The Impact of the Public Policies on Youth Physical Activity and Weight

Food Fit Philly Speaker Series – Get Healthy Philly

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Presentation Overview

• Background and Significance
  • Obesity and Physical Activity Trends Nationwide
  • Relationship between Physical Education, Physical Activity, and Academic Achievement

• Wellness Policy Physical Education (PE), Physical Activity (PA), and Compliance/Reporting Provisions

• Impact of School-based PE and PA--related Policies on:
  • School Practices
  • Student Outcomes

• Examples of Non-PE Policy Strategies Used Nationwide to Facilitate Student PA

The Research presented is funded by the Robert Wood Johnson Foundation-supported Bridging the Gap Program and the National Cancer Institute
Background and Significance
Youth Obesity and Physical Activity Trends
Youth Obesity and Physical Activity Data

• 32 percent of youth are at risk of being overweight or overweight and prevalence of obesity increases as youths move into adolescence.

• 48 percent of boys and 35 percent of girls (aged 6-11) obtain 60 minutes of daily physical activity.

• 12 percent of boys and just over 3 percent of girls (aged 12-15) obtain 60 minutes of daily physical activity.

(Ogden et al. 2008; Troiano et al. 2007)
Trends in Mean BMI by Gender, 1986-2009

**Females**
- 8th Grade (Linear)
- 10th Grade (Linear)
- 12th Grade (Linear)

**Males**
- 8th Grade (Quadratic)
- 10th Grade (Quadratic)
- 12th Grade (Linear)

*BMI = Body Mass Index (weight in kg / height in meters squared)*
Percent of Youths Meeting Physical Activity Guidelines Declines with Age


This data was measured by accelerometers.
Physical Activity in Primary Schools

Percentage of students in schools with physical activity opportunities

- 60+ minutes PE per week
- 20+ minute recess daily
- Intramural sports
- 150+ minutes PE per week
- Safe Routes to School

Turner, et al. (2010) and updates from 2009/10 and 2010/11 Food & Fitness surveys
Physical Activity in Secondary Schools

Percentage of **middle school students** in schools with physical activity opportunities

Percentage of **high school students** in schools with physical activity opportunities

- Requires PE
- Varsity Sports - Boys
- Varsity Sports - Girls
- Intramural Sports - Girls
- Intramural Sports - Boys
- Walk to School

Johnston, et al. (2011) and updates from 2009/10 YES survey
Physical Activity in Secondary Schools

Percentage of students

- Middle School
- High School

Current activities to promote physical activity

Johnston, et al. (2011) and updates from 2009/10 YES survey
Sports, Athletics, or Exercising: Trends in the Percent of Students Participating by Gender, 1976-2010

“How often do you do each of the following? Actively participate in sports, athletics or exercising.” “Participating” defined as participating almost every day or daily.
Daily Vigorous Exercising: Trends in the Percent of Students Participating by Gender, 1979-2010

“How often do you exercise vigorously (jogging, swimming, calisthenics, or any other active sports?” Daily defined as nearly every day or every day.
School Athletic Teams: Trends in the Percent of Students Participating by Gender, 1986-2010

Females
- 8th Grade (Quadratic)
- 10th Grade (Quadratic)
- 12th Grade (Quadratic)

Males
- 8th Grade (Linear)
- 10th Grade (Linear)
- 12th Grade (Cubic)

“To what extent have you participated in the following school activities this year: athletic teams?” Participate defined as considerable or great extent.
Disparities in Youth Physical Activity

• White youth are more physically active than Hispanic youth.
• Girls are less physically active than boys.
• Lower-income youth have lower levels of physical activity.
• Rural youth participate less in physical activity.
• As youth move into adolescence their participation in physical activity decreases.
• One possible explanation for these differences lies in the built environment

(Singh et al. 2008, Hanson and Chen 2007, Joens-Matre et al. 2008)
Relationship between Physical Fitness and Academic Achievement
Likelihood of Passing Academic Tests For Each Fitness Test Passed by Massachusetts Students in Grades 4 to 8

Academic Test Scores Increase with Physical Fitness Scores Among New York Students in Grades K to 8

