



# EVALUATING CHILDREN'S PHYSICAL ACTIVITY IN SCHOOL-BASED PROGRAMS

A WORKING PAPER FROM CHILDOBESITY180

childobesity180  
reverse the trend.

**Tufts**  
UNIVERSITY

Gerald J. and Dorothy R.  
Friedman School of  
Nutrition Science and Policy

The Boston  
Foundation **tBf**

---

## ACKNOWLEDGMENTS

The authors wish to acknowledge program leaders and staff from Build Our Kids' Success, Community Rowing, Inc., Playworks, and Sportsmen's Tennis and Enrichment Center who participated in this research. We also wish to acknowledge Boston Public Schools Health & Wellness, which sponsored our research protocol, facilitated our access to secondary data used in our analyses, and provided general strategic guidance. Finally, we thank the Boston Foundation for funding and thought partnership in support of this work.

---

## ABOUT THE BOSTON FOUNDATION

The Boston Foundation, Greater Boston's community foundation, seeks to bring the collective power of our region's people and resources together to drive real change. Established in 1915, it is one of the largest community foundations in the nation—with net assets of \$1.3 billion. In 2020, the Foundation received \$169 million in contributions and the Foundation and its donors paid \$215 million in grants to nonprofit organizations. The Foundation has many partners, including its donors, who have established more than 1,000 separate charitable funds for the general benefit of the community or for special purposes. With support from the Annual Campaign for Civic Leadership, the Foundation also facilitates public discourse and action, commissions research into the most critical issues of our time and advocates for public policy that advances opportunity for everyone. The Philanthropic Initiative (TPI), a consulting unit of the Foundation, designs and implements customized philanthropic strategies for families, foundations and corporations around the globe. To learn more about the Foundation and its work, visit [TBF.org](http://TBF.org).

## ABOUT CHILDOBESITY180

ChildObesity180 is an initiative of the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy at Tufts University. It works to build effective partnerships that include academia, business, and community-based organizations. Its multi-sector collaborations bring together expertise critical to advancing the science and practice of obesity prevention and to creating healthy, sustainable environments in which all children can thrive.

## ABOUT THE GERALD J. AND DOROTHY R. FRIEDMAN SCHOOL OF NUTRITION SCIENCE AND POLICY

The Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy at Tufts University was established in 1978, bringing together biomedical, social, political, and behavioral scientists to conduct research, educational, and community-service programs to improve the nutritional health and well-being of populations throughout the world. The Friedman School is the only graduate and professional school of nutrition in North America whose goal is to improve nutritional well-being through the areas of clinical nutrition, social and public policy, and biomedicine. Its mission is to generate trusted science, educate future leaders, and produce real-world impact in nutrition science and policy.

*Cover Photo:* kali9 | iStock

© 2021 by the Boston Foundation. All rights reserved.

# EVALUATING CHILDREN'S PHYSICAL ACTIVITY IN SCHOOL-BASED PROGRAMS

A WORKING PAPER FROM CHILDOBESITY180

*This report was prepared for the Boston Foundation by Tufts University researchers to evaluate physical activity programs funded by the Foundation. Additional manuscripts are currently being prepared for peer review in scientific publications using data from this study. Those manuscripts may include results from analyses different from those presented here.*

## **AUTHORS**

Daniel P. Hatfield, Ph.D.  
Daniel J. Schultz, M.S., R.D.  
Peter J. Bakun, B.S.  
Carly E. Gunderson, M.S.  
Christina D. Economos, Ph.D.

## **EDITOR**

Sandy Kendall, The Boston Foundation

## **DESIGN**

Kate Canfield, Canfield Design

DECEMBER 2021

# Table of Contents

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
<b>BACKGROUND</b>	<b>8</b>
<b>OVERALL EVALUATION APPROACH AND METHODS</b>	<b>10</b>
<b>SECONDARY DATA ANALYSIS</b>	<b>12</b>
<b>SCHOOL-BASED RUNNING INITIATIVE SYSTEMATIC REVIEW</b>	<b>17</b>
<b>PHYSICAL ACTIVITY PROGRAM STAFF SURVEY</b>	<b>19</b>
<b>PHYSICAL ACTIVITY PROGRAM LEADERSHIP SURVEY</b>	<b>23</b>
<b>KEY INFORMANT INTERVIEWS</b>	<b>24</b>
<b>STRENGTHS AND LIMITATIONS</b>	<b>31</b>
<b>OPPORTUNITIES</b>	<b>32</b>
<b>REFERENCES</b>	<b>33</b>
<b>APPENDICES</b>	
PA Program Staff Survey	<b>35</b>
PA Program Leadership Survey	<b>38</b>
PA Leadership Key Informant Interviews Script	<b>39</b>
Explanation of the Supportive Physical Activity Environment Variable	<b>42</b>

# Executive Summary

## **BACKGROUND: CHILDREN'S PHYSICAL ACTIVITY AND THE COVID-19 PANDEMIC**

Physical activity confers myriad benefits for children's physical, emotional, and academic health and well-being, but fewer than half of U.S. children achieve the recommended 60 minutes of moderate-to-vigorous physical activity each day. Children of color and children with socioeconomic disadvantage may face particular barriers to physical activity; however, school-based programs may help reduce such disparities, especially given that nearly all children in the United States attend school. Early evidence has shown that, amid widespread school closures, the COVID-19 pandemic may have decreased children's physical activity levels, and these decreases may be notably pronounced for children of color. This, in turn, may lead to increased disparities in other physical activity-related outcomes, like pediatric obesity.

## **RESEARCH CONTEXT, METHODS AND AIMS**

The Boston Foundation has supported several physical activity programs operating in Boston Public Schools: Build Our Kids Success; Boston Run Clubs; Community Rowing, Inc.; Playworks; and Sportsmen's Tennis and Enrichment Center. Initiated in 2019, this research effort aimed to advance understanding of the reach and effectiveness of these programs for participating children.

Our original research plan, involving in-person measurements of physical activity among program participants using accelerometry, became infeasible due to the COVID-19 pandemic. However, we were able to pivot to an alternative evaluation approach that enabled us to evaluate these programs by analyzing secondary data and collecting original data through remote methods. Secondary analysis included data from Boston Public Schools (BPS) about physical activity-related school practices and environments in BPS as well as publicly available school demographic data. Original data included surveys of physical activity program leadership and front-line staff, as well as key informant interviews with program leadership. Finally, because the other components of this study could not include Boston Run Clubs (an initiative that ended in 2019), we conducted a systematic review of peer-reviewed papers testing the effect of similar running programs on physical activity and fitness levels.

Using these data, we aimed to understand: (1) how many and what types of schools and children were reached by Boston Foundation-funded physical activity programs? (2) what dose of physical activity programming time did those programs provide and how effective was that programming? (3) how did the COVID-19 pandemic affect program implementation and effectiveness? and (4) how did support provided by the Boston Foundation impact programs?



## KEY RESULTS

Several important themes emerged from across our research methods.

### Programs' Reach

Boston Foundation–funded physical activity programs achieved wide adoption and reach in BPS: In 2016–2020, the programs reached 34 schools and more than 5,600 children per year, on average, and that reach was equitable based on building-level demographics.

However, the programs tended to cluster in certain buildings, particularly those with more supportive physical activity environments in general, suggesting a potential opportunity to reach more schools with an express need for new physical activity opportunities.

### Program Dose and Effectiveness

In general, the programs provide a meaningful programming dose, averaging about 27 weeks/year, 4 sessions/week, and 1.5 hours/session from 2016 to 2020. Qualitatively, program leaders reported that benefits of programming include not only increases in physical activity but also benefits for social-emotional well-being, school attendance, and academic success. Preliminary results from our systematic review provide some evidence that youth running programs may also help to increase physical activity and cardio-respiratory fitness among participants.

### Impact of the COVID-19 Pandemic on Programming

Program leaders reported that the pandemic led to substantial funding losses and staff cuts. This may have contributed to the decrease in the average number of schools and children served, from around 30 schools and 4,400

children participating per program on average in Fall 2019 to around 13 schools and 2,700 children in Fall 2020. The dose of programming (e.g., weeks of programming, minutes per session) provided for those children that remained engaged also decreased sharply during this time. That being said, programs did develop a variety of programmatic innovations (e.g., new remote delivery models and take-home toolkits) that enabled them to continue providing some programming through the pandemic, and many of those innovations may continue and enhance programming in the future. Although coaches generally agreed that they were able to deliver remote lessons successfully, few agreed that programming during the pandemic was as effective at getting kids physically active as it would have been without the pandemic. Encouragingly, program leaders reported optimism about programs' potential to rebound after the pandemic.

### Impact of Programs' Relationship with the Boston Foundation

Qualitatively, program leaders reported various benefits of their funding from and broader relationship with the Boston Foundation. They emphasized, for example, that the funding enabled their programs to expand their overall reach, especially to schools and children with socioeconomic disadvantage. Further, the multi-year commitment from the Foundation and funding flexibility provided critical stability in general, and particularly through the pandemic, and the broader relationship with the Boston Foundation pushed them to be more strategic and innovative.

## CONCLUSIONS

This mixed-methods evaluation provides evidence that these physical activity programs achieved broad, equitable reach in Boston Public Schools and provided a meaningful amount of programming time for participating children. However, these programs tend to cluster in certain buildings, particularly in ones with otherwise supportive physical activity environments. These programs may provide benefits beyond physical activity in areas like social-emotional health and academic achievement. Although the pandemic substantially decreased nearly all dimensions of program reach and dose, the programs developed some innovations, like remote delivery, that enabled them to continue to serve children; these innovations may persist into the future. Program leaders believe that the Boston Foundation played an important role in programs' reach, especially to schools with limited resources, and also that the flexibility of Boston Foundation funding was crucial to organizational health through the pandemic.



These programs  
may provide  
benefits beyond  
physical activity in  
areas like social-  
emotional health  
and academic  
achievement.

