

# CHOICES NATIONAL ACTION KIT:

## Active School Day 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](http://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.

**Policy requiring schools to provide opportunities for students to participate in physical activity during the school day for at least 30 minutes a day or 150 minutes a week.**

### WHAT POPULATION BENEFITS?

Children in public elementary and middle schools (ages 5-14).

### WHAT ARE THE ESTIMATED BENEFITS?

*Relative to not implementing the strategy*

Increase daily moderate-to-vigorous physical activity which can help promote healthy weight.



✓ Increase in daily moderate-to-vigorous physical activity



✓ 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](https://choicesproject.org/actionkit)

WHAT ACTIVITIES AND RESOURCES ARE NEEDED?

Activities	Resources	Who Leads?
<b>Coordinate and support implementation of the active school day policy</b>	<ul style="list-style-type: none"> <li>Time for school health and wellness staff (Director, Assistant Director, Physical Education Director, Coordinators, and business office staff) to provide support</li> </ul>	School district
<b>Train Wellness Champions, physical education teachers, and lunch monitors in physical activity promotion</b>	<ul style="list-style-type: none"> <li>Time for training consultant to train physical education teachers, Wellness Champions, and lunch monitors</li> <li>Time for Wellness Champions to attend trainings on policy and implementation strategies (either recess or movement breaks in the classroom)</li> <li>Time for physical education teachers to attend training on quality PE strategies</li> <li>Time for lunch monitors to attend trainings on recess strategies (in schools implementing recess strategies)</li> <li>Travel costs for lunch monitors to attend trainings</li> <li>Cost of space rental, food, and promotional flyers for trainings</li> </ul>	School district
<b>Develop and maintain materials to support implementation</b>	<ul style="list-style-type: none"> <li>Cost to develop an online portal or printed materials to support implementation</li> <li>Cost to maintain the online portal or replace printed materials in subsequent years</li> </ul>	School district
<b>Implement strategies that promote physical activity in schools</b>	<ul style="list-style-type: none"> <li>Time for Wellness Champions and instructional coaches to lead implementation of strategies promoting physical activity</li> <li>Time for Wellness Champions and school principals to review performance on strategy implementation</li> </ul>	School district
<b>Purchase equipment and materials for a more active school day</b>	<ul style="list-style-type: none"> <li>Cost of equipment and curricula for promoting physical activity in physical education and in recess or the classroom</li> </ul>	School

- See our resource library for relevant peer-reviewed publications, research reports, & briefs at [choicesproject.org/resource-library](https://choicesproject.org/resource-library)
- Learn more about the evidence for the strategy Active School Day in the CHOICES peer-reviewed publication: [Cradock et al. 2017. Am J Prev Med](#)

*Adapted from CHOICES Strategy Profile: Active School Day CHOICES Project Team at the Harvard T.H. Chan School of Public Health, Boston, MA; November 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.

