

ISSUE BRIEF

The Massachusetts Health Policy Forum



Overweight and Obesity in Massachusetts:

A Focus on Physical Activity

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Table of Contents

Executive Summary	1
Introduction	3
Childhood Obesity Prevalence and Trends	4
Causes of Obesity	4
Energy Gap	
Lack of Physical Activity	
Why Aren't Our Children Physically Active?	7
Needed Recognition - Physical Activity and Academic Achievement	10
Consequences and Costs	11
Strategic Policy Development and Program Adoption	13
Massachusetts Policy and Program Environment	13
MA Department of Public Health	15
Community-Based Interventions and Infrastructure Development	16
Mass in Motion (MIM) Success Stories from Wellness Grants	16
Active Projects in MA Communities	18
School-Based Programs	19
Federal Efforts	21
Other State Efforts	22
Final Recommendation	23

Executive Summary

Obesity continues to be a national epidemic with one-third of children and two-thirds of adults overweight or obese.¹ Inadequate physical activity is one of the driving factors of this public health crisis. We have a problem in our state – our children are not active and are under-fit. Overall, Massachusetts ranks 33rd for percentage of children who are obese, yet we rank last for percentage of high school students engaged in the recommended 60 minutes of physical activity daily, according to NEHI's 2011 report card.^{2,3} We also rank in the bottom 25% of all states for our overall policy environment for promotion of physical education.⁴ Among Massachusetts high school students:

- 57% of students are not physically active for a total of at least 60 minutes a day on 5 or more days during the prior 7 days.
- Only 17% of students are physically active daily.
- 23% of children report not being physically active for 60 minutes *on any day*.
- Nearly 30% of students reported watching television for 3 or more hours per day on school days.
- 44% do not attend PE during an average week.

A lack of physical activity deprives the body of fundamental physiologic stimuli which improves health in a multitude of dimensions. Physically unfit children are more likely to have abnormal blood lipids, elevated blood pressure, elevated blood glucose, and more depressive symptoms.⁵ Unfit children are also more likely to be obese.^{6,7} Obesity costs our nation more than \$190 billion annually which amounts to almost a quarter of all health care expenditures.⁸ Overweight children cost on average \$200 more each year when compared to their healthy weight counterparts.⁹ However, for every \$1 spent on building biking and walking paths nearly \$3 in medical expenses can be saved.¹⁰ Furthermore, 27% of Americans aged 18-24 years are too unfit to join the military.¹¹ Not only is childhood obesity a major public health concern, it has drastic economic consequences for the state and our national security.

Just as there are many factors that impact obesity, policy solutions need to come from a variety of levels – including state, community, and schools - in order to have the greatest impact. Collaborative efforts need to stem from programmatic and regulatory efforts in order to maximize effectiveness. Schools are an essential avenue to increase time to physical activity for our children. The impressive link between physical activity and academic achievement demonstrates the need not only to enhance time and resources dedicated to recess and quality physical education, but to incorporate movement throughout the school day across all grade levels. Strong, supportive school wellness committees will be vital in helping schools implement key strategies to optimize physical activity time. Out of school time, activities and policies are also critical in ensuring that our youth engage in the recommended levels of physical activity.

Communities should be empowered to assess their physical activity environments, raise awareness of the benefits of physical activity, and allocate resources where the need is highest.

State and federal-level money allocated to communities allows each community to target vulnerable populations and utilize funding in the most cost-effective manner. Creation of coalitions will enable all stakeholders including community centers, recreational departments, government agencies, police departments, local businesses and institutions, and non-profit organizations to create sustainable partnerships and make it more feasible to garner support to implement these initiatives. Policy recommendations include:

- Design and support a Massachusetts Physical Activity Plan modeled off of our National Physical Activity Plan to ensure that physical activity is a priority in our state
- Set state-wide policies for quality physical education, more physical activity, and ample recess time in schools
- Require schools to administer physical fitness testing
- Provide funding to communities and schools to enhance quality physical education and develop other innovative school-based initiatives
- Convene strong and supportive school wellness committees to help schools commit to physical activity regulations and recommendations
- Implement zoning changes in the built environment around access to open spaces, public transportation, and safe routes to walk
- Build communities that are pedestrian and cyclist friendly, create schoolyards, open spaces, and trails that are safe and accessible, and improve public transit systems to promote active living
- Increase Department of Public Health funding for physical activity programs via *Mass in Motion*
- Build support for the Affordable Care Act and the funds it supports such as Community Transformation Grants
- Support additional surveillance and evaluation of these policies and programs to inform best practices and sustain the success of existing initiatives

Funding, community engagement, perceived time to be active, and administrative “buy-in” will be the greatest barriers to implement these initiatives that support broad-based change in physical activity. Sustainable relationships and support from all stakeholders will help raise recognition, support, and funding. With the persistent levels of overweight and obesity along with low levels of physical activity and fitness, we must recognize as a state the opportunities for change, make clear messages promoting physical activity, and offer easy opportunities for all ages to be physically active citizens. Lastly, Massachusetts needs to make physical activity not just the *easy choice*, but also the *desired choice*.

Introduction

Overweight and obesity remains an epidemic with major social and economic costs and consequences. About a third of Massachusetts' children are overweight or obese, as are more than half of adults.¹² Obese children are at increased risk of Type II diabetes, cardiovascular disease, hypertension, and obstructive sleep apnea, and experts predict a continued increase in the societal and economic costs of our state and nation's unhealthy weight problem.^{3,4} Proper nutrition and physical activity, the major factors implicated in the obesity trend, are becoming worse on a population level.

This report focuses specifically on physical activity, or the "calories out" side of the energy balance equation. Enabling adults and children to be physically active and preventing the onset of physical inactivity is

crucial to addressing the obesity epidemic.¹³ Children have little say in what food they are provided, where they live, and the amount of access they have to recreational areas. The need for *early* prevention underscores the importance of policies that promote children's physical activity. This issue brief describes the problem, trends and contributors to physical inactivity in Massachusetts, presents the health and economic consequences of the problem, and highlights policies and programs that can promote healthy physical activity behaviors in our state. We conclude that raising public awareness of the problem, prioritizing physical activity, and changing our physical activity environment – through implementing policies and providing funding for programs and initiatives - will be necessary to reverse our state's declining levels of physical activity.

