CHOICES NATIONAL ACTION KIT:

More Movement in Early Care and Education Settings 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

SUGGESTED CITATION:
Barrett JL, Bolton AA, Gortmaker SL, Cradock AL. CHOICES National Action Kit: More Movement in Early Care and Education Settings Strategy Report. CHOICES Project Team at the Harvard T.H. Chan School of Public Health, Boston, MA; December 2023.

ACKNOWLEDGMENTS:
We thank the following members of the CHOICES Project team for their contributions: Molly Garrone, Dar Alon, Stella Zhu, Shilpi Agarwal, Ana Paula Bonner Septien, Jenny Reiner, Matt Lee, Zach Ward.

This work is supported by the National Institutes of Health (R01HL146625), The JPB Foundation, the Centers for Disease Control and Prevention (U48DP006376). The findings and conclusions are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention or other funders. The information provided here is intended to be used for educational purposes. Links to other resources and websites are intended to provide additional information aligned with this educational purpose.

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.

Policy to promote physical activity among children ages 3-5 in licensed early care and education (ECE) programs by requiring training for early care educators in the provision of structured physical activity opportunities using an evidence-based curriculum.

WHAT POPULATION BENEFITS?

Children ages 3-5 who attend licensed early care and education programs.

WHAT ARE THE ESTIMATED BENEFITS?

Relative to not implementing the strategy

Increase children's moderate-to-vigorous physical activity levels and, in turn, promote healthy child weight.

✓ **Increase children's moderate-to-vigorous physical activity**

✓ **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

Continued on the next page

WHAT ACTIVITIES AND RESOURCES ARE NEEDED?

Activities	Resources	Who Leads?
Train early care and education program directors and staff on evidence-based strategies and curricula (Hip Hop to Health Jr.) to provide physical activity instruction	• Time for state early care and education agency training consultant to prepare for and lead training • Time for early care and education program directors and staff to attend training • Travel costs	State early care and education training consultant
Provide materials and equipment for promoting physical activity (such as CDs with activity-promoting music and templates for parent newsletters)	• Cost of materials and equipment	Early care and education programs (or local government)
Assess compliance with new policy to provide training and physical activity opportunities	• Time for state licensor to assess compliance with policy during monitoring visit	State early care and education agency monitoring and compliance staff

- 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 More Movement in Early Care and Education Settings for a local area:
  Boston
- Learn more about the evidence for the strategy More Movement in Early Care and Education Settings in the CHOICES peer-reviewed publication:
  Cradock et al. 2017. *Prev Med*

Adapted from CHOICES Strategy Profile: More Movement in Early Care and Education Settings. 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 cost-effectiveness of the strategy. These national results may help inform your organization's decision-making around promoting healthy weight.

DESCRIPTION	Policy to promote physical activity among children ages 3-5 in licensed ECE programs by requiring training for early care educators using an evidence-based curriculum

OUTCOME	**Mean** (95% UI)*
BEHAVIOR CHANGE PER PERSON *Change in health behavior per person in the first year*	**2,720 more minutes of physical activity** (568; 4,870) *Moderate-to-vigorous physical activity minutes, per year*
COST PER PERSON *Average annualized cost per person to implement the strategy over the model period*	**$4.60** ($4.51; $4.71) See Cost Results
POPULATION REACH *Reach over the model period*	**24,800,000** (24,200,000; 25,300,000)
OBESITY PREVENTED *Cases of obesity prevented in the final year*	**74,100**† (-40,700; 189,000)
CHILD OBESITY PREVENTED *Cases of child obesity prevented in the final year*	**74,100**† (-40,700; 189,000)
HEALTH EQUITY IMPACT *Impact on obesity-related health equity in the final year*	***Likely to improve health equity by race and ethnicity, but not likely to improve health equity by income due to differences in population reach by household income*** See Health Equity Indicators
QUALITY-ADJUSTED LIFE YEARS (QALYS) GAINED *Quality-adjusted life years (QALYs) gained (totals over the model period)*	**22,000**† (-12,300; 56,600)
OBESITY YEARS PREVENTED *Years with obesity prevented (totals over the model period)*	**461,000**† (-255,000; 1,180,000)
HEALTH CARE COSTS SAVED PER $1 INVESTED *Total health care costs saved per total intervention costs over the model period*	**$0.08**† (-$0.04; $0.21)
COST PER QALY GAINED *Net cost per quality-adjusted life year (QALY) gained (totals over the model period)*	**$47,800**† (-$363,000; $443,000)

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.
† There is at least a 5% probability that the intervention does not result in health improvement and related cost savings.