# Background



United States guidelines suggest that children and adolescents should engage in 60 minutes or more of MVPA daily.

Physical activity (PA) offers numerous benefits for children and adolescents.<sup>1</sup> For example, evidence indicates that regular moderate-to-vigorous physical activity (MVPA) supports students' cognitive function, academic performance, and mental health<sup>2</sup> along with numerous dimensions of cardiometabolic health.<sup>3</sup>

United States guidelines suggest that children and adolescents should engage in 60 minutes or more of MVPA daily.<sup>4</sup> However, objective measurements of children's activity generally show that youth do not meet these guidelines. For example, the most recent objectively measured, nationally representative data on PA in the United States showed that just 42% of children and 8% of adolescents met PA recommendations.<sup>5</sup>

Research has shown that students of color have less access to safe, accessible outdoor spaces compared with their white counterparts.<sup>6</sup> However, given that nearly all school-aged children in the U.S. attend school, school-based PA programming can help to reduce disparities in PA opportunities.<sup>7,8</sup>

Preliminary evidence suggests that the COVID-19 pandemic and associated school closures may reduce children's PA levels and exacerbate disparities.<sup>9</sup> Schools began to close their doors in March 2020, impacting access to PA opportunities (e.g., physical education, recess, PA programs) that schools often provide.<sup>10</sup> The effects of the pandemic and school closures have disproportionately impacted certain subgroups, including



children with socioeconomic disadvantage.<sup>11</sup> For example, urban school districts maintained remote schooling for longer durations than did non-urban districts.<sup>8</sup> Even within the same district, students of color were more likely than white students to experience longer durations of remote schooling.<sup>12</sup> These patterns may, in turn, worsen disparities in PA opportunities.

Research capturing the uptake of remote PA programming during the pandemic shows minimal engagement. In one study, parents reported that only 10.4% of children participated in team sports training sessions through remote/streaming services;<sup>13</sup> 28.9% participated in virtual martial arts, yoga, or dance classes; and 2.4% participated in streaming classes or sessions provided by a community gym.<sup>13</sup> Limited participation in remote PA opportunities may have implications for total PA levels. In the same study, 36% of parents reported their child had done much less PA in the past seven days than before the pandemic, and 41% of parents reported their child had done much more sitting in the past seven days than before the pandemic.<sup>13</sup> Another study reported MVPA decreased by 12 minutes per day compared to pre-pandemic levels, with high schoolers having the most substantial decreases.<sup>14</sup>

These findings may have implications for disparities in PA-related health outcomes. For example, a U.S. microsimulation study estimated that decreased PA levels caused by COVID-19 may worsen the childhood obesity prevalence rate overall, especially for non-Hispanic Black and Hispanic children.<sup>15</sup> One model estimated increases in childhood obesity prevalence of 2.9% and 3.1% in Hispanic and Black children, respectively, compared with 2.0% among their White counterparts.

Even before the COVID-19 pandemic, public health recommendations emphasized the critical role schools play in providing equitable opportunities for PA.<sup>16</sup> As schools return to in-person classes, school administration and teachers may need to play an even more significant role providing students opportunities for PA to reverse PA decreases and health inequities intensified by the COVID-19 pandemic.



41% of parents reported their child had done much more sitting in the past seven days than before the pandemic.

# Overall Evaluation Approach and Methods

The Evaluating Children’s Physical Activity in School-Based Programs study, led by researchers at ChildObesity180 at the Tufts Friedman School of Nutrition, was originally funded by the Boston Foundation in 2019 to assess PA programs in Boston Public Schools (BPS) that were part of the Foundation’s portfolio. Our original conceptualization of the study was to use gold-standard methodologies (e.g., accelerometry) to evaluate children’s PA during these programs and to understand whether these programs were equitably benefitting children along dimensions like race-ethnicity, weight status, sex, and socioeconomic status. In Spring 2020, our research protocol was fully developed and approved by both the Tufts University Institutional Review Board (IRB) and the BPS Office of Data and Accountability; however, due to school closures and restrictions on human subjects research, that protocol was not possible to execute.

Therefore, in 2020–2021, we developed an alternative protocol that would be feasible to administer remotely. This new protocol centered mainly on evaluating four school-based programs funded by the Boston Foundation: Build Our Kids Success (BOKS), Community Rowing, Inc. (CRI), Playworks, and Sportsmen’s Tennis and Enrichment Center (Sportsmen’s). Overall, this evaluation addressed the following key questions, using a mix of quantitative and qualitative methods:

- How many schools adopted Boston Foundation-funded PA programs, and what were the characteristics of those schools in terms of building-level demographics and PA-supportive policies and practices?
- How many children were reached by the programs?
- What dose of PA programming time did the programs provide?
- How did the COVID-19 pandemic affect programs’ implementation and effectiveness?
- How did support provided by the Boston Foundation impact the programs?

Our evaluation included analysis of two secondary data sets:

- *BPS Health & Wellness Policy Report Profiles Data*: BPS Health & Wellness provided deidentified data collected through their biannual wellness policy report process for 2017–2018 (the most recent data available), including information on PA-related environmental factors, such as the presence of PA programs, the amount of PA time provided for students, and the presence of policies that support student PA.

- *Massachusetts Department of Elementary and Secondary Education Data:* We extracted publicly available, building-level demographic data for all Boston Public Schools, enabling us to examine whether the availability of Boston Foundation-funded PA programming and other PA-related policies/practices differed by building-level student demographics.

Our evaluation also included three types of original data we collected in early 2021:

- *PA Program Staff Surveys:* This online survey of adult program staff who implement PA programming gauged perceptions of program implementation processes, minutes of PA time provided, and the impact of COVID-19 on program delivery.
- *PA Program Leadership Surveys:* This online survey of senior leaders from each PA partner program gauged the number of buildings adopting the programs, student reach, number of program staff, and the dose of programming customarily delivered, as well as the impact of the COVID-19 pandemic on these factors.
- *Key Informant Interviews:* Remote interviews conducted with senior leaders from each program provided additional qualitative insights in areas such as program reach, effectiveness, and implementation processes; the impact of COVID-19 on program operations; and the impact of Boston Foundation funding.

Finally, because we were unable to otherwise include substantive evaluation of BPS run clubs (for which Boston Foundation funding ended in 2019), we also initiated a systematic review of peer-reviewed papers exploring the impact of running programs on children's PA and fitness. This review provides context for the potential impact Boston Foundation-funded run clubs may have had on children and will also advance science through new published research.

# Secondary Data Analysis

## OVERVIEW

This analysis includes two secondary data sources: (1) BPS School Profiles data include survey data about numerous dimensions of the school physical activity environment in BPS buildings, as reported by school administrators and physical educators in 2017–18 (the most recent year or which data were available); and (2) publicly available, building-level demographic data from the Massachusetts Department of Elementary and Secondary Education (DESE), including the percentage of students with socioeconomic disadvantage, percentage of students who are of color, and percentage of students whose first language is not English.

These data were analyzed in four domains:

1. Demographic and PA-related characteristics of all Boston Public Schools
2. Adoption of Boston Foundation–funded PA programs in BPS: number of schools adopting programs and level of within-building clustering

3. Associations between demographics of Boston public schools and adoption of Boston Foundation–funded PA programs
4. Associations between PA-related policies and practices and adoption of Boston Foundation–funded PA programs

### Demographic and Physical Activity-Related Characteristics of All Boston Public Schools

To contextualize the subsequent analyses, **Table 1** describes the overall building-level demographics of all Boston public schools, including indicators of student economic status and student race-ethnicity for the district overall and for elementary versus high schools. Overall, the district mostly serves children experiencing economic disadvantage and children of color.

TABLE 1  
**SCHOOL-LEVEL DEMOGRAPHICS OF BOSTON PUBLIC SCHOOLS**

CHARACTERISTIC	ALL BPS (N=115)	ELEMENTARY AND MIDDLE SCHOOLS (N=85)	HIGH SCHOOLS (N=30)
% of students with economic disadvantage* (median, IQR)	71.2 (19.6)	69.2 (24.3)	73.6 (9.7)
% of students of color (median, IQR)	92.7 (16.1)	89.8 (17.1)	95.9 (8.8)
Total enrollment (median, IQR)	385 (327)	365 (309)	430 (374)

Source: Department of Elementary and Secondary Education

\*Defined based on whether students participated in one or more of the following programs: the Supplemental Nutrition Assistance Program (SNAP); the Transitional Assistance for Families with Dependent Children (TAFDC); the Department of Children and Families’ foster care program; and MassHealth (Medicaid).

**Table 2** describes PA-related policies and practices in BPS. Overall, elementary and middle schools tend to provide more weekly minutes of PA time than do high schools, driven largely by more minutes of recess. There are numerous opportunities to make

schools more conducive to PA by expanding opportunities before, during, and after school and promoting more universal adoption of policies known to support children’s PA (e.g., prohibiting the withholding of PA as punishment).

