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# **Preventative Healthcare Programs**

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## PREVENTATIVE HEALTHCARE PROGRAMS

Caileb Reilly

A Thesis Submitted in Partial Fulfillment
Of the Requirements for the
University Honors Program

Department of Health Service Administration

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The members of the Honors Thesis Committee appointed to examine the thesis of Caileb Reilly find it satisfactory and recommend that it be accepted.

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#### **ABSTRACT**

### Preventative Healthcare Programs

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The healthcare system in the United States is struggling with excessive costs and disproportionate quality measures. While the U.S. spends the most on healthcare in the world, the quality of the healthcare is not reflected in this cost. With excessive spending being the strategy to improve quality in the past, new strategies need to be implemented to improve quality as increased spending is not raising this statistic. One factor that can improve quality and reduce costs is the introduction and utilization of preventative healthcare programs. These programs are built to keep at-risk populations from developing serious, permanent diseases that deplete resources and increase the cost of health insurance for the population. The implementation and development of these preventative healthcare programs encourages the population to maintain better health practices and reduces the need for repetitive consumption of healthcare by consumers. By compiling data showing the beneficial effects of these programs and their effects at the state level, it will become clear that lowering costs and improving quality of healthcare by utilizing preventative healthcare programs will benefit the healthcare system.

KEYWORDS: Preventative, Healthcare, System, Quality

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#### **Introduction:**

Healthcare is one of the largest industries in the world. Almost all of the population consumes some sort of healthcare in their lives. Although it is one of the most utilized industries in the world, in the United States, healthcare is struggling to maintain affordable costs for consumers. Pharmaceuticals, advancing technology, overhead costs, insurance rates, and a variety of other resources the healthcare system relies on are all increasing in costs.

Organizations have thus begun to establish preventative health measures to avoid further increasing costs and lowering quality. Specifically, some organizations have established preventive healthcare programs that determine patients of being "at risk" for certain preventable diseases. By enrolling patients in these programs, they are informed of what changes they can make to their lifestyles to avoid being diagnosed with these preventable diseases. By compiling data to show how these programs enact changes for health outcomes and the industry as a whole, it can be utilized as evidence for why more patients and organizations need to support these programs.

### The Current State of the Healthcare Industry

In the present market, the factors attributed to the difficulties the healthcare industry makes the United States the most expensive healthcare system in the world (Won, 2022). Outside resources are also straining the healthcare system of the United States. The population is aging as the Baby Boomer generation begins to enter the time of their lives where they require a large amount of healthcare consumption. This generation is also qualifying for Medicare, driving up costs for healthcare as well (Won, 2022). However, having the highest cost of healthcare does not mean the United States has the best quality of healthcare.

Compared to countries with similar development, the United States ranks significantly lower in determinants of quality in healthcare. Life expectancy at birth was similar to comparable countries as of 1980. In the following decades however, the gap increased significantly. Life expectancy in the U.S. as of 2020 was 77.3 years while in comparable countries the average was 82.1 years (Kurani & Twitter, 2022). The U.S. is failing to even meet the average of comparable countries in statistics such as cause, age-adjusted mortality rate, premature death rates, disease burden, and a variety of other determinants of quality (Kurani & Twitter, 2022). Increased spending typically leads to better results in an industry. The healthcare industry in the United States is failing to follow this pattern.

The United States healthcare system is struggling to keep costs down and increase quality. There are a number of factors that have contributed to this overall decline in efficiency, however there are a few that standout. The population size has increased significantly, which has been attributed to a 23% increase in healthcare spending (Sartorious, 2022). Another reason for this substantial increase is that the Baby Boomer population has begun aging into the point of their lives where they consume the majority of the total health care they will consume in their lifetime. The sheer size of the population is already putting a strain on the health care system in the United States, it has not helped that the largest generation in recent history has begun to enter the point of their lives where they begin utilizing large amounts of healthcare resources. In 2016 alone, the age range of 60-64 utilized 280 billion dollars of U.S. healthcare spending as seen in Figure 1. As the aging population begins to qualify for retirement, they utilize more healthcare and undergo various screenings with their newfound free time.

