

Changes in Physical Activity Following Boston's **Active School Day** Policy Interventions



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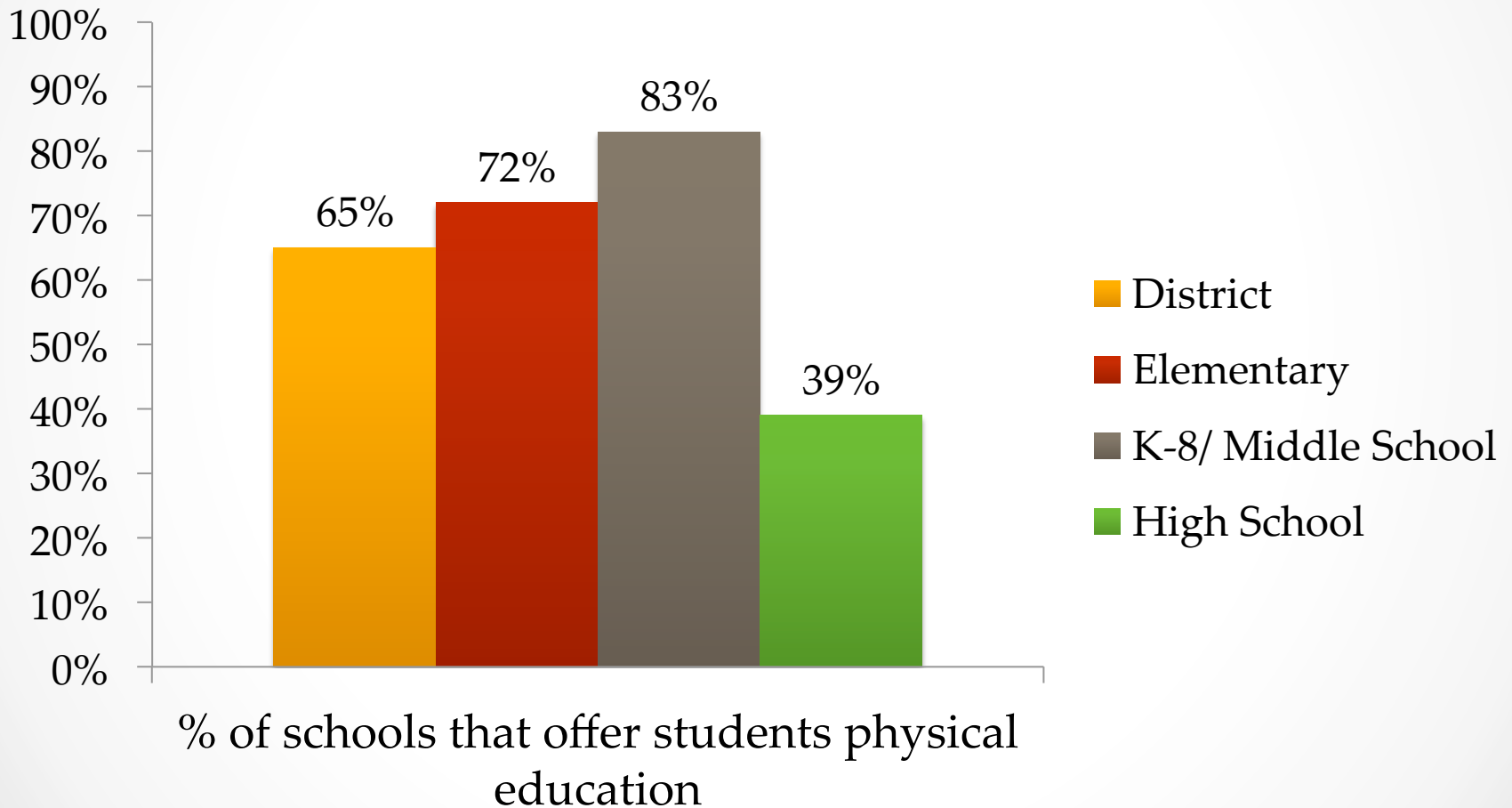
 **FOCUS**
On Children
Boston Public Schools

Boston Public Schools 2010-2011

- Relatively large district, 134 Schools
- Over 56,300 students
 - 39% Hispanic
 - 37% Black
 - 13% White/Non-Hispanic
 - 9% Asian
- 75% Eligible for free or reduced price school meals
- 15% Obese (versus 11% in Massachusetts)
- Reported participation in PE class dropped from 63% in 1993 to 38% in 2009 (Boston YRBS)



Schools offering Physical Education, Boston, MA 2010-2011 School Year



BPS PE & PA Policy and Implementation Targets

Schools must provide all students in grades K-12 with weekly physical education and daily physical activity during the school day as a part of a Comprehensive School Physical Activity Program (CSPAP).

