Innovation in Community-Based Health Promotion Programming: Reimagining the Greater Boston YMCA Diabetes Prevention Program

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INNOVATION IN COMMUNITY-BASED HEALTH PROMOTION PROGRAMMING:
REIMAGINING THE GREATER BOSTON YMCA DIABETES PREVENTION PROGRAM

ERICA LYNNE REAVES

A DELTA Doctoral Thesis Submitted to the Faculty of

The Harvard T.H. Chan School of Public Health

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Innovation in Community-Based Health Promotion Programming: Reimagining the Greater Boston YMCA Diabetes Prevention Program

ABSTRACT

Type 2 diabetes – the seventh leading cause of death in the United States – is a chronic condition that is generally preventable. In 2014, the YMCA of Greater Boston (Boston YMCA) launched a modified version of the evidenced-based National Diabetes Prevention Program to support individuals with prediabetes in addressing modifiable risk factors for diabetes and potential complications. Now at the five-year mark, the Boston YMCA management team aims to redesign its Diabetes Prevention Program to expand its footprint in the local health promotion landscape and increase the likelihood of positive, sustainable lifestyle change for participants. Potential long-term objectives for the Boston YMCA Diabetes Prevention Program (YDPP) are (1) to move toward parity in program offerings by launching, tracking, and maintaining high-quality YDPPs at each branch and (2) to develop and implement community-clinical linkages to streamline participant recruitment and provider-patient communication.

This DELTA (Doctoral Engagement in Leadership and Translation for Action) project examined the diabetes prevention services and supports landscape to map key internal and external stakeholders and identify potential YDPP collaborators. Key themes from qualitative interviews with Boston YMCA executive and branch leadership highlighted neighborhood-level factors that impact enrollment in lifestyle modification programming and opportunities to streamline internal policies and procedures to improve recruitment, lifestyle coach training, participant retention, and data reporting
for YDPP. From YDPP participant surveys and Boston YMCA staff focus groups emerged viable, actionable recommendations for YDPP redesign and relaunch. Looking forward, the Boston YMCA may consider implementing a supplemental, wrap-around health and wellness program – the Year of You™ – to demonstrate improved participant outcomes under a holistic care model that accounts for the social and economic drivers of health inequities.
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ACKNOWLEDGEMENTS

In memory of

Frederick E. Swanson, Jr.
1954 – 2017

Michael Burton
1956 – 2019

LaMont F. Toliver
1963 – 2012

In honor of

Bilhah, Venus, Titus, Juba and the other enslaved people of African descent who toiled
on the campus of Harvard University

With immeasurable gratitude for

My mother, Lisa Swanson Reaves; my grandparents, Frederick and Esther Swanson; my
uncle, James Morton; and beloved family, friends, teachers, and mentors.
**INTRODUCTION**

Diabetes is a growing epidemic and a leading cause of death in the United States, impacting almost one in ten Americans according to the federal Centers for Disease Control and Prevention (CDC). Type 2 diabetes, which accounts for nearly all diabetes diagnoses, is chronic, costly, and preventable. While there are several genetic and environmental factors that increase one’s chance of developing type 2 diabetes, obesity and physical inactivity are the major, modifiable risk factors. The progression to type 2 diabetes can take several years, and people at highest risk are those in the prediabetic range. Recommended lifestyle modifications for prediabetics – increased physical activity and weight loss among those who are overweight – may help delay or prevent the onset of type 2 diabetes and its sequelae.

The Young Men’s Christian Association, commonly referred to as the “YMCA” or “Y,” is a key non-clinical stakeholder in community health. A 2008 study of the CDC-sponsored National Diabetes Prevention Program identified the YMCA as a promising host site for delivery of an evidenced-based approach to diabetes prevention that includes standardized curriculum, group-based discussion, and ongoing monitoring of dietary intake and physical activity. Currently, over 200 YMCAs in the United States offer the YMCA Diabetes Prevention Program (YDPP). With support from trained, experienced YDPP lifestyle coaches, individuals with prediabetes or with a qualifying Body Mass Index (BMI) have access to CDC-approved curriculum as well as YMCA facilities and other member benefits.

With support from YMCA of the USA (Y-USA), the YMCA of Greater Boston (Boston YMCA) launched the YDPP in 2014 at select branches. Early YDPP participant
feedback suggested that the program model may be too rigid and that household or neighborhood factors may hinder participants’ progress to program goals and sustained health behavior change. An internal reorganization in 2017 shifted YDPP recruitment, enrollment, and other administrative responsibilities from branch leadership to the Director of Community Health in the central Boston YMCA office. In late 2018, the Director of Community Health position was eliminated, reestablishing a decentralized structure in which branch staff are responsible for YDPP administrative responsibilities. At present, not every branch offers the YDPP as a result of branch-level variation in director priorities, administrative capacity, program schedules, and participant recruitment yield.

The Boston YMCA recognizes that economic and social conditions – the socioeconomic determinants of health – influence one’s ability to attain or maintain optimal health. The Boston YMCA is the leading social services provider in the Commonwealth of Massachusetts, providing vital services such as transitional housing, financial assistance, and after-school care. Changes in the social, economic or political landscape may directly or indirectly impact the reach and sustainability of the Boston YMCA’s programs, including YDPP. With support from the Alliance of Massachusetts YMCAs and community partners, the Boston YMCA engages elected officials and other community leaders to track and advocate for policy and budget priorities. As the current Massachusetts legislature considers establishing a statewide diabetes action plan and

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* Each YMCA Association is locally governed and can individually respond to programmatic needs in real-time. In 2018, the Boston YMCA Executive Management Team launched an internal reorganization, consolidating recruitment, enrollment, training, and reporting for each branch under the Director of Community Health. The Director of Community Health reported to the Chief Operations Officer and was based in the central office at the Huntington Avenue branch.
providing diabetes prevention program benefits to state employees and retirees, the Boston YMCA executive management team is looking ahead to the next five years of its YDPP. With branches anchored in 13 communities and long-standing partnerships with numerous public and private entities, the Boston YMCA is uniquely positioned to reimagine health education programming and develop a holistic health promotion model that acknowledges socio-economic and socio-cultural barriers to lifestyle modification.

This DELTA project had a triple aim: (1) to explore the political, economic, and organizational forces shaping current and future opportunities for diabetes prevention programming in Greater Boston and Massachusetts; (2) to examine YDPP participants’ experiences with implementing lifestyle and health behavior changes; and (3) to capture Boston YMCA staff reflections about administering YDPP and suggestions for program modifications (see Appendix A) This thesis comprises three main sections: analytical platform, results, and conclusion. The analytical platform section provides an overview of the public health issue (i.e., type 2 diabetes) that motivated this DELTA project, a review of the salient literature, and a description of the qualitative research approach. The results section is a narrative of project life cycle, detailing the connection between the problem statement, literature review, theory of change; recommendations for the Boston YMCA; and insights for public health knowledge translation and leadership. The conclusion section discusses implications for health education and health promotion programming in non-clinical, community-based settings and introduces an innovative patient-centered lifestyle modification program – the Year of You™ – which would supplement YDPP at the Boston YMCA.
PUBLIC HEALTH PROBLEM STATEMENT

Over 100 million Americans – adults and children – have diabetes or prediabetes (CDC, 2017). The CDC estimates that 30.2 million adults aged 18 years or older – 12.2% of all U.S. adults – have diabetes (CDC, 2017, p. 2), placing them at an increased risk for other serious conditions such as stroke, nerve damage, kidney disease, blindness, and depression (NIDDK, n.d.). As a result, diabetes can “reduce quality of our lives, productivity, and life expectancy” (Goldoftas et al., 2015, p. 26). An estimated 84.1 million Americans have prediabetes, a risk state for type 2 diabetes indicated by elevated blood glucose (“blood sugar”) levels that fall below clinical diagnosis thresholds (CDC, 2017, p. 7; Tabák et al., 2012). An alarming 90 percent of people with prediabetes are unaware of their status and may lack access to healthcare information and services (CDC, 2019).

Prediabetes and type 2 diabetes are preventable conditions. Evidence-based, intensive lifestyle interventions, such as the National Diabetes Prevention Program (NDPP) and the YMCA Diabetes Prevention Program (YDPP), target obesity and physical activity, the two most important modifiable risk factors for diabetes. Pharmacotherapy can prevent or delay the onset of type 2 diabetes, though to a lesser degree compared to losing a modest amount of weight via dietary changes and increased physical activity (Knowler et al., 2002; Lily et al., 2009). Fixed risk factors for type 2 diabetes include, but are not limited to, age, race/ethnicity, and family medical history.

Looking ahead, the global prevalence of prediabetes is estimated to exceed 470 million cases in 2030 (Tabák et al., 2012). If trends continue, 20 to 33 percent of adults in the United States will have diabetes by 2050 (CDC, 2010). Given the relatively high
direct and indirect healthcare expenditures for diagnosed type 2 diabetes – $237 billion in direct medical costs and $90 billion in reduced productivity – continued investment in diabetes prevention programming may have a substantial return on investment (ADA, 2018a, p. 917). Healthcare providers, public health practitioners, policymakers, and community-based organizations will remain vital partners in ensuring the provision of health information, diabetes prevention programs, community-clinical partnerships, and wraparound services (e.g., supplemental nutrition assistance, language translation services, case management). A comprehensive, inclusive approach to reducing diabetes-related morbidity and mortality must include strategies to address the socio-structural determinants of health inequities which place vulnerable populations at undue risk of suboptimal health outcomes. Under the current executive management team, the Boston YMCA can reimagine health education approaches and strategically expand its footprint in the health promotion space.

**Host Organization Profile**

The YMCA is a 501(c)(3) nonprofit, mission-driven organization that promotes youth development, social responsibility, and healthy living as guided by four core values: caring, honesty, respect, and responsibility. The YMCA began in 1844 as a modest Evangelical association for young men seeking refuge from tenement housing and hazardous working conditions in London, England. While faith-based associations for young men were not novel at the time, the YMCA was unique in its “drive to meet social need in the community . . .” (YMCA, 2018a). In 1851, a marine missionary established the first YMCA in the United States in Boston, Massachusetts (YMCA, 2018a). By the early twentieth century the YMCA was large-scale social services organization. According to the *Nonprofit Times*, the YMCA is nation’s largest charity,
with $7.1 billion in total revenues (2017). The YMCA employs about 20,000 full-time staff and relies on over 600,000 volunteers nationwide (YMCA, 2019b).

The national YMCA network comprises Y-USA (the central resource office in Chicago, IL), state-based alliances, and 2,700 local associations anchored in approximately 10,000 communities nationwide (i.e., all 50 states, District of Columbia, and Puerto Rico) (YMCA, 2019a). All persons — regardless of age, income, or background — can participate in YMCA-sponsored programs. Physical presence and long-standing relationships with community members allow local associations to "not just to promise, but to deliver, lasting personal and social change" (YMCA, 2018b). The local branches engage 22 million men, women, and children on an annual basis through meaningful membership strategies that aim to strengthen communities through targeted, responsive programming (YMCA, 2018b). Major national programs include after-school and summer academic enrichment, daycare, and group or individual exercise. Other programs, services, and initiatives, often offered in partnership with community-based organizations, address local needs or interests.

