CHOICES NATIONAL ACTION KIT:

Program in Early Care and Education Settings to Reduce TV Viewing 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.

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

Program in Early Care and Education Settings to Reduce TV Viewing

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.

Program to reduce television viewing among young children ages 2-5 in licensed early care and education centers by training educators in an evidence-based curriculum and engaging families in reducing television time at home.

WHAT POPULATION BENEFITS?

Children ages 2-5 attending licensed early care and education centers.

WHAT ARE THE ESTIMATED BENEFITS?

Relative to not implementing the strategy

Reduce child daily television time which can help promote healthy child weight.

✓ **Reduce child daily television time**

✓ **Prevent cases of obesity**

✓ **Projected to be cost-effective**

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

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

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WHAT ACTIVITIES AND RESOURCES ARE NEEDED?

Activities	Resources	Who Leads?
Train early care and education directors and staff on an evidence-based curriculum (Fit5Kids) to reduce television time	• Time for State Early Care and Education Agency Training Consultant to prepare for and lead trainings • Time for early care and education program directors and staff to attend trainings • Travel costs	State early care and education training consultant
Provide training materials for early care educators and administrators to engage children and families in reducing television time	• Cost of training materials	State government
Provide materials to children and families to promote reduced TV time	• Cost of materials for children and families • Cost of the book "The Berenstain Bears and Too Much TV"	Early care and education programs

- 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 Program in Early Care and Education Settings to Reduce TV Viewing for a US city and state:
  Boston
  Mississippi
- Learn more about the evidence for the strategy Program in Early Care and Education Settings to Reduce TV Viewing in the CHOICES peer-reviewed publication:
  Kenney et al. 2021. *Child Obes*

Adapted from CHOICES Strategy Profile: Program in Early Care and Education Settings to Reduce TV Viewing. CHOICES Project Team at the Harvard T.H. Chan School of Public Health, Boston, MA; September 2023.

Program in Early Care and Education Settings to Reduce TV Viewing

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	Program to reduce television viewing among children ages 2-5 in licensed ECE centers by training educators and engaging families using an evidence-based curriculum

OUTCOME	**Mean** (95% UI)*
BEHAVIOR CHANGE PER PERSON *Change in health behavior per person in the first year*	**2,100 fewer minutes of television viewed** (93; 4,210) *per year*
COST PER PERSON *Average annualized cost per person to implement the strategy over the model period*	**$3.31** ($3.28; $3.35) See Cost Results
POPULATION REACH *Reach over the model period*	**6,420,000** (6,260,000; 6,540,000)
OBESITY PREVENTED *Cases of obesity prevented in the final year*	**6,640** (178; 16,200)
CHILD OBESITY PREVENTED *Cases of child obesity prevented in the final year*	**6,640** (178; 16,200)
HEALTH EQUITY IMPACT *Impact on obesity-related health equity in the final year*	***Likely to improve health equity by race, ethnicity, & income*** See Health Equity Indicators
QUALITY-ADJUSTED LIFE YEARS (QALYS) GAINED *Quality-adjusted life years (QALYs) gained (totals over the model period)*	**2,080** (68.1; 5,050)
OBESITY YEARS PREVENTED *Years with obesity prevented (totals over the model period)*	**44,700** (1,580; 110,000)
HEALTH CARE COSTS SAVED PER $1 INVESTED *Total health care costs saved per total intervention costs over the model period*	**$0.04** ($0.001; $0.09)
COST PER QALY GAINED *Net cost per quality-adjusted life year (QALY) gained (totals over the model period)*	**$98,100** ($30,600; $706,000)

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 the program in early care and education settings to reduce TV viewing if implemented nationally 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
Train early care and education directors and staff on an evidence-based curriculum (Fit5Kids) to reduce television time	• Time for State Early Care and Education Agency Training Consultant to prepare for and lead trainings • Time for early care and education program directors and staff to attend trainings • Travel costs	$1.45	State government, School (Early care and education programs)	44%
Provide training materials for early care educators and administrators to engage children and families in reducing television time	• Cost of training materials	$0.09	State government	3%
Provide materials to children and families to promote reduced TV time	• Cost of materials for children and families • Cost of the book "The Berenstain Bears and Too Much TV"	$1.77	School (Early care and education programs)	53%
TOTAL	--	**$3.31**	--	**100%**

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 Payer and Cost Type			
	Cost per Person†		
Payer	**All Costs (% of Total)**	**Budgetary Costs (% of All Costs by Payer)**	**Opportunity Costs (% of All Costs by Payer)**
Federal government	--	--	--
State government	**$0.31 (9%)**	**$0.09 (29%)**	**$0.22 (71%)**
Local government	--	--	--
School district	--	--	--
School (ECE programs)	**$3.00 (91%)**	**$1.95 (65%)**	**$1.05 (35%)**
Family/Individual	--	--	--
Industry	--	--	--
Nonprofit	--	--	--
Health care	--	--	--
TOTAL	**$3.31 (100%)**	**$2.04 (62%)**	**$1.27 (38%)**

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.