TABLE 2  
**PHYSICAL ACTIVITY-RELATED POLICIES AND PRACTICES IN BOSTON PUBLIC SCHOOLS**

CHARACTERISTIC	ALL BPS (N=115)	ELEMENTARY AND MIDDLE SCHOOLS (N=85)	HIGH SCHOOLS (N=30)
Mean # of TBF-Funded PA Programs (Mean, SD)	1.0 (1.2)	1.2 (1.2)	0.4 (0.8)
Mean total # of PA Programs (Mean, SD)	1.7 (1.6)	1.9 (1.7)	1.0 (1.2)
Minutes of weekly PE (Median, IQR)	66.3 (52.9)	60.0 (40.0)	110.0 (118.3)
Minutes of school PA provided weekly, excluding PE* (Median, IQR)	176.4 (128.8)	184.1 (105.4)	93.6 (180.0)
Minutes of weekly recess (Median, IQR)	100.0 (84.3)	100.4 (42.3)	0.0 (121.3)
Have Comprehensive School PA Plan (% yes)**	59.5	64.2	47.6
Have principal who encourages activity breaks (% yes)	82.4	87.3	69.0
Have budget for equipment/curriculum (% yes)	60.5	65.5	58.8
Have PE or PA professional development (% yes)	85.6	89.0	75.6
Have gym facilities (% yes)	51.3	50.6	53.3
Supportive PA Environment Score** (mean, std)	10.8 (3.8)	11.6 (2.8)	8.4 (3.8)
Certified PE teacher (% Yes)	86.4	92.7	66.7
Provide in-class activity breaks (% yes)	82.9	96.3	44.8
Provide before-school PA (% yes)	57.4	67.1	31.0
Provide after-school PA (% yes)	73.0	68.3	86.2
Have a transportation liaison to promote active travel (% yes)	50.9	54.2	41.4
Prohibit withholding PA as punishment (% yes)	50.0	54.2	37.9
Have indoor PA spaces (% yes)	76.5	78.8	70.0
Have outdoor PA spaces (% yes)	50.4	57.7	30.0

Data Source: BPS Profiles Data

\*Sum total of school-reported minutes provided for recess, classroom movement breaks, active classroom lessons, and PA-based promotional activities. Minutes were reported by grade level; values here are the mean across grade levels.

\*\*Composite score for the overall extent to which the school supports student PA. This modified version of the PASS Score<sup>17</sup> includes points for number of physical education (PE) minutes required, licensure for PE teachers, minutes of recess provided, provision of playground supervisors, opportunities for PA before/after school and in class, presence of a transportation liaison to promote active transport, policies prohibiting withholding PA as punishment, and presence of indoor and outdoor PA facilities/spaces. Range: 0-20, with higher scores denoting more supportive environments. See Appendix D for more detail.

TBF-funded = Boston Foundation-funded

## Adoption of Boston Foundation-Funded PA Programs in BPS

Table 3 shows the number of Boston Public Schools that had zero, one, two, three, and four of the Boston Foundation-funded PA programs during 2017–18, as reported by lead physical education teachers. This reflects some clustering of programs within individual buildings: Nearly half (47%) of Boston public schools had no Boston Foundation-funded programs, whereas 15% had three or more programs.

TABLE 3  
CLUSTERING OF TBF-FUNDED PROGRAMS IN BOSTON PUBLIC SCHOOLS, 2017–18

# TBF-FUNDED PROGRAMS	# SCHOOLS
0	54
1	25
2	19
3	14
4	3

Data Source: BPS Profiles Data

TBF-funded = Boston Foundation-funded

## Demographics of Boston Public Schools and Adoption of Boston Foundation-Funded PA Programs

Table 4 shows average building-level demographic characteristics of schools that did versus did not have each of the Boston Foundation-funded PA programs in 2016–17. Analyses tested whether the schools where these programs are adopted are different from non-adopting schools in terms of level of economic disadvantage among students, the proportion of students who are children of color, or the proportion of students whose first language is not English.

Overall, we found little evidence of associations between these building-level demographic factors and adoption of the PA programs. In other words, the schools reached by these programs were demographically similar to the rest of the district. The one exception was for Sportsmen’s Tennis: 39% of Sportsmen’s schools disproportionately serve students who do not speak English as a first language, compared with 49% of schools that did not have Sportsmen’s programming. The magnitude of this difference is small, however.

TABLE 4  
ASSOCIATIONS BETWEEN BUILDING-LEVEL STUDENT DEMOGRAPHICS IN BOSTON PUBLIC SCHOOLS AND ADOPTION OF TBF-FUNDED PHYSICAL ACTIVITY PROGRAMS, 2017-2018

DEMOGRAPHIC CATEGORY	BOKS			CRI			SPORTSMEN’S			PLAYWORKS		
	YES (N=44)	NO (N=72)	P	YES (N=33)	NO (N=82)	P	YES (N=16)	NO (N=99)	P	YES (N=25)	NO (N=90)	P
Mean % students with economic disadvantage	65.8	67.4	0.58	64.1	67.8	0.28	64.3	67.2	0.48	66.5	66.8	0.94
Mean % students of color	86.2	86.8	0.82	85.7	86.9	0.71	82.5	87.2	0.31	84.6	87.1	0.46
Mean % students whose first language is not English	46.5	48.2	0.62	46.9	47.7	0.83	39.0	48.9	0.03 <sup>†</sup>	46.5	47.8	0.76

Source: BPS Profiles Data, DESE Data

p-values are for results of independent-samples t-tests of differences between means

<sup>†</sup>Statistically significant at p < 0.05



## PA-Related Policies and Practices and Adoption of Boston Foundation-Funded PA Programs

We also explored differences in PA-related school policies and practices based on the extent to which schools were adopting Boston Foundation-funded programs. These analyses aim to gauge whether the PA programs are reaching schools that otherwise have supportive PA environments.

**Table 5** compares Supportive PA Environment Scores and minutes of weekly PA provided for schools that do versus those that do not have each PA program. We found that each of the four programs tended to be in buildings that had higher overall scores for supportive PA environments. However, given the cross-sectional nature of this data, it is difficult to determine causal direction—i.e., whether the

PA programs helped to make schools more supportive of PA, or if schools that were more supportive of PA tended to be more likely to adopt PA programs. Whatever the reason, this does show that these programs tend to have less presence in buildings with less general support for PA.

Conversely, there were no significant differences in the average number of PA minutes provided across recess, classroom breaks, active classroom lessons, and PA-based promotional activities. However, this may be because, given the secondary data available to us, the times incorporated into this total did not include before or after school (when BOKS, CRI, and Sportsmen’s typically operate), and Playworks focuses more on increasing the quality of recess than on increasing recess duration.

TABLE 5  
**MEAN SUPPORTIVE PA ENVIRONMENT SCORES AND MEAN MINUTES OF SCHOOL PA PROVIDED WEEKLY (IN RECESS, CLASSROOM BREAKS, ACTIVE LESSONS, AND PROMOTIONAL ACTIVITIES) IN SCHOOLS THAT HAVE VERSUS SCHOOLS THAT DO NOT HAVE TBF-FUNDED PA PROGRAMS, 2017-2018**

DEMOGRAPHIC CATEGORY	BOKS			CRI			SPORTSMEN’S			PLAYWORKS		
	YES (N=44)	NO (N=72)	P	YES (N=33)	NO (N=82)	P	YES (N=16)	NO (N=99)	P	YES (N=25)	NO (N=90)	P
Mean Supportive PA Environment Score*	12.4	9.8	0.0001 <sup>†</sup>	12.4	10.2	0.001 <sup>†</sup>	12.4	10.5	0.02 <sup>†</sup>	12.4	10.4	0.004 <sup>†</sup>
Mean Min. of School PA Provided (Weekly)**	212.0	193.7	0.47	184.1	207.2	0.34	173.1	205.2	0.26	197.7	201.4	0.88

Source: BPS Profiles Data, DESE Data

\* Composite score for the overall extent to which the school supports student PA. This modified version of the PASS Score<sup>17</sup> includes points for number of physical education (PE) minutes required, licensure for PE teachers, minutes of recess provided, provision of playground supervisors, opportunities for PA before/after school and in class, presence of a transportation liaison to promote active transport, policies prohibiting withholding PA as punishment, and presence of indoor and outdoor PA facilities/spaces. Range: 0-20, with higher scores denoting more supportive environments. See Appendix D for more detail.

\*\* Sum total of self-reported minutes provided for recess, classroom movement breaks, active classroom lessons, and PA-based promotional activities. Minutes were reported by grade level; values here are the mean across grade levels.

p-values are for results of independent-samples t-tests of differences between means. Due to skewness, the values for mean minutes of PA were transformed for the t-tests and then back-transformed for values reported in the table.

<sup>†</sup> Statistically significant at p < 0.05

**Table 6** shows the average supportive PA environment scores and minutes of weekly PA provided at schools based on the total number of Boston Foundation-funded PA programs in those schools. Similar to the findings in Table 5, our analysis showed that supportive PA environment scores were higher on average in schools that had more Boston Foundation-funded programs. Statistical significance persisted when we ran this same analysis excluding high schools ( $p=0.01$ ). It is again difficult to determine causal direction of these relationships given the cross-sectional nature of this data.

There were no significant differences in minutes of PA provided based on number of PA programs.

**Table 7** shows the average number of total Boston Foundation-funded programs in buildings that have versus do not have various types of supports for children’s PA. On average, there was a significantly greater number of Boston Foundation programs in schools that offered staff professional development on PA or PE (1.1 programs on average) compared with those that did not offer such opportunities (0.4 programs,  $p=0.004$ ). There was also a borderline-significant ( $p=0.08$ ) difference in the average number of programs in schools with gym facilities (1.2 programs) compared to those without such facilities (0.8 programs).

TABLE 6  
**ASSOCIATIONS BETWEEN SCHOOLS’ MEAN SUPPORTIVE PA ENVIRONMENT SCORES AND MEAN MINUTES OF WEEKLY PA PROVIDED (IN RECESS, CLASSROOM BREAKS, ACTIVE LESSONS AND PROMOTIONAL ACTIVITIES) AND NUMBER OF TBF-FUNDED PA PROGRAMS, 2017-2018**

PA CATEGORY	NUMBER OF TBF PROGRAMS				
	0 (N=54)	1 (N=25)	2 (N=19)	3+ (N=17)	P
Supportive PA Environment Score	9.4	11.1	12.4	12.9	0.0005 <sup>†</sup>
Min. of School PA Provided (Weekly)	195.8	211.2	242.8	154.9	0.3000

Data Source: BPS Profiles Data

p-values are for results of analysis of variance (ANOVA) comparing mean values across groups. Due to skewness, the values for mean minutes of PA were transformed for ANOVA and then back-transformed for values reported in the table.