Medicare spending is another factor increasing the overall cost of healthcare. The aging population is not only required for retirement, but Medicare as well. There are already 64 million

enrollees as of 2021, which is 3.1% of the GDP (Won, 2022). As an increasing number of the aging population begins to qualify for Medicare, the Congressional Budget Office Predicts that Medicare spending will double over the next thirty years. The projected percentage of GDP in 2051 is 6.3%, this projection is relative to the size of the economy as well (Won, 2022). This coincides with the projected growth of the aging population becoming a more substantial portion of the population distribution. The congressional budget office predicts that the female population 80 and older will be the largest distribution section in 2030, with males in the same range comprising a large makeup of the total population as well.

The current state of the U.S. healthcare system is not sustainable. The rising costs of treatment and care are making the utilization of healthcare unattainable for the American population. Patients who are required to pay out of pocket typically avoid acquiring treatment unless it is necessary. Consequently, the cost of treatment is exceedingly high when patients wait, causing the exact financial strain they were trying to avoid. Increasing quality while lowering costs is proving to be difficult when these strategies are implemented after or during the care process or a particular disease. Therefore, the healthcare system needs to begin implementing preventative strategies to remove the cost and quality factor. If more preventable diseases were self-managed by the population affected by them, it would lower the need and demand for healthcare services, which would lower costs and improve quality of life.

#### **Benefits of Preventative Healthcare Programs**

Preventative healthcare programs are becoming increasingly prevalent in the healthcare system. These programs consist of a curriculum, specifically tailored to preventing diseases that patients are "at risk" of developing or being formally diagnosed with. By offering patients who

are at risk of developing these diseases educational resources, it lowers the number of patients who need to receive treatment, for a much lower cost. Most of these programs are focused on improving overall lifestyle. Research has shown that changing simple lifestyle habits can greatly increase overall health. Nutrition expert Dr. Walter Willet observed that, "a healthy diet, not smoking, engaging in moderate activity, and avoiding excess weight could prevent about 70% to 80% of coronary heart disease and 90% of type 2 diabetes." (Tello, 2021). By eliminating this significant portion of patients requiring treatment, costs would be driven down immensely in the next few years as demand for resources depletes and more time can be spent on patients with diseases that are not so easily prevented, driving quality up as well.

Certain preventive services are already in place. The National Commission of
Preventative Priorities states that around "100,000 deaths would be averted each year" if just 5
preventive services delivery structures were improved (National Commission on Prevention
Priorities, 2007). Low-economic value services, services which cost \$50,000 to \$1 million
dollars per quality adjusted life year, take much of the total funding spent on healthcare, while
the high-economic value interventions are not nearly as utilized (Yong et al., 2010). Higheconomic value intervention uses less resources, but only a small fraction of this type of care
produces an economic benefit that outweighs the cost of delivery (Yong et al., 2010).
Immunizing children and counseling smokers to quit are two high-economic strategies of
delivery that do produce net savings. Companies who promote policies of healthy living find that
efficiency and cost savings result from a healthier workforce. Employees miss less days, are
more motivated to complete tasks, and make less mistakes. PriceWatersCoopers, an auditing and
accounting company reported that the nation could save almost \$500 billion per year by
educating their employees on modifiable risk factors such as obesity and smoking

(PriceWatersCoopers, 2008). Utilizing these opportunities for cost savings would reduce the amount of healthcare spending for the nation as whole. Having a healthy workforce limits the economic opportunities lost in other industries as well, promoting a stable flow of products, services, and other activities in the marketplace that promote economic growth.

There are organizations within South Dakota that already implement these programs. The Madison Regional Health System has developed a Diabetes Prevention Program. Patients qualify for the program based on a recommendation from their physician, who determines whether the patient is at risk for type 2 diabetes. The patients are then enrolled in the program which has a year-long lifestyle change program. This gives the patients plenty of time and guidance to adjust to these lifestyle changes. Multiple patients are enrolled in the program at once, allowing the process to have a cooperative element with support from the group. This structure is further emphasized by facilitations of a trained lifestyle coach. With a Center of Disease Control approved curriculum, the enrollees are tasked with setting goals and then pursuing action to achieve these goals, with the overall intention being to prevent these patients from being diagnosed with type 2 diabetes.

