BOSTON MOVES FOR HEALTH

Boston Moves for Health:
An Action Plan for Healthy Weight and Healthy Community

April, 2012

Boston Moves for Health:
An Action Plan for Healthy Weight and Healthy Community

Introduction

In Boston and across the nation, the proportion of adults and children who are obese or overweight continues to increase. Many factors in contemporary society contribute to this epidemic, and effective strategies to reverse the trend are long-term and complex. Yet there are actions that we *can* take, working collaboratively across all community sectors, that will begin to move us back toward health.

There is an urgent need to take action. Obesity is the major factor in the rising prevalence of type 2 diabetes, a debilitating and costly disease. Excess weight increases risk for other preventable chronic diseases such as hypertension, stroke, and some cancers. It is also associated with pregnancy complications, sleep disorders and depression. Increasingly, obese children are being diagnosed with these "adult" risk factors and diseases. According to one study, children born in the year 2000 have a 1 in 3 chance of developing diabetes.[1]

In addition to the human impact, obesity-related disease accounts for more than 10% of overall healthcare costs, amounting to $147 billion a year.[2] A recent analysis estimated that if obesity rates were reduced by just five percent, our nation could almost save $30 billion in the first five years and more than $600 billion in 20 years.[3]

We can begin to reverse these trends by adopting the increasing number of strategies shown to make a difference. Coordinated community-wide efforts for policy and systems changes, creating new social norms and lifestyle interventions that encourage physical activity and healthier diets can prevent chronic disease and are cost-effective.[4] The Trust for America's Health estimated that an investment of just $10 per person per year in effective community-based disease prevention programs in Massachusetts could reduce our state's health care costs by $476 million within five years, a return on investment of $7.40 for each dollar invested.[5]

Measuring Overweight and Obesity

Body Mass Index (BMI) is a measure of an adult's weight in relation to height, specifically weight in kilograms divided by the square of height in meters [weight (kg)/height^2 (m)]. *Overweight* is defined by a BMI of 25 or higher. *Obesity* is defined by a BMI of 30 or higher. An adult who is 5' 4" tall would be about 30 pounds overweight at a BMI of 30.

BMI is a useful tool for tracking population weight trends and for screening. However, waist measurement may be a more accurate tool to assess weight status, particularly since abdominal (visceral) fat is more metabolically active and associated with increased chronic disease risk.

Causes of Obesity

Our physical and social environments significantly shape our behavior. Increasingly, experts agree that the social and environmental policies and trends that make unhealthy choices and behaviors so easy are underlying causes of the obesity epidemic. Calorie-laden, low-nutrient food and beverages are cheap and readily available. These products are marketed by the food industry, including to children, as appealing and related to a popular, happy lifestyle. There is evidence that added sugar, present in most processed foods and particularly beverages, is one of the primary contributors to visceral fat, which is associated with metabolic syndrome and diabetes. Healthier and less-processed foods such as fruits, vegetables and whole grains cost more, take time to prepare, and are not readily available in some low-income neighborhoods. The bottom line is that Americans now consume about 500 more calories daily than we did 30 years ago.[6]

Unfortunately, our physical environment makes it convenient to be sedentary, leading to fewer opportunities to burn off those extra calories. Children are less likely to walk or bike to school, or to have physical education classes and daily recess within the school day, than in past decades. After school and on weekends, children and youth are likely to be indoors, spending increasing hours on computers, video games, and TV (where they also see ads for processed and junk food). Adults also spend more time in sedentary activity, at work, home and while commuting. Nationally, community design standards over the past half century have favored cars and sprawl, making "active transit" through walking and biking more difficult.

> "It is unreasonable to expect that people will change their behavior easily when so many forces in the social, cultural, and physical environment conspire against such change."[7]
> - Institute of Medicine, 2003

Health Inequities in Obesity and Chronic Disease

While these social trends have driven overall rising obesity rates, the burden has not been evenly distributed. Obesity is more prevalent in communities of color and in low-income communities. People with less education are also more likely to be at an unhealthy weight.