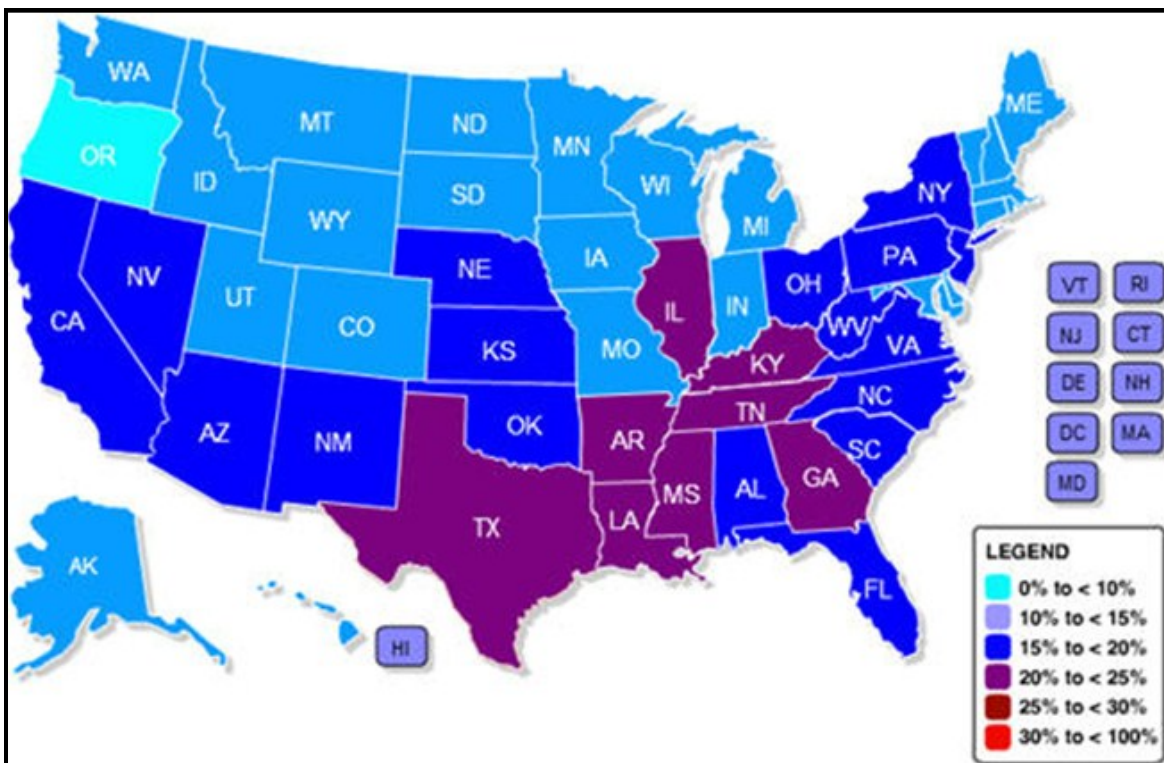


Figure 1: Childhood obesity prevalence (percent) by state. (Trust for America's Health 2011 *F as in Fat* report).

Childhood Obesity Prevalence and Trends

While Massachusetts is not ranked as poorly as the rest of the nation for obesity rates (we have the 4th lowest rate of adult obesity), still 22.3% of adults are obese with obesity prevalence rising from 2007-2009 to 2008-2010.¹⁴ The numbers get worse when looking at our children where we have the 17th lowest rate with 13% of our children classified as obese¹⁵ and a staggering 17% of children aged 2-5 from low-income families in our state are already obese.¹⁶

A 2009 sample of body mass index (BMI) measurements from 1st, 4th, 7th and 10th graders in 80 districts found that 28% of students were overweight or obese.¹⁷ In a 2011 national survey of high school health, where height and weight are self-reported, 15% of Massachusetts high school students are overweight and 10% are obese (Figure 2). And for some demographics the numbers are worse - combined overweight/obesity rates for both low-income and Hispanic children in

Massachusetts are around 45%.¹⁸

The good news is that the overweight and obesity levels may have reached a plateau within some demographics.¹⁹ A recent study from the Boston Metro west region, demonstrates a decline in obesity rates in children under 6.²⁰ The bad news is that we still need to make significant progress to reverse the statistics. Reports indicate no significant changes in overweight and obesity between 2007-2008 and 2009-2010 for U.S. children 2-19 years, but indicate a leveling off of the 20-year upward trend.²¹ This apparent “leveling off” should not minimize the potential consequences from the still very high numbers of obese children in our state and in our nation.

Causes of Obesity

Energy Gap

Obesity is complex and multifaceted with no single cause. On the simplest level weight gain is caused

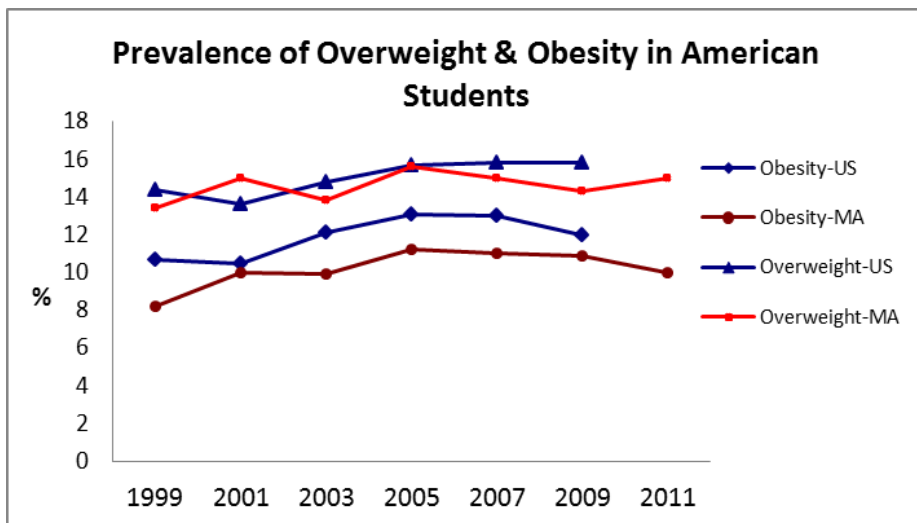


Figure 2. 1999-2011 trends for adolescent overweight and obesity in Massachusetts and the United States through 2009 (Youth Risk Behavior Survey, 2009, 2011).

by an energy imbalance with excess caloric intake not offset by physical activity. This “energy gap” or imbalance between the number of calories consumed each day needed to produce weight gain, has been estimated to be between 110-165 calories per day²⁴ which is roughly equal to a 1-ounce bag of potato chips. Recent research examining this energy gap in children, demonstrate that the energy gap to get childhood obesity rates down by 10% ranges from 87 to 168 calories for 2-19 year olds depending on ethnicity and family income.²⁵ Even more alarming, overweight adolescents consume on average 700-1,000 more calories a day than is needed for normal growth.²⁶ These added calories equate to a shocking gain of an extra 6 lbs per year.²⁷

In 2011 the Massachusetts Department of Public Health released a report on our children’s health behaviors and documented huge gaps between calories consumed and expended, further fueling the obesity epidemic.²⁸ Greater efforts need to be focused on closing this “energy gap.” Recent attention and legislative focus has been on curtailing poor eating habits and implementing regulations for competitive foods (i.e., non-reimbursable foods) in public schools, with new regulations on competitive foods going into effect in August in all Massachusetts public schools. Initiatives that involve improving

physical activity engagement have been somewhat overshadowed by nutrition efforts, yet can have major impacts on a child’s health. For example, simply increasing physical education classes from once per week to three times per week can increase caloric expenditure by 240 kcal per week.²⁹

Lack of Physical Activity

Physical activity is necessary to expend energy and is helpful in achieving energy balance, improving eating behavior, and enhancing psychological well-being, but the majority of American children and adults are not physically active.^{30,31,32,33} More than a quarter of U.S. adults do not engage in any leisure-time physical activity (physical activity engaged in during leisure time).³⁴ Physical activity declines dramatically across age groups, especially between childhood and adolescence, and then continues to decline as people get older.⁶³ Non-leisure time physical activity, such as physical work, walking, biking to work, and household chores, has decreased substantially in the past 20 to 30 years, due to increasing mechanization at work and at home. Increased use of cars for short errand and shopping trips has significantly reduced physical activity.³⁵ It is recommended that adults walk 10,000 steps daily, however most U.S. adults between the ages of 20 and 74 accumulate less than 5,000 steps a day.^{36,37}

In 2008 the first Physical Activity Guidelines for Americans were released which recommend that adults accumulate 150 minutes per week of moderate to vigorous activity and children accumulate at least 60 minutes per day of moderate to vigorous physical activity (Appendix II).³⁸ However, according to an objective measure, only 42% of 6-11 year olds and less than 8% of adolescents aged 12-19 years reach this goal.^{39,40}

According to Kaiser State Health Facts, in 2009 Massachusetts was tied with South Carolina for ranking the worst in the nation for the percentage of high school students not getting the recommended amount of physical activity with 67% of Massachusetts and South Carolina high-school students not meeting the goal.⁴¹ This was especially surprising given that Massachusetts has been a leader in health care providing near universal access to health coverage before any other state and being a hub for some of the world's greatest physicians, teaching hospitals, and sub-specialties. These statistics highlight the need for state, local public health officials, and policy makers to address this problem.

In Massachusetts high school students:^{42,43}

- 57% of students are not physically active for a total of at least 60 minutes a day on 5 or

more days during the prior 7 days.

- Only 17% of students are physically active daily.
- 82% do not attend physical education classes daily and 44% do not attend PE during an average week.
- Over 23% of children report not being physically active for 60 minutes on any day.
- Nearly 30% of students reported watching television for 3 or more hours per day on school days.