<b>DESCRIPTION</b>	Policy/best practice guidelines requiring schools to provide opportunities for students in grades K-8 to participate in physical activity during the school day for at least 30 minutes a day or 150 minutes a week
<b>OUTCOME</b>	<b>Mean</b> (95% UI)*
<b>BEHAVIOR CHANGE PER PERSON</b> <i>Change in health behavior per person in the first year</i>	<b>932 more minutes of physical activity</b> (529; 1,350) <i>Moderate-to-vigorous physical activity minutes, per year</i>
<b>COST PER PERSON</b> <i>Average annualized cost per person to implement the strategy over the model period</i>	<b>\$32.30</b> (\$31.80; \$32.80) <a href="#">See Cost Results</a>
<b>POPULATION REACH</b> <i>Reach over the model period</i>	<b>51,400,000</b> (50,500,000; 52,200,000)
<b>OBESITY PREVENTED</b> <i>Cases of obesity prevented in the final year</i>	<b>33,600</b> (9,530; 64,900)
<b>CHILD OBESITY PREVENTED</b> <i>Cases of child obesity prevented in the final year</i>	<b>26,500</b> (5,130; 55,700)
<b>HEALTH EQUITY IMPACT</b> <i>Impact on obesity-related health equity in the final year</i>	<b>Likely to improve health equity by race, ethnicity, &amp; income</b> <a href="#">See Health Equity Indicators</a>
<b>QUALITY-ADJUSTED LIFE YEARS (QALYS) GAINED</b> <i>Quality-adjusted life years (QALYs) gained (totals over the model period)</i>	<b>11,100</b> (3,560; 20,200)
<b>OBESITY YEARS PREVENTED</b> <i>Years with obesity prevented (totals over the model period)</i>	<b>250,000</b> (74,700; 473,000)
<b>HEALTH CARE COSTS SAVED PER \$1 INVESTED</b> <i>Total health care costs saved per total intervention costs over the model period</i>	<b>\$0.002</b> (<\$0.001; \$0.003)
<b>COST PER QALY GAINED</b> <i>Net cost per quality-adjusted life year (QALY) gained (totals over the model period)</i>	<b>\$1,490,000</b> (\$819,000; \$4,650,000)

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](https://choicesproject.org/action-kit-user-guide)
- ✓ Learn more about CHOICES Methods at [choicesproject.org/methods](https://choicesproject.org/methods)
- ✓ Find definitions of each modeled outcome in the [Glossary \(p.13\)](#) at [choicesproject.org/action-kit-glossary](https://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 Active School Day if implemented in each school district 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 and support implementation of the active school day policy	<ul style="list-style-type: none"> <li>Time for school health and wellness staff (Director, Assistant Director, Physical Education Director, Coordinators, and business office staff) to provide support</li> </ul>	\$28.40	School district	88%
Train Wellness Champions, physical education teachers, and lunch monitors in physical activity promotion	<ul style="list-style-type: none"> <li>Time for training consultant to train physical education teachers, Wellness Champions, and lunch monitors</li> <li>Time for Wellness Champions to attend trainings on policy and implementation strategies (either recess or movement breaks in the classroom)</li> <li>Time for physical education teachers to attend training on quality PE strategies</li> <li>Time for lunch monitors to attend trainings on recess strategies (in schools implementing recess strategies)</li> <li>Travel costs for lunch monitors to attend trainings</li> <li>Cost of space rental, food, and promotional flyers for trainings</li> </ul>	\$0.20	School district, School, Family/ Individual	1%
Develop and maintain materials to support implementation	<ul style="list-style-type: none"> <li>Cost to develop an online portal or printed materials to support implementation</li> <li>Cost to maintain the online portal or replace printed materials in subsequent years</li> </ul>	\$0.12	School district	<1%
Implement strategies that promote physical activity in schools	<ul style="list-style-type: none"> <li>Time for Wellness Champions and instructional coaches to lead implementation of strategies promoting physical activity</li> <li>Time for Wellness Champions and school principals to review performance on strategy implementation</li> </ul>	\$3.18	School district, School	10%
Purchase equipment and materials for a more active school day	<ul style="list-style-type: none"> <li>Cost of equipment and curricula for promoting physical activity in physical education and in recess or the classroom</li> </ul>	\$0.35	School	1%
<b>TOTAL</b>	--	<b>\$32.30</b>	--	<b>100%</b>

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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ACTIVE SCHOOL DAY COST RESULTS *(continued)*

Average Annual Strategy Implementation Cost by Payer and Cost Type			
Payer	Cost per Person†		
	All Costs (% of Total)	Budgetary Costs (% of All Costs by Payer)	Opportunity Costs (% of All Costs by Payer)
Federal government	--	--	--
State government	--	--	--
Local government	--	--	--
School district	\$31.90 (99%)	\$0.16 (<1%)	\$31.70 (>99%)
School	\$0.37 (1%)	\$0.35 (96%)	\$0.02 (4%)
Family/Individual	\$0.01 (<1%)	\$0.00 (0%)	\$0.01 (100%)
Industry	--	--	--
Nonprofit	--	--	--
Health care	--	--	--
<b>TOTAL</b>	<b>\$32.30 (100%)</b>	<b>\$0.51 (2%)</b>	<b>\$31.80 (98%)</b>

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.<sup>1</sup> 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.<sup>2-4</sup> Effective policy and programmatic strategies promoting improved nutrition and increased physical activity can reduce health disparities and improve health equity.

