

WEST VIRGINIA DIABETES ACTION PLAN 2020



WEST VIRGINIA
Department of
Health & Human
Resources
BUREAU FOR PUBLIC HEALTH
Division of Health Promotion
and Chronic Disease



STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES
Bureau for Public Health
Commissioner's Office

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Dear Diabetes Stakeholder of West Virginia:

Diabetes as a chronic disease has far-reaching consequences for West Virginia in terms of complications, decreased quality of life, decreased productivity, deaths, and healthcare cost burden. In 2019, 15.7% of West Virginian adults were reported to have diabetes, over one in 10 (2019 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention).

That year was the first time West Virginia witnessed a decrease in the diabetes prevalence for adults in over a decade. In the most recent data for ranked deaths available from the CDC, diabetes was listed as the sixth leading cause of death for West Virginia, with the state death rate being highest in the nation. All of this is to say that many West Virginians are impacted by this disease—either they themselves are diagnosed with this disease, are at-risk for diabetes, or they love or care for someone who has been diagnosed. Healthcare costs associated with diabetes are extensive and can range from regular healthcare provider visits, prescriptions and materials including insulin or testing strips, hospital in-patient care, etc., and can be extremely costly. If individuals do not manage their diabetes, complications like limb amputations or blindness can result, severely decreasing quality of life and productivity.

While the most recent data does suggest a decrease in the prevalence of the disease, it is uncertain whether this is just a “blip” or an actual trend. The fact is diabetes rates in West Virginia have doubled in the past twenty years. With such a high societal and economic cost, it is important to focus on not only managing this disease, but outright preventing it. It is no longer enough to just tell people they need to eat better or be more active—most of us know we should eat more fruits and vegetables or get some physical activity. Diabetes prevention and management focuses on helping people understand how these principles fit into their busy lifestyle, budget, mobility level, or other considerations.

The *Diabetes Action Plan 2020* seeks to address diabetes and associated chronic diseases through long-term strategies designed around the key aspects of prevention, management, and access to support education, skills and behaviors for care. It is important that we identify and address this disease in a way that emphasizes equity and health disparities so that all West Virginians can see improvement in their health.

Join us in this call to action to help make our State healthier now and in generations to come!

Sincerely,

Ayne Amjad, MD, MPH
Commissioner & State Health Officer

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A. INTRODUCTION: WHY WEST VIRGINIA NEEDS A DIABETES ACTION PLAN

During its 2020 regular session, the West Virginia Legislature enacted West Virginia Code §16-1-21 to require the development of a Diabetes Action Plan by the West Virginia Department of Health and Human Resources, Bureau for Public Health (the “Bureau”). Specifically, the Bureau must create a Diabetes Action Plan that includes the following steps:

- (a) Convene a diabetes task force consisting of a cross-sector of stakeholders to develop the scope of the plan;
- (b) Conduct necessary data and infrastructure/gap analyses;
- (c) Draft a plan to include long- and short-term goals, high-impact and outcome-driven strategies for prevention, disease management and treatment, and evaluation strategies to be published for public comment;
- (d) Produce briefing documents in support of and promoting the use of strategies outlined in the plan for distribution to stakeholders;
- (e) Finalize and share the completed plan;
- (f) Track and trend relevant statistics regarding diabetes; and
- (g) Implement strategies identified in the plan to decrease the prevalence of diabetes in West Virginia.

The Diabetes Action Plan Task Force (the “Task Force”) held a virtual kickoff meeting on August 19, 2020. At the meeting, the Bureau delivered presentations to orient the Task Force to the project, discussed existing diabetes prevention and management program information, and described the burden of diabetes in West Virginia. Initial data collection was shared with the Task Force, and gaps were analyzed with plans formulated for the additional gathering of information.

The development of the scope of the plan brought together diverse stakeholders from various sectors and from across West Virginia (complete participant list is provided in Appendix A). The Task Force developed the scope of the plan through surveys to three targeted audiences: 1) health care teams, 2) payor/insurance companies/employers, and 3) communities and community members. The surveys are reproduced in Appendix B. For a complete list of stakeholders, please see Appendix A.

During a series of meetings, Task Force members were presented with drafted sections of the plan and their input formed the scope of the plan. The Task Force assembled contributions from all the members and formulated a collective approach aimed at: 1) improving prevention of obesity and diabetes, 2) improving diabetes management and treatment, 3) decreasing diabetes prevalence in West Virginia via policy strategies, health care system strategies, and community strategies.

The final plan will be distributed to stakeholders for implementation and presented to the Legislative Oversight Commission on Health and Human Resources Accountability.

B. DATA & GAP ANALYSIS: NUMBER OF WEST VIRGINIANS AFFECTED

Understanding Diabetes and Prediabetes in West Virginia Adults

Diabetes is a metabolic disease or condition that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces.¹ Insulin is used to convert sugar, starches, and other foods into energy needed for daily life activities.² The primary types of diabetes are type 1 diabetes, gestational diabetes, and type 2 diabetes.

Type 1 diabetes is the result of the body not producing enough insulin and requires daily insulin, commonly with a pump. Type 1 diabetes is common in children and young adults, with family history increasing the chance of development. Gestational diabetes is the result of blood glucose values above normal during pregnancy; this type of diabetes is covered more in depth in the next section.

Type 2 diabetes is the result of ineffective insulin use by the body. Type 2 diabetes can be developed at any age but mostly occurs in middle-aged and older adults; individuals are more likely to develop diabetes if they are age 45 or older, have a family history of diabetes, or are overweight/have obesity.³

Various risk factors impact diabetes: age, physical activity level, body mass, high blood pressure, family history, and a history of gestational diabetes all contribute to the risk of developing diabetes.

In addition to the three types of diabetes, some individuals are borderline. Borderline individuals are those with an elevated blood sugar level that is high enough to be concerning and should be clinically managed, but not yet high enough for the individual to meet the criteria for a diagnosis of diabetes; these individuals are considered to have



FACES OF DIABETES IN WV: WILMA

Wilma first learned that she had type 2 diabetes at a routine doctor's visit after having blood work. She received a phone call after the visit during which she discovered that her glucose reading was high. At first, Wilma admitted to feeling frightened:

"The diabetes diagnosis can create some anxiety, but you must learn what you can about management and keep trying to make the necessary changes."

Wilma signed up for a group workshop on diabetes management at Thomas Memorial Hospital in Charleston. During the workshop sessions, she learned the importance of preventative checks such as daily foot self-checks and yearly eye exams. She met with a dietitian and learned how to manage the right number of calories per day. Wilma learned how to divide the calories between her primary meals and two snacks. The dietitian suggested healthy food options. Wilma also participated in the Face to Face Program through the West Virginia Public Employees Insurance Agency. Wilma participated in lifestyle coach training in a program offered through the Partnership of African American Churches (PAAC). She also did self-directed reading and research.

When asked how she would advise a person that was diagnosed with prediabetes or diabetes, Wilma suggested: "Get all the information you can. Learn what lifestyle changes you can make that will help you avoid complications. For example, find a workshop that teaches the value of an increased level of activity, how to read food labels, what foods are healthier choices, and how to cope and remain positive." Wilma added: "Give healthy choices a try and take the life adjustments one step at a time."



FACES OF DIABETES IN WV: NANCY

Nancy was diagnosed with diabetes over 11 years ago. She still remembers walking out of the doctor's office:

"I had in my hands a diet sheet along with information on obtaining a machine to do glucose checks. I had heard of diabetes, but I did not know much about coping with it. So, I went into a type of denial and avoided doing preventative measures like checking my blood glucose regularly."

Nancy recalled that from time to time she would see a diabetes management class advertised in the newspaper, but the locations were always too far to drive. Years later, she discovered a workshop in her neighborhood. The workshop involved six sessions covering multiple management topics from how and why to check glucose levels to the importance of monitoring weight and blood pressure. The workshops were free through a program sponsored by Quality Insights. After participating in the workshop, Nancy began checking and recording her glucose readings regularly, scheduling and attending appointments for yearly eye examinations, began reading food labels and shopping wiser, and found meal planning easier.

When asked what she would like others who do not have diabetes to know, Nancy said: "I would like others in the public to understand the importance of understanding preventative care. The workshop [Everybody with Diabetes Counts] made a big difference for me, and I was saddened to learn that the funding for the program was not renewed. Local education is important. When you have diabetes, knowledge is the key to control. Also, ongoing support is important. I would participate in a support group, but I have never been able to locate one. More resources for education and support are needed."

prediabetes. In 2018, West Virginia ranked first nationally in the prevalence of diabetes diagnosis (16.2% among adults) and 11.8% of adults reported a diagnosis of prediabetes.^{4,5}

Diabetes contributes to several adverse health outcomes, including heart disease, heart attack, stroke, blindness, kidney failure, and lower limb amputation. The risk of developing complications from diabetes is related to several factors including the type of diabetes, duration, and management of the disease.^{6,7}

Healthy lifestyle behavior, adherence to oral medication and/or insulin can manage or even prevent type 2 diabetes.^{8,9} West Virginia has a high rate of type 2 diabetes and prediabetes that can be attributed to several factors that include limited access to quality care, the Appalachian culture of distrust, geographic isolation, and an aging population.¹⁰

Gestational Diabetes

Gestational diabetes mellitus (GDM) is a type of diabetes that can develop during pregnancy in women who do not have pre-existing diabetes. Between 2% and 10% of women develop GDM during their pregnancies every year. In 2019, 6.1% of West Virginia women who gave birth had GDM.¹¹ According to a recent study by the Centers for Disease Control and Prevention (CDC), the symptoms of GDM often disappear within weeks of giving birth. However, GDM is not to be underestimated since evidence shows that gestational diabetes puts both mother and child at risk for developing diabetes later in life.