Differences in activity levels also exist across demographics. Despite the Title IX law that states no one shall be denied benefits, excluded from participating or discriminated under any educational program based on sex, females are significantly less physically active than males (40% compared to 25%, respectively).⁴⁴ Furthermore, Hispanic and Black students were less likely to report being physically active at least 60 minutes per day.⁴⁵ Children living below the federal poverty level are also more likely to be physically inactive.⁴⁶ These facts highlight subpopulations that are more susceptible to high childhood obesity rates, and show a need for policy makers to target these groups that are less prone to being physically active.

Why Aren't Our Children Physically Active?

Active lifestyles have dramatically shifted over the last generation. We live in an environment that does not promote physical activity. Reasons for this range from increased time spent watching television or sitting behind a computer screen to parents not encouraging free play in the outdoors due to over-scheduling or other time demands and safety concerns. Other factors include the built environment where the ability to access sidewalks and parks has diminished or even in some areas where parks and sidewalks abound, safety concerns restrict the ability of children to play outside. Finally, schools have been blamed for decreasing physical education and recess time. Not only do schools not offer adequate physical activity time, but in total, children are getting less exercise in other areas of their lives.

- Physical education and recess time.** Fifty-eight percent of Massachusetts' adolescents attend PE class one or more days per week and a mere 18% attend PE classes daily and these numbers are dropping.⁴⁷ Current guidelines recommend 150 minutes per week of physical education for children in elementary school and 225 minutes per week in middle and high school.⁴⁸ Massachusetts students are far from reaching this recommendation. Table 2 provides additional national standards for physical education.

Schools have been blamed for scheduling inadequate time for exercise, whether that be physical education classes or recess.⁷⁴

Budgetary constraints and increasing pressure to improve standardized test scores have caused school officials to question the value of PE and recess even though recent research has illustrated the benefits of physical activity and fitness on cognitive performance and testing.⁴⁹ Beyond test scores, PE classes may be important in maintaining and/or improving children's physical fitness which helps to decrease adiposity and improve cardiovascular risk factors.^{50,51,52} Finally, physical education is critical to give kids the knowledge, skills, and motivation for a lifetime of physical activity on top of dedicating time for the kids to be physically active. Physical education is an example of primary prevention at its best.

Ability to demonstrate competency in motor skills and movements patters
Ability to demonstrate understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities
Participates regularly in physical activity
Achieves a health-enhancing level of physical fitness
Exhibits responsible personal and social behavior that respects self and others
Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.

National Association of Sports and Physical Education (NASPE). *National Standards for Physical Education* NASPE: 2004.

- Massachusetts law requires that PE be taught in all public school students, but in 1996, the Board of Education repealed regulations mandating minimum annual hours of PE.**⁵⁴ Only 6 states, including Massachusetts, require physical education in every grade K-12, and only 18% of states require daily recess for elementary school children.⁵⁵ With such constraints on PE, there are also limited opportunities for health education that includes information about nutrition as well as physical activity and fitness. Currently legislation is pending in Massachusetts to improve the quality of physical education classes.
- Recess can add significant activity time to a child's total daily physical activity.**^{78,79} In Massachusetts, recess time depends on the individual school's wellness policy. Legislation has been proposed to increase recess time, but none has passed in Massachusetts. Current legislation proposed by

Representative Sánchez of Massachusetts (House Bill No. 01157) would require that students receive at least 30 minutes of physical activity daily from a combination of PE, class, and/or recess.⁵⁶

- Physical fitness.** There is a profound lack of data on the physical fitness of American children, with most of the data being from the 1980s.⁵⁷ What information we have indicates a national decline in cardiovascular physical fitness from 1981 to 2000.^{58,59} Fitness is a reliable objective marker of habitual physical activity and has significant diagnostic and clinical relevance in adults and in children. In adults, maintaining or improving fitness is associated with a lower risk of all-cause mortality in men.⁶⁰ As of 2010, only 12 states have policies requiring administration of a physical fitness test and Massachusetts is not among them.^{86,61} Fitness testing only occurs in 57% of our public secondary schools

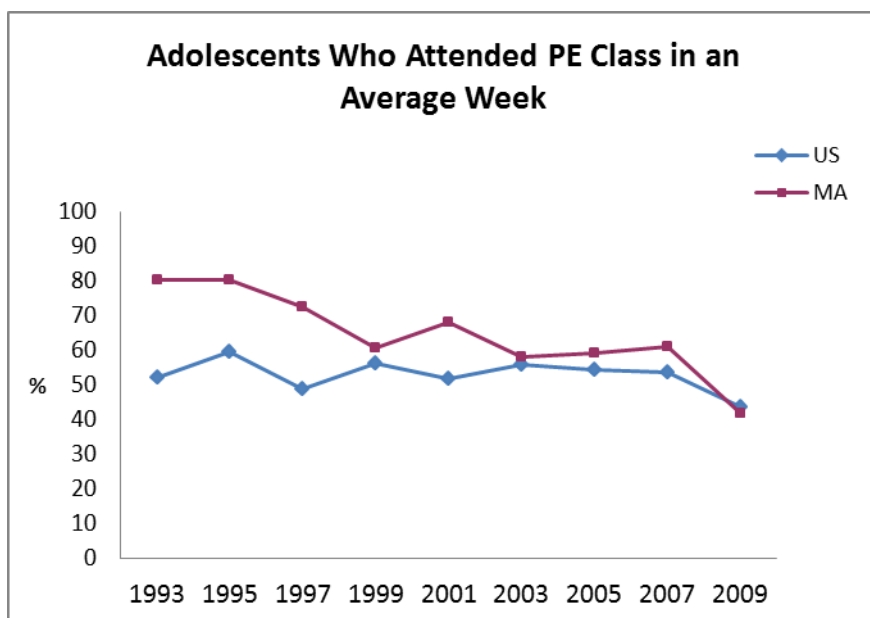


Figure 3. Physical education attendance in high school students, 1993-2009 (Youth Risk Behavior Survey).

and most of these schools do not share results with families or the administration.⁶² In 2007, 61% of 4th through 8th grade students in Cambridge and half of the 4th through 8th grade students in Somerville did not pass the physical fitness test.^{63,64} In Cambridge, researchers demonstrated that poor performance on the endurance shuttle run, which is a good measure of cardiovascular fitness, was predictive of the incidence of overweight in these schoolchildren.⁶⁵ The lack of available data on our children's fitness and the likelihood of less than optimal fitness levels amongst our youth, highlight the need for a broader assessment of physical fitness in American youth.

OBESITY AND PHYSICAL FITNESS IN CALIFORNIA SCHOOL CHILDREN:

In 2005, California legislators and the California Department of Education made changes to the state's public school physical activity programs, including a requirement for increased minutes of activity for students in grades K-12. Since 1996, California schools monitored student performance using Fitnessgram, a test of 6 domains of physical fitness. Early results suggest that their program is slowing the rate of child obesity and increasing levels of fitness and strength.⁶⁶

- **Built environment.** The built environment limits our ability

to commute to school and work via walking or biking or even by public transportation. Research shows that individuals who commute by cycling or walking have an 11% decrease in cardiovascular risk.⁶⁷ Enhancing public transportation access also helps prevent health problems by increasing options to healthy foods and physical activity.⁶⁸ Those who utilize public transportation take 30% more steps and spend about 8 minutes more walking than those who drive.⁶⁹ Each additional hour spent in a car is associated with a 6% increase in the chance of becoming obese, and each additional kilometer walked results in a 5% decrease in the likelihood of obesity.⁷⁰