Place Matters: Social Determinants of Health

Place – where people live, work and play – matters to health. Nationally, low-income and segregated communities are less likely to have supermarkets, more likely to have fast food outlets and more likely to have junk food advertising than are other communities.[8,9] Urban school districts typically offer less physical education and fewer after-school sports programs than do wealthier communities. Fear of violence keeps many families from letting their children walk to school, play outside or bike to local recreation programs. Parks, playgrounds and other green spaces are less available in some urban areas.

The same underlying socio-economic factors that influence many other health outcomes also affect weight and chronic disease. Higher educational status improves earning potential, which affects a family's ability to purchase healthier foods. In a seeming paradox, lower-income populations are more likely to be obese, in part because high-calorie unhealthier foods are less expensive than fruits, vegetables, whole grains, and lean protein. Higher-income individuals can also afford to live in communities with more parks and opportunities to be active.

What's Your Health Code?

In 2010, the Boston Public Health Commission launched a public campaign to draw attention to the role of neighborhood and place in health outcomes. Check out your neighborhood at www.whatsyourhealthcode.com.

Stress

The role of chronic stress in obesity is receiving increasing attention. The hormonal and metabolic changes brought on by consistent daily stress may make weight gain more likely and weight loss more difficult for many people. One possible explanation is that high calorie comfort foods may play a physiological role in alleviating feelings of stress.[10]

Living on a limited income, with chronic conditions or disabilities, or in a neighborhood that experiences violence can all be sources of daily stress. People who experience lack of control about significant aspects of their lives and those who perceive a lack of respect from others also report higher levels of stress.[11]

Impact of Racism

Racism may be a causal factor in the disproportionate prevalence of obesity among communities of color through both place-based and stress-related pathways. Inequities created by the continuing legacy of racism affect equitable access to health-supporting places and resources. Differences in economic and educational opportunities, historical wealth distribution, and segregated neighborhoods with financial disinvestment all contribute to communities of color having poorer health outcomes.

Additionally, the persistence of racial stereotypes and discrimination in daily interaction with the dominant culture causes stress and anxiety. In Boston, Black residents are more than four times as likely as White residents to say they have felt discriminated against based on their race when seeking health care. A much higher proportion of Black and Latino residents than White residents feel that they have been treated worse than others in the workplace because of their race.[12]

Connecting Efforts for Health Equity

In 2005, Mayor Menino's Task Force to Eliminate Ethnic and Racial Health Disparities issued a Blueprint to address health inequities, including those related to poverty and racism. The Boston Moves for Health Action Plan directly addresses some of these recommendations and will continue to connect to this larger framework in citywide obesity prevention efforts.

Boston at a Glance: Health Status, Accomplishments and Challenges

Obesity and Health Behaviors

During the ten-year period 2001 – 2010, there has been a continued rise in both overweight and obesity in Boston, although average weight remains lower than the national average. Adult overweight increased from 30 to 35% and obesity increased from 17 to 21%, for an overall 56% of adults at an unhealthy weight in 2010.[13] In the U.S. in 2010, 64% of adults were overweight or obese.

In 2010, significantly more Black (33%) and Latino (25%) adults were obese compared to White (16%) or Asian (9%) adults. However, for overweight status, there were no statistically significant differences among racial/ethnic groups. A higher percentage of adults living in Mattapan (35%), North Dorchester

(31%), Roxbury (29%) and South Dorchester (28%) were obese than in Boston overall. A lower percentage of adults living in Fenway (7%), Back Bay (9%), Jamaica Plain (14%), South End (14%) and South Boston (16%) were obese than in Boston overall.