Physical education/activity time does not negatively impact academic performance

• 4th/5th grade students in British Columbia who received an extra 50 minutes/week of in-school PA time had similar standardized test scores for mathematics, reading and language arts as did students in the control group

• Analyses of standardized achievement tests among 4th/5th grade students in CA were not adversely affected by an intensive PE program that doubled or tripled PE time and in several cases they performed better than students in control groups

See: Active Living Research Program
Physical education/activity time does not negatively impact academic performance

- Girls who were enrolled in >=70 mins/week of PE → significantly higher achievement scores in mathematics and reading than girls enrolled in PE for <=35 mins/week, according to data from the National Early Childhood Longitudinal Study.

- A study of more than 200 sixth-grade students in Michigan, conducted in 2006, found that students enrolled in PE had similar grades and standardized test scores as students who were not enrolled in PE, despite receiving 55 fewer minutes of daily classroom instruction.

See: Active Living Research Program
Wellness Policy Physical Education (PE), Physical Activity (PA), and Compliance/Reporting Provisions
School District Wellness Policies
Physical Education Required Provisions, SY 2009-10

- PE Addressed: 80%
- PE teaches about PA lifestyle: 60%
- PE curriculum for each grade: 40%
- PE training for PE teachers: 30%
- 50% PE time in MVPA: 20%
- PE time requirements meet NASPE std.: 10%

School District Wellness Policies
Physical Activity Requirements, SY 2009-10

- PA goals
- PA for all grades
- Recess (ES)
- PA breaks

% of districts nationwide

Examples of wellness policy PE/PA-related reporting and compliance provisions

- Annual reporting by superintendent on implementation of PE and PA minutes for students K-5.

- The district will report to state Dept of Ed annually on the daily PE/PA activity for students by school, grade, and class.

- The [wellness] council will assist the superintendent in creating an annual report which includes minutes of PA and PE and/or healthful living education received by students in the district each school year.

- The school district will report to the community…the percentage of students participating in PE classes…

- The wellness committee will be responsible for preparing an annual report by June 15 of each year that includes: listing of PA programs and opportunities for students throughout the school year.

- Reporting on fitness assessments (e.g., Fitnessgram), School health Index results
Impact of School-based PE and PA-related Policies on School Practices
Impact of State and District PE and Recess Policies on Elementary School Practices

Average Percentage of Public Elementary Schools (n=1761) with Barriers to Recess & PE, 2007-2009

- Recess: Time demands
- Recess: Lack of resources
- PE: Financial constraints
- PE: No PE policy
- PE: PE not a school priority
- PE: Competing demands
- PE: Lack of outdoor facilities
- PE: Lack of indoor facilities
- PE: Lack of staff
Multilevel, Multivariate Associations between State and District Policy and ES offering 20 mins of recess daily

* Indicates significant difference from reference, p<.05
Multilevel, Multivariate Associations between State and District Policy and ES PE ≥ 150 mins/week

- State law requiring 150 min PE/weekly
- State law suggests 150 min PE/week or requires <150
- No state PE time-related law
- District policy requiring 150 min PE/weekly
- District policy suggests 150 min PE/week or requires <150
- No district PE policy

* Indicates significant difference from reference, p<.05
Impact of State PE Laws on Public School PE Time by Grade Level

# PE Time (Elementary School)

<table>
<thead>
<tr>
<th>Model Parameters</th>
<th>Beta Coeff.</th>
<th>SE Beta</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>86.5</td>
<td>12.9</td>
<td></td>
</tr>
<tr>
<td>Urbanicity (Non-Urban)</td>
<td>25.3*</td>
<td>11.4</td>
<td>2.21*</td>
</tr>
<tr>
<td>Poverty (High)</td>
<td>2.7</td>
<td>9.3</td>
<td>.09</td>
</tr>
<tr>
<td>Size (Large)</td>
<td>8.5</td>
<td>8.5</td>
<td>1.09</td>
</tr>
<tr>
<td>PERSPCS Code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Requirement</td>
<td>-40.2</td>
<td>14.0</td>
<td>8.19**</td>
</tr>
<tr>
<td>Nonspecific Requirement</td>
<td>-26.7</td>
<td>12.9</td>
<td>4.28*</td>
</tr>
<tr>
<td>Specific Requirement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(reference)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.01, **p<0.05
Elementary School Level