- ✓ 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 More Movement in Early Care and Education Settings 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
Train early care and education program directors and staff on evidence-based strategies and curricula (Hip Hop to Health Jr.) to provide physical activity instruction	• Time for state early care and education agency training consultant to prepare for and lead training • Time for early care and education program directors and staff to attend training • Travel costs	$2.98	State government, School (Early care and education programs)	65%
Provide materials and equipment for promoting physical activity (such as CDs with activity-promoting music and templates for parent newsletters)	• Cost of materials and equipment	$1.57	School (Early care and education programs)	34%
Assess compliance with new policy to provide training and physical activity opportunities	• Time for state licensor to assess compliance with policy during monitoring visit	$0.04	State government	1%
TOTAL	--	**$4.60**	--	**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

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	**$0.05 (1%)**	**$0.001 (1%)**	**$0.05 (99%)**
Local government	--	--	--
School district	--	--	--
School (Early care and education programs)	**$4.55 (99%)**	**$1.62 (36%)**	**$2.92 (64%)**
Family/Individual	--	--	--
Industry	--	--	--
Nonprofit	--	--	--
Health care	--	--	--
TOTAL	**$4.60 (100%)**	**$1.62 (35%)**	**$2.98 (65%)**

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.

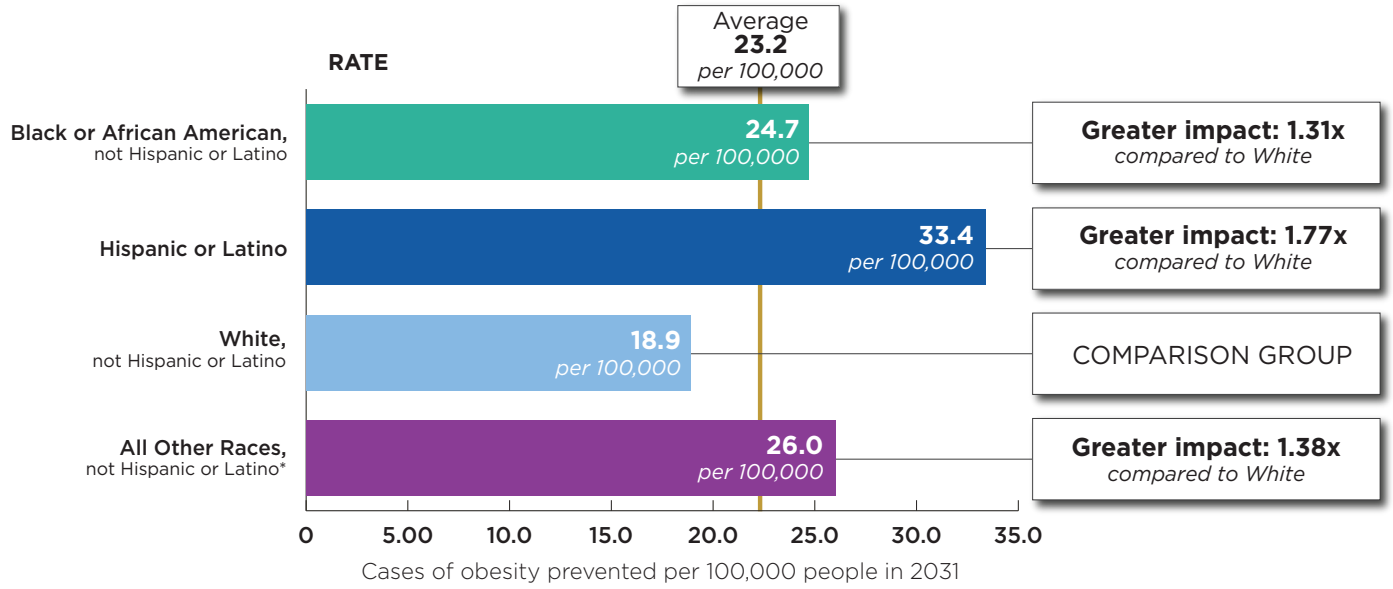
KEY TAKEAWAYS

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

- ✓ **Prevent 74,100 cases of obesity in 2031**
- ✓ **Prevent cases of obesity in all race, ethnicity, and income groups**
- ✓ **Improve health equity by race and ethnicity**
- ✓ **Not likely to improve health equity by 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

