Heart Disease & Diabetes Surveillance

Data Pages

Division of Health Statistics & Informatics

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VERMONT
DEPARTMENT OF HEALTH

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Diabetes and cardiovascular disease (CVD) are leading causes of morbidity and mortality in Vermont and the United States overall.

These are chronic conditions which, like many chronic diseases, are linked to lifestyle, environment, access to equitable care, and genetic factors. Lifestyle choices and social determinants of health, such as poor diet/access to healthy food, physical inactivity, and tobacco use, place people at higher risk of developing these diseases or one of their precursor conditions (e.g., prediabetes, hypertension, or high cholesterol) and experiencing poor health outcomes.

The purpose of this document is to present the most current and pertinent data related to prediabetes, hypertension, high cholesterol, diabetes, and CVD and related risk factors among Vermont adults. The Heart Disease and Diabetes Surveillance Data Pages uses multiple data sources, including:

- 2020 Behavioral Risk Factor Surveillance System (BRFSS)
- 2020 Vermont Health Care Uniform Reporting and Evaluation System (VHCURES)
- 2019 Vermont Vital Statistics
- 2019 Vermont Uniform Hospital Discharge Data Set (VUHDDS)
- 2019 Youth Risk Behavior Survey (YRBS)
- 2019 U.S. Renal Data System (USRDS)

How to Read This Document

Statistical Comparisons

Statistical differences are determined by comparing **95% confidence intervals,** unless stated otherwise. A confidence interval represents the range in which an estimated data point could fall that was calculated based on observed data. This means that one can be 95% confident that the true value of the data point being examined falls within the specified confidence interval range. If the confidence intervals from two groups do not overlap, the estimate was interpreted as significantly different from the other, noted in charts using an asterisk (*) and the terms "statistically different," "significantly different," or "significantly higher or lower."

Age-Adjustment: Measures are adjusted for age for all data sources if they are Healthy Vermonters 2020 measures to make them comparable to the U.S. 2000 population so that they are comparable to national data. Age-adjustment groupings come from those determined by Healthy People 2020. To ensure consistency, whenever a subset of an age-adjusted measure is calculated it is also age-adjusted.

Healthy Vermonters 2020 (HV2020)

When this symbol is seen, a HV2020 measure is reported on the page. For more information on this initiative and to view individual measures visit https://www.healthvermont.gov/about/reports/healthy-vermonters-health-status-reports

Definitions

Body Mass Index (BMI)	A calculation using a person's height and weight to assess the amount of fat tissue in the body and its potential impact on health. For most adults an ideal BMI is 18.5-24.9 while anything less than 18.5 or greater than or equal to 25 is considered unhealthy
Disability	A composite measure of any self-reported disability (mobility, cognitive, visual, hearing, self-care, independent living) of any duration or permanence
Geographic Isolation	Measured using Rural-Urban Commuting Area (RUCA) codes (https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx). **Isolated Small Rural Town:** Sparsely populated areas of less than 2,500 people where travel mainly occurs in similar sized areas **Small Rural Town:** Low population areas of 2,500-9,999 people where 30%-50% of commuting primarily occurs in similar sized areas or areas of higher population, more urbanized, size **Micropolitan:** Higher, more urbanized, population areas of 10,000-49,999 people where commuting primarily takes place in similar sized areas or low population areas where commuting primarily occurs in higher population, more urbanized, areas **Urban:** Densely populated and urbanized areas of >49,999 people where commuting primarily takes place in similar sized areas or less densely populated areas where 30%-50% of commuting takes place in densely populated and urbanized areas
Poor Mental Health	Adults reporting experiencing 14 or more days in a month where their mental health was perceived by them as not good
Sexual Orientation/ Gender Identity	**LGBT:** Any adult self-reporting as being something other than straight and heterosexual/cisgender **Non-LGBT:** Any adult self-reporting as straight and heterosexual/cisgender
Socioeconomic Status (SES)	A composite measure calculated from self-reported household income (based on federal poverty level (FPL)) and level of education: **Low:** household income < 250% of the FPL and a high school or less education **Middle:** household income < 250% of the FPL with some college education or > 250% of the FPL with up to some college education **High:** 4-year college degree or higher education
Vermonters of Color	**White, Non-Hispanic:** self-reported race of white with an ethnicity of not Hispanic **Vermonters of Color:** A self-reported ethnicity of Hispanic of any reported race and all reported races other than white, including multi-race

Key Findings

Cardiovascular disease (CVD) and diabetes, like many chronic conditions, are linked to lifestyle, environment, access to equitable healthcare, and genetic factors. Lifestyle choices and social determinants of health, such as poor diet/access to healthy food, physical inactivity, and tobacco use place people at higher risk of developing these conditions or one of their precursor conditions (e.g., prediabetes, hypertension, or high cholesterol) that regularly result in poor health outcomes and lower quality of life. These data pages highlight several key areas of concern where disease rates are consistently identified as having greater impact:

- The prevalence of high cholesterol, hypertension, prediabetes, CVD, and diabetes are all significantly higher among those living with a disability. Additionally, hypertension, CVD, and diabetes are significantly more likely among those living at a low socioeconomic status compared to a high one. These higher rates suggest an undue burden of chronic disease in these populations that likely influence their quality of life.
- High cholesterol, CVD, and diabetes-related hospitalization rates trended upward in 2019 and have been increasing since at least 2016, while primary care and emergency department visits all trended down from at least 2017 to 2019. While not conclusive, such shifts in trends point towards concerns of poor disease control or condition management.
- High cholesterol, hypertension, CVD, and diabetes have much higher mortality rates as contributing causes to death than as primary causes, highlighting these chronic conditions as ones that influence or worsen others.
- High cholesterol is the most common comorbid chronic condition for those with hypertension, prediabetes, and diabetes and is the second most common comorbid chronic condition for those with CVD. Controlling high cholesterol is an important step in managing other conditions.
- Counties in northeastern Vermont (Caledonia, Essex, and Orleans) are consistently identified with significantly higher rates of chronic conditions than the state average for one chronic condition or another. This indicates that residents of these counties experience a higher burden of chronic disease compared to other areas of the state that are more routinely statistically similar to the state averages.

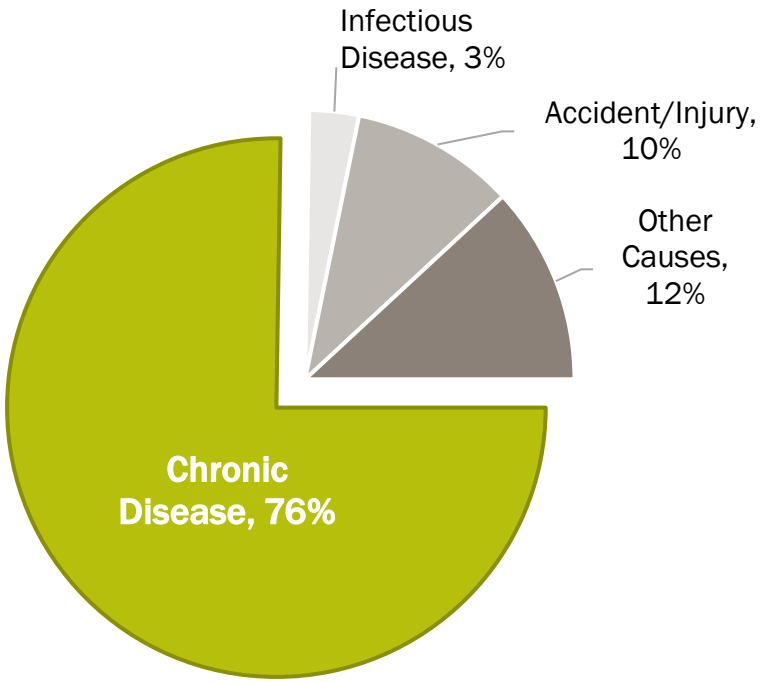
Vermont Chronic Disease Overview

Impact of chronic disease on Vermonters and the risk factors that increase the chance of developing chronic disease.

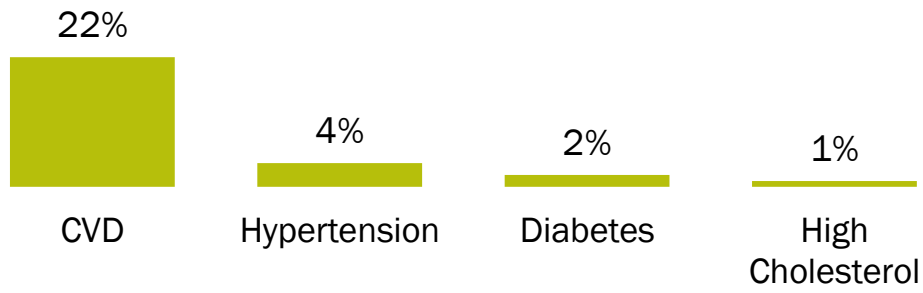
Chronic Disease-Related Mortality

Chronic diseases are the most common cause of death in Vermont. They account for more than three in four deaths (76%). Diabetes and Cardiovascular Disease (CVD) are responsible for over a quarter of all deaths among Vermont residents (27%).

Causes of Death, Vermont^



Proportion of Deaths Due to Diabetes & Cardiovascular Disease-Related Conditions as the Primary Cause among All Vermont Deaths

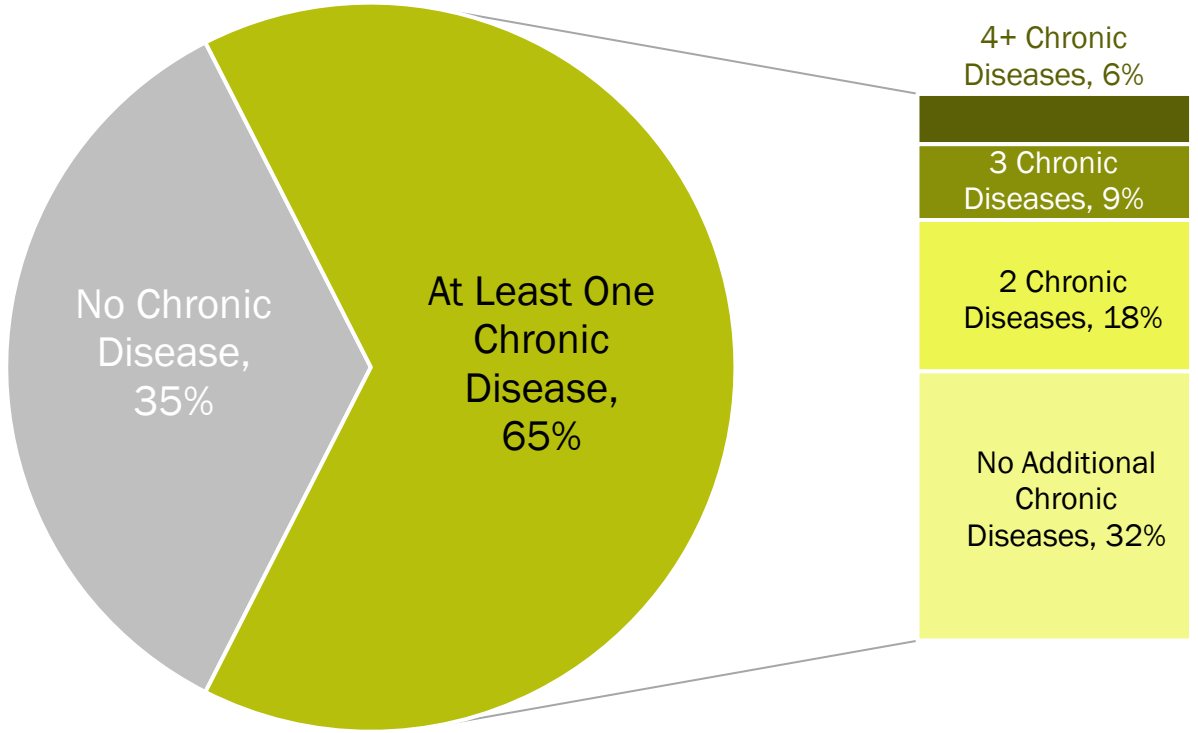


Source: Vermont Vital Statistics, 2019.
^ Values are rounded to the nearest whole number and therefore may not always add to 100% due to the error introduced when rounding.

Prevalence of Multiple Chronic Diseases

Of adult Vermonters living with at least one chronic disease, 23% have diabetes or cardiovascular disease.

Significantly more Vermont adults **have at least one** chronic disease.

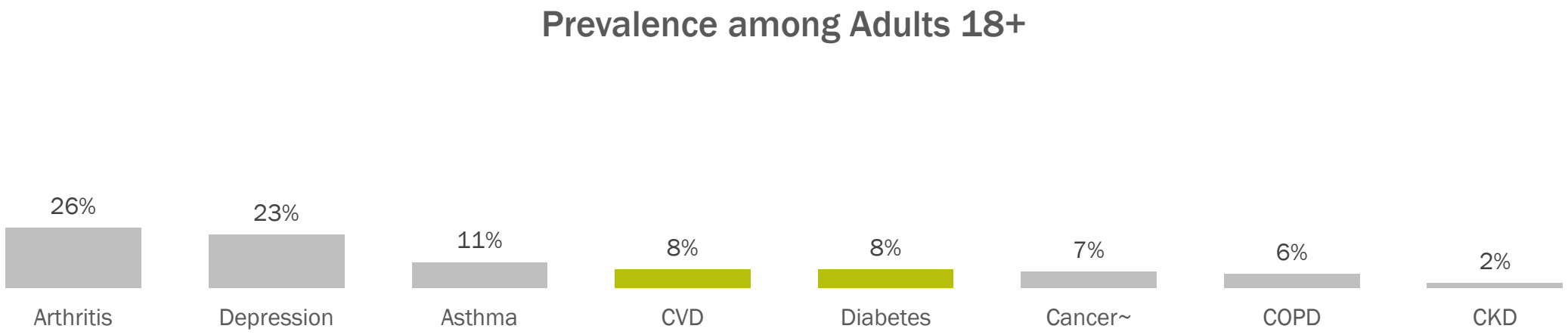


Chronic diseases assessed include: arthritis, asthma, cancer (not including skin cancer), cardiovascular disease (CVD), chronic kidney disease, chronic obstructive pulmonary disorder (COPD), depressive disorder, diabetes, and obesity.

Source: VT BRFSS, 2020.

