Population Health Framework

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PART 1: DEFINITION OF THE POPULATION OF FOCUS

General Epidemiology of Worcester and its Alliance Towns

Worcester and its alliance towns are comprised of a very diverse population with sizeable immigrant and refugee communities **(Table 1)**. Among the biggest hurdles facing public health is the fact that 14% of the population lives below poverty and roughly 6% of the entire population is unemployed **(Table 2)**.

	CMRPHA total	Holden	Leicester	Millbury	Shrewsbury	West Boylston	Worcester	Massachusetts
White, Not Hispanic	70.4%	92.7%	90.8%	92.8%	77.3%	88.9%	59.6%	76.1%
Black or African-American, Not Hispanic	7.1%	0.9%	1.0%	1.2%	2.0%	4.2%	10.2%	6.0%
Hispanic or Latino	14.1%	2.2%	3.8%	2.3%	2.7%	5.3%	20.9%	9.6%
Asian	6.3%	3.0%	1.6%	1.0%	15.3%	0.7%	6.0%	5.3%
Some Other Race	0.5%	0.2%	0.6%	0.5%	1.0%	0.4%	0.9%	11.0%
Two or More Races	1.6%	1.0%	1.3%	1.3%	1.6%	0.6%	2.3%	1.9%

Source: US Census Bureau, American Community Survey (2007-2011)

Table 1. Racial and Ethnic Backgrounds of Alliance Communities **[Adapted from Greater Worcester Region CHIP 2013 Amendment and Annual Report]**

	CMRPHA total	Holden	Leicester	Millbury	Shrewsbury	West Boylston	Worcester	Massachusetts
Population	265,889	17,346	10,970	13,261	35,608	7,669	181,045	6,547,629
Median Household income	$57,464	$85,095	$72,843	$68,046	$85,016	$71,172	$47,415	$65,981
% below poverty	13.8%	3.5%	4.8%	2.9%	3.9%	3.6%	19%	11%
Median age	36.1	41.4	39.7	41.8	38.8	40.4	34.3	38.9
% unemployed	5.6%	5.6%	6.9%	5.6%	4.1%	3.6%	6%	6%

Source: US Census Bureau, American Community Survey (2007-2011)

Table 2. Demographic Qualities of Alliance Communities **[Adapted from Greater Worcester Region CHIP 2013 Amendment and Annual Report]**

Furthermore, public health efforts are also faced with the challenge of Worcester adults being in poorer general and mental health, having higher rates of obesity, asthma and diabetes as compared to the rest of Massachusetts[1]. Moreover, Worcester residents have reported lower rates of healthy foods consumption, higher rates of smoking, and lower rates of physical activity than the rest of the commonwealth[1]. **Table 3** provides a good comparison of these measures between Worcester and Massachusetts as a whole.

	Worcester	Massachusetts
General		
Prevalence of fair or poor health	15.7%	11.9%
Number of days in past 30 days physical health not good	10.1 days	8.5 days
Prevalence of having a disability and needing help	8.4%	5.4%
Physical / Disease-related		
Prevalence of coronary heart disease	6.0%	5.9%
Prevalence of ever diagnosed with Stroke among adults (35+)	1.8%	2.0%
Prevalence of asthma	12.7%	10.3%
Prevalence of diabetes	8.6%	7.5%
Prevalence of obesity	25.1%	23.0%
Prevalence of overweight/obesity	61.4%	58.9%
Mental		
Number of days in past 30 days mental health not good*	12.1 days	8.9 days
Prevalence of symptoms of depression in past two weeks	11.0%	7.4%
Behavioral		
Prevalence of consumption of 5 or more fruits and vegetables per day	24.3%	27.4%
Prevalence of regular physical activity**	46.6%	52.2%
Prevalence of current smoker***	23.1%	15.9%

Source: Massachusetts Department of Public Health, Behavioral Risk Factor Surveillance System CY 2008-2011. *CY 2007-2011. **CY 2001, 2003, 2005, 2007, 2009. ***CY 2006-2010.