The CSPAP implementation targets:

- At least **80 weekly minutes of quality, standards-based physical education** aligned with the Boston Public School Physical Education Curriculum Frameworks.
- An additional **70 or more minutes of standards-based physical education and or planned physical activity**, such as movement breaks, structured recess and cross-curricula lessons involving movement.

Intervention in Boston Public Schools: Improving Quality and Access

Improving quality of PE

In schools with PE teachers:

- A district-wide curriculum focused on MVP and lifelong PA
- Training and equipment
- Instructional Coaching
- PE leadership team

In schools without PE teachers:

- Trained and motivated PE specialists
- Intensive support on overcoming barriers: time, facilities, and scheduling

& Integrating PA across the school day

- Policy and Program Specialist
- Wellness Champions in schools
- Training on four buckets of Physical Activity



Active School Day Study Evaluation Overview

Eligible for
study
inclusion

- 8 schools for Intervention
- 5 schools for Control
- Greater than 200 student enrollment

Matched I/C

- PE FTE/ PA facilities
- Race/ethnic student match
- Enrollment size
- %Eligible for Free/Reduced Price Meal Programs

Recruitment

- 3 Intervention/3 control schools enrolled
- Randomly selected classrooms with 4th and 5th grade students
- ~ 75 students per school, 26 classrooms

Active School Day Evaluation

- Students wore accelerometers (7164/GT3X/GT1M) during the school day for one week (Feb/March & June)
- Teachers in selected classrooms completed weekly activity logs to record minutes per day in:
 - Physical Education Classes (specialist/non-specialist)
 - Physical Activity “Buckets”
 - ✓ Recess
 - ✓ Movement Breaks
 - ✓ Cross-curricular lessons
 - ✓ Movement promotion



ASD Intervention Implementation (Three Evaluation Schools)

- Physical Education Teachers at each school attended SPARK PE Training, received equipment and SPARK binders
- Averaged 7 PE Instructional Coach visits
- Wellness champions trained in two schools
 - One champion (recess),
 - Two champions (classroom movement breaks)



Analysis Methods

- SAS PROC Mixed with nesting of repeated observations within child, classroom and school:
 - Minutes of Moderate and Vigorous, Sedentary Activity, Total Counts
 - Accumulated Minutes and fitness promoting “Bouts”
 - NCI definition of wear time^a, Freedson^b equations with 6 METs vigorous physical activity, 4 -5.9 METs moderate
- Other covariates
 - Monitored time, meter type, race/ethnicity, sex, grade, temperature, precipitation and daily minutes of PE, school matching pairs

^aTroiano et al, 2008;
^bFreedson et al, 2005



	Eligible Students ^a	Participating Students ^b		
	All	All	Intervention	Control
Characteristic	N=842	N=393	N=201	N=192
<i>Gender</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>
Male	431 (51%)	187 (48%)	112 (56%)	75 (39%)
Female	411 (49%)	206 (52%)	89 (44%)	117 (61%)
<i>Race/Ethnicity</i>				
White, Non-Hispanic	17 (2%)	7 (2%)	4 (2%)	3 (1%)
Black, Non-Hispanic	508 (60%)	231 (59%)	130 (65%)	101 (53%)
Hispanic/Latino	247 (29%)	120 (31%)	63 (31%)	57 (30%)
Asian	54 (6%)	27 (7%)	1 (1%)	26 (14%)
Other/Unknown	16 (2%)	8 (2%)	3 (1%)	5 (3%)
4 th grade	441 (52%)	185 (47%)	89 (44%)	96 (50%)
5 th grade	401 (48%)	208 (53%)	112 (56%)	96 (50%)
Age (yr) <i>Mean (SD)</i>	10.2 (0.8)	10.2 (0.8)	10.3 (0.8)	10.2 (0.8)

^a Eligible students: all 4th and 5th grade students attending 6 schools in evaluation sub-sample

^b Participating Students: all students in selected 4th and 5th grade classes who provided at least 2 weekdays of valid accelerometer data at baseline and follow up