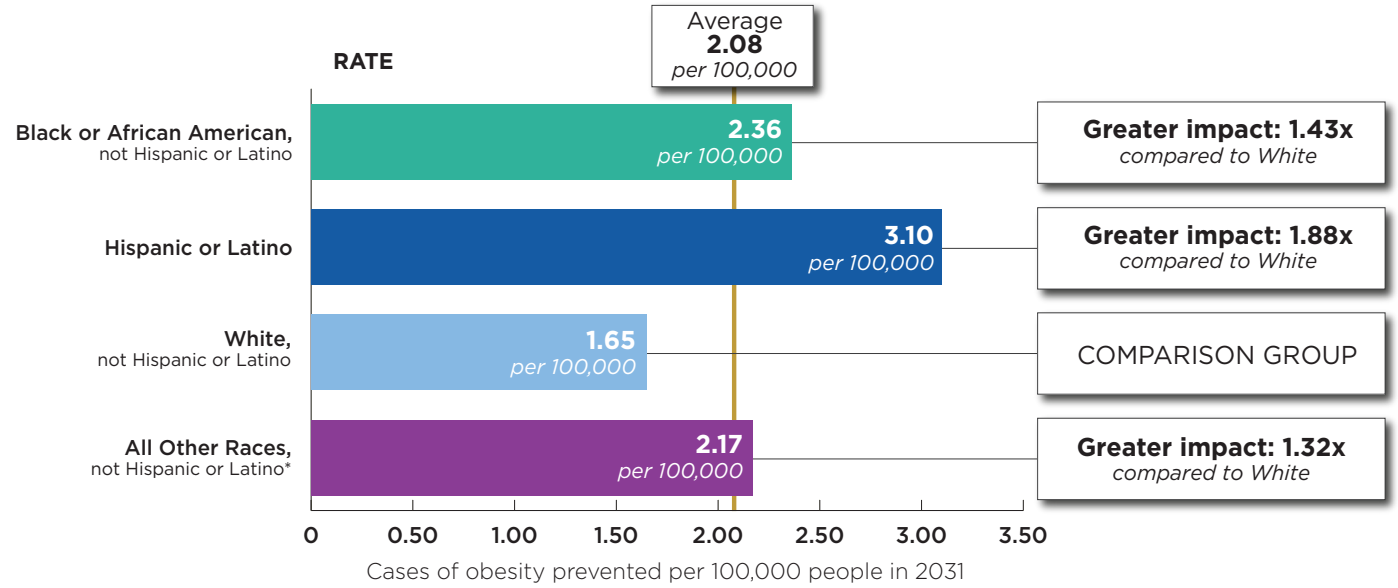
KEY TAKEAWAYS

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

- ✓ **Prevent 6,640 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 1.43 and 1.88 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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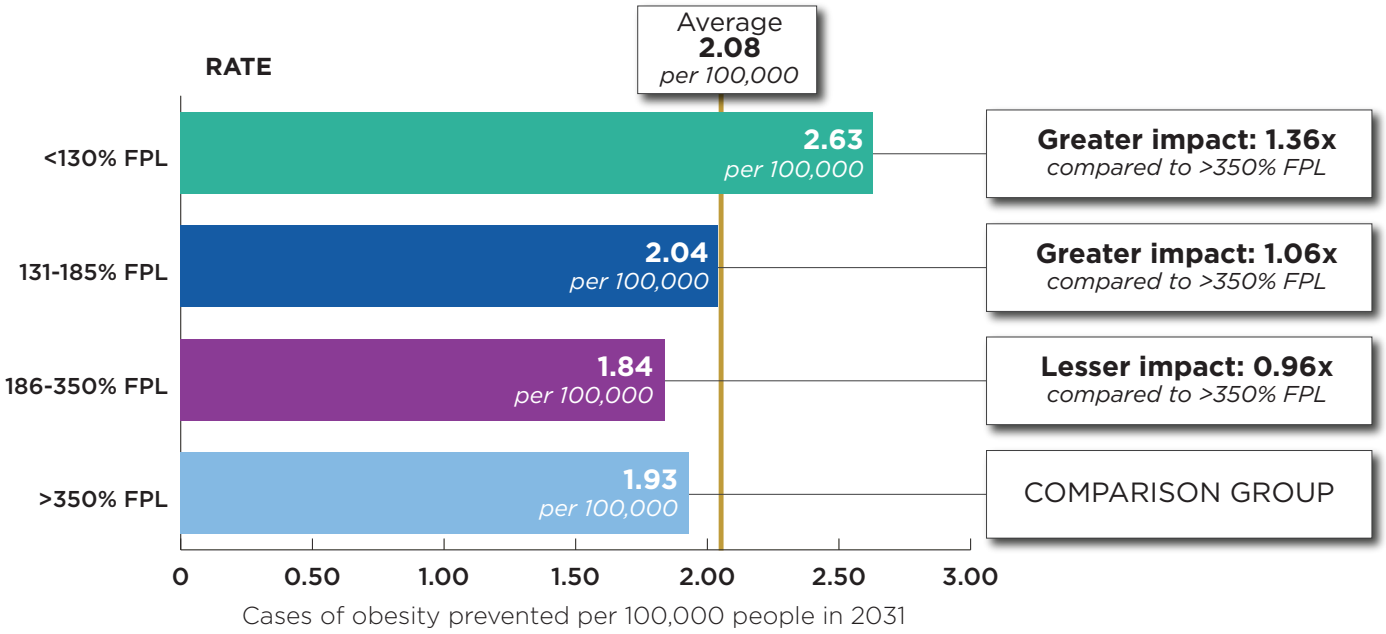
Comparative projected impact of the strategy by household income *as a percentage of the federal poverty level (FPL)*