Research findings indicate GDM has lasting health effects, including that one-third of women diagnosed with GDM will develop diabetes or a milder form of elevated blood sugar soon after giving birth.¹² According to

the American College of Obstetricians and Gynecologists, 15- 70% of women who are diagnosed with GDM during their pregnancy develop diabetes later in life.¹³ Women with a history of GDM have almost a ten-fold increased risk of developing diabetes compared to women with normal glucose levels during pregnancy.¹⁴

Two factors have and likely will continue to underlie increased rates of GDM: An increase in the number of women giving birth at an older age, and an increase in obesity rates. Additionally, GDM contributes to several complications during pregnancy including high birth weight, jaundice, preeclampsia, hypoglycemia, birth defects, and birth-related trauma. Preeclampsia and high blood pressure during pregnancy increase the risk of women developing heart disease and having a stroke later. Children with mothers who had GDM may be at risk of becoming overweight or having obesity during childhood and have a higher risk of developing diabetes.¹³

Understanding Diabetes in West Virginia Youth

Until recently, young children and teens were seldom diagnosed with type 2 diabetes mellitus, which is why it was formerly referred to as adult-onset diabetes mellitus. One-third of children in the U.S. are currently overweight, increasing the risk of developing type 2 diabetes. Children with type 2 diabetes are usually diagnosed in their early teens, with girls more likely to develop the disease. One theory is that the hormones present during puberty can challenge the body's ability to use insulin.¹⁵

The increased number of diabetes diagnoses among youth is a growing public health burden. Youth with type 1 and type



FACES OF DIABETES IN WV: LANCE

Lance was not as concerned when first diagnosed with prediabetes in 2015. He continued to gain weight and was diagnosed with type 2 diabetes a year later. Lab work showed HgA1C, triglyceride, and blood sugar levels were significantly elevated. Along with basic information on how to watch his sugar intake and weight, he was started on a glucose-lowering agent. He was at his all-time worst in 2017, when he was hospitalized for health-related complications.

"I tried to lose weight on my own, but nothing stuck. I made the decision to get my life and health back together. I made a commitment to myself and wife to do this as a team. All else had failed, all the diets, quick fixes, pills, potions, and lotions."

Lance heard about a low-carbohydrate support group in Charleston and Shepherdstown, WV. Dr. Mark Cucuzella, a professor at West Virginia University School of Medicine and Lance's family physician routinely spoke at the support group meetings. Shortly after joining the group, Lance's lab values were within normal limits, he lost a significant amount of weight, he started feeling better, and his reflux was completely resolved. The health of his wife was impacted also. Lance and his wife have become a powerhouse couple sharing their story at various conferences and educating others on how to choose a healthy lifestyle and improve their quality of life. During COVID-19 restrictions, the couple continues to meet with support groups via an online platform to encourage one another and navigate these unprecedented times.

When asked how he would advise a person that was diagnosed with prediabetes or diabetes, Lance suggested: "Connect with a support group. Support and community are key to success. Managing diabetes is a real struggle, but there is real hope. It gets easier over time as the benefits outweigh the challenges encountered on the journey to health."

2 diabetes are at an increased risk of complications, and type 2 diabetes manifests as a severe form of diabetes in youth that responds poorly to treatment and contributes to both microvascular and macrovascular complications.¹⁶ There is evidence that microvascular complications, such as blindness, kidney disease, and nerve damage, and macrovascular complications, such as heart attacks and strokes, are present early in the course of type 2 diabetes in youth. These complications often present within the first five years, and progress rapidly to treatment failure and insulin therapy.¹⁷ Adolescents with type 1 diabetes are also at risk for complications within the first decade of diagnosis.¹⁸

The SEARCH for Diabetes in Youth (SEARCH) Study represents the largest, most diverse study of diabetes in youth. Overall, the incidence of type 1 diabetes increased by 1.4% annually, and type 2 increased by 7.1%.¹⁹ Among youth aged 10 to 19 in five states – South Carolina, Ohio, Colorado, California, and Washington – 3,800 cases of type 2 diabetes were diagnosed in the 2002-2003 period compared to 5,300 in the 2011–2012 cohort. Racial and ethnic minority groups had the highest rates of new cases.¹⁹



FACES OF DIABETES IN WV: MATTHEW

Matthew is a 14-year-old in 8th grade who loves to play soccer, basketball, and video games. His mom and dad (Ginger and Jason) describe him as a happy-go-lucky child, who is sensitive, caring, and always trying to put others first. About a year ago, in November 2019, Ginger noticed that he was drinking a ton of water and kept going to the bathroom several times at night. So just like any good mom, she made an appointment with a doctor for a check-up and basic blood tests. His sugar levels and hemoglobin A1C (HgbA1C) levels came back elevated and he was referred to an endocrinologist. While at the endocrinologist office, more tests were done and a week later the tests revealed he had type 1 diabetes. Ginger knew about diabetes through her work as a nurse and was heartbroken to hear her son diagnosed with the disease. Week after week, she personally watched the impact that diabetes had on her patients, from blindness to amputations. She did not want this for her son. She left the office with a few educational resources and unsure of what the next steps should be.

Ginger searched the web for help in the form of education classes. She called the Juvenile Diabetes Research Foundation's local and main office in New York and both numbers were disconnected. She emailed resources consistently and 4 months later, finally received a response from someone in Pittsburgh with a backpack of useful resources. Without guidance, she relied on Google and Facebook for all her information. Even the endocrinologist office did not offer any classes. They had limited access to a dietitian every three months for 15 minutes. The only classes she could find were for adults, and all geared towards type 2 diabetes. The closest classes for type 1 diabetes were in Parkersburg, West Virginia or Marietta, Ohio, about an hour and a half away. She was very disappointed when she could not find anything locally for support. Even with her background as a nurse, it was difficult to bridge the gap of what her son needed to effectively manage his diabetes.

Luckily, prior to the diagnosis, they had connected with KEYS 4 Healthy Kids and had started on a health journey that has helped Matthew be more active and incorporate more nutritious foods in his daily life. His HgbA1C levels decreased to 5.1%, he lost 40 pounds, and has more energy now. Matthew still finds it challenging to manage his diabetes, count carbohydrates, do all the math that is needed to dose insulin, and keep his blood sugar in a healthy range. He would like more local support in the form of classes and one-on-one counselling to learn to effectively manage his diabetes, so he can continue to play sports and live a healthy life as a teenager.

In West Virginia (2018-2019), there were 19.6% of youth ages 10 to 17 with obesity, ranking seventh highest for this age group among all states and the District of Columbia. Of West Virginia children ages 2 to 4 that participate in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), there were 16.6% with obesity, third highest among the states and District of Columbia. According to the 2019 Youth Risk Behavior Surveillance System, 22.9% of West Virginia high school students reportedly had obesity and 16.5% were overweight.²⁰

Because of the increasing rates of childhood obesity and diabetes in West Virginia, the earlier ages that these diseases are manifesting, and the increased rate at which complications from diabetes occur, action must be taken to prevent and treat these conditions in our children and youth.

Understanding Prediabetes in West Virginia Youth

The increased prevalence of pediatric obesity has led to an increased incidence and prevalence of prediabetes in youth. The rise in the prevalence of prediabetes in children and adolescents has paralleled the rise in childhood obesity seen over the past three decades.²¹ Individuals with prediabetes have above normal glucose levels, but the levels are not high enough to meet the criteria for a diagnosis of diabetes.

Prediabetes in adolescents is characterized by elevated cholesterol and blood pressure levels, low insulin sensitivity, and an excess of abdominal fat, increasing the risk of developing cardiovascular disease and diabetes.²²

The prevalence of prediabetes in adolescents has been increasing, with 1.8% having impaired fasting glucose in 1988-1994, 7.0% in 1999-2000, and 23% in 2007-2008.¹ A new analysis using the 2005-2016 National Health and Nutrition Examination Survey data found that nearly one in five adolescents aged 12-18 years or 18% of adolescents are living with prediabetes, according to a new CDC study published in JAMA Pediatrics. The percentage of adolescents with prediabetes was higher in males at 22.5% versus 13.4% in females. Additionally, adolescents with obesity had a higher rate of prediabetes at 25.7% compared with about 16% of their normal-weight peers.²³ To date, state-level data on prediabetes in children is not available. However, data on the rate of obesity in West Virginia is available as previously mentioned in the Diabetes Children and Youth Section.

According to Ann Albright, Ph.D., former director of CDC's Division of Diabetes Translation, "We're already seeing increased rates of type 2 diabetes and diabetes-related complications in youth and young adults, and these new findings are evidence of a growing epidemic and a tremendously worrisome threat to the future of our nation's health."²² Therefore, focusing efforts on not only managing children and youth with diabetes but also promptly diagnosing and treating prediabetes will aid in reversing this condition before individuals are diagnosed with type 2 diabetes.

