

CHOICES NATIONAL ACTION KIT:

Creating Healthier Afterschool Environments Strategy Report



CHOICES uses cost-effectiveness analysis to compare the costs and outcomes of different policies and programs promoting improved nutrition or increased physical activity in schools, early care and education and out-of-school settings, communities, and clinics. This strategy report describes the projected national population reach, impact on health and health equity, implementation costs, and cost-effectiveness for an effective strategy to improve child health. This information can help inform decision-making around promoting healthy weight. To explore and compare additional strategies, visit the CHOICES National Action Kit at www.choicesproject.org/actionkit.



TABLE OF CONTENTS

Page 2 Strategy Profile | Describes the estimated benefits, activities, resources, and leadership needed to implement the strategy.

Page 4 National Results | Displays the projected national population reach, impact on health behaviors and prevention of excess weight gain, implementation costs, and cost-effectiveness of the strategy.

Page 5 Cost Results | Describes the estimated costs by activity and payer needed to implement the strategy nationally.

Page 7 Health Equity Indicators | Describes the projected impact of implementing the strategy nationally on health equity by race, ethnicity, and income.

Page 10 Strategy Details & Modeling Methods | Describes the reach, effect, and cost assumptions used to make national projections for the strategy, and provides links to additional resources related to the strategy.

Page 12 CHOICES National Action Kit: Modeled Outcomes Glossary | Provides definitions for each modeled output displayed in the National Results table.

Page 13 References

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Contact the CHOICES Project: choicesproject@hsph.harvard.edu

STRATEGY PROFILE

Describes the estimated benefits, activities, resources, and leadership needed to implement a strategy to improve child health. This information can be useful for planning and prioritization purposes.

Creating healthier afterschool environments is a strategy to improve nutrition and physical activity policies & practices through the Out-of-School Nutrition and Physical Activity (OSNAP) initiative for children in grades K-5 attending state-administered 21st Century Learning afterschool programs.

WHAT POPULATION BENEFITS?

Children in grades K-5 attending state-administered 21st Century Learning afterschool programs.



✓ Increase in vigorous physical activity

WHAT ARE THE ESTIMATED BENEFITS?

Relative to not implementing the strategy

Increase vigorous physical activity and improve nutritional quality of snacks and beverages offered in afterschool programs, and, in turn, promote healthy child weight.



✓ Improvement in nutritional quality of snacks



✓ Prevent cases of obesity



✓ Likely to improve health equity by race, ethnicity, and income

➔ More details available on the CHOICES National Action Kit at choicesproject.org/actionkit

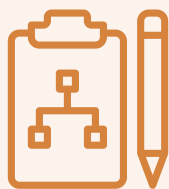
WHAT ACTIVITIES AND RESOURCES ARE NEEDED?

Activities	Resources	Who Leads?
Issue regulations to improve nutrition and physical activity policies and practices in afterschool programs	<ul style="list-style-type: none"> Time to issue and communicate regulations 	State government
Provide training and technical assistance to regional Healthy Afterschool trainers on how to lead learning collaborative sessions	<ul style="list-style-type: none"> Time for state Healthy Afterschool coordinator to lead trainings Time for regional Healthy Afterschool trainers to be trained and receive technical assistance Travel costs Training material costs 	State healthy afterschool coordinator

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WHAT ACTIVITIES AND RESOURCES ARE NEEDED? *(continued)*

Activities	Resources	Who Leads?
Conduct regional learning collaboratives with afterschool program staff including training and technical assistance on goals and implementation activities	<ul style="list-style-type: none"> • Time for regional Healthy Afterschool trainers to lead learning collaboratives and provide technical assistance • Time for afterschool program staff to attend learning collaboratives and receive technical assistance • Training material costs • Travel costs 	Regional healthy afterschool trainer
Assess and implement actions to change program practices to meet Healthy Afterschool standards	<ul style="list-style-type: none"> • Time for afterschool program staff to conduct program practice self-assessments and implement changes at their program • Increase in food costs to provide snacks in compliance with nutrition standards to children attending Healthy Afterschool programs 	Afterschool program director
Develop CEU-accredited course for local program staff	<ul style="list-style-type: none"> • Cost to create a CEU-accredited course 	State healthy afterschool coordinator
Provide educational materials and incentives to local program staff	<ul style="list-style-type: none"> • Material and incentive costs 	State government
Monitor compliance to ensure afterschool programs are following programmatic requirements	<ul style="list-style-type: none"> • Time for state monitoring and compliance staff to monitor compliance • Travel costs 	State government monitoring and compliance staff
Establish a Healthy Afterschool recognition and monitoring website	<ul style="list-style-type: none"> • Time to create and maintain website 	State government website developer



Strategy Modification

This strategy could be modified to benefit children who participate in out-of-school programs administered by other organizations (e.g., YMCA or Boys and Girls Club of America). With this modification, the activities necessary to carry out the voluntary recognition program may not be included (e.g., issuing regulations, creating a healthy afterschool nutrition website, and monitoring compliance). With this modification, the impact on health is expected to be similar, and the impact on reach and cost may vary.