<sup>†</sup>Statistically significant at  $p < 0.05$

TABLE 7  
**MEAN NUMBER OF TBF-FUNDED PROGRAMS IN BOSTON PUBLIC SCHOOLS WITH AND WITHOUT PA SUPPORTS, 2017-2018**

	HAVE BUDGET FOR EQUIPMENT/CURRICULUM			HAVE PE OR PA PROF. DEVELOPMENT OPPORTUNITIES			HAVE GYM FACILITIES AT SCHOOL			CSPAP PLAN DEVELOPED			PRINCIPAL ENCOURAGEMENT FOR PA BREAKS		
	YES (N=69)	NO	P	YES (N=33)	NO (N=82)	P	YES (N=16)	NO (N=99)	P	YES (N=16)	NO (N=99)	P	YES (N=25)	NO (N=90)	P
Mean # of TBF PA Programs	0.9	1.2	0.20	1.1	0.4	0.004 <sup>†</sup>	1.2	0.8	0.08	1.1	0.9	0.5	1.0	1.1	0.74

Data Source: BPS Profiles Data

p-values are for results of independent-samples t-tests of differences between means.

<sup>†</sup>Statistically significant at  $p < 0.05$

# School-Based Running Initiative Systematic Review

From 2014 to 2019, the Boston Foundation supported implementation of ChildObesity180's work to expand youth walking/running clubs in Boston. The project helped public and charter schools and community centers implement free walking/running programs, with the goal of adding incremental PA. During its final year, the initiative reached 80+ sites, with more than 10,000 students participating. During each program year, run club coaches completed surveys regarding program implementation and results. ChildObesity180 published a peer-reviewed article using these survey findings to share learnings and best practices from the project to help other schools and districts to implement such initiatives.<sup>18</sup>

Our run club surveys provided encouraging evidence about children's PA and improvements in fitness, as reported by coaches; however, such self-reported data can be prone to bias. Our original protocol for this research (which had been planned for Spring 2020) included more rigorous, accelerometer-based evaluation of children's PA in Boston run clubs and other Boston Foundation-funded programs. However, that protocol was discontinued due to school closures and limitations on human subjects research. When our new protocol was implemented in 2021, we no longer had a sufficient understanding of which run clubs were still in place to include run club programs in the study.

As an alternative way of understanding the impact of run clubs on children's PA and health, we conducted a systematic review of prior studies testing the effect of such running initiatives. Our two research questions were:

1. What is the effect of youth running initiatives on children and adolescents' objectively measured PA?
2. What is the effect of youth running initiatives on children and adolescents' cardiorespiratory fitness (CRF)?

The systematic review followed the 2020 Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines.<sup>19</sup> Our search process yielded 8,330 titles and abstracts to review. After inclusion and exclusion criteria were applied, the final sample included 17 articles on controlled intervention trials: 12 articles assessed only CRF outcomes, three studies measured both PA and CRF outcomes, and two only evaluated PA outcomes.

The systematic review findings are currently being prepared for a peer-reviewed journal submission. Preliminary findings include the following:

- Ten out of 15 CRF-related studies demonstrated a significant effect on CRF.
- Three out five studies demonstrated statistically significant improvements in PA levels.

- A small number of studies explored differences in effects for boys versus girls; some studies showed that boys had significantly greater increases in PA compared to girls, but changes in CRF-related outcomes were similar for boys and girls overall.
- Few studies explored subgroup differences along dimensions like race-ethnicity, socioeconomic status, or weight status; future research should address this gap.

Overall, this evidence suggests that school-based running programs, similar to those supported in BPS, may have a modest but significant positive effect for children's PA and CRF. Additional studies are needed to explore whether those benefits differ based on child characteristics like sex, race-ethnicity, or weight status. ChildObesity180 plans to complete this review and submit it for review to a scientific journal by the end of 2021.

# Physical Activity Program Staff Survey

## OVERVIEW

The Physical Activity Program Staff Survey (Appendix A) consisted of 22 questions, including items regarding the perceived gender distribution of child participants, amount of PA programming provided (e.g., weeks of programming, days per week, active minutes per session), and spaces where programming was provided, both pre-pandemic (Fall 2019) and during the pandemic (Fall 2020). It also included items regarding perceptions of the impact of COVID-19 on program delivery. The survey was approved by both the Tufts

University Institutional Review Board and the BPS Office of Data Accountability (ODA).

The ODA requires that school administrators provide approval before any study subjects in their buildings are recruited. Of the 32 administrators approached, 23 (72%) provided approval; 19 coaches were not school employees and therefore did not require administrator approval. In February and March 2021, we recruited 42 PA program coaches and had a response rate of 62% (n=26).

**Table 8** provides descriptive statistics of the individuals who responded to the survey.

TABLE 8  
**CHARACTERISTICS OF STAFF WHO RESPONDED TO THE COACH SURVEY (N=26)**

CHARACTERISTIC	%	N
<b>PROGRAM</b>		
BOKS	46	12
Community Rowing, Inc.	12	3
Playworks	38	10
Sportsmen's Tennis and Enrichment Center	4	1
<b>TIME COACHING THE PROGRAM</b>		
1 year	31	8
2 years	23	6
3 years	19	5
4+ years	27	7
<b>ROLE RELATIVE TO PROGRAM</b>		
Program staff member	69	18
Physical education teacher	12	3
Other school staff	12	3
Other roles	8	2

**Table 9** and **Table 10** include data only for survey respondents who served as coaches in both 2019 and 2020. These tables compare coaches' perceptions of the gender distribution of participants, the amount of programming provided, and program delivery spaces from pre-pandemic to during the pandemic. Given the survey's small sample size and limited statistical power, we do not include results of tests of statistical significance.

The perceived gender distribution of participants was relatively stable, though girls were slightly underrepresented both before and

during the pandemic. Nearly all dimensions of program dose decreased from 2019 to 2020, including number of weeks, number of days per week, and number of minutes per session. However, coaches perceived relative stability in the percentage of programming time that children were active, with coaches reporting that kids were moving about two-thirds of the time both before and during the pandemic. It is worth noting, however, that such coach-reported data on the proportion of time children were active is likely prone to bias.

TABLE 9  
**CHANGES FROM FALL 2019 (PRE-PANDEMIC) TO FALL 2020 (MID-PANDEMIC) IN COACH-REPORTED GENDER COMPOSITION OF PARTICIPANTS AND DOSE OF PA PROGRAMMING PROVIDED (N=17)**

ATTRIBUTE OF PROGRAMMING	2019 MEAN (SD)	2020 MEAN (SD)
<b>PARTICIPANT GENDER</b>		
% girls	41.1 (12.6)	38.6 (17.6)
<b>AMOUNT OF PHYSICAL ACTIVITY</b>		
Weeks of programming	12.4 (5.2)	9.3 (6.2)
Days per week	3.5 (1.4)	2.5 (1.9)
Average minutes/session (N=16)	43.8 (11.3)	33.2 (21.0)
Minutes active (N=16)	30.7 (11.8)	22.8 (15.8)
% time active (N=14)	71.2 (23.7)	67.7 (20.3)
Total dose (weeks x days x active minutes)	1479 (793.5)	661.9 (605.4)



**Table 10** shows changes in the spaces that were used for program delivery. Prior to the pandemic, the main spaces used included typical school spaces like gymnasiums, playgrounds, multipurpose rooms, blacktop areas, and classrooms. During the pandemic, delivery shifted mainly to distance options (e.g., remote delivery platforms and recorded

video); to the extent programming was still held in schools, it was mostly in outdoor spaces, like playgrounds and blacktop areas. These findings emphasize the extent to which programs pivoted to new delivery models during the pandemic so they could continue serving children despite challenges like school closures.

TABLE 10  
**CHANGES FROM FALL 2019 (PRE-PANDEMIC) TO FALL 2020 (DURING PANDEMIC)  
 IN SPACES/CHANNELS USED FOR PROGRAM DELIVERY (N=17)**

SPACE/CHANNEL	2019 %	2019 N	2020 %	2020 N
Gymnasium	65%	11	11%	2
Multipurpose room/cafeteria	53%	9	11%	2
Blacktop area	47%	8	17%	3
Grassy field	18%	3	0%	0
Playground	65%	11	28%	5
Classroom	35%	6	11%	2
Trailers/mobile building	6%	1	0%	0
Community center	6%	1	6%	1
Live remote delivery platform (e.g., Zoom, Google hangouts)	12%	2	72%	12
Recorded video	0%	0	22%	4
Other	12%	2	11%	2

**Table 11** shows the proportion of coach respondents who agreed with statements about the impact of the pandemic on various aspects of program delivery. Coaches generally recognized that the pandemic had decreased program reach, with only about a quarter of participants agreeing that the program reached as many children as it would have without the pandemic.

Fewer than half of respondents agreed that they were able to deliver programming as it was intended, and only about one in five agreed that the program was as effective at getting kids moving as it would have been without the pandemic. Although most coaches

believed that they were able to deliver remote lessons successfully, only about a third agreed that children had the space and equipment they needed to participate in remote activities successfully.

Only about half of participants agreed that the pandemic made them feel uncertain about how programming would be delivered in the coming months; this may be related to the fact that the survey was administered relatively late in the pandemic (early 2021), by which point programs may have reached a greater level of stability and predictability with program delivery.

TABLE 11  
**COACH PERCEPTIONS OF THE IMPACT OF THE COVID-19 PANDEMIC ON PHYSICAL ACTIVITY PROGRAM DELIVERY IN BOSTON PUBLIC SCHOOLS (N=26)**

STATEMENT	% AGREE OR STRONGLY AGREE
During the pandemic, program is able to reach as many children as it would have been without the pandemic.	23%
During the pandemic, programming is as effective at getting kids physically active as it would have been without the pandemic.	19%
During the pandemic, I am able to deliver program activities or lessons as they were intended to be delivered.	42%
The pandemic makes me feel uncertain about how I will be delivering programming in the coming months.	58%
During the pandemic, I have been able to successfully deliver program activities or lessons remotely.	81%
During the pandemic, our participants had the physical space and equipment (e.g., technology) to engage with activities or lessons remotely.	31%

# Physical Activity Program Leadership Survey

## OVERVIEW

The Physical Activity Program Leadership Survey consisted of 12 questions about the number of Boston Public Schools adopting programming, student-level program reach, the number of program staff, and the amount of programming delivered (e.g., number of weeks, number of days/week) in a typical program year. It also explored the impact of COVID-19 on some of these items. The survey instrument is included in Appendix B.