National Cancer Institute

PERSPEC Code for School’s State

Min/P.E/Wk

No-Law/Reccomend

Non-Specific Require

Specific-Require
## PE Time (Middle School)

<table>
<thead>
<tr>
<th>Model Parameters</th>
<th>Beta Coeff.</th>
<th>SE Beta</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>191.2</td>
<td>17.7</td>
<td></td>
</tr>
<tr>
<td>Urbanicity (Non-Urban)</td>
<td>11.9</td>
<td>19.8</td>
<td>.36</td>
</tr>
<tr>
<td>Poverty (High)</td>
<td>35.5</td>
<td>12.7</td>
<td>7.78**</td>
</tr>
<tr>
<td>Size (Large)</td>
<td>-12.3</td>
<td>17.2</td>
<td>.51</td>
</tr>
<tr>
<td>PERSPPCS Code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Requirement</td>
<td>-59.2</td>
<td>29.2</td>
<td>4.11*</td>
</tr>
<tr>
<td>Nonspecific Requirement</td>
<td>-60.6</td>
<td>13.9</td>
<td>18.88**</td>
</tr>
</tbody>
</table>

* p<0.01, ** p<0.05
Middle School Level

National Cancer Institute

Min

No-Law/Recommand
Non-Specific Require
Specific-Require

P E W

PERSPEC Code for School’s State
## PE Time (High School)

<table>
<thead>
<tr>
<th>Model Parameters</th>
<th>Beta Coeff.</th>
<th>SE Beta</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>190.9</td>
<td>50.1</td>
<td></td>
</tr>
<tr>
<td><strong>Urbanicity (Non-Urban)</strong></td>
<td>-2.0</td>
<td>20.3</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Poverty (High)</strong></td>
<td>12.1</td>
<td>17.4</td>
<td>.48</td>
</tr>
<tr>
<td><strong>Size (Large)</strong></td>
<td>9.3</td>
<td>18.3</td>
<td>.26</td>
</tr>
<tr>
<td><strong>PERSPCS Code</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonspecific Requirement</td>
<td>-40.54</td>
<td>43.6</td>
<td></td>
</tr>
</tbody>
</table>

* p<0.01, ** p<0.05
Schools Meeting NASPE Recommendation

- ES: Not Required
- MS: Specific Require
- HS: Non-Specific Require
Conclusions

Public Elementary and Middle School Levels:

- Schools within states whose law required a specific amount of PE had significantly more minutes of PE than schools within states whose law either had no PE requirement or required PE but left time unspecified.

- Few schools meeting NASPE recommendations.
Stretch Break
Impact of State PE Laws on Middle School Student PE and PA

Weak PE laws have no impact

Only laws that require 90+ minutes of PE per week increase middle school students’ PE attendance

- **Student data source:** National Center for Education Statistics’ Early Childhood Longitudinal Study, 8th grade (2007)
- **Policy data source:** National Cancer Institute’s Classification of Laws Associated with School Students
Need for complementary laws

Requiring <90 mins/wk does not reduce BMI change unless complemented with strong competitive food laws

Student data source: National Center for Education Statistics’ Early Childhood Longitudinal Study, 8th grade (2007)

Policy data source: National Cancer Institute’s Classification of Laws Associated with School Students
Impact of State PE Laws on Middle School Student Physical Activity

Source: Taber, Chriqui, Slater, Powell, and Chaloupka. “Showing up to class is not enough: policies that only require PE attendance do not reduce socioeconomic disparities in physical activity.” In preparation.
SES disparities in activity

• Adolescents of low socioeconomic status (SES) tend to be less physically active, even though they get equal amounts of physical education.

Student data source: National Center for Education Statistics’ Early Childhood Longitudinal Study, 8th grade (2007)
Does requiring PE help?