The Avera Coordinated Care team is another group within South Dakota that has begun implementing preventative care into their strategic planning. The Coordinated Care team at Avera Medical Group aims to improve patient health by educating patients on their specific health conditions. They also educate patients on how to become well, and how to maintain good health. This care ensures a patient's health needs are being met. The goal of this program is to take a holistic approach to improve the quality of life and healthcare outcomes of the Avera population. The group is simultaneously trying to decrease unnecessary spending and time for both providers and patients.

#### DATA ANALYSIS

The gap between the United States healthcare system and comparable countries is measurable and can be expressed in measurable terms. Although the United States has the highest spending out of any country, the data typically used to determine quality shows that high cost does not necessarily mean higher quality. Although the United States and similar countries have been decreasing years of life lost in the last few decades, the United States had 12,724 years of life lost per 100,000 members of the population, compared to other countries of similar development who had 8,258 years of life lost in the same year (Kurani & Twitter, 2022). Another measure is the all-cause mortality rate, or the number of deaths per 100,000 people. While this group of countries has been decreasing this statistic in the last few decades, it began to plateau before the COVID-19 pandemic. In the year 2020, comparable countries' rates declined at 43%, while the United States only fell 19% (Kurani & Twitter, 2022). These measures of quality display the gap between the United States and other similarly developed countries and why there is a need for strategic intervention at distinct levels of healthcare delivery.

The data derived for this explanation consists of the Avera Medical Groups performance since the implementation of coordinated care, another term for preventive health programs. The main purpose of this thesis is to see if implementing preventative programs in health care can provide measurable outcomes that improve the system based on quality and cost efficiency. One goal for this group was to lower the hospital admittance by 20%. Through the period of October-December 2021, the average admittance reduction was nearly 32% (Mockler, 2022). Education is a major factor for the success of these programs. The Coordinated care team educates patients on their condition. They also educate the patients on how they can get better on their own and stay healthy. High-cost services that deteriorate the cost/quality ratio are typically administered

in the Emergency Room. The goal for reducing the number of patients who needed to visit the ER department was 20% for the year 2021 (Mockler, 2022). Avera found that they met or exceeded this goal for 7 of the 12 months of 2021, with the most consistent reduction coming towards the end of the year. Keeping patients out of the ER is a main priority for organizations as this is the only department where patients have a legal right to treatment, regardless of ability to pay (Barish et al., 2012). By educating the community on preventive measures they can take to avoid requiring treatment for preventable diseases, organizations can save resources and focus treatment on actual emergency medical cases that are already a high cost to the system.

Correlation between the increase of patients admitted to Avera's preventive care programs and the decrease of admittance and cost is seen when comparing these figures to one another. The active patients in these programs have increased significantly just in 2021. Starting at 2,544, it increased to 3,553 by the end of the year (Mockler, 2022). Compared to hospital admittance and emergency room visit rate reduction, the model appears to be having positive effects on the system. Another comparable mark is Avera's initiative to enroll these patients in value-based payment arrangements that do not lower quality. Avera's goal was to reduce the use of payment methods besides Medicare and Medicaid. As more enrollees joined the program throughout the year, only 8% of payment methods were not through Medicare, Medicaid, or Avera Health Plans (Mockler, 2022). Putting more focus on the coordinated care programs and how they can be utilized to lower costs and maintain or increase quality is another reason why the implementation of these programs is vital to the U.S. healthcare system at a state, and national level.

