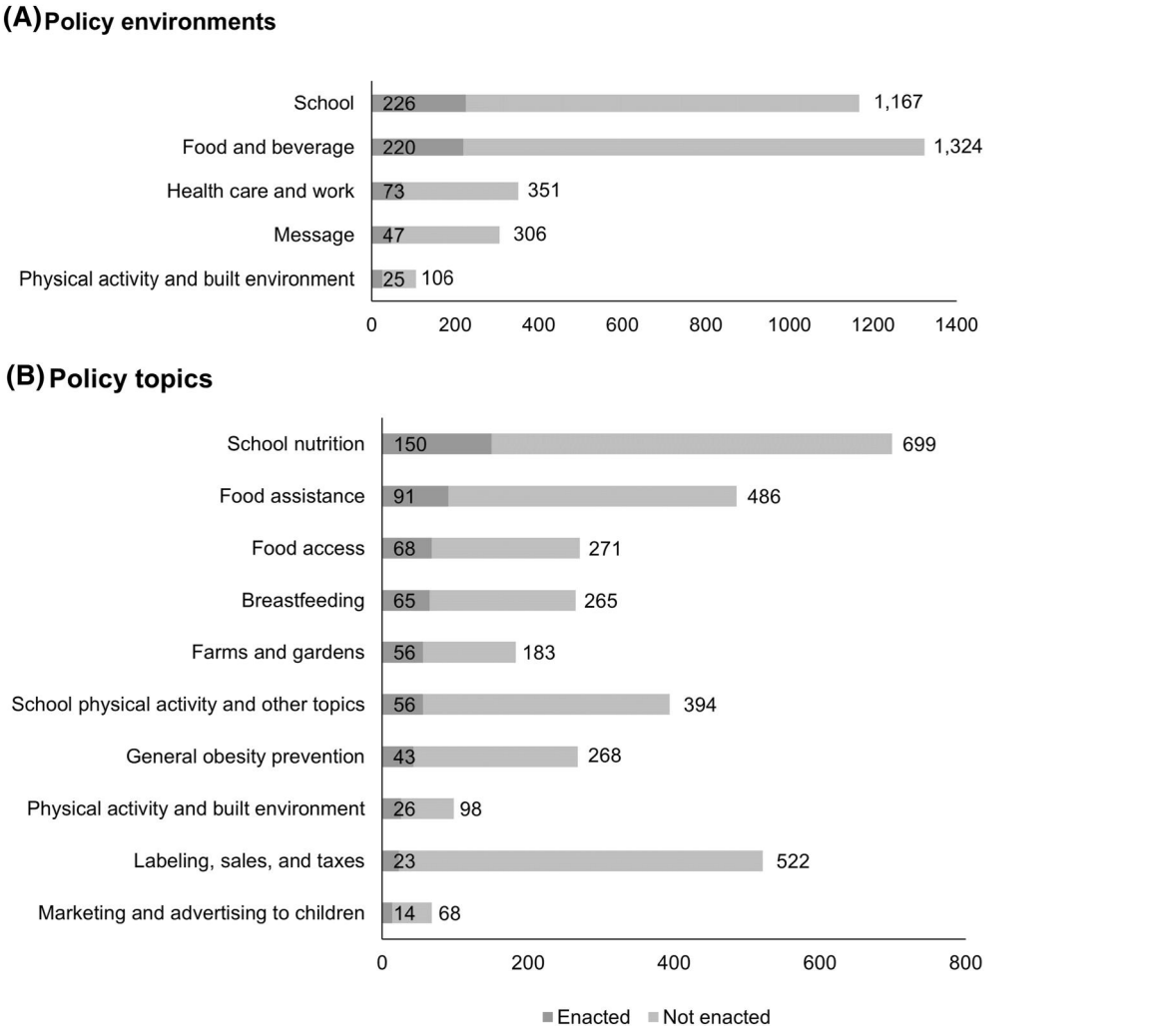

FIGURE 2 Proposed and enacted obesity-related policies by policy environment (panel A) and topic (panel B)

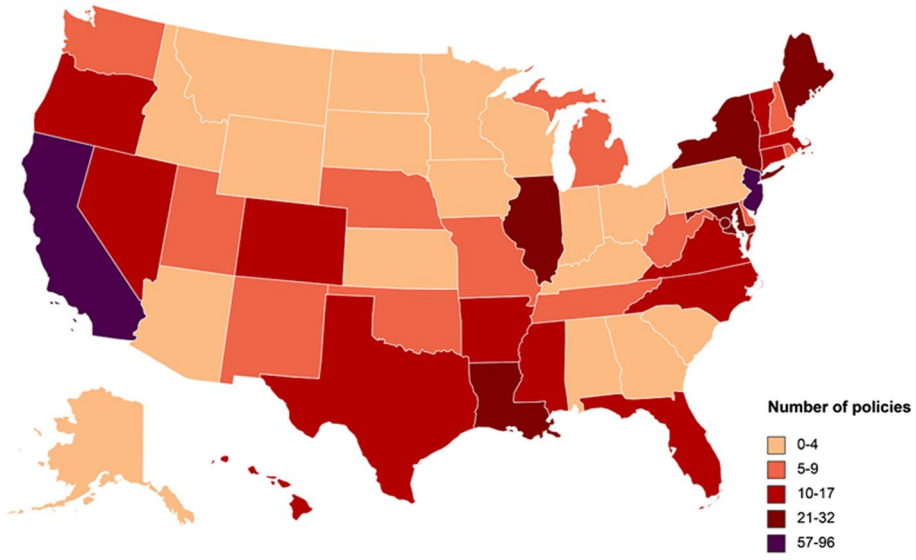

FIGURE 3 Number of enacted obesity-related policies across the US

higher and lower prevalence had an equal enactment rate (13%, Table S6). In 2014, states with lower obesity prevalence (<30%) had the highest passage rate (38%) of any year during the study period. In 2011, states with higher obesity prevalence had the lowest passage rate (7%). Policy topic areas did not differ much across states with differing obesity prevalence, except states with lower obesity prevalence passing more school nutrition bills during this period (25% of all policies passed) compared with states with higher obesity prevalence (20% of all policies passed) (Table S7). For policy environments, the proportions passed were similar between states with lower versus higher obesity prevalence. The biggest difference was a higher passage rate for bills in the food and beverage environment; 40% of all bills passed in higher obesity prevalence states were in this category compared to 35% for lower obesity prevalence states.

