



Published in final edited form as:

Am J Prev Med. 2025 February ; 68(2): 300–310. doi:10.1016/j.amepre.2024.10.007.

Cost-effectiveness of mandating calorie labels on prepared foods in supermarkets

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Abstract

Introduction: The US has required chain food establishments—including supermarkets—to display calorie labels on prepared (i.e., ready-to-eat) foods since 2018. Implementation of this supermarket calorie labeling policy reduced purchases of prepared foods from supermarkets, but it remains unknown whether the policy is cost-effective.

Methods: In 2023–2024, this study applied the Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES) microsimulation model to estimate the effects of the supermarket calorie labeling policy on health, costs, and cost-effectiveness over 10 years (2018–2027) for the US population. The model projected benefits overall and among racial, ethnic, and

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Declaration of Interests

No financial disclosures have been reported by the authors of this paper.

CRedit Statement

Anna H. Grummon contributed to conceptualization, methodology, supervision, funding acquisition, and preparing the original manuscript draft. Jessica L. Barrett contributed to conceptualization, methodology, supervision, project administration, formal analyses, and reviewing and editing the manuscript. Jason P. Block contributed to conceptualization, funding acquisition, and reviewing and editing the manuscript. Stephanie McCulloch contributed to methodology, formal analyses, data curation, and reviewing and editing the manuscript. Amy Bolton contributed to methodology, formal analyses, data curation, and reviewing and editing the manuscript. Roxanne Dupuis contributed to data curation and reviewing and editing the manuscript. Joshua Petimar contributed to data curation, methodology, funding acquisition and reviewing and editing the manuscript. Steven L. Gortmaker contributed to conceptualization, methodology, supervision, funding acquisition, and reviewing and editing the manuscript.

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income subgroups. Sensitivity analyses varied assumptions about the extent to which consumers replace calorie reductions from prepared foods with calories from other sources (i.e., caloric compensation).

Results: From 2018–2027, the supermarket calorie labeling policy was projected to save \$348 million in healthcare costs (95% Uncertainty Interval [UI]: \$263–426 million), prevent 21,700 cases of obesity (95% UI: 18,200–25,400), including 3,890 cases of childhood obesity (95% UI: 2,680–5,120), and lead to 15,100 quality-adjusted life years (QALYs) gained across the US population (95% UI: 10,900–20,500). The policy was projected to prevent cases of obesity and childhood obesity across all racial, ethnic, and income groups. The policy was projected to be cost-saving when assuming low and moderate caloric compensation and cost-effective when assuming very high caloric compensation.

Conclusions: A policy requiring calorie labels on prepared foods in supermarkets was projected to be cost-saving or cost-effective and lead to reductions in obesity across all racial, ethnic, and income groups.

INTRODUCTION

More than 1 in 3 adults in the US have poor diet quality.¹ Poor diet quality is responsible for approximately 500,000 deaths² and more than \$50 billion in healthcare costs in the US every year.³ Consumption of prepared (i.e., ready-to-eat) foods is an important contributor to poor diet quality in the US, accounting for one-third of total calorie consumption.⁴ Prepared foods are generally less healthy than foods made at home: they are served in larger portions, contain more calories, saturated fat, and sodium, and contain less fiber, iron, and calcium and fewer fruits and vegetables.^{4–6}

Although restaurants have traditionally been the primary source of prepared foods, 90% of US supermarkets sell prepared foods,⁷ including fresh bakery foods, entrees, and deli items. A majority of US consumers buy prepared foods from supermarkets⁸ and both supply and sales of prepared foods at supermarkets are growing.^{9–12} These trends are concerning given that prepared foods sold at supermarkets have a generally unhealthy nutritional profile, similar to that of prepared foods sold at restaurants.⁹

To address consumption of prepared foods, the 2010 Affordable Care Act (ACA) included a provision requiring chain food retailers—including supermarkets—with ≥ 20 locations to display calorie labels on prepared foods. The US Food and Drug Administration (FDA) required retailers to implement the calorie labels by May 2018. Quasi-experiments have shown that implementation of these labels was associated with 2–11% reductions in calories purchased from prepared foods at restaurants^{13–15} and supermarkets.¹⁶ A simulation modeling study projected that national implementation of the calorie labels in *fast-food restaurants* would reduce obesity prevalence across racial, ethnic, and income groups and be cost-saving, even under conservative assumptions.¹⁷ The cost-effectiveness and health equity effects of implementing calorie labels in *supermarkets*, however, remain unknown. Understanding these effects is important given the increasing demand for prepared foods at supermarkets and concerns that calorie labeling might widen health disparities.^{18–20} Moreover, estimating the cost-effectiveness of implementing calorie labels in supermarkets

could help lawmakers in other jurisdictions decide whether to include supermarkets among the establishments subject to calorie labeling policies.