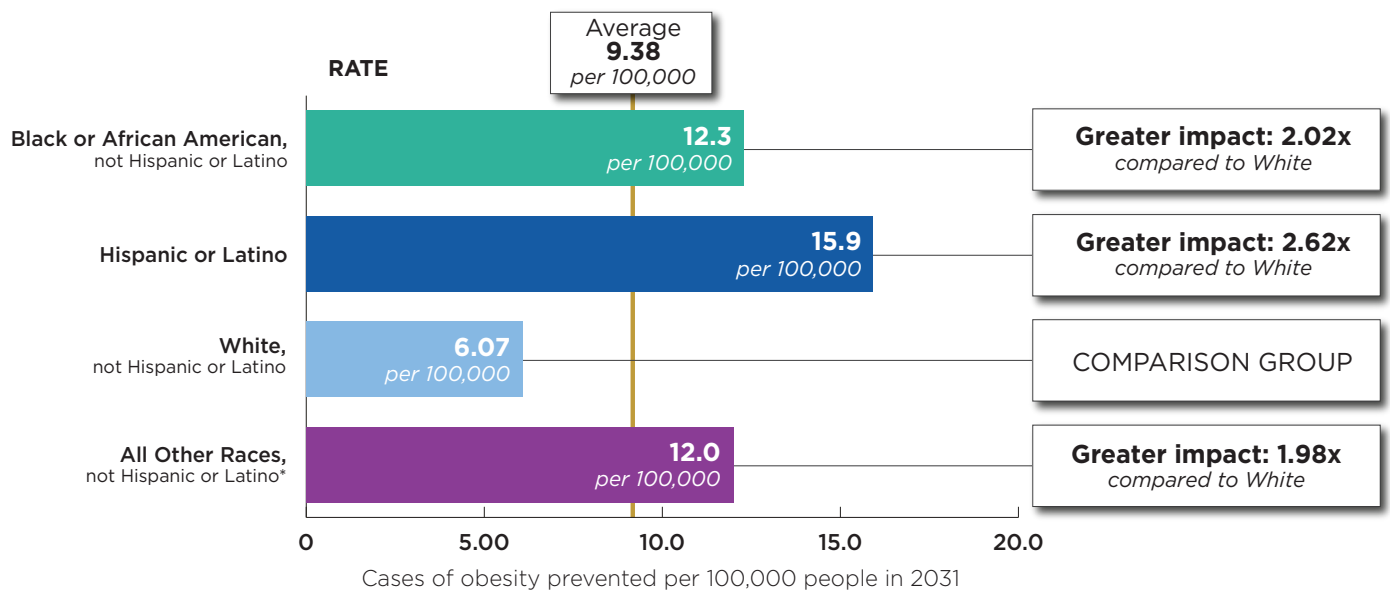
### KEY TAKEAWAYS

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

- ✓ Prevent 33,600 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](https://choicesproject.org/methods/healthequity)