C. RELATED CHRONIC DISEASES & COMPLICATIONS OF DIABETES

People with diabetes have an increased risk of developing additional chronic diseases and serious health problems including:



Consistently high blood glucose from uncontrolled diabetes contributes to serious diseases that affect the teeth, eyes, heart and blood vessels, and kidneys.²⁴ Additionally, people with diabetes have a higher risk of developing infections.²⁵

People with diabetes are at risk for developing heart disease at a younger age than people without diabetes.²⁶ Heart disease and stroke are the most common causes of death among adults with diabetes. Individuals are almost twice as likely to die from heart disease or stroke if they have diabetes.²⁶

People with diabetes are two to three times more likely to experience depression compared to people without diabetes.²⁷ Depression is chronically underdiagnosed, with only 25-50% of individuals with depression being diagnosed and treated. Treatment and therapy are typically effective, but without proper treatment depression may worsen. When depression is present in people with diabetes, self-care is oftentimes inadequate, and the risk of cardiovascular and microvascular and macrovascular complications increase.²⁸

The leading cause of new cases of blindness in adults age 18 to 64 is diabetes. In data from 2018, 11.7% of U.S. adults aged 18 or older with diagnosed diabetes indicated they had a vision disability.²⁹

Kidney disease is another chronic condition closely associated with diabetes. In 2018, the CDC estimated that 37.0% of U.S. adults aged 18 or older with diagnosed diabetes had chronic kidney disease (stages 1-4). More than half (52.5%) of U.S. adults aged 18 or older diagnosed with diabetes and chronic kidney disease had moderate to severe chronic kidney disease (stage 3 or 4).²⁹ The leading cause of end-stage kidney disease was diabetes, with 38.6% of end-stage kidney disease patients listed diabetes as the primary cause.³⁰

Many individuals with diabetes develop a form of neuropathy. There are four different types of diabetic neuropathy: peripheral, autonomic, focal, and proximal neuropathy. The

most common form of neuropathy is peripheral, which affects the feet and legs, and sometimes the hands and arms. Diabetic peripheral neuropathy eventually affects nearly half of adults with diabetes during their lifetime and is associated with substantial morbidity including pain, foot ulcers, and lower limb amputation.³¹

Nearly two million people living in the U.S. are living with limb loss. The World Health Organization states that people with diabetes are 10 times more likely to have a lower limb amputation than those without diabetes.³²

Diabetes also increases the risk of developing periodontitis, also known as gum disease, that can lead to tooth loss. Research shows that individuals with type 2 diabetes were three times more likely to have periodontitis.³¹ In reference to adolescents, research found that adolescents with type 1 diabetes were five times more likely to have periodontitis.³³

Recent evidence suggests diabetes is associated with an increase in other comorbidities including cancer risk and prognosis, fractures, incontinence, and cognitive impairment.³⁴ There is also evidence that diabetes significantly increases the risk for many different cancers.³⁵ Specifically, individuals with diabetes are at a higher risk for liver, colorectal, endometrial, breast, pancreatic, and bladder cancers.³⁶

A large number of deaths in the U.S. are attributable to diabetes. In 2017 it was listed as the underlying cause of death on 83,564 death certificates, and the contributing factor on 270,702 death certificates, making diabetes the seventh leading cause of death for that year.³⁷

D. DIABETES AND COVID-19

The impact of COVID-19 on diabetes is currently unknown. Diabetes may be associated with an increased risk of COVID-19 adverse outcomes.³⁸ In individuals with diabetes, the immune system is compromised, making it more difficult to combat the virus.³⁹ However, when diabetes is well-managed, the risk of becoming ill from COVID-19 is likely to be lower.⁴⁰ New research is emerging daily on information about COVID-19 and its effects on diabetes.

It is unknown what will be left in the wake of the COVID-19 pandemic. The impact of national emergencies can lead to increased HbA1C in those of lower socioeconomic status and those treated with insulin. Diabetic complications, heart attacks, and strokes all increase after a nationwide crisis. A leading cause of morbidity and mortality is the decreased access to needed health care services that occurs after a disaster.⁴¹

E. THE COSTS OF DIABETES & RELATED CHRONIC DISEASES

In West Virginia, the number of citizens diagnosed with diabetes ranks number one in the United States at 15.7% for 2019.⁴² With such a high prevalence, the economic burden for diabetes is enormous. It is estimated that nearly 40% of people in the U.S. have diabetes or prediabetes.⁴³ Of those with prediabetes, up to 30% may develop type 2 diabetes at an enormous cost to the health care system.⁴³

The total direct and indirect medical costs of those with diabetes in the U.S. are estimated to be \$327 billion in 2017.⁴⁴ West Virginia's total medical costs are estimated to be \$1.8 billion in 2017 and medical costs per patient at \$9,595 for patients with diabetes.⁴³ The total diabetes-attributable productivity losses due to morbidity, including presenteeism, household productivity, inability to work, and absenteeism, totaled an estimated \$880 million in 2017 in West Virginia.⁴³

Health care costs related to diabetes include direct costs from the condition itself as well as from related complications such as heart disease, stroke, blindness, kidney disease, and lower-limb amputations.⁴³ Among diabetes-related complications, the U.S. has seen the greatest decline in diabetes-related complications in heart disease, specifically heart attacks. The smallest decline in complications is in end-stage renal disease.⁴⁵ Continued focus on preventative care is vital to diminish the complications among those diagnosed and reducing the economic burden.

When evaluating the burden of diabetes, ensuring concentration on the anticipated rise in diabetes diagnoses is essential. The CDC estimates that nationally “the number of U.S. adults with diagnosed diabetes is projected to nearly triple, and the percent prevalence double” by 2060.⁴⁶ Such an increase in the prevalence of diabetes in West Virginia would be a staggering economic burden to an already overwhelming problem. This underlines the necessity for preventative care and treatment plans to effectively address diabetes in West Virginia.

F. BEHAVIORAL RISKS FOR DIABETES

Certain behaviors have been found to contribute to poor glucose regulation and put people at an increased risk for developing prediabetes and ultimately type 2 diabetes. Among these, weight gain, tobacco use, physical inactivity, and improper sleep have been shown to have the greatest impact. According to data from 2019, 39.7% of all adults in West Virginia were considered to have obesity and 32.3% were overweight.⁴⁷ An estimated 34.9% of adolescents were overweight or had obesity.⁴⁸

The major contributing factors of obesity are unhealthy dietary patterns and low activity levels. Guidance from the U.S. Department of Agriculture (USDA) recommends focusing on variety, amount, and nutrient-dense foods to achieve healthy dietary patterns⁴⁹. A healthy dietary pattern includes eating the recommended servings (within calorie limits) of fruits and vegetables, grains, dairy, protein, oils and reducing or eliminating added sugars, such as sugar-sweetened beverages (SSB).

In 2017 in West Virginia, 44.9% of adults consumed less than one serving of fruit each day, and 18.3% consumed less than one serving of vegetables each day.⁵⁰ Correspondingly, 45.8% of West Virginia youth reported they consumed fewer than one serving of fruit, and 44.6% consumed fewer than one serving of vegetables each day.⁵⁰ Nine out of every 10 adults (90.8%) in West Virginia consume fewer than five servings of fruits and vegetables each day.⁵¹ In West Virginia, 35.8% of adults consume at least one SSB a day and nationally 26.2% of adolescents consume SSBs at least one time per day.^{51,52}

The *Physical Activity Guidelines for Americans, 2nd edition*, recommends that all adults engage in 150 minutes of moderate-intensity aerobic activity and two days of muscle-strengthening activity each week.⁵³ Regular physical activity, moving more and sitting less, have tremendous benefits for everyone. According to data from 2018, West Virginia ranked 43rd among states for physical inactivity.⁴⁹ Additional surveillance from 2019 showed 28.2% of West Virginians reported doing no physical activity or exercise other than their regular job in the past 30 days.⁵⁴

Tobacco use is another major contributor to the development of type 2 diabetes. Research shows that smokers are up to 30-40% more likely to develop diabetes than non-smokers.⁵⁵ Based on data from 2018, more than a quarter of West Virginia adults (25.3%) smoke tobacco.⁵⁶ West Virginia currently has the highest rate of smoking among all states.⁵⁷

West Virginia also has a large number of people suffering from poor sleep hygiene. A lack of sleep, which is critical for a healthy body and immune functions, has been tied to several chronic health conditions including diabetes. One out of every three adults in the United States suffers from a lack of adequate sleep, which is defined as less than the recommended seven to eight hours nightly for adults. According to a 2019 analysis, 41.4% of West Virginians report sleeping on average less than seven hours per night.⁵⁸

G. SOCIAL DETERMINANTS OF HEALTH

Social determinants of health (SDOH) are the conditions in the places people live, learn, play, and work.⁵⁹ These conditions shape an individual's health risks and outcomes. The United States Office of Disease Prevention and Health Promotion's Healthy People 2020 groups the SDOH into a framework of five key areas: Health and Health Care, Education, Social and Community Context, Economic Stability, and Neighborhood and Built Environment.

Poor SDOH, where an individual lacks resources, can strongly impact the risk factors for many conditions including chronic diseases. Low income level or low educational attainment level, as well as factors like limited access to healthy foods (such as food deserts) are related to increased risk for type 2 diabetes. In 2017, the prevalence of diabetes for West Virginians who had less than a high school education was much higher than for other higher educational attainment levels.⁶⁰ Alternatively, the prevalence of diabetes was much lower among West Virginians who reported an income of \$75,000+, compared to individuals in lower-income levels.⁶⁰

"Social determinants of health play a significant role in influencing a person's ability to successfully prevent type 2 diabetes or manage diabetes and prevent dangerous and costly complications," according to Leandris Liburd, Ph.D., director of CDC's Office of Minority Health and Equity.⁶¹ Increasingly, SDOH are being recognized for the opportunities they present to counter the soaring incidence of diabetes and prediabetes. It is important to focus on addressing the effects of physical and social environment, which may include low educational attainment, low income, employment insecurity, poor living conditions on health outcomes.

Table 1. July 2020 Diabetes Prevention Recognition Program Report (n=2035)

Age Group	Number of People
18-44	563
45-64	1043
65+	429
Sex	
Males	439
Females	1586
Race	
Hispanic	22
Non-Hispanic White	1861
Non-Hispanic Black	42
Non-Hispanic AIAN	5
Non-Hispanic Asian	10
Non-Hispanic NHOPI	-
Other	95

Source: Centers for Disease Control and Prevention (July 2020). DPRP State-Level Evaluation Report: July 2020. *Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services.*

Because SDOH are shaped by the distribution of power, money, and other resources, the World Health Organization links SDOH to health inequities. Health inequities are different than health disparities. Health disparities are the disproportionate burden of illness, injury, disability, or mortality experienced by one group when compared to another group. Health inequities are unfair and avoidable differences in health status observed between different groups. These differences can be based on many factors, including age, gender, race, ethnicity, socioeconomic status, disability status, geography, sexual orientation, etc. These factors are usually not isolated from each other and may stack to increase health inequity effects.⁶² It is imperative and necessary to advocate for individuals with prediabetes or diabetes who are impacted by systemic health inequity, so that all West Virginians will have access to quality health care.