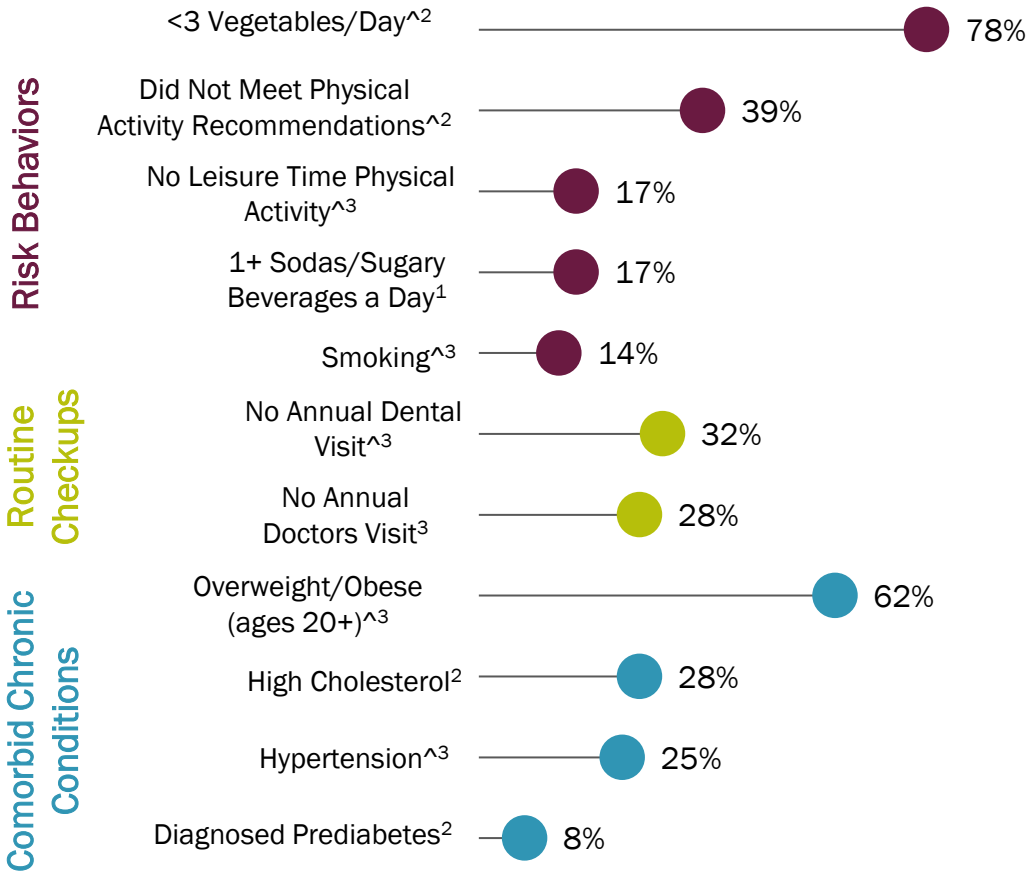
Prevalence of Chronic Disease in Vermont

- Vermont adults are significantly more likely to have arthritis or depression than any other chronic disease.
- They are statistically more likely to have asthma than diabetes, cardiovascular disease (CVD), cancer, or chronic obstructive pulmonary disorder (COPD).
- Adults are similarly likely to have diabetes, CVD, or cancer and were more likely to have ever had diabetes or CVD than COPD.
- They are statistically more likely to have chronic obstructive pulmonary disorder (COPD) than chronic kidney disease (CKD).



Source: VT BRFSS, 2020.
~Excludes those whose form of cancer was skin cancer.

Adult Prevalence of Chronic Disease Risk Factors



Data Source: VT BRFSS 2017[1], 2019[2], 2020[3].
^Data are age-adjusted to the U.S. 2000 population.

Most chronic diseases are caused or made worse by one or more common risk factors.

A person who has more risk factors is more likely to develop a chronic disease.

- Most adults (78%) consume less than three vegetables a day. While nearly two in five do not get the recommended amount of aerobic physical activity (39%) and one in seven smoke (14%).
- Nearly a third (32%) of Vermont adults did not visit a dentist and almost three in ten (28%) did not visit a doctor for routine care in the last year.
- Three in five have a BMI classified as overweight/obese (62%), which can be a gateway to the development of other chronic conditions.

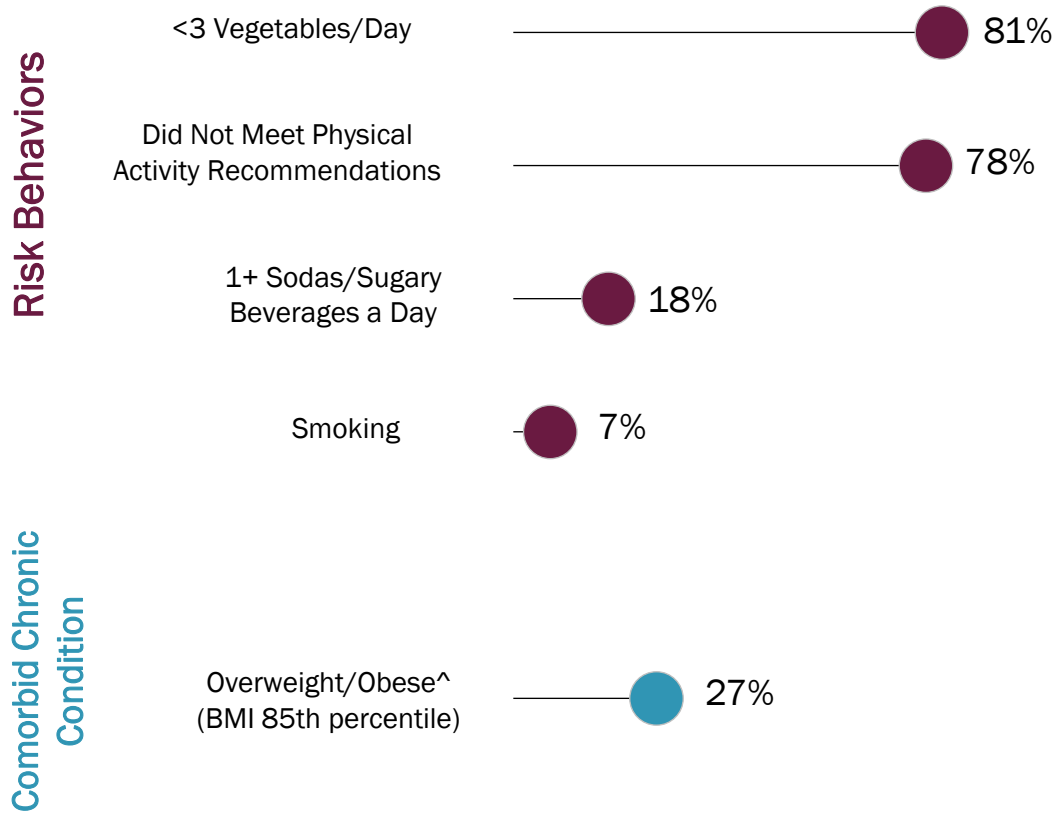
Youth (Grades 9-12) Prevalence of Chronic Disease Risk Factors

Several behaviors can lead to the eventual development of chronic disease.

Three behaviors known to specifically lead to the development of chronic disease

- Most youth do not consume the recommended amount of vegetables a day (81%).
- The majority of youth do get the recommended amount of aerobic physical activity (78%).
- Seven percent smoke◊.

- Over a quarter of Vermont youth (27%) are in the 85th percentile or higher for BMI indicating unhealthy weight (overweight/obese).



Source: VT YRBS, 2019.
◊ This is likely an underestimate of youth tobacco risk as the rate of e-cigarette use and vaping are both on the rise among high school students.
^ Youth BMI is assessed in comparison to other children of the same age and gender and expressed as a percentile rather than an absolute value like for adults. A healthy BMI for youth is greater than or equal to the 5th percentile and less than the 85th percentile.

High Cholesterol

What is high cholesterol? How many Vermont adults are being screened for it and how many have it? What is the risk, management, burden and mortality for those who have it?

About High Cholesterol (Hyperlipidemia)

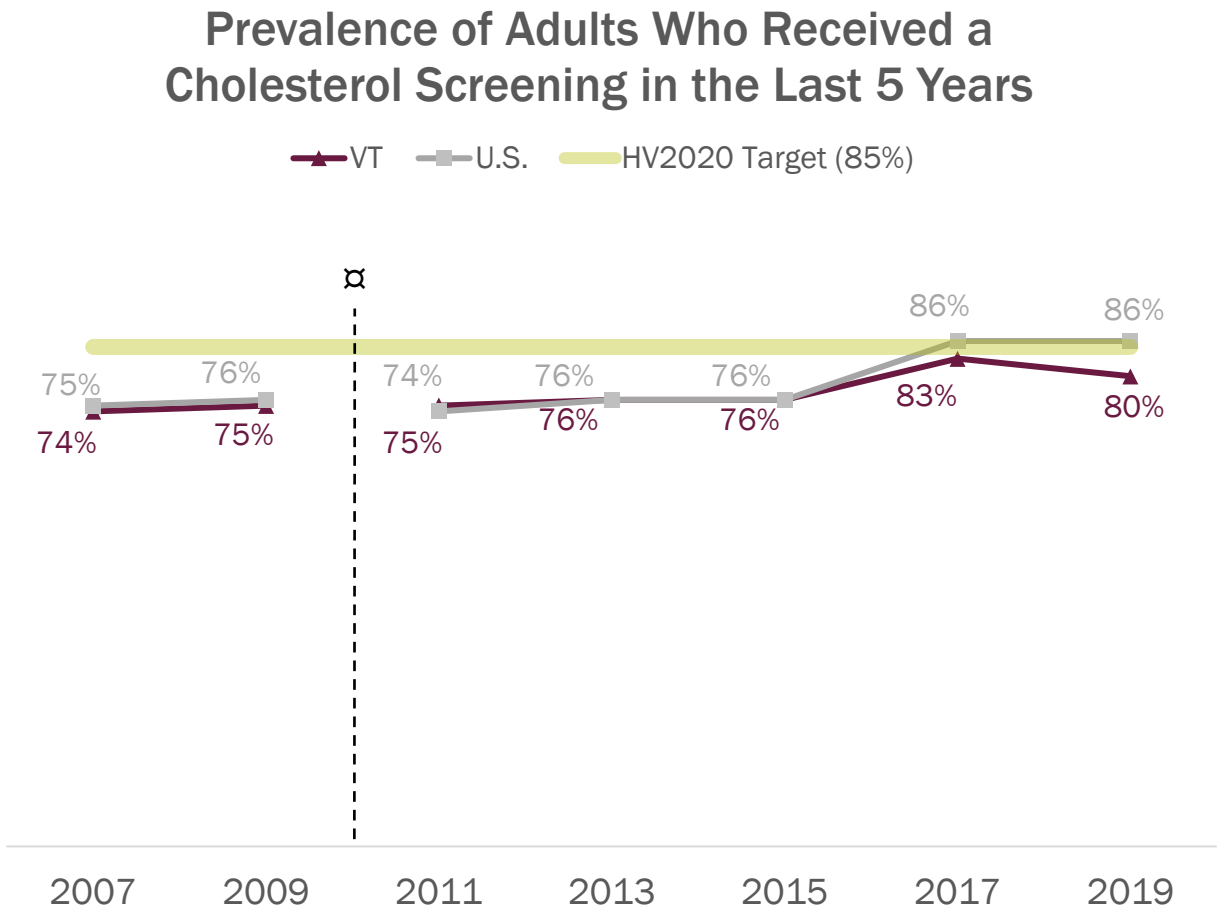
- High cholesterol is a major risk factor for future health problems, including diabetes and heart disease & stroke.
- Cholesterol is a waxy substance in blood that is used by the body to build cells. It is naturally produced by the liver and also broken down from animal products, such as meats and full-fat dairy products, during digestion.
- The high saturated and trans fats found in those foods, and in oils like palm or coconut oil, can cause the liver to make more cholesterol than normal.
- Cholesterol comes in two forms, low-density lipoprotein (LDL) or ***bad*** cholesterol and high-density lipoprotein (HDL) or ***good*** cholesterol. Too much bad, or not enough good, cholesterol increases the risk that cholesterol will slowly build up on the inner walls of the arteries to the heart and brain; this is known as **high cholesterol** (aka hyperlipidemia).
- Family history of high cholesterol and behaviors such as poor diet, lack of physical activity, smoking or being around people who smoke, and being overweight or obese can lead to high cholesterol.

