CHOICES NATIONAL ACTION KIT:

Home Visits to Reduce TV Time 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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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 disseminate a screen time managing device to families through a home visiting program to reduce screen time among children ages 4-7.

WHAT POPULATION BENEFITS?

Children ages 4-7 wtih BMI >75th percentile who receive home visits.

WHAT ARE THE ESTIMATED BENEFITS?

Relative to not implementing the strategy

Reduce child daily television time which can help improve dietary intake and in turn, promote healthy child weight.

✓ **Decrease in television viewing time**

✓ **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

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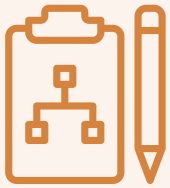
WHAT ACTIVITIES AND RESOURCES ARE NEEDED?

Activities	Resources	Who Leads?
Coordinate the training rollout	• Time for the director to coordinate the trainings	Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program
Train community health workers who would implement the program	• Time for community health workers to receive trainings • Travel costs • Material costs	Home Visiting Program Coordinator
Train registered nurses about referring children to home visits to reduce screen time	• Time for registered nurses to receive trainings • Travel costs	Home Visiting Program Coordinator
Purchase program materials	• TV control device cost • Posters cost • Incentives for children cost	Home Visiting Programs
Coordinate patient referrals and provide counseling during home visits	• Time for registered nurses to recruit and refer patients • Time for community health workers to implement	Community health center registered nurses and community health workers



Strategy Modification

Some state and local health agencies added to this strategy by teaching about parental controls on their screen devices (e.g., tablets, smartphones, etc.). This could help parents limit all types of screen time for their children, not just on the television. This would require additional training and materials for families.

- 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 Home Visits to Reduce TV Time for a local area:

  Boston, MA
- Learn more about the evidence for the strategy Home Visits to Reduce TV Time in the CHOICES peer-reviewed publication:

  Kenney et al. 2021. *Child Obes*

Adapted from CHOICES Strategy Profile: Home Visits to Reduce TV Time. CHOICES Project Team at the Harvard T.H. Chan School of Public Health, Boston, MA; September 2023.

NATIONAL RESULTS

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

DESCRIPTION	Home visiting program that disseminates a screen time managing device to families to reduce home television viewing among children ages 4-7

OUTCOME	**Mean** (95% UI)*
BEHAVIOR CHANGE PER PERSON *Change in health behavior per person in the first year*	**6,140 fewer minutes of television viewed** (2,140; 10,200) *per year*
COST PER PERSON *Average annualized cost per person to implement the strategy over the model period*	**$80.70** ($75.50; $85.80) See Cost Results
POPULATION REACH *Reach over the model period*	**200,000** (182,000; 223,000)
OBESITY PREVENTED *Cases of obesity prevented in the final year*	**652** (103; 1,540)
CHILD OBESITY PREVENTED *Cases of child obesity prevented in the final year*	**652** (103; 1,540)
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)*	**168** (41.4; 358)
OBESITY YEARS PREVENTED *Years with obesity prevented (totals over the model period)*	**4,170** (891; 8,880)
HEALTH CARE COSTS SAVED PER $1 INVESTED *Total health care costs saved per total intervention costs over the model period*	**$0.003** ($0.001; $0.01)
COST PER QALY GAINED *Net cost per quality-adjusted life year (QALY) gained (totals over the model period)*	**$959,000** ($454,000; $3,900,000)

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 Home Visits to Reduce TV Time 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
Coordinate the training rollout	• Time for the director to coordinate the trainings	$0.07	Federal government	<1%
Train community health workers who would implement the program	• Time for community health workers to receive trainings • Travel costs • Material costs	$0.39	Federal government, State government	<1%
Train registered nurses about referring children to home visits to reduce screen time	• Time for registered nurses to receive trainings • Travel costs	$0.76	Federal government; Industry (Home Visiting Programs)	1%
Purchase program materials	• TV control device cost • Posters cost • Incentives for children cost	$33.70	Federal government	42%
Coordinate patient referrals and provide counseling during home visits	• Time for registered nurses to recruit and refer patients • Time for community health workers to implement	$45.70	Industry (Home Visiting Programs)	57%
TOTAL	--	**$80.70**	--	**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).

Continued on the next page

HOME VISITS TO REDUCE TV TIME COST RESULTS *(continued)*

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	$33.90 (42%)	$33.70 (99%)	$0.19 (1%)
State government	$0.37 (<1%)	$0.003 (1%)	$0.37 (99%)
Local government	--	--	--
School district	--	--	--
School	--	--	--
Family/Individual	--	--	--
Industry (Home Visiting Programs)	$46.40 (58%)	$0.00 (0%)	$46.40 (100%)
Nonprofit	--	--	--
Health care	--	--	--
TOTAL	**$80.70 (100%)**	**$33.70 (42%)**	**$46.90 (58%)**

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.