Physical Activity Offerings: Teacher Logs

Minutes/Week Offered	Baseline		Follow Up	
	Intervention Mean (SD)	Control Mean (SD)	Intervention Mean (SD)	Control Mean (SD)
PE, Specialist	38.6 (21.3)	53.1 (30.1)	33.6 (33.6)	53.8 (25.5)
PE, non-specialist	3.1 (11.8)	N/A	3.6 (12.9)	7.6 (29.6)
Recess	53.6 (47.3)	31.9 (29.1)	85.8 (26.9)	75.1 (33.8)
Movement Break	6.9 (19.3)	2.8 (8.4)	17.8 (25.7)	5.5 (14.9)
Cross-curricular lesson	8.4 (25.2)	20.7 (52.7)	7.8 (15.6)	1.4 (6.4)
Movement Promotion	N/A	15.6 (36.4)	7.8 (24.8)	0.9 (3.2)
Any Physical Activity	110.6 (64.9)	121.3 (103.9)	156.6 (60.7)	144.3 (64.6)
Crude Change			+46 min	+23 min

Estimated Intervention Impact (n=393)

	Baseline	Follow Up	Crude Change ^a	Adjusted Change ^b	
	<i>Mean (SE)</i>	<i>Mean (SE)</i>	<i>Mean</i>	<i>Beta (SE)</i>	<i>95% CI</i>
Minutes MVPA Overall					
Intervention	16.3 (3.2)	24.4 (3.2)	8.1	3.9 (1.1)	1.8 – 6.0
Control	20.7 (3.2)	25.1 (3.2)	4.4		
Minutes MVPA in Bouts					
Intervention	4.4 (2.8)	9.1 (2.8)	4.7	3.3 (1.0)	1.3 – 5.3
Control	9.2 (2.8)	10.6 (2.8)	1.4		
Minutes VPA Overall					
Intervention	3.9 (1.5)	6.9 (1.5)	3.0	1.8 (0.6)	0.7 – 3.0
Control	6.7 (1.5)	8.0 (1.5)	1.3		
Minutes VPA in Bouts					
Intervention	0.1 (0.6)	1.7 (0.6)	1.6	2.4 (0.4)	1.6 – 3.2
Control	2.4 (0.6)	1.7 (0.6)	-0.7		

^a Adjusted for daily wear minutes and meter type

^b Adjusted for daily wear minutes, meter type, race/ethnicity, sex, grade, % deviation from annual average temperature, precipitation and daily minutes of physical education

Estimated Intervention Impact (n=393)

	Baseline	Follow Up	Crude Change ^a	Adjusted Change ^b	
	<i>Mean (SE)</i>	<i>Mean (SE)</i>	<i>Mean</i>	<i>Beta (SE)</i>	<i>95% CI</i>
Minutes Sedentary Overall					
Intervention	181.3 (5.3)	162.6 (5.3)	-18.7	-10.6 (2.4)	-15.3 – -5.8
Control	183.6 (5.5)	174.5 (5.5)	-9.1		
Minutes Sedentary in Bouts					
Intervention	164.7 (7.1)	139.7 (7.1)	-25.0	-15.0 (3.5)	-21.9 – -8.1
Control	168.1 (7.4)	156.6 (7.4)	-11.5		
Total Activity Intensity Counts					
Intervention	131,732 (15,460)	179,018 (15,437)	47,286	23,342 (5,428)	12,699 – 33,984
Control	150,466 (15,529)	176,549 (15,554)	26,083		

^a Adjusted for daily wear minutes and meter type

^b Adjusted for daily wear minutes, meter type, race/ethnicity, sex, grade, % deviation from annual average temperature, precipitation and daily minutes of physical education

Conclusions

- At follow-up, students in intervention sites achieved ~40% of recommended daily MVPA during the school day
- Compared to control sites, students in intervention school sites achieved significantly:
 - **More MVPA per day** (~4 min/day, 24% increase)
 - **More VPA per day** (~ 2 min/day, 46% increase)
 - **Fewer sedentary minutes** (~11 min/day, 6% decrease)
 - **Higher overall activity levels**
 - **More time in “fitness promoting bouts”** and
 - **Less time in prolonged sedentary activities**
- Ongoing annual implementation costs
 - Training, staffing, equipment replacement
 - \$4457/school or \$25/school day



THANK YOU



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