To address these gaps, the objective of this study was to estimate the 10-year cost-effectiveness and health equity effects of the ACA's mandate to require calorie labels on supermarket prepared foods by 2018 (hereafter 'supermarket calorie labeling policy'). This study used evidence from an analysis of approximately 375 million transactions before and after a large supermarket chain implemented the calorie labeling policy,¹⁶ which is the only published study to date to estimate the effects of this policy on supermarket purchases.

METHODS

This study used the Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES) microsimulation model to estimate the costs, effects on obesity, and cost-effectiveness of a national supermarket calorie labeling policy compared to no intervention.²¹ This study used a 10-year time-horizon (from 2018, the year the supermarket calorie labeling policy became effective nationwide, through 2027) to ensure that the cost estimates were policy-relevant²² and to reflect that most weight change occurs within 3–5 years after initial changes in calorie consumption.^{23–25} Table 1 provides details on key input parameters. This study was determined to be Not Human Subjects Research by the Harvard Pilgrim Health Care Institutional Review Board.

Study Population

The model assumed that the supermarket calorie labeling policy would affect all individuals aged ≥ 2 years. Analyses therefore created a virtual nationally representative population of US residents aged ≥ 2 years using data from the 2010 US Census at the census tract level. The model then assigned characteristics (e.g., height, weight, age, race, and ethnicity) to individuals using data from the National Health and Nutrition Examination Surveys (NHANES), American Community Survey, Behavioral Risk Factor Surveillance System, and National Survey of Children's Health. The model accounted for population growth using data from the US Population Projections, baseline mortality rates using life tables and the NIH-AARP Diet and Health Study, and changes in height and weight due to aging and secular trends using published analyses.²⁶ The CHOICES model has been calibrated to empirical data.²⁶ Additional details are provided elsewhere²¹ and in the Appendix.

Measures

This study used the CHOICES model to estimate outcomes under 2 scenarios: a policy scenario assuming the virtual population experienced the supermarket calorie labeling policy, and a status quo scenario assuming no policy. Figure 1 depicts the logic model of how the policy could affect health. Specifically, the policy scenario projected how individuals would change their purchases and consumption of supermarket prepared foods in response to the supermarket calorie labeling policy, how changes in consumption of supermarket prepared foods would affect total calorie consumption, and how changes in total calorie consumption would affect body weight and weight-related health outcomes over

time. The status quo scenario assumed no changes in consumption of prepared foods from supermarkets.

In the policy scenario, the model projected proportional (rather than absolute) changes in consumption of supermarket prepared foods relative to individuals' baseline consumption. To estimate baseline calorie consumption of supermarket prepared foods, the study estimated age-, sex-, and race/ethnicity-specific consumption of supermarket-acquired bakery, entrée, and deli foods from NHANES 2015–2018 dietary recall data (Appendix Table 4), and estimated the percent of those calories that would come from prepared (versus packaged) foods using transaction-level data from a large supermarket chain (see Appendix).¹⁶ Analyses assumed that 21.6% of these calories were obtained from large chains required to implement calorie labels (and thus would be affected by implementation of the supermarket calorie labeling policy), given that ~24% of supermarkets are chains subject to the policy (i.e., have ≥ 20 locations, based on County Business Patterns data²⁷) and ~90% of supermarkets sell prepared foods.⁷