The Massachusetts YMCAs - 30 associations with 59 branches and 726 service locations – serve 1.3 million people across the Commonwealth annually (Alliance of Massachusetts YMCAs, 2019). The Alliance of Massachusetts YMCAs promotes, supports, and protects member associations “by influencing public policy and connection to evidenced based solutions, supports and advocates on behalf of its member[s] ... to share their collective impact” (Alliance of Massachusetts YMCAs, n.d.). With over 22,000 volunteers and 21,000 employees, the YMCA is one of the largest employers in the Commonwealth (Alliance of Massachusetts YMCAs, n.d.). Together,
the YMCAs in Massachusetts leverage their brand, capacity, and key partnerships with YMCA leaders, volunteers, public officials, and other stakeholders to enable organizational, programmatic, and operational impact. Key strategies include:

- “Communicate Y[MCA] priorities and program impacts regularly, both internally and externally, with a unified message representing the collective strength and impact of YMCAs in Massachusetts.” (Alliance of Massachusetts YMCAs, 2017, p. 5)
- “Build committed relationships, with appointed and elected public officials (local, state and federal), community and other key leaders and partners, sharing agreed upon messages regarding the Y’s mission and charitable cause.” (Alliance of Massachusetts YMCAs, 2017, p. 6)
- “Monitor and influence policy that impact Ys sustainability, viability, and focus areas.” (Alliance of Massachusetts YMCAs, 2017, p. 6)

In addition to awarding $30 million for youth scholarships and $28 million in financial aid for membership and wellness programs in 2018, the YMCAs in Massachusetts are collectively committed to “solving critical social issues” such as child hunger, academic enrichment, and job readiness (Alliance of Massachusetts YMCAs, n.d.; Alliance of Massachusetts YMCAs, 2019).

The Boston YMCA is the largest association in the Commonwealth, comprising 13 branches, and ranks as one of the nation’s largest urban YMCA associations (YMCA of Greater Boston, n.d.a). The Boston YMCA is dedicated to “improving the health of mind, body, and spirit of individuals and families in our communities. [The Boston YMCA] welcome[s] men and women, boys and girls of all incomes, faiths and cultures” (YMCA of Greater Boston, n.d.a).
of Greater Boston, n.d.b). The Boston YMCA is the primary provider of after-school programs and childcare in the Commonwealth, leveraging resources to provide over $10.3 million annually in critical services on a sliding scale for individuals and families with low incomes (YMCA of Greater Boston, n.d.a). The Boston YMCA, under the direction of President and CEO James Morton, pledges to “partner with others to create a community of caring people to improve health and empower youth and families” (YMCA of Greater Boston, n.d.b). In 2017, over 180,000 individuals participated in child development, workforce development, or health and wellness programs (YMCA of Greater Boston, 2019b).

The YDPP was the first signature chronic disease program of the Y-USA. The 2002 National Institutes of Health (NIH) randomized controlled clinical trial – the Diabetes Prevention Program – demonstrated that modest lifestyle changes among overweight or obese individuals with prediabetes led to weight loss of 5 to 7 percent and reduced their risk of type 2 diabetes by 58 percent. The 2008 Diabetes Education and Prevention with a Lifestyle Intervention Offered at the YMCA (DEPLOY) pilot study—a matched-pair, group-randomized pilot intervention — compared weight loss outcomes of two participant groups: brief counseling only and community-based, group-based diabetes prevention program facilitated by trained YMCA staff. The DEPLOY study found that the low-cost, smaller-scale version of the DPP facilitated by trained YMCA staff could achieve weight loss outcome comparable to the original NIH-funded study (Ackermann et al., 2008). In 2010 the Y-USA, in partnership with the American Medical Association (AMA), expanded health programming to include diabetes prevention with
pilot sites at YMCA of Greater Indianapolis and the YMCA of the Greater Twin Cities (Staff News Writer, 2014).

In 2013, Y-USA selected the Boston YMCA to administer the YDPP (Washington, n.d.). The Boston YMCA YDPP launched in spring 2014, with financial support from Sun Life Financial, to supplement the Y Weight program, a joint community-based weight loss program with the Joslin Diabetes Center that targeted people with type 2 diabetes (Joslin, 2012). As of 2018, the Boston YMCA is among fourteen YMCAs in Massachusetts with active YDPPs. Of the 38 active DPPs in the Commonwealth, 7 are in Boston. As of 2018, approximately 150 YMCAs in 40 states had active DPPs in more than 1,000 locations (CDC, n.d.).

Sun Life Financial (Wellesley, MA) is “a leading international financial services organization, providing a diverse range of insurance, wealth and asset management solutions to individuals and corporate Clients” (SunLife Financial, 2018a). The organization’s purpose is “to help our Clients achieve lifetime financial security and live healthier lives” (SunLife Financial, n.d.a). To this end, there is corporate giving strategy focused on diabetes, specifically the awareness, prevention, education and care. Since 2014, Sun Life Financial has donated $19 million globally to the prevention of diabetes through incentive-based community programs as well as fundraising campaigns (SunLife Financial, n.d.b). Sun Life Financial was an early supporter of the YDPP, contributing to the launch of the program in Boston, Massachusetts; Kansas City, Missouri; and Hartford, Connecticut. Sun Life Financial, in partnership with the Boston Celtics, sponsors #SunLifeDunk4Diabetes, an annual social fundraising and digital marketing campaign that coincides with National Diabetes Awareness Month (i.e.,
November). For each dunk made by a Celtics player and “#SunLifeDunk4Diabetes”
mention on social media (e.g., Twitter, Instagram, Facebook), Sun Life Financial
donates $1,000 and $1, respectively, to the Boston YDPP. In 2018, the
#SunLifeDunk4Diabetes campaign raised $102,000, including $25,000 matching funds
from the Celtics organization. To date, the #SunLifeDunk4Diabetes campaign has raised
$392,000 for the Boston (SunLife Financial, 2018b). With this support, the Boston
YMCA can offer the YDPP at no cost to participants.

**Literature Review**

Diabetes is a chronic disease state characterized by abnormal metabolism of
glucose (“sugar”), the body’s main energy source. The most common types of human
diabetes are type 1, type 2, and gestational diabetes (NIDDK, 2016b); type 2 diabetes
accounts for 90-95 percent of adult cases (CDC, 2017, p. 1). People with type 2 diabetes
do not process insulin properly. Insulin, a hormone produced by the pancreas, signals
cells to absorb sugar from the bloodstream where it will be utilized for energy. Poor
production or signaling of insulin results in malabsorption of sugar from the
bloodstream. Elevated blood glucose (“blood sugar”) can lead to health problems such
as cardiovascular disease, kidney disease, vision impairment, oral health disease, and
nerve damage.

There are modifiable and non-modifiable risk factors for prediabetes and type 2
diabetes (see Figure 1). Physical inactivity and obesity – the prime targets of evidence-
based diabetes prevention interventions – are established modifiable risk factors for
numerous chronic diseases. Non-modifiable risk factors for prediabetes and type 2
diabetes include age, race/ethnicity, and sex, as well as family medical history (e.g., genetics).

**Figure 1. Type 2 Diabetes Risk Factors**

<table>
<thead>
<tr>
<th>Individuals are more likely to develop type 2 diabetes if they:</th>
</tr>
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<tbody>
<tr>
<td>• Are overweight or obese</td>
</tr>
<tr>
<td>• Are age 45 or older</td>
</tr>
<tr>
<td>• Have a family history of diabetes</td>
</tr>
<tr>
<td>• Are African American, Alaska Native, American Indian, Asian American, Hispanic/Latino, Native Hawaiian, or Pacific Islander</td>
</tr>
<tr>
<td>• Have high blood pressure</td>
</tr>
<tr>
<td>• Have a low level of HDL (&quot;good&quot;) cholesterol or a high level of triglycerides</td>
</tr>
<tr>
<td>• Have a history of gestational diabetes or gave birth to a baby weighing 9 pounds or more</td>
</tr>
<tr>
<td>• Are not physically active</td>
</tr>
<tr>
<td>• Have a history of heart disease or stroke,</td>
</tr>
<tr>
<td>• Have depression</td>
</tr>
<tr>
<td>• Have polycystic ovary syndrome</td>
</tr>
<tr>
<td>• Have acanthosis nigricans, a skin condition</td>
</tr>
</tbody>
</table>


Type 2 diabetes symptoms advance over the course of several years, with clinical presentation and disease progression varying from patient to patient. Prediabetes often presents as insulin resistance, a condition in which muscle, liver, and fat cells do not take up insulin well, resulting in an increased insulin demand as sugar builds up in the bloodstream. Over time, the pancreas cannot produce sufficient amounts of insulin, and blood sugar levels rise. People with prediabetes are usually asymptomatic, so the condition may go undetected for years until a health concern (e.g., increased thirst, blurred vision, fatigue) or a risk screening result warrants diabetes diagnostic testing (NIDDK, 2016c). With early intervention, prediabetes can be reversed, returning blood glucose levels to the normal range. An estimated five to ten percent of prediabetes cases progress to type 2 diabetes each year (Forouhi et al., 2007; Nathan et al., 2007).
The American Diabetes Association (ADA) *Standards of Medical Care in Diabetes—2019* recommends that healthcare professionals screen for prediabetes and type 2 diabetes “through an informal assessment of risk factors or with an assessment tool” to determine if a “diagnostic test for prediabetes ... and previously undiagnosed type 2 diabetes is appropriate” (ADA, 2019, p. S29). Prediabetes and type 2 diabetes are only diagnosed via blood tests administered and interpreted by a healthcare professional. Each test follows a different protocol and uses a different measurement of blood glucose to determine an individual’s diabetes status. The ADA recommends that individuals who are age 45 or older or are between the ages of 19 and 44, overweight or obese, and have one or more other diabetes risk factors should undergo routine testing for type 2 diabetes. Those with prediabetes should be monitored on an annual basis as well (ADA, 2016, p. S10).

People with prediabetes or type 2 diabetes may need an array of services from a diverse team of care professionals to manage their health from diagnosis to management. In addition to primary care providers who are “more likely to alter medications and consistently provide lifestyle counseling,” a patient may need preventive or management care services provided by endocrinologists, registered dietitians, certified diabetes educators, pharmacists, dentists, ophthalmologists, podiatrists, mental health specialists, or social workers (Morrison et al., 2013, p. 1147). The AMA recommends that healthcare professionals refer patients with prediabetes to an intensive behavioral lifestyle intervention program modeled on the NDPP. In 2014, the AMA issued an implementation guide “to facilitate the conversation between clinicians and patients about prediabetes” and to offer “recommendations for how to
identify, screen and refer patients to the YMCA Diabetes Prevention Program (AMA, 2014, p. 1). The AMA also recommends that providers and patients consider technology-assisted diabetes prevention interventions such as web-based programs or mobile applications. People with type 2 diabetes may need prescription medications, in addition to proper diet and exercise, to control their blood glucose levels. There are risks and benefits for each medication; care teams should consider a patient’s other health conditions and ability to access medications, among other factors. The ADA maintains that “metformin [a prescription medication] has the strongest evidence base and demonstrated long-term safety as pharmacologic therapy for diabetes prevention” (ADA, 2018b, p. S53).

**Diabetes Incidence and Prevalence**

The World Health Organization (WHO) estimates that 422 million adults worldwide were living with diabetes (all types) in 2014, a 291 percent increase from 1980 (WHO, 2016, p. 21). The diabetes prevalence rate is higher in low- and middle-income countries compared to high-income countries like the United States. The CDC’s Division of Diabetes Translation asserts that the annual diabetes incidence rate in the United States is still increasing, albeit at a slower rate compared to previous years. According to the 2017 CDC *National Diabetes Statistics Report*, there were 1.5 million new adult cases of diabetes in 2015 (CDC, 2017, p. 5). National rates of diagnosed diabetes increased with age; the prevalence was higher among adults ages 65 and over (25%) than of adults ages 18-44 (4%) (CDC, 2017, p. 2). Compared to non-Hispanic whites (7.4%), diabetes prevalence was higher among American Indians/Alaska Natives (15.1%), non-Hispanic blacks (12.7%), and Hispanics (12.1%), and Asians (8.0%) (CDC,
Diabetes prevalence was indirectly related to education level; 12.6 percent adults with less than a high school education had diabetes compared to 7.2 percent of adults with more than a high school education (CDC, 2017, p. 5). Across all racial and ethnic groups and education levels, more men (36.6%) had prediabetes than women (29.3%) (CDC, 2017, p. 14).