Source: American Heart Association, Cholesterol, 2017. https://www.heart.org/en/health-topics/cholesterol

Cholesterol Screening

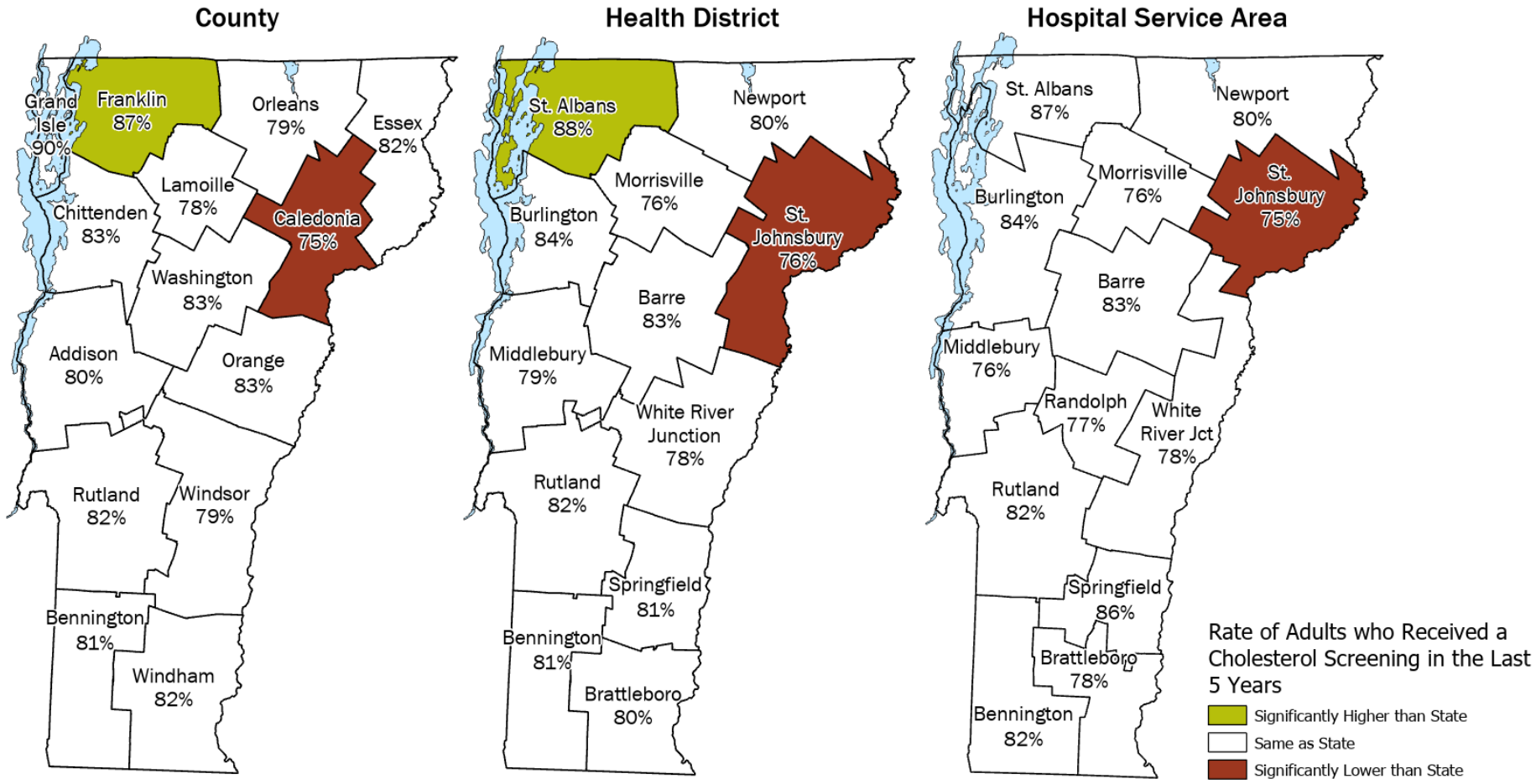
- Vermont prevalence held steady from 2011 to 2015.
- Cholesterol screening among Vermont adults in 2017 trended upward and then remained statistically similar in 2019.
- In 2019, Vermont adults were significantly **less likely** to have had their cholesterol checked than U.S. adults overall.

Though rates increased from 2015, changes to the survey question in 2017 make it difficult to know whether the change is a true increase or related to the question change



Source: VT BRFSS, 2007-2019.
Data are age-adjusted to the U.S. 2000 population.
¤ Due to BRFSS methodology changes, caution should be made when comparing data from prior to 2011 and after.

Cholesterol Screening by Subgeography

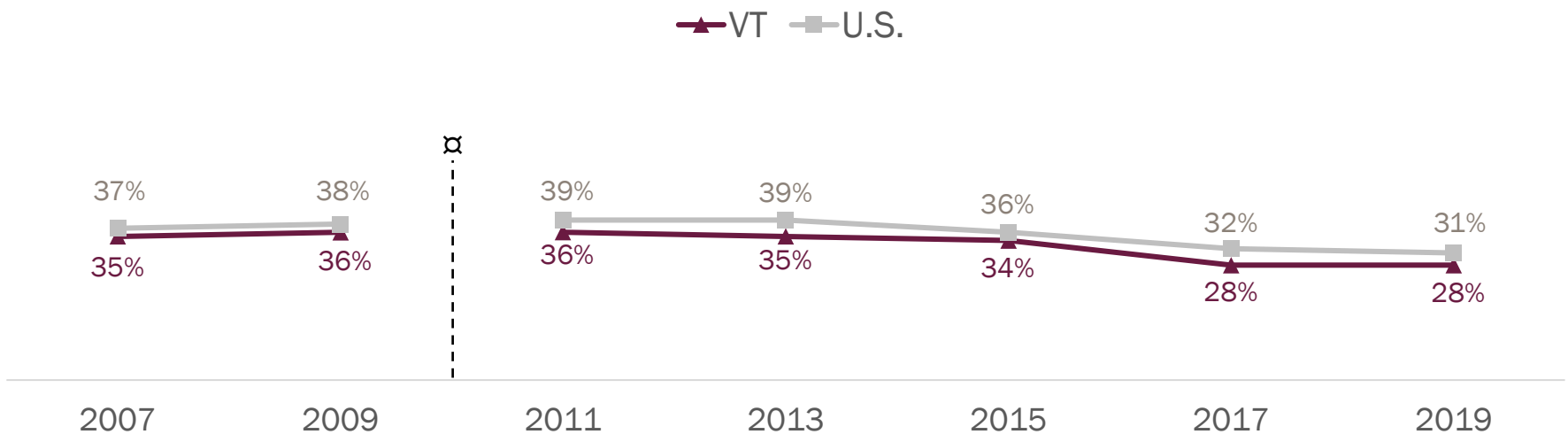


The rate of cholesterol screening in the last 5-years among Vermont adults is significantly higher in Franklin County and the St. Albans Health District when compared to the state average. Cholesterol screening in the last 5-years was significantly lower than the state average in Caledonia County and the St. Johnsbury Health District and Hospital Service Area.

Source: VT BRFSS, 2017 & 2019.
Data are age-adjusted to the U.S. 2000 population.

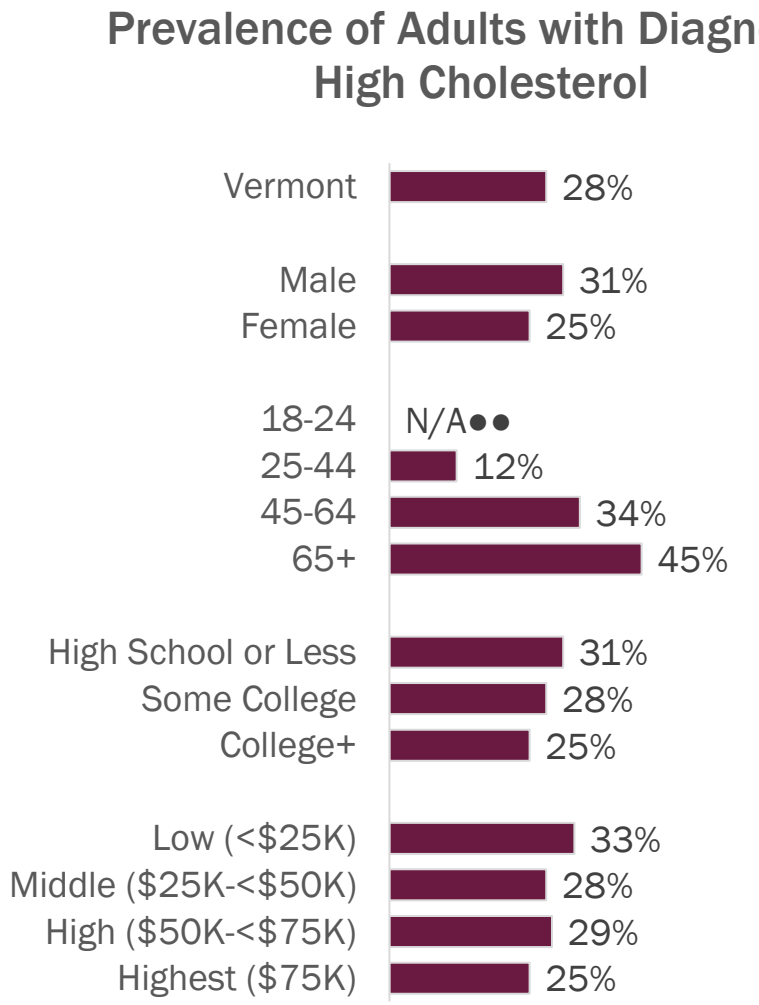
Adult Trend of High Cholesterol

- The prevalence of high cholesterol among Vermont adults in 2019 is 28%. This rate is statistically lower than the prevalence for all years from 2011 through 2015.
- From 2015 to 2017 there was a decrease, however, conclusions drawn from this change should be made with caution as changes in the question used to measure cholesterol screening in 2017 make it difficult to know whether the change represents a true decrease.
- High cholesterol prevalence among Vermont adults in 2019 was significantly lower than that of U.S. adults overall.



Source: VT BRFSS, 2007-2019.
¤ Due to BRFSS methodology changes, caution should be made when comparing data from prior to 2011 and after.

High Cholesterol Demographics



Source: VT BRFSS, 2019.
●●Value suppressed because sample size too small or relative standard error is > 30.

- Nearly three in ten (28%)[α] or approximately 129,800 adult Vermonters have ever been diagnosed with high cholesterol.
  - High cholesterol is significantly more likely to be seen:
    - Among men.
    - With advancing age.
    - Among those with a high school degree or less education compared to those with a college degree or higher.
    - Among those in households with incomes less than $25,000 a year, compared to those making $75,000 or more.

[α] This is likely an underestimate given that only 80% of adults have been tested for high cholesterol in the last year (see page 14).

Health inequalities lead varying impacts of high cholesterol.

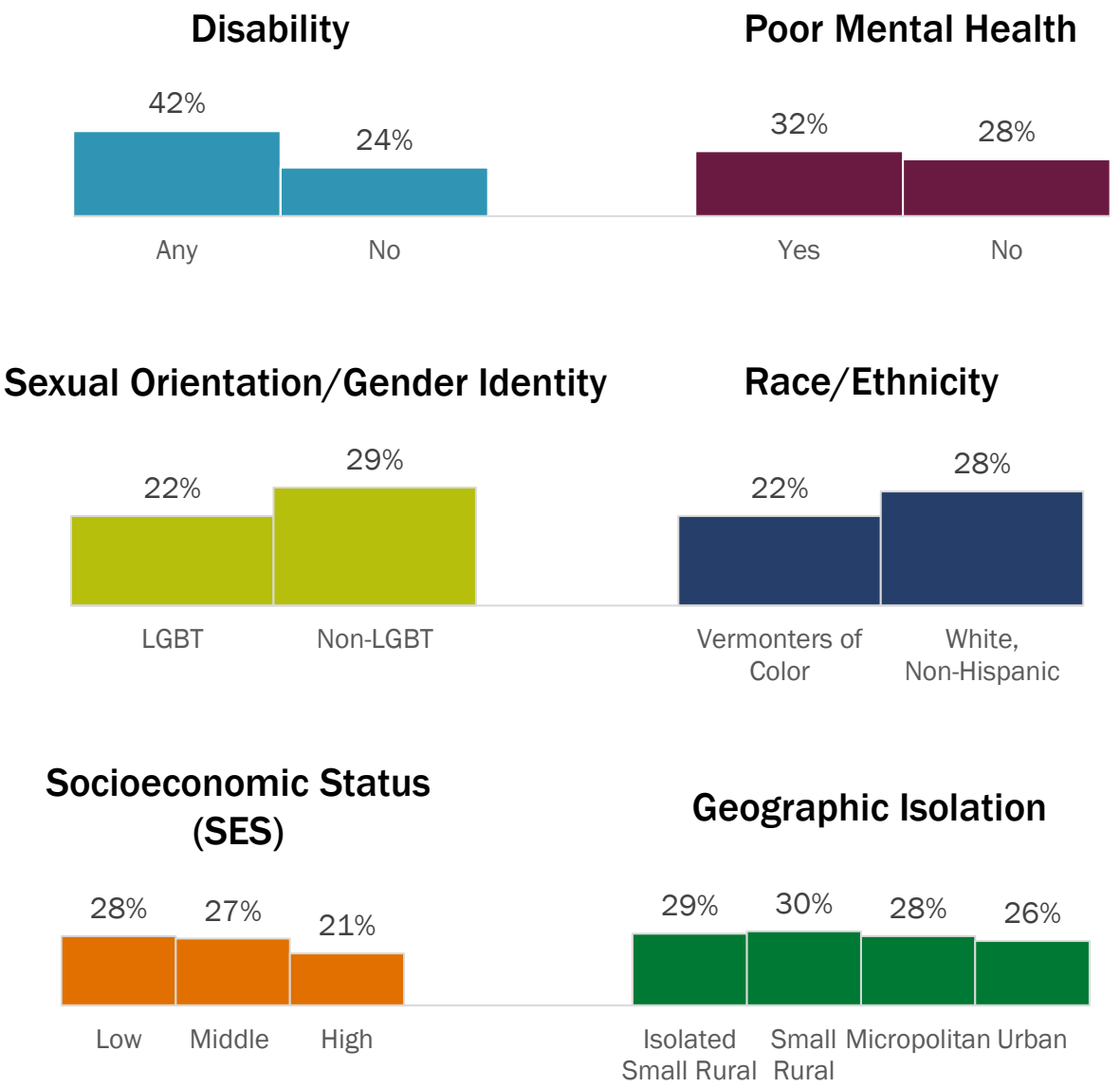
High cholesterol is significantly more likely among adults:

- With any disability.