Populations with lower household incomes (185% FPL or less) are projected to experience preventive benefits that are 1.06-1.36 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?

Every child deserves opportunities to grow up at a healthy weight. Television viewing can lead to increased risk for obesity because it exposes children to advertising for unhealthy foods and drinks that influences intake and choice preferences.[5,6] Further, food and beverage companies disproportionately market less healthy foods and beverages to Black and Hispanic/Latino consumers,[7] and Black and Hispanic/Latino people and people from households with lower incomes spend more time viewing television compared to other population groups.[8] Young children spend an average of two and a half hours per day viewing screens,[9] and children from households with the lowest incomes spend more than half an hour per day viewing broadcast television.[8] One strategy to limit the health risks associated with marketing and advertising is to minimize television viewing time. This can be accomplished through a program to reduce television viewing among young children ages 2-5 in early care and education centers by training educators in an evidence-based curriculum and engaging families in reducing television time at home. ECE practices and programs to reduce television time can support healthy growth when children are young and help young children build a foundation for healthy living. This strategy is expected to improve health the most among Black and Hispanic or Latino populations, who are at greater risk of obesity compared with White children.[10] Thus, the strategy is likely to improve health equity by race and ethnicity. Multiple barriers to accessing licensed ECE programs exist for families with lower incomes,[11] resulting in lower enrollment in ECE programs among children from households with lower incomes compared with higher incomes.[12] However, this strategy is expected to improve health the most and improve health equity among populations with low incomes, who spend more time viewing television compared with populations with higher incomes.[8]

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

	OBESITY PREVENTED[b]	OBESITY PREVENTED PER 100,000[b]	COMPARATIVE IMPACT[b]	
	Cases of obesity prevented in the final year	*Cases of obesity prevented per 100,000 people in the final year*	*Ratio of obesity prevented per 100,000*	
Race and Ethnicity			***Compared with White, not Hispanic or Latino***	***Compared with Population Average***
Overall	**6,640** (178; 16,200)	**2.08** (0.06; 5.11)	--	**1.00 (Reference)** N/A
Black or African American, not Hispanic or Latino	**958** (0; 2,470)	**2.36** (0; 6.07)	**1.43** (0.65; 2.58) *87% likelihood of greater impact*	**1.13** (0.59; 1.73) *70% likelihood of greater impact*
Hispanic or Latino	**2,020** (51; 4,910)	**3.10** (0.08; 7.56)	**1.88** (1.09; 3.27) *99% likelihood of greater impact*	**1.49** (1.01; 2.02) *98% likelihood of greater impact*
White, not Hispanic or Latino	**3,050** (77; 7,620)	**1.65** (0.04; 4.11)	**1.00 (Reference)** N/A	**0.79** (0.60; 0.96) *99% likelihood of lesser impact*
All Other Races, not Hispanic or Latino[d]	**612** (0; 1,670)	**2.17** (0; 5.90)	**1.32** (0.56; 2.55) *78% likelihood of greater impact*	**1.04** (0.48; 1.72) *53% likelihood of greater impact*
Household Income *as a percentage of the federal poverty level (FPL)*			***Compared with >350% FPL***	***Compared with Population Average***
Overall	**6,640** (178; 16,200)	**2.08** (0.06; 5.11)	--	**1.00 (Reference)** N/A
<130% FPL	**1,990** (51; 4,840)	**2.63** (0.07; 6.37)	**1.36** (0.88; 2.40) *93% likelihood of greater impact*	**1.26** (0.92; 1.70) *94% likelihood of greater impact*
131-185% FPL	**675** (0; 1,750)	**2.04** (0; 5.23)	**1.09** (0.43; 1.93) *56% likelihood of greater impact*	**0.98** (0.40; 1.52) *55% likelihood of lesser impact*
186-350% FPL	**1,510** (26; 3,760)	**1.84** (0.03; 4.55)	**0.96** (0.56; 1.55) *59% likelihood of lesser impact*	**0.88** (0.59; 1.19) *81% likelihood of lesser impact*
>350% FPL	**2,460** (51; 6,120)	**1.93** (0.04; 4.80)	**1.00 (Reference)** N/A	**0.93** (0.66; 1.14) *78% likelihood of lesser impact*