<table>
<thead>
<tr>
<th>Table 1. Massachusetts Diabetes Prevalence Forecasts</th>
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<tbody>
<tr>
<td>Year</td>
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<tr>
<td>------</td>
</tr>
<tr>
<td>2015</td>
</tr>
<tr>
<td>2020</td>
</tr>
<tr>
<td>2025</td>
</tr>
<tr>
<td>2030</td>
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As shown in Table 1, the Institute for Alternative Futures estimates that 1.9 million Massachusetts residents (27%) will have prediabetes in 2020, stating “these forecasts assume a steady, but conservative, reduction in the number of people with complications due to better awareness of the risks of diabetes, earlier screening and intervention, and more effective therapies” (IAF, 2015). Massachusetts Behavioral Risk Factor Surveillance System data indicate that the prevalence of diabetes in Massachusetts more than doubled from 3.9% in 1993 to 8.9% in 2015 (Massachusetts Department of Public Health, n.d.). Among Massachusetts residents, diabetes prevalence differs by race and ethnicity; 12.3% of Black non-Hispanic residents have diabetes compared to 11.7% of Hispanic residents and 8.7% of White non-Hispanic residents. Diabetes prevalence increases with age, with 18.5% and 22.8% of residents
ages 65-74 and ages 75 and over, respectively, reported having diabetes (Massachusetts Department of Public Health, n.d.).

The Boston Public Health Commission (BPHC) reported that 8 percent of Boston adult residents had diabetes from 2016 to 2017 (BPHC, 2018, p. 388). The prevalence among adults was higher for the Black (15%) and Latino (11%) populations and lower for White adults (5%) (BPHC, 2018, p. 389). As with the national and state trends, the diabetes prevalence for Boston residents increases with age; 2 percent of adults ages 25-44 reported having diabetes compared to 16 percent and 24 percent of people ages 45-64 and ages 65 and older, respectively (BPHC, 2018, p. 389). Diabetes prevalence among adults differed by educational attainment, employment status, and household income (BPHC, 2018) (see Figure 2).

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Employment Status</th>
<th>Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black: 15%</td>
<td>“other” employment status: 16%</td>
<td>annual income of less than $25,000: 14%</td>
</tr>
<tr>
<td>Latino: 11%</td>
<td>out of work: 10%</td>
<td>annual income of $25,000-$49,999: 9%</td>
</tr>
<tr>
<td>White: 5%</td>
<td>employed: 5%</td>
<td>an annual income of $50,000 or more: 4%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-44: 2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-64: 16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65+: 24%</td>
<td></td>
<td></td>
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<tr>
<td>Educational Attainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>no high school diploma:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>high school diploma: 11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>some college education: 6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renters who received rental assistance: 16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renter/Homeowner Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boston Housing Authority residents: 18%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeowner: 8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diabetes prevalence in the City of Boston also varies by neighborhood. The share of adult residents with diabetes was lower in Allston/Brighton (A/B), Back Bay (BB), Charlestown (CH), Fenway (FW), Jamaica Plain (JP), and South Boston (SB) relative to the citywide average. Diabetes prevalence was highest in Mattapan (17.3%), Roxbury...
(14.1%), and Dorchester (12.8% in ZIP codes 02121 and 02125), which historically have been communities of color (BPHC, 2018, p. 391) (see Figure 3).

Costs of Diabetes Care

Diabetes care represents a substantial financial burden on the U.S. economy, impacting healthcare systems, labor markets, and households. The ADA estimates the expenditures for diagnosed diabetes rose 26 percent, from $245 billion in 2012 to $327 billion in 2017 (ADA, 2018a, p. 918). The ADA asserts that the higher annual expenditures are “due to the increased prevalence of diabetes and the increased cost per person with diabetes ... primarily among the population aged 65 years and older” (ADA, 2018a, p. 917). In 2015, the federal government, via the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and the Division of Diabetes Translation at the CDC, invested almost $190 million in diabetes-related research projects or diabetes prevention and educational programs in Massachusetts (ADA, n.d.). Direct and indirect costs for diabetes and prediabetes care totaled an estimated $8.1 billion in Massachusetts (ADA, n.d.).

Hospital inpatient care accounted for the largest share of diabetes care expenditures at 30 percent in 2017 (ADA, 2018a). Other expenditure categories included prescription medications (30%), anti-diabetic agents and diabetes supplies (15%), and physician office visits (13%). Total medical expenditures among those with diagnosed diabetes are 2.3 times higher, on average, than expenditures in the absence of diabetes. Annual average medical expenditures among people with diabetes totaled $16,752; over half (57%, or $9,601) is attributed to diabetes-related care (ADA, 2018a). Indirect costs associated with diabetes total almost $90 billion; such costs include, absenteeism ($3.3
billion), disease-related disability ($37.5 billion), and early mortality ($19.9 billion) (ADA, 2018a). Intangible costs include, but are not limited to, uncompensated care provided by family caregivers and diminished quality of life as a result of chronic pain or disability (ADA, 2018a).

The government is the primary payer for diabetes care in the United States, with 67 percent of expenditures covered by Medicare, Medicaid, or military benefits programs. Private commercial insurance covers 31 percent, and out-of-pocket payments for those without insurance account for the remaining 2 percent (ADA, 2018a). In 2011, almost one in four (23%) people with diabetes (age 18 to 64) had relatively high out-of-pocket expenses for healthcare, regardless of coverage status (Li et al., 2014, p. 1631). Service utilization among people with diabetes also varies by health insurance coverage status; compared to insured patients, uninsured patients have fewer physician office visits and utilize fewer medications, but they have 168% more emergency department visits (ADA, 2018). People living with type 2 diabetes are at increased risk for depression, anxiety, chronic stress, and disordered eating (Ducat et al., 2014); cost estimates of behavioral health impacts of diabetes remain elusive as does economic values of care provided by uncompensated family caregivers (ADA, 2018a).

A 2013 American Journal of Preventative Medicine study estimated the average lifetime direct medical expenditures for treating type 2 diabetes and its complications among newly diagnosed individuals. Expenditures were reported by gender and by age at diagnosis. For men, average expenditures ranged from $54,700 (ages ≥65) to $124,700 (ages 25-44 years) (Zhuo et al., 2013, p. 258). The lifetime expenditures for women ranged from $56,600 (ages ≥65) to $130,800 (ages 25-44) (Zhuo et al., 2013, p.
Zhou et al. asserted that the majority (53%) of the “age–gender weighted average of the lifetime medical costs” ($85,200) was “due to treating diabetic complications” (Zhuo et al., 2013, p. 253).

Health Behavior Change and Prevention

Individual, household, and community-level factors affect one’s ability to obtain and maintain optimal physical, mental and social well-being over the course of their lifetime. Health education aims to impart knowledge, attitudes, and skills needed to adopt and maintain healthy behaviors, and is an essential component of disease or injury prevention initiatives (American Association for Health Education, 2012). Health education alone may be insufficient to achieve substantial changes in health behavior given the socio-economic and socio-cultural influences on health seeking behavior. Health promotion accounts for health education as well as the “... political, environmental, regulatory, or organizational mechanisms that support actions and conditions of living conducive to health of individuals, groups, and communities” (American Association for Health Education, 2012, p. 14). Health behavior change theories capture the complexity of health promotion and present a systematic way of understanding health seekers’ personal motivations, values, and circumstances (e.g., transportation, work and home environments, social support systems). Health promotion interventions aimed at multiple levels of influence on health behaviors – from individual factors (e.g., knowledge, attitudes, beliefs, and personality) to community and public policy factors – stand a better chance of producing positive, sustained changes for individuals and families.
The most cited theoretical models of health behavior change are the Health Belief Model, the Transtheoretical Model, the Social Cognitive Theory, and the Social Ecological Model. The Health Belief Model, which is predominantly applied to prevention-related and asymptomatic health concerns, posits that one’s readiness for health behavior change is a function of their beliefs about personal health risks as well as anticipated benefits of taking action (Becker & Maiman, 1975; Glanz, 2016). The Transtheoretical Model states that readiness to adopt healthful behaviors occurs in different stages; the “stage of change” construct is useful in explaining and predicting health behavior changes (Prochaska and DiClemente, 1982; Glanz, 2016). Social cognitive theory integrates personal factors, environmental influences, and behavior, and asserts that health seekers learn from both experiences and observations of others’ actions and outcomes (Bandura, 1986; Glanz, 2016). The social ecological model emphasizes that multiple streams of influence shape a health seeker’s environment, and that environment may or may not be conducive to health education or adoption of healthy behaviors (Sallis et al., 2008; McLeroy et al., 1988; Glanz, 2016).

A prediabetes diagnosis is not always a call to action for patients. The ADA advises clinicians to take a life-course perspective in care planning discussions, including patients’ goals and making prevention a concrete health behavior by using relatable terms. With an understanding of a patient’s values and goals, clinicians can contextualize that patient’s priorities and motivate action by outlining steps and resources (e.g., lifestyle change programs, personal coaching, support groups) that advance stated health goals. With a feedback or monitoring system in place, perhaps via an electronic health record platform, clinicians can monitor patients’ enrollment and
progress to health goals, solicit patients’ feedback, and strengthen community-clinical linkages (Henry, 2018).

**Community-Clinical Linkages**

According to the Code of Medical Ethics: Physicians & the Health of the Community, physicians, as stewards of healthcare resources, are obligated to implement effective, patient-centered health promotion practices (AMA, n.d.). The clinician-patient relationship is a key factor in the success of public health interventions as clinicians are often the main referral source for disease prevention programs such as YDPP. Each clinical encounter provides a face-to-face or technology-aided opportunity for a healthcare provider to discuss and document patients’ needs, preferences, and readiness for change, as well as relevant modifiable risk factors. The AMA recommends that physicians remain abreast of changes in preventive care guidelines and support research to bolster the evidence base for disease prevention and health promotion. In addition, fostering community-clinical linkages – “connections between community and clinical sectors to improve health” – can improve patients' access to preventive services and care coordination outcomes (CDC, 2016, p. 1).*

Community-clinical linkages increase access to clinical preventive services, community-based programming, and necessary medical treatment, thereby reducing the prevalence and incidence of disease in communities. Community-clinical linkages also provide referral mechanisms for clinicians and community programs and continue to gain prominence as an effective approach for improvement in clinical health

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* For example, in 2010, UnitedHealthcare established the Diabetes Prevention and Control Alliance to facilitate community-clinical linkages to replicate YDPP nationwide and establish medical billing infrastructure for participating YMCAs.
outcomes and behavioral changes (CDC, 2016). Evaluations of community-clinical collaborations, funded by the federal Agency for Healthcare Research and Quality Health Care Innovations Exchange, concluded that most of the community-clinical linkages addressed multiple target health behaviors and conditions. The linkages fell into the following categories: “(1) referral process, (2) provision of training and resources to improve medical provider practices, (3) clinical partner referral to health resources, (4) clinical partner volunteering at community programs, and (5) other” (Porterfield, 2010; AHRQ, 2013a; AHRQ, 2013b; AHRQ, 2010; AHRQ, 2008).
Theory of Change

A theory of change (TOC) is a “comprehensive description and illustration of how and why a desired change is expected to happen in a particular context” (Center for Theory of Change, n.d.). The TOC process comprises a backwards mapping, linking planning, intervention, and evaluation via a “pathway of change.” Through the TOC approach, stakeholders articulate the desired outcomes; visualize and prioritize early and intermediate change goals; define activities and outputs; and identify the necessary and sufficient conditions for achieving the long-term outcomes. The six stages of the TOC process are as follows:

- “Identifying long-term goals
- Backwards mapping and connecting the preconditions or requirements necessary to achieve that goal and explaining why these preconditions are necessary and sufficient.
- Identifying your basic assumptions about the context.
- Identifying the interventions that your initiative will perform to create your desired change.
- Developing indicators to measure your outcomes to assess the performance of your initiative.
- Writing a narrative to explain the logic of your initiative.”

(Center for Theory of Change, n.d.)