4 | DISCUSSION

During the 11-year period between 2009 and 2019, states legislators across all 50 states and Washington DC proposed 3256 new obesity-related policies; only 18% were enacted into law. This is comparable to a 15% enactment rate of obesity-specific bills found by Lankford and colleagues in the decade prior (2001–2010) and by Pomeranz et al. from 2009 to 2015, as well as the 17% enactment rate reported by Donaldson et al. for adult obesity prevention bills between 2010 and 2013.[18,22,25] In this study, the number of total bills proposed varied widely by year, perhaps because some states do not have consistent legislative sessions every year (e.g., some have sessions only every other year); however, approximately the same number of bills were enacted (41–64 per 2-year period) every 2 years.[26]

Although all states proposed at least one obesity prevention bill during the study period, 27 states enacted 6 bills or fewer over 11 years. New York proposed more than twice the number of obesity-related policies compared with New Jersey, the second-ranked state on this dimension. However, California and New Jersey enacted the most obesity-related policies. Enactment rates could be specific to state receptivity to obesity-related policies or could be correlated with overall bill enactment rates within states, as prior research has shown.[18] Louisiana had the distinction of being the only Southern state to enact over 20 obesity-related policies (21) and the only state with more than 20 policies enacted among the 15 states with adult obesity prevalence >35%.[27] From this descriptive analysis, states with lower obesity prevalence (<30%) had higher enactment rates than among states with higher obesity prevalence in all years except 2012, when enactment rates were equal across states with lower and higher obesity prevalence. The data in the present study cannot speak to the mechanisms underlying this association; future research should explore this relationship in greater depth.

In prior studies, the dominant political party in states was not consistently related to obesity policy proposals or enactment.[25] By contrast, in our study, Democrat-controlled states had higher enactment rates overall than Republican and mixed-controlled states, with some exceptions such as between 2014 and 15, when mixed-controlled states had the highest enactment rates (35%) for obesity-related bills. Across environments, Democratic-controlled states enacted more legislation addressing the school environment and specifically addressing the school nutrition topic area, while Republican-controlled states enacted more legislation focused on the obesity general topic and addressing the healthcare and work environment (Table S5). Mixed-control states enacted more bills addressing the food and beverage environment. Additional studies examining the factors explaining these relationships are warranted.

Variation in proposal and enactment rates by topic and environment could reflect areas where state jurisdiction is most powerful. For example, although federal sources provide significant funding for school nutrition, states have important roles in governing school nutrition, and this topic area was the most common among policies proposed and enacted, as seen in prior studies.[25,28,30] School nutrition policies have been associated with improvements in children's diets and perhaps reductions in obesity rates.[29] By contrast, bills on marketing to children were the least likely to be proposed or enacted. Changes to marketing likely requires action at the federal, rather than state, level, given that these measures could face first amendment challenges and well-funded corporate lobbying opposition.[30,31]

States have some role in policies related to the built environment and physical activity, an area that also had fewer policy proposals and enactment. However, municipalities might even have a larger role in these areas, leading state leaders to defer action in these areas to municipal leaders. Proposal and enactment could also reflect the expected effectiveness of the policy for obesity prevention. Labeling, sales, and taxes, which encompass a wide range of marketplace interventions, was the topic area with the second most proposed policies, but also had the second lowest enactment rate (4% enactment rate). These types of bills, especially taxes on unhealthy beverages, have far-reaching impacts (effecting all consumers) and been found to reduce sales of taxed products. However, the food industry often lobbies extensively against these bills, perhaps contributing to their lower enactment rates.[18] By contrast, school nutrition bills may face less organized opposition.[32]

One important potential limitation of this study is that we may have failed to capture all policies related to obesity prevention. While this search was comprehensive and spanned multiple databases, the search may have missed some key words related to obesity prevention. For example, 'built environment' was not specifically included in the search terms. Another limitation is that this study did not evaluate the impact of the policies – alone or in combination with one another – on obesity prevalence or other population health outcomes. Additionally, municipal or county level policies were not included in analyses given the lack of data on these policies.

In summary, states are taking a variety of approaches to address obesity by proposing and enacting policies affecting multiple environments. State legislatures are uniquely poised to draft and enact obesity prevention legislation tailored to the needs and challenges present in that state. Future work should evaluate the impact of these policies individually, and in combination, on trends in obesity and related chronic conditions.

AUTHOR CONTRIBUTIONS

Lauren P. Cleveland: Conceptualization; methodology; validation; data curation; writing original draft; supervision; administration and visualization. **Anna H. Grummon**: Formal analysis; writing – review and editing; visualization and data curation. **Elsa Konieczynski**: validation; methodology; data curation; writing original draft and editing; visualization. **Sally Mancini**: data curation; writing – editing and review. **Anjali Rao**: data curation and writing – editing and review. **Denise Simon**: writing – editing and review; project administration; supervision. **Jason P. Block**: Conceptualization; methodology; validation supervision; administration, writing – editing and review and funding acquisition.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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