It increases activity, but it does not reduce disparities

Policies that require a minimum amount of moderate-to-vigorous activity during PE class do reduce disparities among boys

- **Student data source:** National Center for Education Statistics’ Early Childhood Longitudinal Study, 8th grade (2007)
- **Policy data source:** Bridging the Gap
State PE Coordinators Insights on Approaches to Increasing PA time during the School Day
State PE Coordinators Recommended Policy Strategies for Increasing PA Time during the School Day

- Require more time in PE
- Require PE teachers to be certified
- Require a minimum amount of physical activity in PE
- Require physical activity to be incorporated into the classroom
- Require schools to provide structured physical activity during recess
- Require consequences for non-compliance
- Require each school district to appoint a PE or physical activity coordinator
- Identify sources of funding in the policy document
- Make PE waivers harder to obtain

Source: Carlson et al., State Policies about Physical Activity Minutes in Physical Education or During the School Day. Manuscript under review, *J Sch Health*. 
Non-PE Policy Strategies Used to Facilitate Student PA
In-school PA opportunities
Percentage of Public Elementary Schools that **Prohibit Teachers from Withholding Students from Recess**, by District Policy and State Law Status

<table>
<thead>
<tr>
<th></th>
<th>District</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Policy/Law</td>
<td>33.9</td>
<td>68.1</td>
</tr>
<tr>
<td>Without Policy/Law</td>
<td>18.3</td>
<td>20.3</td>
</tr>
<tr>
<td></td>
<td>45.1</td>
<td>79.4</td>
</tr>
<tr>
<td>With Policy/Law</td>
<td>25.4</td>
<td></td>
</tr>
<tr>
<td>Without Policy/Law</td>
<td>28.4</td>
<td></td>
</tr>
</tbody>
</table>

**Withholding Recess for Completion of Schoolwork**

**Withholding Recess for Poor Behavior**

Note: Data are for 2008-09 and 2009-10 school years, weighted at the school level, percentages are unadjusted for covariates.
Other strategies employed by schools to facilitate in-school physical activity opportunities

- “Brain breaks” or “brain gym”
- Walking club
- Before/after school exercise clubs
- Recess (ES/MS typically)
- Lunch activity time (non-elementary level)
  - Lunchtime sports competitions/clubs/intramurals
  - Activity/wellness breaks
  - Open gym/fields during lunch
- Allow students to use gym/cardio/weight room in lieu of homeroom
- End of day activity breaks broadcast on school tv/video
- Standing desks
- School garden as a physical activity opportunity (and nutrition education opportunity)
- Before/after school open gym time
- Stair Club (log of stair walking)
- Elective courses (MS/HS)

Source: Open-ended responses to BTG Food & Fitness and Monitoring the Future/YES Surveys
Percent Improvement in On-Task Behavior for N.C. Elementary Students Based on Physical Activity Breaks

Out-of-school PA opportunity examples
Percentage of Public Elementary Schools Organizing a Walking School Bus Program, by District Policy and State Law Status

<table>
<thead>
<tr>
<th>District Policy on Safe and Active Routes to School</th>
<th>State Law Requiring Crossing Guards</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Policy/Law</td>
<td>7.8</td>
</tr>
<tr>
<td>Without Policy/Law</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Note: Data are for 2008-09 and 2009-10 school years, weighted at the school level, percentages are unadjusted for covariates
Impact of state safe routes to school-related laws on elementary school student walking/biking to school

<table>
<thead>
<tr>
<th>State SRTS law</th>
<th>Zero Students Walking/Biking to School</th>
<th>Relative Proportion of Students Walking/Biking to School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Sidewalk construction</td>
<td>0.64</td>
<td>0.38, 1.08</td>
</tr>
<tr>
<td>Employ crossing guards</td>
<td>0.39</td>
<td>0.20, 0.75</td>
</tr>
<tr>
<td>Traffic control measures</td>
<td>0.56</td>
<td>0.39, 0.82</td>
</tr>
<tr>
<td>Speed zones</td>
<td>0.61</td>
<td>0.37, 1.01</td>
</tr>
<tr>
<td>Any law</td>
<td>0.54</td>
<td>0.31, 0.92</td>
</tr>
</tbody>
</table>

- The odds of zero students walking/biking to school were lower among schools in states with SRTS laws

Joint Use Agreements
Creating Opportunities for Physical Activity

Introduction
Today, two-thirds of adults and nearly one-third of children and teenagers in the United States are overweight or obese, and lack of physical activity is a leading contributor to this epidemic. Providing access to recreational facilities is a critical strategy for helping people of all ages be more active.