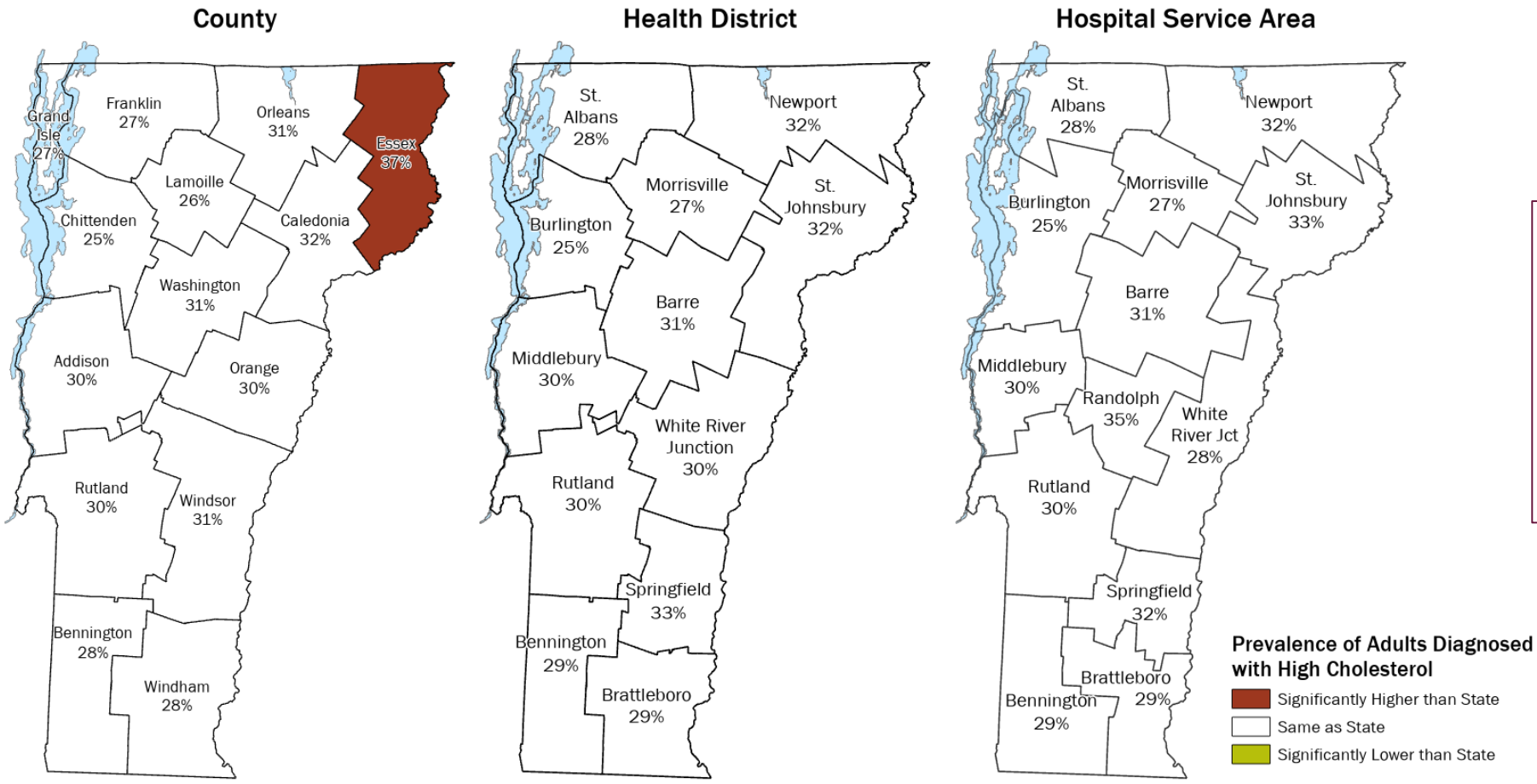
While other measures show varying impact of high cholesterol, these differences are not statistically significant.

Source: VT BRFSS, 2019.

High Cholesterol Prevalence and Health Inequality



High Cholesterol by Subgeography



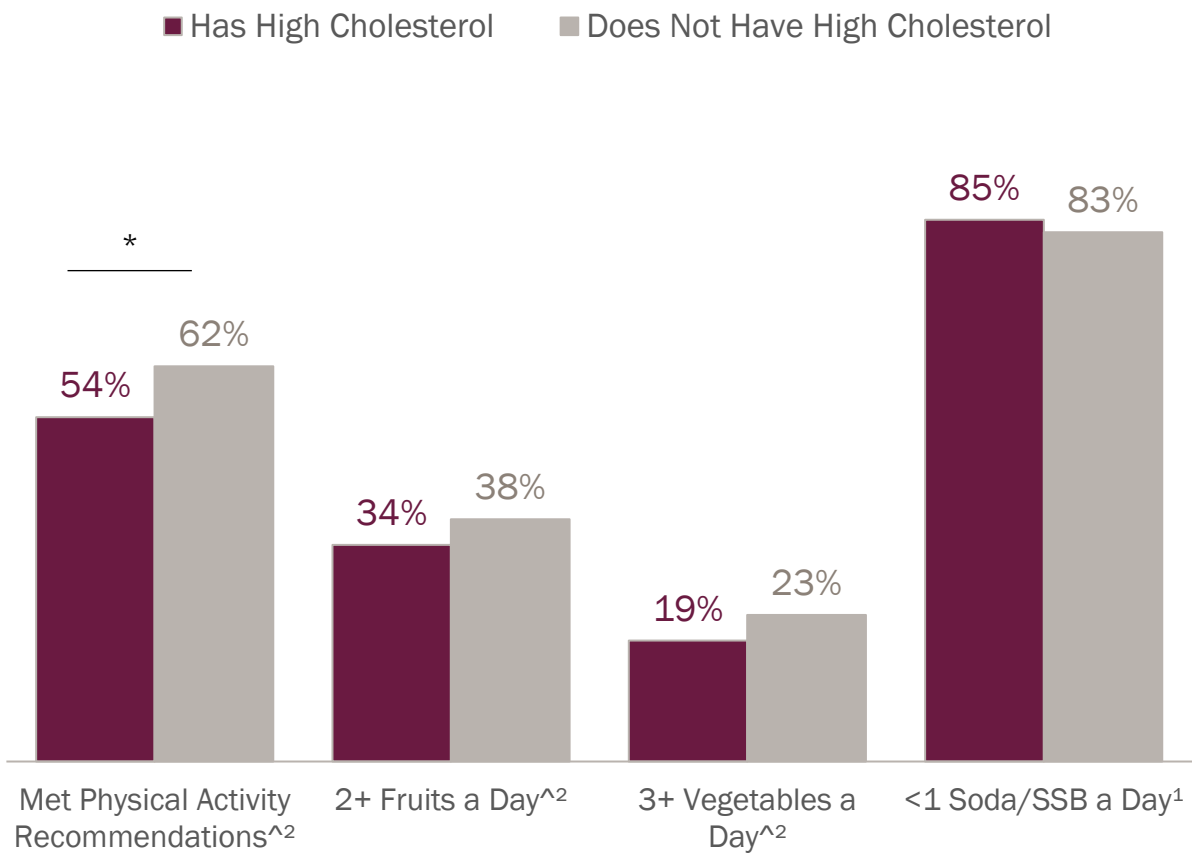
The prevalence of high cholesterol among Vermont adults is significantly higher in Essex County when compared to the state average.

Source: VT BRFSS, 2017 & 2019.

Adults with high cholesterol are significantly <u>less likely</u> to get the recommended amount of aerobic physical activity than those who do not have high cholesterol.

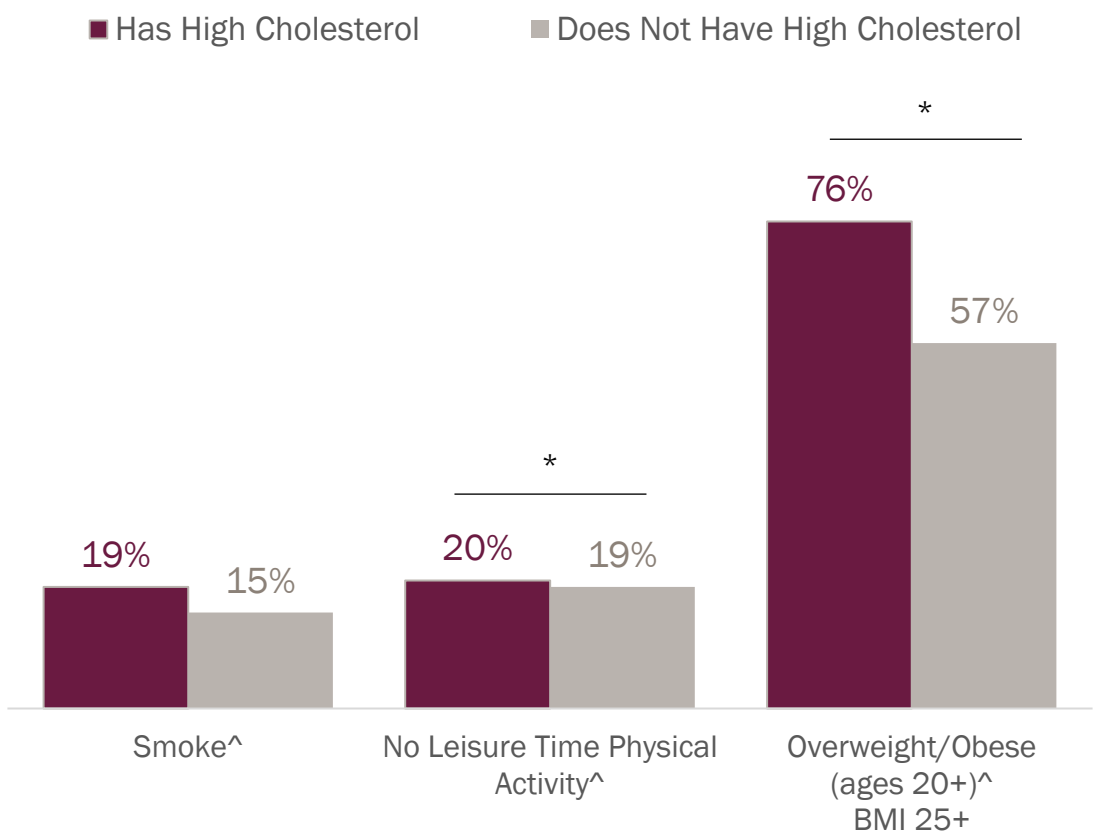
Actions or biological and community factors that are linked to a **<u>lower</u>** likelihood of developing or reducing disease are considered **<u>protective</u>** against disease.

Behaviors That Protect Against Developing High Cholesterol



Source: VT BRFSS, 2017[1] & 2019[2].
^ Data are age-adjusted to the U.S. 2000 population.

Risk Factors for Developing High Cholesterol



Source: VT BRFSS, 2019.
^ Data are age-adjusted to the U.S. 2000 population.

Adults with high cholesterol are significantly more likely to engage in no leisure time physical activity or have a BMI classified as overweight/obese.

Actions or biological and community factors that are linked to a **higher** likelihood of developing or worsening disease are considered **risk factors** for disease.

High Cholesterol and Healthcare Access

Vermont adults with high cholesterol are:

Significantly more likely to **have a personal doctor** than those not diagnosed with high cholesterol (93% vs. 86%).[2]

More likely to have **visited a doctor in the last year** compared to those not diagnosed with high cholesterol (88% vs. 75%).[2]

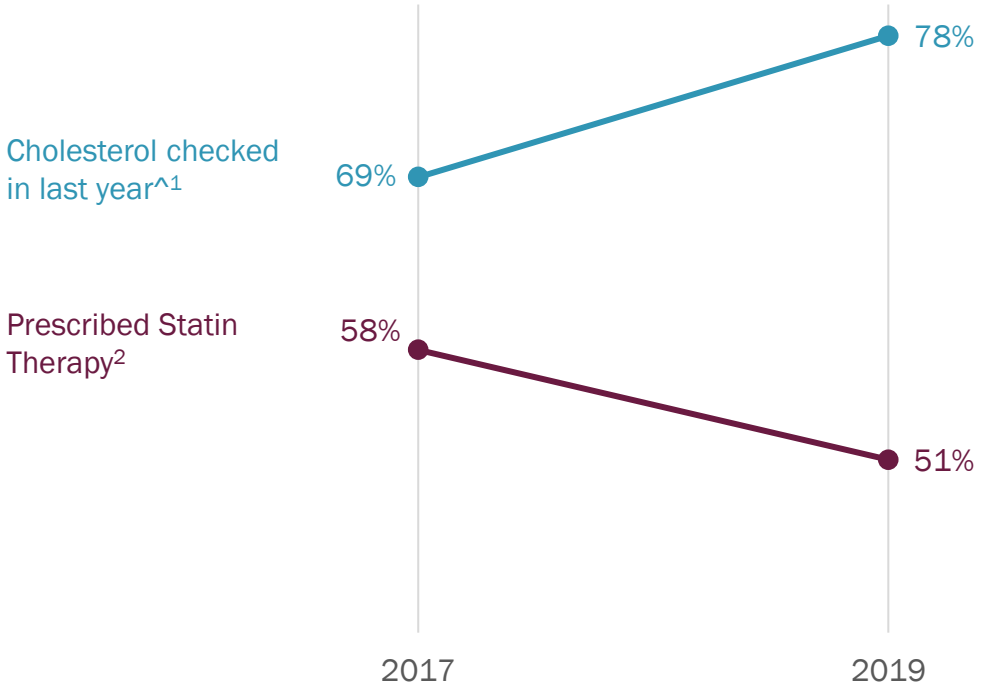
Significantly more likely to be covered by **public insurance*** (55% vs. 39%) while **significantly fewer** are covered by **private insurance** (43% vs. 58%) compared to those not diagnosed with high cholesterol.[1]

*Medicare: 40% vs. 21% - Medicaid 12% vs. 14% - TRICARE/IHS 4% vs. 3%

Source: VT BRFSS, 2017[1] & 2019[2].

Management of High Cholesterol

Vermont adults (20-75) diagnosed with high cholesterol **prescribed statin therapy** decreased slightly from 2017 to 2019.