Walking to school for many children is not easy or safe if sidewalks are unavailable.⁷¹ The 2009 YRBS survey found that more than half of students did not walk or bike to school within the past 5 days.⁷² Playing outdoors is more difficult if there are not adequate parks and recreational areas for children to play safely.⁷³ Many housing developments lack sidewalks or recreational areas.⁷⁴ Poor neighborhoods are much less likely to have places where children can be active, such as parks, green spaces, and bike paths and lanes.⁷⁵ Safety in inner city neighborhoods also makes it difficult for youth to play outside.⁷⁶ Physical activity in children has been shown to be associated with the proportion of green space,⁷⁷ with the residential density, with the general impression of activity-friendliness of the neighborhood, sports fields, water, dog waste, heavy traffic, and safe walking

and cycling conditions in the neighborhood.⁷⁸ Children's physical activity is associated with certain modifiable factors of the built environment. For example, state spending on parks and recreation is positively associated with girls' overall physical activity.⁷⁹

- **Free play.** State park officials, educators, and innovative “thinkers” have advocated for more “free play” time.⁸⁰ This implies that our children are over-scheduled and need time to play as they please, in an unstructured manner which will spontaneously stimulate physical activity on a regular basis. This may also give children the time and freedom to explore the outdoors and nature and become more interested in being outside which would increase physical activity. There may also be an overestimation of how much activity a child is getting in structured play settings. For example, a parent may assume that a child playing organized soccer is sufficiently active. However, a child may only have a game and/or practice a few times per week, or may not play an entire 50-minute game, and possibly not even meet the recommendation of 60 minutes of physical activity per day even on a “soccer day.”⁸¹
- **Increased screen time.** As technology continues to advance at a rapid rate, children spend more time being sedentary playing on computers, phones, using other technological devices, or watching television. Children spend on average 7.5 hours per day behind a screen.⁸² Increased screen time is also linked to unhealthy

nutritional practices in children. Combined increased screen time and associated poorer nutrition lead to higher BMI rates in children and poorer health outcomes.^{83,84,85} Nearly half of Boston high school students reported daily screen time that exceeded 3 hours with non-school screen time estimated at 3.6 hours on an average school day.⁸⁶ Even among middle school students in Massachusetts, almost two-thirds were exposed to 3 or more hours of screen time (computer or television) each school day.⁸⁷ In total, our students screen time is well beyond the recommended 2-hour limit suggested by the American Academy of Pediatrics.⁸⁸ No television is recommended for children under 2 years, yet 53% of 1-5 year-old children in our state watch at least one hour of television or a video during a weekday.⁸⁹

Needed Recognition - Physical Activity and Academic Achievement

Not only is physical activity closely linked to a healthy weight status,⁹⁰ according to a Centers for Disease Control and Prevention (CDC) review of 50 studies, physical activity improves students' academic performance, including grades and standardized test scores.⁹¹ Students who are engaged in aerobic physical activity 3 or more times a week have better grades than those who do not engage in vigorous physical activity.⁹² Physically active students also have lower drop-out rates, behave better in class, have improved self-esteem, are more engaged in school activities, have lower absentee rates, and have fewer health

problems than non-active children.^{93,94,95,96,97} Just as health advocates look to schools to enhance opportunities for physical activity and physical education in an effort to improve fitness and curb the obesity epidemic, schools are cutting back time committed to these endeavors in an effort to focus on academic achievement. The evidence that enhancing physical activity may promote academic achievement appears to be contrary to many school administrators' expectations that increased time and attention to core subjects will improve test scores, and most states have yet to embrace policies or practices that enhance physical activity within the school day.⁹⁸

Consequences and Costs

The World Health Organization estimates that 1.9 million deaths worldwide are attributable to physical inactivity.¹⁰⁸ Simply greater time spent sitting is also associated with mortality.¹⁰⁹ Chronic diseases associated with physical inactivity include cancer, diabetes, and coronary heart disease and cognitive impairment in the elderly.¹¹⁰

Inactivity and obesity pose significant economic cost burdens in Massachusetts and the nation.¹¹¹ It is estimated that medical expenditures for overweight and obese children are about \$200 more per year when compared to healthy weight children.¹¹² In 2003, Massachusetts spent about \$1.8 billion on adult obesity related medical costs, which is almost 5% of the total amount of money spent annually on health care.¹¹³ These numbers do not include out-of-pocket expenses such as over-the-counter diet pills and weight-loss programs. If childhood obesity continues to rise, health care costs will escalate as the obese children become obese adults and incur more health complications.

More than a quarter of health care costs in the U.S. are attributable to obesity. Obesity-associated annual hospital costs in youths aged 6-17 years have more than tripled from \$35 million during 1979-1981 to \$127 million during 1997-1999.¹¹⁴ Trust for America's Health 2011 report concluded that the United States could save \$29.8 billion in 5 years in health care costs if obesity rates were reduced by just 5%. In 10 years the savings would add up

Physical Activity and Academic Achievement in Massachusetts. In Massachusetts, the odds of passing both the MCAS Mathematics test and the MCAS English test increased as the number of fitness tests passed increased.⁹⁹ Other intervention studies suggest that increasing time on structured physical activity, while decreasing time on Mathematics and English, does not lower test scores¹⁰⁰ but may even raise them.^{101,102} Likewise, many observational studies suggest that fitness and/or increased physical activity are either positively or at least neutrally associated with academic achievement.^{103,104,105,106,107} *It is unknown whether school administrators are either not aware of this research evidence or do not know how to apply the information to their school policies and practices. Promoting fitness by increasing opportunities for physical activity during physical education, recess, and out of school time may support academic achievement.*

to \$158.1 billion, and in 20 years the U.S. could save \$611.7 billion.¹¹⁵ A new 2012 report found that obesity-related health care expenses in 2005 reached a staggering \$190 billion.¹¹⁶ This amounts to 21% of all medical spending, which is greater than the costs incurred by smoking or consuming alcohol.^{117,118}

Obesity also places economic burdens on businesses. Obese employees miss more days of work than non-obese employees due to short-term absences, disability, or premature death.¹¹⁹ Furthermore, many companies including hospitals, airplanes, public buses, and stadiums have had to spend money to build wider seats. Even cars burn almost a billion gallons of gasoline more every year than they would if passengers weighed what they did in the 1960s.¹²⁰

As these numbers show, the U.S. spends large amounts of money on medical services, yet the solutions and improvements are found at the prevention and public health levels. Last year, Massachusetts spent over \$63 billion on public and private health care, while affording less than \$600 million on public health and prevention measures.¹²¹ Furthermore, a 2010 study found that the median physical education budget for schools in the U.S. was only \$764 per school and 61% of PE teachers report an annual budget of under \$1,000.¹²² Policy makers need to invest more money and time in public health initiatives in order to save money and the lives our children. Yet the cost of obesity-related health expenditures was over \$140 billion in 2008.¹²³ As the mismatch of health care spending in Massachusetts has widened, obesity rates have more than doubled and

diabetes rates have increased by 40% in just 10 years. Residents spend more than \$10,000 per capita on health care, while public health programs have had major budget reductions in recent years.¹²⁴

Despite the potential for public health interventions to mitigate these costs the public health budget and prevention programs continue to get cut. An American Heart Association review of more than 200 research studies in 2011 found that through direct medical care and community-based prevention programs and policies, cardiovascular disease could be prevented or delayed to older age.¹²⁵ The report also highlighted significant cost savings from prevention programs:¹²⁶

- For every \$1 spent on building biking and walking paths, nearly \$3 in medical expenses can be saved.
- For every \$1 spent in wellness programs, businesses can save \$3.27 in medical costs and \$2.73 in absenteeism costs.
- For every \$1 spent on one-year interventions targeting poor eating and physical activity behaviors, \$1.17 can be saved.
- Changes in nutrition and activity behaviors reduce the likelihood of having Type 2 diabetes by 58% compared to drug therapy, which only reduces the likelihood by 31%.

Obesity is also affecting the readiness of U.S. military as well as fire and police officers. One group that has been a proponent of healthy living and physical fitness is the U.S. army. A group of retired military leaders published the report "Too

Fat to Fight” advocating for immediate policy change to address the obesity epidemic. They cite excess weight as the number one medical reason for rejection to serve in the army.¹²⁷ In total, some 27% of Americans aged 18-24 years are too heavy to join the military.¹²⁸ These problems are also being seen among firefighters and police officers. More than half of the 1.1 million firefighters are overweight and almost a third are obese.¹²⁹ In addition, many police officer recruits have difficulty passing the fitness requirement.¹³⁰ These facts underscore the detrimental impacts obesity has not only on the individual but also on national defense and public safety which is why it is vital to make obesity prevention a top priority among policy makers.