The YDPP is a well-defined, evidenced-based intervention; there is no indication that the Boston YMCA intends to shift from the program standards set forth by the CDC-endorsed NDPP despite anecdotal evidence from YDPP participants that the branch-based program is “not as effective as it could be – too long, not focused on the right merits, and more” (J. Morton, personal communication, 2018). To date, there is no mechanism in place for the Boston YMCA management team to systematically collect
feedback from YDPP participants or Boston YMCA staff outside of the periodic CDC-endorsed survey instruments which focus on personal health outcomes among participants. The Boston YMCA has yet to articulate desired changes, a timeframe, or success criteria for the next iteration of its YDPP. The results of this DELTA project may inform Boston YMCA’s YDPP planning activities or a general evidence-based planning framework for public health, which may or may not include a TOC process. The hypothetical TOC process detailed below informed the research approach for this DELTA project.

**Stage 1: Identifying long-term goals**

Through the Alliance of Massachusetts YMCAs, local partnerships, and its Board of Directors, the Boston YMCA remains informed and well-positioned to leverage public and private resources to ensure targeted health promotion programming and services for health seekers of all ages and income levels throughout the Boston metropolitan region. In response to generalized feedback about YDPP or proposed bills in the Legislature to create a statewide “diabetes action plan” and cover DPP (at eligible sites) as a benefit for state employees and retirees, the Boston YMCA may opt to prioritize efforts to evaluate its current YDPP in its next strategic plan. Looking ahead, there are two main goals for the Boston YMCA YDPP: (1) to develop and implement community-clinical linkages – partnerships between healthcare providers and community-based organizations – to expand the Boston YMCA’s footprint in the local health promotion landscape and (2) to launch and maintain a YDPP at each Boston YMCA branch. Currently, obtaining preliminary CDC recognition status via the Diabetes Prevention Recognition Program, a designation that signifies demonstrated effectiveness by
achieving all of the performance criteria for duration, intensity, and reporting, is not a top priority for the Boston YMCA (CDC, 2018). Without the CDC designation, the Boston YMCA YDPP would be ineligible to participate in or generate revenue from the state employee benefit program if enacted as written. Regardless of recognition or provider status, the Boston YMCA will continue to offer the YDPP, supporting at-risk health seekers and fostering lifelong relationship with members, communities, and institutions.

**Stage 2: Backwards mapping of the preconditions and long-term goals**

Health education and, more broadly, health promotion aligns with the YMCA’s mission and core values of the Boston YMCA. The longevity and effectiveness of the Boston YMCA YDPP depends on the skill, capacity, and support of YMCA staff and administrators as well as sustained engagement with “health seekers” and their care and support networks. A recent internal reorganization created a specialized staff position to streamline general membership and wellness program recruitment, enrollment, and engagement efforts across the association. While the CDC Diabetes Prevention Recognition Program performance indicators (e.g., data privacy, geographic coverage, delivery mode, staffing, training, and curriculum) align with the Boston YMCA’s general priority improvement areas, additional changes may be needed to meet the long-term goals stated above. Internal controls include human resources systems, community

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* To ensure high quality and impact, CDC established the Diabetes Prevention Recognition Program (DPRP) to establish standards for organizations that wish to administer a lifestyle change program with various delivery modes (i.e., in-person, online, and combination). The DPRP awards three categories of recognition: (1) pending; (2) preliminary; and (3) full recognition. Regardless of recognition status, each organization must to submit performance data every 6 months. Organizations are granted preliminary status upon arrival of a DPRP application. With preliminary recognition status, organizations can participate in Medicare DPP.
mobilization strategies, communications strategies, financial forecasts, team norms, and leadership styles. The Boston YMCA’s strategic planning and annual reporting processes focus on association-wide outcomes, but, given the organization’s decentralized management structure, the locus of change, in practice, is the branch executive director who reports directly to the Chief Operating Officer. As such, the scope of and timeline for long-term goals related to meaningful membership differ from branch to branch. Any shift from the status quo related to YDPP and other wellness programs will require a tailored change management approach with incentives that align with branch directors’ leadership styles and branch staff’s capacity for delivering new or expanded high-quality programs and services.

**Stage 3: Identifying your basic assumptions about the context**

The main assumptions that underlie health promotion are (1) that biological, psychological, behavioral, and social factors contribute to health and (2) habit-forming interventions can attenuate adverse behaviors that directly or indirectly influence health. The YDPP model, focused on primary prevention, assumes that participants can comprehend the curriculum and have the agency and resources to form new, healthful habits, e.g., at least 150 minutes of physical activity per week. Additionally, the YDPP model assumes that in-person or online health/lifestyle coaching is superior to a product or alternative platform (e.g., mobile application) for health promotion. The Boston YMCA YDPP model assumes that self-referrals as well as partnerships with local community-based organizations and healthcare providers will yield eligible participants and that staff and YDPP lifestyle coaches are or will be adequately trained to address the intrapersonal, interpersonal, and socio-cultural aspects of health behavior modification.
with each participant over the participation period. Currently, the Boston YMCA does not have an action or evaluation plan for its YDPP.

**Step 4: Identifying the interventions**

Addressing present concerns about its YDPP may require the Boston YMCA to engage its support network (e.g., Y-USA, the Alliance of Massachusetts YMCAs, other YMCAs); existing partners can provide a range of technical, administrative, or financial support to the Boston YMCA executive management team. New, external partners will be key stakeholders in establishing community-clinical linkages to expand wraparound service options (e.g., legal aid, nutrition assistance, medical assistance), and the number and type of stakeholders required will likely vary by branch/neighborhood. Internal pilot interventions, at the association or branch level, can serve as a leadership development opportunity for staff and provide additional data about the YDPP participant and lifestyle coach experiences.

**Step 5: Developing performance indicators for initiative**

At present, there are no internal performance benchmarks for the Boston YDPP program apart from what is required by Y-USA for compliance monitoring. Under the CDC Diabetes Prevention Recognition Program, an organization must report session attendance for months 1-6 and 7-12 for the prior participation year. To obtain preliminary recognition, at least 60 percent of YDPP participants must attend a minimum of nine sessions in the first six months of the participation year. To obtain full recognition, organizations must report participants’ body weight, physical activity (in minutes), and weight loss. The Boston YMCA currently collects these data in aggregate (i.e., at the association level) via a web-based electronic health record platform to
comply with Y-USA reporting requirements and track participants’ health outcomes over their participation year. To date, the Boston YMCA does not use these data to inform chronic disease programming or communicate with participants’ healthcare providers for more streamlined, comprehensive monitoring. Planning and launching an internal performance monitoring system for YDPP or other programs is beyond the scope of this TOC process, but given the goal to offer YDPP at each branch, a monitoring system should reflect the input of branch-level staff (e.g., executive directors, healthy living directors) and capture member/participant data to allow for targeted responses. Performance indicators inform prioritization criteria for weighing response alternatives; for example, low performance on YDPP recruiting may lead decision makers to allocate additional resources to outreach as opposed to facility upgrades or other needs. Given the existing organizational structural and reporting systems, applying for the Diabetes Prevention Recognition Program is the most efficient method to streamline performance across the association.

**Step 6: Writing a narrative to explain the logic of the initiative**

The Boston YMCA remains committed to taking a socially responsible approach to health and wellness promotion for Boston area residents regardless of age, physical ability, or ability to pay. To this end, expanding its YDPP across all branches positions the Boston YMCA as a key non-clinical partner in curbing the type 2 diabetes incidence rate through health education and strategic partnerships. The Boston YMCA, through its 13 branches, is also well-positioned to contribute to existing efforts to address socio-economic barriers to optimal health such as food insecurity or unaffordable housing. With wraparound programs and services that extend beyond the current membership
benefits, the Boston YMCA can add value for members and anchor neighborhoods while deepening partnerships with local entities to address individual and community health needs.

**Methods**

This DELTA project employed a qualitative approach to elucidate the motivations, behaviors, and experiences of Boston YMCA staff, YDPP participants, and other stakeholders. The Human Research Administration in the Office of Regulatory Affairs and Research Compliance at the Harvard T.H. Chan School of Public Health approved this research protocol (Protocol IRB19-0085). The protocol does not qualify as human subjects research as defined by the U.S. Department of Health and Human Services.

**Document and Website Content Analysis**

Document and website content analyses were completed to develop federal, state, and local stakeholder landscapes. Stakeholders of interest included public and private entities with a focus on diabetes prevention, diabetes management, diabetes education, nutrition, physical training, clinical care, health education, or health policy. Reviewed document and website content included public records (e.g., annual reports, strategic plans, regulations) and artifacts (e.g., posters, agendas, training materials). Internet searches were executed using a keyword search approach. For example, for the local landscape, key Web search phrases included the following: “[City, Town, or Neighborhood], MA, board of health”; “[City, Town, or Neighborhood], MA, diabetes”; “[City, Town, or Neighborhood], MA, diabetes prevention”; “[City, Town, or Neighborhood], MA, community health, diabetes”; and “[City, Town, or Neighborhood],
MA, community health, diabetes prevention.” Confidential materials or non-English materials were not reviewed.

**Qualitative Interviews with Boston YMCA Staff**

From July 2018 and February 2019, nine semi-structured qualitative interviews were completed with Boston YMCA branch staff (i.e., Burbank, Charles River, Dorchester, East Boston, North Suburban, Parkway, Roxbury, Hyde Park, and Waltham) at the main site for each respective branch. Initial requests for interviews were sent via email to the executive director listed on the Boston YMCA website as of November 1, 2018. The semi-structured interviews covered health and wellness programming priorities, administrative and operational challenges, member engagement anecdotes, and community/neighborhood partnerships, among other topics. The interviews were not audio-recorded, per staff requests. General themes were gleaned from the interviewer’s notes and are presented in aggregate. A limitation of this approach was that questions beyond the interview guide (see Appendix B) and the subsequent analyses were subject to confirmation bias.

**Qualitative Interviews with External Stakeholders**

From November 2018 to February 2019, 12 qualitative interviews were completed with external stakeholders working in the area of public health advocacy, clinical care, health communications, health services research, or public policy. Each interview, conducted via phone or in-person, covered a range of topics, including health inequity, weight stigma, private-public partnerships, and marketing strategies, among other topics. The interviews were not audio-recorded per interviewee requests. Insights gleaned from the interviewer’s notes informed recommendations to the Boston YMCA
(see Conclusion section). As with the qualitative interviews of Boston YMCA staff, reliance on interviewer’s notes may have introduced confirmation bias into the analysis of these interviews.

**Secret Shopper/Secret Health Seeker Calls**

In January and February 2019, each Boston YMCA branch was screened via telephone to determine the variation in information and referral experiences for potential YDPP participants. Branch phone numbers were pulled from the Boston YMCA website. The caller, posing as a health seeker requesting YDPP enrollment information, followed the automated prompts to connect to the front desk (also called the “welcome center” or “welcome desk” depending on the branch), noting wait time, options for Spanish speakers, staff members’ familiarity with YDPP, and staff members’ response to the request for additional information (e.g., transfer to the branch’s Healthy Living Director). The caller ended each call prematurely during the voicemail prompt to avoid initiating a false YDPP enrollment process or set into motion a follow-up process.

**Participant Survey Data**

In February 2019, the Boston YMCA CEO and Association Director of Member Experience and Healthy Living completed their final review of the *YMCA of Greater Boston Diabetes Prevention Program Participant Survey* instruments (see Appendix C). The Association Director of Member Experience and Healthy Living disseminated hard/paper copies of the survey for current participants to Healthy Living Directors and YDPP lifestyle coaches at branches with active YDPPs as of March 2019. Electronic copies of the survey were disseminated to past participants via SurveyMonkey (San Mateo, CA) using the last known e-mail addresses on file. The survey did not ask past
participants to report their current health status with respect to pre-diabetes or BMI. The survey period closed in June 2019. The response rate was 35% (25 completed out of 71). Boston YMCA analyzed the raw data in aggregate, so the findings cannot be reported at the branch level or by participation status-type (i.e., current or past).