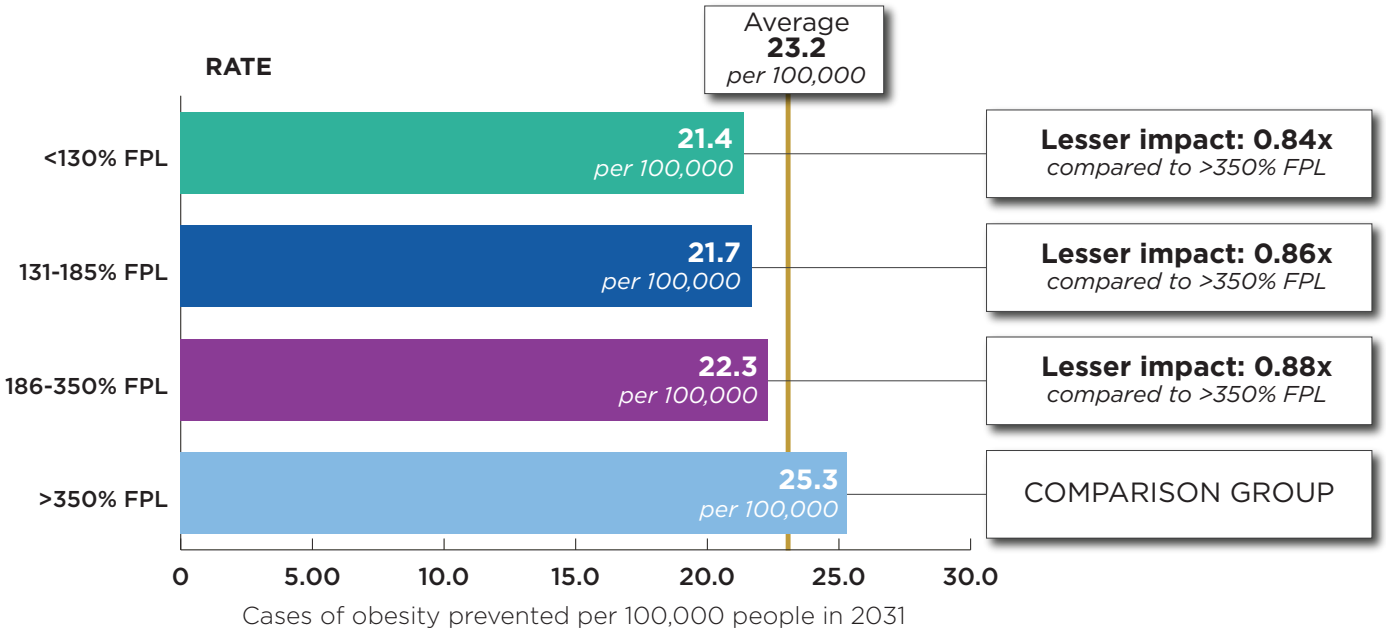


*All Other Races includes people who identify as American Indian/Alaska Native, Asian, Native Hawaiian or Pacific Islander, Multi-racial, or another race or ethnicity not represented in the categories shown. While each of these groups represent distinct populations with differences in health opportunities, 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 1.31 and 1.77 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.*

Continued on the next page

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 0.84-0.86 times the preventive benefits experienced by 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 be physically active each day to support their health and wellbeing. Physical activity plays a vital role in children's physical and mental health,[5] and engaging in physical activity during early childhood can help children build movement skills and learn healthy habits. Not all children have access to safe streets, playgrounds, or spaces to be physically active.[6,7] Half of young children ages 3-5 attend an early care and education (ECE) program that may be regulated at the state-level, and increasing physical activity in ECE programs is a national health priority.[8] One way to ensure more young children have an opportunity to be active and build a foundation for healthy living is by helping early care educators integrate best practices for promoting physical activity in ECE settings. Requiring training for early care educators in the provision of structured physical activity opportunities is expected to improve health the most among Black and Hispanic or Latino children, who are at greater risk of obesity compared with White children.[9] Thus, the strategy is likely to improve health equity by race and ethnicity. Multiple barriers to accessing ECE programs exist for families with lower incomes,[10] resulting in lower enrollment in ECE programs among children from households with lower incomes compared with higher incomes.[11] Therefore, implementing this strategy in licensed ECE programs statewide is not likely to improve health equity by income. However, prioritizing efforts to support adoption of the strategy in ECE programs that serve more children from households with low incomes could lead to improved health equity by income.

