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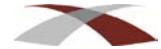
# Assessing the Current Value and Potential Contributions of the Greater Indianapolis YMCA

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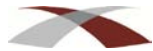
# Assessing the Current Value and Potential Contributions of the Greater Indianapolis YMCA

**December 2011**

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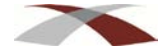
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# Introduction

In 2010, the YMCA of Greater Indianapolis (YMCA) had 13 branch locations in central Indiana which served over 185,000 members (80,706 individual members and 31,118 family memberships). The YMCA recently completed a strategic planning process and is committed to helping make Indianapolis one of the ten healthiest cities in the United States as part of its *Our Cause is You* campaign. To help achieve this goal, the YMCA wants to make its services available to citizens in areas of Indianapolis that are currently not being served by YMCA or other private sector exercise and fitness facilities.

Site research consultants determined that the most underserved areas were in the core area of Marion County. In an effort to meet demand in these underserved areas, the YMCA is proposing to develop three new facilities. These new opportunities include a downtown location (as part of the CityWay development), in the new development at the Meadows (Avondale Meadows), and in Pike Township. By providing new exercise and fitness opportunities for current residents in these neighborhoods, it is expected that these facilities will help make Indianapolis one of the nation's ten healthiest cities. The facilities will also make the surrounding neighborhoods more attractive and marketable to new residents.

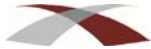
Feasibility studies (performed by consulting firms for the YMCA) suggest that the three new facilities have the potential to attract 18,185 new members. This represents a 10 percent increase in the number of YMCA members. The YMCA's expansion strategy will provide residents of underserved urban neighborhoods with access to a wide range of fitness and education programs.

The YMCA contracted with the Indiana University Public Policy Institute (PPI) to measure the potential contributions to the community and YMCA members of the expansion strategy as well as current operations. The following analysis identifies and quantifies some of the key benefits attributable to the YMCA's current operations, its expansion strategy, and the healthy city campaign.

## Determining Economic Contributions

A thorough explanation of the economic valuation methodology used in this analysis is provided in Appendix 3. In a traditional sense, the Greater Indianapolis YMCA's operation and the construction of new facilities generates economic activity within the central Indiana region as it purchases goods and services from other local firms and as its employees purchase goods and services in the area. The economic activity associated with operations and construction are best understood through the use of input/output modeling which predicts the amount of indirect and induced (commonly referred to as spin-off) activity associated with operating and construction expenditures. This analysis uses IMPLAN (one of the two most commonly used input/output models) to estimate the economic activity occurring with the nine-county metropolitan area (Boone, Hancock, Hamilton, Hendricks, Johnson, Madison, Marion, Morgan, and Shelby Counties).

Additionally, the YMCA (and many other not-for-profit institutions) provides benefits to its patrons and the region that has value that is not captured by traditional economic impact analysis. These additional benefits include the provision of services at rates below those of the private sector as well as the health benefits associated with participation in the programs. Perhaps most importantly, the YMCA makes its services (and the participation benefits associated with those services) available to residents who might otherwise not be able to participate and in parts of the region where access to similar services is limited.

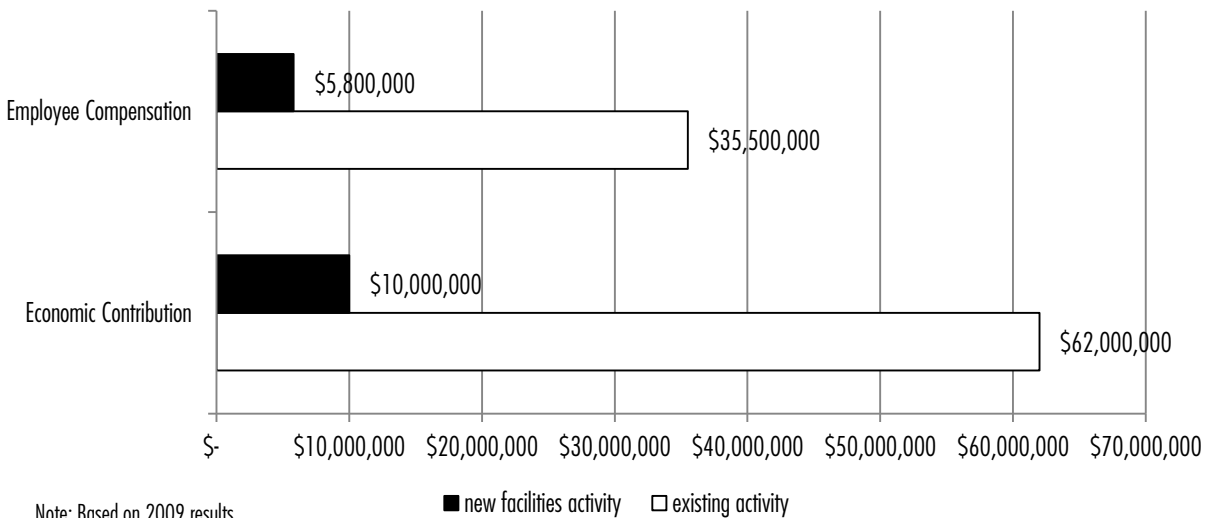


While the YMCA provides a wide range of programs, that also provide benefits associated with accessibility and long-term outcomes, YMCA staff selected the Before & After School program, its summer camp, and the Diabetes Prevention program to service as examples the benefits it provides.

## Economic Contributions of the Greater Indianapolis YMCA

Based on a standard approach to economic impact analysis, using the IMPLAN input/output model, we estimate that in 2009 the YMCA's operating expenditures of more than \$32 million generated an additional \$30 million of economic activity in the region. The \$62 million of economic activity attributable to YMCA includes about 950 jobs and more than \$35 million in employee compensation. While the economic contributions associated with the YMCA's operations are annual and ongoing, they will vary based on changes in operating budgets. Figure 1 shows the estimated economic activity based on a typical year (2009) and the additional activity if the YMCA does open three new facilities and operating expenditures at the three new facilities are similar to 2009 operations. The YMCA's annual economic contribution would increase by an additional \$10 million, including 155 additional jobs and \$5.8 million in additional employee compensation.

**Figure 1. Annual Economic Contributions of YMCA Operations and Projected Economic Activity of New Facilities**



In addition to the annual economic contribution attributable to operations, the YMCA's expansion strategy will require the design and construction of three new facilities. The total construction cost of the three new facilities is estimated to be \$48,375,000.<sup>1</sup> As the construction dollars invested by the YMCA work their way through the economy in forms ranging from construction subcontracts to the purchase of supplies, nearly \$31 million of additional indirect or spin-off economic activity will be generated. Thus, the total contribution to the local economy attributable to the construction of the three new facilities will be nearly \$80 million and include 1,300 one-year non-recurring construction jobs (full-time equivalents) and over \$23 million in employee compensation. Figure 2 displays the direct and indirect economic contributions of construction costs at each facility.

<sup>1</sup> The construction cost estimates includes some expenditures made by the YMCA's partners (IU Health and Purpose Built Communities) at the proposed Meadows/New Avondale facility.

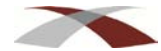
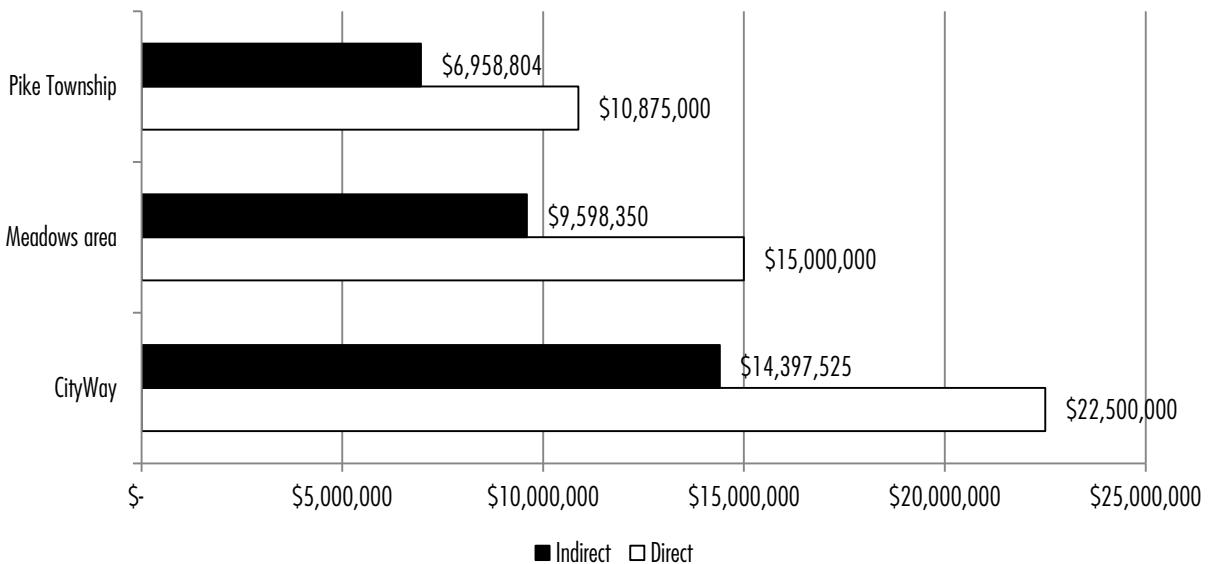


Figure 2. Estimated Economic Contribution Attributable to New YMCA Facility Construction



## Proactive Intervention Contributions of the Greater Indianapolis YMCA

While the YMCA's current and potential economic contributions are substantial (especially in the current economic climate), a traditional economic contribution analysis does not measure the impact of the YMCA's programs on the well-being of those who participate. For example, the YMCA offers a Diabetes Prevention Program which clinical research indicates has the potential to reduce the incidence or delay the onset of Type II diabetes.<sup>2</sup>

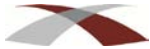
### Diabetes Prevention Program

Since the YMCA began the program, it has provided diabetes prevention services to 505 individuals, and there were 42 active participants in the program in 2010. Economic benefits of these types of services are realized through reduced health care costs – including individual out-of-pocket costs and provider costs – reduction in the risk of having to receive disability, increased workplace productivity, reduced mortality, and an improved quality of life. To assess the value of the diabetes program PPI staff examined four studies of similar diabetes intervention programs and found that cumulative per-participant benefits are estimated to range from a low of \$11,222 to a high of \$15,785 over the first ten years following successful completion of the program. By multiplying the high and low ten-year savings by the number of total participants, we can estimate that the total post program ten-year savings attributable to the YMCA's Diabetes Prevention Program ranges from a high of nearly \$8 million to a low of \$5.6 million.

To estimate the potential benefits attributable to the YMCA's expansion plans, PPI calculated the 2010 diabetes program participation rate based on the ratio of 42 current participants in the Diabetes Prevention Program divided by total YMCA membership (0.04 percent) and then applied that rate to the total

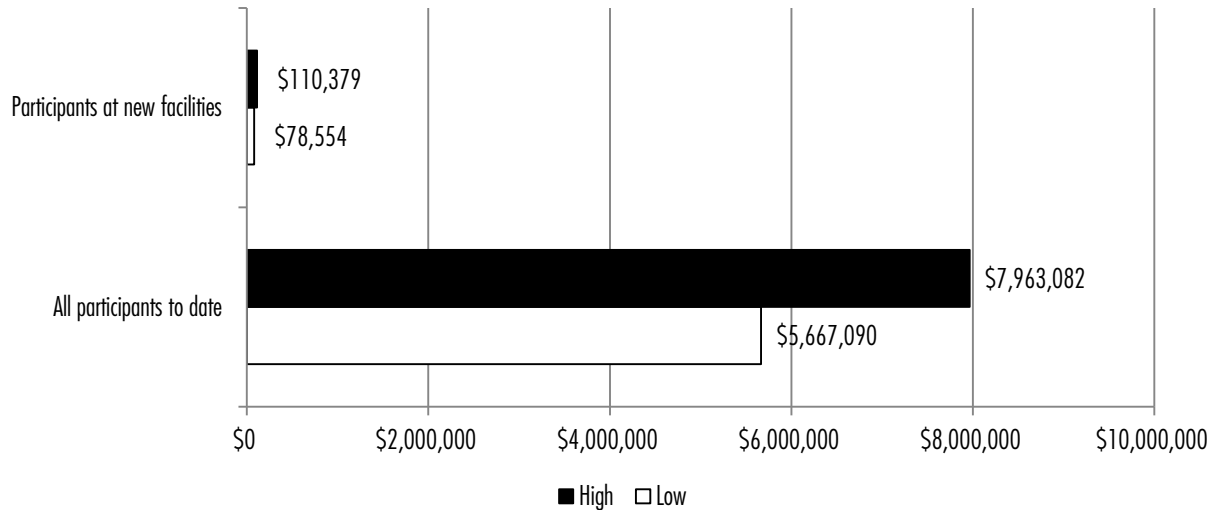
<sup>2</sup> Appendices 1 and 2 provide a detailed explanation of the research and methodology upon which the estimates of proactive intervention in this section are based.