- See our resource library for relevant peer-reviewed publications, research reports, & briefs at choicesproject.org/resource-library
- Learn more about strategy modifications and CHOICES projections of the strategy Creating Healthier Afterschool Environments for a US city and state: [Boston, MA](#)
- Learn more about the evidence for the strategy Creating Healthier Afterschool Environments in the CHOICES peer-reviewed publication: [Cradock et al. 2017. Am J Prev Med](#)

Adapted from CHOICES Strategy Profile: Creating Healthier Afterschool Environments. CHOICES Project Team at the Harvard T.H. Chan School of Public Health, Boston, MA; May 2023.

NATIONAL RESULTS

Projected national population reach, impact on health behaviors and prevention of excess weight gain, implementation costs, and cost-effectiveness of the strategy. These national results may help inform your organization's decision-making around promoting healthy weight.

DESCRIPTION	Improving nutrition and physical activity policies and practices through the Out-of-School Nutrition and Physical Activity initiative for children in grades K-5
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OUTCOME	Mean (95% UI)*
BEHAVIOR CHANGE PER PERSON <i>Change in health behavior per person in the first year</i>	515 more minutes of physical activity (298; 728) <i>Vigorous physical activity minutes, per year</i>
	7,710 fewer snack calories (4,510; 10,900) <i>Fewer calories, due to improvements in snack quality, per year</i>
COST PER PERSON <i>Average annualized cost per person to implement the strategy over the model period</i>	\$26.50 (\$20.80; \$40.80) See Cost Results
POPULATION REACH <i>Reach over the model period</i>	179,000 (96,900; 262,000)
OBESITY PREVENTED <i>Cases of obesity prevented in the final year</i>	1,180 (386; 2,370)
CHILD OBESITY PREVENTED <i>Cases of child obesity prevented in the final year</i>	1,180 (386; 2,370)
HEALTH EQUITY IMPACT <i>Impact on obesity-related health equity in the final year</i>	Likely to improve health equity by race, ethnicity, & income See Health Equity Indicators
QUALITY-ADJUSTED LIFE YEARS (QALYS) GAINED <i>Quality-adjusted life years (QALYs) gained (totals over the model period)</i>	303 (129; 520)
OBESITY YEARS PREVENTED <i>Years with obesity prevented (totals over the model period)</i>	6,850 (2,880; 12,400)
HEALTH CARE COSTS SAVED PER \$1 INVESTED <i>Total health care costs saved per total intervention costs over the model period</i>	\$0.02 (\$0.01; \$0.03)
COST PER QALY GAINED <i>Net cost per quality-adjusted life year (QALY) gained (totals over the model period)</i>	\$154,000 (\$97,000; \$307,000)

Projections for the model period 2022-2031 (10 years, inclusive of the start and end years).

Costs are in 2019 dollars and discounted at 3% annually.

*Results displayed are the mean and 95% uncertainty interval (UI). CHOICES calculates 95% uncertainty intervals by running the model 1,000 times and reporting the range (95% of estimates, centered on the mean) of projected outcomes that account for uncertainty from data sources and population projections.

- ✓ Explore our User Guide for more information about the CHOICES National Action Kit at choicesproject.org/action-kit-user-guide
- ✓ Learn more about CHOICES Methods at choicesproject.org/methods
- ✓ Find definitions of each modeled outcome in the [Glossary \(p.12\)](#) at choicesproject.org/action-kit-glossary

COST RESULTS

Describes the estimated costs by activity and payer needed to implement a strategy to improve child health nationally. This information can be useful for planning and prioritization purposes.

This report includes estimates of the implementation costs of Creating Healthier Afterschool Environments if implemented in each state in the United States. Costs are estimated from a societal perspective, meaning costs needed to implement the strategy are included regardless of who pays or whether the costs are budgetary or opportunity costs.