Projections for the model period 2022-2031 (10 years, inclusive of the start and end years).
[a]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.
[b]All cases of obesity prevented are among children, since all people reached by the strategy would still be children in the final model year.
[c]Ratio 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.
[d]All 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 program to reduce television viewing among young children would include implementing the Fit5Kids curriculum in early care and education (ECE) settings and engaging children and parents/caregivers in reducing television at home.[13-15]

The Fit5Kids curriculum would include training opportunities for ECE program directors and staff, offering ongoing support and technical assistance, and providing parents with educational materials that may lead to reducing screen time in young children. The Fit5Kids curriculum provides specific information on the lessons and activities included in the program.[16]

REACH

This strategy would reach children ages 2-5 years old attending a licensed ECE center that implements the Fit5Kids curriculum. We estimate that an average of 39% of children ages 2-5 attend a licensed center-based ECE program.[17,18] We estimate that 31% of ECE centers would actually implement the program.[19]

This strategy would have a 10-year reach of 6.42 million children if implemented nationwide.

EFFECT

CHOICES estimates that in 2031, 6,640 cases of childhood obesity would be prevented.

The population reached by this intervention would decrease television viewing time by 2,100 minutes per year. We assumed children ages 2-5 years view 0.42 hours per day of television,[9] with children from households with lower incomes viewing more television time compared with children from households with higher incomes.[8] This strategy would decrease television hours viewed per day by 29%.[14,15] To convert change in television hours viewed per day to change in BMI, we used an estimate of the average change in child BMI per one hour reduction per day of television from two randomized trials (-0.33 BMI units/hour).[20,21]

COST

Implementation of this strategy involves preparing a training for child care center directors on the Fit5Kids curriculum and training directors on implementing the curriculum. Training and curriculum materials for the eligible programs are included in the model. The costs of materials and handouts provided to children and families are also included.

In addition, the model accounts for travel to and from the trainings.[13-15]

A program to reduce television viewing in early care and education centers by implementing the Fit5Kids curriculum would incur an annual cost per child of $3.31.

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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,[22] greater healthcare expenditures,[23] and increased mortality risk.[24] 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 (m^2).[25] 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.[26,27] 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.[28] 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.

For more information about this strategy, see:

Kenney EL, Mozaffarian RS, Long MW, Barrett JL, Cradock AL, Giles CM, Ward ZJ, Gortmaker SL. Limiting Television to Reduce Childhood Obesity: Cost-Effectiveness of Five Population Strategies. Child Obes. 2021. doi: 10.1089/chi.2021.0016. Available at: https://www.liebertpub.com/doi/full/10.1089/chi.2021.0016

CHOICES NATIONAL ACTION KIT: MODELED OUTCOMES GLOSSARY

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

Modeled Output	Definition
BEHAVIOR CHANGE PER PERSON* *Change in health behavior per person in the first year*	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. *Averaged across people who actually receive the strategy.*
COST PER PERSON *Average annualized cost per person to implement the strategy over the model period*	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). See the Cost Results for a breakdown of implementation costs by activity and payer. *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).*
POPULATION REACH* *Reach over the model period*	The number of people reached by the strategy over the model period. *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).*
OBESITY PREVENTED* *Cases of obesity prevented in the final year*	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.
CHILD OBESITY PREVENTED* *Cases of child obesity prevented in the final year*	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.
HEALTH EQUITY IMPACT* *Impact on obesity-related health equity in the final year*	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.
QUALITY-ADJUSTED LIFE YEARS (QALYS) GAINED *Quality-adjusted life years (QALYs) gained (totals over the model period)*	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.
OBESITY YEARS PREVENTED *Years with obesity prevented (totals over the model period)*	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.
HEALTH CARE COSTS SAVED PER $1 INVESTED *Total health care costs saved per total intervention costs over the model period*	The amount avoided in health care cost related to excess weight for every dollar spent to implement the strategy over the model period. See the Cost Results for a breakdown of implementation costs by activity and payer.
COST PER QALY GAINED *Net cost per quality-adjusted life year (QALY) gained (totals over the model period)*	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.

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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