Program leaders were recruited to participate in the survey in January and February of 2021. Eight leaders from participating PA programs were recruited, with a response rate of 63% (n=5). At least one survey was completed for each of the Boston Foundation-funded PA programs. For one program, two leaders completed the survey, and the responses for those leaders were averaged, so that only one set of values were used for that program in our analyses.

TABLE 12  
**MEAN NUMBER OF BPS SITES AND STUDENTS SERVED AND NUMBER OF PAID PROGRAM STAFF FOR TBF-FUNDED PHYSICAL ACTIVITY PROGRAMS, 2015-2020**

	2015-2020 AVG. PER YEAR	FALL 2019	FALL 2020
Mean # of BPS sites served (SD and range)	34 (24, 8 – 65)	30 (26, 5 – 65)	13 (16, 0 – 34)
Mean # of BPS students served (SD and range)	5,663 (6,341, 1,050 – 15,000)	4,444 (5,797, 175 – 13,000)	2,733 (4,584, 0 – 9543)
Mean # of paid staff (SD and range)	43 (59, 8 – 130)	40 (60, 4 – 130)	15 (18, 0 – 40)

Table 12 shows the average number of BPS sites and students served on average from 2015 to 2020, as well as in Fall 2019 compared with Fall 2020. On average, the programs had broad reach in BPS during this time and had sizeable staffs to support program delivery. However, there was substantial drop-off from pre-pandemic to mid-pandemic in terms of schools and students reached and number of paid staff.

Table 13 shows the mean program duration, days per week programming was provided, and length of program sessions from 2015 to 2020. On average, schools provided a high program dose, with programming offered for

most of the academic year and most days per week and each session averaging about an hour and a half in length.

TABLE 13  
**MEAN PROGRAM DURATION, NUMBER OF DAYS PROGRAMMING WAS OFFERED EACH WEEK, AND LENGTH OF PROGRAM SESSIONS, 2015-2020**

DIMENSION OF DOSE	MEAN (SD, RANGE)
Mean weeks of program duration per school year	27 (7, 19-35)
Mean days per week program offered	4 (1, 3-5)
Mean length of program session in minutes	98 (101, 40-250)

# Key Informant Interviews

## OVERVIEW

To complement the quantitative data analyses conducted with secondary data and original survey data, key informant interviews were conducted with program leaders via Zoom to gain additional qualitative insights. These interviews explored perceptions around programs' building- and child-level reach and effectiveness, implementation processes and barriers, and perceptions around the programs' partnerships with the Boston Foundation. The interview script is included in Appendix C. All methods were approved by the Tufts University IRB.

Two senior leaders from each of the four participating programs, all with director- or manager-level positions, were recruited to participate, and all eight leaders agreed. Interviews occurred in January 2021.

In emails prior to the interview and during the interview itself, we emphasized that results would be fully anonymized to encourage participants to provide candid responses. Upon completion of all interviews, interviews were transcribed. The transcriptions were reviewed independently by two researchers and themes were then determined by consensus. One researcher then re-reviewed the transcripts and coded them for those themes using NVivo.

**Tables 14–19** summarize key themes and representative quotations in five different areas: program adoption and reach, program delivery, barriers to implementation, program effectiveness, and the impact of programs' relationship to the Boston Foundation. The numbers accompanying each quotation are codes for the interviewees.

TABLE 14

## KEY THEMES FROM INTERVIEWS WITH PHYSICAL ACTIVITY PROGRAM LEADERS REGARDING PROGRAM ADOPTION AND REACH

THEME	REPRESENTATIVE QUOTATION
<i>During typical years, programs prioritize reaching schools with high levels of disadvantage and schools with limited existing programming.</i>	<ul style="list-style-type: none"> <li>• On average, about 80% of the students we serve are considered high need. And Massachusetts Department of Elementary and Secondary Education defines that as anything from economically disadvantaged to SEL or EL learner or special needs. (6)</li> <li>• We want to go where we can make the most difference, especially where kids may have limited access to [programming]. A lot of times, that means that schools have a need to increase the physical activity because of whether it be rates of obesity in their community or their schools, or poverty, or lack of access to other programs. (1)</li> </ul>
<i>Programs added almost no new schools during the pandemic, and there was substantial falloff in terms of returning schools</i>	<ul style="list-style-type: none"> <li>• We have not had any new schools coming on board this year. (3)</li> <li>• I'd say about half of the schools are still doing [Program]. (7)</li> <li>• A lot of what COVID has done has impacted our ability to deliver our services, which has meant we have fewer partners than we had previously. (5)</li> </ul>
<i>Schools with which programs had a long history of engagement were more likely to continue adopting programs through the pandemic</i>	<ul style="list-style-type: none"> <li>• Schools that have been with [Program] for a long time, where we have established relationships with principals and with PE teachers, those are the schools where we've seen a lot of people still return to [Program]. (7)</li> <li>• We've been there so long that we're almost looked at as being part of a school structure. So, they incorporate us in conversations that they might not have included us in if we were a brand-new partner. (3)</li> <li>• That's probably the biggest pattern, to be honest, is that there's just been a consistency of working with those schools for a long time. And so they trusted our ability to adapt this year and that they would want us to continue there in the future. (5)</li> </ul>
<i>Due to the pandemic, there were substantial decreases in the number of children reached overall</i>	<ul style="list-style-type: none"> <li>• I think that the cuts that we made as an organization and the limits that we had to impose on the numbers of people in the building, those were the biggest impact on the number of kids served. (1)</li> <li>• I'm going to say the long trend is, it's reduced so greatly because so much of our work was within the school and being able to work on the school site and a lot of the additions like field trips. (2)</li> <li>• In the summer, typically, we have 400 people [in programming space], and this summer we had 40 people [in programming space]. (2)</li> <li>• Through the applications, the 27 schools gave us just over 10,000 kids they expected to participate. Through our first round of grantee reports they told us 4,800 were participating, so, definitely less than 50% of what they thought would be. And just looking at their grant reports, from what they told us, a lot of it is just heavy screen time, getting kids on board, and finding the right way to incentivize them and bring up engagement seem to be part of the issues that they were seeing. (8)</li> </ul>
<i>Children with special needs were particularly challenging to reach during the pandemic</i>	<ul style="list-style-type: none"> <li>• We serve kids with disabilities under the program too and for a lot of reasons, transportation and otherwise, those numbers are way off. So, kids with disabilities, I think were probably impacted the most... To expect students with disabilities to follow every code guideline in person—we heard from families that that was probably a lot. (1)</li> </ul>

TABLE 15

## KEY THEMES FROM INTERVIEWS WITH PHYSICAL ACTIVITY PROGRAM LEADERS REGARDING PROGRAM DELIVERY

THEME	REPRESENTATIVE QUOTATION
<i>Programs transitioned from in-school delivery to delivery in non-school sites or to virtual delivery</i>	<ul style="list-style-type: none"> <li>• We're working with a few non-school sites to provide a similar type of experience and we're starting to get some traction, but that took a tremendous amount of phone calls and approvals and permissions. (1)</li> <li>• In addition to just fundamentally changing our program, implementation is shifting from an in-person provider working with the space of whatever size blacktop that school has, we are now just doing it completely differently. The bulk of the work needs to maximize that remotely in the virtual setting to make it a fun, safe, inclusive, and active space for kids. (6)</li> </ul>
<i>Programs provided flexibility with implementation to ensure programming could continue to be delivered</i>	<ul style="list-style-type: none"> <li>• We're really trying to move away from the thought of prescribing these rigid lesson plans and really just providing resources for anyone to use as they see fit. (7)</li> <li>• This has forced us in a really good way to be much more creative and deliver new fresh content that's relevant now. (8)</li> </ul>
<i>Remote delivery did not fully replicate the experience of in-person programming</i>	<ul style="list-style-type: none"> <li>• We lost the ability to do some of the kinds of things virtually that we did with our direct participants that we couldn't do with school-based participants. You're trying to figure out who's going to dial in today. Who's going to log in? How do you keep them engaged? They don't have the same equipment in front of them. (3)</li> <li>• There are pieces that we aren't able to do in a virtual setting. Some of the things around culture and community are just not as possible virtually. (5)</li> <li>• Kids are not always turning their cameras on.... [When] you're in person... you can see which kids are participating [and] who maybe needs a little extra support. It's not always that easy over camera. (7)</li> </ul>
<i>Participants reported various program innovations, including remote delivery, take-home kits, activities that don't require equipment, and new methods for engaging families; these innovations are likely to persist into the future</i>	<ul style="list-style-type: none"> <li>• We've done Facebook Live [programming], we've done the weekly games, we've done the drop-in sessions, a family night and I think those things are here to stay and we'll continue to do that. And we'll use the virtual space as a way to promote it and to have direct access to that. (5)</li> <li>• That's one thing that we hope to maintain is continuing to send home resources that the kids can do to play at home with their families, and to continue to provide more and more resources to families so that they have that access too. (6)</li> <li>• Our biggest win in terms of future implementation is the fact that we've created all these resources that remove barriers, they remove equipment, they removed time constraints, and so I think they'll be much easier for all schools to implement moving forward. (7)</li> <li>• We quickly pivoted to create more digital program activities that were geared towards individuals working in that hybrid remote environment. (8)</li> </ul>