**Boston YMCA Staff Focus Groups**

In July 2019, the Boston YMCA Senior Director of Healthy Living and Medically Based Programs scheduled two 90-minute focus groups with Healthy Living Directors and other health and wellness staff. The project was branded as the “YDPP Relaunch and Research Study” in e-mail communications with staff. Eleven of the thirteen Boston YMCA branches were represented across the two sessions. Participants received background materials that summarized key findings from the staff qualitative interviews and the participant surveys (see Appendix D). Participants were asked to respond to the takeaways and then brainstorm about challenges to or opportunities for launching or strengthening YDPP at their respective branches. The focus groups were not audio-recorded per staff requests.
RESULTS STATEMENT

The Boston YMCA takes pride in being a pillar in the community, offering positive transformative experiences while ensuring safety, stability, and opportunity. Meeting this goal for 150,000 members and staff each year requires continuous evaluation backed by an engaged, responsive leadership team. This DELTA project stemmed from concern at the executive level that branch-level administrative and implementation barriers had adversely impacted participants’ ability to achieve the YDPP goals. These barriers included absent or inefficient referral mechanisms, attrition rates, and inadequate staffing. The Boston YMCA leadership team wanted an outsider’s opinion, an objective take on how to assess the strengths and challenges of the YDPP and community partnerships.

In July 2018, at the beginning of the DELTA period, there was a Director of Community Health in place to oversee the YDPP and other chronic disease programs across the association. The Director of Community Health was responsible for participant recruitment, staff recruitment, staff training, staff evaluation, and reporting (internal and external), as well as administrative support for this DELTA project. From July 2018 to November 2018, the Director of Community Health was instrumental in facilitating staff introductions, providing access to internal materials, and identifying existing state and local partners. In November 2018, just as the branch staff and external stakeholder interviews commenced, the Boston YMCA President & CEO indicated that a general internist at the Brigham and Women’s Hospital was also advising the executive leadership team on strategies for improving health and wellness programming. In December 2018, the Director of Community Health position was
eliminated as a result of an association-wide reorganization of mid-level management. This change directly impacted this DELTA project as the Director of Community Health had been charged with supporting staff and resource needs through May 2019. From the student-observer perspective, it was not clear if the organization was prompted by staff evaluations, member feedback, or both. In February 2019, oversight of health and wellness programs was merged with membership engagement initiatives under the newly appointed Association Director of Member Experience and Healthy Living. The new director became the point person for this DELTA project with approximately five weeks remaining before the planned end date.

Like the reorganization and staff change, the February 2019 YMCA Advocacy Day at the Massachusetts State House was an inflection point in the DELTA project lifecycle. The then current policy priorities of the Alliance of Massachusetts YMCAs included enactment of diabetes prevention legislation. While the proposed legislation (described below) had no direct implications for the Boston YMCA during the DELTA project period, advocacy activities revived the interest and commitment to this DELTA project among the Boston YMCA branch leadership. Participation in YMCA Advocacy Day allowed for face-to-face connections with branch staff that would have been facilitated by the Director of Community Health and legitimized the role for a student-observer.

**Diabetes Prevention Landscapes**

*Local Diabetes Prevention Landscape*

The results of an environmental scan of external and internal stakeholders, in aggregate, define the local, state, and federal diabetes prevention landscapes. The
results also offer novel insights from Boston YMCA staff about organizational culture as well as health and wellness program administration and operations.

Local stakeholders were defined as public or private entities in any of the Boston YMCA anchor or service neighborhoods with a mission or charge to address chronic disease prevention or management via direct clinical care or institution or community-based health education programming. For each of the 13 Boston YMCA branches, a working list of stakeholders was developed in preparation for discussions with Boston YMCA staff about current or pending community partnerships. Local stakeholders included municipal boards of health; municipal departments of recreation, community health, or community services; inpatient, outpatient, or mobile medical centers (including federally-qualified health centers); pharmacies; biomedical research centers; non-profit organizations; academic institutions (including medical schools); food suppliers (such as farmer’s markets and food pantries), and community-based health advocacy groups. These entities serve as viable points of entry into the diabetes prevention or management services network for English-speaking health seekers with internet or phone access, but none have a formalized agreement with the Boston YMCA to generate referrals for YDPP, other health and wellness programs, or general YMCA membership benefits.

Three of the Boston YMCA branches are located outside of Boston proper. Given that the majority (69%) of the Boston YMCA branches are located within city limits, Boston-specific stakeholders are especially relevant to advancing health and wellness initiatives like YDPP. The most relevant citywide entity is the BPHC, which oversees the Mayor’s Health Line, the Community Health Center Finder, the Community Health
Education Center, and various food/nutrition and active living initiatives. The Boston YMCA and the BPHC Chronic Disease Division are currently piloting a partnership with Baraka Community Wellness, a Boston-based 501(c)(3) nonprofit organization, through which participants in Baraka-sponsored nutrition-related programming (e.g., the Community Cooking Academy) are referred to the Boston YMCA branches for additional health and wellness supports, particularly physical activity programming (e.g., aquatics, personal training).

State Diabetes Prevention Landscape

State stakeholders were defined as public or private entities serving the Commonwealth of Massachusetts, including the Boston metropolitan area, with a mission or charge to address chronic disease prevention or management via direct clinical care, institution or community-based health education programming, or public resource stewardship. The main state entities in the diabetes prevention landscape include the following: General Court for legislation of the Commonwealth of Massachusetts and numerous offices in the Department of Public Health (e.g., Bureau of Community Health and Prevention, Bureau of Family Health and Nutrition, Office of Health Equity, Office of Local and Regional Health, Health Disparities Council, and MassHealth (Medicaid agency)).

To date, there is no statewide action plan to address diabetes prevention and management. Bill H.4844/S.1289 – An Act relative to diabetes prevention, if enacted, would amend current law to mandate a diabetes action plan to be drafted by the state department of public health commissioner in consultation with Health Policy Commission, the Center for Health Information and Analysis, the Group Insurance
Commission, and the Division of Medical Assistance (190th General Court, 2018; 191st General Court, 2019). Bill H.2209/S.1525 – An Act to provide diabetes prevention program benefits, if enacted, would amend current law to mandate that the Group Insurance Commission,

“provide to any active or retired employee of the commonwealth who is insured under the group insurance commission and is identified as someone with prediabetes those items and services furnished under a diabetes prevention program recognized as a National Diabetes Prevention Program as established by the federal Centers for Disease Control and Prevention” (191st General Court, 2019).

As of January 22, 2019, S.1289 and S. 1525 were referred to the Joint Committee on Public Health.

In addition to the Alliance of Massachusetts YMCAs, other state or local level stakeholders with an interest in diabetes prevention legislation include the Massachusetts Public Health Association, the ADA New England Office, Massachusetts League of Community Health Centers, Health Care for All, Massachusetts Coalition for Coverage and Care, Massachusetts Health & Hospital Association, Massachusetts Health Officers Association, Massachusetts Health Policy Forum, Massachusetts Medical Society, Massachusetts Public Health Fund, and the organizations with active DPPs, among others.
Federal Diabetes Prevention Landscape

A 2016 Presidential Proclamation from Barack Obama declared November to be “National Diabetes Month,” calling upon “all Americans, school systems, government agencies, nonprofit organizations, health care providers, research institutions, and other interested groups to join in activities that raise diabetes awareness and help prevent, treat, and manage the disease” (The White House, 2016). The following year, President Donald Trump, made a statement commemorating National Diabetes Month, stating that, “Every American should take charge of his or her own care by learning about diabetes, and making appropriate modifications to their diets and lifestyles” (The White House, 2017). On November 2, 2017, President Trump signed into law Public Law No: 115-80 – National Clinical Care Commission Act. This Act establishes “a National Clinical Care Commission within the Department of Health and Human Services (HHS) to evaluate federal programs related to clinical care for individuals with a complex metabolic or autoimmune disease such as diabetes” (CBO, 2017). The Commission, comprising medical professionals, advocates, and representatives from many agencies within the federal Department of Health and Human Services, Department of Veterans Affairs, Department of Defense, and Department of Agriculture have until federal fiscal year 2022 to issue a report on,

“(1) HHS programs that focus on prevention, (2) current activities and gaps in federal efforts to support clinicians in providing integrated care, (3) improvement in federal education and awareness activities related to prevention and treatment, (4) methods for outreach and dissemination of education and
awareness materials, and (5) opportunities for consolidation of overlapping federal programs” (National Clinical Care Commission Act, 2017)

The Congressional Budget Office estimated the Commission will require approximately three employees each year, on average, totaling about $2 million over the 2017-2022 period (CBO, 2017).

In his 2018 statement on National Diabetes Month, President Trump asserted, “We know, for example, that people who have prediabetes can prevent or delay the onset of type 2 by losing a modest amount of weight” and that “federal agencies have made great strides in combatting diabetes,” citing NDPP and the Medicare Diabetes Prevention Program (MDPP) (The White House, 2018). The main agencies or offices related to diabetes prevention within HHS are the CDC (specifically, the National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation), the Centers for Medicare & Medicaid Services, the NIDDK, the Food and Drug Administration, the Office of the Surgeon General, and the Offices of the Assistant Secretaries. The Department of Agriculture oversees the Special Supplemental Nutrition Program for Women, Infants, and Children (“WIC”), the Supplemental Nutrition Assistance Program (“food stamps”), and the ChooseMyPlate.gov initiative. The Departments of Veterans Affairs and Defense recently updated their Clinical Practice Guideline for the Management of Type 2 Diabetes Mellitus in Primary Care, calling for the patient, their family, and their health care team to share information and decisions in a shared decision-making encounter (VA & DoD, 2017).

In addition to the ADA, national, non-government stakeholders include the American Academy of Family Physicians, the American Association of Clinical
Endocrinologists, the American Association of Diabetes Educators, the American College of Preventive Medicine, the American Public Health Association, the National Association of Chronic Disease Directors, the National Association of County and City Health Professionals, the National Conference of State Legislatures, and the National Medical Association.

**Qualitative Interviews with Boston YMCA Staff**

Semi-structured qualitative interviews with executive directors, operations directors, healthy living directors, and lifestyle coaches yielded key takeaways, captured here as strengths, challenges, and opportunities. Not all branches had active YDPPs during the interview period, so insights should not be interpreted as program-specific unless stated otherwise. These results were presented to the Boston YMCA President & CEO, Chief Operating Officer, and Association Director of Member Experience and Healthy Living, and were explored via focus groups with the healthy living directors.

Commonly cited strengths within the branches and across the association included the following: high commitment to the mission and vision; staff relationships with members and community-based organizations; impactful print, email, and social media campaigns that feature actual members and their stories; individual and family-centric, year-round resources that traditional healthcare settings do not or cannot provide (e.g., gym membership, personal training, child care, social interaction); and opportunities for innovation at the branch level. Member engagement is at the core of all YMCA activities, and staff pride themselves on cultivating “mission moments” with members for meaningful, positive impact. For members who do not meet the YDPP
eligibility criteria, branch-level programs may exist to help those members meet their weight loss and physical activity goals, though without the benefit of lifestyle coaching.

Boston YMCA staff were asked to identify current administrative or operational challenges. Within branches and across the association, noted administrative challenges included staff turnover rate, meeting internal goals with respect to YDPP lifestyle coach recruitment and training, YDPP participant retention, and data reporting processes. Several branch executive directors noted their dissatisfaction with the applicant pool for positions in the healthy living department; one executive director noted that given the low unemployment rate in Massachusetts, it remains challenging to find experienced individuals with a clinical, personal fitness, or social work background to oversee or administer health and wellness programs for adults and seniors. Operational challenges included lack of accommodations for non-English speakers or people with hearing or vision impairments and lack of private spaces for members to discuss personal health information with staff. The type and intensity of identified challenges varied by branch, which in turn impacts parity of member experience and opportunity across the association. Opportunities for shared learning to address challenges happen at the branch executive director level, but not across healthy living departments. Similarly, branch-level YDPP participant data are reported in aggregate (i.e., at the association level), limiting the ability of the healthy living departments to respond to specific staff and member feedback in a timely fashion.