### Comparative projected impact of the strategy by race and ethnicity



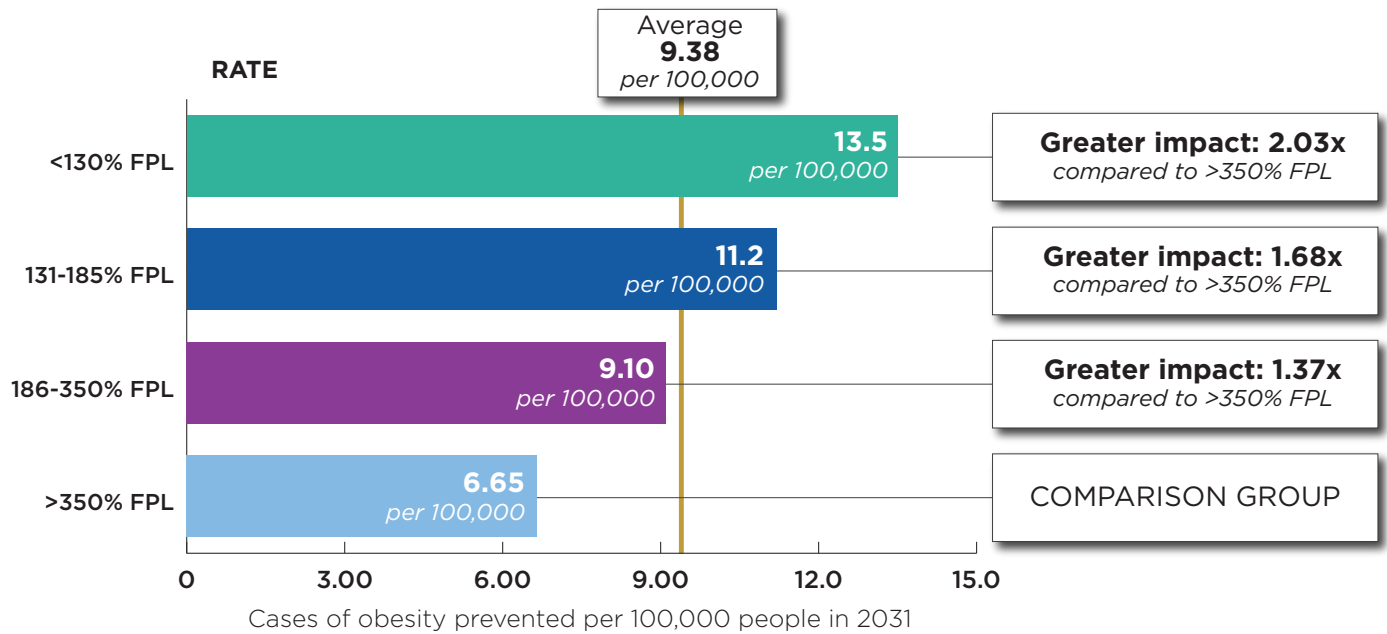
\*All Other Races includes people who identify as American Indian/Alaska Native, Asian, Native Hawaiian or Pacific Islander, Multi-racial, or another race or ethnicity not represented in the categories shown. While each of these groups represent distinct populations with differences in health opportunities, 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 the largest preventive benefits, which are 2.02 and 2.62 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 1.68-2.03 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 be physically active each day to support their health and wellbeing. Physical activity plays a vital role in children’s physical and mental health.<sup>5</sup> While not all children have access to safe streets, playgrounds, or spaces to be physically active,<sup>6,7</sup> schools can provide an environment that supports physical activity. A comprehensive strategy to promote increased physical activity for all students in elementary and middle schools may be implemented through a policy requiring schools to provide opportunities for students to participate in physical activity during the school day for at least 30 minutes a day or 150 minutes a week. Helping all educators integrate best practices for an active school day will ensure more students have an opportunity to be active and help children grow up healthy and ready to learn. Promoting an active school day in public schools is expected to improve student health and promote health equity for Black and Hispanic or Latino students and students from households with lower incomes, who are more likely to attend public schools than non-Hispanic White students and students in households with higher incomes.<sup>8-11</sup>