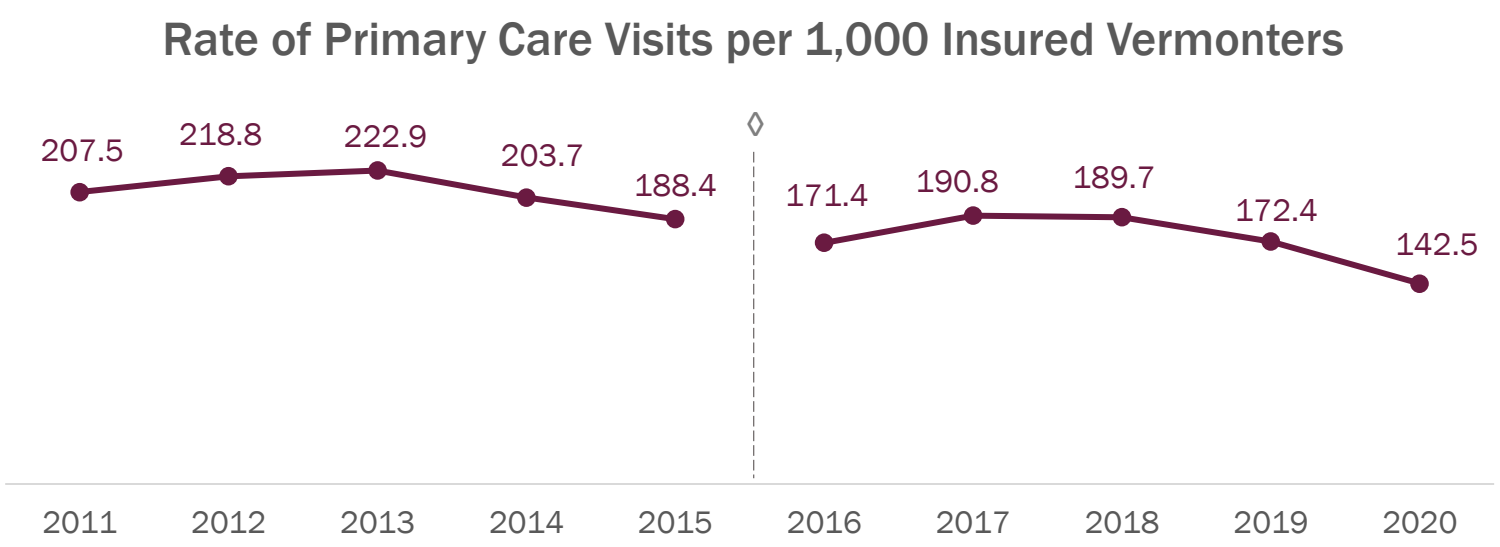


- The rate of adults 18 and older who had their cholesterol checked in the last year increased from 2017 (69%) to 2019 (78%).
  - The increase from 2017 to 2019 was not statistically significant. However, the 2019 rate was statistically higher than 2015 (64%).
- Statin therapy prescriptions decreased slightly between 2017 (58%) and 2019 (51%) for adults 20 to 75 years of age diagnosed with high cholesterol and continuously covered by a prescription benefits plan for the calendar year.
  - The 2019 decrease continues a descending trend since 2015 (data not shown).

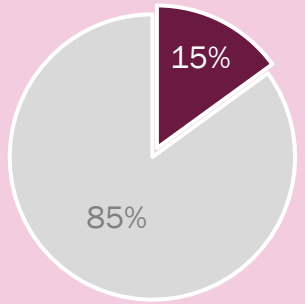
Source: VT BRFSS, 2017 & 2019[1]; GMCB VHCURES, 2017 & 2019 – extract 306 – extracted 02/25/22[2]
^ Data are age-adjusted to the U.S. 2000 population.

Primary Care Visits for High Cholesterol

- For every 1,000 insured Vermonters, 142.5 had a primary care visit related to high cholesterol in 2020 (93,220 visits among 61,658 people).
- The rate of primary care visits for high cholesterol among insured Vermonters significantly decreased from 2019 to 2020 and was significantly lower than the 2016 rate. The rate of primary care visits changed significantly between each year 2016-2020 except between 2017 and 2018. The decrease in 2020 is likely due to decreased healthcare visits during the COVID-19 pandemic.
- On average, there were 1.5 primary care visit per insured person for high cholesterol in 2020, slightly lower than the 2019 average of 1.6 per person.



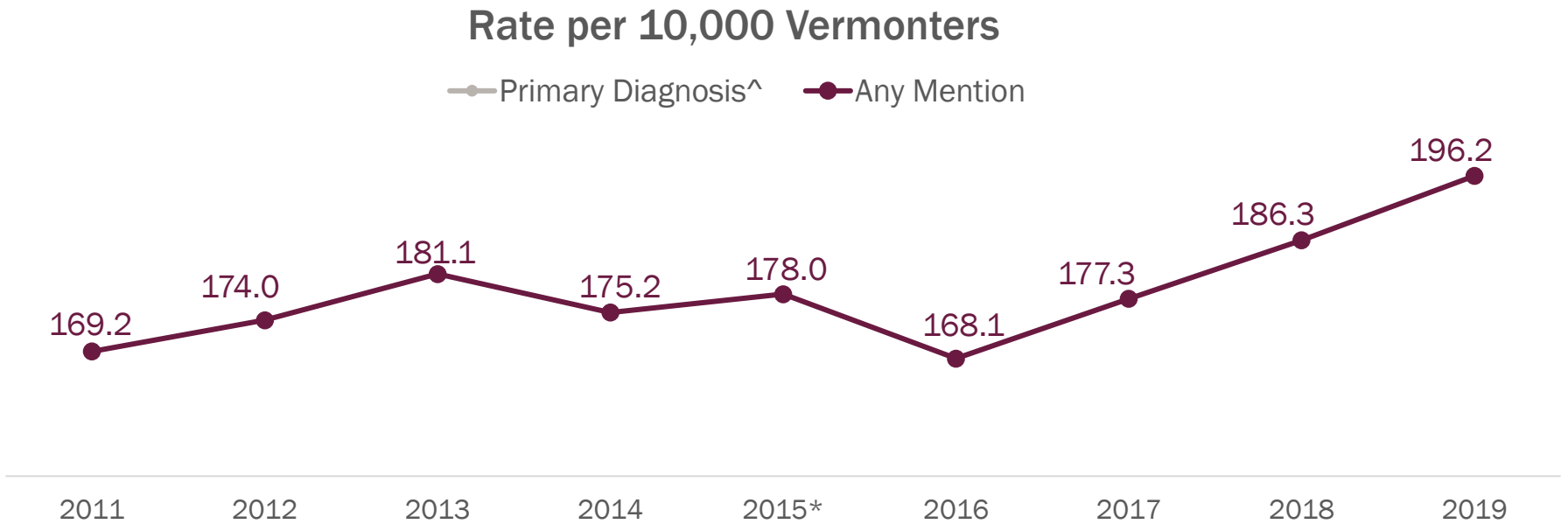
Nearly one in six (15%) high cholesterol-related primary care visits in 2020 were **telehealth** visits



Source: GMCB VHCURES, 2011-2020 – extract 3005 – extracted 10/18/22.
◊ Comparisons 2015 and earlier to post-2015 should be made with caution due to changes in the number of private payers submitting to VHUCRES beginning in 2016.
Statistical comparisons were performed using Z-scores.

High Cholesterol-Related Hospital Discharges

In 2019, there were 196.2 hospital discharges with any mention of high cholesterol for every 10,000 Vermonters (12,244 discharges). The rate of hospital discharges with any mention of high cholesterol statistically increased annually from 2016 to 2019. There were too few (< 6) discharges each year with a primary diagnosis of high cholesterol to report, highlighting high cholesterol as a condition that contributes to other chronic diseases.

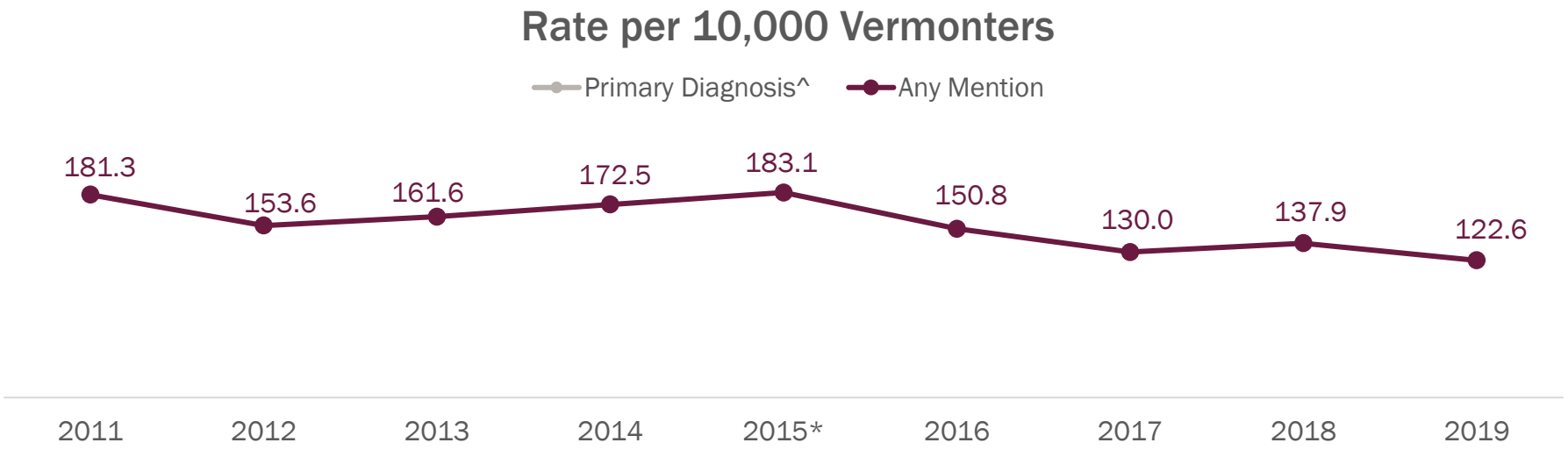


Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include hospitalizations for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.
^Values are too small to report and suppressed due to lack of statistical reliability.

High Cholesterol-Related Emergency Department (ED) Visits

There were 122.6 ED visits with any mention of high cholesterol for every 10,000 Vermonters (7,653 ED visits) in 2019. Since 2015, the trend of ED visits with any mention of high cholesterol has trended downward. The rate in 2019 was statistically lower than all preceding years. There were too few (< 6) ED visits across the years with a primary diagnosis of high cholesterol to establish a trend.

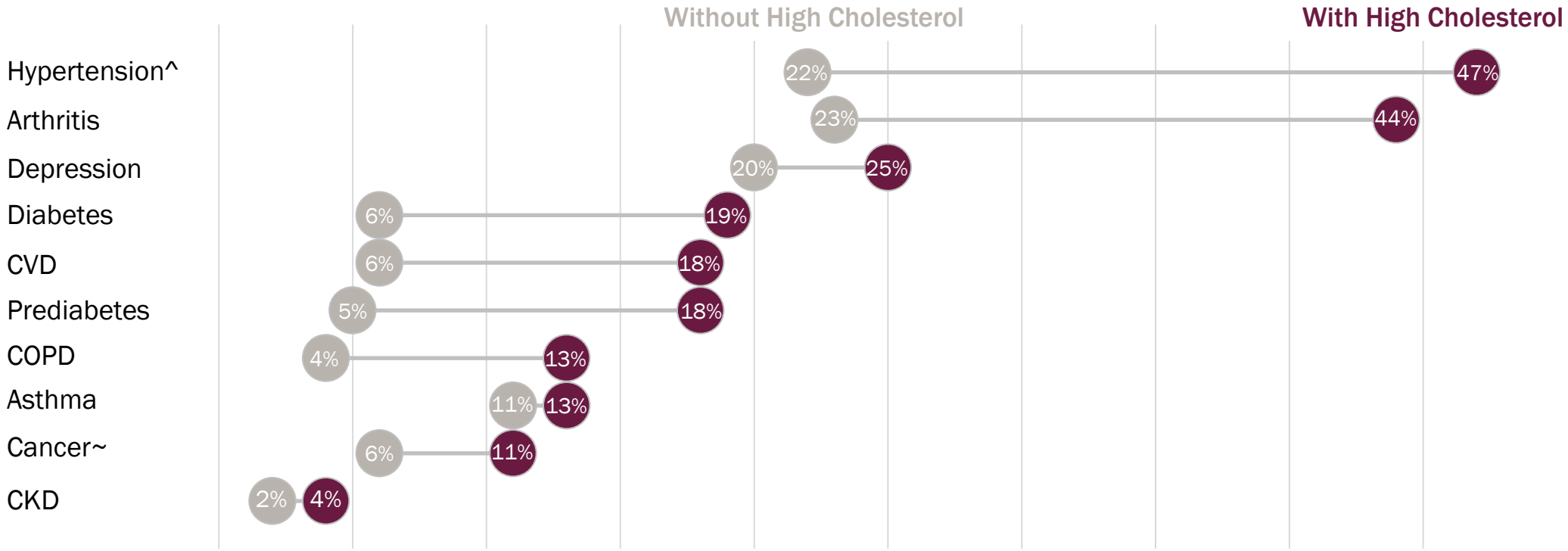
While the rate of ED visits with any mention of high cholesterol have been on the decline, hospital discharges have been on the rise since 2016 (page 25). This reflects the chronic versus acute nature of the condition and its impact on long-term health status.



Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include ED visits for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.
^Values are too small to report and suppressed due to lack of statistical reliability.

High Cholesterol and Prevalence of Co-Occurring Chronic Disease

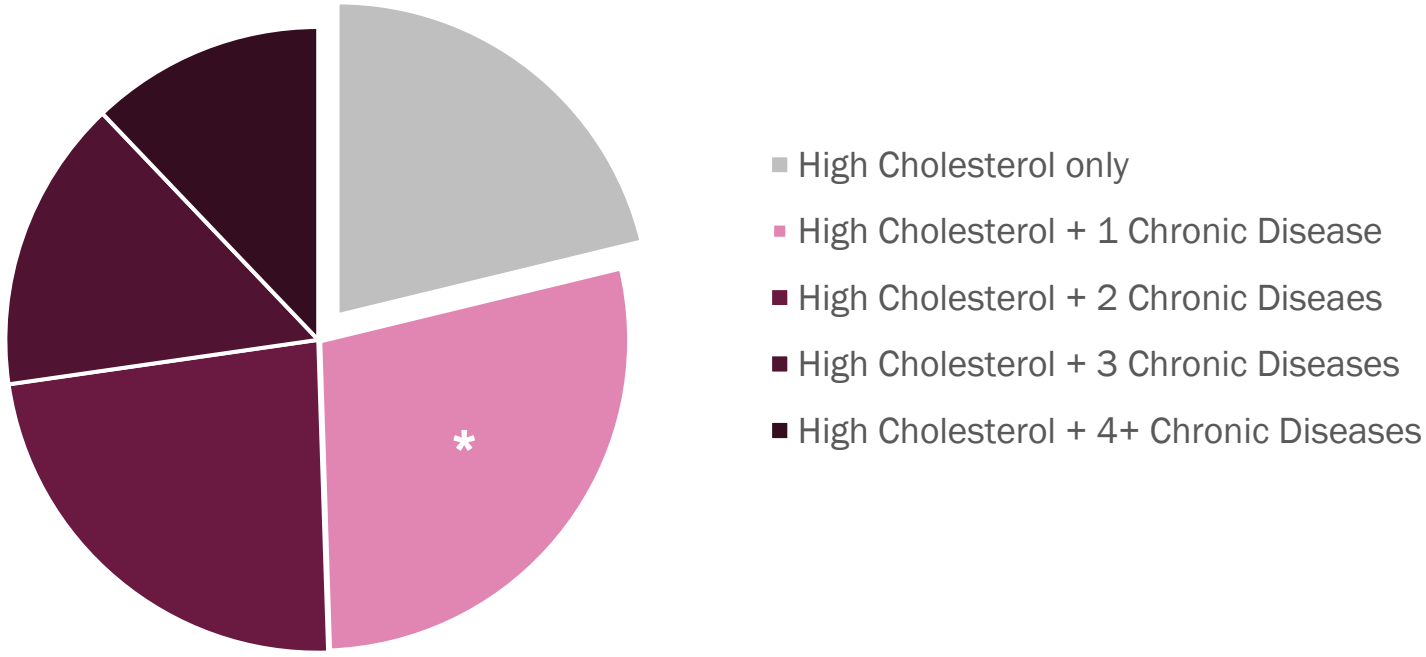
Adults **with high cholesterol** are significantly more likely to have a co-occurring chronic disease than those **without high cholesterol**. Rates of asthma and CKD do not differ by high cholesterol status.