Branch staff also identified opportunities to improve branch operations and streamline association-wide policies and procedures for YDPP and the association in general. Most of the comments focused on centralizing various processes and resources,
such as YDPP marketing, recruitment, and enrollment; program calendars (including class sessions and community events); and reporting and feedback systems. Branch staff were in favor of a single point of contact for all chronic disease programming to facilitate region-level and national resource sharing via Y-USA. Given the ongoing challenges with YDPP recruitment, staff expressed a need to build or strengthen partnerships with clinicians and wellness providers, food access/supplemental nutrition programs, schools, faith-based organizations, and civic organizations. Staff also expressed support for on-site pre-diabetes diagnostic services, i.e., BMI measurement and A1C blood test.

Focusing on the YDPP participant experience, staff noted a need for an updated curriculum that includes culturally relevant guidance on diet as well as group exercise options based on personal interest or physical ability. Association-wide opportunities include offering YDPP off-site (e.g., at a worksite or in a clinical setting) to support external organizations in meeting workplace wellness goals.

**Qualitative Interviews with External Stakeholders**

External stakeholders of interest included clinicians, policymakers, public health practitioners, and community-based health advocates. Insights from the interviews are grouped by these broad stakeholder categories.

**Clinicians**

Clinicians are generally not equipped to address all the factors that influence patients’ health and wellbeing in the context of an office visit or professional consultation. While healthcare professionals and paraprofessionals are duty-bound to promote chronic disease prevention and management, they may not be aware of available community-based resources or how to refer patients to social services and
supports. Additionally, if a health system has a diabetes prevention program in place, there is incentive to refer a patient to that program to streamline referral and feedback processes. As more hospitals and clinics participate in MDPP or NDPP, both potentially revenue-generating programs, competition for patients/participants may intensify. Clinician-community linkages are required to address social determinants of health, but a health system’s desire and ability to institutionalize prevention programming varies. Clinicians also emphasized the importance of patients’ personal agency (e.g., knowing their family medical history) as a key factor in empowering individuals to participate in primary prevention measures such as screenings.

Public Health Practitioners

Several themes emerged from the interviews with Boston-based public health practitioners about community-clinical linkages. Stakeholders identified gaps or improvement focus areas including cultural humility in health education and promotion approaches; proactive engagement of vulnerable populations and communities; investment in evaluation of population health models; and patient and provider incentives. In addition, stakeholders noted that more public resources are needed to evaluate population-level outcomes in addition to individual or clinical outcomes.

Community-Based Health Advocates

Advocates emphasized that the primary goal of wellness management and disease prevention is to improve life expectancy as well as quality of life. Stakeholders noted the importance of trusted “influencers” in communities to connect individuals to healthcare settings and community-based organizations. Further, advocates asserted that chronic disease prevention interventions should incorporate strategies to engage inter-
generational relatives and consider individuals’ attitudes and beliefs. Furthermore, stakeholders maintained that enclave cluster studies could inform culturally sensitive approaches to develop, launch and sustain chronic disease prevention interventions.

Health Communications Specialists

Stakeholders emphasized the need to segment health and wellness campaigns to appeal to specific populations (e.g., parents, seniors, active health seekers). To address the “call to action” issue, the Boston YMCA may wish to explore more external campaigns that include health seekers at all stages of health behavior change and in various settings. At the Boston YMCA, diabetes awareness campaigns run only in November, but there are benefits to running full-year campaigns, emphasizing the importance of prevention and healthful habits throughout the year and over a life course.

Secret Shopper/Health Seeker Calls

This research activity sought to elucidate the health seeker experience at each Boston YMCA branch, regardless of the branch’s current YDPP status. Each branch is charged with assisting potential and current members in identifying a home branch and programs of interest. The majority (77%) of Boston YMCA utilized an automated greeting with a department and staff directory; only two branches offer a Spanish language option. Of the branches with active YDPP classes, staff members accurately indicated that there was an active class. Of the branches with no immediate plans to launch a YDPP in 2019, each referred the caller to another Boston YMCA branch. One branch accurately shared that a new YDPP class would launch within a month; this staff member also reviewed general YDPP information with the caller. Another branch
offered to pull literature to send via mail, but later determined that the literature was for another health and wellness program. At the conclusion of each call, the staff member offer to transfer the caller to the branch’s healthy living director for additional information. In each instance, the caller agreed to be transferred; at some branches pre-recorded advertisements for current programs and services played during the brief hold.

**Participant Survey Data**

As shown in Figure 4, the majority (60%) of survey respondents were current YDPP participants. Over half (56%) of respondents qualified for YDPP based on a recent pre-diabetes diagnosis versus 15 percent who qualified based on their BMI score. A plurality (48%) of participants learned about YDPP via a healthcare provider such as a physician or nurse; 17 percent reported learning about YDPP via a YMCA website. The majority (56%) of survey respondents reported they contacted the Boston YMCA via phone to enroll in YDPP, and 60 percent enrolled at their preferred branch. Over half (56%) reported a wait time – from first contact to first YDPP session – of one to three months; 40 percent reported a wait time of three to six months. When asked to reflect on their enrollment experiences, survey respondents shared the following:

- “[My lifestyle coach] was fantastic, I felt like she cared right from the first call.”
- “Can’t recall exactly how long it took to start, but it was longer than I would have liked.”
• “I wanted to enroll with my friend, she has diabetes though so she couldn’t participate.”
• “Start date moving was frustrating, I get that you want a ‘bigger group’ but I felt I was signed up for months before we actually began.”
• “Wished it stayed with weekly sessions.”
• “Too long.”
• “Make it easier – felt like a job interview.”
• “It took a while to receive a response, and after that it was wait until we have enough to run the class. It took about 4 months from my email till my first class.”

All survey respondents reported that the program materials were easy to understand, and 92 percent felt the program material contained information they did not know prior to YDPP. The vast majority (92%) thought the YDPP program materials would be helpful for understanding how to prevent or delay type 2 diabetes. Just over three-quarters (76%) of respondents reported seeking information about pre-diabetes from other sources such as books and the World Wide Web, and only 36 percent had participated in other diabetes prevention-related programs or activities in the past.

All survey respondents liked learning about health and wellness in a group setting, and 80 percent anticipated that they would complete the program. The vast majority (88%) felt that their YDPP lifestyle coach understood their personal health goals. Two-thirds of respondents were confident that they would meet the YDPP weight loss goal (i.e., 7% decline in total weight). Respondents were more optimistic about

![Figure 5. Survey Respondents’ Confidence in Meeting Program Goals](source: Analysis of the YMCA of Greater Boston Diabetes Prevention Program Participant Survey, 2019.)
engaging in 150 minutes of exercise per week, with 72 percent reporting confidence in their ability to meet this second YDPP goal (see Figure 5). Still, nearly all respondents (96%) reported a desire to have group exercise as a standard component of YDPP in addition to the classroom lectures, with 84 percent sharing that they would use YMCA facilities (e.g., pool, equipment, group exercise classes).

The majority (72%) of survey respondents were not YMCA members prior to enrolling in YDPP. Most participants (84%) viewed the free membership (which begins once participant complete YDPP session 5) as helpful in advancing their health goals. At present, YDPP is offered at no cost to participants. When asked if they would have paid to participate in YDPP, the majority (64%) of respondents reported in the negative.

The survey prompted participants to indicate what types of information would enhance their YMCA experience. As shown in Figure 6, participants were interested in more information on health and wellness (86%), education (43%), public benefit programs (43%), and parenting/childcare (36%), among other topics.
Boston YMCA Staff Focus Groups

The focus groups served a dual purpose: (1) to convene health and wellness branch staff, including the new Senior Director of Healthy Living and Medically Based Programs, to discuss branch-level and association-wide administrative processes that underpin chronic disease programming (e.g., participant recruitment, staff training, feedback mechanisms) and (2) to solicit insights about successes, opportunities, and challenges specific to launching or maintaining YDPP across the association in a manner that empowers staff, advances parity in member/participant experiences within and across branches, and addresses the social and economic factors that impact health behavior change. To frame and guide the conversations, focus group participants received a summary of findings from the qualitative interviews and YDPP participant surveys. General themes from the focus groups are summarized below by topic.

Lifestyle Coaches

Lifestyle coaches are in short supply across the association due to staff turnover and the time-intensive nature of the required trainings (e.g., motivational interviewing, YDPP curriculum training, small group facilitation). Most lifestyle coaches are current YMCA staff, so trainings must be completed in the evenings or on weekends. (Some trainings require in-state travel.) In addition, in their role as a paid lifestyle coach, YMCA staff cannot provide personal training or nutrition consultations, effectively limiting what guidance coaches provide in the YDPP group sessions. Many focus group participants cited this as a concern because YDPP participants look to their lifestyle coaches for information and hands-on support beyond the curriculum or classroom. Other focus group participants stated they see themselves as facilitators and would be
more comfortable referring YDPP participants to colleagues, thereby encouraging personal responsibility and interaction with other staff members. Several focus group participants with lifestyle coaching experience (in YDPP or other programs) cited the ability to form close relationships with YDPP participants as the primary incentive for participating in YDPP.

**Participant Recruitment**

While YDPP is not yet active at all Boston YMCA branches, each branch offers at least one chronic disease program for which branch-level staff are responsible for recruitment, enrollment, tracking, and reporting. Most focus group participants cited persistent challenges with recruiting participants from the community without formal referral networks or community-clinical linkages in place, and many endorsed the idea of shifting to a centralized recruitment strategy for the association. Under this hypothetical centralized approach, a two to three-person team in the central association office would manage recruitment, intake, and enrollment. The team would also maintain a web-based master calendar to track each YDPP cohort throughout the participation year. At present, health and wellness staff must contact other branches about their YDPP status; the Boston YMCA website is often outdated, so staff do not always know if or when another branch plans to launch a YDPP cohort.

Branches use multiple media or communication channels to promote awareness about YDPP and other chronic disease programs such as LIVESTRONG, a program that “promote[s] the importance of physical activity after a cancer diagnosis” (LIVESTRONG, 2019). The association marketing team, under the direction of the Vice President of Marketing and Communications, issues branded templates and written
guidance about posting, but branches have considerable latitude with respect to tailored
design approaches and dissemination strategies. Most branches utilize social media
platforms (e.g., Facebook, Instagram), paper flyers, and e-mail advertisements to
promote chronic disease programming; large marketing campaigns mostly focus on
general membership, after-school or summer programs, and childcare. Many focus
group participants shared that word-of-mouth is an effective recruitment strategy for
LIVESTRONG, but that same robust referral network does not yet exist for YDPP in the
greater Boston area. Most focus group participants endorsed formal partnerships with
hospitals, community health centers, senior centers, health advocacy groups, and
healthcare professionals as an additional recruitment and network-building strategy to
boost sustained interest and enrollment in YDPP across the association.

*Scheduling Concerns*

Physical space constraints for health and wellness group programming is an issue
at every branch. Scheduling a full year of YDPP sessions can be difficult as classrooms
are often needed at different times for childcare or after-school programming. Those
same classrooms are often reserved in the evenings as well. Several focus group
participants endorsed the option to host YDPP sessions off-site at locations such as
hospitals, community centers, and schools. In addition to lifestyle coach shortages and
physical space constraints, there may not be enough interest to launch new YDPP
cohorts on a regular basis; some branches will maintain a waiting list for several months
until at least eight participants complete the enrollment process. To limit participants’
wait time, health and wellness staff at branches without active YDPP waiting lists often
refer potential participants to other branches.
 Modifications to Program and Session Structure

Some focus group participants noted that making a yearlong commitment is daunting for lifestyle coaches as well as participants. Weekly one-hour sessions (1-16) allow the lifestyle coach and participants to build rapport as they incorporate learnings from the YDPP curriculum and group discussions to implement lifestyle modifications; the remaining bi-monthly sessions (17-22) and monthly sessions (23-25) focus on sustained behavioral change. Focus group participants did not express surprise at the survey finding that participants wanted group exercise to be formally incorporated into YDPP; thoughts on how to address this feedback were mixed. Some focus group participants stated that exercise should not be part of YDPP as the program aims to promote independence and participants should learn how to self-motivate for long-term success. Other focus group participants felt that the current model could be modified to include an at-home learning component, reducing in-person instruction time per session to 30 minutes; the remaining 30 minutes could be used for group exercise or a weight-training circuit. While lifestyle coaches cannot train YDPP participants, coaches can schedule personal training in-take appointments and review group exercise schedules with participants.