In the policy scenario, the model projected how implementation of the supermarket calorie labeling policy would change purchases of supermarket prepared foods using effect estimates from analyses of approximately 375 million transactions before and after a large supermarket chain implemented calorie labeling.¹⁶ Specifically, the model assumed that the policy would reduce purchases of prepared bakery items by 5.1% (95% CI: -5.8%, -4.4%) and deli items by 11.0% (95% CI: -11.9%, -10.1%) and would increase purchases of prepared entrees by 0.3% (95% CI: -2.5%, 3.0%). To the authors' knowledge, these are the only published estimates of the effect of the supermarket calorie labeling policy on purchases of prepared foods from supermarkets. These estimates are similar in magnitude to those observed in large studies of restaurant purchases.^{13–15,28} The model assumed the same effect sizes across population subgroups (i.e., by income, race, and ethnicity) because research suggests calorie labels have similar effects on purchases of prepared foods from supermarkets regardless of the socioeconomic level of the neighborhood where the supermarket is located.¹⁶ The model projected that these reductions in purchases would translate to equivalent reductions in consumption of those foods.

Individuals who reduce their calorie consumption from prepared foods might replace these calories with calories from another source (i.e., caloric compensation). In primary analyses, the model assumed that 25% of the calorie reduction in prepared foods after labeling would translate to changes in total (net) calorie consumption (i.e., that 75% of reductions in calorie consumption from prepared foods after labeling would be replaced by other sources). This is a conservative assumption based on studies of sugary drink caloric compensation.^{29–34} (To the authors' knowledge, no studies have examined caloric compensation after reductions in consumption of prepared foods).

The model then translated changes in total calorie consumption into changes in weight using the Hall et al. energy balance models for children and adults.^{23,24} The model assumed a time-to-effect for change in weight of 24 months for children and 36 months for adults and assumed that the intervention and its effects would be maintained over the 10-year time horizon.^{23,24}

Analyses examined how implementing the supermarket calorie labeling policy would affect four categories of outcomes. First, the study examined *reach* (i.e., number of people affected by the policy). Second, the study examined *health impacts*, including cases of obesity and childhood obesity prevented at the end of the 10-year time horizon, Quality-Adjusted Life Years (QALYs) gained, and deaths averted. Third, the study examined *costs*, including implementation costs, healthcare-related costs, and net costs. Analyses estimated implementation costs using a modified societal perspective.^{21,35} Following the FDA's analyses of the calorie labeling policy as well as prior studies,^{17,36} analyses estimated implementation costs in the following categories (grouped by assumed payer): policy dissemination and guidance (borne by the federal government); nutritional assessment of prepared foods, menu design and replacement, and legal review (borne by supermarket chains); and compliance monitoring (borne by local government agencies). Analyses estimated age- and sex-specific healthcare-related costs associated with changes in body mass index (BMI) based on prior analyses.³⁷ Analyses converted costs into 2019 dollars and used a 3% discount rate.³⁸ Fourth, the study examined *cost-effectiveness* outcomes, including cost per QALY gained. Analyses assumed a cost-effectiveness threshold of \$150,000 per QALY.³⁹ Following cost-effectiveness analysis guidelines, cost per QALY gained was not reported when it was negative or cost-saving.³⁵

Statistical Analyses

Analyses used the CHOICES model to project the impact of the supermarket calorie labeling policy on the outcomes. CHOICES is a stochastic, discrete-time microsimulation model that creates a virtual population and simulates how these individuals grow and incur health outcomes and expenditures related to excess weight over time.^{21,26,37} Analyses used Monte Carlo simulations with 1,000 repetitions to generate means and 95% uncertainty intervals (UI, bounded by the 2.5th and 97.5th percentile of the simulations) for each outcome.^{21,40} Probabilistic sensitivity analyses were conducted by stochastically sampling individuals to create the virtual population and by drawing key input parameters from predetermined distributions.

To examine how calorie labeling would affect health equity, analyses examined health impacts when stratifying by race and ethnicity (i.e., Black or African American, not Hispanic or Latino [hereafter 'Black']; Hispanic or Latino ['Hispanic']; White, not Hispanic or Latino ['White']; all other races, not Hispanic or Latino ['other races']) and household income as a percent of the federal poverty level (FPL; 0%–130%, 131%–185%, 186%–350%, or ≥351%). These groups were selected because they have different baseline diet quality¹ and, for racial and ethnic groups, different baseline consumption of supermarket-acquired foods (Appendix Table 4).

This study conducted one-way sensitivity analyses to examine robustness of results when assuming that 50% and 5% of calorie reductions from prepared foods would be translated into changes in total calorie consumption (vs. 25% in primary analyses). Analyses were conducted in 2023–2024.