Slightly more than half (57%) of adults engaged in regular physical activity and 26% ate at least five servings of fruits and vegetables daily. These health behaviors have remained relatively stable over the same ten-year period that average weight status has increased. Thirteen percent (13%) of adults consumed at least one soda daily, with Latino adults more likely (21%) to consume at least one compared to White adults (10%). A higher percentage of adults living in Back Bay (72%) and South Boston (66%) and a lower percentage of those living in East Boston (45%) engaged in regular physical activity than Boston overall.[14]

In Boston, 32% of public high school students are considered overweight (18%) or obese (14%). For 2009-2011 combined, Black (20%) and Latino (20%) students were more likely to be overweight than White (11%) students. The three groups were similar in terms of obesity, while Asian students were less likely to be obese.[15]

In 2011, only 29% of public high school students engaged in regular physical activity and 19% ate at least five servings of fruits and vegetables daily, while 24% consumed at least one soda daily.[16]

Boston's Assets and Accomplishments

Boston's Action Plan for Healthy Weight and Healthy Community builds on a solid foundation of commitment and action. Under the leadership of Mayor Thomas M. Menino, Boston has maintained and expanded investment in critical neighborhood infrastructure and programs. Vibrant citywide and neighborhood-based organizations, coalitions and partnerships have worked in concert with the City to achieve the following "Moves for Health".

- Twenty-six (26) supermarkets, in almost every Boston neighborhood, have opened since 1993.
- There are now 26 seasonal farmers' markets selling locally-sourced fresh fruits, vegetables and other food products across Boston's neighborhoods. Most accept Boston Bounty Bucks, an innovative "double value" program launched in 2007 that increases the buying power of low-income residents with SNAP (food stamps) and senior or WIC coupons at farmers' markets by matching their purchases with an additional $10. In 2011, more than 1600 low-income customers spent $56,486 in Boston Bounty Bucks incentives and $63,615 in SNAP at farmers' markets.
- The City of Boston is supporting urban agriculture opportunities through zoning changes, land use policies, rooftop gardening promotion, and development of new community garden plots. Boston Natural Areas Network recently added 250 garden plots to the network of 165 community gardens through support from Boston Public Health Commission (BPHC) and the Department of Neighborhood Development. The Food Project's newly opened Dudley Greenhouse in Roxbury also benefitted from BPHC funding support. The Boston Redevelopment Authority has created a zoning overlay district for urban agriculture, beginning with three pilot parcels in Dorchester.
- In 2004, Boston Public Schools eliminated sugary beverages throughout the district. As a result, fewer youths report regular soda consumption.[17] In 2011, Mayor Menino and BPHC engaged all sectors of the City in a campaign to reduce consumption of sugary beverages, the nation's largest single contributor to caloric intake. This initiative began with a mayoral executive order to remove sugar-sweetened beverages from city property. It has also involved ten hospitals making moves to reduce consumption through a variety of strategies. More than 50 youth organizations, including those working with the Boston Centers Youth and Families' ROCKS campaign, signed up to serve

only healthier beverages. These efforts were supported by two media campaigns to bring the message home to youth and adults throughout Boston.

- Boston Transportation Department and Boston Bikes are supporting the ability of all Bostonians to move more through active transit. New guidelines for "Complete Streets" require that street re-design and infrastructure improvements put pedestrians, bicyclists, and public transit users on an equal footing with motor vehicle drivers. Fifty miles of bike lanes have been installed in less than five years. The Hubway bike share system, launched in 2011 with 600 rental bikes and 60 bike stations, exceeded all first-year projections with more than 140,000 trips and 3,700 annual memberships. BPHC collaborated with Boston Bikes to provide low-income subsidized memberships to Hubway and to get more than 1,000 refurbished used bikes to neighborhood residents through the Roll it Forward program.
- Boston Public Schools have leveraged federal grant funds, directly and through BPHC support, to establish a Health and Wellness Department that has re-vitalized physical education infrastructure and programs, trained school-based wellness champions to promote physical activity opportunities, developed new health education frameworks, and become a focal point for coordinated school health.
- Boston Parks and Recreation Department continues to upgrade and renovate playgrounds and parks on its 2,200 acres of parkland and to collaborate with a network of green space organizations to offer programming that supports Bostonians being active in their neighborhoods.
- Boston has a world-class health care system, including 25 community health centers and twelve teaching hospitals. Thanks to landmark health reform efforts in Massachusetts that have resulted in 97% of residents having health insurance, most Boston residents have access to excellent neighborhood primary care and citywide specialty care.