Average Annual Strategy Implementation Cost by Activity and Payer				
Activity	Resources	Cost per Person†	Payer	Percent of Total Cost
Issue regulations to improve nutrition and physical activity policies and practices in afterschool programs	<ul style="list-style-type: none"> Time to issue and communicate regulations 	\$4.53	State government	17%
Provide training and technical assistance to regional Healthy Afterschool trainers on how to lead learning collaborative sessions	<ul style="list-style-type: none"> Time for state Healthy Afterschool coordinator to lead trainings and provide technical assistance Time for regional Healthy Afterschool trainers to be trained and receive technical assistance Travel costs Training material costs 	\$0.08	State government	3%
Conduct regional learning collaboratives with afterschool program staff including training and technical assistance on goals and implementation activities	<ul style="list-style-type: none"> Time for regional Healthy Afterschool trainers to lead learning collaboratives and provide technical assistance Time for afterschool program staff to attend and receive technical assistance learning collaboratives Training material costs Travel costs 	\$1.64	State government; School (Afterschool programs)	6%
Assess and implement actions to change program practices to meet Healthy Afterschool standards	<ul style="list-style-type: none"> Time for afterschool program staff to conduct program practice self-assessments and implement changes at their program Increase in food costs to provide snacks in compliance with nutrition standards to children attending Healthy Afterschool programs 	\$11.30	School (Afterschool programs)	43%
Develop CEU-accredited course for local program staff	<ul style="list-style-type: none"> Cost to create a CEU-accredited course 	\$0.01	State government	<1%
Provide educational materials and incentives to local program staff	<ul style="list-style-type: none"> Material and incentive costs 	\$0.01	State government	<1%

Costs are in 2019 dollars and discounted at 3% per year. Sums may not equal total due to rounding.

†Average annualized cost per person to implement the strategy over the model period 2022-2031 (10 years).

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Average Annual Strategy Implementation Cost by Activity and Payer <i>(continued)</i>				
Activity	Resources	Cost per Person†	Payer	Percent of Total Cost
Monitor compliance to ensure afterschool programs are following programmatic requirements	<ul style="list-style-type: none"> Time for state monitoring and compliance staff to monitor compliance Travel costs 	\$4.08	State government	15%
Establish a Healthy Afterschool recognition and monitoring website	<ul style="list-style-type: none"> Time to create and maintain website 	\$4.13	State government	16%
TOTAL	--	\$26.50	--	100%

Average Annual Strategy Implementation Cost by Payer and Cost Type			
Payer	Cost per Person†		
	All Costs (% of Total)	Budgetary Costs (% of All Costs by Payer)	Opportunity Costs (% of All Costs by Payer)
Federal government	--	--	--
State government	\$13.60 (51%)	\$12.80 (94%)	\$0.81 (6%)
Local government	--	--	--
School district	--	--	--
School (Afterschool programs)	\$12.90 (49%)	\$11.80 (91%)	\$1.15 (9%)
Family/Individual	--	--	--
Industry	--	--	--
Nonprofit	--	--	--
Health care	--	--	--
TOTAL	\$26.50 (100%)	\$24.60 (93%)	\$1.96 (7%)

Costs are in 2019 dollars and discounted at 3% per year. Sums may not equal total due to rounding.
 †Average annualized cost per person to implement the strategy over the model period 2022-2031 (10 years).

→ To compare the costs and impacts of strategies, use the [CHOICES National Action Kit comparison builder](#). The strategy implementation cost tables included in this report may provide information useful for planning purposes.

DEFINITIONS

All costs include budgetary and opportunity costs.

Budgetary costs refer to the actual financial costs incurred.

Opportunity costs refer to the value of what you have to give up in order to choose something else. For example, if an annual professional development training for bullying prevention is replaced with a training for active physical education, there is no budgetary impact, but costs for teachers to attend the training are considered an opportunity cost. The opportunity cost of their time is included in a cost analysis from a societal perspective.

HEALTH EQUITY INDICATORS

Describes the projected impact of implementing a strategy nationally on health equity by race, ethnicity, and income.

Every person deserves access to healthy foods and drinks and opportunities to be physically active, which can help them grow up and live at a healthy weight. However, obesity levels vary by race, ethnicity, and income. Nationally, current and future projected obesity levels are highest among Black or African American and Hispanic or Latino race and ethnicity groups and populations with low household incomes.¹ These disparities are driven by many forces, including commercial determinants leading to increased intake of highly processed and marketed foods and drinks, as well as structural racism and social and economic determinants of health.²⁻⁴ Effective policy and programmatic strategies promoting improved nutrition and increased physical activity can reduce health disparities and improve health equity.