Source: VT BRFSS, 2019.
^ Data are age-adjusted to the U.S. 2000 population.
~Excludes those whose form of cancer is skin cancer.

Multiple Chronic Diseases and High Cholesterol

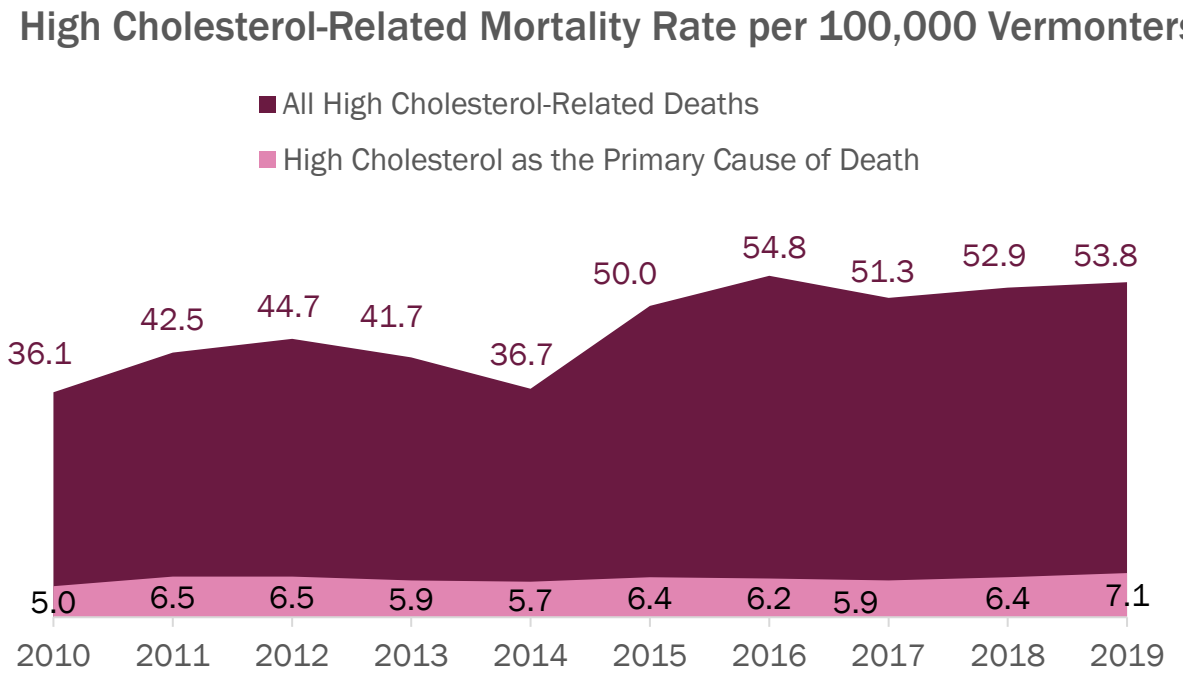
Adults with high cholesterol are significantly more likely to have high cholesterol plus **one** chronic disease than to have high cholesterol alone or have high cholesterol plus four or more chronic diseases.



Source: VT BRFSS, 2019.

High Cholesterol-Related Mortality

All high cholesterol-related deaths among Vermonters is significantly higher than **high cholesterol as the primary**, or principal, cause for death. **This indicates that the burden of high cholesterol is as a contributing factor to disease.**



Source: VT Vital Statistics, 2010-2019.

- As a primary cause of death, high cholesterol is statistically unchanged since 2010.
- All cause high cholesterol-related mortality was statistically similar from 2015-2019 though there was a significant increase from 2014 to 2019.
- Though the all-cause mortality rate increased slightly from 2018 to 2019, this change was not statistically significant.

Hypertension

What is hypertension? How many Vermont adults have it? What is the risk, management, burden and mortality for those who have it?

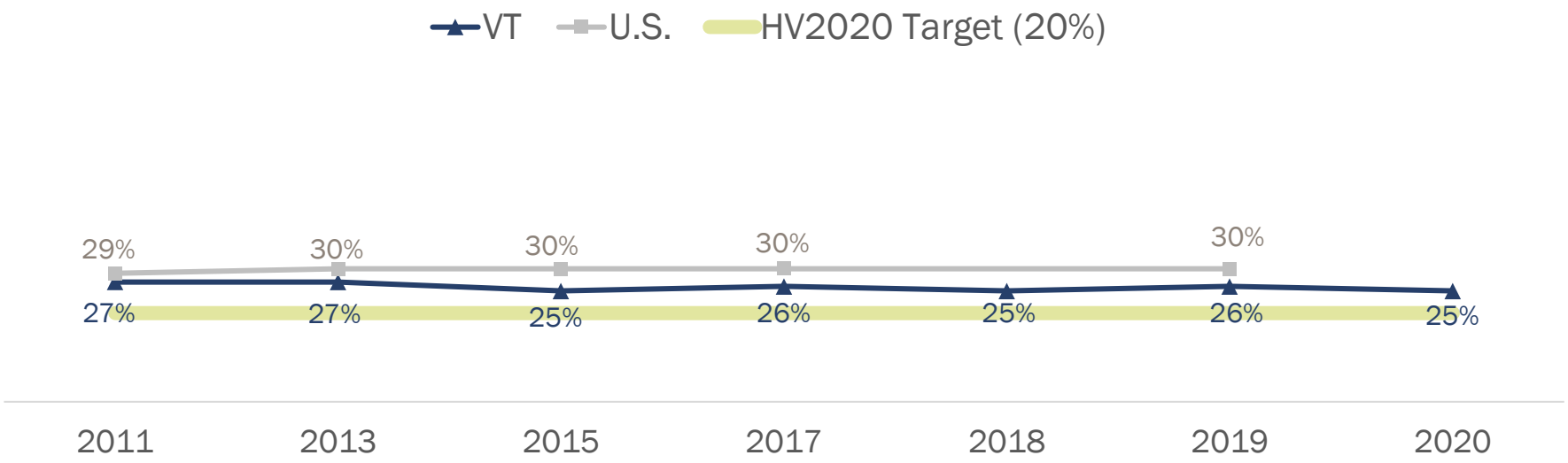
About Hypertension (High Blood Pressure)

- Blood pressure normally rises and falls throughout the day. If it remains high for a long time, it can cause damage to the blood vessels, decreasing the elasticity, as well as damage the heart.[1]
- Hypertension raises the risk for heart disease and stroke, which are leading causes of death in the U.S.[1] and in Vermont.[2]
  - With age, blood vessels become less flexible and increase pressure throughout the circulatory system. This increases the risk of hypertension with advancing age.[3]
  - Hypertension contributes to several health complications including high cholesterol, heart disease, heart failure, stroke, and chronic kidney disease (CKD).[1]
- **There are few or no symptoms for hypertension and many people do not know they have it.[1]**
- In November 2017, the American Heart Association and American College of Cardiology released new guidelines for hypertension diagnosis.[4] The data presented here span the transition and may be influenced by the change as the new definition began to be adopted and routinely implemented by healthcare providers.

Source: [1]Centers for Disease Control and Prevention, High Blood Pressure, May 18, 2021.
[2]Vermont Vital Statistics, 2019.
[3]American Heart Association, Understand Your Risk for High Blood Pressure, September 4, 2014.
[4]American College of Cardiology/American Heart Association, November 2017.

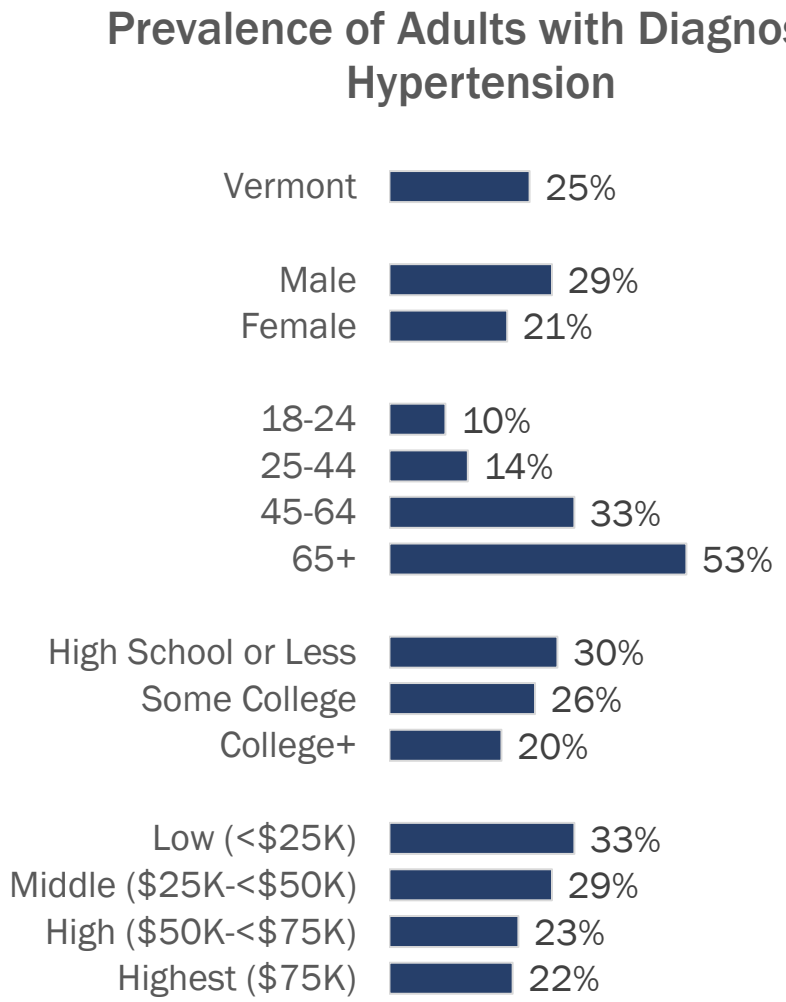
Adult Trend of Hypertension

- The prevalence of hypertension in Vermont is statistically unchanged from 2011-2019.
- Hypertension prevalence among Vermont adults is above the Healthy Vermonters 2020 target of 20%.
- The prevalence of Hypertension among Vermont adults in 2019 (26%) is significantly less than the 30% of U.S. adults overall.



Source: VT BRFSS, 2011-2020.
Data are age-adjusted to the U.S. 2000 population.

Hypertension Demographics



Source: VT BRFSS, 2020.
Data are age adjusted to the U.S. 2000 population except for those broken down by age.

- A quarter (25%) or approximately 129,900 Vermont adults have ever been diagnosed with hypertension.
  - Hypertension is significantly more likely among:
    - Men.
    - Adults 45 years and older compared to 44 and younger. Adults 65 and older are statistically different from those 45-64.
    - Those with some college or less, education.
    - Those in households with incomes less than $25,000 a year, compared to those making $50,000 or more.

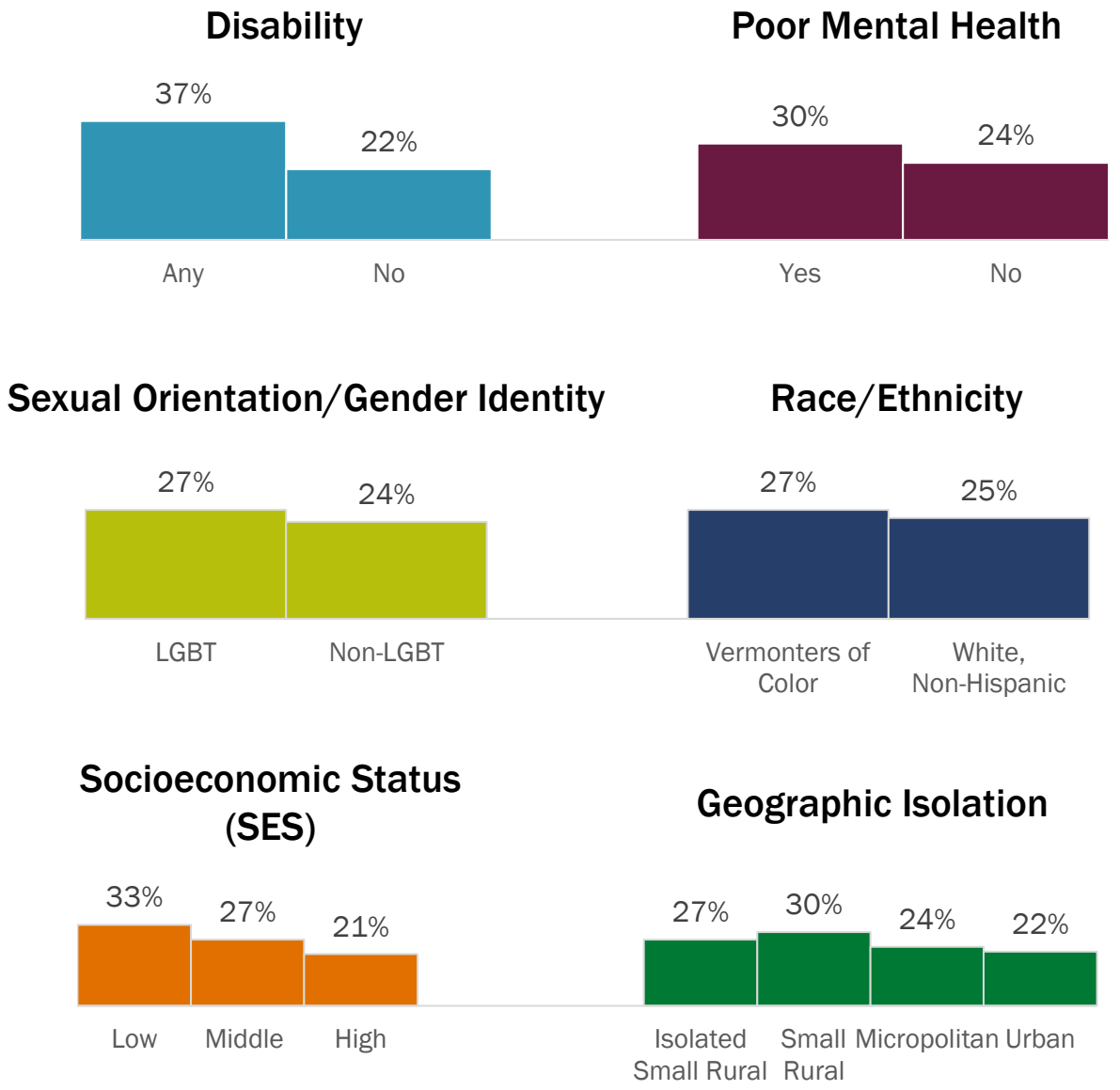
Health inequalities lead to varying impacts of hypertension.