TABLE 15 continues next page



TABLE 15 continued

THEME	REPRESENTATIVE QUOTATION
<i>Participants expressed overall confidence in their programs' ability to rebound from the pandemic and implement programming successfully</i>	<ul style="list-style-type: none"> <li>• I have every reason to believe that we will, if anything, have a broader reach than what we've had in the past because of the fact that there will be more schools that will be open to this kind of environment. (3)</li> <li>• I'm highly optimistic. And the reason I feel that way is, I think people care about kids and making sure that they have the resources and tools and people in their lives that are going to help them physically, socially, emotionally. (6)</li> <li>• I'm very confident that we'll be able to continue with an improved impact and my hope is that we will continue to impact more schools, because of our increased flexibility. (7)</li> </ul>
<i>After the pandemic, programs may have a particular need to train staff in trauma-informed delivery</i>	<ul style="list-style-type: none"> <li>• We feel very confident in our ability to train coaches, hire coaches, put them in schools, but I do think there'll be challenges around mental health and trauma and things that are a result of COVID that we maybe haven't had to tackle before and potentially might need additional training for our staff on how to handle those things. (5)</li> <li>• I think there are severe supports needed for trauma and anxiety and depression that kids are facing ... So, if students have dealt with trauma, we're going to have to make sure we have a whole series on trauma-informed practices and how to modify our programming to support students in new ways. (6)</li> </ul>

TABLE 16

### KEY THEMES FROM INTERVIEWS WITH PHYSICAL ACTIVITY PROGRAM LEADERS REGARDING BARRIERS TO PROGRAM DELIVERY

THEME	REPRESENTATIVE QUOTATION
<i>Complicated COVID restrictions (e.g., capacity limits, sanitation protocols) reduced capacity and slowed delivery</i>	<ul style="list-style-type: none"> <li>• Right now, with what's going on, more of the guidance and direction is coming from the district level than from the individual schools. So, we're sort of trying to adjust and figure out what that's going to look like. (3)</li> <li>• Are they tested, are they not tested, are they going to be safe to the community? We can't bring in extra people and the equipment they're using and when we have to bring in equipment, everything being wiped down if other kids are going to use it. There are so many other pieces now to it that you never really thought about before. (4)</li> </ul>
<i>COVID-related uncertainty made planning difficult</i>	<ul style="list-style-type: none"> <li>• Because there's just so much uncertainty, it seems like every time you create a plan and you get halfway through the planning process, there was a change in what's going to be allowed. And so we sort of start back from square one. (3)</li> <li>• The uncertainty around how schools would actually be implemented this fall has decreased the number of school partners that we decided to partner with now. (6)</li> </ul>
<i>Increased competition with academic priorities made it difficult to convince some schools to support program delivery</i>	<ul style="list-style-type: none"> <li>• Rightly so, the emphasis of course is on academics. So I think it was hard enough to get people to recognize the importance of physical activity, of quality physical activity, when it was easy to do in the school system. Now, when you have the situation where you're trying to convince the school leadership to invest in physical activity, I think it's even that much more challenging really to get the time allocated and the resources allocated for physical activity. (3)</li> <li>• Some schools more than others have been willing to let us pop into a class that might be technically during their academic time. Others have said, nope, we need academic hours during all of this and you're not allowed to pop into any of that at all. (5)</li> </ul>

TABLE 16 continues next page

TABLE 16 continued

THEME	REPRESENTATIVE QUOTATION
<i>Some students had limited access to technology, complicating remote delivery</i>	<ul style="list-style-type: none"> <li>• Virtual learning is not working in low-income communities. That's just my opinion. I think that there are very few schools and families that were able to pivot successfully consistently. (3)</li> <li>• The technology piece and essentially just rolling out getting kids the technology that they need to actually access programming was pretty slow. (5)</li> </ul>
<i>Some programs experienced resistance to programming delivered via screens</i>	<ul style="list-style-type: none"> <li>• We've had some schools that have said we want to prioritize breaks as being away from a computer and consequently they didn't feel like the additional virtual [programming] was going to be as beneficial for their school. (5)</li> <li>• We had a lot of schools that said we love [Program], we'd love to offer [Program] in person. However, the feedback we're getting from families and our teachers is that we want to maximize our on-screen time and allow our kids to have breaks off-screen and so for those schools, we had to hit pause. (6)</li> </ul>

TABLE 17  
KEY THEMES FROM INTERVIEWS WITH PHYSICAL ACTIVITY PROGRAM LEADERS REGARDING  
**PROGRAM EFFECTIVENESS AND IMPACT**

THEME	REPRESENTATIVE QUOTATION
<i>Program leaders believe that their programs increase children's physical activity both now and into the future</i>	<ul style="list-style-type: none"> <li>• We are increasing the percentage of kids that are meeting those benchmark goals of the amount of moderate to vigorous physical activity they're getting. (3)</li> <li>• It is not just for the sake of [sport] that we do this, but we also want to make sure that students are getting the physical activity and exercise that they need and also developing healthy lifestyles because this is something that they can use in the future. (4)</li> </ul>
<i>Program leaders believe that their programs confer benefits for school attendance and academic performance</i>	<ul style="list-style-type: none"> <li>• The basic steps that we always talk about is we want to help with high school graduation, and college acceptance, college attendance, and help college graduation...we have, I think, over 95% college attendance and a similar rate of high school graduation. (2)</li> <li>• I certainly think having movement breaks and having kids get a chance to take a break and play and move is probably benefiting them academically as well. (5)</li> <li>• At [Program] schools, we actually see an increase in attendance rate because I think there's that joy of play and that kids are feeling safe and included. (6)</li> </ul>
<i>Program leaders believe that their programs confer social-emotional benefits and inter-personal connection, which may be especially important during the pandemic</i>	<ul style="list-style-type: none"> <li>• We talked about promoting positive school culture, so decreasing bullying, increases in positive language you might hear on the playground, changing the way students resolve conflicts with each other by teaching conflict resolution. (5)</li> <li>• The social, emotional, and physical health benefits that [Program] can offer their school is a fundamental component. (6)</li> <li>• We know that in some regard [Program] is providing...a social component that we know is missing in virtual learning. (7)</li> </ul>

TABLE 18  
**KEY THEMES FROM INTERVIEWS WITH PHYSICAL ACTIVITY PROGRAM LEADERS REGARDING  
 PROGRAM STAFFING AND BUDGET**

THEME	
<i>During the pandemic, programs experienced budgetary decreases due to reduced dollars from funders and from other revenue sources</i>	<ul style="list-style-type: none"> <li>• Overall, our organization struggled because one other facet is revenue base to cover a lot of the other programming and that revenue didn't come in. So, a lot of our projections were really twisted upside down. (2)</li> <li>• There were some cuts in funding, mostly due to some of our other funders having to freeze their budget. (7)</li> </ul>
<i>Flexible funding was essential to sustain organizational health through the pandemic</i>	<ul style="list-style-type: none"> <li>• The best thing has been for us the funders who have said, as long as you can keep serving the mission, you can be flexible. If you need to spend it on the electric bill, spend it on the electric bill. So that has helped us tremendously. (1)</li> <li>• And then there were some funders, like the Boston Foundation, who released a lot of their restrictions on their grants. And so we were able to say we have this funding, we're still providing the programming, we're not spending the funding the same way. So we're able to use some of that funding to provide... to sort of augment what we're doing with staff to keep them whole, and to keep them engaged. (3)</li> </ul>
<i>Programs experienced decreases in the number of staff due to budget cuts and other COVID-related issues</i>	<ul style="list-style-type: none"> <li>• The main impact that COVID has had on us is the massive reductions in staff. (1)</li> <li>• We're struggling a little bit right now, we're down staff and not by choice. I think the pandemic has had varying impacts on people. There are some folks that have been devastated by the loss of revenue. There are other folks that have said, you know what, I was trying to decide whether to stop working, go back to school and maybe the decision was made for me. (3)</li> <li>• So we went from having at least two [Program] trainers at each school to maybe one, sometimes two. And again, that's with a little more than half of the schools that we were impacting previously. (7)</li> </ul>

TABLE 19

KEY THEMES FROM INTERVIEWS WITH PHYSICAL ACTIVITY PROGRAM LEADERS REGARDING  
**THE IMPACT OF THEIR RELATIONSHIP WITH THE BOSTON FOUNDATION**

THEME	REPRESENTATIVE QUOTATION
<p><i>TBF funding enabled PA programs to expand their overall reach, especially to schools and children with socioeconomic disadvantage</i></p>	<ul style="list-style-type: none"> <li>• I felt like they gave us a lot of support to pursue growing our program. Getting to work with more schools, they were a huge support. (2)</li> <li>• I would say that the Foundation has allowed us to provide access to healthy quality physical activity that would have been lacking for hundreds if not thousands of students. (3)</li> <li>• The Boston Foundation funds us so that we're able to absorb most of the costs, and in a few cases we have stopped all the costs, and we come there for free and it's only through funding from the Boston Foundation. (4)</li> <li>• I think the funding that we received from TBF definitely helps offset costs for our schools...Particularly right now budgets are really tough with schools and so that funding is incredibly important as we look at how much can schools really afford to pay for programming like ours. (5)</li> </ul>
<p><i>The multi-year commitment from TBF and flexibility of the funding provided critical stability in general, and particularly through the pandemic</i></p>	<ul style="list-style-type: none"> <li>• The ability of a grant-making organization to give multi-year commitments is a huge relief. We wouldn't have probably been able to launch it to the scale that we did without knowing that we had some long-term funders really supporting what we were trying to do. (1)</li> <li>• We unfortunately had budget cuts due to COVID...we had very minimal funding into the [Program], which goes directly to schools, so we did have to heavily rely on external partners like the Boston Foundation to help continue to provide that funding for us. (8)</li> </ul>
<p><i>Programs' relationship with TBF pushed them to be more strategic and innovative</i></p>	<ul style="list-style-type: none"> <li>• Our work with the Boston Foundation has really helped us be more thoughtful and reflective about the practice, especially as we scaled up ... It helped us both design and reflect on what going to scale meant for us and ... how effective we were being and how we might change things. (1)</li> <li>• Their continued support has allowed us to continue to innovate and find new ways to get kids active. They not only have supported our expansion and serving our schools, but also the creation of these new programs and new supports for students in school. (6)</li> </ul>

# Strengths and Limitations

Some strengths of our study include a mixed-methods design encompassing data gathered from diverse stakeholders, including PA program leaders, coaches, and school administrators and staff. In addition, despite school closures and restrictions on human subjects research, we were able to develop a feasible study design that tested novel and timely research questions. We believe that these analyses yielded a variety of useful findings for the Boston Foundation and participating programs. These findings also have the potential to contribute to the peer-reviewed research literature; for example, there are, to our knowledge, no prior studies that have evaluated the impact of the COVID-19 pandemic on multiple school-based PA programs.