Youth Leadership for Health

Boston youth understand that a healthy community is needed to support healthy choices. Across the City, they've taken leadership to advocate for change. Some recent examples include:

- Boston Latin School's Youth Climate Action Network club successfully advocated for the first salad bar in a Boston public high school. East Boston's Healthy in the Hood club then obtained a grant for a salad bar at East Boston High School. The Get Fresh Crew of the Boston Collaborative for Food and Fitness held a forum for other students to learn about these successes and take action within their own schools. Boston Public Schools has now pledged to continue to add salad bars in high schools.
- In Mission Hill, Sociedad Latina youth were concerned about the health risks of sugar-sweetened beverages, particularly for their immediate community. They surveyed the vending machine options in the Longwood Medical Area's major hospitals, presented the results, and asked hospitals to make changes to healthier selections. Several hospitals made commitments and changes are underway.
- Mattapan Food and Fitness Coalition's Vigorous Youth group has been working for healthier options in corner stores in partnership with Boston Public Health Commission's Healthy on the Block campaign. Youth interns from The Food Project have also helped out with community surveys. There are now four Healthy on the Block corner stores in the neighborhood.
- The youth leadership group at Neighborhood of Affordable Housing (NOAH) wanted to support making East Boston a more bikable community. Because the neighborhood is across the harbor, the MBTA's Blue Line is its lifeline to downtown Boston, yet the T prohibited bikes during rush hour. NOAH's youth participated in the successful advocacy for the Bikes on the Blue Line pilot program that expanded bike access hours.

Challenges

While there are many assets and accomplishments on which to build continuing obesity prevention efforts, Boston also faces challenges, similar to those facing other cities across the nation.

- Despite having a relatively low overall crime rate, violent crime in several neighborhoods causes significant personal safety concerns. This limits opportunities for adults to walk or bike commute, for children and youth to play outside, and for everyone to use their parks and playgrounds. However, residents working on violence prevention are beginning to connect with those interested in food and fitness through community coalitions, offering the potential for these healthy community issues to achieve greater impact together.
- Growing income inequality in Boston and the U.S. has contributed to a divide among those who can afford to be active or purchase healthy food options and those who find it increasingly difficult. As the costs of basic needs like housing and energy have risen, too many families face the hard choice to "heat or eat".
- Federal government policies that incentivize the production of highly caloric and processed foods create an unequal playing field for healthier and fresh food. It is difficult to address food price differentials at the community level.
- Intensive food industry marketing practices that influence consumers' choices are also not subject to community control, except within organizational settings.
- Budget constraints at all government levels have contributed to difficulties maintaining affordable community recreational opportunities and school-based physical activity and physical education.
- Eliminating health inequities must be the primary focus of Boston's commitment to prevent obesity and chronic disease. The challenges of addressing both racism and larger federal policies that lead to inequitable wealth and income distribution must continue to be a priority for public health advocates and community members concerned with obesity.

Action Plan Framework

Boston's Obesity Goal

In 2011, the Boston Public Health Commission adopted the following strategic goal as part of its five-year overarching goal to address health inequities:

Reduce obesity rates among Boston residents, and reduce the gap between White and Black/Latino combined obesity/overweight rates in children and youth by 30% and in adults by 20%.

Policy, Systems and Environmental Approach

As described above, the obesity epidemic has developed from a variety of societal trends that have created a "toxic environment" that incentivizes unhealthy choices. We will most easily influence people's behavior if we can create physical environments and social norms in which making the healthier choice is the *easier* choice.

This approach asks all sectors – including schools, child and youth programs, workplaces, healthcare, business, faith organizations, community development, and government – to design and implement policies that support healthier choices for *all* the people whose lives they touch.

Although many factors impact obesity, it is important to focus and prioritize limited resources toward strategies that are likely to have the greatest reach, impact and sustainability. For this reason, high priority strategies have a PRIORITY! tag next to them.