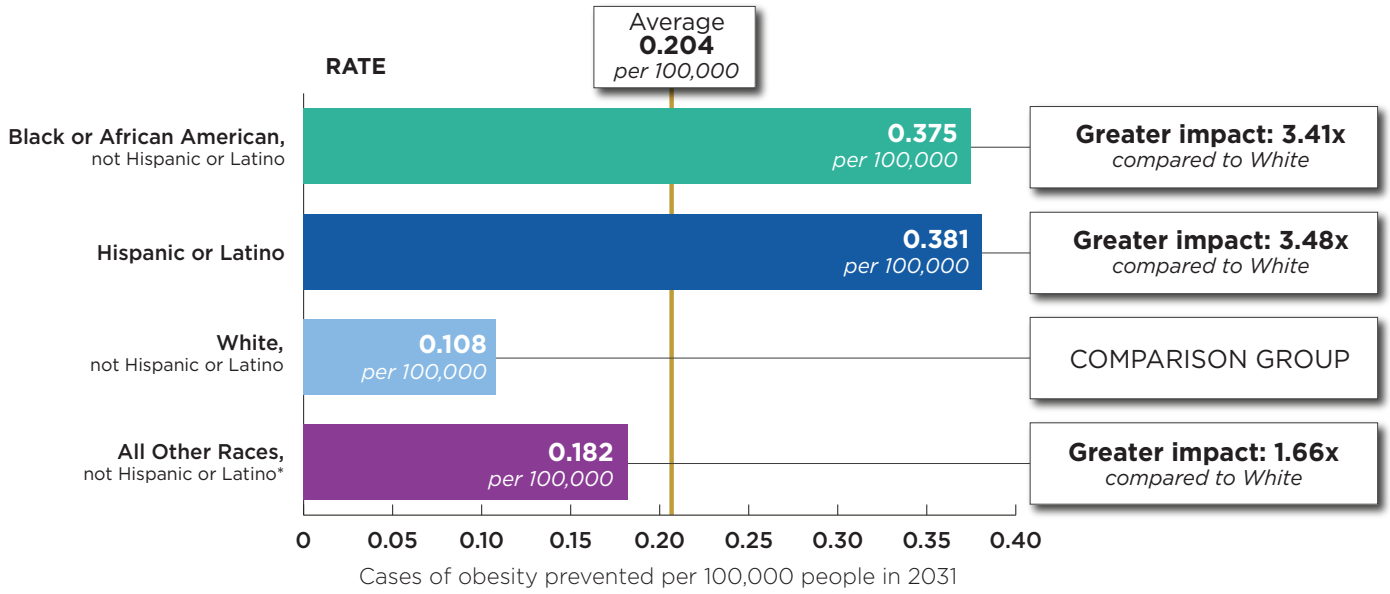
KEY TAKEAWAYS

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

- ✓ **Prevent 652 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 3.41 and 3.48 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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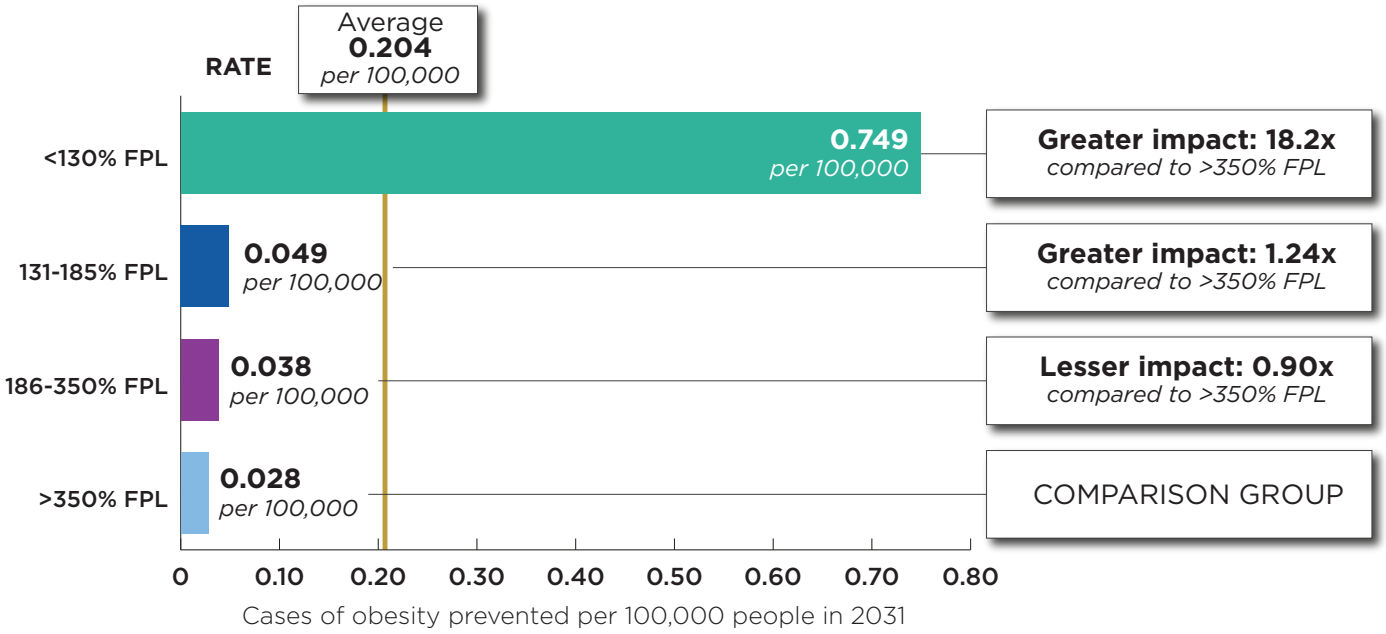
Comparative projected impact of the strategy by household income *as a percentage of the federal poverty level (FPL)*