Limitations of our study include our reliance on self-reported data, which raises the potential for various types of bias (e.g., social desirability bias and recall bias). We also had small sample sizes for some components of the research, particularly the surveys and key informant interviews, though we believe these data nonetheless provide a useful understanding of these programs. This research drew upon validated survey instruments to the extent possible; however, particularly given our interest in exploring questions related to the COVID-19 pandemic, we had to develop some instruments or individual questions that were new and not validated. Finally, the cross-sectional nature of our data limits the potential to draw causal inferences.



These findings have the potential to contribute to the peer-reviewed research literature; there are no prior studies that have evaluated the impact of the COVID-19 pandemic on multiple school-based PA programs.

# Opportunities

The findings from this project reflect a number of potential opportunities for the future:

- Boston Foundation-funded PA programs have broad, equitable reach in BPS and appear to have a positive impact on children’s PA and general well-being. Although program leaders expressed general optimism for their ability to rebound from COVID, they suffered significant cuts in budgets and staffing as well as decreases in the amount of programming they were able to provide. **The programs may need supports to ensure they are able to fully return to normal operations.**
- Our findings showed that Boston Foundation-funded programs tend to reach schools with environments that are supportive of PA more generally. It may be that such schools are more responsive to adopting PA programs. However, **finding ways to reach schools that have less supportive environments might help ensure more even distribution of PA opportunities across the BPS district.**
- Survey data suggested that, overall, participating coaches perceived girls to be slightly under-represented in these PA programs both before and during the pandemic. These data should be interpreted somewhat cautiously given the small sample size and reliance on self-report; furthermore, our limited sample size constrained our ability to explore whether this same pattern held true for all four programs individually. Still, **programs may benefit from examining the gender distribution of participants and ensuring they are equitably engaging girls.** This is particularly important given research evidence showing that girls tend to be less physically active than boys on average and may therefore have particular need for these types of programs.
- Survey data and key informant interviews showed that PA programs innovated during the pandemic with developments like remote delivery models, take-home kits, equipment-free activities, and family engagement strategies. These **innovations appear to have potential to persist into the future and to reach children and families in novel ways.**
- **Programs may benefit from securing new sources of long-term, flexible funding.** Such funding both enables innovation in normal times and supports organizational health through shocks like the COVID-19 pandemic. Grantmaking organizations should be aware of the critical importance of such funding for programs like these.
- Few studies have explored whether PA programs equitably impact children along dimensions like race-ethnicity, socioeconomic status, and weight status; **future research exploring such equity-related questions would make a valuable contribution to the literature.**



# References

1. Chaput J-P, Willumsen J, Bull F, et al. 2020 WHO guidelines on physical activity and sedentary behaviour for children and adolescents aged 5–17 years: summary of the evidence. *Int J Behav Nutr Phys Act.* 2020;17(1):141. doi:10.1186/s12966-020-01037-z
2. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. 779.
3. Murray K, Placidi E, Schuring EA, et al. Aerated drinks increase gastric volume and reduce appetite as assessed by MRI: a randomized, balanced, crossover trial. *Am J Clin Nutr.* 2015;101(2):270-278. doi:10.3945/ajcn.114.096974
4. Physical Activity Guidelines for Americans, 2nd edition. 118
5. Troiano RP, Berrigan D, Dodd KW, Mâsse LC, Tilert T, Mcdowell M. Physical Activity in the United States Measured by Accelerometer. *Med Sci Sports Exerc.* 2008;40(1):181-188. doi:10.1249/mss.0b013e31815a51b3
6. Park Y, Guldmann J-M. Understanding disparities in community green accessibility under alternative green measures: A metropolitan-wide analysis of Columbus, Ohio, and Atlanta, Georgia. *Landsc Urban Plan.* 2020;200:103806. doi:10.1016/j.landurbplan.2020.103806
7. Vander Ploeg KA, Maximova K, McGavock J, Davis W, Veugelers P. Do school-based physical activity interventions increase or reduce inequalities in health? *Soc Sci Med.* 2014;112:80-87. doi:10.1016/j.socscimed.2014.04.032
8. Kerr C, Smith L, Charman S, et al. Physical education contributes to total physical activity levels and predominantly in higher intensity physical activity categories. *Eur Phys Educ Rev.* 2018;24(2):152-164. doi:10.1177/1356336X16672127
9. Caputo EL, Reichert FF. Studies of Physical Activity and COVID-19 During the Pandemic: A Scoping Review. *J Phys Act Health.* 2020;17(12):1275-1284. doi:10.1123/jpah.2020-0406
10. Hoffman JA, Miller EA. Addressing the Consequences of School Closure Due to COVID-19 on Children's Physical and Mental Well-Being. *World Med Health Policy.* 2020;12(3):300-310. doi: <https://doi.org/10.1002/wmh3.365>
11. Dooley DG, Bandy A, Tschudy MM. Low-Income Children and Coronavirus Disease 2019 (COVID-19) in the US. *JAMA Pediatr.* 2020;174(10):922. doi:10.1001/jamapediatrics.2020.2065
12. Dorn E, Hancock B, Sarakatsannis J, Viruleg E. COVID-19 and learning loss—disparities grow and students need help. 12
13. Dunton GF, Do B, Wang SD. Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the U.S. *BMC Public Health.* 2020;20(1):1351. doi:10.1186/s12889-020-09429-3

14. Tulchin-Francis K, Stevens W, Gu X, et al. The impact of the coronavirus disease 2019 pandemic on physical activity in US children. *J Sport Health Sci*. Published online February 28, 2021. doi:10.1016/j.jshs.2021.02.005
15. An R. Projecting the impact of the coronavirus disease-2019 pandemic on childhood obesity in the United States: A microsimulation model. *J Sport Health Sci*. 2020;9(4):302-312. doi:10.1016/j.jshs.2020.05.006
16. Hatfield DP, Chomitz VR. Increasing Children's Physical Activity During the School Day. *Curr Obes Rep*. 2015;4(2):147-156. doi:10.1007/s13679-015-0159-6
17. McKenzie TL, Lounsbery MA. Physical Activity School Score Background and Technical Manual.
18. Schultz DJ, Hatfield DP, Economos CD. Implementing Successful School Run Clubs: Lessons Learned from a District-level Initiative in Boston Public Schools. *J Phys Educ Recreat Dance*. 2019;90(2):31-42. doi:10.1080/07303084.2018.1546631
19. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. doi:10.1136/bmj.n71

## Appendix A:

# PA Program Staff Survey

1. What is your role relative to [PA program name]?
  - [PA Program name] staff member
  - Physical education teacher
  - Classroom teacher
  - Other school staff
  - Parent
  - Other (please explain)
2. Including the current academic year, how many years have you led [specific PA program]?
  - 1 year (this is my first year)
  - 2 years
  - 3 years
  - 4 years
  - 5 or more years

[Skip logic: If question 2 = 1 year, skip to Question 10]

For the next items, please reflect back on delivery of [program name] programming in Fall (September-December) 2019.

3. In Fall 2019, approximately what proportion of Boston Public School [program name] participants were girls?
  - 0-20%
  - 21-40%
  - 41-60%
  - 61-80%
  - 81-100%
4. Please mark all spaces/channels that you used to deliver [program name] programming to Boston Public School students in Fall 2019 (check all that apply)
  - Gymnasium
  - Multipurpose room/cafeteria
  - Blacktop area
  - Grassy field
  - Playground
  - Classroom
  - Trailers/mobile building
  - Community center
  - Live, remote delivery platform (e.g., Zoom, Google Hangouts)
  - Recorded video
  - Other [please explain, open field]

5. On average, across all sites with which you worked, how many weeks was the program active in fall 2019? [Numeric field with a maximum of 20 weeks]
6. On average, during the weeks your program was active, how many days per week did your program meet in Fall 2019? [Numeric field with maximum of 7 days]
7. On average, what was the scheduled length of a typical program session in Fall 2019?  
\_\_\_\_\_ scheduled minutes

Questions 8. And 9. Ask about the average actual minutes reported in question 8. The sum of minutes for these items should equal the number of minutes reported in question 8.

8. In Fall 2019, during a typical program session, think about how **long** most students were typically physically inactive, such as while receiving instructions or waiting for a turn. Estimate the number of total minutes students were typically **lying down, sitting, or standing**. \_\_\_\_\_ minutes per session (Provide the average)
9. In Fall 2019, during a typical program session, think about how **long** most students were physically active at least to the intensity level of a moderately paced walk. Estimate the number of total minutes students were engaged in **moderate to vigorous physical activity**. \_\_\_\_\_ minutes per session (Provide the average)

For the next items, please reflect on delivery of [program name] programming in Fall (September-December) 2020.

10. In Fall 2020, approximately what proportion of Boston Public School [program name] participants were girls?
  - 0-20%
  - 21-40%
  - 41-60%
  - 61-80%
  - 81-100%
11. Please mark all spaces/channels that you used to deliver [program name] programming to Boston Public Schools students in Fall 2020 (check all that apply)
 

<input type="checkbox"/> Gymnasium	<input type="checkbox"/> Community center
<input type="checkbox"/> Multipurpose room/cafeteria	<input type="checkbox"/> Live, remote delivery platform (e.g., Zoom, Google Hangouts)
<input type="checkbox"/> Blacktop area	<input type="checkbox"/> Recorded video
<input type="checkbox"/> Grassy field	<input type="checkbox"/> Other [please explain, open field]
<input type="checkbox"/> Playground	
<input type="checkbox"/> Classroom	
<input type="checkbox"/> Trailers/mobile building	



12. On average, across all sites with which you worked, how many weeks was the program active in fall 2020? [Numeric field with a maximum of 20 weeks]
13. On average, during the weeks your program was active, how many days per week did your program meet in Fall 2020? [Numeric field with maximum of 7 days]
14. On average, what was the scheduled length of a typical program session in Fall 2020?  
\_\_\_\_\_ scheduled minutes

Questions 15. And 16. Ask about the average actual minutes reported in question 9. The sum of minutes for these items should equal the number of minutes reported in question 9.