Emphasis on Reach, Impact, Sustainability, and Coordination

The Goals and Objectives below are the backbone of the Boston Moves for Health Action Plan. They were developed with input from an expert Obesity Prevention Planning Working Group convened by Mayor Menino in winter 2011/12. (See Acknowledgements for Working Group participants.)

The Goals and Objectives are focused and somewhat narrow by design. They build on Boston's accomplishments and current needs, emphasize initiatives for which research indicates the highest likelihood of reach and impact, and address sustainability for efforts that have been ongoing for several years. The Working Group recognized that in a time of limited resources, the City should look to stakeholders, including funders and community partners, to work together on specific, achievable goals.

Boston Moves for Health Action Plan

Goals and Objectives

PHYSICAL ACTIVITY

GOALS

1. K-12 students receive 30 - 60 minutes of physical activity within the extended school day (including before- and after-school programming), including structured physical education, to promote fitness and enhance health and learning.
2. Affordable, neighborhood-based fitness opportunities that support adults and youth to be active a minimum of 30 minutes per day are widely available.
3. Early childcare programs adopt policies and programs that align with best practices for ensuring physical activity and minimal screen time.
4. Parents utilize childcare programs as sources of evidence-based information for promoting physical activity for their children.
5. Create a Boston Moves for Health wellness portal (website) to connect residents to resources that can help them attain or maintain a healthy weight.

OBJECTIVES

Schools and Out-of-school programs

1. PRIORITY! Support ability of Boston Public Schools (BPS) and charter schools to offer daily physical activity and physical education.

   - Provide all students with daily school-based physical activity opportunities through active recess, class-based movement, special events, after-school programming and active transportation (walking or biking) to/from school.

   - Provide all students with high quality, frequent physical education.

   - Implement standardized physical education curricula that encourages moderate to vigorous physical activity for at least 50% of class time, focuses on supporting life-long physical activity, and is aligned with national and district physical education frameworks.

   - Institute policy and monitoring systems (e.g., FitnessGram) to ensure all students receive and benefit from sufficient physical activity.

2. Support state legislation that both mandates and funds school-based physical education and physical activity.

3. Support after school physical activity programs.
   - Identify a common physical activity curriculum that programs can implement.

Early childhood programs

1. Provide training, technical support and incentives for childcare program staff in best practices for a healthy childcare setting and how to make organizational change.

2. Provide site-based outreach, information and education for parents that support their efforts to encourage healthy behaviors.

3. Develop a recognition/certification program for childcare programs that implement best-practice policies.

4. Collaborate with pediatric providers to educate parents about healthy childcare programs and practices.

Workplaces

Distribute workplace wellness toolkits and provide related technical assistance to local businesses.

Community and Neighborhoods

1. Implement "Complete Streets" design guidelines.

2. Expand the Hubway bikeshare system and bicycling infrastructure to reach most neighborhoods.

3. Implement a "green routes network" that connects green spaces across Boston.

4. Partner with community coalitions so that violence prevention and outdoor activity promotion are addressed as coordinated efforts.

5. Expand NeighborWalk, a network of socially supported walking groups, to offer year-round walking opportunities in neighborhoods, parks, green spaces, and indoor venues. Create an umbrella citywide campaign message for walking.

6. Expand availability of fitness equipment and programming at Boston Centers for Youth and Families (BCYF) community centers.

7. Expand availability of private community and fitness facilities through reduced membership fees, expanded hours, and enhanced programming.

8. Expand park-based infrastructure, such as outdoor fitness equipment and walking 'mile markers', to encourage active utilization of parks.

9. Implement, maintain and publicize web-based community resource directory that includes listings of community-based physical fitness opportunities.