Hypertension is significantly more likely among adults:

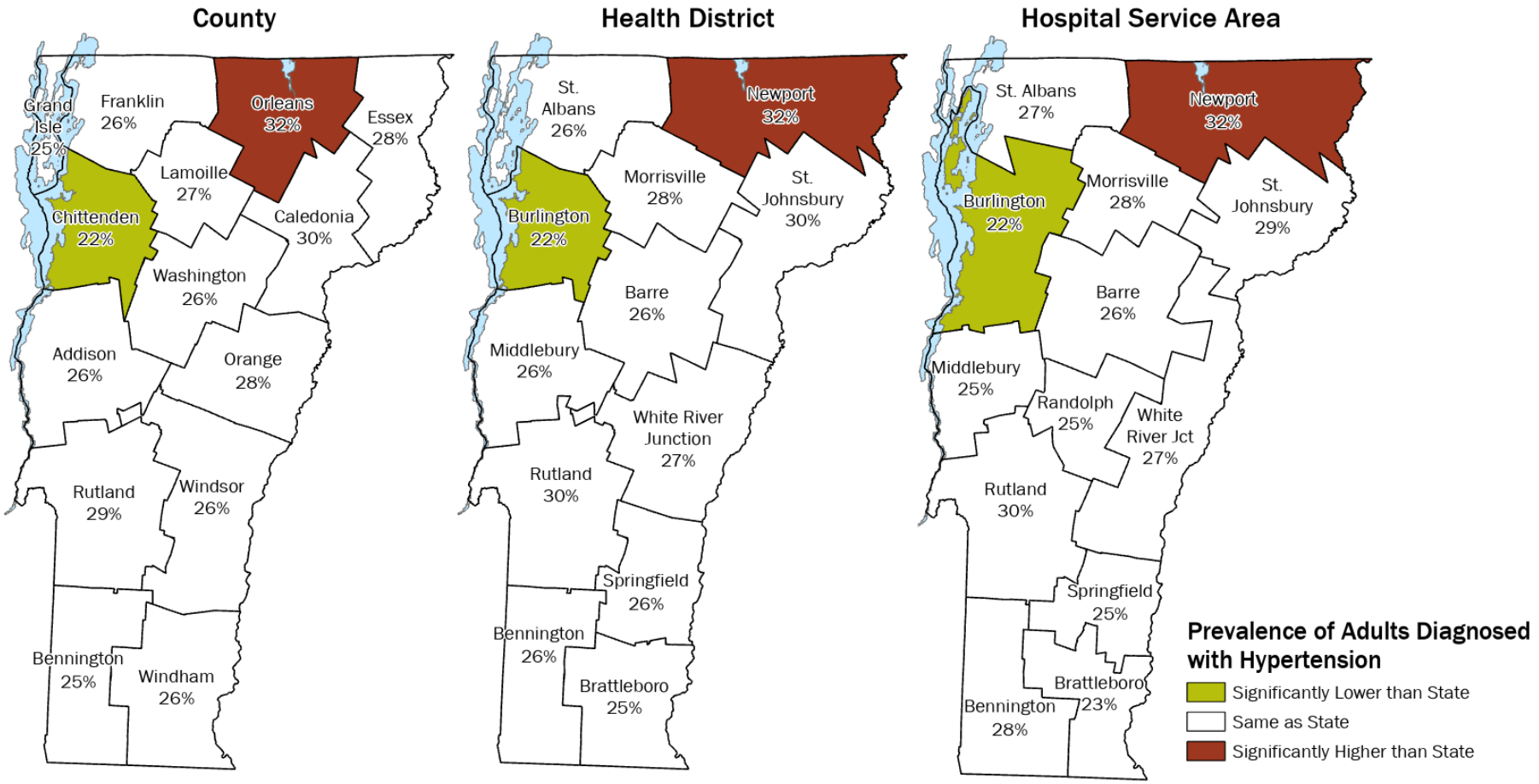
- With any disability.
- With poor mental health.
- Among those living at a low or middle SES compared to a high SES.
- Among those living in a small rural town compared to an urban one.

Source: VT BRFSS, 2020.
Data are age-adjusted to the U.S. 2000 population.

Hypertension Prevalence and Health Inequality



Hypertension by Subgeography



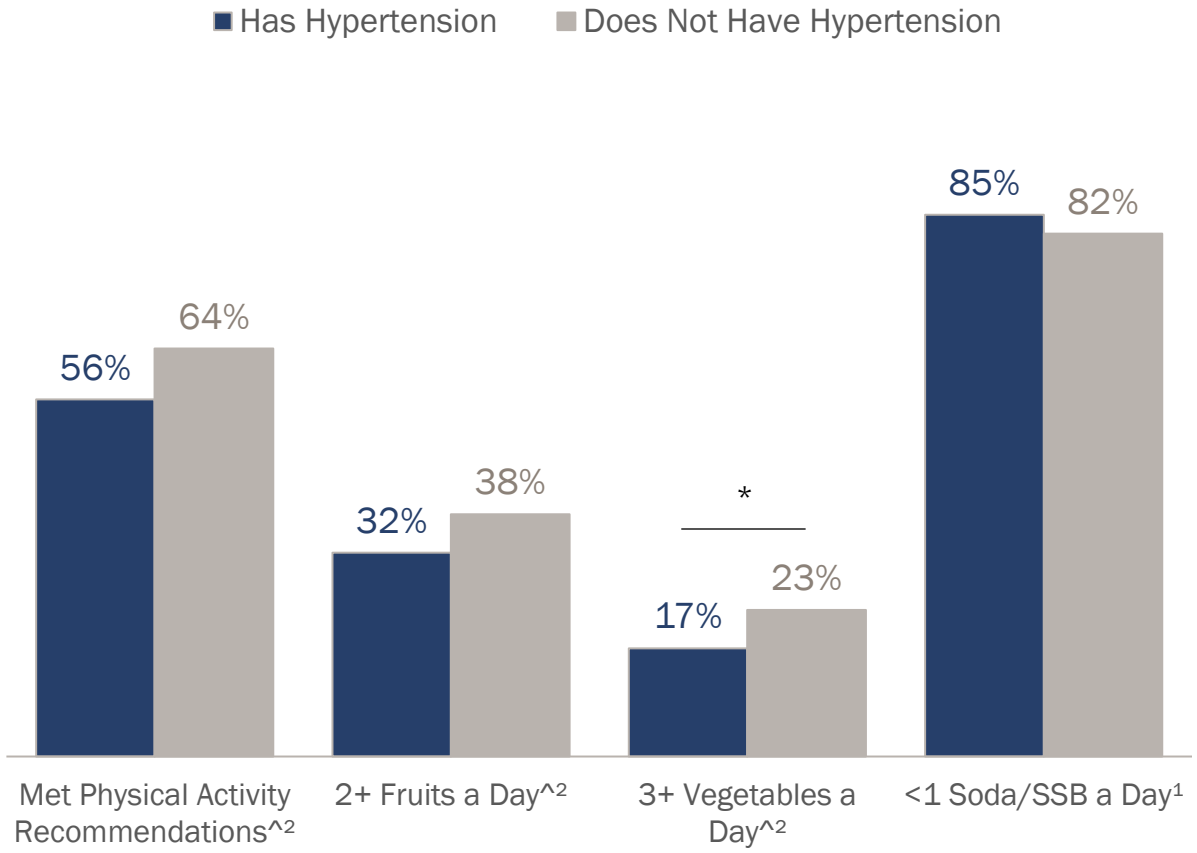
The prevalence of hypertension among Vermont adults is significantly higher in Orleans County as well as the Newport Health District and Hospital Service Area (HSA) when compared to the state average. Prevalence is significantly lower than the state average in Chittenden County and the Burlington Health District and HSA.

Source: VT BRFSS, 2019 & 2020.
^ Data are age-adjusted to the U.S. 2000 population.

Adults with hypertension are significantly <u>less likely</u> to consume the recommended amount of vegetables than those who do not have hypertension.

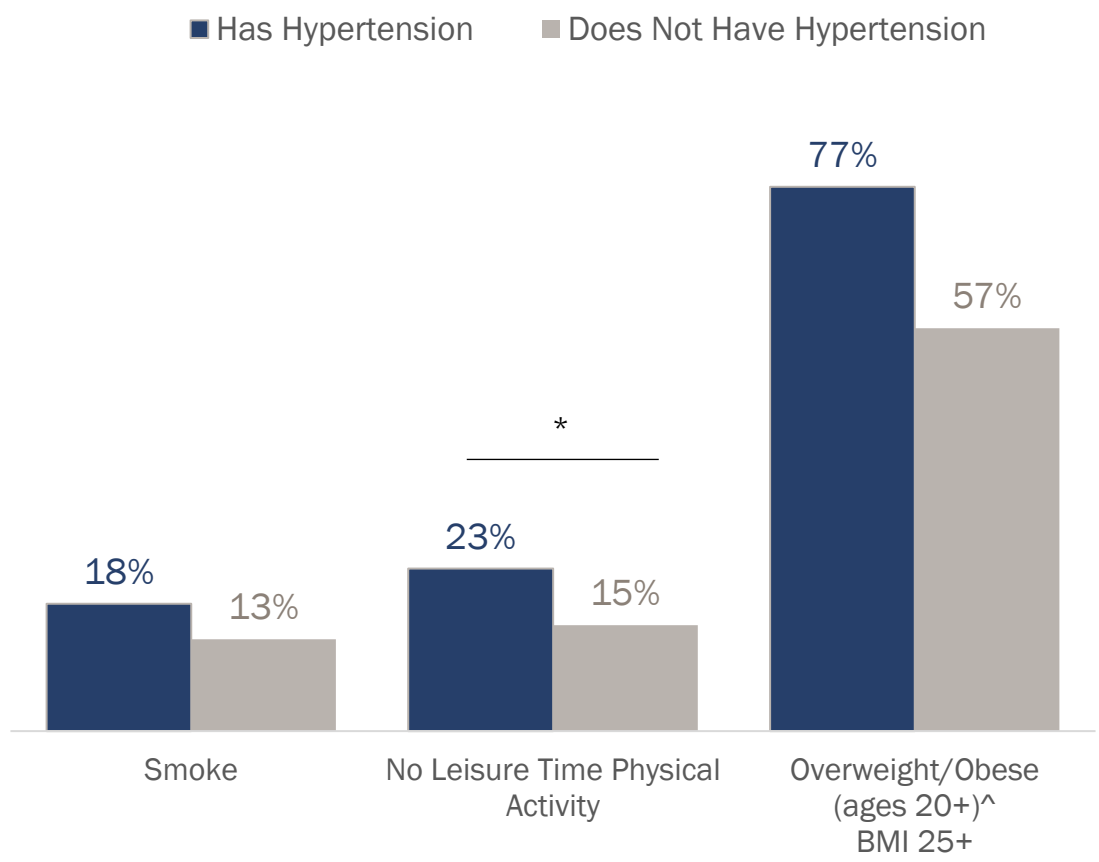
Actions or biological and community factors that are linked to a **lower** likelihood of developing or reducing disease are considered **protective** against disease.

Behaviors That Protect Against Developing Hypertension



Source: VT BRFSS, 2017[1] & 2019[2].
^ Data are age-adjusted to the U.S. 2000 population.

Risk Factors for Developing Hypertension



Source: VT BRFSS, 2020.
Data are age-adjusted to the U.S. 2000 population.

Adults with hypertension are significantly <u>more likely</u> to have no leisure time physical activity or have a BMI classified as overweight/obese.

Actions or biological and community factors that are linked to a **higher** likelihood of developing or worsening disease are considered **risk factors** for disease.

Hypertension and Healthcare Access

Vermont adults with hypertension are:

Significantly more likely to **have a personal doctor** than those not diagnosed with hypertension (92% vs. 82%).[2]

More likely to have **visited a doctor in the last year** compared to those not diagnosed with hypertension (87% vs. 66%).[2]

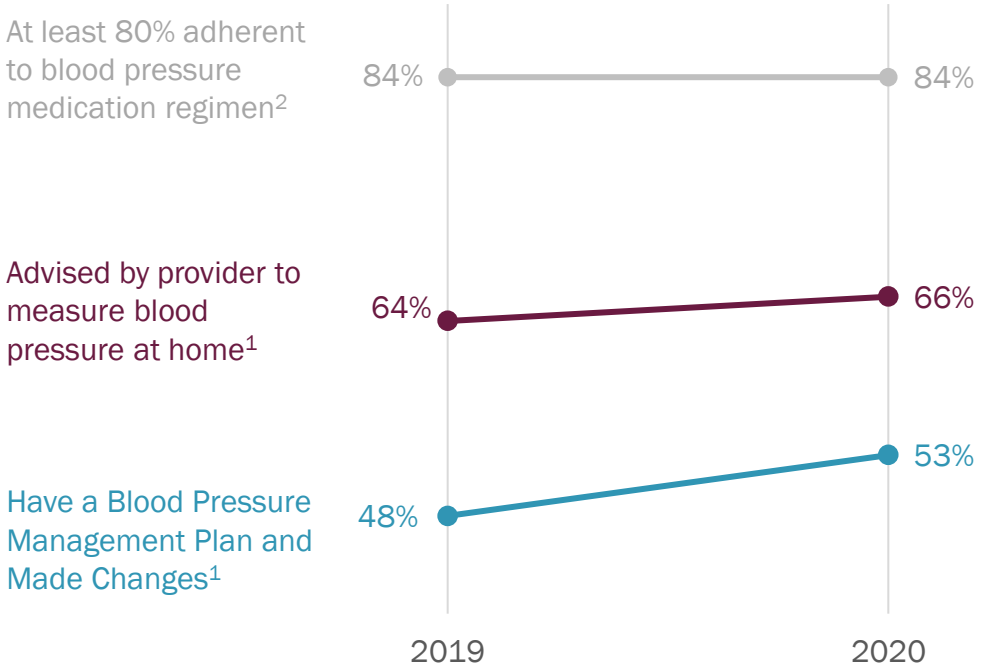
Significantly more likely to be covered by **public insurance*** (59% vs. 35%) while **significantly fewer** are covered by **private insurance** (39% vs. 62%) compared to those not diagnosed with hypertension.[1]

*Medicare: 45% vs. 19% - Medicaid 10% vs. 13% - TRICARE/IHS 4% vs. 3%

Source: VT BRFSS, 2018[1] & 2020[2].