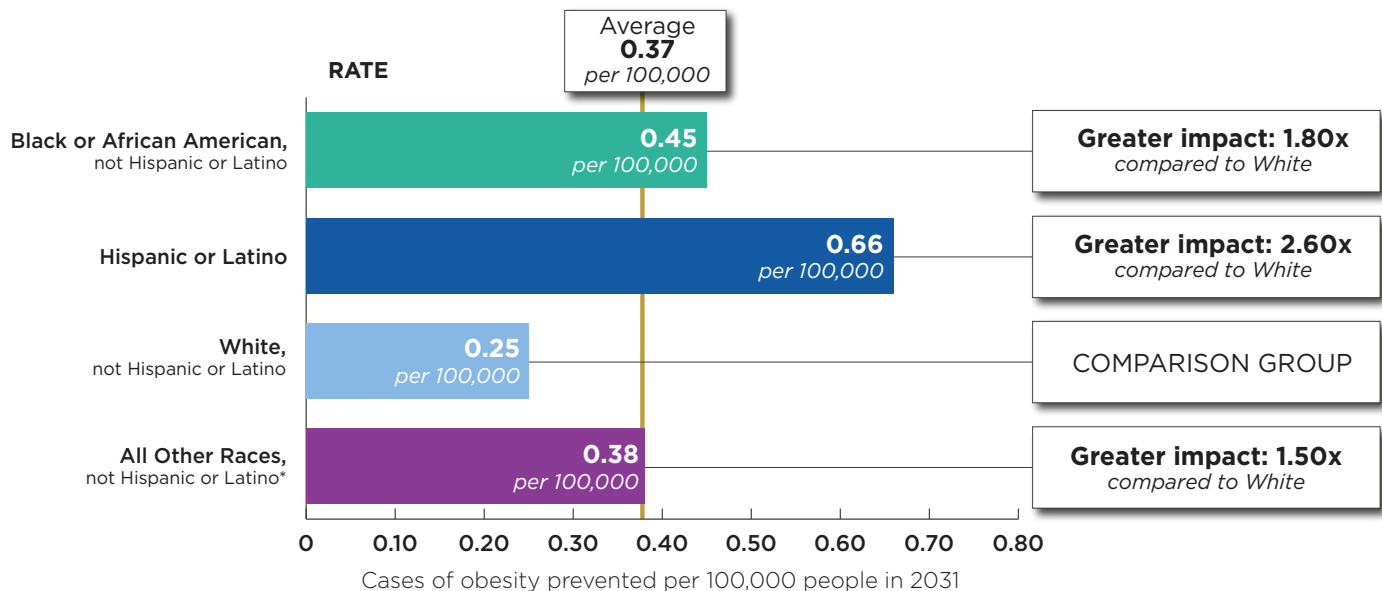
KEY TAKEAWAYS

If implemented over 10 years (2022-2031), this strategy is projected to:

- ✓ **Prevent 1,180 cases of obesity in 2031**
- ✓ **Prevent cases of obesity in all race, ethnicity, and income groups**
- ✓ **Improve health equity by race, ethnicity, and income**

Learn more about CHOICES methods for projecting health equity impacts at choicesproject.org/methods/healthequity

Comparative projected impact of the strategy by race and ethnicity



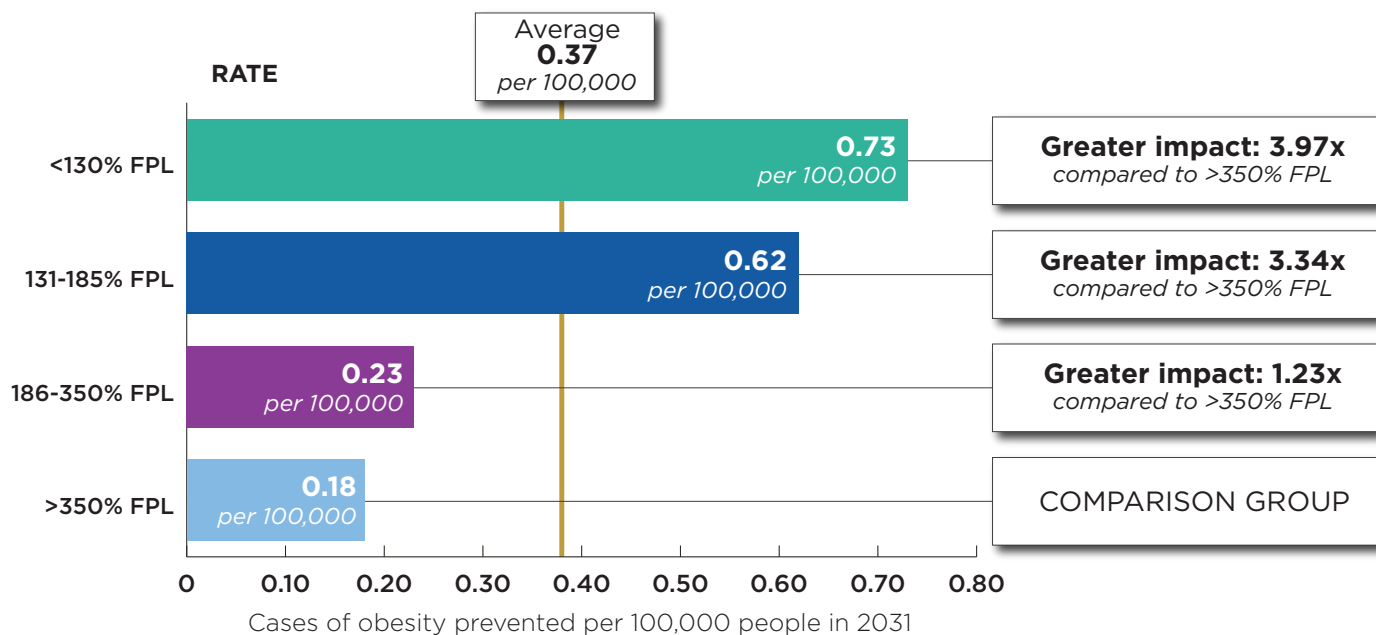
*All Other Races includes people who identify as American Indian/Alaska Native, Asian, Native Hawaiian or Pacific Islander, Multi-racial, or another race or ethnicity not represented in the categories shown. While each of these groups represent distinct populations with differences in health opportunities, risk, and outcomes, they are summarized together due to limited data in national- and state-level surveillance systems.