Continued on the next page

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	**74,100**[†] (-40,700; 189,000)	**23.2**[†] (-12.8; 59.5)	--	**1.00 (Reference)** N/A
Black or African American, not Hispanic or Latino	**10,000**[†] (-5,380; 25,900)	**24.7**[†] (-13.2; 63.8)	**1.31** (0.71; 1.93) *84% likelihood of greater impact*	**1.06** (0.77; 1.36) *63% likelihood of greater impact*
Hispanic or Latino	**21,700**[†] (-11,800; 55,800)	**33.4**[†] (-18.1; 85.4)	**1.77** (0.49; 2.53) *89% likelihood of greater impact*	**1.44** (0.63; 1.77) *89% likelihood of greater impact*
White, not Hispanic or Latino	**35,000**[†] (-19,300; 91,700)	**18.9**[†] (-10.4; 49.6)	**1.00 (Reference)** N/A	**0.81** (0.69; 1.30) *88% likelihood of lesser impact*
All Other Races, not Hispanic or Latino[d]	**7,350**[†] (-4,020; 20,000)	**26.0**[†] (-14.3; 71.4)	**1.38** (0.66; 1.80) *88% likelihood of greater impact*	**1.12** (0.78; 1.45) *72% likelihood of greater impact*
Household Income *as a percentage of the federal poverty level (FPL)*			***Compared with >350% FPL***	***Compared with Population Average***
Overall	**74,100**[†] (-40,700; 189,000)	**23.2**[†] (-12.8; 59.5)	--	**1.00 (Reference)** N/A
<130% FPL	**16,200**[†] (-9,060; 41,100)	**21.4**[†] (-11.9; 54.2)	**0.84** (0.69; 1.30) *84% likelihood of lesser impact*	**0.92** (0.78; 1.18) *78% likelihood of lesser impact*
131-185% FPL	**7,180**[†] (-3,890; 18,400)	**21.7**[†] (-11.8; 55.7)	**0.86** (0.64; 1.39) *77% likelihood of lesser impact*	**0.93** (0.72; 1.26) *67% likelihood of lesser impact*
186-350% FPL	**18,300**[†] (-10,400; 47,400)	**22.3**[†] (-12.6; 57.5)	**0.88** (0.74; 1.23) *83% likelihood of lesser impact*	**0.96** (0.84; 1.13) *69% likelihood of lesser impact*
>350% FPL	**32,300**[†] (-17,800; 85,100)	**25.3**[†] (-13.9; 66.7)	**1.00 (Reference)** N/A	**1.09** (0.88; 1.18) *86% likelihood of greater 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.
[†] There is at least a 5% probability that the intervention does not result in health improvement and related cost savings.

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 the More Movement in Early Care and Education Settings intervention assumes a nationwide, state-by-state change to early care and education (ECE) state licensing regulations that would require ECE providers (in both child care centers and family daycare homes) to acquire training in providing structured physical activity opportunities to young children and to implement structured PA curricula.[12]

Hip Hop to Health Jr., an intervention implemented and studied in several low-income child care populations[13-16] was modeled as the curriculum program to be adopted by licensed ECE providers. The program involves having providers lead structured physical activity opportunities for young children (as well as lesson plans about healthy eating and screen time reduction).[17]

Implementation of the More movement in early care and education settings policy consists of training ECE providers and staff in the Hip Hop to Health Jr. curriculum,[18] providing materials and equipment for promoting physical activity (such as CDs with activity-promoting music and templates for parent newsletters), and monitoring policy compliance at the state level.[17]

REACH

The intervention reaches all 3-5-year-old children attending licensed ECE programs (both centers and family daycare homes) in the U.S.[17] We estimate that 50% of children ages 3-5 attend a licensed ECE program, with children from households with higher incomes more likely to attend licensed ECE programs compared to those from households with lower incomes.[11,19]

The More Movement in Early Care and Education Settings strategy would have a 10-year reach of 24.8 million children.

EFFECT

The impact of the More Movement in Early Care and Education Settings strategy on moderate-to-vigorous physical activity (MVPA) and BMI was modeled based on two studies demonstrating the effectiveness of Hip Hop to Health Jr. in a real-world implementation setting.