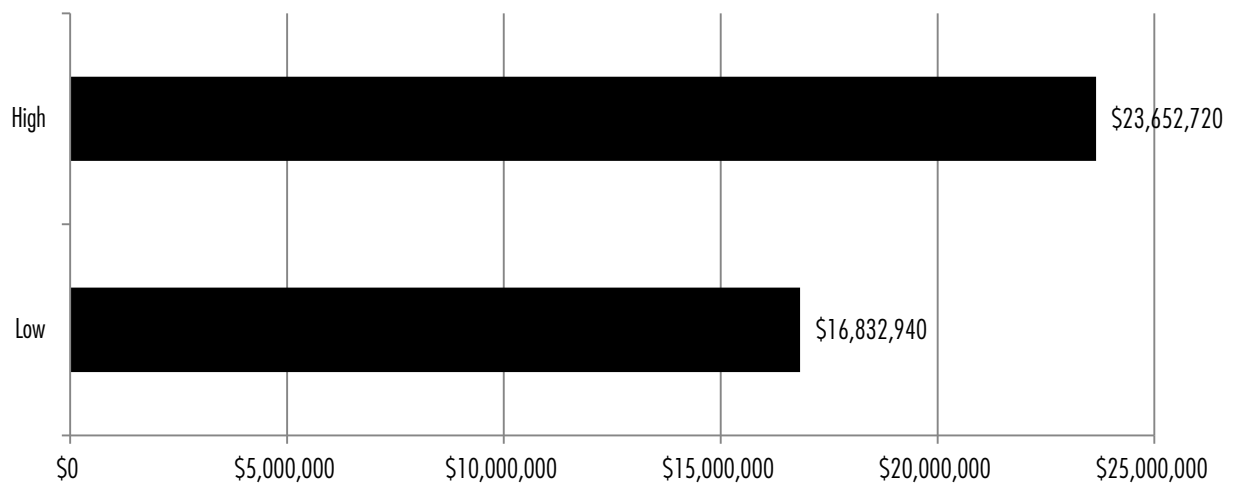
number of expected new members (from the feasibility studies). Based on this approach we estimate that there will be seven new diabetes program members attributable to increased membership at the new facilities. We then applied the range of savings, outlined above, to those seven participants and determined that the total economic benefit attributable to new member participation in the diabetes programs would range from a low of \$78,554 to a high of \$110,379 over the ten years after completion of the program (Figure 3).

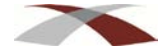
**Figure 3. Total Estimated Ten-year Savings Attributable to YMCA Diabetes Prevention Program Participants**



The YMCA reports that it has the capacity (facilities and staff) to offer the Diabetes Prevention Program to 1,500 participants. If the YMCA were to successfully leverage the new facilities and the healthy city program to reach maximum capacity, the total public economic benefit is likely to range from a low of \$16.8 million to a high of \$23.6 million over a ten-year period following successful completion of the program.

**Figure 4. Estimated 10-year Impacts Attributable to YMCA's Reported Diabetes Program Capacity**





## Before & After School Program

The YMCA's provision of affordable after school care throughout central Indiana has the potential to provide significant social benefits for participants and the region. For the purposes of this analysis, we focus on the value of the public benefit provided by these programs (including a reduction in risky behavior as well as improved academic outcomes), while acknowledging that there are significant present and future private benefits that will additionally be realized by the participants in these programs. Most importantly, it must be noted that research on the benefits attributable to after school programs suggest that the programs must be intentionally designed to have impact on improved participant outcomes. The estimates of potential benefits are based on the idea that the YMCA program meets those standards.

Further, the estimates below are derived from diverse research efforts that each focused on programs designed to have an impact on a specific metric or set of metrics, rather than impact all of the potential outcomes we include in the economic benefit analysis. Given the diversity of the programs presented in the literature, it is unlikely that all of the benefits listed below would be realized in their full effect simply by the provision of an after school program. Finally, it is important to recognize that while immediate benefits accrue to all enrollees, life-time benefits are limited to those who remain in the program long enough to receive the full benefit of the program. Our estimates are based on the YMCA's five-year retention rate.

The YMCA currently has 4,026 individuals enrolled in full-time after school programs or full-time before and after school programs. PPI's research into published literature suggests that participants receive immediate benefits, including improved parental employment opportunities, reduced need for academic remediation, and reductions in risky behaviors including pregnancy, crime, and drug use. While PPI sought to include a range of metrics on which after school programs could have an impact, it should be noted that many of the programs studied examined the effects on particular demographic groups (age, socioeconomic status, gender, etc.) and the benefits may not translate to the entire population taking advantage of the YMCA's school programs.

Research suggests that the value of these benefits to society include:

- Between \$236 and \$573 per participant in annual tax revenue associated with improved parental employment,
- Between \$116 and \$467 reduced cost per enrollee related to teenage pregnancy and other social behavior, and
- Between \$550 and \$996 less academic remediation costs per enrollee.

Partially offsetting the value of these benefits is the cost of providing educational services to students who stay in school, which is estimated to range from \$914 to \$1,218 per program enrollee. Figure 5, displays the total costs and benefits associated with the 4,026 students enrolled full-time in the YMCA's school programs. Most importantly, the final data item (net benefit) displays the potential range of benefits after the cost of providing additional education services to students who remain in school is considered.

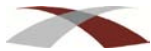
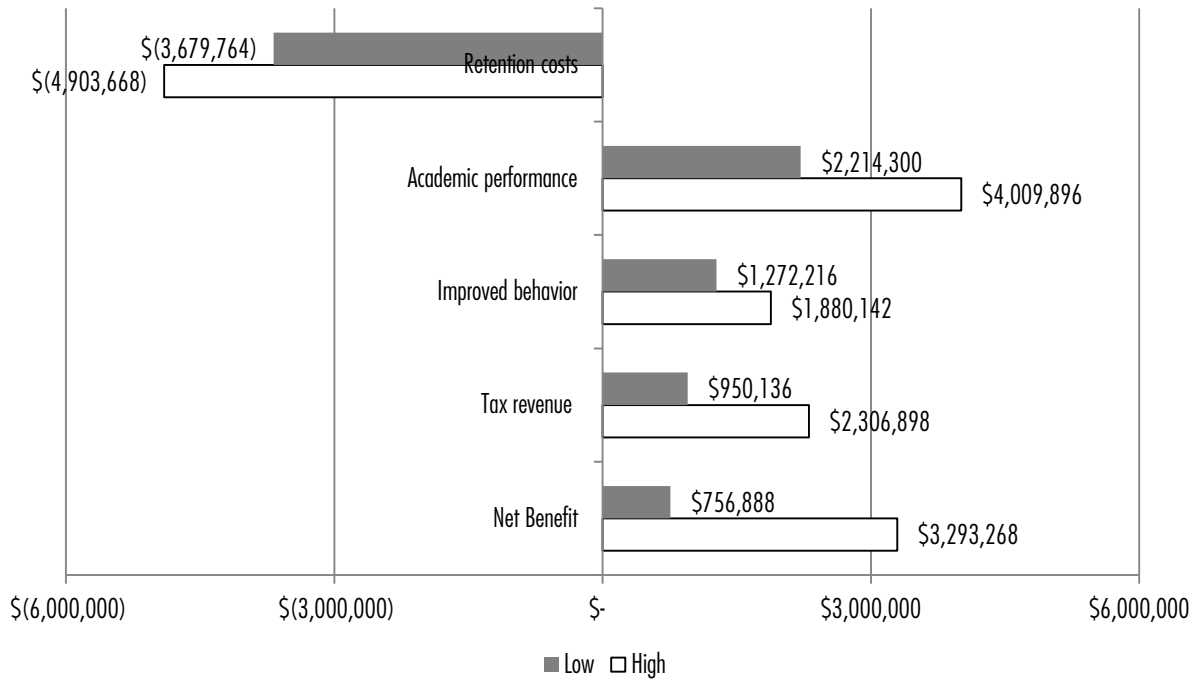
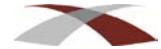


Figure 5. Immediate Benefits Associated with YMCA Before & After School Programs

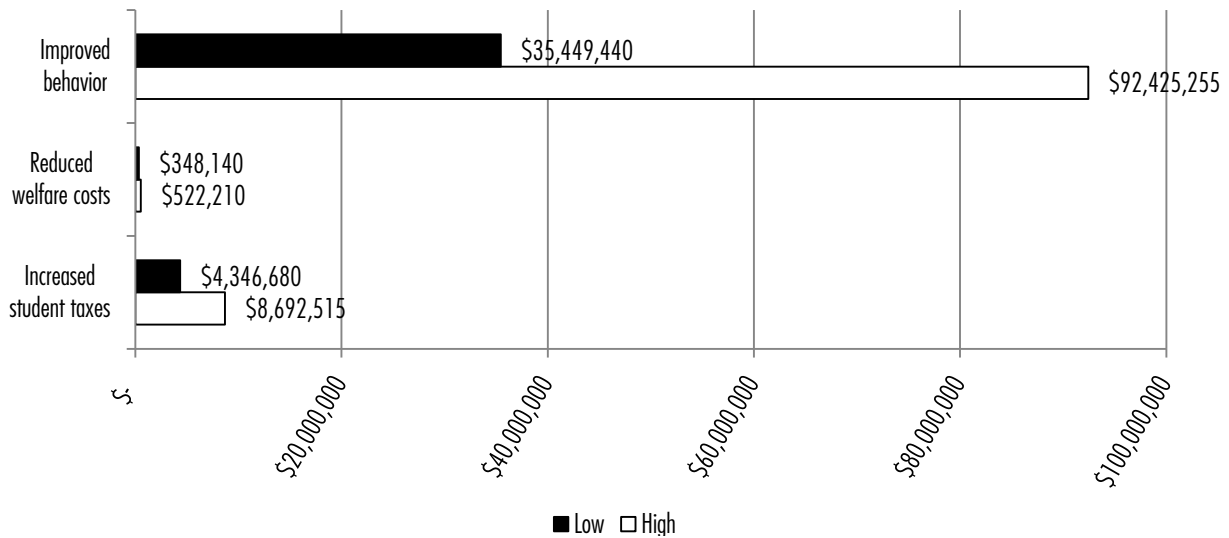


As previously stated, lifetime benefits are most likely to accrue to those who participate in school programs for five or more years. The Greater Indianapolis YMCA reports a five-year retention rate of 21 percent. In 2010, there were 4,026 student enrolled full-time in the YMCA's after school program (some were also enrolled in the pre-school day program). Assuming the 21 percent five-year retention rate, 845 of these students would remain enrolled long enough to realize lifetime benefits.