HEALTHY EATING

GOALS

1. Sugar-sweetened beverage (SSB) consumption decreases.
2. Consumption of healthier beverages, especially water and low-fat milk (for children) increases.
3. Access to and consumption of affordable fruits, vegetables and whole grains increases, including through schools, retail outlets, restaurants and workplaces.
4. Marketing, availability and consumption of foods high in saturated and trans fats, added sugars and salt, decreases, including through schools, retail outlets, restaurants and workplaces.
5. Early childcare programs adopt policies and programs that that align with best practices for ensuring healthy foods and beverages, and supportive breastfeeding environments.
6. Parents utilize childcare programs as sources of evidence-based information for promoting healthy eating for their children.

OBJECTIVES

All Sectors

1. PRIORITY! Continue to build public awareness of health impact of SSBs, including by convening Boston partners and supporting other local, state and national efforts.

2. PRIORITY! Ensure that tap water is widely available in school, city, workplace, and community locations.

School and Out-of-School Programs

1. Support capacity of Boston Public Schools' Food and Nutrition Services to offer appealing, healthy meals, including fresh fruits and vegetables and whole grains.

2. Continue implementation of BPS competitive foods policy.

Early Childhood Programs

1. Provide training, technical support and incentives for childcare program staff in best practices for a healthy childcare setting and how to make organizational change.

2. Provide site-based outreach, information and education for parents that support their efforts to encourage healthy behaviors.

3. Develop a recognition/certification program for childcare programs that implement best-practice policies.

4. Collaborate with pediatric providers to educate parents about healthy childcare programs and practices.

Workplaces

1. Collaborate with healthcare and other organizational sectors to implement healthy food procurement policies that complement the current Healthy Beverage Initiative.

2. Collaborate with the health and healthcare community to take leadership in addressing SSB consumption both in their organizations and citywide.

3. Distribute workplace wellness toolkits and provide related technical assistance to local businesses.

Community and Neighborhoods

1. Continue implementation and monitoring of Mayor Menino's Healthy Beverages Executive Order.

2. Support a pilot initiative to offer a common kids' menu for Boston restaurants.

3. Continue to develop support neighborhood farmers markets, corner stores, and other venues as sources for fresh and healthy produce and whole grains.

4. Support pilot initiatives to lower the price for affordable healthy options for low-income residents, including further development of Boston Bounty Bucks.

5. Support pilot initiatives to implement point-of-purchase and placement strategies for healthier products at retail markets.

6. Develop sustainable network of cooking and nutrition workshops to help parents and families prepare and serve healthy meals.

Acknowledgements

Obesity Prevention Planning Working Group

Andrew Dreyfus
President and Chief Executive Officer
Blue Cross Blue Shield of Massachusetts

Barbara Ferrer, PhD, MPH, MEd
Executive Director
Boston Public Health Commission

Matthew E. Fishman
Vice President, Community Health
Partners HealthCare

Sarah Iselin, MS
President
Blue Cross Blue Shield of Massachusetts Foundation

Steven Gortmaker, PhD
Professor of the Practice of Health Sociology
Department of Society, Human Development, and Health
Director, Harvard Prevention Research Center
Harvard School of Public Health

David Ludwig, MD, PhD
John Fielding Crigler, Jr. & Mary Adele Sippel Crigler Chair in Pediatric Endocrinology
Director, New Balance Foundation Obesity Prevention Center
Boston Children's Hospital
Professor of Pediatrics
Harvard Medical School

Vivien Morris, MS, RD, MPH, LDN
Chair
Mattapan Coalition for Food and Fitness

Shari Nethersole, MD
Medical Director for Community Health
Children's Hospital Boston

Karen Voci
Executive Director
Harvard Pilgrim Health Care Foundation

Walter Willett, MD, MPH, DPH
Fredrick John Stare Professor of Epidemiology and Nutrition
Chair, Department of Nutrition
Harvard School of Public Health

Boston Public Health Commission Staff

Lisa Conley, JD, MPH
Barbara Ferrer, PhD, MPH, MEd
PJ McCann, JD
Megan McClaire, MSPH
Anne McHugh, MS
Aliza Wasserman, MS, MPH

References

[1] Narayan KM, Boyle JP, Thompson TJ, Sorensen SW, Williamson DF. Lifetime Risk for Diabetes Mellitus in the United States. Journal of the American Medical Association, 290(14): 1884-1890, 2003.