Table 3. State Behavioral Risk Factor Surveillance Survey Data for Worcester, MA. **[Adapted from Greater Worcester Region CHIP 2013 Amendment and Annual Report]**

Table 4 illustrates overweight and obesity prevalence in Worcester and alliance town high schools versus the entire Commonwealth of Massachusetts. Obesity is a major predictor of poor health and is a main focus of public health efforts in making the region the healthiest in New England.

	Wachusett**	Leicester	Millbury	Shrewsbury	Worcester*	Massachusetts
Overweight	13.3%	22.3%	18.0%	17.1%	18.9%	16.7%
Obese	9.3%	17.4%	21.4%	11.0%	20.9%	15.7%
Overweight or Obese	22.6%	39.7%	39.3%	28.2%	39.8%	32.3%
Grade 1 Overweight or Obese	16.0%	33.1%	31.6%	26.8%	35.2%	28.4%

Source: Massachusetts Department of Public Health, School Health Unit, "The Status of Childhood Weight in Massachusetts, 2011."
*Worcester data do not include Grade 10, which may lower overall rate. **Wachusett School District includes Town of Holden.

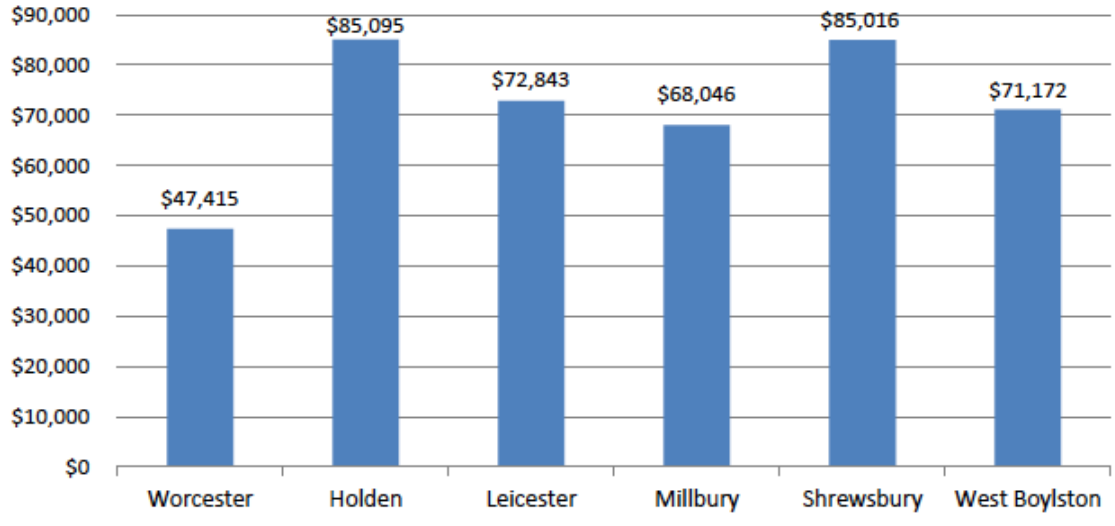
Table 4. Overweight and Obesity Prevalence in Area High Schools **[Adapted from Greater Worcester Region CHIP 2013 Amendment and Annual Report]**

Social Determinants

"The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels" (World Health Organization, 2014).