RESULTS

Implementing the supermarket calorie labeling policy was projected to reach 349 million Americans from 2018 through 2027 (95%UI: 348 million, 350 million, Table 2). Relative to the status quo of no policy, implementing the policy was projected to prevent 21,700 (95%UI: 18,200, 25,400) cases of obesity by the end of the 10-year period (or 6.98 cases per 100,000 people [95%UI: 5.86, 8.19]). This included 3,890 (95%UI: 2,680, 5,120) cases of childhood obesity prevented. Implementing calorie labels on supermarket prepared foods would yield an increase of 15,100 QALYs (95%UI: 10,900, 20,500).

Implementing the supermarket calorie labeling policy would prevent cases of obesity across all racial and ethnic groups. The policy was projected to prevent 7.40 cases of obesity per 100,000 people for Hispanic individuals, 7.22 cases per 100,000 people for White individuals, 6.17 cases per 100,000 people for Black individuals, and 5.59 cases per 100,000 people for individuals identifying as all other races (Figure 2, Appendix Table 5). The pattern was similar for childhood obesity.

Implementing the supermarket calorie labeling policy would also prevent cases of obesity across all income groups. When examining obesity among both adults and children, implementing the policy was projected to prevent 7.42 cases per 100,000 people among the highest-income households ($\geq 351\%$ FPL), 7.09 cases per 100,000 people among households with income 186%–350% FPL, 6.50 cases per 100,000 people among households with income 131%–185% FPL, and 6.30 cases per 100,000 people among households with income 0%–130% FPL (Figure 2, Appendix Table 5). Similarly, when examining childhood obesity, implementing the policy was projected to prevent 5.35–5.75 cases of childhood obesity per 100,000 people, depending on the income group.

Over the period of 2018 to 2027, implementing the supermarket calorie labeling policy was projected to cost a total of \$188 million (95%UI: \$106 million, \$247 million, Table 2). This equates to a total cost of \$0.54 per benefitting person over the 10-year period (95%UI: \$0.30, \$0.71), or \$0.05 per benefitting person per year (see also Appendix Table 6). Under primary assumptions, implementing the policy would be cost-saving based on cost per QALY gained. The policy would lead to \$348 million in healthcare costs saved over 10 years (95%UI: \$263 million, \$426 million) from reductions in excess weight, yielding health care cost savings of \$1.85 per \$1 invested (95%UI: \$1.20, \$3.46). After accounting for implementation costs and healthcare costs saved, implementing calorie labels was projected to save a net total of \$160 million (95%UI: \$48 million, \$275 million).

Sensitivity analyses indicated that calorie labeling in supermarkets is either cost-saving or cost-effective under all assumptions (Table 2). When assuming lower caloric compensation than primary analyses (i.e., 50% of reductions in calorie consumption from prepared foods would translate to reductions in total calorie consumption instead of only 25%), the supermarket calorie labeling policy was projected to prevent more cases of obesity than in the primary analyses. The policy would be cost-saving in this scenario. When assuming higher compensation (i.e., only 5% of reductions in calorie consumption translate to reductions in total calorie consumption), fewer cases of obesity would be prevented than

in the primary analyses, but the policy would remain cost-effective (cost per QALY gained of \$39,000).

DISCUSSION

In this simulation modeling study, the national policy requiring calorie labels on supermarket prepared foods was projected to be a cost-saving intervention that would avert more than 21,000 cases of obesity (including nearly 4,000 cases of childhood obesity). The reductions in excess weight due to the policy would result in approximately \$350 million in healthcare costs saved over 10 years. The policy was projected to prevent cases of obesity in all racial, ethnic, and income groups and under all scenarios (i.e., including assuming high caloric compensation).