[2] Finkelstein EA, Trogdon JG, Cohen JW, Dietz W. Annual Medical Spending Attributable to Overweight and Obesity: Payer- and Service-Specific Estimates. Health Affairs, 28 (5): w822- 31, 2009.

[3] Levi J, Segal LM, Salay R. Issue Brief: Bending the Obesity Cost Curve. Trust For America's Health, February 2012. http://www.healthyamericans.org/assets/files/TFAH%202012ObesityBrief06.pdf. Accessed April 15, 2012.

[4] Weintraub WS, Daniels SR, Burke LE et al. Value of Primordial and Primary Prevention for Cardiovascular Disease: A Policy Statement from the American Heart Association. Circulation, 124: 967-990, 2011.

[5] Trust for America's Health. Prevention for a Healthier America: Investments in Disease Prevention Yield Significant Savings, Stronger Communities. July 2008. http://www.healthyamericans.org/reports/prevention08/Prevention08.pdf. Accessed 4/15/12.

[6] United States Department of Agriculture. Agriculture Fact Book, 2001-2002. US Government Printing Office, March 2003. http://www.usda.gov/factbook/index.html. Accessed 4/15/12.

[7] National Research Council. *The Future of the Public's Health in the 21st Century*. Washington, DC: The National Academies Press, 2002.

[8] Morland K, Wing S, Diez-Roux A, & Poole C. Neighborhood characteristics associated with the location of food stores and food service places. American Journal of Preventive Medicine, 22(1): 23-29, 2002.

[9] Horowitz CR, Colson KA, Herbert PL, & Lancaster K. Barriers to buying healthy foods for people with diabetes: Evidence of environmental disparities. American Journal of Public Health, 94(9): 1549-1554, 2004.

[10] Chuang J, Perello M, Sakata I. Ghrelin mediates stress-induced food-reward behavior in mice. Journal of Clinical Investigation, 121(7): 2684-2692, 2011.

[11] Williams, DR, Neighbors HW, & Jackson, JS. Racial/Ethnic discrimination and health: Findings from community studies. American Journal of Public Health, 93:200-208, 2003.

[12] Mayor's Task Force to Eliminate Ethnic and Racial Health Disparities. Mayor's Task Force Blueprint. Boston Public Health Commission, July 2005. http://www.bphc.org/chesj/resources/Documents/Reports/Mayor's%20Task%20Force%20Blueprint%20Report.pdf. Accessed 4/15/12.

[13] Boston Behavioral Risk Factor Survey, 2001, 2003, 2005, 2006, 2008, and 2010, Boston Behavioral Risk Factor Surveillance System (BBRFSS), Boston Public Health Commission. DATA ANALYSIS: Research and Evaluation Office

[14] Boston Behavioral Risk Factor Survey 2003, 2005, 2006, 2008, and 2010, Boston Behavioral Risk Factor Surveillance System (BBRFSS), Boston Public Health Commission. DATA ANALYSIS: Research and Evaluation Office

[15] Youth Risk Behavior Survey 2007, 2009, 2011, Youth Risk Behavior Surveillance System (YRBS), Centers for Disease Control and Prevention (CDC). DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office

[16] Youth Risk Behavior Survey 2011, Youth Risk Behavior Surveillance System (YRBS), Centers for Disease Control and Prevention (CDC). DATA ANALYSIS: Boston Public Health Commission Research and Evaluation Office

[17] Cradock AL, McHugh A, Mont-Ferguson H, Grant L, Barrett JL, Wang C, et al. Effect of school district policy change on consumption of sugar-sweetened beverages among high school students, Boston, Massachusetts, 2004-2006. Preventing Chronic Disease, 8(4): A74, 2011. http://www.cdc.gov/pcd/issues/2011/jul/10_0149.htm. Accessed 4/15/12.