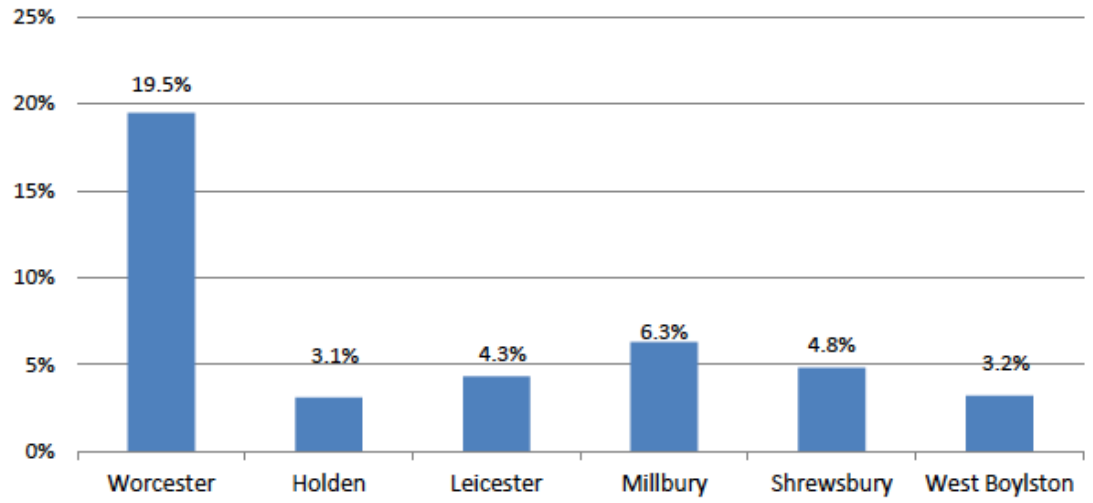
Socioeconomic Factors

The greater Worcester area includes six communities with very diverse socioeconomic conditions. The median household income in Worcester in 2009 was $47,415 while the surrounding communities ranged from $68,046 to $85,095 (**Figure 1**). Additionally, 19.5% of individuals in Worcester were below the poverty line, compared to 3.1%-6.3% in the surrounding communities.



DATA SOURCE: U.S. Census, American Community Survey, 2009 as cited in city-data.com and CHNA8 assessment

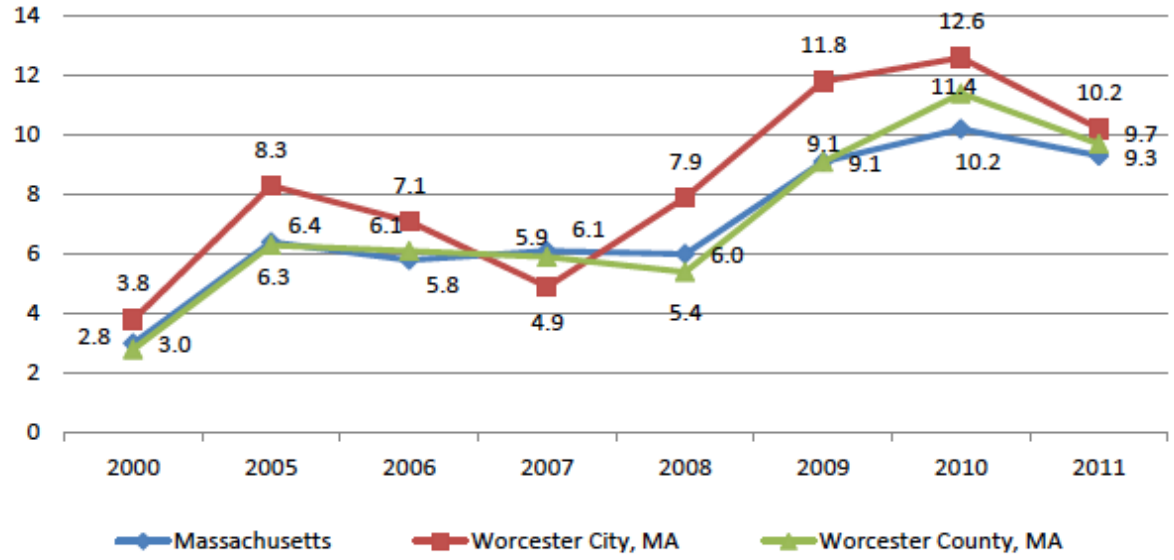
Figure 1: Median Household Income in Greater Worcester Area, 2009 *[Obtained from 2012 Greater Worcester Community Health Assessment (CHA)]*



DATA SOURCE: U.S. Census, American Community Survey, 2009 as cited in city-data.com and CHNA8 assessment

Figure 2: Percent of Individuals Below Poverty in Greater Worcester Area, 2009 *[Obtained from 2012 Greater Worcester CHA]*

The unemployment rates in Worcester from 2000 to 2011 were higher than those of Worcester County and Massachusetts every year except for 2007 (**Figure 3**). In 2011, Worcester had a 10.2% unemployment rate, compared to 9.7% in Worcester County and 9.3% in Massachusetts.