The Black or African American and Hispanic or Latino populations are projected to experience preventive benefits that are 1.80 and 2.60 times greater compared to the White population. *The comparative impact in each population group compared to the population average is provided in a table on [page 9](#).*

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Comparative projected impact of the strategy by household income as a percentage of the federal poverty level (FPL)



Populations with lower household incomes (185% FPL or less) are projected to experience preventive benefits that are 3.34-3.97 times greater compared to populations with the highest income (>350% FPL). *The comparative impact in each population group compared to the population average is provided in a table on [page 9](#).*

How is this strategy expected to impact health equity?

All students deserve opportunities to grow up healthy. Regular physical activity, healthy eating, and adequate hydration can help children maintain a healthy weight. Afterschool programs can provide important opportunities for students to learn healthy eating habits and promote physical activity and wellness. However, not all programs offer the same opportunities for healthy afterschool environments.⁵ One proven strategy to help afterschool students in grades K-5 increase their physical activity and consumption of healthy snacks is the implementation of the Out-of-School Nutrition and Physical Activity (OSNAP) initiative. Multiple communities have successfully implemented OSNAP.⁶⁻⁸ By providing training and technical assistance opportunities for afterschool programs, afterschool program staff are able to provide opportunities for physical activity and improve the nutritional quality of snacks and beverages consumed. Implementing this strategy in Nita M. Lowey 21st Century Community Learning Centers (21st CCLCs) is expected to improve health among children from households with lower incomes and improve health equity by income, since most students attending 21st CCLCs have low household incomes.⁹

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Projected impact of the strategy by race, ethnicity and income, mean (95% UI)^a

	OBESEITY PREVENTED ^b	OBESEITY PREVENTED PER 100,000 ^b	COMPARATIVE IMPACT ^c	
	<i>Cases of obesity prevented in the final year</i>	<i>Cases of obesity prevented per 100,000 people in the final year</i>	<i>Ratio of obesity prevented per 100,000</i>	
Race and Ethnicity			<u>Compared with White, not Hispanic or Latino</u>	<u>Compared with Population Average</u>
Overall	1,180 (386; 2,370)	0.37 (0.12; 0.74)	--	1.00 (Reference) N/A
Black or African American, not Hispanic or Latino	184 (0; 566)	0.45 (0; 1.39)	1.80 (0; 8.48) <i>70% likelihood of greater impact</i>	1.22 (0; 3.26) <i>55% likelihood of greater impact</i>
Hispanic or Latino	426 (51; 1,030)	0.66 (0.08; 1.59)	2.60 (0.42; 10.9) <i>88% likelihood of greater impact</i>	1.77 (0.45; 3.24) <i>85% likelihood of greater impact</i>
White, not Hispanic or Latino	466 (102; 1,130)	0.25 (0.06; 0.61)	1.00 (Reference) N/A	0.68 (0.23; 1.18) <i>89% likelihood of lesser impact</i>
All Other Races, not Hispanic or Latino ^d	107 (0; 386)	0.38 (0; 1.37)	1.50 (0; 8.86) <i>58% likelihood of greater impact</i>	1.02 (0; 3.48) <i>42% likelihood of greater impact</i>
Household Income as a percentage of the federal poverty level (FPL)			<u>Compared with >350% FPL</u>	<u>Compared with Population Average</u>
Overall	1,180 (386; 2,370)	0.37 (0.12; 0.74)	--	1.00 (Reference) N/A
<130% FPL	558 (129; 1,260)	0.73 (0.17; 1.66)	3.97 (0.85; 26.4) <i>97% likelihood of greater impact</i>	1.98 (0.83; 3.21) <i>95% likelihood of greater impact</i>
131-185% FPL	205 (0; 643)	0.62 (0; 1.93)	3.34 (0; 23.7) <i>86% likelihood of greater impact</i>	1.67 (0; 4.24) <i>70% likelihood of greater impact</i>
186-350% FPL	188 (0; 566)	0.23 (0; 0.69)	1.23 (0; 9.66) <i>57% likelihood of greater impact</i>	0.62 (0; 1.57) <i>82% likelihood of lesser impact</i>
>350% FPL	232 (26; 669)	0.18 (0.02; 0.52)	1.00 (Reference) N/A	0.49 (0.04; 1.11) <i>94% likelihood of lesser impact</i>