H. AN ASSESSMENT OF THE BENEFITS FOR DIABETES PREVENTION & MANAGEMENT STRATEGIES

To achieve diabetes management, prevention, and improve outcomes, it is essential to implement clinical care recommendations, also known as “Preventive Care Practices.”

The American Diabetes Association (ADA) updates practices annually, which include screening, diagnostic, and therapeutic actions such as:

1. Measuring blood pressure every office visit.
2. Regularly checking feet for sores and providing a thorough foot exam at least once a year.
3. Conducting laboratory testing such as A1C at least twice per year, as well as kidney function tests, and cholesterol tests.
4. Immunizing against flu, pneumococcal disease, and hepatitis B per guidelines,
5. Referrals for preventative exams such as a dental checkup twice a year.
6. An annual dilated eye exam.
7. Referring for Diabetes Self-Management Education and Support Services (DSMES).⁶³

DSMES Programming

Although clinical care represents a vital part of chronic disease management, complex conditions like diabetes benefit from a comprehensive, strategic approach that also include behavioral changes/self-management strategies, education, and support programs. These increase the likelihood of people with diabetes achieving control with their condition and reduce short- and long-term complications. The 2017 National Standards for Diabetes Self-Management Education and Support defines DSMES as “the ongoing process of facilitating the knowledge, skills, and ability necessary for diabetes self-care as well as activities that assist a person in implementing and sustaining the behaviors needed to manage his or her condition on an ongoing basis beyond or outside of formal self-management training.”⁶⁴ These standards are supported by professional organizations including the Association of Diabetes Care and Education Specialists (ADCES, formerly known as the American Association of Diabetes Care and Education Specialists/AADE) and the ADA. Under these standards, DSMES is noted as a “critical element” of care for people with diabetes.⁶⁵

In 2015, a joint position statement on DSMES was released by professional organizations including ADA, ADCES, and the Academy of Nutrition and Dietetics (AND), highlighting four times in care where it was critical to assess, provide, and adjust DSMES:

1. When type 2 diabetes is first diagnosed;
2. Scheduled annually to maintain health and prevent complications;
3. When new complications in self-management occur; and
4. When any transitions in care occur.⁶⁶

Medical Nutrition Therapy

An additional important modality of diabetes education and management is medical nutrition therapy (MNT). There is not one single dietary template that fits for all individuals with diabetes; it is important that diet reflects preference, culture, and local availability. After a new diagnosis of diabetes, it is important that patients receive individualized and/or group MNT provided by a registered dietitian nutritionist (RDN) who has diabetes-specific professional training. Studies have documented that MNT delivered by a RDN is associated with an A1C decrease of 0.3%-1% for those with type 1 diabetes and 0.5%-

2% for patients with type 2 diabetes.⁶⁷ The goal for including MNT in this care should be to promote healthy eating patterns for patients with diabetes while taking into account the patient as an individual. This includes their personal preferences, cultural background, health literacy, willingness to change their eating habits, other relevant medical conditions, lab values, barriers to change, etc.⁶⁸

Team-Based Care

Another proven method of diabetes management involves team-based care. The Community Preventive Services Task Force (CPSTF) recommends team-based care to manage type 2 diabetes based on strong evidence of effectiveness. In 1996, the U.S. Department of Health and Human Services established the CPSTF as experts with the mission to provide guidance and recommendations regarding community-based health promotion and disease prevention interventions. Recommendations are made based on scientific evidence and replicable, systematic reviews of the available literature. This specific CPSTF recommendation is based on results from a systematic review of 35 studies (the search period ranging from 1960 to October 2015) that evaluated the impact of team-based care on metrics like blood glucose, blood pressure, and lipid levels. Evidence demonstrates that team-based care results in better disease management which improves patients' blood glucose (measured using A1C levels), blood pressure, and lipid levels. Interventions also increase the proportion of patients who reach target blood glucose, blood pressure, and lipid levels.⁶⁹

Team-based care is a systems-level change that requires organizational buy-in from the health care provider. Key to this strategy is a multidisciplinary team that includes the patient, the patient's primary care provider (which does not automatically mean a physician), and at least one other health professional, but may include more. All team members are involved in the patient's diabetes care and management in some way.

Team-based care that focuses on diabetes control and management aims to do the following:

1. Ensure the patient receives all tests and examinations that are appropriate for their condition (e.g., blood glucose level, blood pressure, lipid level, weight, eye and foot examinations),
2. Manage and control the patient's risk factors (e.g., blood glucose level, blood pressure, lipid level) through medications as appropriate,
3. Educate and assist the patient with self-management strategies and in adherence to treatment regimens,
4. Promote and assist the patient in adopting healthy behaviors and lifestyle choices (e.g. better diet, physical activity, cessation of smoking), and
5. Overall improve the patient's quality of life and prevent complications related to their diabetes.⁶⁹

Interventions Engaging Community Health Workers/Care Coordinators

CPSTF also recommends social and medical support interventions that allow community health workers to help patients manage their diabetes, improve the patient's glycemic and

lipid values, and decrease the patient’s health care usage.⁷⁰ Economic evidence indicates these interventions are cost-effective. Interventions engaging community health workers for diabetes management aim to improve diabetes care and self-management behaviors among patients.

Community health workers (CHWs) (including *promotores de salud*, community health representatives, community health advisors, and others) work to connect health care systems and underserved communities. Community health workers can operate within intervention teams or as a single entity to deliver services and programs to those who need it most in a variety of settings. These settings include individual or group sessions and can take place within patients’ homes, the community, or in clinical settings.⁷⁰

There is specific evidence in West Virginia that CHWs can be an effective mode of diabetes management. Marshall University School of Medicine (MUSOM), a funded partner of the Bureau for Public Health, Division of Health Promotion and Chronic Disease (HPCD), developed a chronic care management model led by a team comprised of a mid-level provider, a nurse, and CHWs (see Appendix D). The role of the team is to receive referrals for diabetes management from providers, assess patients’ level of risk, and enroll eligible patients in intensive management. The CHWs help link patients with community services and conduct regular home visits to assist patients with medication adherence, chronic disease self-management, healthy eating, and active living goals. The CHWs can interact with patients in the comfort of their homes as trusted members of the community while understanding the culture, language, and life experiences of the neighborhood.⁷¹

	Number of Patients	Percent of Cohort	Mean Baseline A1C	Mean Last A1C	Percent Difference
Improved A1C	109	67	10.2%	8.3%	-1.9
Increased A1C	49	30	8.5%	9.8%	+1.3
No Change	4	2	9.3%	9.3%	0

Source: Marshall University School of Medicine Chronic Care Management Model, see Appendix D.

In MUSOM’s chronic care management program, enrollment of high-risk patients has occurred continuously since May 2017. As of September 2020, 326 high-risk patients have been enrolled by 14 Federally Qualified Health Centers (FQHCs) in West Virginia. The health centers employ a total of 13 CHWs. The most prevalent chronic condition of the enrolled patients is diabetes. Of these patients, 162 have been enrolled long enough to have a baseline and at least a six-month follow-up A1C test. The change in the mean A1C from baseline to follow up is presented in Table 2. The mean change in A1C status was 1.9 percentage points lower during this time period. Sixty-seven percent (109/162) of the cohort lowered their A1C during this time period.⁷¹

MUSOM has a CHW partnership with two Medicaid managed care organizations in West Virginia, the Health Plan and Aetna Better Health. The Health Plan produced an actuarial study on their members who have been enrolled in a CHW program for 12 or more months. The costs for these patients decreased by 47% compared to 24 months prior to enrollment. An actuarial study from Aetna is expected before the end of 2020.⁷¹

In addition to state CHW successes, the Affordable Care Act of 2010 gave state Medicaid agencies the option of creating Health Homes to provide a comprehensive system of care coordination for Medicaid individuals with chronic conditions. The Health Homes initiative identifies the health care and social needs of patients by connecting them with the medical, behavioral health, and social service resources that will best address their needs. After the patient's needs are identified, the Health Home initiative provides comprehensive care management, health promotion, and social support services.

Two Health Homes have been established in West Virginia. The first Health Home began in July 2014 in a six-county area in southern West Virginia for eligible Medicaid members with bipolar disorder and infected with or at risk of infection by hepatitis B or C. In April 2017, the Health Home concept expanded statewide, and a second Health Home started in April 2017 as a pilot program designed for eligible Medicaid members with prediabetes, diabetes, or obesity and at risk of having anxiety or depression. This pilot program is in a 14-county region in West Virginia.

Community Clinic Linkages

An effective approach to manage and prevent diabetes that is recently receiving emphasis amongst many public health leaders is the use of clinic community linkages. Community clinic linkages are the connections between the community and clinical sectors that help to improve public health.⁶⁹ Community clinic linkage-focused strategies seek to improve access to preventive services, community-level activities, and appropriate medical treatment. These collaborations have been shown to reduce and prevent disease in communities.⁷² Effective community clinic linkages provide patients with additional support in changing unhealthy behaviors, enable clinicians to offer services to patients that they cannot provide themselves, and enable community programs to connect with clients for whom their services were designed.⁷²

West Virginia diabetes work includes an innovative community clinic linkage initiative funded by HPCD and managed and promoted by West Virginia University School of Public Health, Office of Health Services Research (WVU OHSR). WVU OHSR has a four-decade history in building and sustaining clinic-community linkages. WVU OHSR assists primary care centers in accurately tracking patient outcomes, benchmarking care against national standards, and modifying clinical policies and procedures for improved outcomes. This is a three-fold effort, comprised of: support in use of electronic health records (EHRs) and registries to monitor and target care, provider and staff training/education on chronic disease prevention and management, and assistance in the use of outcomes data for quality improvement.