DATA SOURCE: 2000 Census, 2005-2011 American Community Survey.

Figure 3: Unemployment Rates in City of Worcester, Worcester County, and MA, 2000-2011 *[Obtained from 2012 Greater Worcester CHA]*

Another socioeconomic determinant of health is race. Out of the six towns listed above, Worcester is the most diverse with 59.6% White, 10.2% Black of African-American, 20.9% Hispanic or Latino, and 6.0% Asian (**Table 1 in section above**). The surrounding towns range from 77.3%-92.8% White with smaller percentages of other races, the one exception being 15.3% Asian in Shrewsbury.

Healthcare Access Factors/Cultural Factors

There are numerous barrier to healthcare access. One helpful indicator of the presence of such barriers is the use of the emergency department (ED) for non-urgent issues. In Worcester, the leading causes of ED visits are respiratory illnesses, particularly among children at 58.0 per 1000 (Worcester Community Health Assessment, 2011). Survey respondents explained that limited access to health care was a major reason for the use of the ED to manage chronic illnesses (CHIP Report 2013).

A list of challenges to accessing healthcare are listed in **Figure 4** below, according to Greater Worcester CHA Survey of 2012. Lack of evening/weekend services are a major challenge, according to 38.2% of respondents. Other leading causes include long waits for appointments (33.2%), cost of care (23.6%), and insurance problems (18.9%). One can imagine how these can be related to non-acute visits to the emergency department. Finally, cultural factors can also influence access to healthcare. Discrimination of the provider or staff (7.2%) and language barriers (2.4%) are among the challenges reported by survey respondents.

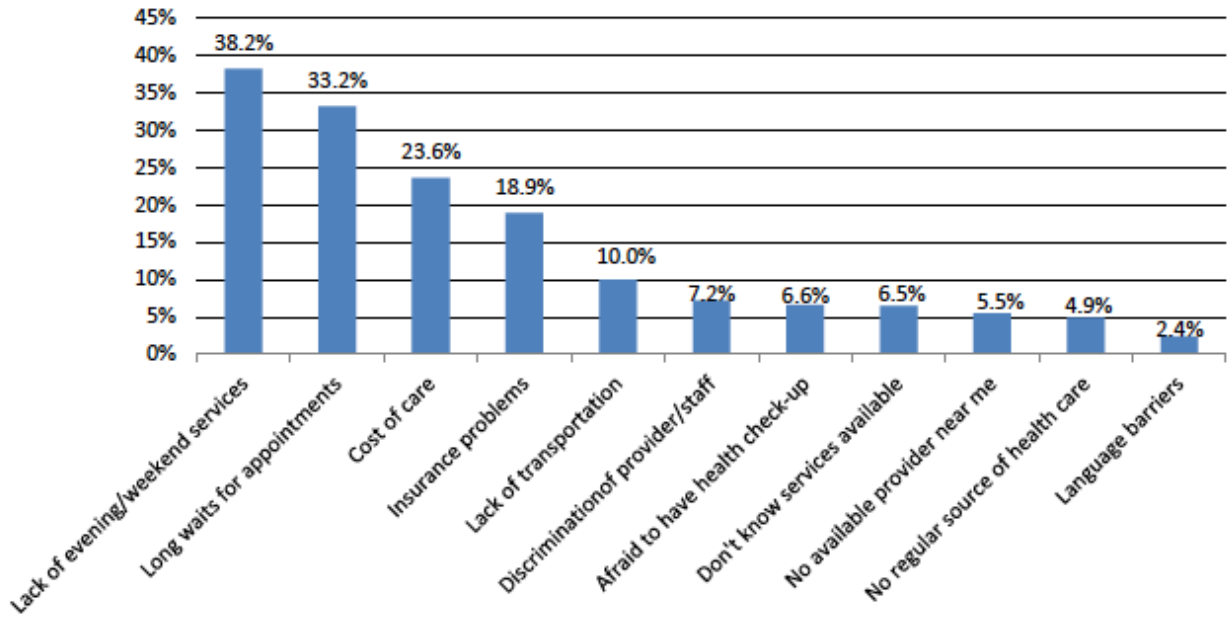


Figure 4: Challenges to Accessing Health Care in the Greater Worcester Area (Worcester CHA Survey 2012)