The lifetime benefits of long-term participation in after school programs include: improved social behavior (primarily a reduction in criminal activity and drug use), and improved employment outcomes (which result in decreased dependency on welfare services and an increase in income). The literature review suggests that improved social behaviors are likely to result in a benefit of between \$41,952 and \$109,379 per participant (primarily attributable to reduced criminal activity). The increase in tax revenue related to increased employment outcomes is estimated to range from \$5,144 to \$10,287 per participant, and decreased dependency on welfare services is expected to reduce those costs by between \$412 and \$618. The analysis results in a range of estimated benefits for the expected 845 long-term participants from a low of just over \$40 million to a high of nearly \$101.5 million. Figure 6 displays the benefit by impact category.



**Figure 6. Total Estimated Lifetime Benefits Attributable to YMCA School Programs Based on 21 percent Five-year Retention Rate**

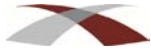


## Economic Valuation of Public Benefits to YMCA Members

In addition to providing proactive intervention-related benefits, the YMCA also provides benefits to many of its members through lower than private market rate participation costs as well as fee reductions to eligible families and individuals. These contributions are not included in traditional economic impact analysis, but they do provide benefits to consumers. These public benefits or access-related benefits can be measured through economic valuation methodology.

Economic valuation analysis focuses on the value of the service to consumers rather than the amount of economic activity it engenders. Typically, user value is determined in one of two methods. The first method is to value the services based on the amount of time spent by the user in obtaining the service (including travel time as well as the time consuming the service). A second method is based on obtaining comparable costs of services when other firms (typically in the private sector) do charge for the same service. The reduced costs associated with both the rate difference and fee reduction may also contribute to increased enrollment in the program (by making the programs more accessible to low and moderate income individuals and households) and thus indirectly may contribute to the overall health and well-being of the residents of central Indiana. While the YMCA provides a wide array of programs, many of which provide access-related benefits, this analysis is limited to the Before & After School program and the summer camp program.

The rate difference benefit represents the difference between the YMCA's fee and the average private sector fee for similar programs in either the school district with the Before & After School programs or in the township in which the YMCA is located for the summer program. To estimate the rate difference benefit researchers collected a sample of private sector fees for before and after school programs as well as summer camps. Because the data collected showed that private sector costs for both programs vary by region, the private sector costs were divided into catchment areas that surround the school districts that provide YMCA school programs and the individual YMCA facilities where the summer camp program is provided. There were at least five private sector fees collected for each school district with a YMCA program or YMCA summer camp facility, and the rate difference analysis is based on the average of those

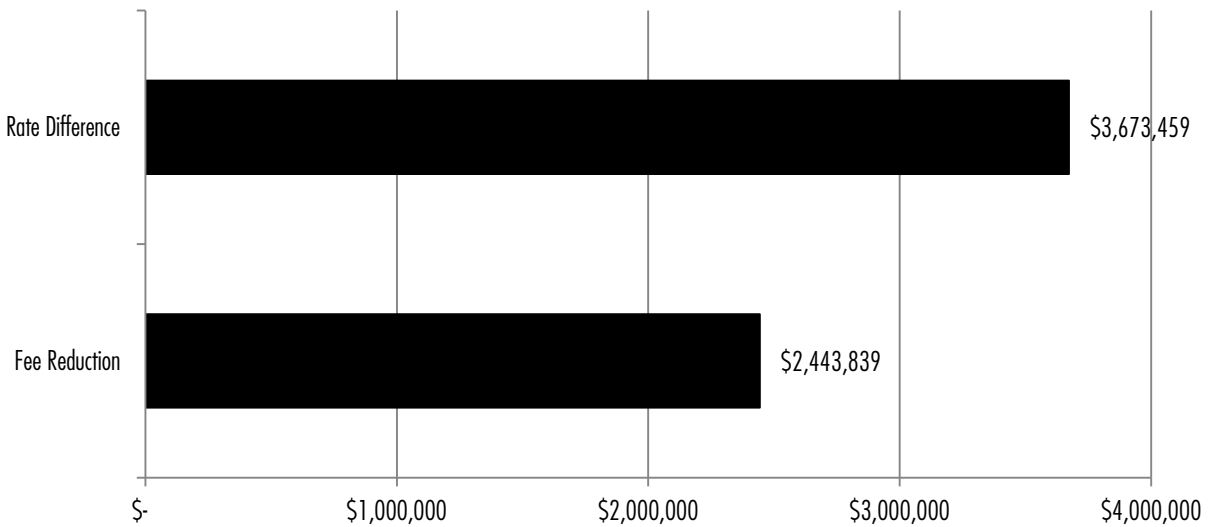


fees. Fee reduction is the second access-related benefit the YMCA provides to eligible families. The fee reduction data in this analysis are not an estimate rather it is based on fee data provided by the YMCA and analyzed by PPI.<sup>3</sup>

## Before & After School Programs

In 2010, the YMCA provided before and after school programs to nearly 8,200 students and provided a reduced rate to nearly 2,500 of those students. Over the 36 weeks of the program, the average rate difference per student between private programs and YMCA programs was about \$12.50 per week or \$450 over the 36-week program. The average fee reduction for eligible students in the YMCA programs was \$28 per week per student or \$1,015 per student over the entire 36 weeks. (The students who qualified for a fee reduction also benefited from the rate difference, thus those receiving a fee reductions actual received an average benefit of \$40.50 per week.) In 2010, the total public benefit provided to participants of the YMCA's school programs was over \$6 million. Because these programs are provided at the schools, it is unlikely that the new facilities will have an impact on enrollment. Figure 7 displays the public benefits attributable to the rate difference and the fee reduction elements.

Figure 7. Access-related Benefits of YMCA Before & After School Programs, 2010

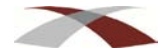


## Summer Camp

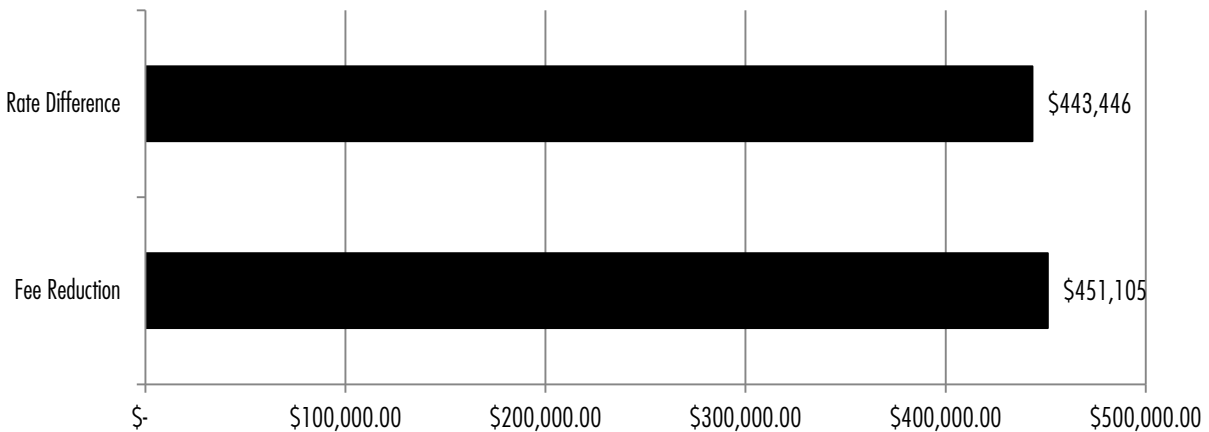
Over the course of the YMCA's nine-week summer camp program in 2010, the average weekly attendance was 2,848 children. A weekly average of 781 of these participants received a fee reduction; in a typical week approximately 27 percent of the participants received a fee reduction from the YMCA.

When both the rate difference and fee reduction are taken into account, in 2010, the YMCA provided nearly \$1 million in benefit to participants in the summer camp program. As shown in Figure 8, the rate difference and fee reduction benefits were nearly equal. Private sector average weekly summer camp rates ranged from a low of \$103 in the area surrounding the Pike Township YMCA to a high of \$160 in the Baxter YMCA catchment area. In 2010, the standard YMCA summer camp rate for all Marion County facilities was \$149 per week, and the fee varied slightly in the outlying counties (typically lower). As previously stated, in a typical week 781 children or 27 percent of the summer camp participants received a fee reduction. While the amount of assistance varied widely, the average weekly assistance was \$32.08 per child.

<sup>3</sup> Appendix 3 provides a detailed explanation of the research and methodology upon which the estimates of economic valuation in this section are based.

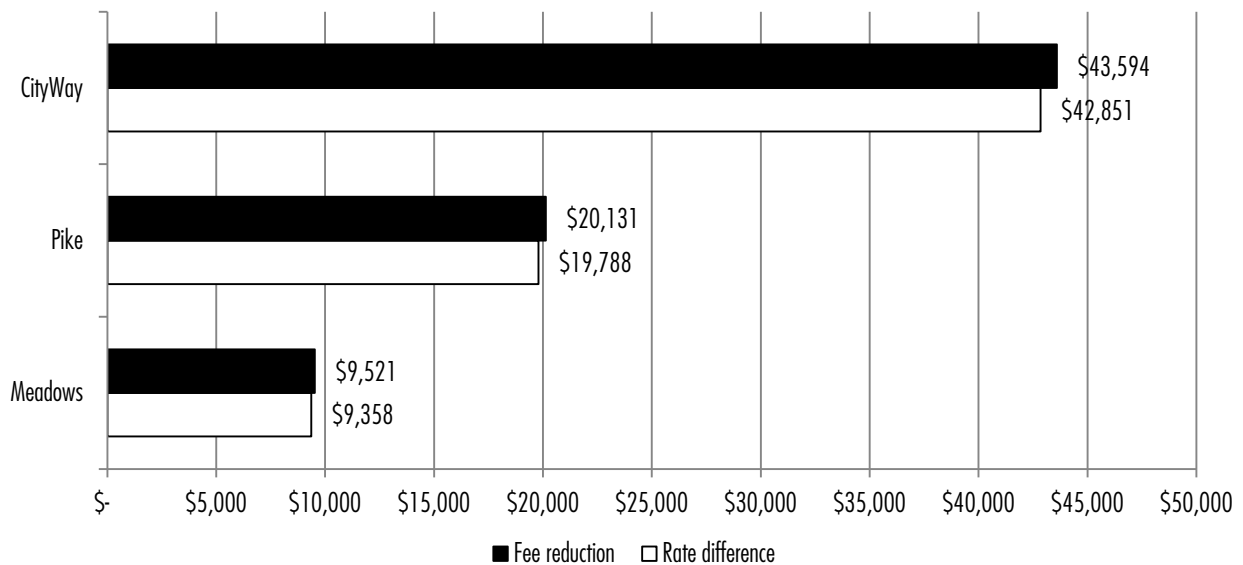


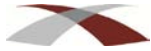
**Figure 8. Access-related Benefits of YMCA Summer Camp Programs, 2010**



Because the YMCA's summer camp program occurs at its facilities rather than at local schools, it is reasonable to assume that the construction of three new facilities will increase summer camp participation. Assuming participation rates at the three proposed facilities are similar to participation rates at YMCA facilities currently offering the summer camp program, we estimate that the new facilities would add 462 new summer camp participants. The estimate for number of summer camp participants at the CityWay YMCA is 275, 127 at the Pike facility, and 60 at the Meadows. To estimate the public benefit we assume that the rate differential and fee reduction benefits at the new facilities would be approximately equal to the average benefits currently experienced across all Marion County YMCA summer camp programs. In this case, the opening of the new YMCA facilities will provide summer camp participants with \$145,242 of additional public benefits. Figure 9 displays the benefits provided at each of the new facilities.

**Figure 9. Estimated Access-related Benefits of YMCA Summer Camp Programs at New Facilities**





# Qualitative Benefits Related to the YMCA's Expansion Strategy

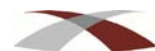
In addition to the quantitative benefits described in the prior sections, the YMCA's proposed facilities will provide a series of qualitative benefits directly related to providing services to underserved markets. Providing current residents with access to a wide range of exercise and health-related activities can contribute to improved long-term health outcomes (similar to the savings attributable to the Diabetes Prevention program). The new facilities also may play a role in encouraging residents to remain in the neighborhood rather than migrate to suburban areas with a wide range of health and fitness facilities.