West Virginia Health Connection (WVHC) helps to facilitate clinical-community linkages to support improved health and social wellbeing, focusing first on diabetes and hypertension prevention and management. WVHC is a system for patients to discover community wellness programs that are convenient and accessible. To do this, WVHC links health care providers to local chronic disease prevention services and connects patients to health promotion programs while also allowing for outcomes to be tracked over time. WVHC is an initiative that utilizes HIPAA-compliant software offering data tracking, reporting, and referrals as well as a public website offering program availability, logistics, and mapping. WVHC offers technical assistance to clinical and community-based partners to support:

1. Awareness of available community-based programming;
2. Referrals to community-based programming;
3. Ability to track health outcomes securely and reliably;
4. Ability to measure effectiveness of programming and demonstrate value;
5. Communication and collaboration around critical public health issues; and
6. Promoting a culture of health statewide.

WVHC can offer diverse and multidisciplinary technical assistance because of the wide array of state-wide stakeholders they collaborate with including: coalitions, community-based organizations, extension agents, local health departments, payors, pharmacies, primary care settings (FQHCs, rural health clinics, community hospitals), state public health leadership, state-based organizations, universities, and wellness facilities. The diabetes prevention and management programs that WVHC support include the National Diabetes Prevention Program, Chronic Disease Self-Management Education, Diabetes Self-Management Education and Support, Chronic Disease Self-Management Program, and the Chronic Pain Self-Management Program.

Over the past three and a half years, WVHC has collected and managed state-wide data for clinic and community-based programming among 191 site locations, and 280 leaders/coordinators. Additionally, 612 workshops/trainings have been tracked with a total of 2619 participants.

National Diabetes Prevention Program

When examining diabetes prevention evidence, multiple research studies over the past 25 years have been conducted in the United States and around the globe including China, Finland, India, and Sweden. These studies demonstrate that lifestyle change can prevent or delay the onset of type 2 diabetes by 45-58% in individuals with prediabetes or a high risk of developing diabetes.^{64,65,66,73} Long-term follow-up from 15-23 years shows a reduction in type 2 diabetes as well as other chronic diseases and all-cause mortality among certain populations.^{73,74,75,76}

The amount of weight loss, and the ability to maintain weight loss is the primary predictor in reducing the incidence of type 2 diabetes. Research suggest that for every two pounds of weight loss, participants in the Diabetes Prevention Program (DPP) experienced a 16% reduction in the development of type 2 diabetes.^{77,78} Participants in this DPP trial lowered their body weight by approximately 7% after one year (decreasing to a weight loss of about 4% after four years), which led to a 58% reduction in the risk of progressing to type

2 diabetes over three years compared with standard lifestyle recommendations plus a placebo. In comparison to drug therapy with Metformin, this intervention proved to be more effective.⁷⁹ Additionally, individuals were able to maintain weight loss by reaching the daily physical activity goal, which is a critical aspect in diabetes management.^{80,81}

According to the CDC, the National Diabetes Prevention Program (National DPP) is a public/private partnership working to offer evidence-based, cost-effective interventions across the U.S. with the goals of reducing the growing problem of prediabetes and type 2 diabetes as well as to build on the DPP trial results with a focus on scalability.⁸² Organizations who offer DPP must incorporate three components to apply for CDC recognition through the Diabetes Prevention Recognition Program (DPRP): use a CDC-approved curriculum to increase physical activity to encourage weight loss, provide a lifestyle coach, and provide a support group for program participants. To achieve recognition, data on participant weight and number of minutes of physical activity must be provided annually to the CDC. By providing this data, the CDC is able to evaluate the program impact on preventing the onset of type 2 diabetes.⁸²

Combined diet and physical activity promotion programs are effective in reducing new-onset diabetes, increasing reversion to normoglycemia, and improving diabetes and cardiometabolic risk factors in persons at increased risk for type 2 diabetes.⁸³ People who have received diabetes education are more likely to:

1. Use primary care and preventive services;
2. Take medications as prescribed;
3. Manage their blood glucose, blood pressure, and cholesterol levels; and
4. Have lower health costs.⁸⁴

According to a recent West Virginia study conducted with participants from the greater Morgantown and Charleston areas, community-based intervention programs can be successful in helping individuals with dysglycemia (abnormal glucose control) to make positive lifestyle changes and self-manage their chronic conditions.⁸⁵

Another recent analysis examined the return on investment for West Virginians participating in lifestyle change programs to prevent diabetes. WVU OHSR collected and analyzed data from 320 West Virginians who completed a National DPP. Participant attendance locations included 16 site locations in eight different health systems. Of this group, 32.4% encountered a diabetes risk reduction, and health care savings per year totaled an estimated \$341 per person, at a program cost of \$50 per person. Those that completed the program experienced an increase of 1:1 quality-adjusted life years.⁸⁶

Sugar Sweetened Beverage Policy

Numerous studies show a clear link between excessive consumption of soda and other sugary drinks to the nation's epidemic of obesity, diabetes, and other chronic diseases. In 2019, the American Academy of Pediatrics and American Heart Association released a recommendation calling for public policies to reduce consumption of added sugars including consideration of approaches that increase the price of sugary drinks such as excise tax.⁸⁷ According to estimates from the Harvard CHOICES project, a 1-cent-per-

ounce tax on sugary sweetened beverages could reduce the state's diabetes incidence rate by 8% over 10 years, while a 2-cent-per-ounce tax could result in a 15% reduction.⁸⁸

Telehealth

The utilization of telehealth is another promising diabetes prevention and management intervention. Substantial evidence supports its value in the management of adult and pediatric diabetes.^{89,90,91,92}

The CDC describes the many benefits of DSMES delivery via telehealth: "(1) It is scalable; (2) It is reimbursable; (3) It provides a way to reach more people with diabetes in less time; (4) It provides an affordable way to effectively and efficiently reach underserved populations; (5) It can increase access by addressing barriers such as transportation and area-specific provider shortages; (6) It can be easy to engage some people with diabetes with a smartphone, app, or other technology; (7) It may require less staff time for follow-up; and (8) It can bridge the gap between in-person visits."⁹³

According to BroadbandNow, a for-profit group that combines public and private datasets to map broadband coverage and quality nationally, West Virginia ranks 44th lowest in connectivity among all states.⁹⁴ There are an estimated 403,000 residents without a wired broadband (25 Mbps or more) internet connection, and approximately 399,000 West Virginians have a single option when selecting a wired internet service provider. Only 39.3% of West Virginians have an internet plan that costs less than \$60 per month.

I. HIGH-IMPACT & OUTCOME-DRIVEN STRATEGIES FOR DIABETES PREVENTION & MANAGEMENT

In September 2018, the Bureau was awarded funds under a 5-year cooperative agreement with the CDC to address the serious national health problems of diabetes, heart disease, and stroke. The agreement supports the following efforts:

1. Prevent or delay the development of type 2 diabetes in people at high risk;
2. Improve the health of people living with diabetes; and
3. Prevent and manage cardiovascular disease.

The Bureau has formed synergistic partnerships to optimize diabetes management and decrease diabetes prevalence. Although entities aim to advance diabetes prevention and management and work to decrease the prevalence of diabetes in West Virginia, the major partners brought together by the Bureau include:

1. Division of Health Promotion and Chronic Disease (HPCD)
2. West Virginia University Office of Health Services Research (WVU OHSR)
3. West Virginia State Office of Rural Health
4. Marshall University
5. West Virginia Academy of Family Physicians.

These partners are working towards several long-term goals related to diabetes prevention and management, specifically working within health systems and communities

to implement programming and policy changes to support these goals. The long-term goals include:

1. Create community environments that encourage healthy living to reduce the prevalence of diabetes in West Virginia;
2. Expand the reach of National DPP in West Virginia;
3. Implement or strengthen Diabetes Self-Management Education and Support (DSMES) coverage policies among public; and
4. Increase enrollment in CDC-recognized lifestyle change programs.

The following tables outline the partnerships between the organizations listed above, short-term goals, and general evaluation of the activities that align with the above long-term diabetes prevention and management goals.

Table 3. Long-Term Goal 1: Create community environments that encourage healthy living			
Activity	Responsible Entity	Short-Term Goal	Evaluation Strategy
Allocate funding for mini-grants to address and sustain physical activity and nutrition policy, systems, and environmental (PSE) changes in West Virginia communities	HPCD	Fund community-based organizations, worksites, and other entities for health promotion work	Assessment of PSE changes made after each grant cycle
Recognize West Virginia communities that have created community environments that promote healthy living through the Healthy People Healthy Places Recognition Program	HPCD	See growth in the number of communities recognized from year to year	Increase in communities that apply for recognition, change in policies over time for repeat applicants
Create the West Virginia Health Equity Action Team to examine the health needs of disenfranchised communities in West Virginia	HPCD Office of Rural Health Office of Minority Health Division of Tobacco Prevention	Conduct needs assessment of racial and ethnic minorities and LGBTQ+ people in West Virginia	Completion of needs assessment

Table 4. Long-Term Goal 2: Expand the reach of National Diabetes Prevention Programming in West Virginia

Activity	Responsible Entity	Short-Term Goal	Evaluation Strategy
Expand the availability of National DPP as a covered benefit for Medicaid, state/public employees, employees of private sector organizations	West Virginia Academy of Family Physicians Marshall University WVU OHSR	Collaborate with insurers and employers to strategize a plan to obtain National DPP coverage and reimbursement	Assess commitment in implementing a plan to expand National DPP as a covered benefit
Implement a National DPP value-based payment system in rural hospitals	HPCD West Virginia State Office of Rural Health West Virginia Hospital Association WVU OHSR Marshall University	Provide technical assistance to rural hospitals that implement a National DPP value-based payment system	Measure outcomes of the National DPP value-based payment system
Train small rural hospitals on virtual National DPP implementation, SMBP implementation, value-based payment schedule	HPCD West Virginia Hospital Association West Virginia Academy of Family Physicians Marshall University	Expand lifestyle management programs in rural areas	Number of small rural hospitals that offer lifestyle management programs
Provide National DPP Lifestyle coach trainings	HPCD Marshall University WVU OHSR	Offer training in areas of the state that are underrepresented in National DPP	Number of certified lifestyle coaches
Provide training to National DPP sites in West Virginia on how to utilize WVHC	HPCD WVU OHSR	All National DPP sites in West Virginia trained on the utilization of WVHC	Number of sites that completed training on utilization of WVHC