Social Manifestations and Implications

According to the *County Health Rankings and Roadmaps* the City of Worcester ranks nine out of fourteen in overall health outcomes, which includes measures of the length of life, quality of life, health behaviors, clinical care, physical environment, and social economic factors (2014). The access to primary care physicians in Worcester is a ratio of 971:1, only marginally improved over the state average ratio of 977:1. A combination of this data provides public health workers in Worcester a snap shot of the community's health as a whole and a way to better understand

the lack of access to preventative and primary care in the city and surrounding areas. The Division of Public Health (DPH) in Worcester can use this data to help better understand the population they are serving, and to better target the population that does not have access to these resources.

Mental health continues to be a public health issue that the community struggles with because "mental health is something some people don't want to talk about" (*Greater Worcester 2012 Community Health Assessment*, 2012, p. 67). *County Health Rankings and Roadmaps* helps to illustrate this problem with a ratio of 322 patients to 1 mental health provider in the Worcester area and the Massachusetts state average of 248:1 (2014). This statistic clearly illustrates the lack of care and support for the population in Worcester that has mental and behavioral health needs. The DPH has identified behavioral health as one of the five domains in the Greater Worcester Community Health Improvement Plan (CHIP). The CHIP consists of five domains that aim to improve the long-term health and well being of the Central Massachusetts Regional Public Health Alliance (Holden, Leicester, Millbury, Shrewsbury, West Boylston, and Worcester). Each domain consists of numerous strategies to help reach the overarching goal of long-term health and well being of these vibrant and diverse communities. In regards to behavioral health the CHIP hopes to increase 500 key community members' understanding of metal health issues and to improve the gatekeepers/systems reaction to this common problem (*Greater Worcester Community Health Improvement Plan*, 2012).

The 2014 data from the *County Health Rankings and Roadmaps* also provides data to support many of the other CHIP domains. One domain in particular is the healthy eating/active living domain of the CHIP. Adult obesity is ranked at 26% in Worcester, which is higher than the state average of 24%, and physical inactivity is ranked at 23% in Worcester (*County Health Rankings and Roadmap*, 2014). The DPH has designed this domain to help target these statistics by increasing the availability of and access to affordable fresh local fruits and vegetables, increasing the community's access to physical activity resources, and increasing the percentage of children in grade 1 who are a healthy weight (*Greater Worcester Community Health Improvement Plan*, 2012).

The allocation of resources among the five different domains in the CHIP is not an easy task. All of the domains have a specific and important impact on the overall health and well being of the Greater Worcester Community, and all need numerous resources including manpower and financial support. There are only 25 employees at the DPH in Worcester, and limited financial resources. In order to determine which project is allocated the most time and resources, the DPH utilizes a Community Health Assessment strategy that allows them to continue to monitor the trends in each of the communities within the alliance.

With 19.5% or individuals living below poverty and 31.5% of children in the City of Worcester (*Greater Worcester 2012 Community Health Assessment*, 2012, p. 16) it is important for the DPH to make sure that all of the programs they are implementing with the CHIP are reaching all members of the Greater Worcester Community, including those who are often underserved. A key informant in the social service sectors interview for the *2012 Community Health Assessment* commented, "people live in the same city but live in different worlds" (p. 81). A second key informant in the health care sector commented, "when we look at health indicators, there is a

difference between the rest of the city and the white population" (p. 81). When the DPH is collecting information for the Community Health Assessment in order to allocate resources for the CHIP, it is important to look at comments such as these and allow affordability and accessibility to all of the CHIP programs for the entire community.

The DPH is helping to promote health equity for the Worcester community through the implementation of the CHIP's domains, objectives, and strategies. The DPH is focused on reaching across all of the Greater Worcester Community to promote overall health and well being across the *entire* population. An example of this strategy in action is the Regional Environmental Council's mobile farmer's markets that travel to low income neighborhoods in Worcester to help deliver affordable, local farm fresh fruits and vegetables to the areas of Worcester that don't usually have access to such resources. This mobile farmer's market also accepts federally funded programs such as the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). This intervention would fall under the first domain of the CHIP that is looking to increase availability and access to affordable fruits and vegetables for the low-income residents.