Risk Stratification has been a major factor that helps organizations divide patients into subgroups to determine what care approach is best suited for their specific needs. Optimizing

patient care helps lower costs and increase quality. Avera has split the patient population into four categories based on risk. These categories are low risk, rising risk, high risk, and catastrophic. Fifty percent of the population eligible for these programs are low risk. Rising risk accounts for 30% of this population, and the remaining 20% is high risk and catastrophic (Mockler, 2022) The same population of sub-groups was then differentiated in a similar graphic based on healthcare spending. It was found that 20% of the population that is made up of high risk and catastrophic patients, account for 81.2% of total healthcare spending at Avera. The catastrophic population makes up 49.5% of the spending, and the rising risk population makes up 31.7% of the spending (Mockler, 2022). The catastrophic patient population characteristically includes patients with extraordinary life-threatening illnesses or trauma that have extreme demand on health care resources. These patients are afflicted with diseases or trauma that has already happened, which is why they consume such a large percentage of the total spending. The high risk, and rising risk populations, however, are where the effect of the coordinated care programs can be seen. Combining for a total of 47.6% of the total spending at Avera (Mockler, 2022). These populations are where the coordinated care team begins to implement their strategies to lower the total usage of health care services that cost the industry large sums of capital.

The Madison Regional Hospital also has programs in place to prevent diseases. This includes the Diabetes Prevention Program. This program's main goal is to prevent patients who are at risk of developing Type 2 diabetes from becoming diabetic. Cohort 1 had 16 participants and the program lasted from September of 2019 until September of 2020. Cohort 1's final results included 56% of participants achieving 7% weight loss. The average weight loss was 20 pounds among participants. The total weight lost was 321 pounds. The average body weight loss was

8%, which includes participants who gained weight during the year long program. The program goal was to have 150 minutes of physical activity a week or more, which was achieved by 50% of participants. The Average minutes per week of physical activity was 177. Although this Cohort, and the others as well, have small sample sizes, Madison is a small community and by starting to prevent community members from being diagnosed with preventable diseases, resources can be allocated to other patients and costs will begin to reduce.

Avera population health management shows how the implementation of these programs has aided quality and lowered cost. Avera's average quality score was 91% in 2021. Avera also had a 20% reduction in ER visits and hospital admissions for the coordinated care patients. The COVID Care Transitions program followed 5,000 patients to determine what strategies work for these patients, and they saw a significant low in the readmission rate, being 5.3% (Mockler, 2022). These programs can all be classified as preventative care programs, and the Avera Medical Group's partnership with the Medicare Shared Savings Program partnered with these initiatives has enrolled 100,000 patients in value-based arrangements, with savings of 30 million in Medicare ACOs. Emergency Room Visit Rate ranks in the top quartile as well (Mockler, 2022). With a high-quality score, significant cost savings, it is clear that these programs have positive correlation to increased quality and lower cost for consumers.



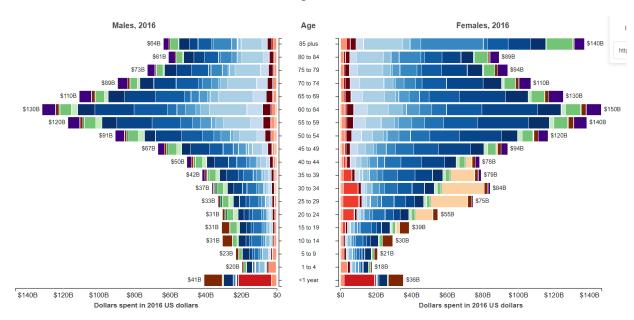
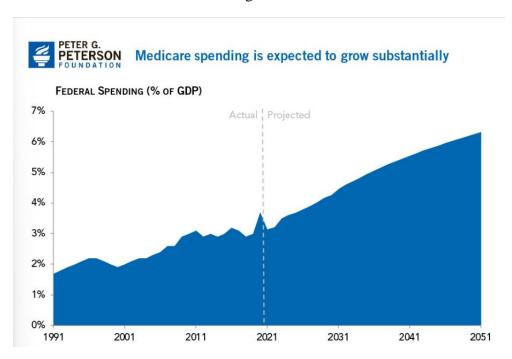


Figure 1 displays the population distribution based on the amount of healthcare spending that is attributed to each age range. The largest portions of the spending is in the blue portions, which represent Musculoskeletal disorders, diabetes, urogenital diseases, blood and endocrine diseases, digestive diseases, chronic liver and respiratory diseases, and cardiovascular diseases.(Sartorious, 2022) These portions are especially large in the aging population as they begin to qualify for Medicare and can take advantage of this insurance program. The figure above shows how much of healthcare spending is used for chronic diseases.