Additionally, the development of the new YMCA facilities has the potential to improve the perception of the quality of the bundle of goods available to future residents in the neighborhoods. For example, adding access to first rate health and fitness facilities to a bundle of goods that includes unique restaurants and retail shops, live theater, concert facilities, the symphony, museums, sports, and immediate access to the Cultural and Monon trails, may increase demand for housing and make urban Indianapolis more attractive to the young professionals and empty nesters. If the urban neighborhoods in and around downtown become more popular with young professionals and empty nester households, the city will realize increased tax revenue to be derived from the income of new residents, as well as increased property taxes attributable to increased property values rather than tax rates.

Additionally, if demand for housing grows, in part in response to, the new YMCA facilities there would logically be a decline in the number of vacant and abandoned homes in the county (especially in Center Township). The decrease in vacant and abandoned homes would likely result in lower crimes rates, decreased cost of public safety and perhaps most importantly an improved safety in the neighborhoods. The new YMCA facilities may also interact with and add to the value and impact of the city's park improvement and trail development efforts.

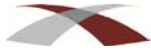
Thus the YMCA and its planned expansion strategy has the potential to not only provide demonstrable and measurable benefits to those who participate in its programs but to work in harmony with a wide range of recreational, cultural, and commercial investment intended to:

- assure the ongoing growth of downtown Indianapolis as commercial center;
- provide access to health and fitness programs to current residents of downtown and near downtown neighborhoods; and
- contribute to efforts to attract new residents to Marion County's core neighborhoods.



# Appendix 1: Diabetes in Marion County





Diabetes mellitus refers to a group of disorders that share a common feature: high levels of glucose in the blood. The implications and management of the disease are complex as the incidence of diabetes is associated with a number of complications including neuropathy, retinopathy, nephropathy, cardiovascular disease, chronic heart failure, and coronary heart disease. Type II diabetes, which has been shown through clinical trials to be largely preventable (or at least can be delayed) through lifestyle interventions, accounts for between 80 and 90 percent of all cases of diabetes in the United States (Vijgen, 2006)

As of 2007, there were nearly 16.5 million people living in the United States with Type II diabetes, costing the nation approximately \$159.9 billion (2007\$)<sup>4</sup> in medical expenditures and indirect costs such as lost productivity and premature mortality. Further, it is estimated that nearly 57 million additional American adults have pre-diabetes which, left to progress without intervention, could progress to Type II diabetes. Those who are pre-diabetic result in an additional \$25 billion (2007\$) in annual medical expenditures (Dall, 2010).

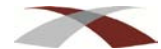
In Marion County, more than 62,000 adults are afflicted with diabetes and another 6,820 are pre-diabetic. Additionally, it is estimated nationwide that as much as one-quarter of diabetes cases may be undiagnosed, as the initial stages of the disease are difficult to detect; applied to Marion County, as many as an additional 12,400 undiagnosed cases could be unreported in the above figures. The prevalence of the disease grew at an annual rate of more than 5.6 percent in Marion County from 2000 to 2008, outpacing the prevalence of the disease in both Indiana and the United States as a whole (Marion County Health Department, 2010).

As seen in Map 1, the geographic distribution of the prevalence of diabetes varies widely throughout the county. Diabetes tends to be more prevalent in high poverty areas and in those areas where adult obesity is also prevalent. Prevalence of diabetes ranges from 3.3 percent in the Outer Pike Township Health Planning Area to as high as 18.2 percent in the North Center Health Planning Area.<sup>5</sup>

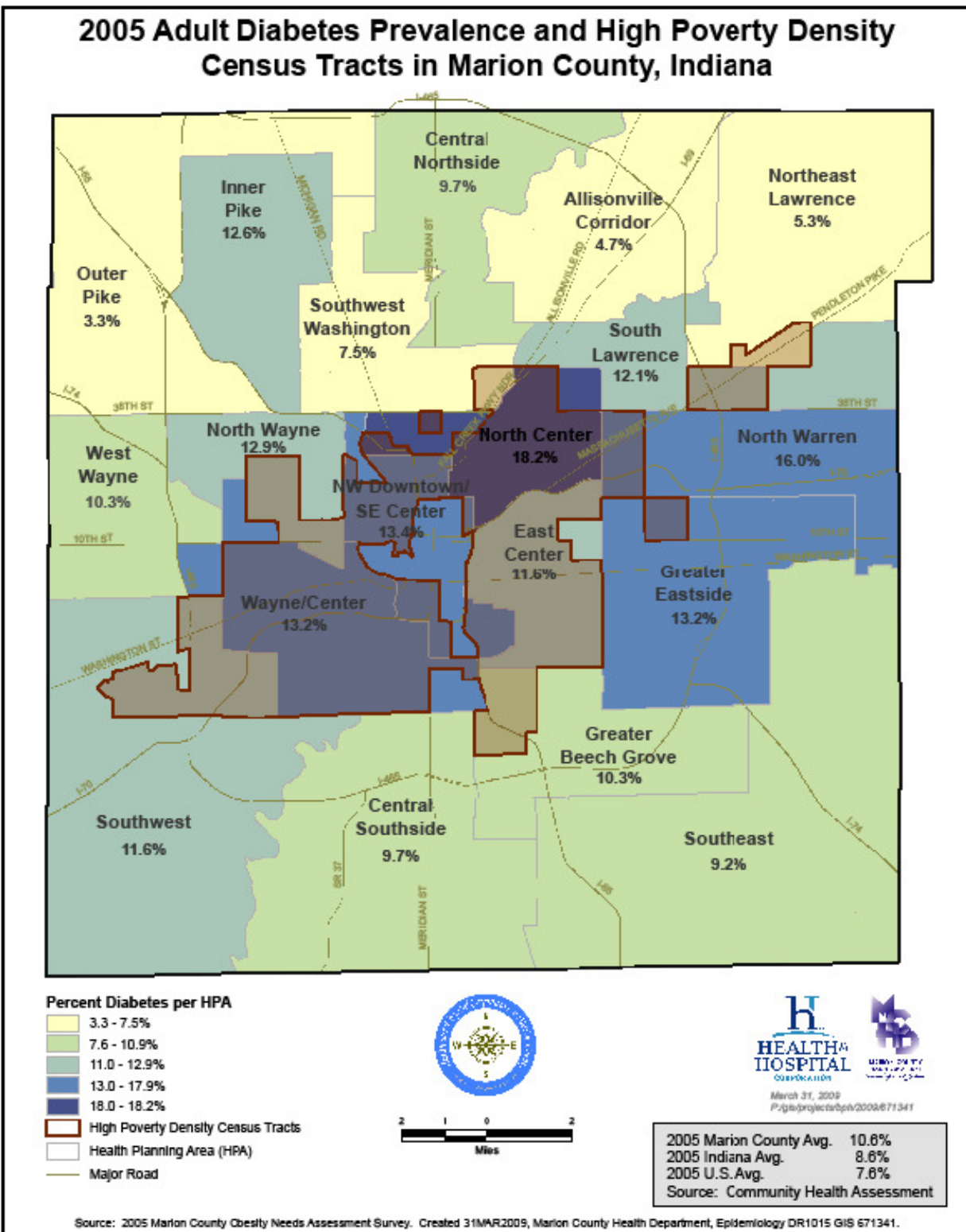
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<sup>4</sup> Monetary figures throughout the report are adjusted to 2010 constant dollars using the CPI unless otherwise noted.

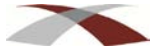
<sup>5</sup> The graphics, tables, and figures included in this Appendix were created by PPI unless otherwise noted. In cases where the graphic, tables, and figures were used directly from other sources, bibliographic citations are provided below the graphic, table, or figure.



Map 1.



Map 1 Taken From: Marion County Health Department, Health and Hospital Corporation of Marion County (2010). *Diabetes Facts for Marion County 2009*. Retrieved from [http://www.mchd.com/pdf/epi\\_diabetes\\_2010\\_report.pdf](http://www.mchd.com/pdf/epi_diabetes_2010_report.pdf)



In addition to geographic disparities in the prevalence of diabetes, there are also significant disparities among racial groups in Marion County. According to the Marion County Health Department's 2005 *Adult Obesity Needs Assessment Survey*, 15 percent of the black (non-Hispanic) population of Marion County is afflicted with diabetes, while only 9.3 percent of the white (non-Hispanic) population and 7 percent of the Hispanic population are affected. Nearly 40 percent of all blacks over the age of 65 have the disease, a number that is nearly double that of whites in the same age cohort. Marion County's black population had nearly 2.77 times more diabetes-related hospitalizations than did Marion County's white population from 2006 to 2008. Finally, blacks in Marion County are twice as likely the white population to die from complications of diabetes (25.6 diabetes deaths per 100,000 versus 11.8 per 100,000 in 2008) (Marion County Health Department, 2010).

When considering the economic impact to an individual managing the disease – annual medical expenditures among individuals with diabetes are between 2.3 and 2.6 times higher than those without diabetes – Marion County's black population faces a greater economic burden from the disease than does the white population, thereby compounding the negative impact that diabetes plays in the lives of affected populations (Dall, Mann, Zhang, Martin, & Chen, 2008; Zhang, Engelgau, Norris, Gregg, & Narayan, 2004).

With 62,000 known cases of diabetes, 6,280 residents in a pre-diabetic state, and the possibility of as many as 12,400 undiagnosed cases in Marion County, applying the national average medical costs associated with each of those medical states (\$6,745, \$1,834, and \$455, respectively; see Table 2.);<sup>6</sup> annual diabetes-related expenditures in Marion County may be in excess of \$440 million.

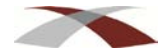
## Preventing or Delaying Diabetes: The Lifestyle Intervention

According to clinical research the most effective method of preventing or delaying the onset of Type II diabetes in at-risk populations is an intensive lifestyle intervention that couples increased physical activity (more than 150 minutes per week) and a change in dietary habits. Participants who completed the lifestyle intervention had their risk of diabetes incidence reduced by 58 percent relative to the group that received no such intervention, and had better health outcomes than those who were provided a pharmacological treatment (31 percent risk reduction in the incidence of diabetes among the pharmacological group – taking metformin – when compared with the control group) (Diabetes Prevention Program Research Group, 2002). According to numerous clinical studies, lifestyle interventions proved to be the most effective option – in terms of survival years, disease-free time, and quality-adjusted life expectancy – of the interventions studied (Saha & Johansson, 2010).

In the United States, the benchmark diabetes prevention study is the Diabetes Prevention Program (DPP), convened by a large team of diabetes researchers from 1996 through 2001. Within the DPP, the goal of the lifestyle intervention was to achieve seven percent loss of the participant's initial body weight through increased physical activity and dietary changes. Participants were expected to engage in physical activity at a moderate intensity, such as brisk walking, for at least 150 minutes per week. Additionally, participants pursuing the lifestyle intervention sought to improve their dietary habits through a low calorie, low fat diet. To assist them in meeting their goals, participants worked one-on-one with behavioral counselors over 24 weeks through a 16 lesson curriculum that focused on diet, exercise, and behavior modifications (Diabetes Prevention Program Research Group, 2002).

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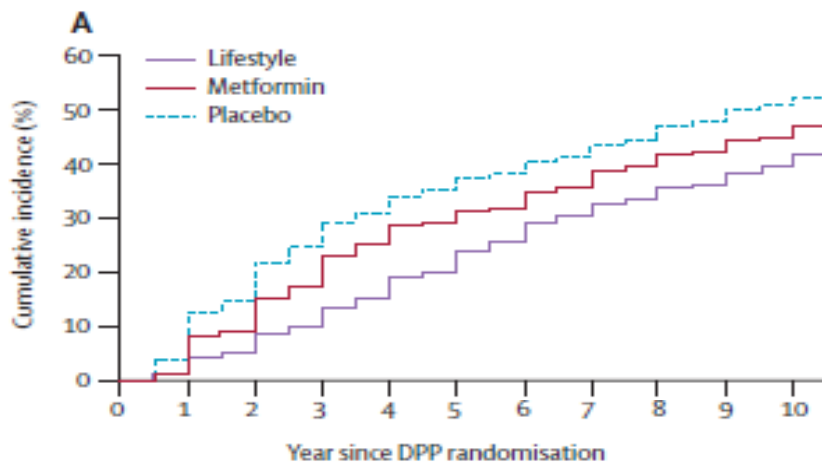
<sup>6</sup> Reported costs are those costs associated with the treatment of diabetes, not total medical expenditures.