To the authors' knowledge, this is the first study to project the effects of calorie labeling of supermarket prepared foods on health, costs, and cost-effectiveness. Primary analyses projected that the policy would prevent cases of obesity and be cost-saving. These results add to the growing body of evidence indicating that calorie labeling policies are cost-saving. For example, three prior studies of calorie labeling at fast-food and full-service restaurants have also projected that this policy would improve health outcomes (e.g., reduce obesity prevalence and decrease incidence of type 2 diabetes and cardiovascular disease) and be cost-saving.^{17,21,41}

Although the policy was projected to prevent a modest number of cases of obesity (approximately 21,000 cases prevented), the costs of implementing the policy were low (especially compared to other obesity prevention interventions²¹), and the policy was projected to be cost-saving or cost-effective in all scenarios. This suggests that policymakers outside of the US should consider including supermarkets among the food retail establishments subject to their calorie labeling policies. Moreover, implementing calorie labels for prepared foods may be a sensible policy even if effects on health are modest. Calorie labels provide easy-to-access nutrition information to consumers, most of whom support policies requiring calorie labels on prepared foods.⁴² Calorie labeling policies may also spur retailers to offer more low-calorie foods,^{43–46} creating more options for consumers looking for these foods.

Limited research has examined whether supermarket calorie labels exert different effects depending on consumers' race, ethnicity, or income. Based on prior research,¹⁶ this study assumed similar effects across these subgroups. Under this assumption, the supermarket calorie labeling policy was projected to prevent cases of obesity among adults and children of all racial, ethnic, and income groups. There were small differences in obesity reductions across groups, likely driven by differences in baseline consumption of prepared foods. These findings suggest that supermarket calorie labeling policies could benefit multiple population groups and may be unlikely to widen or narrow racial, ethnic, or income-based disparities in obesity.

Limitations

This study had several limitations. First, like all models, this model was a simplification of reality and does not represent the full complexity of factors affecting weight and health. However, the CHOICES model prioritizes evidence from high-quality studies with limited risk of bias. Second, to estimate the impact of the supermarket calorie labeling policy on consumption of prepared foods, analyses relied on the only study to the authors' knowledge that has examined how the calorie labeling policy affected purchases of prepared foods from supermarkets.¹⁶ That study used a robust quasi-experimental design and a dataset of ~375 million transactions made across 173 stores in a large supermarket chain in the northeast, but its results may not generalize to all supermarkets. Third, analyses assumed that the supermarket calorie labeling policy would have constant effects on purchases over time, but some prior studies have suggested that calorie label effects wane slightly over time^{13,14} or grow slightly over time.¹⁵ Fourth, analyses assumed that consumption of supermarket prepared foods would be constant in the absence of the supermarket calorie labeling policy. This may have led to an underestimate of the benefits of the policy given recent growth in sales of prepared foods at supermarkets.⁹ This study also did not model changes to consumer behavior or obesity that occurred during the COVID-19 pandemic,^{47,48} given uncertainty in whether these trends would persist post-pandemic. Fifth, calorie labeling policies may lead retailers to offer foods with fewer calories,^{43–46} but this study did not model such changes, potentially leading to underestimates of the benefits of this policy. Sixth, this study did not quantify all possible costs and benefits. For example, calorie labels could reduce consumer welfare by inducing guilt,^{49,50} or conversely, could yield health benefits beyond obesity (e.g., by reducing sodium consumption,¹⁴ with corresponding reductions in cardiovascular disease⁵¹).

CONCLUSIONS

This microsimulation model projected that a policy requiring calorie labels on prepared foods in supermarkets in the US would be cost-saving and prevent cases of obesity across all racial, ethnic, and income groups.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGEMENTS

Funding

This research was supported in part by a grant from the National Institutes of Health (NIH) National Institute of Diabetes and Digestive and Kidney Diseases to Jason P. Block (R01 DK115492) and the NIH National Heart, Lung and Blood Institute at the National Institutes of Health (R01 HL14662501), the JPB Foundation (Grant no 1085) and the Centers for Disease Control and Prevention (CDC, U48 DP006376). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH, JPB Foundation, or CDC. The funders had no role in the study design; collection, analysis, or interpretation of the data; writing the manuscript; or the decision to submit the paper for publication.