Figure 2



The Congressional budget office has released their projections for Medicare spending in the next 30 years. With the current strategic plan, the federal spending will consist of just under 7% of the GDP. (Won, 2022) This will increase the cost of healthcare as the Medicare population begins utilizing the resources they now qualify for.

Figure 3  $\label{eq:Figure 3} \mbox{All cause age-adjusted mortality rate per 100,000 population, 1980-2020}$ 

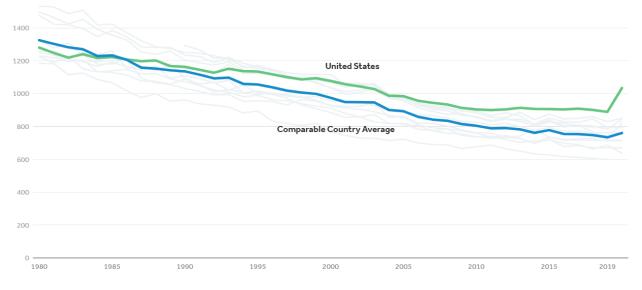
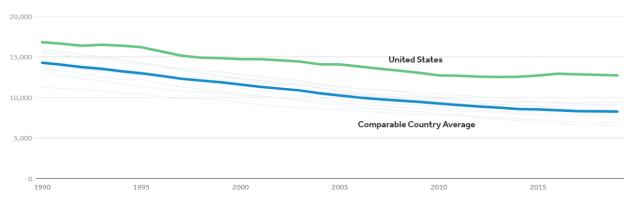


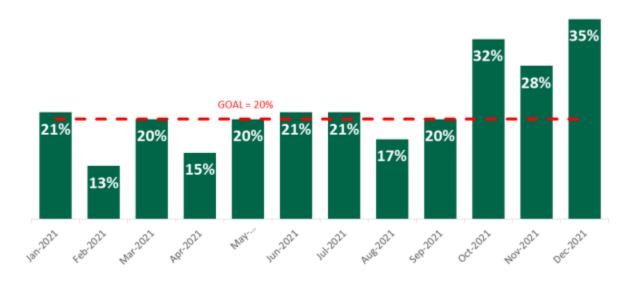
Figure 3 displays the gap between all cause age-adjusted mortality rates for the United States and comparable countries such as France, Sweden, Germany, and other countries. The gap has been steadily increasing for the past three decades. Although both rates had been declining until very recently, the gap has still widened. The United States has the highest cost of healthcare per capita, which should result in higher quality measures. The opposite effect is visually present here.

 $Figure\ 4$  Overall age-adjusted potential years of life lost per 100,000 population, 1990-2019



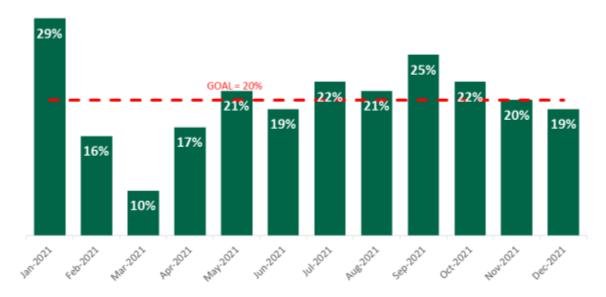
The gap between Overall age-adjusted potential years of life lost is another measure of quality that displays how the United States lacks reasonable data for having the highest cost of health of healthcare in the world. With more years of life lost than comparable countries, Figure 4 shows the disparity between The United States and other countries and how the gap is widening even further.