Given the short term nature of many of the clinical studies – generally two to three years – and given that most of this research has occurred relatively recently, there is as of yet no consensus as to the long-term efficacy of the lifestyle intervention. Nevertheless, many follow-up studies are pointing to residual benefits of the lifestyle intervention in preventing or delaying the onset of diabetes. In a ten-year follow up to the DPP study, researchers found that the incidence rate of the lifestyle intervention group was 34 percent when compared to the placebo group and the onset of diabetes could be delayed by about four years through undergoing lifestyle interventions (Figure 10) (Diabetes Prevention Program Research Group, 2009). Extrapolating the results of the base-case DPP study, researchers estimated these figures to be 63 percent and 11.1 years (Figure 11) (Herman, 2005).<sup>7</sup>

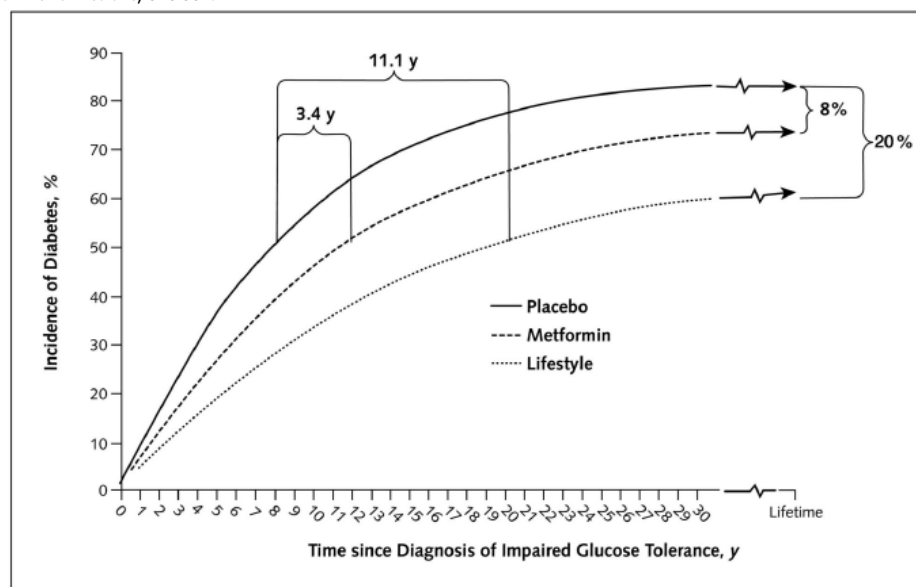
### Figure 10. Ten-year Realized Benefit of Lifestyle Intervention

Taken from: Diabetes Prevention Program Research Group. (2009). 10-Year Follow-Up of Diabetes Incidence and Weight Loss in the Diabetes Prevention Program Outcomes Study. *Lancet*, 1677-1686

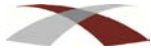


### Figure 11. 30-year Projected Benefit of Lifestyle Intervention

Taken from: Herman, W.H. et. al. (2005). Cost-Effectiveness of Lifestyle Modification or Metformin in Preventing Type 2 Diabetes in Adults with Impaired Glucose Tolerance. *Annals of Internal Medicine*, 323-332.



<sup>7</sup> The DPP Research Group cautioned that the figures found in the ten-year follow up may be conservative because the control group outperformed expectations; that performance is perhaps attributable to the control group having access to some of the same knowledge interventions that the lifestyle group originally received once the initial study was completed.



In 2003, after the initial study by the DPP Research Group, the same researchers studied the costs associated with the three methods of primary prevention outlined in the DPP. The research included direct medical costs that would typically be borne primarily by a health system and secondarily spread across society in higher premiums, non-medical direct costs that would typically be borne by the participant, and indirect costs such as lost productivity that would be borne by employers. For the purposes of identifying the cost to participants, the out-of-pocket costs of services such as exercise classes, health club memberships, personal trainers, etc. – was found to be an average of \$813 over the three years; fitness equipment was found to be \$282, and the cost of shoes over the three years was found to be \$556. Transportation costs to and from the interventions were also considered and equaled \$712 over the three years.<sup>8</sup> Food costs related to the program over the three years was found to be \$11,589; however, that was \$90 less than the control group.<sup>9</sup> Finally, study participants purchased food preparation equipment, such as blenders and food scales, to help them prepare healthier options in the home; in the lifestyle intervention group, these purchases averaged \$100 for the three-year time period. Taken together, the total out-of-pocket expenses for the lifestyle intervention group were \$2,373 over the three years or \$791 annually (Diabetes Prevention Program Research Group, 2003).

**Table 1. Out of Pocket Costs Associated with the DPP (Three Year Averages)**

Services	\$813
Fitness Equipment	\$282
Shoes	\$556
Transportation	\$712
Food (relative to control group)	(\$90)
Food Preparation Equipment	\$100
Three Year Total	\$2,373
Annual Total	\$791

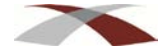
(Diabetes Prevention Program Research Group, 2003)

It is important to note that the above figure does not capture the direct costs not borne by the individual participants of the study – including the use of behavioral therapists that worked with study participants. There is a disagreement among researchers as to whether broadly providing the lifestyle intervention across a population could be cost effective when all costs are included in the analysis. One solution to reduce the cost of the intervention that has been proposed is to offer the behavioral modification lessons in a group setting, which would spread a portion of the per participant costs over the number participants in the group setting. Further, to the degree that an intervention program could utilize trained instructors to implement this program as opposed to behavioral experts, the cost of the implementation of the program could become more cost effective.

In 2008, Ackermann and his colleagues pursued a study to find whether the YMCA could be an effective vehicle to cost-effectively implement the Diabetes Prevention Program widely across a population. Ackerman’s study established a control group and an intervention group, and the intervention group received a free group-based intervention program similar to that offered to individuals in the original DPP. After one year, the intervention group showed clinically meaningful and significant differences in the percent change of body weight, and that taken together with studies that show that modest weight loss can

<sup>8</sup> In the original study by the DPP Research Group, the cost of a participant’s time to, from, and during physician visits, exercising, and program-related shopping were considered as well; due to the difficulty and variability in assigning value to people’s time, it is not included in this analysis.

<sup>9</sup> For the purposes of analysis here, we will use the cost of food relative to the control group, assuming that if one found out that they were at risk of diabetes, they would make dietary changes similar to those in the study by any of the groups. Therefore, the cost of the food relative to the control group is the more meaningful figure in finding the cost of the diabetes prevention program. The researchers reported that the cost of food for the lifestyle intervention group was less than that of the control group because they ate out less, ostensibly due to being better informed about the health of eating out and using their leisure time to exercise.



significantly decrease a person's likelihood of developing diabetes suggests that the YMCA could be an effective vehicle for widely disseminating the DPP program throughout the at-risk population (Ackermann, 2008). The YMCA of Greater Indianapolis – where Ackermann's pilot study was convened – has continued this program as the YMCA Diabetes Prevention Program (Y-DPP).

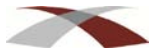
## Estimating the Value of Lifestyle Intervention

### Costs Associated with Managing Diabetes

In the context of health economics, researchers generally point to two kinds of costs associated with the incidence of disease: 1) direct medical costs or outcomes, and 2) indirect morbidity and mortality outcomes. Direct costs include preventative measures, diagnostic tests, and treatment services. These costs are generally shared by a patient and the private health insurance industry (or perhaps Medicaid or Medicare) as the patient sees physicians at clinics or hospitals, undergoes medical procedures, utilizes laboratory testing, and purchases prescription drugs. In addition to the direct costs of treatment, health economists also consider the indirect costs associated with morbidity and early mortality when considering the true cost of a disease. These costs generally include the time that the individual is absent from work (or absenteeism); the time that the individual is at work, but not producing at his or her full capability (termed “presenteeism”); societal costs incurred that result from the individual receiving disability payments, the reduction in the individual's quality of life, and the lost productivity associated with an individual's premature death resulting from the disease. Indirect costs are generally shared by the individual and society at large. The individual may see lost wages from decreased productivity or premature mortality; whereas, society pays the cost of the individual's disability (through increased disability insurance premiums and/or through Medicaid) and the worker's lost productivity represents a cost to the overall economy (Wolf, 2002).

To date, the most comprehensive data detailing the costs of diabetes to the individual stems from a series of reports authored by Timothy Dall and colleagues from 2007 to 2010. Dall and colleagues tabulated the economic costs (direct and indirect) associated with diabetes and pre-diabetes across age groups (Dall, Mann, Zhang, Martin, & Chen, 2008; Dall, et al., 2009; Zhang, et al., 2009; Dall, Zhang, Chen, Quick, Yang, & Fogli, 2010). Table 2 details their findings, with the costs adjusted to 2010 dollars. According to their findings, the national cost associated with diabetes is nearly \$230 billion, more than \$975 for every American adult regardless of diabetes status (Dall et al., 2010).





**Table 2. Costs Associated with Diabetes in the United States in 2007 (Adjusted to \$2010)**

<b>Cost by Age Group</b>	<b>All</b>	<b>Type I</b>	<b>Type II</b>	<b>Undiagnosed</b>	<b>Pre-diabetes</b>
Total national cost (in millions)	\$ 183,431	\$ 15,697	\$ 167,733	\$ 18,975	\$ 26,556
Medical Costs	\$ 122,265	\$ 11,093	\$ 111,172	\$ 11,560	\$ 26,556
Non-Medical Costs	\$ 61,165	\$ 4,604	\$ 56,561	\$ 7,415	Not Estimated
<b>Average Cost Per Case (dollars)</b>					
Medical Costs (by age group)	\$ 6,993	\$ 11,037	\$ 6,745	\$ 1,834	\$ 455
18-34	\$ 3,961	\$ 3,751	\$ 4,035	\$ 5,705	\$ 221
35-44	\$ 4,001	\$ 5,022	\$ 3,906	\$ 1,445	\$ 321
45-54	\$ 4,886	\$ 6,717	\$ 4,797	\$ 2,447	\$ 411
55-59	\$ 5,453	\$ 8,622	\$ 5,339	\$ 2,170	\$ 513
60-64	\$ 5,876	\$ 12,328	\$ 5,636	\$ 5,009	\$ 565
65+	\$ 10,215	\$ 37,192	\$ 9,529	\$ 609	\$ 753
Non-Medical Costs (by age group)	\$ 3,498	\$ 4,586	\$ 3,432	\$ 1,177	Not Estimated
18-34	\$ 4,313	\$ 4,350	\$ 4,300	\$ 3,677	Not Estimated
35-44	\$ 6,487	\$ 7,124	\$ 6,427	\$ 992	Not Estimated
45-54	\$ 6,262	\$ 6,372	\$ 6,254	\$ 2,833	Not Estimated
55-59	\$ 4,698	\$ 6,412	\$ 4,637	\$ 1,570	Not Estimated
60-64	\$ 3,459	\$ 4,865	\$ 3,406	\$ 2,549	Not Estimated
65+	\$ 799	\$ 1,036	\$ 793	\$ 127	Not Estimated
<b>Total</b>	<b>\$ 10,490</b>	<b>\$ 15,624</b>	<b>\$ 10,177</b>	<b>\$ 3,012</b>	<b>\$ 455</b>

Source: (Dall, Zhang, Chen, Quick, Yang, & Fogli, 2010)

Notes:

1. Original figures updated using the Consumer Price Index to reflect 2010 dollars
2. Numbers do not necessarily add to totals due to rounding and the exclusion of gestational diabetes from the original table.
3. Medical costs include physician office visits; emergency visits; ambulance services; hospital outpatient visits; home health visits; hospital inpatient care; nursing/residential facility care; hospice care; podiatry visits; prescriptions; other equipment and supplies; and (for diagnosed diabetes only) insulin, oral agents, and diabetic supplies.
4. Nonmedical costs include absenteeism, presenteeism (reduced productivity at work), disability that prevents working, reduced non-workforce labor, and early mortality.