15. In Fall 2020, during a typical program session, think about how **long** most students were typically physically inactive, such as while receiving instructions or waiting for a turn. Estimate the number of total minutes students were typically **lying down, sitting, or standing**. \_\_\_\_\_ minutes per session (Provide the average)
16. In Fall 2020, during a typical program session, think about how **long** most students were physically active at least to the intensity level of a moderately paced walk. Estimate the number of total minutes students were engaged in **moderate to vigorous physical activity**. \_\_\_\_\_ minutes per session (Provide the average)

The next questions relate to your perceptions of how the COVID-19 pandemic affects implementation of [program name] programming for Boston Public School students. Please indicate your level of agreement with each statement.

[Five-point Likert, scale strongly disagree to strongly agree or (NA) if not relevant to program]

17. During the pandemic, [program name] is able to reach as many children as it would have been without the pandemic.
18. During the pandemic, [program name] programming is as effective at getting kids physically active as it would have been without the pandemic.
19. During the pandemic, I am as able to deliver [program name] activities or lessons as they were intended to be delivered.
20. The pandemic makes me feel uncertain about how I will be delivering [program name] programming in the coming months.
21. During the pandemic, I have been able to successfully deliver [program name] activities or lessons remotely.
22. During the pandemic, our participants had the physical space and equipment (e.g., technology) to engage with activities or lessons remotely.

## Appendix B:

# PA Program Leadership Survey

### A. Number of adopting schools

1. On average, from 2015 to now, in approximately how many Boston Public Schools was [program name] programming provided each year? [open field]
2. From September to December 2019, in approximately how many Boston Public Schools was [program name] programming provided? [open field]
3. From September to December 2020, in approximately how many Boston Public Schools was [program name] programming provided? [open field]

### B. Child reach

4. On average, from 2015 to now, approximately how many Boston Public Schools students have participated in [program name] each year? [open field]
5. Approximately how many Boston Public Schools students participated in [program name] from September to December 2019? [open field]
6. Approximately how many Boston Public Schools students participated in [program name] from September to December 2020? [open field]

### C. Staff and volunteers

7. On average, from 2015 to now, approximately how many paid [program name] staff (including all adults who received payments or stipends) led [program name] programming in Boston Public Schools each year? [open field]
8. Approximately how many paid [program name] staff led [program name] programming in Boston Public Schools from September to December 2019? [open field]
9. Approximately how many paid [program name] staff led [program name] programming in Boston Public Schools from September to December 2020? [open field]

### D. Program dose

For the next items, please provide responses about your programming as it was typically delivered in Boston Public Schools between 2015 and 2019, prior to the COVID-19 pandemic.

10. For a typical school site, how many weeks was the [program name] active during the school year? [Numeric field with a maximum of 35 weeks]
11. For a typical school site, during the weeks [program name] was active, how many days per week did your program meet, on average? [Numeric field with maximum of 7 days]
12. For a typical school site, what was the scheduled length of a typical program session, on average? \_\_\_\_\_ scheduled minutes

## Appendix C:

# PA Program Leadership Key Informant Interviews Script

Hi, this is colleague \_\_\_\_\_ from Tufts University.  
My colleague \_\_\_\_\_ is also on the call and will be assisting me today.

Before we begin, can you please confirm that you have received and read through the informed consent document?

Do you consent to participate in this study?

Do you agree to be audiotaped? *(Only continue if answer to both questions is yes)*

Thank you for taking the time to speak with me about your perceptions of [PA program name] and how the COVID pandemic has influenced programming. We understand how busy your schedule can be and appreciate your generosity with your time.

Before we begin, I'd like to briefly reiterate some important points from the consent form.

Your feedback today will help TBF and other individuals and organizations understand how school-based physical activity programs influence children as well as the impact of the pandemic on program delivery and outcomes.

General feedback from this interview and interviews with other representatives will be summarized. That summary feedback will be provided to the Boston Foundation. We may also use those summarized feedback in research publications to help inform policy and practice more broadly.

We're taking notes and recording the session because we want to make sure we don't miss any of your comments. Please feel free to opt-out of any questions you may not want to answer. You also have the right to stop participating in the interview at any time.

I expect the interview to last approximately 30 to 45 minutes. Feel free to let me know if you need to pause or take a break at any time.

Do you have any questions? Okay, let's get started.



**Introductory Questions:**

1. How long have you worked with [program name]? Can you tell me about the nature of your work with the organization?
2. If you had to summarize your organization's experience with the Boston Foundation in one sentence, what would you say?
  - Probe: How has funding from TBF impacted your ability to reach children and schools or changed the quality of programming provided?

**Topic Area 1: Impact of COVID on general program operations**

First, we'd like to discuss how the COVID epidemic has impacted your general program operations.

1. Could you tell me about any ways in which COVID-19 has impacted your program budget this year? What have been the reasons for those changes?
  - Probes: more competitive funding climate, needing to divert funding to other priorities
2. Could you explain how the pandemic has impacted the program administrators, including staff and any other adults who receive payment/stipends? For example, have the number or types of people who lead programming changed?

**Topic Area 2: Program adoption and maintenance**

Next, I'd like to talk about the Boston schools that have been involved with [program name] delivery and how that's changed because of COVID.

1. Tell me about the types of Boston Public Schools where [program name] has offered programming in recent years and the types of children that typically participate. Are there types of communities or individual children that you generally prioritize?
2. To what extent have schools that were engaged with [program name] programming in the 2019-20 academic year maintained their programming this year?
  - a. Are there any patterns in terms of the types of schools that have maintained or not maintained programming?
  - b. What factors do you think explain why schools have maintained or not maintained programming?
3. To what extent have new schools newly adopted [program name] programming this year? Could you talk about why that might be?

### **Topic Area 3: Program reach**

Next, I'd like to talk about the children that [program name] reaches and whether that's changed because of COVID-19.

1. Could you tell me about any ways in which the number of Boston public school children that you're reaching changed during the pandemic?
  - a. What are your thoughts on *why* your overall reach has changed?
    - i. Probes: school district or public health policies, changes in staffing on volunteer capacity, limitations around facilities
2. Tell me about any ways in which the *types* of schools or children you're reaching has changed.
  - a. Probes: differences by gender, socioeconomic status, race-ethnicity, other factors?
  - b. What are your thoughts on why the types of children you're reaching have changed?

### **Topic Area 4: Program implementation and effectiveness**

Now I want to ask you about your thoughts on how [program name] is being implemented and its effectiveness in promoting physical activity or other outcomes in participating children.

1. First, can you share a bit about what program implementation has looked like for [program name] this year?
  - a. How has implementation changed? Is your organization able to implement programming the way it's intended to be delivered?
  - b. Have you introduced any new implementation approaches or innovations that you might maintain into the future, even after the pandemic has passed?
2. In typical times, what are the main ways in which you think [program name] affects participating children in Boston Public Schools? What types of outcomes do you think your program usually generates?
3. Tell me about any changes in program effectiveness for children that have been able to continue participating in school since the pandemic. Has program effectiveness changed? How so?

### **Topic Area 5: Recovery from the Pandemic**

1. How confident do you feel about [program name] 's ability to return to normal after the pandemic has come under control? What makes you feel that way?
2. What types of resources or supports would help [program name] return to normal after the end of the pandemic?

Those are all the questions I have for you. Is there anything else you'd like to share?

Thank you for your participation.

## Appendix D:

# Explanation of the Supportive Physical Activity Environment Variable

This is an adapted version of the Physical Activity School Score (PASS),<sup>17</sup> modified for this research study based on the variables available through the BPS Profiles data set.

**Criterion 1. Average weekly minutes of physical education provided across grade levels**

- 5 points: at least 150 minutes per week
- 3 points: 90 to 149 minutes per week
- 1 point: 60 to 89 minutes per week
- 0 points: fewer than 60 minutes per week

**Criterion 2. Physical education teacher is certified, licensed, or endorsed by the state to teach physical education in elementary, middle, or high school.**

- 1 point: Yes
- 0 points: No

**Criterion 3. Average minutes of weekly recess provided across grade levels**

- 5 points: at least 100 minutes per week
- 4 points: from 80 to 99 minutes per week
- 1 point: from 60 to 79 minutes a week
- 0 points: fewer than 60 minutes per week

**Criterion 4. Recess is supported by Playworks to promote PA**

- 1 point: Yes
- 0 points: No

**Criterion 5. The school provides opportunities for students to participate in daily physical activity during the school day through: (a) classroom activity breaks; (b) before school programs; (c) after school programs**

- 3 points: all three of the above
- 2 points: two of the three above
- 1 point: one of the three above
- 0 points: none of the three above

**Criterion 6. The school has a transportation liaison to facilitate communication regarding district efforts to promote safe, physically active travel to and from school**

- 1 point: Yes
- 0 points: No

**Criterion 7. Staff at the school are prohibited from withholding physical education or physical activity as punishment for students (e.g., such as incomplete work)**

- 1 point: Yes
- 0 points: No

**Criterion 8. The school has adequate facilities/space to support children's physical activity throughout the school day**

- 3 points: both indoor and outdoor physical activity facilities are available
- 2 points: only indoor physical activity facilities are available
- 1 point: only outdoor physical activity facilities are available
- 0 points: playspace/facilities are not available to support children being physically active