Strategic Policy Development and Program Adoption

In order to effectively reverse the numbers of obese Americans, policies need to address multiple systems in which we live in order to have the largest impact. On May 8, 2012 the Institute of Medicine released a report which highlights key strategies for accelerating progress in obesity prevention.¹³¹ The committee took a comprehensive approach and identified that engagement, leadership and action had to be taken by ALL – individuals, families, communities, and society. The goals include:

- 1) Integrate physical activity every day in every way
- 2) Market what matters for a healthy life

- 3) Make healthy foods and beverages available everywhere
- 4) Activate employers and health care professionals
- 5) Strengthen schools as the heart of health

Four of these goals work directly to promote physical activity. In order to successfully reach these goals, key strategies, policies, and laws have to be implemented. A coordinated effort from both the regulatory and programmatic side must be used to evoke societal change. However, without funding and support from local communities, schools, the state, and federal government we will not be able to fully catalyze change.

Massachusetts Policy and Program Environment

In 2010, Massachusetts joined 10 other states to pass school nutrition and nutrition education laws. The MA Senate unanimously passed a bill banning the sale of salty and sugary snacks, as well as, high – calorie sodas in public schools.¹³² The bill requires schools to sell fresh fruits and vegetables, buy locally when possible, provide information on nutrition and exercise, and ban the sale of deep fried foods. Now with a successful nutrition bill in place, Massachusetts has recently turned towards improving physical education requirements throughout the state, although none have been enacted to date. Massachusetts currently ranks in the bottom 25% of all states for our overall state index of policy environment for

promotion of physical education – this includes time requirements, staffing requirements, curriculum requirements and assessment of fitness (Figure 4).¹³³

In 2011, Massachusetts legislation debated more than 10 physical activity or physical education bill requirements.¹³⁵ Some of these pending bills like House Bill 1157 “An Act to promote healthy people and a healthy economy in Massachusetts” sponsored by Representative Sánchez, House Chair, Joint Committee on Public Health, specify the number of minutes students should engage in physical activity.¹³⁶ The other three components of Sánchez’s legislation include a tax credit for healthy food businesses to attract healthy stores and promote job opportunities, health impact reports for public capital building projects, and BMI examinations. Other legislation like House Bill 1053 “An Act for mandatory physical education for all students grades K-12” sponsored by Ms. Fox of Boston, focus on improving the

quality of physical education classes by specifying what should be taught in PE classes at each grade level.¹³⁷

In addition a dozen bills were pending in 2011 concerning zoning regulations that either directly or indirectly address the obesity epidemic. Senator James Eldridge, sponsored a bill (Senate bill 1019) to require zoning to protect open spaces and areas to develop. It would also create partnerships to prioritize state funding for communities that adopt standards that are better aligned with state health, environmental, and housing goals.¹³⁸ Policies, programs, and regulatory efforts that address the challenges of the obesity epidemic intersect with a number of domains including health, the environment, and economic development. To effectively change behavior, local, state, and federal governments need to work together with schools, communities, individuals, and businesses for a coordinated effort.

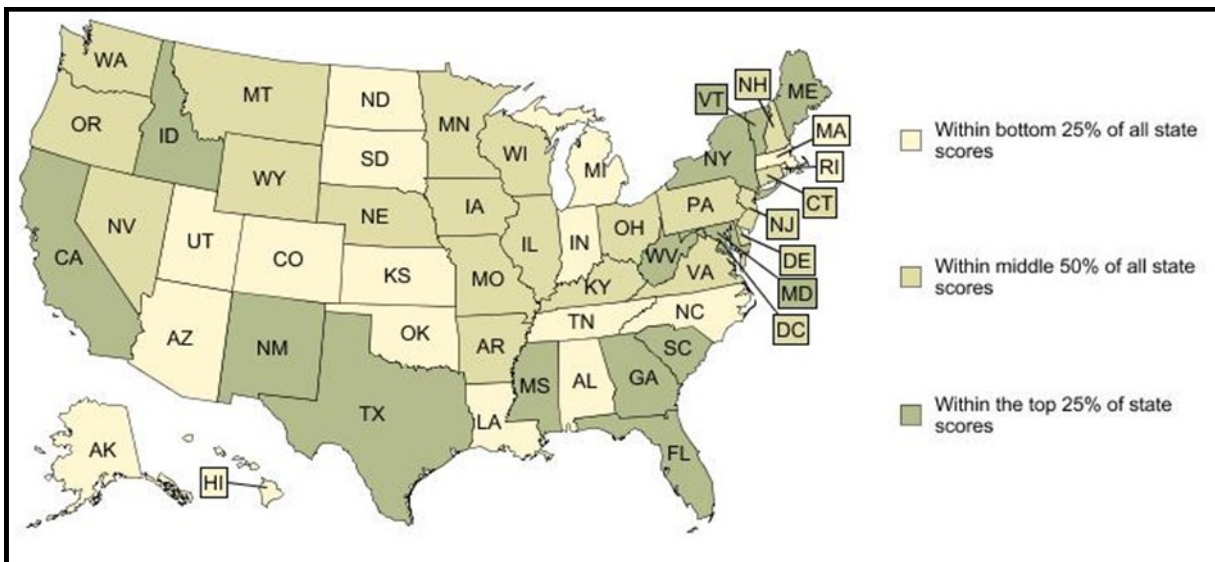


Figure 4. Physical Education Weighted Summary Score (2010) from the Classification of Laws associated with School Students, C.L.A.S.S. (National Cancer Institute).

MA Department of Public Health

The Massachusetts Department of Public Health (MA DPH) has taken significant strides in addressing the obesity epidemic. In 2009 MA DPH launched *Mass in Motion* to promote obesity prevention and wellness with a focus both on physical activity and healthy eating. *Mass in Motion* has distributed community-based wellness grants to 53 towns and cities in order to jump-start initiatives at the community level.¹³⁹

The MA DPH was also granted funding from the CDC's Childhood Obesity Research Demonstration (CORD) project which works to improve the nutritional health and activity levels among underserved children by investing in existing community efforts that combat childhood obesity.¹⁴⁰ The four year CORD project targets children ages 2-12 years who are covered by the Children's Health Insurance Program (CHIP) in order to implement innovative approaches to improve children's health by involving a variety of stakeholders. This funding has been allocated to Fitchburg and New

Bedford and has already been successful in enabling the bike path collaboration between New Bedford and Fall River. Upon completion of the grant, researchers will assess the overall impact of the projects to inform best practices in childhood obesity prevention efforts in Massachusetts communities. By providing financial support at the local level, *Mass in Motion* and the CORD grants provided seed money with significant community flexibility and have been successful in allowing communities to utilize resources in the most effective means that fit their needs.

The MA DPH also has a Health Prevention and Promotion line item which funds programs to prevent and control conditions that contribute to health care costs and those that are most preventable including obesity, heart disease, and diabetes. Preventive programs are vital to ensure a healthy community and reduce health care expenditures. Without these funds from the MA DPH, *Mass in Motion* communities would not be able to implement the successful initiatives highlighted below. Despite these efforts, budget cuts continue to threaten the

Mass in Motion

Launched in 2009 by the Massachusetts Department of Public Health

- Statewide obesity prevention initiative that promotes physical activity and healthy eating.
 - Key components:
 - *Schools*: BMI testing of public school students in grades 1, 4, 7 and 10
 - *Statewide*: Executive Order (E0509) by Governor Patrick requiring state agencies that serve food to provide nutrition standards
 - *Communities*: There are currently 33 MIM programs that serve 53 municipalities.
 - *Workplace*: Worksite Wellness Program to encourage health behaviors and reduce health care costs.
 - *Mass in Motion* website to raise awareness about healthy choices.
 - MA Children at Play Initiative and 2000-Calorie Campaign funded by federal grants
-

sustainability of these public health initiatives.¹⁴² This underscores the need for policy-makers to intervene now in order to ensure programs that promote healthier lifestyles continue to succeed.