## Savings from the Prevention of One Case of Diabetes: The Case of the Individual

Given the cost of Type II diabetes outlined above, it is possible to estimate the cost savings realized from a single individual not getting diabetes. To do so, we use the calculations outlined above that yielded an annual cost of the DPP program to the individual to be \$791.<sup>10</sup> Additionally, the figure presented does not include the cost of proactive screening to identify individuals who are at risk of developing diabetes. Because the Y-DPP registration form requires that the screening be done by a physician, it is not included as an additional cost in the costs associated with the program as it is already embedded in the medical costs associated with being pre-diabetic outlined in Table 2, above.

The savings from preventing a single case of Type II diabetes are significant; savings range from \$7,545 in the youngest cohort to as much as \$10,260 in the 45-54 age cohort. On average, preventing a single case of diabetes would save \$9,386 in costs (Table 3). While the costs of preventing a single case are impressive, it should be noted that not all of these savings would accrue to the individual avoiding diabetes; a significant portion of the amount saved would be realized by private health insurers or government

<sup>10</sup> This figure does not include the cost of the individual's time; nor does it include the total cost of food associated with implementing the DPP, it only includes the difference between the lifestyle intervention and the control intervention used in the original DPP study.



insurance programs; additionally, the savings associated with not incurring indirect costs would accrue to employers in terms of maintained level of productivity rather than to the individual who does not contract diabetes.

**Table 3. Total Realized Savings from Preventing One Case of Diabetes**

Age Group	Total Costs of Type II Diabetes	Total Savings from Preventing One Case
18-34	\$8,336	\$7,545
35-44	\$10,333	\$9,542
45-54	\$11,051	\$10,260
55-59	\$9,976	\$9,185
60-64	\$9,042	\$8,251
65+	\$10,322	\$9,531
Avg.	\$10,177	\$9,386

To calculate the out-of-pocket cost savings to an individual who does not develop diabetes, we must consider the out-of-pocket health costs the at-risk individual would be likely to incur once they are diagnosed with diabetes and subtract the costs associated with the DPP program (See Table 4). For the purpose of this calculation, it is assumed that all of the indirect cost savings would accrue to society (in the form of increased productivity and the reduction in risk of becoming eligible for partial or full disability payments) rather than to the individual.

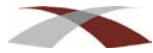
**Table 4. Individual Out-of-Pocket Annual Savings from Preventing One Case of Diabetes**

Age Group	Direct Costs of Type II Diabetes	Out-of-Pocket Medical Costs	Individual's Out-of-Pocket Savings from Prevention
18-34	\$8,336	\$1,210.58	\$ 419.58
35-44	\$10,333	\$1,171.77	\$ 380.77
45-54	\$11,051	\$1,439.00	\$ 648.00
55-59	\$9,976	\$1,601.80	\$ 810.80
60-64	\$9,042	\$1,690.77	\$ 899.77
65+	\$10,322	\$ 752.81	\$ (38.19)

Research suggests that individuals with Employer or Union Group Insurance (74 percent of the insured population in 2008) pay between 26 and 34 percent of the total costs of their share of total health spending, depending upon the size of their firm (<10 and >250, respectively). Employees at mid-sized firms or organizations pay 30 percent of their total health spending (10-49, 50-249). For the purposes of calculating out-of-pocket costs for the age cohorts up to age 65, we have used 30 percent of costs as a proxy for the individual's share of the total costs. Because a significant portion of the 65 and older cohort would be covered through Medicare, 7.9 percent of total health spending is used to calculate their out-of-pocket costs (Baicker, 2011). All cohorts except for the 65+ cohort show savings ranging from \$380.77 (35-44 age cohort) to \$899.77 (60-64). In addition to the point in time savings presented here, the younger cohorts can expect to have a longer remaining life expectancy; therefore, over the course of a lifetime, the aggregate savings realized by the younger cohorts could significantly outweigh those realized by the older cohorts.

Given the cost savings to society (Table 3) and the individual out-of-pocket savings (Table 4) that can be realized from preventing diabetes, the Y-DPP should be valued at both the individual level as well as the broader private payer health system perspective.





# Savings across a Population

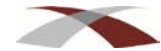
In considering the aggregate savings of diabetes prevention across a population, we look to find the difference between those individuals undertaking the DPP in comparison to those who do not. Because some individuals who are at-risk of developing diabetes will not actually develop the disease regardless of their participation in a prevention program, the efficacy of the prevention program lies in its comparison to the group who is at risk yet does nothing. Researchers do this by presenting either the relative risk reduction (RRR) of a treatment or the absolute risk reduction of a treatment (ARR). Of the two, the absolute risk reduction illustrates the total decreased likelihood that an individual receiving treatment will not contract the disease (whereas the relative risk reduction illustrates the effectiveness of one treatment relative to another). To illustrate the difference, the DPP found that the relative risk reduction for the lifestyle intervention group to be 58 percent (meaning that the treatment was 58 percent more effective than the control group in preventing diabetes); however, the absolute risk reduction – the likelihood of a participant contracting diabetes – was 14.5 percent (meaning that we could expect 14.5 percent of the at-risk population not to get diabetes even if they had not undergone the lifestyle intervention).

To assess the reduction in absolute risk to participants in a DPP-style lifestyle intervention, as well as the savings to be realized from the intervention, we examined four studies and limited the window of the projections to ten years. Two of the studies from which we derive our data, the Diabetes Prevention Program Outcomes Study (DPPOS) and the follow-up of the Finnish Diabetes Prevention Study (DPS), are continuing studies of initial clinical trials that helped to establish the lifestyle intervention as an effective approach to preventing or delaying the onset of Type II Diabetes. The YMCA's current program is based on a modified version of the intervention used in the DPP, and the DPS used an intervention similar to the DPP (more so than any other clinical studies examined during the study). Furthermore, the DPP and the DPS reported similar results in the effectiveness of lifestyle interventions preventing or delaying the development of diabetes (Diabetes Prevention Program Research Group, 2009; Finnish Diabetes Prevention Study Group, 2006).

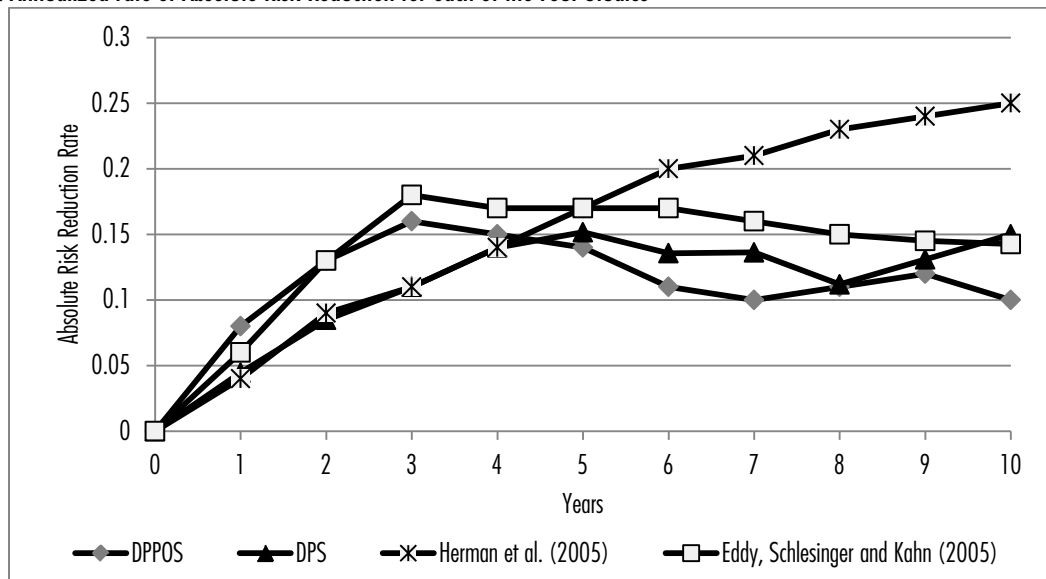
The other two studies used to estimate the savings of a DPP-style intervention are two 30-year models constructed in 2005 to assess the long-term effectiveness of a DPP intervention over a longer time horizon. Both models use the DPP-intervention as their basis and assessed the long-term efficacy of the intervention using different modeling approaches. Herman and colleagues use a model with a Markov structure that was modified to include data from the DPP on progression, costs, and quality of life, and included annual transition probabilities between disease states (Herman, et al., 2005). Another approach used an Archimedes model that was intended to reach a far greater level of anatomic, physiologic, clinical, and administrative detail than other models (Eddy, Schlessinger, & Kahn, 2005). The Markov approach is more commonly used in assessing the effects of interventions (as well as many other outcomes) to inform policymakers, while the Archimedes model seeks to be more detail-oriented (and more complex). While both models project over 30 years, in order to compare them with the realized outcomes stated in the DPP and DPS follow-up reports, we only concern ourselves with the absolute risk reduction reported by the models in the first ten years.<sup>11</sup> Within the first ten years, the Archimedes approach shows a DPP lifestyle intervention being very effective in the first few years and then leveling off, while the Markov approach shows it being less effective than the Archimedes approach in the first few years but showing markedly better health outcomes over the life of the model. The annualized rate of absolute risk reduction for the two models and the two follow-ups of the clinical trials can be found below in Figure 10.

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<sup>11</sup> In the case of both the reported findings and the models, when the yearly ARR is not reported in the literature, we estimate the ARR by examining the charts provided in the literature and assume our estimate to be within .01 of the actual ARR presented.



**Figure 12. Annualized rate of Absolute Risk Reduction for each of the Four Studies**



Neither of the clinical trials sustained the early impact on absolute risk reduction that they initially saw during the clinical trial period. Researchers suggest that the narrowing in absolute risk reduction between the intervention and the control groups may be the result of the control groups having access to a more intensive approach than they had during the study period, pointing to evidence that the control groups outperformed expectations in expected incidence of diabetes once the study was unmasked. If true, one could reasonably expect the absolute risk reduction to be greater than the two follow up studies suggest; therefore, the lower end of the range presented here may be a conservative figure.

To monetize the savings to be realized across the population, we examine each model’s annual absolute risk reduction for each given year and multiply it by the average total cost savings to be realized from preventing one case of diabetes.<sup>12</sup> In presenting the results we multiply that figure by 100 to assess the total cost savings to be realized per 100 participants served. Table 5 presents the annual savings and cumulative total savings that could be realized from bringing a DPP approach to scale. The results, as presented, show the total savings at the end of each year (i.e., the total for Year 1, show the savings to be realized from preventing diabetes from years 0-1). For every 100 participants in a DPP program, the YMCA could expect to be responsible for between \$1,122,195 and \$1,576,848 in total cost savings from the prevention of diabetes over ten years.