Table 5. Long-Term Goal 3: Implement or strengthen Diabetes Self-Management Education and Support coverage policies among public or private insurers or employers

Activity	Responsible Entity	Short-Term Goal	Evaluation Strategy
Improve coverage policy for DSMES with Well@Work participants	WVU OHSR West Virginia Academy of Family Physicians	Support policy changes in workplaces for improved coverage	Number of workplaces DSMES coverage policies reported
Increase Medicaid coverage for DSMES services for West Virginia Bureau for Medical Services (BMS)	BMS WVU OHSR	Collaborate with BMS to strategize and establish a plan to standardize coverage	Assessment of change in Medicaid coverage for DSMES services
Expand policy library to provide guidance to employers and health care systems to implement sustainable changes to DSMES policies	HPCD WVU OHSR	Incorporate DSMES policies into existing policy library	Assessment of the number of policies provided pre- and post-expansion
Obtain coverage for DSMES and medical nutrition therapy (MNT) via telehealth services for Medicaid recipients	HPCD West Virginia Academy of Family Physicians WVU OHSR	Support health systems that are implementing telehealth services and evaluate outcomes	Measured expansion for DSMES and MNT via telehealth obtained for Medicaid recipients
Offer technical support to health care facilities for DSMES billing processes	HPCD West Virginia Academy of Family Physicians WVU OHSR Marshall University	Create technical support documentation for health care facilities	Assessment of the technical support provided to health care facilities

Table 6. Long-Term Goal 4: Increase enrollment in CDC-recognized lifestyle change programs

Activity	Responsible Entity	Short-Term Goal	Evaluation Strategy
Train staff at health systems on how to use electronic health records data to identify patients with or at-risk for prediabetes	HPCD WVU OHSR	Recruit health systems and provide training to identify patients with or at-risk for prediabetes	Number of patients identified through EHR and number participating health systems
Train staff at health systems on prediabetes standards of care and management, knowing when and how to refer patients to WVHC, and patient follow-up guidance	HPCD WVU OHSR Marshall University	Recruit health systems and provide training to increase referrals for National DPP enrollment	Number of patients referred through EHR and number of participating health systems
Provide referral process education to providers to help refer patients to evidence-based programming for diabetes prevention and management	HPCD WVU OHSR West Virginia Academy of Family Physicians	Disseminate referral process education materials to providers	Number of provider-participants participating in referral training
Extend the WVHC referral process to incorporate provider feedback loop	HPCD WVU OHSR	Create and implement provider feedback loop	Provider feedback loop is implemented
Provide an online resource that identifies all diabetes prevention and management programs with contact information in the state	HPCD WVU OHSR	Keep the online resource updated with diabetes prevention and management programs in West Virginia	Number of website hits where resource is housed
Provide funding for DSMES programs to become ADA-recognized/ADCES-accredited	HPCD Marshall University WVU OHSR	Recruit and provide technical assistance with current and potential DSMES programs that are not recognized or accredited	Number of programs that become ADA-recognized/ADCES-accredited

J. ACTIONS TO IMPROVE DIABETES OUTCOMES

The following policy recommendations by the Task Force will create community environments that encourage healthy living and reduce the prevalence of diabetes in West Virginia. Positive change will result from expanding the reach of the National DPP implementing and strengthening DSMES coverage policies and increasing enrollment in CDC-recognized lifestyle change programs.

Policy Recommendation #1: Modify the Soft Drink Tax Code

- Increase the per ounce tax rate in W.Va. Code §11-19-2 for sugar-sweetened beverages (current rule from 1951 taxes requires \$0.01 per 6.9-ounce bottle of soda).
- Remove carbonated water and diet soft drinks from the list of items included in the sugary beverage tax (current rule from 1951 includes these beverages).
- Allocate a percentage of the revenue from the tax increase towards obesity prevention programming.

Policy Recommendation #2: Expand Broadband Accessibility to Improve Health Equity via Telehealth

- The COVID-19 pandemic response has illuminated the need for telehealth via broadband internet access.
- In 2019, West Virginia ranked in the bottom tier for broadband internet access in the U.S. (West Virginia Broadband Enhancement Council).
- Broadband internet access has become a super-determinant in health equity and impacts health care access and public health outcomes.⁹⁵

Policy Recommendation #3: Increase Insulin Availability

- Creation of a discounted insulin purchasing program for West Virginia residents who are not covered by a state-regulated health insurance plan and who are diagnosed with diabetes (type 1, type 2, and gestational) and using insulin for treatment.
- This would produce health benefits for:
 - Individuals relying on Medicare Part B for insulin assistance.
 - Individuals who are uninsured.

Policy Recommendation #4: Conduct a Marketing Campaign to Increase Awareness of National DPP and DSMES Programs

- Surveys completed by the Task Force reflect a limited public awareness of diabetes prevention and management programs (see Appendix B).
- Recent studies show marketing campaigns to be effective in increasing participation in National DPP.⁹⁶
- The marketing campaign should include targeted recruitment of men and racial and ethnic minority participants in National DPP.

Policy Recommendation #5: Require Coverage/Reimbursement for National DPP and DSMES with Medicaid Beneficiaries; State/Public Employees; Employees of Private Sector Organizations

- Research and evaluation indicate improved health outcomes after participation in National DPP and DSMES.^{97,98,99}
- National DPP and DSMES are proven to improve clinical outcomes, health status, and quality of life.^{98,99}

K. CONCLUSION

In accordance with West Virginia Code §16-1-21, the Bureau convened a Task Force of diverse stakeholders from various sectors across the state to address diabetes prevention and management in West Virginia. The Task Force incorporated contributions from all the members into a collective approach aimed at:

1. Improving prevention of obesity and diabetes;
2. Improving diabetes management and treatment; and
3. Decreasing diabetes prevalence in West Virginia via policy strategies, health care system strategies, and community strategies.

The data and gap analysis offers insight into the need for a Diabetes Action Plan in West Virginia. West Virginia ranks first in the nation for the number of adult citizens diagnosed with diabetes (15.7%), 6.1% of West Virginia women who gave birth in 2019 had gestational diabetes mellitus, and West Virginia ranks relatively high for diabetes in West Virginians under the age of 18.^{42,11,20} Moreover, addressing the prevalence of diabetes in West Virginia will simultaneously address the prevalence of other types of chronic health conditions as people with diabetes have an increased risk of developing other chronic diseases and serious health problems.

The activities, short-term goals, and evaluative measures outlined in this Diabetes Action Plan will address the prevalence of diabetes within the state. This collaborative effort between HPCD and key partners furthers the broader long-term goals of creating community environments that encourage healthy living, expanding the reach of National DPP in West Virginia, implementing or strengthening DSMES coverage policies among the public, and increasing enrollment in CDC-recognized lifestyle change programs.

For maximum results in the state's effort to reduce the prevalence of diabetes and provide support to West Virginians who have been diagnosed with diabetes, the Task Force makes the following recommendations:

1. Modernize taxation of sugary beverages;
2. Expand broadband internet accessibility to improve health equity via telehealth;
3. Increase insulin availability;
4. Conduct a marketing campaign to increase awareness of National DPP and DSMES programs; and

5. Require coverage/reimbursement for National DPP and DSMES with Medicaid beneficiaries, state/public employees, and employees of private sector organizations.

In conjunction with the planned action by HPCD and its state partners, and with legislative support for the proposed policy recommendations, West Virginia can improve prevention efforts for obesity and diabetes, improve diabetes management and treatment, and decrease the prevalence of diabetes.

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APPENDIX A. DIABETES ACTION PLAN LIST OF CONTRIBUTORS

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APPENDIX B. SURVEY FOR STATE STAKEHOLDERS



Survey Questions for Communities and Community Members Regarding Diabetes Management and Prevention

The West Virginia Department of Health and Human Resources, Bureau for Public Health is conducting a brief survey to better understand diabetes prevention, management tools and resources available for communities. This survey has been approved by the Diabetes Action Plan Task Force. The information you provide will be vital in the development of the West Virginia Diabetes Action Plan. Your opinion is valued and will enhance care for those in your community with pre-diabetes or diabetes. Responses from this survey will be kept confidential and anonymous.

Thank you in advance for your time and input.