Community-Based Interventions and Infrastructure Development

Community-based interventions have the potential to address many factors that affect a child's access to physical activity including access to safe sidewalks and neighborhoods, recreational areas, bike paths, public transportation, and open space in order to build communities that are more pedestrian and cyclist friendly. Local coalitions can be created in order to ensure partnerships between local officials, police department, Department of Transportation, Parks and Recreational Department, and volunteers. Each community can conduct their own needs assessment to determine where the needs are greatest, and then target resources in those areas to achieve the greatest impact. Appropriate funding and resources at the local level are necessary to maximize effectiveness and make sustainable changes.

Mass in Motion (MIM) Success Stories from Wellness Grants:

Springfield, Massachusetts

Springfield has one of the highest obesity rates in Massachusetts (43.6% of children are overweight or obese). Springfield mapped out neighborhoods that lacked safe areas for physical activity which were

also the areas in the city with the highest obesity rates. With their MIM grant, they targeted the areas of greatest need by implementing two programs.

- *Open Gyms Program:*¹⁴³ With additional funding donated from Health New England and the Davis Foundation, Springfield implemented a joint use policy with local elementary school gyms. The joint use policy allowed the gyms to be open after school hours to the public during the winter time. Despite little marketing, on average 70 kids per night showed up to play at the gym. After a successful year they were able partner with a community center which was taken over by a YMCA to offer hip hop dance lessons.
- *Walking School Bus:* Three out of fifty-four schools have signed on to do safe routes to school walking school bus where a staff member walks with children to and from school. Springfield hopes to expand this program to other schools and acquire stipends to pay for parents to monitor the children.

Gloucester, Massachusetts

- Gloucester implemented their *Get Fit Gloucester!*¹⁴⁴ Project with their MIM grant money. Partnering with the Community Development Department, the city repaired sidewalks and improved roads to make them more pedestrian friendly.
- The city has also expanded pedestrian access between downtown and the harbor front. It has expanded the Harborwalk so more than 200 pedestrians each hour can walk along the waterfront.

- Gloucester has also developed its first Open Space and Recreation (OSRC) Plan in the past 12 years. Now they have a comprehensive list of parks, playgrounds, beaches, and other open space areas; and have utilized a GIS database and maps to analyze areas in need of more open spaces.

Fitchburg, Massachusetts

Fitchburg has the second highest rate of childhood obesity in Massachusetts.

Despite having 44 different parks in Fitchburg, 18 of them classified as active, many have remained underused due to safety concerns. *Fun 'n FITchburg*¹⁴⁵ (Fitchburg MIM) was able to conduct park and walk audits including interviews with stakeholders, youth and residents to find that common barriers to use the parks included: lack of signage, graffiti, used needles and syringes, litter, and isolated areas which posed safety concerns.

Partnering with the community, departments such as the City Police, Board of Health, Parks and Recreation, and Department of Public Works Fitchburg has created and implemented policy, systems, and environmental changes that increase safety in parks, access to parks, and resources for key city departments including:

- An Adopt-a-Park program and campaign with 5 parks adopted by community groups/individuals and improvements under way (weekly clean-ups, plantings, and trash reports to DPW)
- A multi-media campaign to create high profile parks image (Rock with *Fun 'n FITchburg PSA*)

- Working with local environmental groups to begin creation of natural open space and new park (plantings, clearing near climbing tree, creating a path from field to parking lot) in public housing

Working on Wellness Program (MA DPH)

- Guides employers on how to create the infrastructure to maintain and support a healthy workforce. Activities include:
 - Creating new policies in the workplace like improving stairwells and outdoor spaces
 - Exploring ways to take advantage of healthcare benefits
 - Incorporating wellness into the company's overall mission
- The Family Service Association (FSA), a non-profit organization in Fall River, MA that employs almost 350 workers, joined the MA DPH's *Working on Wellness* program in order to assess employee's health behaviors and develop a wellness program. Activities of the wellness program included blood drives, team-based walking competition, stress reduction program, and proper footwear and care fashion show. The program resulted in an overall reduction in cholesterol, stress, and weight loss, as well as, a decrease in employee turnover to 10.6% in 2009 from 17% in 2008.

Active Projects in MA Communities

Shape Up Somerville: *Shape-Up Somerville: Eat Smart, Play Hard*¹⁴⁷ was initially funded by a research grant obtained by Tufts University through the Centers for Disease Control. It was first implemented by the City of Somerville in 2002 and has been self-sustainable since 2006 through community and grant support. In the fall of 2011, Somerville was awarded federal Community Transformation Grant (CTG) dollars and became part of the Mass in Motion initiative. This city-wide endeavor takes a multi-faceted approach to promote healthful eating and lifestyles. Some of the eleven initiatives that relate to physical activity include:

- *Healthy Eating Active Time* (HEAT) curriculum for classroom and after-school programs
- Parent, city employee, pediatrician and community outreach
- Improved walkability through promotion of the *Safe Routes to School* program
- Extension of the Community Path to create access to a low income neighborhood
- Outreach and training for school nurses to conduct height and weight measurements
- Policy initiatives to promote wellness of students, school staff and city employees

- Farmers markets and community/school gardens

Hubway: In 2011, Mayor Menino signed a contract with Alta Bicycle Share to announce Boston's first bike share system. Launched in July 2011 with over 600 bicycles and in 61 stations throughout Boston, Hubway members can grab a bicycle and cycle around the city. As of November 2011, 3,600 people had signed up. The City of Boston is working with MassDOT, MAPC, MBTA and the FTA to expand the system to other communities including Brookline, Cambridge, and Somerville.¹⁴⁸

These initiatives have been so successful because funding was secured by the MA DPH, help from the federal government, and through other partnerships to allow communities to allocate resources to the highest areas of need in their areas. *Shape Up Somerville* was a community-based participatory research project spearheaded by Tufts University which worked closely with restaurants, transportation department, grocery stores, and schools in order to assess and maximize their efforts. Springfield was able to evaluate their Open Gyms Program and found that many girls were not attending. After partnership with a community center, Springfield has been able to attract more girls to the program through their dance classes. These examples show that in order to make the most cost-effective impact that is most equitable, then each community must assess and constantly evaluate where their needs lie. Coalitions can be utilized as a place for all parties (corporations, universities, schools, police departments, community centers, public health agencies,

government officials, transportation workers, etc.) to come together and collaborate in order to implement best practices that are best suited for their community. It is vital to maintain the success and sustainability of these initiatives that continued funding and support be allocated to communities and public health agencies.

School-Based Programs

School-based programs are critical for our success in combating obesity.¹⁴⁹ Children spend most of their days at school and in before or after school programs. Recommendations by the IOM state that we should be striving to ensure that all students in grades K-12 have adequate opportunities to engage in 60 minutes of physical activity per school day including time spent in quality physical education.¹⁵⁰ To reach this impressive goal, key strategies for Massachusetts would include: strengthening school wellness policies, enacting policies to improve the quality and frequency of physical education for grades K-12, ensuring that at least 50% of PE time be dedicated to moderate-to-vigorous physical activity, and having local agencies

that adopt programs and requirements that include opportunities for active transport, intramural sports, active recess, classroom breaks, after-school physical activity programming, and integrate physical activity into lesson plans.¹⁵¹

The path to progress is underway in our state. MA DPH has implemented a Coordinated School Health Program (CSH) that partners with the MA Department of Elementary and Secondary Education. Funded by the U.S. Centers for Disease Control and Prevention, the CSH promotes the physical, social, and emotional health of our children and youth by delivering evidence-based health education, developing health-related policies, and promoting healthy school environments.¹⁵³ Through this partnership, the MA DPH works to improve coordination between schools and communities. Boston Public Schools is a great example of a district that has used this model to incorporate wellness into whole-school improvement. They have dramatically improved the quality and access to physical education and worked creatively to integrate physical activity across the school day – SPARK (research-based PE programs and curriculum)¹⁵⁴ is being used in K-8th and