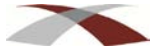
**Table 5. Annual Total Cost Savings (Direct and Indirect) per 100 Participants in a DPP Program**

Year	1	2	3	4	5	6	7	8	9	10	Total
DPPOS	\$75,088	\$122,018	\$150,176	\$140,790	\$131,404	\$103,246	\$93,860	\$103,246	\$112,632	\$93,860	\$1,126,320
DPS	\$41,827	\$79,672	\$103,246	\$131,404	\$142,259	\$127,300	\$127,854	\$104,966	\$122,878	\$140,790	\$1,122,195
Herman et. al (2005)	\$37,544	\$84,474	\$103,246	\$131,404	\$159,562	\$187,720	\$197,106	\$215,878	\$225,264	\$234,650	\$1,576,848
Eddy et al. (2005)	\$56,316	\$122,018	\$168,948	\$159,562	\$159,562	\$159,562	\$150,176	\$140,790	\$136,097	\$133,844	\$1,386,875

As noted above, the majority of the total cost savings from preventing a case of diabetes does not accrue to the individual but to health insurers, employers, and society in general. An individual’s cost savings is a function of the savings realized by the individual’s smaller annual expenditure on out-of-pocket medical expenses less the cost of participating in a DPP program.<sup>13</sup> To calculate an individual’s out-of-pocket

<sup>12</sup> See Table 3

<sup>13</sup> See Table 4 for an individual’s out-of-pocket savings.



savings we multiply the absolute reduction rate for each year with the out-of-pocket savings realized by the individual; in this case, however, research did not provide an average of savings across cohorts so we first must adjust the individual out-of-pocket savings to fit the age cohorts across a population. In doing so, we assume that the Y-DPP participant sample would mirror that of the adult population in Marion County. In fitting the individual out of pocket savings to the various adult age cohorts, we find a weighted average individual cost savings of \$451.36; therefore, the equation that yields the individual cost savings is  $(ARR)^t * \$451.36$  where  $t$  is the year. Again, we consider the cost savings per 100 program participants. Given that, the YMCA can expect to prevent between \$53,965 and \$75,828 (Table 6) in individual out-of-pocket diabetes spending over a ten-year period for every 100 participants it serves. In terms of economic impact to the county, this is more significant than total cost savings in that it frees local capital that can be spent or invested in something other than diabetes-related spending.

**Table 6. Annual Individual Out-of-pocket Cost Savings per 100 Participants in a DPP Program**

Year	1	2	3	4	5	6	7	8	9	10	Total
DPP Follow-Up	\$3,611	\$5,868	\$7,222	\$6,770	\$6,319	\$4,965	\$4,514	\$4,965	\$5,416	\$4,514	\$54,163
Eddy et al. (2005)	\$2,708	\$5,868	\$8,124	\$7,673	\$7,673	\$7,673	\$7,222	\$6,770	\$6,545	\$6,436	\$66,693
DPS Follow-Up	\$2,011	\$3,831	\$4,965	\$6,319	\$6,841	\$6,122	\$6,148	\$5,048	\$5,909	\$6,770	\$53,965
Herman et. al (2005)	\$1,805	\$4,062	\$4,965	\$6,319	\$7,673	\$9,027	\$9,479	\$10,381	\$10,833	\$11,284	\$75,828

## Cautions and Limitations

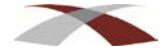
Throughout our analysis we have discussed a few cautions and limitations that must be taken when using the findings presented herein. First, when the absolute rate of reduced risk (ARR) was not directly stated within the literature, we estimated the rate of reduction using the charts provided within the reports; in so doing, we assume that the ARR we used is within .01 of the actual rate of reduction found in the report. Second, the two clinical trial follow-up reports we used to assess the efficacy of the DPP (or DPS) state that the control groups outperformed their original expectations. Researchers in both cases suggest that the control group's positive outcomes may be attributed to the studies being unmasked and control groups receiving a mini-intervention similar to the lifestyle intervention group; if that is the case, the absolute risk reductions presented here, may be conservative figures.

Third, the annual and cumulative individual out-of-pocket savings are weighted according to age cohorts of Marion County's adult population; as such, our calculations assume a sample of 100 participants that mirror the age of Marion County's population. Should the actual sample have more individuals aged less than 45 or more than 64, the stated savings may be overstated; should the actual sample of 100 participants have a higher rate of individuals aged 45-64, the stated savings may be conservative.

It should also be noted that all figures, unless otherwise stated, were updated to 2010 constant dollars using the Consumer Price Index. With that being said, according to the Bureau of Labor Statistics CPI reports, the cost of medical care grew at a faster pace than general costs from 2007 (the year from which the figures were derived) to 2010 (the reference year). Given that, the direct medical expenditures presented here may be conservative.

Additionally, in calculating the individual's out-of-pocket savings, we used 0.3 to determine the individual's share of his or her medical expenditures for the age cohorts younger than age 65 (with the balance being the responsibility of health insurers or otherwise absorbed the health care system). Given that those facing pre-diabetes may utilize the health care system at a greater frequency than those who have no known disease, it is possible that pre-diabetics may spend more than the average individual.<sup>14</sup> To that end,

<sup>14</sup> Associated with this limitation is that while a pre-diabetic is likely to use the health system more, he or she is unlikely to use it so much as to meet their out-of-pocket maximums established under their health insurance program as those with full-blown diabetes might, and therefore may pay a higher share of their costs than those with diagnosed diabetes.



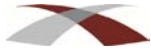
the individual out-of-pocket savings may be slightly overstated, depending on an individual's actual use of the health care system and his or her individual health insurance program.

Also related to calculating the individual out-of-pocket savings, research presents three-year averages for a variety of categories associated with an individual's participation in a DPP program; we converted the three-year average into an annual cost and updated that figure to 2010 dollars. While many of the categories would recur over time and would not be impacted by the time horizons established in the original research, the purchasing of fitness equipment and food preparation equipment would be unlikely to recur every three years. While the original research provided for some depreciation of the equipment, the three-year average cost of the program in those categories may be overstated as individuals would likely use that equipment longer than three years. Thus, in reality, the annual cost associated with that equipment would be fully depreciated over a longer period of time. To the degree that those depreciation horizons are truncated to fit into the three-year averages provided by the research, they may cause the savings stated within this report to be slightly more conservative than they may be in practice.

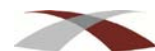
Finally, the DPP and DPS, as well as the two models from which we derive the annual absolute risk reductions, studied only those individuals who were at "high-risk" of developing diabetes. The savings stated herein reflect the bias of those studies toward individuals who are at high-risk of developing diabetes; and to the degree that the YMCA's Y-DPP participants vary from this profile, the actual results of the YMCA's program may differ from those stated within this report. Specifically, should the YMCA open the program to a population broader than those considered at high-risk, the actual absolute risk reduction may not be as great as the studies presented in this report suggest (Diabetes Prevention Program Research Group, 2009; Finnish Diabetes Prevention Study Group, 2006; Eddy, Schlessinger, & Kahn, 2005; Herman, et al., 2005).

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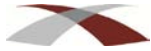
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## Appendix 2: After School Programs



The YMCA's provision of affordable after school care throughout central Indiana has the potential to provide significant social benefits for our community. For the purposes of this analysis, we focus on the value of the public benefit provided by these programs, while acknowledging that there are significant present and future private benefits that will additionally be realized by the participants in the after school care program. Specifically, we examine the YMCA's Before & After School program's potential to provide social benefit in the following areas:

- The social benefit of a lifetime of increased earnings by participants, reflected here in increased expected tax revenue derived from a more productive citizen;
- The annual social benefit from a parent able to work, reflected here in increased tax revenue derived from a parent who would not work but for the availability of after school care;
- The averted social costs of risky teen behavior, including reduced teenage pregnancy and/or criminal activity; and
- The costs and benefits of improved academic outcomes for individual students reflected in local school expenditures.

In presenting the figures below, it should be noted that the middle and high estimates presented here are derived from research focused on particular programs that were designed to have a significant impact on the metrics presented below (i.e., were intentionally designed to curb risky teen behavior, improve academic outcomes, or both). Research suggests that the intentionality of the program's design, the quality of the program's offerings, and the intensity with which participants engage in the programs offerings are key factors in obtaining the levels of success presented below (Gottfredson, Gerstenblith, Soule, Womer, & Lu, 2004; Goldschmidt & Huang, 2007; Vandell, Reisner, & Pierce, 2007; Durlak, Weissberg, & Pachan, 2010). While it is possible that some success would be realized from programs that did not meet the standards of the programs upon which the research was based, that effect is not likely to reach the upper bounds suggested by the high estimate – or even the middle estimate – presented below.

## **Social Benefits of Increased Earnings**

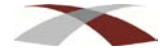
Any after school care program is likely to provide some level of immediate public benefit derived from the increased compensation of parents who are able to work because of the program. These benefits accrue through higher tax revenues, which thereby lessen the tax burden on other citizens and/or decrease political pressure to cut publicly-funded services or programs. Annually, each registration provides between \$236 and \$572 in immediate social benefits through tax revenue derived from parents of students who would not work but for the provision of quality and affordable after school care (Kane, 2004; Levine & Zimmerman, 2003; Bianchi, 2000).

Beyond the immediate impact, to the degree that the after school program improves academic outcomes that leads to today's student-participants becoming tomorrow's more productive citizens, the program can have a residual public benefit throughout a participant's lifetime. Over a person's lifetime, it is estimated that improved academic performance and increased high school graduation rates attributable to successful after school programs could yield as much as \$18,533 in additional social benefits (tax revenues), and avert as much as \$618 in administrative costs associated with the provision of the social safety net (Kane & Staiger, 2002; Durlak & Weissberg, 2007; Lauer, Akiba, Wilkerson, Apthorp, Snow, & Martin-Glenn, 2006; Brown, Frates, Rudge, & Tradewell, 2002; Policy Studies Associates, 2011; Schirm, Stuart, & McKie, 2006; Berrueta-Clement, Schweinhart, Barnett, Epstein, & Weikart, 1984).

## **Risky Teen Behavior**

Research suggests that the highest rates of crimes perpetrated by juveniles spikes between the hours of 3 pm and 6 pm – after school is adjourned but before parents provide supervision. Not surprisingly, juveniles also are more likely to be a victim of a crime between these same hours than they are any other time of day. Research also suggests that adolescents who are unsupervised during after school hours may be more





likely to engage in sexual intercourse or other behavior that increases the likelihood of a subsequent sexual encounter. Unsupervised after school time can contribute to the economic, social, and emotional issues associated with teenage pregnancy. Similarly, unsupervised time after school may also provide adolescents an opportunity to experiment with alcohol and drugs. For these reasons, curbing risky behavior by providing a safe place with adequate adult supervision was one of the primary motivations for the initial proliferation of after school programs throughout the country and remains a reason why many parents choose to take advantage of these programs (Goldschmidt & Huang, 2007) (Levine & Zimmerman, Evaluating the Benefits and Costs of After-School Care, 2003) (Richardson, et al., 1989) (Levine & Zimmerman, After School Programs, 2010).

Research suggests that the societal cost of one lifetime criminal may be as high as \$2 million and the societal cost of a lifetime of drug use may be as high as \$1.43 million; these costs represent the direct costs of the criminal justice system as well as the costs of victim's loss of property, pain, and suffering. Given these figures, if an after school program can prevent participants from a lifetime of crime, a lifetime of drugs, or both, it will have a substantial public benefit. Research suggests that an after school program that focuses on long-term crime prevention among its participants can provide as much \$109,379/slot in public benefit (Cohen, 1998) (Levine & Zimmerman, Evaluating the Benefits and Costs of After-School Care, 2003) (Brown, Frates, Rudge, & Tradewell, 2002).

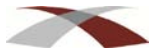
Additionally, to the degree that an after school program is intentional about preventing teenage pregnancy, research suggests that a program could prevent about 5.4 percent of teenage pregnancies (pregnancies that would have happened but for a person's participation in the program). Given that effectiveness and assuming that only half of the participants in the programs are young women or adolescent girls, we find that each individual slot could yield an annual benefit of up to \$467 (Philliber, Kay, Herrling, & West, 2002) (Levine & Zimmerman, Evaluating the Benefits and Costs of After-School Care, 2003).

It is evident that quality affordable afterschool care may have a substantial social benefit in reducing risky teen behavior, especially when that impact prevents long-term negative consequences from occurring. With that being said, some caution should be taken in examining the upper bounds of these estimates. Most of the research from which the figures were derived chose to examine sample populations that were at high risk of experiencing a negative event (crime, drug use, or a teenage pregnancy); it is somewhat unlikely that the participants that are self-selecting to enter the YMCA's school program share the same characteristics of the at-risk populations of the studies. Therefore, while the YMCA's programs will likely have some impact, it may not be as substantial as the figures derived from the research.