PART 2: INTER-PROFESSIONAL ANALYSIS

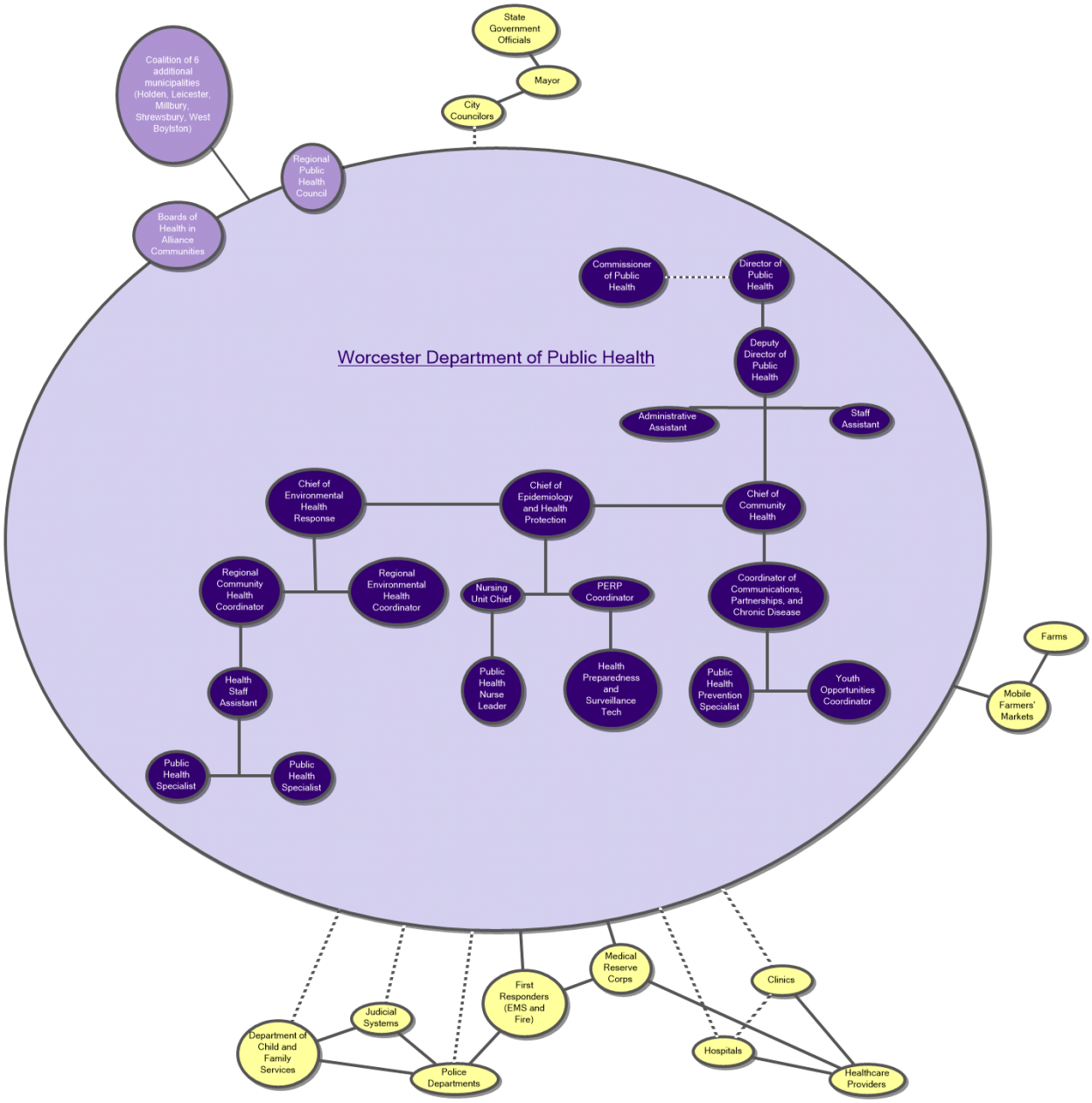


Figure 1. This figure depicts a schematic representation of the Worcester Department of Public Health, its components, and the affiliations that exist between it and other community institutions. The lines represent collaborations and associations. The dotted lines represent connections that could be improved and strengthened.