Projections for the model period 2022-2031 (10 years, inclusive of the start and end years).

^aResults displayed are the mean and 95% uncertainty interval (UI). CHOICES calculates 95% uncertainty intervals by running the model 1,000 times and reporting the range (95% of estimates, centered on the mean) of projected outcomes that account for uncertainty from data sources and population projections.

^bAll cases of obesity prevented are among children, since all people reached by the strategy would still be children in the final model year.

^cRatio that compares cases of obesity prevented per 100,000 in each population group with the reference group. When the value is greater than 1.0 for a population group, we project a greater health benefit for that group compared with the reference group. When the value is less than 1.0, we project a lesser health benefit.

Note: Ratios are sensitive to extremely high and low rates, so they should be interpreted in the context of the absolute rates, represented by Obesity Prevented per 100,000 here. Results may differ if estimating absolute rates and relative impacts among children only. Likelihood of greater or lesser impact compared with the reference group is estimated based on running the model 1,000 times.

^dAll Other Races includes people who identify as American Indian/Alaska Native, Native Hawaiian or Pacific Islander, Multi-racial, or another race or ethnicity not represented in the categories shown. While each of these groups represent distinct populations with differences in health opportunities, risks, and outcomes, they are summarized together due to limited data in national- and state-level surveillance systems.

STRATEGY DETAILS & MODELING METHODS

Describes the reach, effect, and cost assumptions used to make national projections for the strategy, and provides links to additional resources related to the strategy.

STRATEGY

The CHOICES model for nationwide implementation of a Healthy Afterschool intervention involves a policy implemented in each U.S. state that establishes a voluntary recognition program for state-administered 21st Century Community Learning Center Afterschool Programs (CCLC) serving children 5-11 years of age.¹⁰ The focus of the recognition program would be on healthy eating and physical activity practices at these programs, based on the [Out-of-School Nutrition and Physical Activity \(OSNAP\) standards](#).⁶⁻⁸ State agencies would oversee the recognition and monitoring systems and establish a website focused on the recognition program. A state trainer would facilitate train-the-trainer sessions to train regional Healthy Afterschool trainers. These regional trainers would conduct learning collaboratives for afterschool program staff, during which staff would receive training on policy and environmental strategies to promote healthy eating and physical activity through improved program practices. Educational materials, incentives, and Continuing Education Units (CEUs) would be provided to participants.

REACH

This intervention strategy impacts children ages 5-11 in grades K-5 in state-administered 21st Century Learning afterschool programs in states that do not have existing guidelines for nutrition or physical activity as specified in the Healthy Afterschool recognition program. The model assumes no states have existing guidelines that meet OSNAP standards, and that 20% of afterschool programs voluntarily agree to participate in the recognition program and implement the healthy eating and physical activity standards.¹⁰ Based on 21st CCLC program data,⁹ an estimated 1.8% of children ages 5-11 in grades K-5 attend 21st CCLC programs, with a higher percentage of children from households with low incomes attending (2.7%) compared with children from households with higher incomes (1.1%).

The Healthy Afterschool intervention would have a 10-year reach of 179,000 children.

EFFECT

The Healthy Afterschool intervention would lead to improvements in dietary intake and physical activity for children. Children would have an increase of 3.2 minute per day in vigorous physical activity during afterschool programming.⁷ The intervention would result in a 47 kcal reduction in snack consumed, mainly beverage kcal, per day attending afterschool programming.⁸ Mathematical models developed by Hall et al.¹¹⁻¹³ were used to calculate the projected impact of reduced calorie intake as a result of implementing Healthy Afterschool.

In 2031, 1,180 cases of obesity would be prevented.