*Continued on the next page*



**Projected impact of the strategy by race, ethnicity and income, mean (95% UI)<sup>a</sup>**

	<b>OBESITY PREVENTED</b>	<b>OBESITY PREVENTED PER 100,000</b>	<b>COMPARATIVE IMPACT<sup>b</sup></b>	
	<i>Cases of obesity prevented in the final year</i>	<i>Cases of obesity prevented per 100,000 people in the final year</i>	<i>Ratio of obesity prevented per 100,000</i>	
<b>Race and Ethnicity</b>			<b><u>Compared with White, not Hispanic or Latino</u></b>	<b><u>Compared with Population Average</u></b>
<b>Overall</b>	<b>33,600</b> (9,530; 64,900)	<b>9.38</b> (2.66; 18.1)	--	<b>1.00 (Reference)</b> N/A
Black or African American, not Hispanic or Latino	<b>5,590</b> (1,670; 11,200)	<b>12.3</b> (3.67; 24.5)	<b>2.02</b> (1.31; 3.00) <i>&gt;99% likelihood of greater impact</i>	<b>1.31</b> (0.95; 1.71) <i>95% likelihood of greater impact</i>
Hispanic or Latino	<b>11,600</b> (3,290; 22,200)	<b>15.9</b> (4.52; 30.6)	<b>2.62</b> (1.81; 4.17) <i>&gt;99% likelihood of greater impact</i>	<b>1.69</b> (1.32; 2.16) <i>&gt;99% likelihood of greater impact</i>
White, not Hispanic or Latino	<b>12,600</b> (3,290; 24,500)	<b>6.07</b> (1.58; 11.8)	<b>1.00 (Reference)</b> N/A	<b>0.65</b> (0.51; 0.76) <i>&gt;99% likelihood of lesser impact</i>
All Other Races, not Hispanic or Latino <sup>c</sup>	<b>3,800</b> (1,040; 7,690)	<b>12.0</b> (3.30; 24.5)	<b>1.98</b> (1.31; 2.87) <i>&gt;99% likelihood of greater impact</i>	<b>1.28</b> (0.88; 1.74) <i>90% likelihood of greater impact</i>
<b>Household Income as a percentage of the federal poverty level (FPL)</b>			<b><u>Compared with &gt;350% FPL</u></b>	<b><u>Compared with Population Average</u></b>
<b>Overall</b>	<b>33,600</b> (9,530; 64,900)	<b>9.38</b> (2.66; 18.1)	--	<b>1.00 (Reference)</b> N/A
<130% FPL	<b>11,500</b> (3,210; 22,400)	<b>13.5</b> (3.75; 26.3)	<b>2.03</b> (1.54; 2.58) <i>&gt;99% likelihood of greater impact</i>	<b>1.44</b> (1.24; 1.64) <i>&gt;99% likelihood of greater impact</i>
131-185% FPL	<b>4,150</b> (1,180; 8,550)	<b>11.2</b> (3.21; 23.0)	<b>1.68</b> (1.19; 2.30) <i>&gt;99% likelihood of greater impact</i>	<b>1.19</b> (0.92; 1.53) <i>90% likelihood of greater impact</i>
186-350% FPL	<b>8,410</b> (2,430; 16,400)	<b>9.10</b> (2.62; 17.8)	<b>1.37</b> (1.07; 1.77) <i>99% likelihood of greater impact</i>	<b>0.97</b> (0.82; 1.14) <i>64% likelihood of lesser impact</i>
>350% FPL	<b>9,520</b> (2,660; 18,300)	<b>6.65</b> (1.85; 12.8)	<b>1.00 (Reference)</b> N/A	<b>0.71</b> (0.61; 0.82) <i>&gt;99% likelihood of lesser impact</i>

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

<sup>a</sup>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.

<sup>b</sup>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.