School Wellness Policies. School wellness policies are in the middle of a makeover. The *Healthy, Hunger-Free Kids Act of 2010* expanded the scope of school wellness policies. That same year, the MA legislature passed “An Act Relative to School Nutrition” which called for regulations facilitating the establishment of school wellness advisory committees (SWAC); these regulations go into effect in August 2012. SWAC’s are standing committees, appointed by the superintendent, which are required to include school nurses, physical activity staff, school nutrition staff, parents, students, school committee members, school administrators and the public. The group must conduct a needs assessment and develop and implement an annual plan, both of which must include attention to nutrition, physical activity and obesity. They will also be charged with evaluating progress and writing an annual report. SWAC’s can play a major role in setting physical activity goals along with suggesting key elements for implementation. The CDC has put together a set of guidelines to promote both health eating and physical activity which can support local school wellness policies (Appendix III).¹⁵²

BOKS (see below)¹⁵⁵ has already been implemented in 19 elementary schools. They have also incorporated annual fitness testing in several grades using FITNESSGRAM.¹⁵⁶

Barriers to increasing physical activity in schools - budget cuts, pressures to increase standardized test scores - need to be addressed in cost effective solutions that do not take away from classroom instruction time. Innovative activity bursts and monitored recess are less costly options that do not take away from classroom time but ensure children are staying active. In addition, funds and support need to be spent on innovative school pilot programs. Examples of some existing creative initiatives are detailed below.

ABC for Fitness (Activity Bursts): ABC for Fitness is a physical activity program for elementary school children to help them settle down and concentrate during school through structured and productive bursts of supervised physical activity. It is a simple, fun, no-cost program that encourages physical activity during the day without taking away from classroom instruction. It was developed at the Yale School of Public Health.¹⁵⁷

BOKS (Build Our Kids' Success): BOKS is a before-school program that provides physical activity opportunities for elementary school children. Powered by communities, schools, and volunteers, BOKS energizes children in before school activities, promotes team building exercises, teaches children a skill to maintain a healthy lifestyle, and gives them tools to stay active throughout the school day such as BOKS bursts. BOKS is based on

Dr. John Ratey's research in his book *Spark*, which explores how moderate exercise can help enhance memory, improve thinking, lift individual's mood, and helps individuals handle stress.¹⁵⁸ BOKS operates in more than 30 schools in Massachusetts including Boston Public Schools, schools in Holyoke and Natick, and has several programs in New York and Washington D.C.¹⁵⁹

Playworks is a national nonprofit organization that promotes safe and healthy inclusive play and physical activity to low-income schools at recess and during the day. It is the only nonprofit organization in the country that sends full-time trained program coordinators, called "coaches," to low-income urban schools to enhance the recess experience and help them focus and ready to learn in the classroom. They operate in more than 300 schools in 23 cities across the nation, serving more than 130,000 elementary school students each day.¹⁶⁰ Since 2006, the Metro Boston branch has worked in 27 schools and plans to expand to 40 schools in 2013.¹⁶¹

Many of these programs operate at relatively low cost without interrupting classroom instruction time. Complementing PE classes with activity opportunities scattered throughout the day enables each student to obtain the adequate amount of activity. For example, the recommended 60 minutes of activity can be broken into different components like 10 minutes of activity bursts, 30 minutes at recess, and 20 minutes of play before school. It is important to note that most of these programs such as Playworks and BOKS do not require the school to have access to gyms; instead many of the

the Playworks and BOKS staff are creative with utilizing spaces in schools such as using school cafeterias for a fun exercise. Some schools have also partnered with local parks, community centers, or colleges within the area in order to use their open spaces and recreational centers, and corporate sponsorships may be able to provide some additional resources to the schools.

Out-of-school time. While much effort is currently aimed at improving the school wellness environment, research on the impact of childhood obesity prevention programs during out-of-school time are limited. The majority of school-aged children in the U.S. are currently enrolled in out-of-school activities, including after school, weekend and summer activities. However, there is great variability in the foods and beverages served and opportunities for physical activity offered to children participating in these programs. Comprehensive, evidence-based physical activity and healthy eating standards for out-of-school time programs in the U.S. were developed locally through Wellesley College's National Institute on Out-of-School Time (NIOST), YMCA of the USA, and a coalition of other national afterschool service and advocacy groups. The standards are currently being integrated into afterschool accreditation requirements.

The comprehensive NIOST standards were designed for programs that serve children for 3 hours or more per day and provide meals, snacks, and childcare. More succinct messaging may be necessary for other, shorter out of school time programs. Such messaging has also been developed locally by the Healthy Kids Out of School

Initiative as part of Childhood Obesity 180 – a national strategy to catalyze, prioritize and drive the necessary systemic changes to reverse the trend of childhood obesity within one generation's time.¹⁶² The implementation and evaluation of this messaging in Massachusetts, Maine and New Hampshire is currently being researched by Tufts University through funding by the Harvard Pilgrim Healthcare Institute.

Federal Efforts

Besides state and community aid, federal funding opportunities surrounding public health efforts have enabled states to implement some preventive measures within their communities. The CDC and Department of Health and Human Services (HHS) are responsible for the majority of federal programming that targets obesity. The U.S. Department of Health and Human Services (HHS) gave out more than \$100 million in Community Transformation Grant (CTG) funding to states and communities to fight chronic disease. Massachusetts Department of Public Health was the only state health department to receive two CTG grants for \$1.5 million each.¹⁶³

Let's Move is First Lady Michelle Obama's comprehensive initiative to raise awareness about the obesity epidemic and promote healthy lifestyles.¹⁶⁴ She launched the initiative in 2010 to raise awareness about the issue across the country to children, parents, teachers, and policy makers.

National Physical Activity Plan is a comprehensive set of policies to increase physical activity across the nation through a

collaborative private-public partnership.¹⁶⁵ Partners include government agencies such as the CDC and the USDA to scientific organizations such as the American College of Sports Medicine, to societies such as the American Medical Association, the American Heart Association, and the American Academy of Pediatrics.

Affordable Care Act (ACA) provides several areas to enhance obesity prevention such as the Prevention and Public Health Fund, Community Transformation Grants (CTG), expanded coverage of preventive services, nutrition labeling, Center for Medicare and Medicaid Innovation, and the Children's Health Insurance Program Childhood Obesity Demonstration Project.¹⁶⁶ In 2011, \$103 million was given to 61 counties and states for CTG that focused on prevention priorities.¹⁶⁷ The Massachusetts Department of Public Health received over \$3 million from the CTG to work on expanding efforts in active living and healthy eating, social and emotional wellness, safe physical environments, tobacco prevention, and other preventive services.¹⁶⁸

Safe, Accountable, Flexible, Efficient, Transportation Equity (Surface) Act¹⁶⁹ addresses the obesity problem through enhancing access to transportation and increasing the availability of sidewalks and bike paths in order to enhance physical activity. The act encourages communities to incorporate complete streets and safe routes to schools.

Other State Efforts

State policy plays an important role in tilting the energy balance equation towards a more active and healthy lifestyle. West

Virginia has successfully modeled its own state physical activity plan after the national plan. Their physical activity plan provides a strategic direction for physical activity promotion across the state. The priority areas include: 1) School-based programs & initiatives; 2) Public awareness & social marketing; 3) Community engagement & environment; 4) Institutional & organizational support; and 5) Policy.

To date, 21 states have legislation concerning BMI or health information collection. This information is vital for policy makers to see where the most vulnerable populations are, but also enable school officials and communities to raise awareness about the issue and garner support to address the problem. Twelve states require fitness testing which is another means to monitor and assess fitness capabilities of each student.