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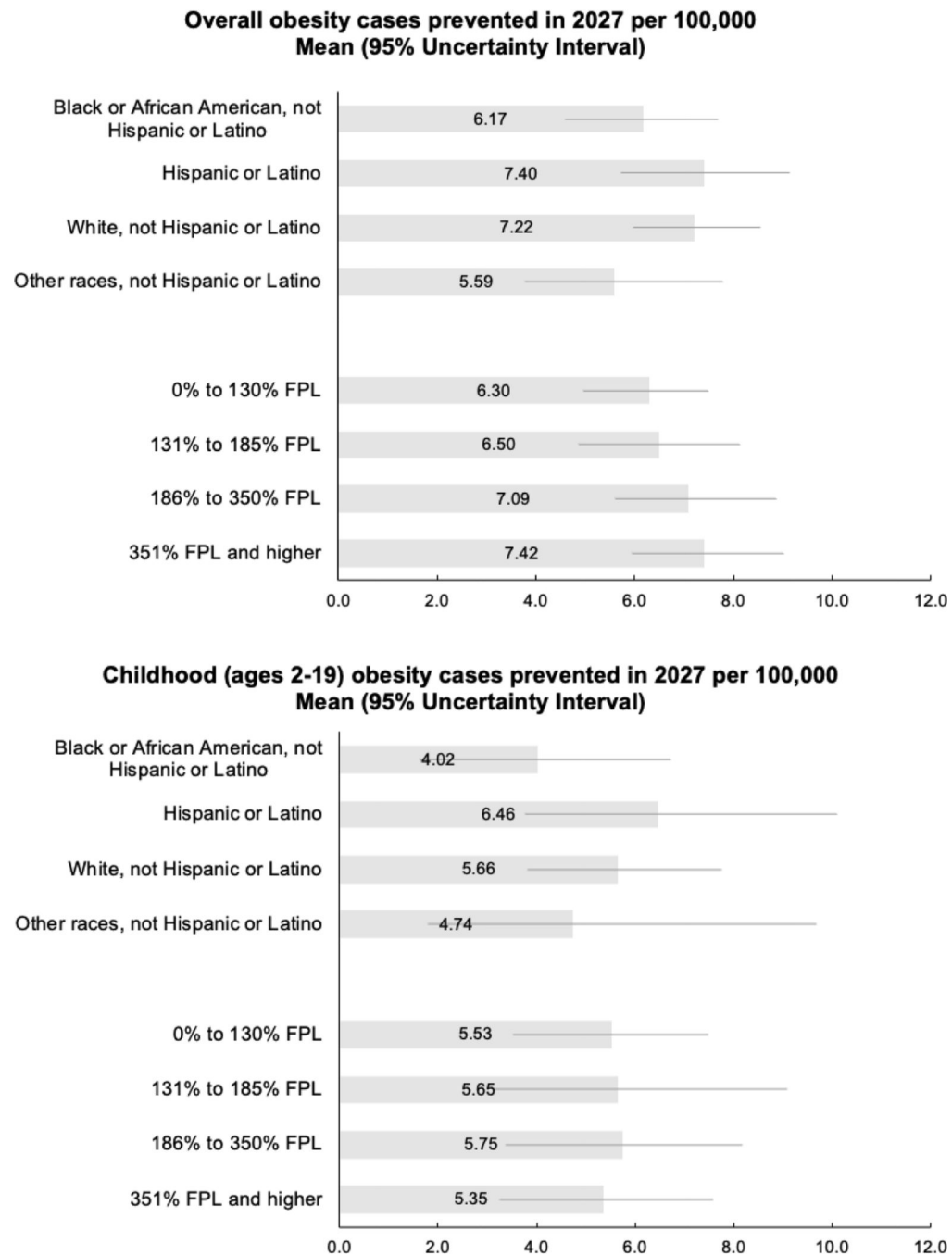
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Figure 1.

Logic model linking the supermarket calorie labeling policy with changes in body weight and body mass index

Note. Logic model was adapted from the CHOICES model²¹ and Dupuis et al. 2024.¹⁷

**Figure 2.**

Projected cases of overall (top panel) and childhood (bottom panel) obesity prevented per 100,000 population in 2027 following a national supermarket calorie labeling policy, by race and ethnicity and income as a percent of the Federal Poverty Level (FPL).

Table 1.