The Worcester Department of Public (DPH) consists of 25 employees who are tasked to serve the 182,500 residents of the city as well as the residents of the six alliance towns (Grafton, Holden, West Boylston, Millbury, and Leicester). Alliance towns have access to all programs and services, as well as Emergency Preparedness Programs. Within DPH, there are three major programs: Environmental Health, Epidemiology and Nursing, and Community Health. Each of these areas is responsible for their own subset of public health responsibilities. Due to the small size of the department, DPH seeks to form sustainable relationships with various community institutions in order to collaboratively care for the city of Worcester and the alliance towns. Many of these relationships are strong, which is evident due to the vast number of programs and improvements implemented by DPH and its partners. One example of these positive collaborations is with the Mobile Farmers' Market program and local farms. This program seeks to provide fresh and local produce to the people of Worcester, especially low-income individuals and families, in areas convenient for them.

Some relationships between DPH and affiliated organizations could be improved. Strengthening these connections would benefit the community, allowing for better programs and more collaborative problem solving. A common discussion point that continuously surfaces throughout the clerkship was the struggle to maintain good relationships with the city councilors, who play an important role in large-scale policy changes that impact the city. DPH is looking into improvements within their ranks that will help to better this relationship. One important change is the dissolution of the Commissioner of Public Health position and the creation of a Board that will act in his place. The former Commissioner of Public Health will become the Medical Director. These changes, in addition to improving internal communication and efficacy, aim to improve relations with legislators.

Improvements can also be made in the communication and collaboration between public service institutions such as the police departments, EMS and fire, the judicial system, and the department of child and family services. Because these are also government-funded programs, they, like DPH, are subject to budgetary adjustments and cuts. This can lead to impaired communication both internally and externally. These institutions are all tasked with the similar goals, such as keeping the public safe and promoting a healthy community. DPH currently collaborates with many of these organizations on certain projects, but continued efforts to improve these relationships would be beneficial.

DPH also has shared goals with other healthcare organizations, like hospitals and clinics. Worcester has multiple large hospitals, as well countless general practice and specialized clinics. DPH developed and implemented a Community Health Improvement Plan (CHIP), which aims to make Worcester the healthiest city in New England by 2020 with a variety of actions in five priority areas. Hospitals and clinics could help to carry out and further this plan with collaboration between clinicians of these institutions and DPH. Additionally, UMass Medical School and its three graduate schools have a wealth of students with varied interests and knowledge. Interested students could aid DPH with specific initiatives that would directly impact the CHIP.

PART 3: HEALTH ADVOCACY

Advocacy Organizations	
What are some of the local, state, national or international organizations that do advocacy work related to the health of the population of focus?	Regional Environmental Council (REC), Worcester Free Clinic Coalition (WFCC), AIDS Project Worcester, Community Healthlink's Homeless Outreach and Advocacy Program (HOAP), Worcester Refugee Assistance Program (WRAP), Massachusetts Advocates for Children (MAC), Obesity Action Coalition (OAC), Massachusetts Association for Mental Health (MAMH), Mass in Motion (MiM), World Health Organization (WHO), Coalition on Human Needs (CHN), Alliance for Justice (AFJ), and countless other organizations working to benefit Worcester.
Advocacy Issue: ***Try to choose an advocacy issue that will in some way affect the population of focus.*** **Advocacy specifically refers to promoting legislation, policies, systems, or specific budgetary appropriations that positively affect a health issue. This may occur through decreasing barriers to accessing health services, providing an infrastructure conducive to effective health promotion programs, or directly increasing the resources and infrastructure of the public health system.**	
Looking at the state, national, and/or international level, at the websites or information from the organizations above, what is a major area of advocacy at this time?	These groups are concerned with many issues, including access to healthy foods, education, healthcare, and exercise in order to tackle the growing obesity problem and to improve the overall health of the population.
Is there a specific law, policy or appropriation being advocated for? If so, what?	These organizations are currently advocating for many different pieces of legislation, including the **Child Nutrition and WIC Reauthorization Act**, which would provide low income children with healthy foods daily, the **Treat and Reduce Obesity Act**, which would enable healthcare providers to better treat obesity, the **Promoting Physical Activity for Americans Act**, which would spread awareness about the importance of exercise, an **Act relative to healthy kids**, which would require physical education and health classes in the schools, and some provisions under the **Affordable Care Act**.
Which organizations are doing the advocating and to whom?	Notably, the Community Healthlink's Homeless Outreach and Advocacy Program (HOAP), Worcester Refugee Assistance Program (WRAP), Regional Environmental Council (REC), Massachusetts Advocates for Children (MAC), Obesity Action Coalition (OAC), Massachusetts Association for Mental Health (MAMH), Mass in Motion (MiM), and Coalition on Human