We estimated the impact of the strategy directly on BMI using data from a 1-year follow-up study of children attending intervention child care programs, which found that they experienced a nonsignificant -0.13 (SE: 0.11) change in BMI compared to children in control programs.[16] The model assumes, on average, a smaller change in BMI among children reached by the strategy, based on the mean BMI effect observed in the study, and we also account for the uncertainty observed. This means that there is some likelihood that implementing the strategy will not reduce excess weight in the population.

To estimate the impact of the strategy on behavior change, we modeled the impact on MVPA separately (that is, not via the pathway to BMI change), based on data from the same cohort over a shorter follow-up period.[15] This study found that children attending child care programs participating in the intervention experienced a change of 7.46 (SE: 3.09) minutes of MVPA compared to children in control programs.[15] In addition to these changes in MVPA, changes in BMI may have been impacted by shifts in energy intake.[17]

Young children reached by the More Movement in Early Care and Education Settings strategy would engage in 2,720 more minutes of moderate-to-vigorous physical activity per year. In 2031, 74,100 cases of childhood obesity would be prevented.

Continued on the next page

MORE MOVEMENT IN EARLY CARE AND EDUCATION SETTINGS STRATEGY DETAILS & MODELING METHODS *(continued)*

COST

At the state level, the model estimates labor and travel costs for a state training consultant to implement training for ECE program directors in the "Hip Hop to Health, Jr." program for all state programs in the first year of implementation, as well as annual costs for training a sub-portion of programs (to account for staff turnover) and annual labor costs to account for the time required on the part of state licensing staff to review participating ECE programs' compliance.[17]

At the ECE program level, the model estimates labor costs for ECE directors to attend trainings and for ECE directors to then train other ECE staff within their program, both in the first year of implementation for all programs and then in subsequent years for a subset of programs to account for staff turnover. We also account for the costs of supportive curriculum materials (including physical activity equipment, a CD of PA-promoting music, and templates for curricular activities and parent newsletters) using an estimate provided to us by "Hip Hop to Health Jr." study staff.[17]

The More Movement in Early Care and Education Settings strategy would incur an annual cost per child of $4.60.

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,[20] greater healthcare expenditures,[21] and increased mortality risk.[22] 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).[23] 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.[24,25] 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.[26] 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:

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

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.