<sup>c</sup>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.*

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### STRATEGY

The Active School Day strategy involves implementation of a district-level policy requiring public elementary and middle schools to provide opportunities for students to participate in moderate-to-vigorous physical activity (MVPA) during the school day for at least 30 minutes a day or 150 minutes a week.<sup>12</sup> This intervention was based on a model implemented in one quasi-experimental study<sup>13</sup> and a similar model implemented in one experimental study<sup>14</sup> and subsequent scale-up trial.<sup>15,16</sup>

Implementation of the Active School Day policy included strategies for increasing physical activity levels during physical education (PE) class as well as incorporating more opportunities for students to engage in physical activity throughout the school day. Implementation of the PE component consists of training PE teachers on strategies and curricula to implement active PE and providing materials and equipment for active PE, for example, via the SPARK PE<sup>17</sup> model. Strategies to increase physical activity during other times of the school day include training Wellness Champions and recess monitors on physical activity policies and active recess or classroom activity strategies. Coordination of the policy would be carried out by district-level physical education and physical activity staff support.<sup>12</sup> Resources from the Centers for Disease Control and Prevention provide a framework<sup>18</sup> and practical guide<sup>19</sup> for increasing physical education and physical activity in schools as part of a Comprehensive School Physical Activity Program.<sup>20</sup>

### REACH

The strategy reaches children and youth in grades kindergarten through 8 (ages 5-14) who attend public elementary and middle schools in school districts without a policy requiring a minimum amount of time for physical activity opportunities during the school day. School districts in the states of Colorado, Iowa, Louisiana, Mississippi, Missouri, and West Virginia were excluded from the reach due to existing state policies requiring that schools provide opportunities for elementary and middle school students to participate in MVPA during the school day for at least 30 minutes a day or 150 minutes a week.<sup>21</sup> In other states, we assumed 88% of school districts did not already have an active school day policy at the elementary school level and 91% of districts did not have a policy at the middle school level.<sup>22</sup> We assumed that 67% of schools adopting the policy would fully implement the policy, and the students in these schools would receive a health benefit.<sup>15</sup>

The Active School Day strategy would have a 10-year reach of 51.4 million children.

### EFFECT

The model used evidence from one quasi-experimental study evaluating a policy change to provide opportunities for 150 minutes per week of MVPA during the school day in one large school district<sup>13</sup> and from one experimental study evaluating a multi-component intervention in secondary schools.<sup>14</sup> The studies measured changes in objectively measured physical activity following implementation of the policy or best practice guidelines through provision of evidence-based curricula and equipment, teacher training, and technical assistance. Students in intervention schools engaged in 3.9<sup>13</sup> to 7.0<sup>14</sup> more MVPA minutes per day over time compared to students in schools that did not receive the intervention. Every 1 MVPA minute per day increase due to Active School Day would correspond with a lower BMI change of 0.02<sup>23</sup> to 0.04<sup>14</sup> units.

Active School Day would engage children in 932 more minutes of MVPA per person per year. By 2031, 26,500 cases of child obesity would be prevented.

*Continued on the next page*

### COST

Implementation consists of strategies to make PE class more active and promote physical activity opportunities during the school day outside of PE classes. Active PE implementation includes providing training for all PE teachers and purchasing materials and equipment for active PE. Other physical activity strategies would be implemented by Wellness Champions at each school, who would receive an annual stipend for their effort. In the first year of implementation, Wellness Champions would attend a training on either recess or activity break strategies, at which they would receive materials for implementing these strategies, and also a training on policy to promote physical activity at their school.<sup>12</sup> In schools choosing recess strategies, lunch monitors would be trained each year on promoting physical activity at recess. After the first year, we assume each Wellness Champion would attend a single training that combines the policy training with either recess or movement breaks training.

In the first year, substantial additional district-level wellness staff time would be necessary to get implementation started – labor from a Wellness Director, Assistant Director, PE Director, and Wellness Champion coordinator, and PE instructional coaches providing support to PE teachers and providing PE in underserved schools. In subsequent years, PE instructional coaches would remain, and a full-time Project Coordinator would replace the partial effort from other central staff.<sup>12</sup>

The Active School Day intervention would incur an annual cost per child of \$32.30.

### 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](https://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,<sup>24</sup> greater healthcare expenditures,<sup>25</sup> and increased mortality risk.<sup>26</sup> 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<sup>2</sup>).<sup>27</sup> 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.<sup>28,29</sup> 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.<sup>30</sup> 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.

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### **For Additional Information**

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

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

\* Not discounted.

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