All states with the exception of Colorado and Oklahoma require schools to provide health education, however, health or physical education does not ensure children are receiving enough physical activity within their day. Furthermore, only 6 of those states require PE for all grade levels. Eleven states have physical activity requirements; Massachusetts is not one of them (Figure 7).¹⁷⁰ Some states have started enacting laws to require schools to provide a certain number of minutes and/or level of physical activity including Colorado, Illinois, Ohio, and Tennessee this past year.¹⁷¹ These states can be good examples for Massachusetts to follow in terms of specific legislative requirements.

Figure 7.
2011 United States Legislation School Standards

Type of Legislation	Enacted
BMI or Health Information Collection	21 States: AR, CA, DE, FL, IL, IA, LA, ME, MA, MO, NV, NY, NC, OH, OK, PA, SC, TN, TX, VT, WV
Physical Activity (min requirement)	11 States: AZ, CO, IL, IN, KY, LA, ME, NC, ND, OH, TN
Require Physical Education K-12	6 States: IL, IA, MA, NM, NY, VT (NJ and RI require PE in grades 1-12)
Require fitness testing	12 States: AL, AR, CA, CT, DE, MO, MS, SC, TX, UT, VA, WV

(adapted from Trust for America’s Health and AAHPERD)^{172,173}

Final Recommendation

As First Lady Michelle Obama said, *“It wasn’t that long ago that here in America, our children led reasonably healthy lives. They walked to school, had recess every day and gym class several times a week, and spent afternoons playing for hours outside. Home-cooked meals were the norm, fast food was a special treat, and snacking between meals was against the rules. But today, for many children, all that has changed.”*

We have a problem: obesity rates remain steady, physical inactivity is rampant, diabetes and other chronic illnesses are on the rise, and the economic burden is real. We have minimal policies in place to support daily physical activity and our low state ranking in high school physical activity levels demonstrate the magnitude of the

problem within our state. Solutions based on key strategies must be promoted and implemented – through individuals, schools, communities, and the state – with initiatives, programs and policies. Viable options could include:

- Design and support a Massachusetts Physical Activity Plan modeled off of our National Physical Activity Plan to ensure that physical activity is a priority in our state
- Set state-wide policies for quality physical education, more physical activity, and ample recess time in schools
- Require schools to administer physical fitness testing
- Provide funding to communities and schools to enhance quality physical

education and develop other innovative school-based initiatives

- Convene strong and supportive school wellness committees to help schools commit to physical activity regulations and recommendations
- Implement zoning changes in the built environment around access to open spaces, public transportation, and safe routes to walk
- Build communities that are pedestrian and cyclist friendly, create schoolyards, open spaces, and trails that are safe and accessible, and improve public transit systems to promote active living
- Increase Department of Public Health funding for physical activity programs via *Mass in Motion*
- Build support for the Affordable Care Act and the funds it supports such as Community Transformation Grants
- Support additional surveillance and evaluation of these policies and programs to inform best practices and sustain the success of existing initiatives

School and community interventions have already begun to attack the problem at various levels. Although many of these programs cost money now, they will lead to long-term benefits and reduced costs later on. Prevention is always cheaper than a cure. In order to have the greatest impact that is most equitable and cost-effective, policy makers need to pull from these best practices and adopt a solution that best fits their community. To be most successful, policies need to be incorporated at the

legislative, school, community, and infrastructure/transportation level. Studies have shown that when communities implement initiatives to increase physical activity, children are significantly more engaged when parents are aware of the initiative and are involved in the process.¹⁷⁴ A coordinated strategy that partners with various stakeholders will maximize resources and garner support. Attacking the problem from many angles will enable these efforts to positively impact the movement against obesity. As the Institute of Medicine has stated, Massachusetts needs to “*Integrate physical activity every day in every way.*”

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APPENDIX I.

Surveys

Massachusetts Youth Health Survey (YHS). The Massachusetts YHS is the Massachusetts Department of Public Health's (MDPH) surveillance project to assess the health of youth and young adults in grades 6-12. It is conducted by the MDPH Health Survey Program in collaboration with the Massachusetts Department of Elementary and Secondary Education (DESE) in randomly selected public middle and high schools in every odd-numbered year. The anonymous survey contains health status questions in addition to questions about risk behaviors and protective factors.

Massachusetts Youth Risk Behavior Survey measures high school risk behaviors over time. DPH's Youth Health Survey provides a snapshot of middle school student risk behaviors as well as other health status indicators in high school.

National Health and Nutrition Examination Survey (NHANES). NHANES data are obtained by direct measurement and physical examinations conducted by study staff. The most recent data on BMI in children and youth is available through 2010.¹⁷⁵

Pediatric Nutrition Surveillance System (PedNSS). PedNSS tracks health outcome data in low-income children between 0 to 5 years old participating in Federal child nutrition programs. Data are collected as part of clinic visits then analyzed at the state level.

Youth Risk Behavior Surveillance Survey (YRBSS). The YRBSS collects anonymous self-report data on height, weight, diet, physical activity from students in grades 9-12. Massachusetts data are available through 2009 and a few statistics are available from 2011. Boston data from the YRBSS are available due to the city's participation in the CDC's "Steps to a Healthier U.S." campaign.

Massachusetts Essential School Health Services Data (MESHS). The Massachusetts Department of Public Health's MESHS program promotes comprehensive school health services and coordination with local healthcare providers. Health screenings, including height and weight measurements are part of this model. During 2008-2009, height and weight of pupils in grades 1, 4, 7 and 10 were measured in 89 of the 109 Massachusetts school districts (82% of participating districts) participating in the ESHS Program.

- 946 schools in 80 ESHS school districts School nurses in 76 districts conducted Body Mass Index screenings on 109,674 students in grades 1, 4, 7 and 10. In each of the 4 grade levels, at least 28% of the students screened were overweight or obese.

APPENDIX II.

Physical Activity Guidelines for Americans

In 2008, the Department of Health and Human Services issued the first-ever Physical Activity Guidelines for Americans. The guidelines provide physical activity recommendations for Americans over the age of six.

Adults. For adults, the guidelines recommend that adults engage in a minimum of 150 minutes each week of moderate-intensity exercise, or 75 minutes of vigorous physical activity. Moderate-intensity aerobic activity includes activities like brisk walking, while vigorous-intensity aerobic activities include jogging or running, swimming laps, and hiking uphill. For more health benefits, adults should increase their aerobic physical activity to five hours a week of moderate-intensity, or 150 minutes a week of vigorous-intensity aerobic physical activity. At least 2 days per week, adults should incorporate muscle strengthening activities such as weight training, push-ups, sit-ups, carrying heavy loads or heavy gardening.

Children. For children (2-19 years), aerobic activity should make up most of your child's 60 or more minutes of physical activity each day. This can include either moderate-intensity aerobic activity, such as brisk walking, or vigorous-intensity activity, such as running or jumping rope. Children should be engaged in vigorous-intensity aerobic activity on at least 3 days per week. In addition, muscle strengthening activities, such as gymnastics or push-ups, and bone strengthening activities such as jumping rope or running, should each be included at least 3 days per week as part of the 60-minute per day recommendation.

APPENDIX III.

CDC's School Health Guidelines to Promote Healthy Eating and Physical Activity¹⁷⁷

1. Use a coordinated approach to develop, implement, and evaluate healthy eating and physical activity policies and practices.
2. Establish school environments that support healthy eating and physical activity.
3. Provide a quality school meal program and ensure that students have only appealing, healthy food and beverage choices offered outside of the school meal program.
4. Implement a comprehensive physical activity program with quality physical education as the cornerstone.
5. Implement health education that provides students with the knowledge, attitudes, skills, and experiences needed for lifelong healthy eating and physical activity.
6. Provide students with health, mental health, and social services to address healthy eating, physical activity, and related chronic disease prevention.
7. Partner with families and community members in the development and implementation of healthy eating and physical activity policies, practices, and programs.
8. Provide a school employee wellness program that includes healthy eating and physical activity services for all school staff members.
9. Employ qualified persons, and provide professional development opportunities for physical education, health education, nutrition services, and health, mental health, and social services staff members, as well as staff members who supervise recess, cafeteria time, and out-of-school-time programs.

End Note

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