Figure 1: Joint Use Agreement Provisions

<table>
<thead>
<tr>
<th>WHAT FACILITIES MAY BE USED</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities generally</td>
<td>56%</td>
</tr>
<tr>
<td>School buildings and grounds generally</td>
<td>83%</td>
</tr>
<tr>
<td>Gymnasium</td>
<td>50%</td>
</tr>
<tr>
<td>Fields</td>
<td>44%</td>
</tr>
<tr>
<td>Other*</td>
<td>40%</td>
</tr>
<tr>
<td>Playground</td>
<td>22%</td>
</tr>
<tr>
<td>Track</td>
<td>16%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHO CAN USE THE FACILITIES</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>School-sponsored or school-affiliated groups</td>
<td>86%</td>
</tr>
<tr>
<td>Community** groups</td>
<td>81%</td>
</tr>
<tr>
<td>City or municipal</td>
<td>54%</td>
</tr>
<tr>
<td>Athletic/other recreational groups</td>
<td>45%</td>
</tr>
<tr>
<td>Groups generally</td>
<td>40%</td>
</tr>
<tr>
<td>Individuals generally</td>
<td>34%</td>
</tr>
<tr>
<td>Parks and recreation department</td>
<td>23%</td>
</tr>
<tr>
<td>YMCA</td>
<td>8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHEN THEY CAN USE THE FACILITIES</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any time that does not interfere</td>
<td>70%</td>
</tr>
<tr>
<td>Weekends</td>
<td>31%</td>
</tr>
<tr>
<td>Vacations</td>
<td>21%</td>
</tr>
<tr>
<td>After school</td>
<td>16%</td>
</tr>
<tr>
<td>Holidays</td>
<td>13%</td>
</tr>
<tr>
<td>Before school</td>
<td>3%</td>
</tr>
</tbody>
</table>

N=146 public school districts with agreements in place during school year 2009-10.
*Other includes: pool, basketball courts, tennis courts and/or weight room.
**Community groups may include groups not explicitly mentioned, such as Boys & Girls Clubs or other organizations.
Joint Use Agreements
Secondary Schools, SY 2009/10

Low SES
Mid SES
High SES

Middle School
High School

Low SES
Mid SES
High SES
Concluding Remarks and Policy Opportunities
Concluding Remarks

- Policies that require physical education for a minimum amount of time are associated with in-school physical education opportunities
  - Physical education does not adversely effect academic achievement
- Need for a multi-pronged approach
  - Physical education requirements effect BMI only when coupled with strong competitive food policies
- There are a number of non-physical education-related strategies that can be taken to increase in-school and out-of-school physical activity
  - E.g., infrastructure improvements to support walking/biking to school, activity breaks, walking school buses, joint use agreements
Policy Strategies for Improving the Quality and Quantity of PE and PA in schools

• Include PE as a core requirement and do not “bundle” PE with PA

• Ensure that the majority of PE time is spent engaged in “active” PA time (ideally moderate-vigorous level)

• Ensure that trained/certified physical educators teach PE

• Adopt high quality national PE standards (e.g., NASPE)

• Provide funding/resources for PE including courses, curriculum, infrastructure, etc.

Sources: Chriqui et al., 2010; Active Living Research; Leadership for Healthy Communities
Policy Strategies for Providing PA Opportunities Outside of School Settings

• Safe routes to school programs, walking school bus programs

• Joint use agreements

• Work with local planning and zoning authorities to incorporate provisions for open space, trails, playgrounds, etc. in newly developed and redeveloped residential areas

• Encourage local policy makers to create incentive programs to encourage developers to create parks, playgrounds, trails, etc. in neighborhoods
Questions?