COST

Implementation costs related to establishing and coordinating the policy, providing training and technical assistance, and operating afterschool programs to meet OSNAP standards were included.¹⁰

Initial costs include the cost of issuing state level regulations and establishing a state-specific Healthy Afterschool recognition and monitoring website. A state-level coordinator would train regional Healthy Afterschool trainers, who would conduct a series of three learning collaboratives with afterschool program staff. At least two afterschool staff from each program would spend time traveling to and participating in these sessions, conducting program practice self-assessments and implementing changes at their program. The state coordinator would provide technical assistance to the regional Healthy Afterschool trainers, who in turn would provide technical assistance to local program staff. Training curriculum and education program materials and the costs of obtaining Continuing Education Units for ongoing certification for program staff members at Healthy Afterschool Program sites are included in the model.

The model assumes that participating afterschool programs will incur increased food costs for snack menu improvements. The state-level coordinator would engage in compliance and monitoring activities to verify sites' compliance with programmatic requirements for certification.

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CREATING HEALTHIER AFTERSCHOOL ENVIRONMENTS STRATEGY DETAILS & MODELING METHODS

(continued)

The Healthy Afterschool intervention would incur an annual cost per child of \$26.50.

CHOICES METHODS

CHOICES uses cost-effectiveness analysis to compare the costs and outcomes of different policies and programs promoting improved nutrition or increased physical activity in schools, early care and education and out-of-school settings, communities, and clinics. Our methods include:

- **Key partner consultation:** Working with key partners & researchers to identify the most promising programs & policies for evaluation
- **U.S. population model:** Building a computer model of the U.S. population & projecting Body Mass Index (BMI) changes & health outcomes over time
- **Systematic reviews & meta-analyses:** Synthesizing scientific literature to estimate the likely effects of promising obesity prevention interventions on BMI & physical activity
- **Cost-effectiveness analysis:** Integrating information on the economic costs & health effects of interventions, utilizing a structured & transparent process
- **Health equity lens:** Projecting the impact of effective intervention strategies on population health and health equity

Learn more about CHOICES methods at choicesproject.org/methods.

WHY DOES CHOICES USE BMI AS A POPULATION HEALTH INDICATOR?

CHOICES focuses on programs and policies that can help reverse the societal and environmental conditions that drive increases in excess body weight and that emphasize healthy eating, improved physical activity, and reduced screen viewing. Excess body weight is associated with reduced quality of life and increased risk for chronic diseases like diabetes, heart disease, and cancers,¹⁴ greater healthcare expenditures,¹⁵ and increased mortality risk.¹⁶ Obesity is a category of excess weight defined by body mass index (BMI), which is calculated as the ratio of a person's weight (kg) to their height squared (m²).¹⁷ Obesity is a chronic health condition recognized by the National Institutes of Health, the American Medical Association, Medicare, and Medicaid.

BMI is a useful population health indicator, although it does have limitations. BMI has been shown to be a good measure of individual-level adiposity, correlating highly ($r=0.8$) with gold standard measures of percent body fat, among adults, children and adolescents and for different gender and racial and ethnic groups.^{18,19} BMI is relatively simple to collect and easy to calculate, and it is used widely in medical and scientific research to measure population health.

However, weight stigma occurs when people are blamed for their weight. Weight stigma can increase a person's risk of engaging in unhealthy eating behaviors and low levels of physical activity and can reduce both the quality of health care a person receives and their utilization of care, all undermining public health.²⁰ CHOICES evaluates the cost-effectiveness of policies and programs aimed at improving nutrition and physical activity environments, promoting related health behaviors, and promoting a healthy weight across all population groups and BMI levels.

For Additional Information

Contact the CHOICES team at choicesproject@hsph.harvard.edu for additional information about model assumptions.

Cradock AL, Barrett JL, Kenney EL, Giles CM, Ward ZJ, Long MW, Resch SC, Pipito AA, Wei ER, Gortmaker SL. Using cost-effectiveness analysis to prioritize policy and programmatic approaches to physical activity promotion and obesity prevention in childhood. *Prev Med.* 2017 Feb;95 Suppl: S17-S27. doi: 10.1016/j.ypmed.2016.10.017. Supplemental Appendix with strategy details available at: <https://ars.els-cdn.com/content/image/1-s2.0-S0091743516303395-mmc1.docx>

For more information about this strategy, see:

Cradock AL, Barrett JL, Giles CM, et al. Promoting Physical Activity With the Out of School Nutrition and Physical Activity (OSNAP) Initiative: A Cluster-Randomized Controlled Trial. *JAMA Pediatr.* 2016;170(2):155-162.

Lee RM, Giles CM, Cradock AL, Emmons KM, Okechukwu C, Kenney EL, Thayer J, Gortmaker SL. Impact of the Out-of-School Nutrition and Physical Activity (OSNAP) Group Randomized Controlled Trial on Children's Food, Beverage, and Calorie Consumption among Snacks Served. *J Acad Nutr Diet.* 2018 Aug;118(8):1425-1437. doi: 10.1016/j.jand.2018.04.011.