Key input parameters

Input parameter	Value or assumptions	Sources and notes
Reach		
Benefitting population	Assumed US children ages 2–19 and US adults ages 20–100 in all 50 states and Washington, DC would benefit.	Population size estimated using the 2010 Census, US Population Projections, life tables, and the NIH-AARP Diet and Health Study. Sampled from 50 virtual populations to account for uncertainty from data sources and population projections (see Appendix Table 1 and Gortmaker et al. 2015 ²¹).
Effects		
Baseline daily consumption of supermarket prepared foods subject to the calorie labeling policy	Individuals are assigned values based on age, sex, race, and ethnicity, sampled from normal distribution for each of 3 food groups. Overall mean values (see Appendix Table 4 for means and SEs for each demographic subgroup): • Bakery: 6.9 kcal per day • Entrée: 18.6 kcal per day • Deli: 0.8 kcal per day.	Assigned to individuals in the virtual population based on consumption of supermarket-acquired bakery, entrée, and deli foods in dietary recalls collected in the 2015–2018 NHANES; author analyses of the proportion of supermarket-acquired food that is prepared (vs. packaged); and prior research ⁷ and County Business Patterns data on the proportion of supermarkets subject to the calorie labeling policy. See Appendix for details.
Change in consumption of supermarket prepared foods because of the supermarket calorie labeling policy	Percent change of baseline consumption. Sampled from normal distribution with different mean changes (95% CIs) for each of 3 food groups: • Bakery: –5.1% (95% CI: –5.8%, –4.4%) • Entrée: +0.3% (95% CI: –2.5%, 3.0%) • Deli: –11.0% (95% CI: –11.9%, –10.1%).	From study on the effects of the supermarket calorie labeling policy on purchases of supermarket prepared foods. ¹⁶
Change in total calorie consumption because of a change in consumption of supermarket prepared foods	Primary (secondary) analyses assumed 25% (5%, 50%) of the change in calories consumed from supermarket prepared foods would translate into a change in total daily calorie consumption. That is, 75% (95%, 50%) of reductions in consumption of supermarket prepared foods are replaced with calories from other sources.	Range of estimates from prior studies. ^{17,52–54}
Change in weight because of a change in total calorie consumption	Weight change over time based on energy balance dynamics for children and adults.	Hall et al. energy balance models for children and adults. ^{23,24}
Costs (assumed payer)		
Implementation costs		
Policy dissemination and guidance (federal government)	Assumed mean of 10 hours of labor by Food and Drug Administration (FDA) staff at \$96.12/hour during Year 1 only.	FDA impact analysis of calorie labeling; ³⁶ federal salary estimates and prior cost effectiveness evaluations of labeling policies. ^{17,21} Wage estimates from the US Bureau of Labor Statistics ^d occupation code 11–1021 General Operations Managers.
Nutritional assessment (supermarket chains)	Assumed: • Mean of 4 hours of labor per prepared food item by a dietician at \$45.36/hour • Mean of \$56 per item to use database to calculate nutritional information • Mean of 2,496 prepared food items per chain need nutritional analysis in Year 1, and mean of 581 (SD 338) new prepared food items per chain need nutritional analysis annually in Years 2+. • 286 chains subject to the policy of which 36% sell items that	FDA impact analysis of calorie labeling; ³⁶ Bureau of Labor Statistics salary estimates; and author analyses of number of unique prepared food items for sale at 2 large supermarket chains. Wage estimates from the US Bureau of Labor Statistics ^d occupation code 29-1031 Dietitians and Nutritionists.

Input parameter	Value or assumptions	Sources and notes
	would be in scope for labeling • Costs borne in Year 1 for all prepared food items and Years 2+ for new prepared food items.	
Menu design and replacement (supermarket chains)	Assumed: • Mean costs to redesign menu of \$3,706 per chain • Menu of 2 menu boards per individual establishment at large chains • Mean of \$550 to create new menu board (range: \$100-\$1,000) • Mean of 17,187 individual establishments where new menus are needed • Mean of 90% of establishments sell prepared foods • Mean of 1 hour for manager at \$43.54/hour and 0.5 hours for staff at \$16.92/hour to install new menu board • Mean of 360 (range: 120–600) of printed menus created per establishment • Mean cost of \$0.06 per printed menu • Costs borne in Year 1 only.	FDA impact analysis of calorie labeling; ⁷ Bureau of Labor Statistics salary estimates; prior research on proportion of supermarkets that sell prepared foods. ⁷ Wage estimates from the US Bureau of Labor Statistics ^a occupation codes 11–9051 Food Service Managers and 35–3023 Fast Food and Counter Workers.
Legal review (supermarket chains)	Assumed: • Mean of 10 hours (range: 8–12) of labor by lawyer at \$104.09/hour to review regulations • Costs borne in Year 1 for chains present in 2018 and Years 2+ for new chains.	FDA impact analysis of calorie labeling; ⁷ Bureau of Labor Statistics salary estimates. Wage estimates from the US Bureau of Labor Statistics ^a occupation code 23–1011 Lawyers.
Compliance monitoring (local governments)	Assumed: • Mean of 0.0005 full-time equivalents (FTE) of labor per restaurant by local food safety inspector or compliance monitor at \$88,234/FTE to check compliance • Costs borne in Year 1 for chains present in 2018 and Years 2+ for new chains.	FDA impact analysis of calorie labeling. ⁷ Wage estimates from the US Bureau of Labor Statistics, ^a occupation code 19–5012 Occupational Health and Safety Technician.
Healthcare costs (society)	Assumed healthcare costs changed in response to changes in body mass index, estimated by age and sex.	Prior analyses of the relationship between body mass index and health care costs by age and sex. ³⁷