The Avera Coordinated Care program measured hospital admittance reduction after implementing educational programs for diseases such as diabetes. With a goal of 20% reduction, Avera began exceeding this goal toward the end of 2021 as seen in Figure 5. (Mockler, 2022) Educating patients on the importance of maintaining healthy practices that prevent them from becoming diagnosed and admitted to hospitals is a major step to reducing costs.



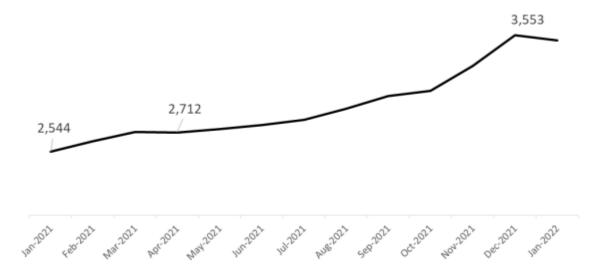


Reducing emergency room visits is a major step in reducing costs for healthcare systems. They deplete resources and can be detrimental to the system if not used efficiently. By lowering the number of visits, organizations can utilize resources properly and efficiently. Lower cost absorption from organizations also lowers prices for consumers, benefiting both parties. Figure 6 illustrates how incorporating programs that implement preventive care practices can lower these visit rates.

Figure 7

Active Patients - Coordinated Care

Clinic-Embedded Case Management + Centrally Located Disease Management Programs



Compared to Figures 5 and 6, as the number of active patients in Coordinated Care increased, patient admittance reduction increased, especially near the end of the year. Emergency room visits also declined, though not as significantly as patient admittance.

Figure 8

The payor mixes also began to meet Avera's goals consistent with Figure 7's display of increased enrollment in the programs. This is also because value-based programs such as shared savings programs (SSPs) and accountable care organizations (ACOs).

Jul-2021

Aug-2021

Sep-2021

Oct-2021

Jun-2021

May-2021

Jan-2021

Feb-2021

Mar-2021

Figure 9

Cost-Effectiveness CE ratio < 0 (cost saving)	Preventive Service Advising at-risk adults to take aspirin Childhood immunization Smoking cessation advice and help to quit Screening adults for alcohol misuse and brief counseling Vision screening (for adults age 65 and older)
CE ratio = \$0-13,999/QALY	Chlamydia screening (sexually active adolescents and young women) Colorectal cancer screening (adults age 50 and older) Influenza immunization (adults age 50 and older) Pneumococcal immunization (adults age 65 and older) Vision screening in preschool age children
CE ratio = \$14,000–34,999/QALY	Cervical cancer screening (all women)  Counseling women of childbearing age to take folic acid supplements  Counseling women to use calcium supplements  Injury prevention counseling for parents of young children  Hypertension screening (all adults)

These clinical preventive services displayed in Figure 5 are all high-value services that promote low cost of delivery and have been identified as more beneficial to patient quality than services that are currently being utilized. Redistributing spending to these services reduces the need for forms of delivery that have higher costs with little to no increase in quality adjusted life years (Yong et al., 2010).

#### Conclusion

The United States has been struggling to maintain affordable healthcare rates and currently has the highest healthcare cost in the world. Despite having high rates of cost, the quality measures are significantly lower than comparable countries. With excessive costs not meeting the standard quality measures, the U.S. healthcare system is in a crisis. As more spending to increase quality of care is clearly not the solution, the way organizations deliver care and educate their patients on maintaining good health has been fundamentally important to reducing costs and maintaining or even increasing quality.