	Needs (CHN) are all advocating to congressmen and other elected officials in support of these bills.
Whom will this issue affect?	This issue will affect the entire population of Worcester both directly by improving the health of its citizens and indirectly as a result of medical costs.
Were they or will they (in your opinion) be successful and why?	Although the enactment of these bills will help to reduce disparities in healthcare, education, and access to exercise and healthy foods, it is difficult to change a cultural mindset. Even if these pieces of legislation pass, citizens might not adapt a healthier lifestyle. For example, in schools, when children are given healthy fruits and vegetables, they often throw them out, thus negating the positive benefits of the initiative. Further, even if citizens are made aware that they should be exercising more and that a healthy diet and exercise is the best method to counteract obesity, that knowledge doesn't mean that they will alter their lifestyle. Therefore, any change is going to take many years to become visibly apparent because the current generation is much less likely to alter its behavior than future generations, which don't know of an alternative, unhealthier lifestyle. In spite of this obstacle, these organizations still have the potential to be successful, but positive change will take many years, and the process will be a slow one.
If they are not successful, what other strategies can be used to achieve the same goal?	If these organizations are not successful, there are other, more financially based incentives that can be used to achieve the same goal. As previously said, having the means to a healthy lifestyle is only half of the battle. The other issue lies with the people of Worcester, and their willingness to utilize these resources in order to adapt a healthier way of living. Therefore, other strategies can address the half of the equation dependent upon the person itself, namely through financial considerations. For example, in the United Kingdom, there is currently a proposal, which would pay overweight or obese citizens for losing weight. The evidence for this proposal comes from a Mayo Clinic study, which found that financial incentives significantly enhanced weight loss. Now, this isn't to say that a bill as such would ever be enacted in the area, but the idea of motivating people with money to lose weight is a strong one. In a similar but much more feasible proposal, insurance companies could offer stronger incentives for weight loss in the form of decreased insurance rates or other credits. This financial motivation would likely encourage people to adapt a healthier

	lifestyle. With the means to a healthy way of living already in place as a result of the current legislation, such motivation could result in a dramatic decrease in obesity rates and an improvement in the health of the region. (http://money.cnn.com/2014/10/24/news/economy/obesity-cash-incentives/) (http://www.shrm.org/hrdisciplines/benefits/articles/pages/weight-loss-incentives.aspx)
What are the consequences of success/failure?	The consequences of success/failure are astronomical. Overweight and obese people have significantly higher rates of diabetes, cardiovascular disease, cancer, and musculoskeletal problems. The healthcare costs associated with these issues are in the billions of dollars without including the lost hours of work and productivity. Therefore, success is essential as the consequences of failure are so severe that it would negatively impact everyone in the region. (http://www.who.int/mediacentre/factsheets/fs311/en/)
How do you think physicians and/or nurses can be involved in this advocacy issue?	Physicians and nurses can certainly help in this advocacy issue. Through their interactions with patients, they can help to convince them to adapt a healthier lifestyle and to inform them of resources in the area. Additionally, medical professionals have influence in the community as they can talk to community members and local legislature about the importance of these issues. Further, though professional organizations such as the American Medical Association (AMA), they can influence decisions on the national level. In short, physicians and nurses play an integral role in the health of the citizens of Worcester and must lead the charge against the growing obesity issue.

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