REFERENCES

1. Ward ZJ, Bleich SN, Cradock AL, Barrett JL, Giles CM, Flax C, Long MW, Gortmaker SL. Projected U.S. State-Level Prevalence of Adult Obesity and Severe Obesity. N Engl J Med. 2019 Dec 19;381(25):2440-2450.
2. Kumanyika SK. A Framework for Increasing Equity Impact in Obesity Prevention. Am J Public Health. 2019 Oct;109(10):1350-1357.
3. Bleich SN, Ard JD. COVID-19, Obesity, and Structural Racism: Understanding the Past and Identifying Solutions for the Future. Cell Metab. 2021 Feb 2;33(2):234-241.
4. Swinburn BA, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML, Gortmaker SL. The global obesity pandemic: shaped by global drivers and local environments. Lancet. 2011 Aug 27;378(9793):804-14.
5. US Department of Health and Human Services. Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: US Department of Health and Human Services; 2018.
6. Jenkins GR, Yuen HK, Rose EJ, Maher AI, Gregory KC, Cotton ME. Disparities in Quality of Park Play Spaces between Two Cities with Diverse Income and Race/Ethnicity Composition: A Pilot Study Int J Environ Res Public Health. 2015 Jul; 12(7): 8009–8022.
7. Van Dyke ME, Cheung PC, Franks P, Gazmararian JA. Socioeconomic and Racial/Ethnic Disparities in Physical Activity Environments in Georgia Elementary Schools Am J Health Promot. 2018 Feb;32(2):453-463. doi: 10.1177/0890117117717016. Epub 2017 Jul 6
8. Office of Disease Prevention and Health Promotion, Office of the Assistant Secretary for Health. Increase the proportion of child care centers where children aged 3 to 5 years do at least 60 minutes of physical activity a day — PA-R01. Accessed December 6, 2021. https://health.gov/healthypeople/objectives-and-data/browse-objectives/physical-activity/increase-proportion-child-care-centers-where-children-aged-3-5-years-do-least-60-minutes-physical-activity-day-pa-r01
9. Stierman B, Afful J, Carroll MD, Chen TC, Davy O, Fink S, et al. National Health and Nutrition Examination Survey 2017–March 2020 prepandemic data files—Development of files and prevalence estimates for selected health outcomes. National Health Statistics Reports; no 158. Hyattsville, MD: National Center for Health Statistics. 2021. DOI: https://dx.doi.org/10.15620/cdc:106273.
10. Johnson-Staub C. Equity Starts Early: Addressing Racial Inequities in Child Care and Early Education Policy. Center for Law and Social Policy (CLASP); December 2017. Accessed October 27, 2023 at: https://www.clasp.org/sites/default/files/publications/2017/12/2017_EquityStartsEarly_0.pdf
11. National Center for Education Statistics. Fast Facts: Child Care. Institute of Education Sciences; 2019. Accessed March 23, 2023 at: https://nces.ed.gov/fastfacts/display.asp?id=4.
12. 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. Available at: https://pubmed.ncbi.nlm.nih.gov/27773710
13. Fitzgibbon ML, Stolley M, Schiffer L, Van Horn L, KauferChristoffel K, Dyer A. Two-year follow-up results for hip-hop to health Jr.: A randomized controlled trial for overweight prevention in preschool minority children. J Ped. 2005;146(5):618-625. Available at: https://pubmed.ncbi.nlm.nih.gov/17030973
14. Fitzgibbon ML, Stolley MR, Schiffer L, Van Horn L, KauferChristoffel K, Dyer A. Hip-Hop to Health Jr. for Latino preschool children. Obesity. 2006;14(9):1616-1625.
15. Fitzgibbon ML, Stolley MR, Schiffer LA, et al. Hip-Hop to Health Jr. Obesity Prevention Effectiveness Trial: post intervention results. Obesity (Silver Spring). 2011;19(5):994-1003. Available at: https://pubmed.ncbi.nlm.nih.gov/21193852
16. Kong A, Buscemi J, Stolley MR, et al. Hip-Hop to Health Jr. Randomized Effectiveness Trial: 1-Year Follow-up Results. Am J Prev Med. 2016;50(2):136-144. Available at: https://pubmed.ncbi.nlm.nih.gov/26385162
17. 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 [supplemental appendix]. Prev Med. 2017 Feb;95 Suppl: S17-S27. doi: 10.1016/j.ypmed.2016.10.017. Available at: https://ars.els-cdn.com/content/image/1-s2.0-S0091743516303395-mmc1.docx
18. SNAP-Ed Toolkit. Obesity Prevention Interventions and Evaluation Framework. Hip Hop to Health Jr. University of Illinois at Chicago. September 11, 2023. https://snapedtoolkit.org/interventions/programs/hip-hop-to-health-jr/
19. National Association for Regulatory Administration. 2017 Child Care Licensing Study. Minneapolis, MN: National Association for Regulatory Administration; 2017.
20. Centers for Disease Control and Prevention. Consequences of Obesity. Accessed September 13, 2023 at: https://www.cdc.gov/obesity/basics/consequences.html
21. Ward ZJ, Bleich SN, Long MW, Gortmaker SL. Association of body mass index with health care expenditures in the United States by age and sex. PLoS ONE. 2021 Mar;16(3): e0247307. doi10.1371/journal.pone.0247307
22. Ward ZJ, Willett WC, Hu FB, Pacheco LS, Long MW, Gortmaker SL. Excess mortality associated with elevated body weight in the USA by state and demographic subgroup: A modelling study. eClinicalMedicine. 2022 Apr;48. doi:10.1016/j.eclinm.2022.101429
23. Centers for Disease Control and Prevention. Obesity Basics. Accessed September 13, 2023 at: https://www.cdc.gov/obesity/basics/index.html
24. Woolcott OO, Bergman RN. Relative fat mass (RFM) as a new estimator of whole-body fat percentage – A cross-sectional study in American adult individuals. Sci Rep. 2018 Jul 20;8(1):10980.
25. Woolcott OO, Bergman RN. Relative Fat Mass as an estimator of whole-body fat percentage among children and adolescents: A cross-sectional study using NHANES. Sci Rep. 2019 Oct 24;9(1):15279.
26. Puhl RM, Heuer CA. Obesity stigma: Important considerations for public health. Am J Public Health. 2010;100(6):1019-1028. doi.org/10.2105/AJPH.2009.159491