Program Materials

Several focus group participants noted that the program materials, written and endorsed by the CDC, are outdated. One participant suggested that the Boston YMCA hire a consultant to review and update the materials so that participants and staff have access to current information about pre-diabetes, diabetes risk profiles, personal nutrition (e.g., meal planning), and other diabetes prevention-related topics. At present,
the CDC materials offer a one-size-fits-all approach to health behavior modification, discounting local factors such as the restaurant and food retail landscape or paths/sidewalks for walking, running, or biking. Tailoring the YDPP curriculum to the Boston context would be a departure from the evidence-based, CDC-endorsed NDPP, but several focus group participants shared that they are not wedded to the national model for the purpose of recognition or grant funding. In addition to tailoring the YDPP materials, focus group participants noted their need for promotional and educational materials in Cantonese, Mandarin, and Portuguese; currently, promotional materials are only available in English and educational materials are only available in English and Spanish.
DISCUSSION AND RECOMMENDATIONS

Lifestyle change is the cornerstone of diabetes prevention, yet structured programs, which generally do not account for contextual or environmental factors that impact health, may result in adherence difficulties for participants. Diabetes prevention is not a “one size fits all” proposition; it should be a person-centered approach that promotes wellness across the numerous drivers of health. While evidence-based interventions such as the DPP appear to be effective, further research is needed to support the translation of interventions to prevent diabetes at a population level. Clinical guidelines on how to identify and manage patients with prediabetes provide a standardized approach to diagnosing, treating, and monitoring people with prediabetes, but few healthcare settings have formal arrangements with community-based lifestyle management programs like YDPP. Through community-clinical linkages, health systems can integrate DPPs to improve patient-centered health outcomes and enhance patient engagement.

From this DELTA project, the following priorities for the next iteration of the Boston YMCA’s YDPP emerged:

- **Priority 1**: sustained member/participant engagement before, during, and after enrollment and completion

- **Priority 2**: formalized partnerships in the form of community-clinical linkages to streamline the referral, enrollment, and monitoring processes

- **Priority 3**: new and expanded programming, services, and partner-driven events to address the varied needs of participants as well as the social drivers of health inequities in Greater Boston anchor communities
Building on these results, this DELTA project includes a proposal for an innovative program – Year of You™ – to expand access to comprehensive health and wellness services and supports for Boston YMCA members and other community-based health seekers. Program eligibility is not contingent upon risk status, diagnosis, or biometric such as BMI. All community members are eligible, and participation is free. As such, the Year of You™ program is meant to supplement, not replace, existing programs at the Boston YMCA such as YDPP.

**Year of You™ in Action**

The proposed Year of You™ program could address the noted YDPP priorities in the following ways:

- **Priority 1: sustained member/participant engagement before, during, and after enrollment and completion**

  As reported, the majority of YDPP participants waited one to three months from initial contact to their first YDPP session. The Year of You™ program can be a touchpoint for community members on the YDPP waiting list, providing an orientation to Boston YMCA programs and services. Each Year of You™ program participant would be paired with a staff member who will streamline assessments and communications about monthly events. Participants in YDPP could enroll simultaneously in Year of You™. Likewise, YDPP participants could choose to participate in Year of You™ after exiting YDPP regardless of their progress toward the program goals or attendance record.

- **Priority 2: formalized partnerships in the form of community-clinical linkages to streamline the referral, enrollment, and monitoring processes**
The Boston YMCA, a member of the Alliance of Massachusetts YMCAs, is a major supplier of social services in the Commonwealth. The Boston YMCA, through its Board of Directors and staff, has ongoing relationships with numerous public and private entities that have healthcare-focused missions or business lines. As such, implementing the Year of You™ program would not require extensive hiring or training to ensure in-house administrative capacity; instead, the Boston YMCA would enter into formal or informal partnerships with healthcare providers, healthcare institutions, and community-based organizations to meet the monthly staffing, training, and marketing needs.

- **Priority 3:** new and expanded programming, services, and events to address the varied needs of participants as well as the social drivers of health inequities in Greater Boston anchor communities

  While consistency in an intervention is important for outcomes evaluations, health education and promotion programs must consider participants’ diverse backgrounds, motivations, and limitations. Unlike YDPP lifestyle coaches, Year of You™ coaches sourced from community partners or Boston YMCA paraprofessional staff would be able to provide personal training and help participants navigate social services and supports offered by public and private entities. As the program expands and gains traction within the health promotion landscape, the Boston YMCA would be better positioned to respond to members’ requests for information and resources that are currently outside the scope of the association’s core services (e.g., adult learning, transitional housing, and childcare). As identified by the **YMCA of Greater Boston Diabetes Prevention Program Participant Survey**, YDPP participants want more health and wellness
information beyond the topics covered in the CDC-endorsed curriculum. Furthermore, the YDPP curriculum could be of interest and useful for health seekers managing diabetes. A yearlong program, which would run on a calendar year cycle would normalize health behavior change as a long-term endeavor and allows staff, participants, and community partners flexibility from month to month.

Each month Year of You™ programming would focus on specific health conditions or wellness topics, following the healthline Awareness Month calendar (see Figure 7). Some topics – the six vital signs (i.e., blood pressure, pulse, temperature, respiration, height, and weight) and basic biomarkers (e.g., hemoglobin A1c, low-density lipoprotein cholesterol) – would carry over from month-to-month so that regardless of when a health seeker enrolls, they will possess their basic personal health information. In addition, Year of You™ programming will cover health-related topics such as nutritional support programs, caregiver supports, health insurance coverage, adult learning, affordable housing, accessibility for people with disabilities, childcare, etc.

With support from community-based partners and Boston YMCA staff, Year of You™ participants will have access to lifestyle coaching, seminars, health fairs with screenings, personal training, and consultations. Year of You™, a knowledge transmission program at its core, will bolster patient agency – responsibility, compliance, and empowerment – in obtaining and managing personal health information.
Planning and operationalizing the Year of You™ program will require the executive management team to select the pilot branch(es), identify preferred community partners, and designate a person or team to provide administrative oversight of coach training, partner relationship management, and event scheduling. Given that Year of You™ would be an in-house program, the Boston YMCA would not be beholden to Y-USA or CDC DPP requirements or standards. As such, the Year of You™ can also serve
as a learning laboratory for central office and branch staff to address the challenges and opportunities gleaned from the qualitative stakeholder interviews, YDPP participant surveys, and healthy living director focus groups.
CONCLUSION

Whether or not the Boston YMCA opts to pursue the Year of You™ program, changes to YDPP are warranted based on the qualitative findings presented above. Using a change management model can inform and streamline the Boston YMCA’s YDPP planning, execution, and evaluation processes. Once such model, Kotter’s 8-step process, comprises the following steps: (1) create a sense of urgency; (2) build a coalition; (3) form a strategic vision and initiatives; (4) enlist a volunteer army; (5) enable action by removing barriers; (6) generate short-term wins; (7) sustain acceleration; and (8) institute change (Kotter, 2019). Applying this model to the Boston YMCA’s YDPP, the anecdotes about YDPP that had been relayed to CEO Morton and the pending diabetes prevention-related state legislation created a sense of urgency for the Boston YMCA to assess its YDPP. In addition to creating a positive, impactful experience for YDPP participants and lifestyle coaches, the Boston YMCA wants to ensure that it is well-positioned to respond to current and future need for diabetes prevention programming among health seekers, clinicians, or other entities (e.g., workplace wellness programs). To this end, the Boston YMCA sought to understand the diabetes prevention landscape and how the current management structure bolsters or hinders YDPP operations across and within branches.

Now that the local, state, and federal landscapes are mapped, a potential next step for the Boston YMCA is to develop a cross-branch, chronic disease programming coalition. Under the direction of the Association Director of Member Experience and Healthy Living, the advisory group can further evaluate the experiences of participants and staff, articulate short and long-term program improvement goals, and report on
program performance on a more regular basis. In addition to Boston YMCA staff, this advisory group could include external, community-based stakeholders with expertise in diabetes care, community-clinical linkages, lifestyle coaching, and social supports. The opportunity to co-develop a strategic vision or new initiatives with the Boston YMCA may be a selling point for external stakeholders – health systems, clinicians, healthcare advocates, social justice advocates, and grantmakers – looking to expand their reach with respect to chronic disease prevention or community health. Once an implementation plan for YDPP expansion and/or Year of You™ is in place, the Boston YMCA could recruit staff, volunteers, and program participants for the pilot. Cross-branch collaboration and robust feedback mechanisms that include all levels of staff and management may support the association in removing administrative barriers, improving YDPP participants’ outcomes, and catalyzing positive institutional change throughout the organization.
LOOKING AHEAD

At the start of this DELTA project, the Boston YMCA executive leadership team chose to focus on the YDPP participant experience, surmising that insights from participant surveys may also inform general membership engagement initiatives. The 13 Boston YMCA branches have varied programming needs based on the hyperlocal socio-economic and cultural landscapes in the surrounding communities. This DELTA project was a springboard for closer examination of YDPP, but it is unclear how the senior association staff (i.e., the Senior Director of Healthy Living and Medically Based Programs and the Association Director of Member Experience and Healthy Living) will use these data in relaunching YDPP across the 13 branches in the context of a decentralized management structure.

Looking ahead, the Boston YMCA will be challenged to find the optimal management structure that supports its goals to: (1) engage and empower branch leadership and staff prioritize meaningful membership for all health seekers and (2) expand its footprint in the chronic disease prevention and management landscape. An association-wide relaunch of YDPP or shifting centralized management structure across all adult health and wellness programs may exacerbate current challenges related to cross-branch communication, staffing, and participant engagement from intake assessment to program completion. In a system that places a premium on branch autonomy, mandates from the central office may be perceived as a threat to branch directors’ authority to respond, as needed, to the day-to-day needs of staff and members. On the contrary, branch staff may have more time to deepen their relationships with individuals, families, and communities if basic administrative
processes such as participant screening or lifestyle coach recruitment were executed at the association level. A supplemental health and wellness promotion innovation – Year of You™ – was developed as part of this DELTA project to respond directly to the administrative and programming opportunities identified via a qualitative research approach. Year of You™ could serve as a low-stakes learning laboratory for the Boston YMCA branches and the central office to pilot management strategy alternatives or new or expanded community-clinical partnerships. A relaunch of YDPP with modifications or implementation of Year of You™ will reduce unmet need for health and wellness services and supports among health seekers in Greater Boston, thereby advancing the Boston YMCA’s mission.
BIBLIOGRAPHY


## Appendix A: Project Logic Frame

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Outputs</th>
<th>Research Activities</th>
</tr>
</thead>
</table>
| Objective 1: to explore the political, economic, and organizational forces shaping current and future opportunities for diabetes prevention programming in Greater Boston and Massachusetts | • Environmental scan of the federal/national, state, and local type 2 diabetes landscapes | • Document and web content analyses  
• Qualitative interviews |
| Objective 2: to examine YMCA Diabetes Prevention Program (YDPP) participants’ experiences with implementing lifestyle and health behavior changes | • Survey instrument  
• Interview or focus group guide | • Survey data analysis  
• Interview/focus group analysis |
| Objective 3: to capture Boston YMCA staff reflections about administering YDPP and suggestions for program modifications | • Survey instrument  
• Interview or focus group guide | • Survey data analysis  
• Interview/focus group analysis |
APPENDIX B: QUALITATIVE STAKEHOLDER INTERVIEW GUIDE

YMCA Leadership and Staff

1. YMCA Mission, Vision, Culture and Strategy
2. Current Chronic Disease Prevention Impact and Growth Opportunities
3. Community Partnerships and Member Engagement
4. YMCA DPP Experiences from Enrollment to Program Completion (as applicable)

Clinicians and Public Health, Health Policy, and Biomedical Researchers

1. Clinical Care or Public Health Research Ethos
2. Approach to Chronic Disease Prevention
3. Knowledge of Current Diabetes Prevention Services Landscape
4. Reflections on Social Determinants of Health and Implications for Primary and Preventive Services

Public and Private Partners, Funders, and Other Stakeholders

1. Community Partnerships and Public Health Advocacy Ethos
2. Health Promotion Marketing and Communication
3. Knowledge of Current Diabetes Prevention Services Landscape
4. Reflections on Social Determinants of Health
Please read the following message:

The health of individuals, families, and communities remains a top priority of the YMCA of Greater Boston. We hope that you will support ongoing efforts to improve our Diabetes Prevention Program (“the Program”) by completing this short survey about your experiences as a past participant.