Populations with low household incomes (<130% FPL) are projected to experience preventive benefits that are 18.2 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 excess weight 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 home visiting program that disseminates a screen time managing device to families to reduce home television viewing among children ages 4-7. This strategy may promote health equity related to healthy weight by reducing television viewing among children from households with lower incomes, whose families are more likely to participate in home visiting programs compared to families with higher household incomes.[10,11]

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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[c]	
	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	**652** (103; 1,540)	**0.204** (0.032; 0.483)	--	**1.00 (Reference)** N/A
Black or African American, not Hispanic or Latino	**152** (0; 489)	**0.375** (0; 1.20)	**3.41** (0; 20.4) *88% likelihood of greater impact*	**1.83** (0; 4.39) *78% likelihood of greater impact*
Hispanic or Latino	**248** (26; 695)	**0.381** (0.040; 1.07)	**3.48** (0.63; 19.9) *93% likelihood of greater impact*	**1.87** (0.45; 3.49) *85% likelihood of greater impact*
White, not Hispanic or Latino	**201** (0; 592)	**0.108** (0; 0.320)	**1.00 (Reference)** N/A	**0.53** (0; 1.09) *96% likelihood of lesser impact*
All Other Races, not Hispanic or Latino[d]	**51** (0; 232)	**0.182** (0; 0.820)	**1.66** (0; 13.1) *58% likelihood of greater impact*	**0.89** (0; 3.76) *66% likelihood of lesser impact*
Household Income *as a percentage of the federal poverty level (FPL)*			***Compared with >350% FPL***	***Compared with Population Average***
Overall	**652** (103; 1,540)	**0.204** (0.032; 0.483)	--	**1.00 (Reference)** N/A
<130% FPL	**569** (77; 1,390)	**0.749** (0.102; 1.83)	**18.2** (3.42; 71.6) *>99% likelihood of greater impact*	**3.66** (2.61; 4.21) *>99% likelihood of greater impact*
131-185% FPL	**16** (0; 103)	**0.049** (0; 0.309)	**1.24** (0; 11.5) *45% likelihood of greater impact*	**0.24** (0; 1.40) *94% likelihood of lesser impact*
186-350% FPL	**31** (0; 154)	**0.038** (0; 0.187)	**0.90** (0; 7.57) *42% likelihood of greater impact*	**0.19** (0; 0.84) *99% likelihood of lesser impact*
>350% FPL	**35** (0; 180)	**0.028** (0; 0.141)	**1.00 (Reference)** N/A	**0.14** (0; 0.59) *>99% 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 strategy to reduce television time through a home visiting program would include implementing a home visiting program and distributing a screen time management device that automatically limits television time to a prespecified allowance.[12-14]

REACH

This strategy would reach children ages 4-7 with a BMI at or above the 75th percentile for age and sex who already receive home visits through the Maternal, Infant, and Early Childhood Home Visiting Program.[14] Using data and information from the U.S. Census[11] and the Maternal, Infant, and Early Childhood Home Visiting Program,[10] the model assumes that 0.52% of households with children ages 4-7 receive home visits, with a higher percentage of children reached from households with low incomes (2.1%) compared with children from households with higher incomes (0.19%).

This strategy would have a 10-year reach of 200,000 children if implemented nationwide.

EFFECT

CHOICES estimates that in 2031, 652 cases of childhood obesity would be prevented.

The population reached by this intervention would decrease television viewing time by 6,140 minutes per year. We assumed children ages 4-7 years view 0.47 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 reduce television hours viewed per day by 49%.[13] 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).[13,15]

COST

Implementation of this strategy involves providing training to trainers, community health workers, and registered nurses on how to implement the program. The trainers would train registered nurses on how to refer eligible children to home visits and community health workers on how to implement home visits to reduce screen time. Registered nurses and community health workers would also receive a training package to help them implement the program.[12,13] Children and families would receive a television management device that automatically limits television time, posters, and monetary and other incentives to encourage behavior change.[12,13] The model also accounts for the time each community health worker spends per child at home visits.

Home visits to reduce TV time would incur an annual cost per child of $80.70.

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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, greater healthcare expenditures,[17] and increased mortality risk.[18] 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).[19] 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.[20,21] 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.[22] 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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