Preventable diseases are one problem that is causing prices to increase and quality to be sub-par, as the population fails to maintain good health practices that reduce the occurrence of diseases such as diabetes, obesity, and other preventable diseases. Instead of prescribing medication and allocating resources to patients once they have been diagnosed, a cost-effective approach that changes the way care is delivered is preventive health programs. These programs encourage at-risk patients to act themselves, with help from providers and healthcare organizations, to prevent themselves from being diagnosed with these diseases. Educating patients and keeping them accountable once enrolled in these programs motivates the at-risk population to take measures that will reduce their chances of being diagnosed and requiring medical treatment. These programs also, on a basic level, just promote good health practices which typically leads to a more enjoyable life. Avera and the Madison Regional Hospital have already begun implementing these programs at a state and community level respectively, with positive results for cost reduction, quality improvement, and patient health. These programs are not expensive to integrate into health care systems, as the main output from the organizations sponsoring them is simply educational material and goal systems. The reduction in patient

admittance and saved resources also more than make up for the minimal expenses. Implementing these programs on a larger scale is a large step to achieving affordable costs that maintain high quality measures for many health-care systems in the United States.

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## **Appendix**

This entails the remaining results for the 6 cohorts of participants in the Diabetes

Prevention Program at the Madison Regional Hospital. Not all data is used in the data analysis as some of the results are unfinished.

# **Diabetes Prevention Program Cohort 1 Final Results**

### Cohort 1 Final Group Results

September 2019 - September 2020

# of participants who completed DPP	16
% of participants achieved 5% weight loss	56%
% of participants have achieved 7% weight loss	56%
Average weight loss (pounds)	20
Cumulative weight loss (pounds)*	321
Average % BW Loss*	8%
Met program goal of 150 minutes of PA or more	50%
Average minutes per week of physical activity	177

<sup>\*</sup>includes those with weight gained in program

#### Final Stats DPP - Cohort 2

Count: 10 participants completed year-long program

Average % Body Weight Loss	6%
Average minutes per week of activity	167
% of participants have achieved 5% weight loss in 12 months	80%
% of participants have achieved <b>7%</b> weight loss in <b>12</b> months	70%
Average weight loss in 12 months (pounds per person)	12
Cumulative weight loss (entire group in pounds)	122

### Program Goals:

- > Lose at least 5% of starting body weight
- > Achieve 150 minutes activity per week

# **Diabetes Prevention Program Cohort 3 Final Results**

### Cohort 3 Final Group Results

10 participants completed yearlong program

# of participants who completed DPP	16
% of participants achieved 5% weight loss	70%
% of participants have achieved 7% weight loss	50%
Average weight loss (pounds)	14
Cumulative weight loss (pounds)*	298
Average % BW Loss*	8%
Met program goal of 150 minutes of PA or more	50%
Average minutes per week of physical activity	178

<sup>\*</sup>includes those with weight gained in program

# **Diabetes Prevention Program Cohort 4 Final Results**

### **Cohort 4 Final Group Results**

Oct 2021-Oct 2022

# of participants who completed DPP	16
% of participants achieved 5% weight loss	33%
% of participants have achieved 7% weight loss	18%
Average weight loss (pounds)	6.5
Cumulative weight loss (pounds)*	278
Average % BW Loss*	3.5%
Met program goal of 150 minutes of PA or more	62%
Average minutes per week of physical activity	186

<sup>\*</sup>includes those with weight gained in program

# **Diabetes Prevention Program Cohort 5 Six Month Data**

### **Cohort 5 Six-Month Report**

March 2022-March 2023

# of participants who completed DPP	15
% of participants achieved 5% weight loss	66%
% of participants have achieved 7% weight loss	40%
Average weight loss (pounds)	16.5
Cumulative weight loss (pounds)*	263
Average % BW Loss*	7.8%
Met program goal of 150 minutes of PA or more	80%
Average minutes per week of physical activity	295

<sup>\*</sup>includes those with weight gained in program

# Diabetes Prevention Program Cohort 6 Six Month Report

## Cohort 6 (FALCON work group) Six Month Report

April 2022-April 2023

# of participants who completed DPP	5
% of participants achieved 5% weight loss	20%
% of participants have achieved 7% weight loss	20%
Average weight loss (pounds)	4.6
Cumulative weight loss (pounds)*	26
Average % BW Loss*	2.5%
Met program goal of 150 minutes of PA or more	83%
Average minutes per week of physical activity	288

<sup>\*</sup>includes those with weight gained in program