1. What gender do you identify as?
 - Female
 - Male
 - Non-binary/third gender
 - Prefer to self-describe
 - Prefer not to say
2. Please specify your ethnicity
 - Hispanic or Latino
 - Not Hispanic or Latino
 - Prefer not to say
3. Please specify your race
 - American Indian or Alaska Native
 - Black or African American
 - Asian
 - Native Hawaiian or Other Pacific Islander
 - White
 - Prefer not to say
4. What is your zip code?
5. Have you ever been screened for pre-diabetes?
 - Yes
 - No
 - I do not know
6. Have you ever been diagnosed with pre-diabetes?
 - Yes
 - No
 - I do not know

7. When was the last time since you had a check-up/ preventative wellness visit with a Physician or Health Care Provider?
- Last 12 months
 - 2 years ago
 - 3 years ago
 - More than 3 years ago
 - I don't remember
 - I've never had one
8. Have you ever been diagnosed with diabetes?
- Yes
 - No
 - I do not know
9. Which type of diabetes were you diagnosed with?
- Type 1 diabetes
 - Type 2 diabetes
 - Gestational diabetes (elevated blood sugar during pregnancy)
 - I do not know
10. Have you ever received treatment for pre-diabetes or diabetes?
- Yes
 - No
 - I do not know
11. If you answered "yes" to question 7, what type of treatment have you received for pre-diabetes or diabetes? (select all that apply)
- Encouraged to maintain healthy weight
 - Encouraged participation in physical activity
 - Encouraged to stop smoking
 - Prescribed medication
 - Received basic nutrition education
 - Received Medical Nutrition Therapy with Dietitian
 - Participated in a Lifestyle Change Program
 - National Diabetes Prevention Program
 - Chronic Disease Self-Management Program
 - Diabetes Self-Management Education Program
 - Other
12. What programs have you been referred to for diabetes prevention or management? (select all that apply)
- National Diabetes Prevention Program/Lifestyle Coach Program; Prevent T2
 - Chronic Disease Self-Management Programs
 - Diabetes Education Empowerment Education Workshops
 - Gateway Diabetes and Cardiovascular Guidelines
 - Diabetes Education Accredited Programs
 - 1:1 Sessions with a Dietitian - Medical Nutrition Therapy

- 1:1 Sessions with Certified Diabetes Care and Education Specialists
- Other

13. Are you aware of diabetes management or prevention classes offered in your community?

- Yes
- No

14. What barriers do people face in your community that would make it difficult to participate in group or individual counseling to improve diabetes prevention or management? (select all that apply)

- Awareness/knowledge of programs
- Lack of programs
- Lack of screening
- Insurance coverage
- Other

List other barrier(s):

15. What diabetes services are lacking or inadequate in your community? (select all that apply)

- Public awareness and education about diabetes
- Lifestyle management classes
- Medical Nutrition Therapy (1:1 counseling with dietitian)
- Financial assistance/better insurance coverage for diabetes
- Insulin pump therapy
- Exercise facilities
- I don't know

16. What are the top two barriers for obtaining insulin medication to manage diabetes?

- Lack of adequate Insurance benefits/ Loss of insurance
- High out of pocket costs/ diabetes specific financial stress
- Having to choose between purchasing insulin or paying bills
- Lack of community resources to provide free or reduced insulin
- Access to Health Care
- Delay by Health Care Provider to refill insulin prescription
- Life transitions that delay access to insulin (moving, changing health care providers, moving from pediatric to adult care, new insurance, new medication prescription)
- Lack of transportation to pick-up insulin
- Other
- Comment

17. How familiar are you with the content of the National Diabetes Prevention Program - Lifestyle Coach Program: Prevent T2?

- Very familiar
- Somewhat familiar
- Not familiar with the content
- Never heard of the program

18. Have you ever participated in individual or group diabetes classes to prevent or manage diabetes?
- Yes
 - No
 - I don't know
19. Please highlight any diabetes projects/initiatives in your community. (list examples)
20. Have you had additional concerns about your diabetes management or your family member's diabetes management due to COVID-19? If so, please list examples:
21. Thank you for completing the survey. Is there anything else you'd like us to know about pre-diabetes and diabetes management in your community?

Pediatric Questions:

1. Do you have a child/children?
 - Yes
 - No
2. Please specify your child's gender?
 - Female
 - Male
 - Prefer not to say
3. Please specify your child's race?
 - Hispanic or Latino
 - Not Hispanic or Latino
 - Prefer not to say
4. Please specify your child's ethnicity.
 - American Indian or Alaska Native
 - Black or African American
 - Asian
 - Native Hawaiian or Other Pacific Islander
 - White
 - Prefer not to say
5. Has your child ever been screened for pre-diabetes or diabetes?
 - Yes
 - No
 - I do not know
6. Do you have a child who has been diagnosed with pre-diabetes?
 - Yes
 - No
 - I do not know
7. In which age range was your child diagnosed with pre-diabetes?
 - <4yrs old

- Preschool (4-5)
 - Childhood (5-12)
 - Teenager (13-18)
8. Do you have a child who has been diagnosed with diabetes?
- Yes (If you answered “yes”, please continue to questions 6-10.)
 - No
 - I do not know
9. Which type of diabetes was your child diagnosed with?(majority voted to remove GDM as an option)
- Type 1 diabetes
 - Type 2 diabetes
 - I do not know
10. At what age was your child diagnosed with diabetes?
- <4yrs old
 - Preschool (4-5)
 - Childhood (5-12)
 - Teenager (13-18)
11. After being diagnosed, were they referred to anyone? If yes, who?
- Yes, Referred to: _____
 - No
 - I do not know
12. Are you aware of diabetes management or prevention classes for children/adolescents offered in your community?
- Yes
 - No
13. Have you had additional concerns about your child’s diabetes management due to COVID-19? If so, please list examples:

Survey Questions for Insurance Companies/Payers/Employers Regarding Diabetes Management and Prevention

The West Virginia Department of Health and Human Resources, Bureau for Public Health is conducting a brief survey to better understand diabetes prevention and management resources that are provided by managed care organizations (MCOs), insurers and/or employers. The information will be vital in the development of the West Virginia Diabetes Action Plan. This survey has been approved by the Diabetes Action Plan Task Force. The insight you provide will be utilized to assess current practices and identify opportunities to enhance diabetes care. All information will be confidential and compiled as aggregate data.

Thank you for your time and input to improve the health of all West Virginians.

1. Select which best applies to you. (New proposed question)
 - a. Employer organization company (fill in the blank-List the name of the Insurance company)
 - b. Insurance company (fill in the blank)
 - c. Other _____
2. Does your organization provide coverage for participation in the National Diabetes Prevention Program?
 - Yes, covered by insurance
 - Yes, offered by employer wellness
 - No
 - I do not know
3. Does your organization provide coverage for any of the following? (select all that apply)
 - Diabetes Education Empowerment Program Workshops (licensed by University of Illinois)
 - Diabetes Self-Management Education Programs (licensed by Self-Management Resource Center)
 - Diabetes Education Accredited Programs through Association of Diabetes Certified Education Specialists (ACDES)
 - Individual counseling by a Certified Diabetes Education Care Specialist
 - Chronic Disease Self-Management Program (licensed by Self-Management Resource Center)
 - Medical Nutrition Therapy
 - None
 - Other

Please list the other American Diabetes Association recognized, or Association of Diabetes Care and Education Specialist accredited diabetes self-management programs that your organization provides coverage for:

4. Does your organization offer incentives for weight loss?
 - Yes (short answer)
 - No
 - I do not know

5. Does your organization offer discounts for memberships to fitness centers?
 - Yes (short answer)
 - No
 - I do not know

6. Does your organization provide coverage for sessions with a certified fitness trainer?
 - Yes
 - No
 - I do not know

7. Please identify the type of diabetes management education your organization provides coverage for:

8. Please describe policies addressing diabetes prevention adopted by your organization:

9. Does your organization offer additional resources to your members with diabetes or pre-diabetes as a response to COVID-19?
 - Yes
 - No
 - I do not know

10. Thank you for completing this survey. Do you have any additional comments on priorities for the West Virginia Diabetes Action Plan?

Survey Questions for Health Care Team Members Regarding Diabetes Management and Prevention

The West Virginia Legislature has directed the West Virginia Department of Health and Human Resources, Bureau for Public Health to develop the West Virginia Diabetes Action Plan. We need your input to develop effective interventions and strategies for disease management and prevention. This survey has been approved by the Diabetes Action Plan Task Force. Please answer the questions to the best of your ability and provide comments as desired. Names will not be published, and data will be reported in aggregate form only.

Thank you for investing in the health of West Virginians.

1. Are you completing the survey on behalf of your organization or as an individual?

- Name:
- Organization:
- Email Address:

What referrals have you made for patients in need of diabetes prevention or management? (select all that apply)

- National Diabetes Prevention Program/Lifestyle Coach Program; Prevent T2
- Chronic Disease Self-Management Programs
- Diabetes Education Empowerment Education Workshops
- Gateway Diabetes and Cardiovascular Guidelines
- Diabetes Education Accredited Programs
- Medical Nutrition Therapy
- 1:1 Sessions with Certified Diabetes Care and Education Specialists
- None of the above
- Developed own curriculum

Please describe the curriculum you developed:

1. What tools do you use to link patients to diabetes prevention or management programs?

- Electronic referral form
- Phone call
- WV Health Connection
- Other: _____

2. How do you identify patients that need a referral?

- Electronic health record data mining/query
- When a patient asks for referral
- When a patient experiences a continual rise in HbA1C
- No process for referral in place
- Other: _____

3. Do you or does your facility charge for diabetes education or prevention?
 - Yes
 - No
 - I do not know

4. If you or your facility charge for diabetes education or prevention, which payors provide reimbursement? (select all that apply)
 - Medicare
 - Public Employee Insurance Agency (PEIA)
 - Aetna Better Health WV
 - West Virginia Family Health
 - UniCare
 - The Health Plan
 - Blue Cross Blue Shield
 - UMWA Health and Retirement Funds: 1993 Plan Individual Employer Program of Benefits
 - Mountain Health Choices
 - Other

5. Do you or your facility have a Certified Diabetes Care and Education Specialist or Licensed Dietitian on the team?
 - Yes (please list names below)
 - No
 - I do not know
 - Other _____

List names: _____

6. Do you or your facility have staff trained to present National Diabetes Prevention Programs, Diabetes Self-Management Education and Support, Chronic Disease Self-Management Program, or Diabetes Self-Management Programs?
 - Yes (please list names and email address or phone number below)
 - No
 - I do not know
 - Other _____

List names/email addresses/phone numbers: _____

7. What training have you or staff at your facility received?
 - National Diabetes Prevention Program (DPP)
 - Diabetes Self-Management Education and Support (DSMES)
 - Chronic Disease Self-Management Program (CDSMP)
 - Diabetes Self-Management Program (DSMP)

Please list names of staff trained to present National DPP, DSMES, CDSMP, or DSMP on the team:

8. Are you willing to offer telehealth services for diabetes management and prevention?
- Yes
 - No
 - I do not know
9. Would you like technical assistance for offering telehealth services for diabetes management and prevention?
- Yes
 - No
 - I do not know
10. If patients are referred for diabetes prevention or management programs, what potential barriers or challenges do they report? (select all that apply)
- Transportation
 - Cost
 - Lack of patient engagement
 - Other: _____
11. Are there any policies that West Virginia needs to put into place to help you in caring for your patients with diabetes or related chronic diseases?
- Yes
 - At the state levels
 - At the level of your health organization
 - Other: _____
 - No
 - I do not know
12. Please list any policies at the state level that you feel needs to be put into place to help you in caring for your patients with diabetes or related chronic diseases:
13. Please list any policies at the level of your health care organization that needs to be put into place to help you in caring for your patients with diabetes or related chronic diseases:
14. Please list any other policies that needs to be put into place to help you in caring for your patients with diabetes or related chronic diseases:
15. Since COVID-19 restrictions, what do you think needs to be available for your patients with pre-diabetes or diabetes to optimize health outcomes?
16. Thank you for completing this survey. Do you have any additional comments on priorities for the West Virginia Diabetes Action Plan?