If you agree to participate, please respond to the questions to the best of your ability. If you do not wish to participate, please return this survey to a YMCA staff member.

We estimate that this survey will take no more than 15 minutes to complete.

Your responses will remain confidential. If you have questions, please contact the Association Director of Member Experience and Healthy Living. Thank you!

Question 1: What is your current status in the Program?

☐ Enrolled
☐ No longer enrolled + did complete the one-year program
☐ Don’t know/Not sure
☐ No longer enrolled + did not complete the one-year program

Question 2: How did you qualify for the Program?

☐ Prediabetes diagnosis by a healthcare provider such as a doctor or nurse
☐ Body Mass Index (BMI)
☐ Don’t know/Not sure

Question 3: How did you learn about the Program?

☐ Doctor, nurse, or other healthcare provider
☐ Family member or friend
☐ YMCA website
☐ Advertisement on the T/
☐ Email from the YMCA of Greater Boston
☐ Flyer or banner at a YMCA
☐ Don’t know/Not sure
☐ Other: _____________________
Question 4: How did you (or someone acting on your behalf) contact the YMCA to enroll in the Program?

- Phone
- Website
- Don’t know/Not sure
- Email

Question 5: Were you able to enroll in the Program at your preferred branch?

- Yes
- No. My preferred branch is: ____________________________

Question 6: How much time passed from when you first contacted the YMCA about the Program and your first Program session?

- 1-3 months
- 3-6 months
- 6-9 months
- more than 9 months
- Don’t know/Not sure

Question 7: Reflecting on your enrollment experience, is there any feedback that you wish you share now? If so, please write your comments below.

________________________________________________________________________

________________________________________________________________________

Question 8: Please read each statement below and indicate if you think the statement is true or false.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>I thought the program materials were easy to understand.</td>
<td></td>
<td></td>
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<tr>
<td>I thought the program materials were interesting.</td>
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<td></td>
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<tr>
<td>The program materials had information that was new to me.</td>
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<tr>
<td>I got information about prediabetes from other sources (books, internet, etc.) while enrolled in the Program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I participated in other programs or activities to prevent diabetes following the YMCA program.</td>
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<tr>
<td>I liked learning about health and wellness in a group.</td>
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<tr>
<td>I felt that my lifestyle coach understood my personal health goals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I had regular access to fresh fruits and vegetables while enrolled in the Program.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I had access to reliable transportation (car, T/subway, bus) to get to the YMCA while enrolled in the Program. □ True □ False

I had support from my family or friends to meet my personal health goals while enrolled in the Program. □ True □ False

I had support from a healthcare provider to meet my personal health goals while enrolled in the Program. □ True □ False

I met the Program’s 7% body weight loss goal. □ True □ False

I met the Program’s physical activity goal (150 minutes/week). □ True □ False

I wish that group exercise had been a part of the Program too. □ True □ False

I used YMCA facilities (pool, gym, etc.) to exercise. □ True □ False

I was a YMCA member before enrolling in the Program. □ True □ False

I am still a YMCA member. □ True □ False

I think my free membership at the YMCA helped my progress during the Program. □ True □ False

I would recommend the Program to friends or relatives. □ True □ False

The Program was free, but I would have paid to participate in the Program. □ True □ False

Question 9: What did you like best about the Program?

__________________________________________________________________________

Question 10: What, if anything, would you change about the Program?

__________________________________________________________________________

Question 11: What additional information would have enhanced your YMCA experience?

□ Financial Planning for Homeownership □ Legal Advice and Counsel

□ Benefits (e.g., Social Security, Transitional Assistance, Workers’ Compensation) □ Parenting/Child Care

□ Management of Household Expenses □ Education

□ Job Training □ Health and Wellness

□ Other: ________________________________
Question 12: Did you complete the full one-year program?

☐ Yes ☐ Don’t know/not sure
☐ No

Question 13: Are you still concerned about your diabetes risk?

☐ Yes, because____________________________________________
☐ No, because __________________________________________
☐ Don’t know/not sure

Please share any additional feedback on the Program or the YMCA below.
______________________________________________________________
______________________________________________________________

Thank you for completing our survey! We appreciate your time.
**YMCA of Greater Boston Diabetes Prevention Program Participant Survey**

Please read the following message:

The health of individuals, families, and communities remains a top priority of the YMCA of Greater Boston. We hope that you will support ongoing efforts to improve our Diabetes Prevention Program (“the Program”) by completing this short survey about your experiences as a current participant.

If you agree to participate, please respond to the questions to the best of your ability. If you do not wish to participate, please return this survey to a YMCA staff member.

We estimate that this survey will take no more than 15 minutes to complete.

Your responses will remain confidential. If you have questions, please contact the Association Director of Member Experience and Healthy Living. Thank you!

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**Question 1:** What is your current status in the Program?

- [ ] Enrolled
- [ ] No longer enrolled + did complete the one-year Program
- [ ] Don’t know/Not sure
- [ ] No longer enrolled + did not complete the one-year Program

**Question 2:** How did you qualify for the Program?

- [ ] Prediabetes diagnosis by a healthcare provider such as a doctor or nurse
- [ ] Body Mass Index (BMI)
- [ ] Don’t know/Not sure

**Question 3:** How did you learn about the Program?

- [ ] Doctor, nurse, or other healthcare provider
- [ ] YMCA website
- [ ] Email from the YMCA of Greater Boston
- [ ] Family member or friend
- [ ] Advertisement on the T
- [ ] Flyer or banner at a YMCA branch
- [ ] Don’t know/Not sure
- [ ] Other: ________________

**Question 4:** How did you (or someone acting on your behalf) contact the YMCA to enroll in the Program?

- [ ] Phone
- [ ] Website
- [ ] Email
- [ ] Don’t know/Not sure
Question 5: Were you able to enroll in the Program at your preferred branch?

☐ Yes
☐ No. My preferred branch is: _______________________________

Question 6: How much time passed from when you first contacted the YMCA about the Program and your first Program session?

☐ 1-3 months  ☐ 3-6 months  ☐ 6-9 months  ☐ more than 9 months
☐ Don't know/Not sure

Question 7: Reflecting on your enrollment experience, is there any feedback that you wish you share now? If so, please write your comments below.

__________________________________________________________________
__________________________________________________________________

Question 8: Please read each statement below and indicate if you think the statement is true or false.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think the program materials are easy to understand.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I think the program materials are interesting.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>The program materials have information that is new to me.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I think the program materials will help me understand how to prevent or delay type 2 diabetes.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I participated in other programs or activities to prevent diabetes in the past.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I get information about prediabetes from other sources (books, internet, etc.).</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I like learning about health and wellness in a group.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I feel that my lifestyle coach understands my personal health goals.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I have regular access to fresh fruits and vegetables.</td>
<td>☐ True   ☐ False</td>
</tr>
<tr>
<td>I have access to reliable transportation (car, T/subway, bus) to get to the YMCA.</td>
<td>☐ True   ☐ False</td>
</tr>
</tbody>
</table>
I have support from my family or friends to meet my personal health goals.  □ True □ False

I have support from a healthcare provider to meet my personal health goals.  □ True □ False

I am confident that I will reach the Program’s 7% body weight loss goal.  □ True □ False

I am confident that I will reach the Program’s physical activity goal (150 minutes/week).  □ True □ False

I wish that group exercise was a part of the Program too.  □ True □ False

I was a member of the YMCA before enrolling in the Program.  □ True □ False

I think my free membership at the YMCA is helping/will help my progress during the Program.  □ True □ False

I use or will use YMCA facilities (pool, gym, etc.) to exercise.  □ True □ False

I anticipate that I will complete the one-year Program.  □ True □ False

The Program is free, but I would have paid to participate in the Program.  □ True □ False

Question 9: What additional information would enhance your YMCA experience?

☐ Financial Planning for Homeownership
☐ Benefits (e.g., Social Security, Transitional Assistance, Workers’ Compensation)
☐ Management of Household Expenses
☐ Job Training
☐ Other: _______________________________

☐ Legal Advice and Counsel
☐ Parenting/Child Care
☐ Education
☐ Health and Wellness

Please share any additional feedback on the Program or the YMCA below.

________________________________________________________________________
________________________________________________________________________

Thank you for completing our survey! We appreciate your time.
Focus Group Goals:

1. Introductions (10 minutes)
2. Reflections on challenges and opportunities (20 minutes)
3. Reflections on YDPP participant survey data (20 minutes)
4. Reflections on next steps for YDPP
5. Closing

Key Themes from YGB Branch Staff Interviews
(November 2018 – January 2019)

Challenges:

• Staff turnover
• YDPP lifestyle coach training and retention
• YDPP participation timeline (i.e., one-year commitment)
• Translation services for non-native English speakers and people with hearing or vision impairments
• Private spaces for members to discuss personal health information
• Data reporting processes and use of data to inform branch-level decisions
• Prediabetes diagnosis not always a “call to action”
• Health systems focus on chronic disease management, not prevention
• Equity of member experience and opportunity across branches

Opportunities:

• Centralize YDPP marketing, recruitment, and enrollment
• Centralize YDPP calendar of class sessions and community events
• Centralize feedback system with opportunities for cross-branch learning
• Single office or main point of contact for all chronic disease programming with region-level resource sharing
• Build or strengthen partnerships with clinicians and wellness providers, food share/delivery programs, schools, faith-based organizations, and civic organizations
• Offer pre-diabetes diagnostic services, i.e., BMI measurement and A1C test
• Offer services and supports for members while on YDPP waiting list
• Update YDPP curriculum (e.g., culturally relevant guidance on diet)
• Leverage participants’ social networks to increase chances of short and long-term success
• Offer off-site programs (e.g., YDPP at a private employer)
• Offer group exercise as a component of YDPP
• Support external organizations in meeting health & wellness goals for employees/members

**Key Takeaways from YDPP Participant Survey (Spring 2019)**

1. 56% qualified based on their prediabetes diagnosis
2. 48% learned about YDPP via a clinician
3. 40% experienced a wait time of 3-6 months from first contact to enrollment
4. 100% thought the program materials were easy to understand; 92% believed the program materials would help them prevent or delay type 2 diabetes
5. 100% liked learning about health & wellness in a group setting
6. 96% had regular access to fresh fruits and vegetables; 76% had access to reliable transportation
7. 84% had support from family or friends, while only 60% had support from a healthcare provider
8. 60% were confident that they would meet the body weight loss goal; 72% were confident that they would meet the physical activity goal
9. 96% wished that group exercise was a part of YDPP
10. 72% were not a YMCA member prior to YDPP; 84% thought the free membership would help their progress; 84% used or would use YMCA facilities
11. 80% anticipated they would complete YDPP

12. 64% would not have paid to participate in YDPP

13. 86% thought additional information on health and wellness would enhance their experience