## Public Education

As noted above, a quality afterschool program that focuses on improving academic outcomes may have a substantial social benefit in terms of increased compensation, derived from the private benefits of an individual's increased compensation throughout his or her lifetime. In addition to that benefit, there are also costs and benefits that are reflected in the local school system, namely the reduced costs of providing remediation and the increased costs of educating students who would otherwise have dropped out. Taken together, the social benefit, when limited to the scope of the educational institution, is actually a cost of as much as \$222/after school program slot; however, that cost would likely be offset many times over, as much as 46 times over, in social benefits (tax revenue) derived from a citizen who graduated high school rather than one who dropped out (Brown, Frates, Rudge, & Tradewell, 2002).





**Table 7. Social Benefits of an After School Program**

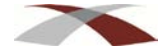
Social Benefit	Low Estimate	Middle Estimate	High Estimate	Period over which benefit will accrue
Social Benefits of Increased Compensation				
Social Benefit of Maternal Employment	\$236	\$473	\$573	Annual
Increased Tax Revenue from Academic Improvement	-	\$3,467	\$8,266	Lifetime
Increased Tax Revenue from Increased Graduation Rates	-	\$5,144	\$10,287	Lifetime
Reduced Welfare Dependency	-	\$412	\$618	Lifetime
Reduced Risky Teen Behavior				
Teen Pregnancy	-	\$316	\$467	Annual
Crime/Drugs	-	\$41,952	\$109,379	Lifetime
Education				
Benefit of Reduced Remediation	-	\$550	\$996	Annual
Cost of Retention	-	(\$914)	(\$1,218)	Annual
<b>Total Social Benefit</b>	<b>\$236</b>	<b>\$51,400</b>	<b>\$129,368</b>	

Figures represent the public value of one slot; all figures presented in 2010\$.

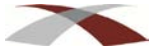
Note: Middle and High Estimates assume an intentional approach on the part of the YMCA to address these specific concerns through its curriculum and support; without such intentionality on the part of the service provider, results will tend toward the low estimate.

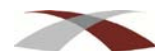
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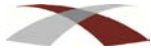


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# Appendix 3: Economic Valuation of the Benefits of YMCA Programs



Economic valuations of services provided by not-for-profit or public sector institutions attempt to place an economic value on the services provided to a community, when services are provided for no charge or at reduced rates. Critically, the economic valuation focuses on the value of the service to consumers rather than the amount of economic activity it engenders. Typically, user value is determined in one of two methods. The first method is to value the services based on the amount of time spent by the user in obtaining the service (including travel time as well as the time consuming the service). A second method is based on obtaining comparable prices of services when other firms (typically in the private sector) do charge for the same service.

The two services valued in this analysis are the YMCA's Summer Camp and Before & After School programs. Because both these services are also provided by the private sector, the method used to estimate the value of services provided by the YMCA is to compare the costs of comparable services provided by the private sector. The average private sector price charged to the user establishes a measure of the economic value of the services to the consumer. The assumption is then made that the service provided by the not-for-profit has the same value as that provided by the private sector; thus, the difference between the private sector price and the YMCA charge to the user is the economic value of the public benefits of the YMCA programs.

In addition to providing these two programs at below market rates, the YMCA provides eligible families with an additional fee reduction, further reducing the price but not the value of the service. The amount of fee reduction is also included in the economic valuation analysis.

## **Economic Valuation of the Before & After School Program**

The YMCA's Before & After School program runs for 36 weeks and provides before and after school services in six different attendance formats. The students can attend on a full-time (five days a week) or limited (part-time) basis either before and after school, before school, or after school. The YMCA provided researchers with program participation data by school district by form of attendance, as well as a count of the number of students receiving a fee reduction and the value of the fee reduction.

## **Rate Difference**

To estimate the market rate differential benefits of the YMCA's Before & After School program, PPI researchers collected a sample of private sector fees for before and after school programs within each of the school districts within Marion County that partnered with the YMCA to deliver services, and on a countywide basis for the suburban counties that had school districts participating in the YMCA's program. The private sector fee varied by district/county and thus a separate rate differential analysis was carried out for each school district/county that partners with the YMCA. PPI staff collected a minimum of five private sector fee schedules for each school district or county. Table 8 displays the average full-time rates for the after and before and after school programs for each school district included in the analysis.



**Table 8. Average Weekly Private Sector Rates for School Programs**

	<b>Full-time Before and After</b>	<b>Full-time After</b>
Franklin	\$101.50	\$72.10
IPS	\$68.00	\$42.56
Perry	\$88.75	\$67.75
Washington	\$82.00	\$69.12
Wayne	\$90.20	\$55.58
Hamilton	\$94.00	\$65.50
Hancock	\$80.50	\$49.00
Hendricks	\$68.00	\$64.00
Johnson	\$88.50	\$62.36

The typical weekly fee for the YMCA’s program was \$82 for full-time before and after school students and \$41 for full-time after school only students.<sup>15</sup> In 2010, the YMCA served 2,519 full-time before and after school students and 3,354 full-time after school students. The full-time rates for students in private before and after school programs in the IPS school district and Hendricks and Hancock counties were lower than the YMCA’s rate, areas as a result the rate difference benefits in those two school districts were limited to students in the after school only program.

The calculation of the rate difference savings was based on the following formula:

$$((\text{Average Private Sector rate} - \text{YMCA rate}) * \text{total number of students}) * 36 \text{ weeks}$$

The average rate difference per student was about \$12.50 per week or \$450 over the 36 week program and the total weekly benefits by school district/county are shown in Table 9. The savings rate for the 2,300 students that accessed the YMCA’s services on a part-time or occasional basis were estimated to be 50 percent of the weekly savings for full-time students in their respective districts/counties.

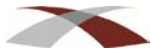
**Table 9. Weekly Rate Difference Benefit, 2010**

<b>School District</b>	<b>Full-time</b>	<b>Part-time</b>
Franklin	\$14,879	\$3,606
IPS	\$769	\$244
Perry	\$10,452	\$4,427
Washington	\$2,362	\$281
Wayne	\$5,941	\$1,154
Hamilton	\$28,823	\$8,582
Hancock	\$1,704	\$548
Hendricks	\$8,464	\$2,197
Johnson	\$7,332	\$2,639

## Fee Reduction

In 2010, the YMCA provided a reduction in fees to 2,407 of the 8,173 students that accessed the Before & After School program. The fee reduction analysis is based on a one-month sample of 2010 billing data provided by the YMCA to PPI, these monthly data were then used to create daily and weekly fee reduction estimates. The weekly fee reduction estimate was then the basis for the estimate of the aggregate

<sup>15</sup> There was some minor variation in YMCA prices especially in the suburban counties.



fee reduction over the 36 weeks of the program. The students that received a fee reduction also benefited from the rate difference in the school districts and counties where the rate difference occurred. Table 10 provides the data upon which the valuation of the fee reduction benefit was based.

**Table 10. Fee Reduction and Enrollment, 2010**

	Total Fee Reduction	Total Enrolled	Total Fee Reduction
After Full-time	\$613,405	2,032	672
After Part-time	\$356,169	1,335	406
Before and After Full-time	\$925,424	1,994	650
Before and After Part-time	\$262,244	689	209
Before Full-time	\$198,292	1,338	295
Before Part-time	\$88,306	785	175

## Economic Valuation of the Summer Camp Program

Over the course of the YMCA’s nine-week summer camp program in 2010, the average weekly attendance at all camps was 2,848 children. A weekly average of 781 participants received a fee reduction. In a typical week, approximately 27 percent of the participants received a fee reduction from the YMCA.

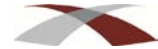
### Rate Difference

The economic valuation methodology used to estimate the benefit (cost savings) attributable to the YMCA’s Summer Camp program is similar to the methodology used to estimate the benefit for the YMCA’s Before & After school program. The sample of private sector fees for summer camps collected by PPI showed that the private sector summer camp rates varied by region. To facilitate the analysis, the private sector costs were divided into catchment areas around the YMCA summer camp program facilities; by township or group of townships in Marion County and countywide in other counties. There were at least five private sector fees collected for each facility (summer camp or catchment area), and then an average private sector fee was calculated for use in the analysis. Table 11 displays the average weekly private sector price by catchment area and the average weekly YMCA price for participants who did not receive a fee reduction. The average YMCA rate was calculated by dividing total revenue associated with unsubsidized students by the total number of unsubsidized students.

**Table 11. Summer Camp Weekly Rates, 2010**

YMCA summer camp facility	Average private sector weekly rate	YMCA rate
Baxter	\$160.80	\$127.84
Benjamin Harrison	\$143.50	\$136.93
Fishers	\$153.75	\$144.15
Hendricks Regional Health YMCA	\$132.00	\$119.75
Jordan	\$138.67	\$142.32
Pike	\$103.20	\$149.45
Ransburg	\$114.00	\$137.32
Witham Family YMCA	\$140.16	\$115.04
Youth Enrichment	\$153.80	\$142.62

As shown in Table 11, the typical weekly price of the YMCA’s summer program ranged from a high of \$149.45 at Pike to a low of \$115.04 at the Witham Family YMCA. Average weekly attendance ranged from 853 at the Baxter YMCA to a low of 52 at the Witham facility (Table 12).



**Table 12. Total Attendance and Average Weekly Attendance by Facility**

YMCA summer camp facility	Total Attendance	Average Weekly Attendance
Baxter	7,681	853
Benjamin Harrison	1,678	186
Fishers	6,882	765
Hendricks Regional Health YMCA	2,016	224
Jordan	4,387	487
Pike	764	85
Ransburg	878	98
Witham Family YMCA	464	52
Youth Enrichment	886	98

Based on the nine weeks of data used to create summary tables 4 and 5, the calculation for each week's rate difference benefit was for each facility:

$$((\text{Average Private Sector rate} - \text{YMCA rate}) * \text{total number of students})$$

Then savings for the nine-week period were calculated. The average rate difference per student was about \$17.30 per week or \$155.68 over the nine-week program. The total summer program rate difference benefits by facility are displayed in Table 13. The average private sector rates in Pike Township and the Ransburg area were lower than the YMCA rate and as a result are not included in Table 13.

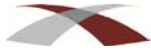
**Table 13. Total Summer Camp Rate Difference Benefit by Facility/catchment Area for Nine-week Program, 2010**

YMCA summer camp facility	Total rate difference
Baxter	\$265,797.71
Benjamin Harrison	\$28,833.05
Fishers	\$39,169.19
Hendricks Regional Health YMCA	\$20,691.57
Jordan	\$38,929.92
Witham Family YMCA	\$6,494.14
Youth Enrichment	\$43,530.21

*Fee Reduction*

As previously stated, in a typical week 781 children or 27 percent of the summer camp participants received a fee reduction. The YMCA provided PPI with a weekly report on the total number of students and total amount of fee reduction by summer camp facility. The valuation of fee reduction calculation was performed by summing the weekly fee reduction by facility. Table 14 presents the total amount of fee reduction, the total number of students receiving fee reduction, and the average weekly fee reduction per student.





**Table 14. Summary of Fee Reduction Data by Facility for Nine-week Program, 2010**

<b>YMCA summer camp facility</b>	<b>Total Fee Reduction</b>	<b>Total participants receiving reduction</b>	<b>Average weekly fee reduction</b>
Baxter	\$118,477.62	1,964	\$6.70
Benjamin Harrison	\$40,241.05	719	\$6.22
Fishers	\$76,858.93	924	\$9.24
Hendricks Regional Health YMCA	\$23,476.14	365	\$7.15
Jordan	\$105,401.01	1,874	\$6.25
Pike	\$32,562.15	484	\$7.48
Ransburg	\$33,972.90	551	\$6.85
Witham Family YMCA	\$11,149.30	150	\$8.26
Youth Enrichment	\$8,965.52	360	\$2.77



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