Abbreviations: CI, confidence interval; FDA, Food and Drug Administration; FTE, full-time equivalents.

^aWages estimated from annual mean salary from the May 2019 National Occupational Employment and Wage Estimates,⁵⁵ assuming 2000 hours per full-time equivalent, and a fringe benefit rate of 1.4556 overall, 1.5625 for government workers, and 1.4327 for private sector workers.⁵⁶

Table 2.

Reach, health impacts, costs, and cost-effectiveness of the Affordable Care Act's mandate requiring calorie labels on supermarket prepared foods, 2018–2027^a

Outcome	Primary analyses Mean (95% UI)	Low compensation Mean (95% UI)	High compensation Mean (95% UI)
Reach			
10-year population reach (millions)	349 (348, 350)	349 (348, 350)	349 (348, 350)
First year population reach (millions)	314 (314, 315)	314 (314, 315)	314 (314, 315)
Health impacts, totals over model period			
Cases of obesity prevented in final model year (2027)	21,700 (18,200, 25,400)	43,400 (36,300, 50,500)	4,310 (3,290, 5,300)
Cases of obesity prevented per 100,000 people	6.98 (5.86, 8.19)	14.00 (11.70, 16.20)	1.39 (1.08, 1.69)
Cases of childhood obesity prevented in final model year (2027)	3,890 (2,680, 5,120)	7,770 (5,710, 9,880)	758 (463, 1,310)
Cases of childhood obesity prevented per 100,000 people	5.54 (3.80, 7.28)	11.10 (8.14, 14.00)	1.08 (0.66, 1.86)
Years of life gained	5,120 (597, 11,600)	10,200 (3,030, 18,900)	1,060 (0, 4,240)
Deaths averted	1,200 (309, 2,470)	2,390 (926, 4,320)	239 (0, 926)
Quality-Adjusted Life Years (QALYs) gained	15,100 (10,900, 20,500)	30,000 (23,200, 38,300)	3,050 (1,960, 5,550)
Costs			
10-year intervention implementation costs (\$, millions)	188 (106, 247)	188 (106, 247)	188 (106, 247)
10-year intervention implementation cost per person reached (\$)	0.54 (0.30, 0.71)	0.54 (0.30, 0.71)	0.54 (0.30, 0.71)
Healthcare costs saved over 10 years (\$, millions)	348 (263, 426)	697 (557, 842)	69.2 (36.6, 90.3)
Healthcare costs saved per \$1 invested (\$)	1.85 (1.20, 3.46)	3.70 (2.43, 6.89)	0.37 (0.17, 0.72)
Net cost difference (\$, millions; negative numbers indicate costs saved)	–160 (–275, –48)	–509 (–671, –342)	119 (30.4, 200)
Cost-effectiveness			
Cost per QALY gained (\$)	Cost-saving	Cost-saving	39,000 (11,200, 81,800)

Abbreviations: UI, uncertainty interval.

^aPrimary analyses assumed that 25% of reductions in calorie consumption from supermarket prepared food would be translated into changes in daily calorie consumption and the remaining 75% of calorie reductions would be replaced by calories from other sources. In the low and high compensation scenarios, analyses assumed 50% and 5% of reductions in calorie consumption from supermarket prepared food, respectively, would be translated into changes in daily calorie consumption.