Lee RM, Okechukwu C, Emmons KM, Gortmaker, SL. Impact of Implementation Factors on Children's Water Consumption in the Out-of-School Nutrition and Physical Activity (OSNAP) Group Randomized Trial. *New Directions for Youth Development.* 2014;(143):79-101.

CHOICES NATIONAL ACTION KIT: MODELED OUTCOMES GLOSSARY

Provides definitions for each modeled output displayed in the National Results table.

Modeled Output	Definition
<p>BEHAVIOR CHANGE PER PERSON* <i>Change in health behavior per person in the first year</i></p>	<p>The change in health behavior a person is projected to have after a strategy is put in place. Health behavior changes may include decreases in sugary drink intake, increases in physical activity, decreases in time spent watching TV, or increases in water intake. Behavior change per person is reported when the strategy aims to improve a specific health behavior and data are available to project how much a behavior would improve.</p> <p><i>Averaged across people who actually receive the strategy.</i></p>
<p>COST PER PERSON <i>Average annualized cost per person to implement the strategy over the model period</i></p>	<p>The average annualized cost to implement the strategy over the model period (e.g., 10 years) per person reached over the model period. This includes cost by all payers (government, private sector, non-profit, individual/family).</p> <p>See the Cost Results for a breakdown of implementation costs by activity and payer.</p> <p><i>Averaged across people in the intended population of focus where the strategy is adopted (that is, people who are eligible based on age, income, geographic area, and/or participation in the setting or program of focus, and who could potentially receive the strategy based on estimated adoption rates).</i></p>
<p>POPULATION REACH* <i>Reach over the model period</i></p>	<p>The number of people reached by the strategy over the model period.</p> <p><i>Includes all people in the intended population of focus where the strategy is adopted (that is, people who are eligible based on age, income, geographic area, and/or participation in the setting or program of focus, and who could potentially receive the strategy based on estimated adoption rates).</i></p>
<p>OBESITY PREVENTED* <i>Cases of obesity prevented in the final year</i></p>	<p>In the final year of the model, the difference in the projected number of people with obesity if the strategy were not put in place and the projected number of people with obesity if the strategy were put in place.</p>
<p>CHILD OBESITY PREVENTED* <i>Cases of child obesity prevented in the final year</i></p>	<p>In the final year of the model, the difference in the projected number of children with obesity if the strategy were not put in place and the projected number of children with obesity if the strategy were put in place.</p>
<p>HEALTH EQUITY IMPACT* <i>Impact on obesity-related health equity in the final year</i></p>	<p>The projected impact on differences in obesity levels between population groups defined by race, ethnicity, and by household income. Learn more about our methods for projecting health equity impacts.</p>
<p>QUALITY-ADJUSTED LIFE YEARS (QALYS) GAINED <i>Quality-adjusted life years (QALYs) gained (totals over the model period)</i></p>	<p>The difference in total number of quality-adjusted life years (QALYs) in the population over the model period if the strategy were not put in place compared with if the strategy were put in place. A QALY is a measure of both the quantity and quality of life. CHOICES estimates the QALYs gained as a measure of how much implementing a strategy to prevent future excess weight gain could improve the quantity and quality of life for a population. See our User Guide for more information about QALYs.</p>
<p>OBESITY YEARS PREVENTED <i>Years with obesity prevented (totals over the model period)</i></p>	<p>The difference in total number of person-years lived without obesity if the strategy were not put in place compared with if the strategy were put in place. This measure sums up portions of years lived without obesity across all the persons in the model, comparing the result if the strategy were put in place or not.</p>
<p>HEALTH CARE COSTS SAVED PER \$1 INVESTED <i>Total health care costs saved per total intervention costs over the model period</i></p>	<p>The amount avoided in health care cost related to excess weight for every dollar spent to implement the strategy over the model period.</p> <p>See the Cost Results for a breakdown of implementation costs by activity and payer.</p>
<p>COST PER QALY GAINED <i>Net cost per quality-adjusted life year (QALY) gained (totals over the model period)</i></p>	<p>The total cost impact to improve population health in terms of quality-adjusted life years gained. Cost per QALY gained is a measure of cost-effectiveness. It includes costs to implement a strategy, cost savings due to efficiencies when implementing a strategy, and health care cost savings related to reductions in excess weight after a strategy is implemented. See our User Guide for more information about QALYs and cost per QALY gained.</p>

All metrics reported for the population over the model period and discounted at 3% per year, unless otherwise noted. Definitions for these modeled outputs are all written assuming that an intervention is implemented.

* Not discounted.

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