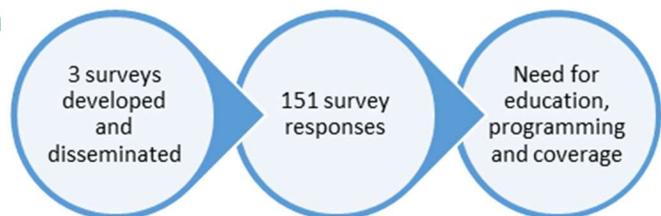
APPENDIX C. PRELIMINARY ANALYSIS OF SURVEYS DISSEMINATED TO STATE STAKEHOLDERS IN WEST VIRGINIA FOR THE DIABETES ACTION PLAN

Survey Development and Data Collection

The West Virginia Department of Health and Human Resources, Bureau for Public Health, Division of Health Promotion and Chronic Disease (HPCD) and Diabetes Action Plan (DAP) Task Force members developed surveys to obtain input from stakeholders across the state. The surveys were approved by the DAP Task Force then built in a secure web application, REDCap (Research Electronic Data Capture) to allow for electronic dissemination, which included questions specific to each targeted audience. Surveys were conducted to better understand diabetes prevention and management tools and resources available for communities and provided by managed care organizations, insurers and/or employers. The intent was to gather information to be used for refining development and sustainability of interventions and strategies for disease management and prevention. Surveys were disseminated to the following targeted audiences from September 24, 2020 through November 2, 2020: 1) health care teams, 2) payor/insurance companies/employers, and 3) communities and community members. Results are included except for among payor/insurance companies/employers due to too low of a response rate to reliably interpret.

Results

Survey results were reviewed and interpreted by the Writer's Committee for dissemination to the DAP Task Force. Most respondents had a check-up/preventive wellness visit with a primary care provider within the past 12 months. The majority of adults reported they were screened for prediabetes but did not meet diagnosis criteria, whereas a good portion of children represented reported never being screened for prediabetes or diabetes. Most adults received some type of treatment for prediabetes or diabetes with a higher number of responses indicating receiving encouragement to maintain healthy weight/participation in physical activity or medication prescription. There were limited responses for lifestyle programming as a treatment option. Furthermore, awareness/knowledge of management or prevention classes offered in the community was limited along with insurance coverage for these programs. Additionally, the top barrier for obtaining insulin medication to manage diabetes was high out-of-pocket costs.



For the health care survey, referrals to group classes were limited compared to individual sessions. Electronic referral forms were the preferred method. Currently, patients are identified for referral via one of three ways: the electronic health record, when a patient experiences a high HbA1c, or when the patient asks for a referral. Some primary care providers were not aware if they had staff trained in chronic disease programming. A majority were willing to provide programming or telehealth services as long as there was

coverage. Some potential barriers for participation in programming are transportation, cost, or lack of patient engagement. Moreover, additional policies at the state level were requested when caring for patients with diabetes or related chronic diseases.

Looking Forward

Overall, these survey results along with other data sources and support will be used to drive recommendations for the Diabetes Action Plan for the State of West Virginia. There will be a focus on creating community environments that encourage healthy living to reduce the prevalence of diabetes in West Virginia by expanding reach of programming, implementing new programming, and strengthening coverage policies for the public.

APPENDIX D. MARSHALL UNIVERSITY SCHOOL OF MEDICINE CHRONIC CARE MANAGEMENT MODEL



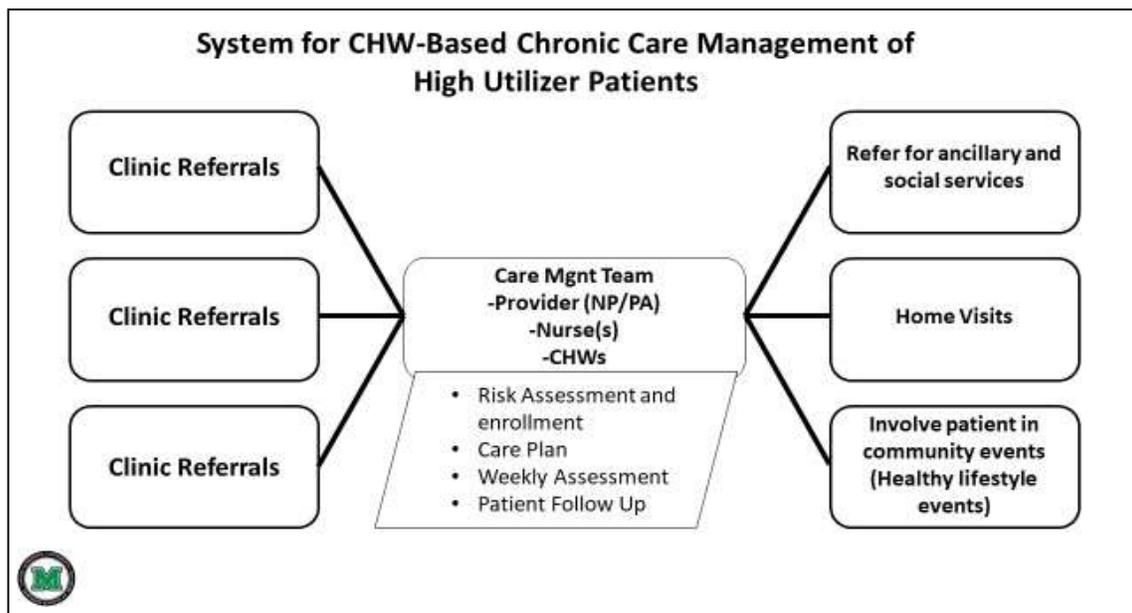
COMMUNITY HEALTH WORKER-BASED CHRONIC CARE MANAGEMENT FOR HIGH RISK PATIENTS WITH CHRONIC CONDITIONS

Richard Crespo, Ph.D.

Marshall University School of Medicine

Background: While primary and secondary prevention are essential long-term goals, lower cost for high- risk patients have the greatest immediate return on investment for insurance payers. To this end, we developed a chronic care management model led by a teams comprised of a mid-level provider, a nurse, and community health workers (CHW). The role of the team is to receive referrals from providers, assess patients' level of risk, and enroll eligible patients in intensive care management. This involves a thorough assessment of patients' health status, creating care plans, and regularly following up with patients in their homes and communities. The following diagram provides a description of the organizational structure.

Figure 1: Care Coordination Organizational Structure



The clinical chronic care management team is led by a mid-level provider. The nurse on the team manages the clinical side of case coordination such as making referrals, contacting patients' primary care providers, and helping to set up clinical appointments. The CHWs help to link patients with community services and conduct regular home visits to assist patients with medication adherence, chronic disease self-management, health eating, and active living goals. The CHWs receive their instructions for patient care at the weekly care coordination meetings and are in regular contact with the team nurse.

Community Health Workers: The CHWs are trusted members of their community, have a close understanding of the culture, language, and life experiences of the community served. They interact with patients in the safety and comfort of their homes, in a setting where patients can freely discuss their problems and concerns. In this care management model, their scope of practice is as follows.

1. Work under the direct supervision of a medical provider.
2. Assist patients in self-management of chronic illnesses and medication adherence as directed by the medical provider.
3. Bridge, or culturally mediate between, individuals, families, communities, and health and human services.
4. Provide culturally appropriate health education, information, and outreach in community-based settings, including, homes, schools, hospitals, clinics, shelters, and community centers.
5. Provide direct services, including counseling on access to health and human services, social support, lifestyle management, care coordination, and health screenings.

Status: Enrollment of high-risk patients has occurred continuously since May 2017. As of September 2020, 326 high-risk patients have been enrolled by 14 Federally Qualified Health Centers in West Virginia. The health centers employ a total of 13 CHWs. The most prevalent chronic condition of the enrolled patients is diabetes. Of these patients, 162 have been enrolled long enough to have a baseline and at least a six-month follow-up A1c test. The change in the mean A1c from baseline to follow up is presented in Table 1. The mean change in A1c status was 1.9 percentage points lower during this time period. Sixty-seven percent (109/162) of the cohort lowered their A1c in this time period.

	No. Patients	Percent of Cohort	Mean Baseline A1c	Mean Last A1c	Percentage Point Difference
Improved A1c	109	67%	10.2%	8.3%	-1.9
Increased A1c	49	30%	8.5%	9.8%	+1.3
No Change	4	2%	9.3%	9.3%	0

Lower Cost: We have a partnership with two Medicaid Managed Care Organizations in West Virginia, The Health Plan and Aetna Better Health. The Health Plan produced an actuarial study on their members who have been enrolled in this program for 12 or more months. The cost for these patients decreased by 47% compared to 24 months prior to enrollment. We expect to have an actuarial study from Aetna before the end of 2020.

For comments and questions, please contact the
Division of Health Promotion and Chronic Disease
www.wvchronicdisease.org

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