Management of Hypertension

Management behaviors for Vermont adults 18 and older diagnosed with hypertension are statistically unchanged from 2019 to 2020.

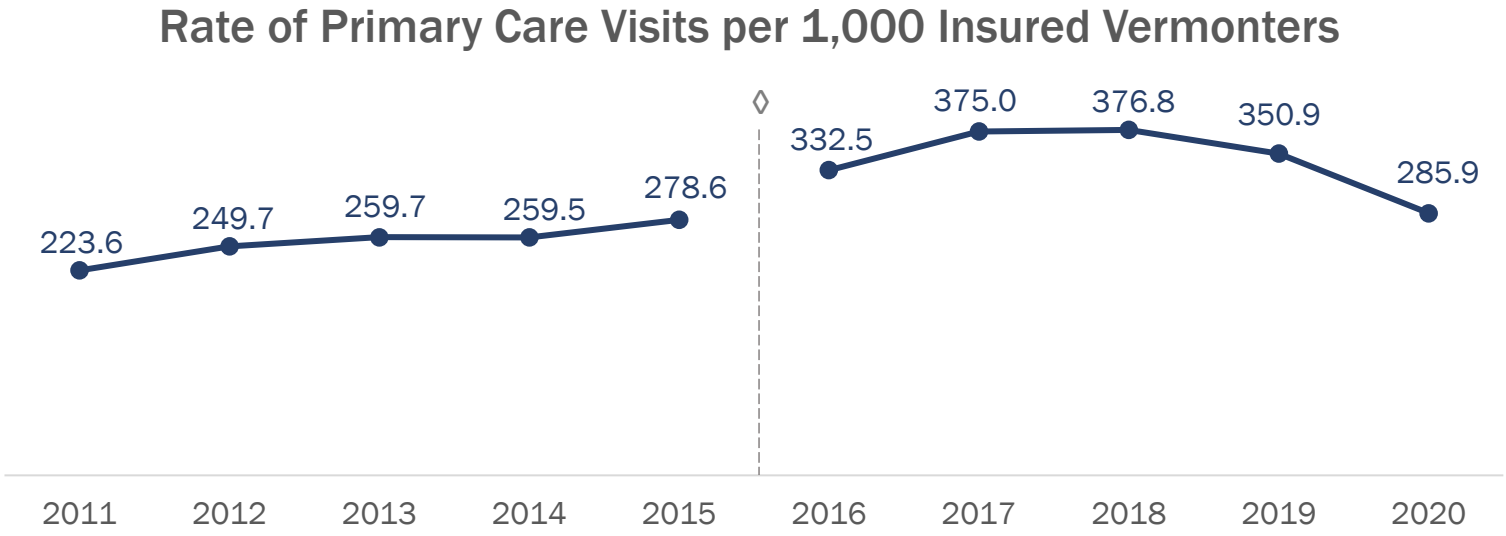


- The rate of adults 18 and older diagnosed with hypertension who worked with their provider to create a plan to manage their hypertension and have made changes in their life increased from 2019 (48%) to 2020 (53%).
- Two-thirds (66%) of adults diagnosed with hypertension in 2020 have been advised by their provider to monitor their blood pressure at home.
- Being at least 80% adherent to antihypertensive medication regimens remained stable at 84% from 2019 to 2020 for adults 18 and older diagnosed with hypertension and continuously covered by a prescription benefits plan for the calendar year.
  - Medication adherence is measured using proportion of days covered (PDC). This refers to the proportion of days that a person should have medication from the time of their first prescription date through the end of the calendar year.

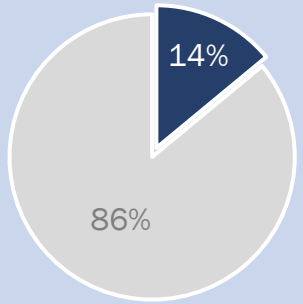
Source: VT BRFSS, 2019 & 2020[1]; GMCB VHCURES, 2019 & 2020 – extract 306 – extracted 04/07/22[2]

Primary Care Visits for Hypertension

- For every 1,000 insured Vermonters, 285.9 had a primary care visit related to hypertension in 2020 (187,066 visits among 87,225 people).
- The 2020 rate was significantly lower than all previous years 2016-2019. The decrease in the rate of primary care visits in 2020 is likely due to decreased healthcare visits during the COVID-19 pandemic.
- On average, there were 2.1 primary care visits per insured person for hypertension in 2020, slightly lower than the 2019 average of 2.4 per person.



One in seven (14%) hypertension-related primary care visits in 2020 were **telehealth** visits

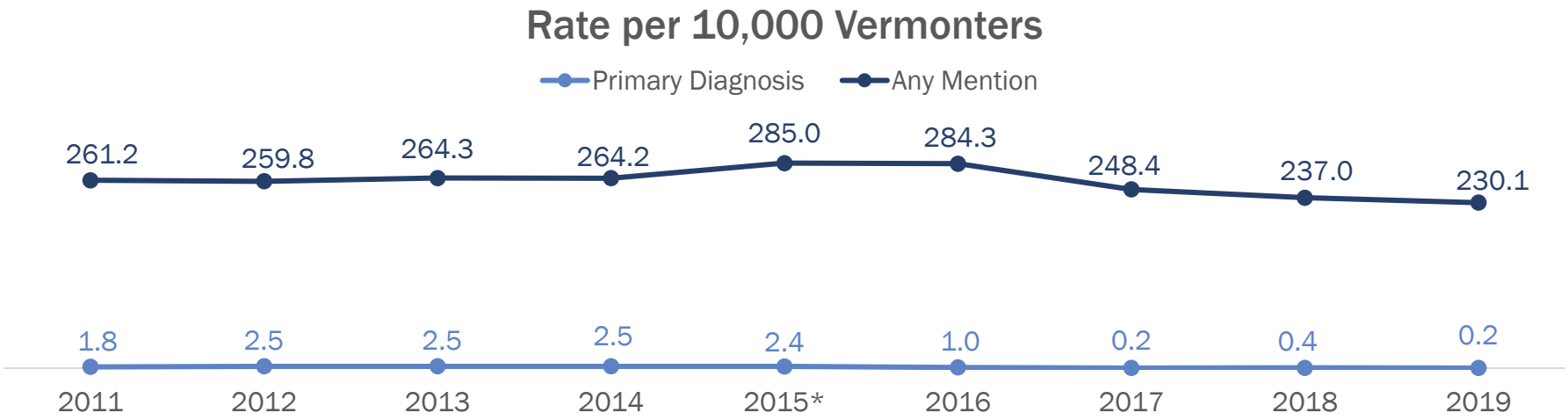


Source: GMCB VHCURES, 2011-2020 – extract 3005 – extracted 10/25/22.
◊ Comparisons 2015 and earlier to post-2015 should be made with caution due to changes in the number of private payers submitting to VHUCRES beginning in 2016.
Statistical comparisons were performed using Z-scores.

Hypertension-Related Hospital Discharges

There were 0.2 hospital discharges with a primary diagnosis of hypertension for every 10,000 Vermonters (14 discharges) in 2019. The trend has remained relatively low. The 2019 rate is significantly lower than 2016 and statistically similar to 2017 and 2018.

Hospital discharges with any mention of hypertension are statistically higher than the rate of discharges as a primary diagnosis. The rate of hospital discharges with any mention of hypertension has been descending since 2016. In 2019, there were 230.1 discharges with any mention of hypertension for every 10,000 Vermonters (14,355 visits). The 2019 rate is statistically similar to 2018 but lower than all other years reported.

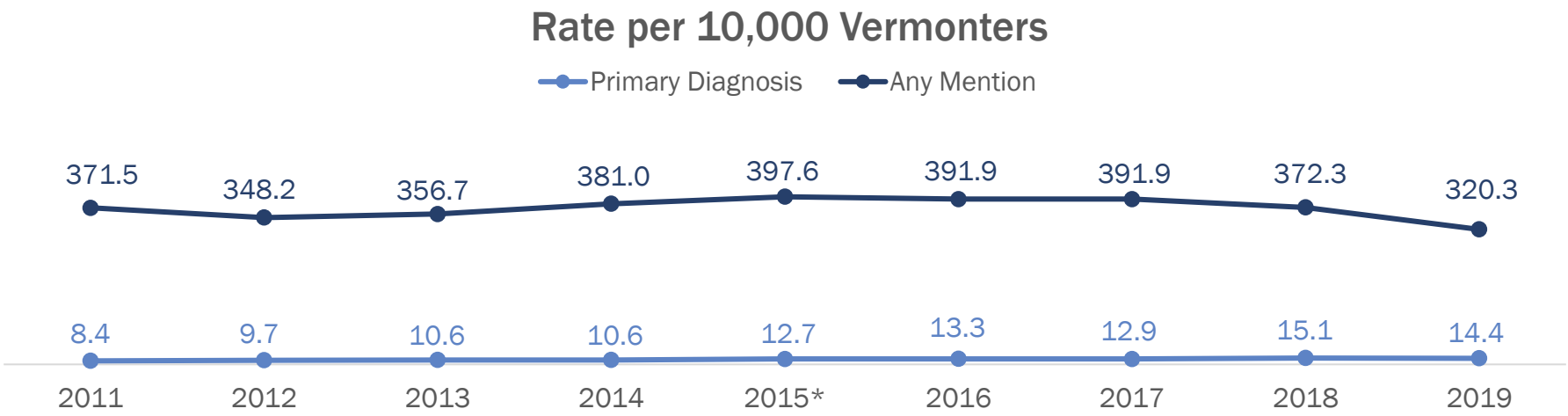


Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include hospitalizations for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.

Hypertension-Related Emergency Department (ED) Visits

There were 14.4 ED visits with a primary diagnosis of hypertension for every 10,000 Vermonters (901 visits) in 2019. The rate of ED visits with a primary diagnosis of hypertension has remained statistically unchanged since 2015.

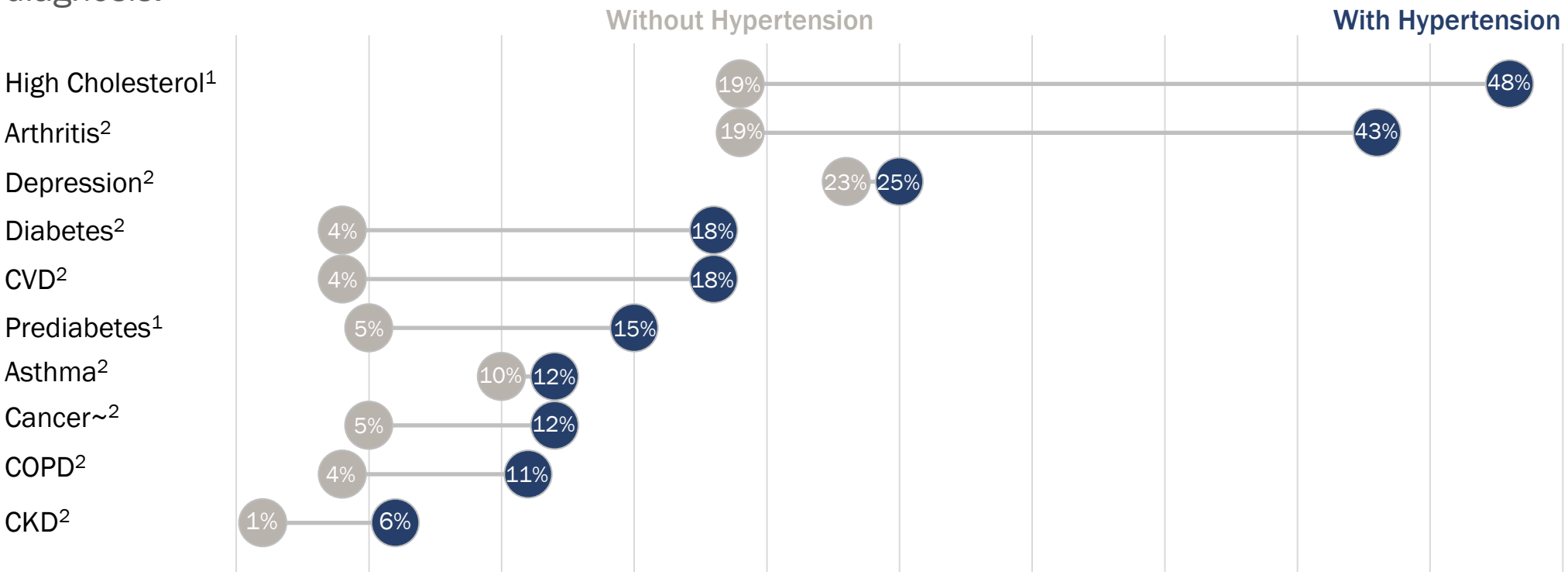
ED visits with any mention of hypertension are statistically higher than the rate of visits of hypertension as a primary diagnosis. In 2019 there were 320.3 ED visits with any mention of hypertension for every 10,000 Vermonters (19,988 visits). The rate of ED visits with any mention of hypertension has been descending since 2015. The 2019 rate is statistically lower than all years reported.



Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include ED visits for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.

Hypertension and Prevalence of Co-Occurring Chronic Disease

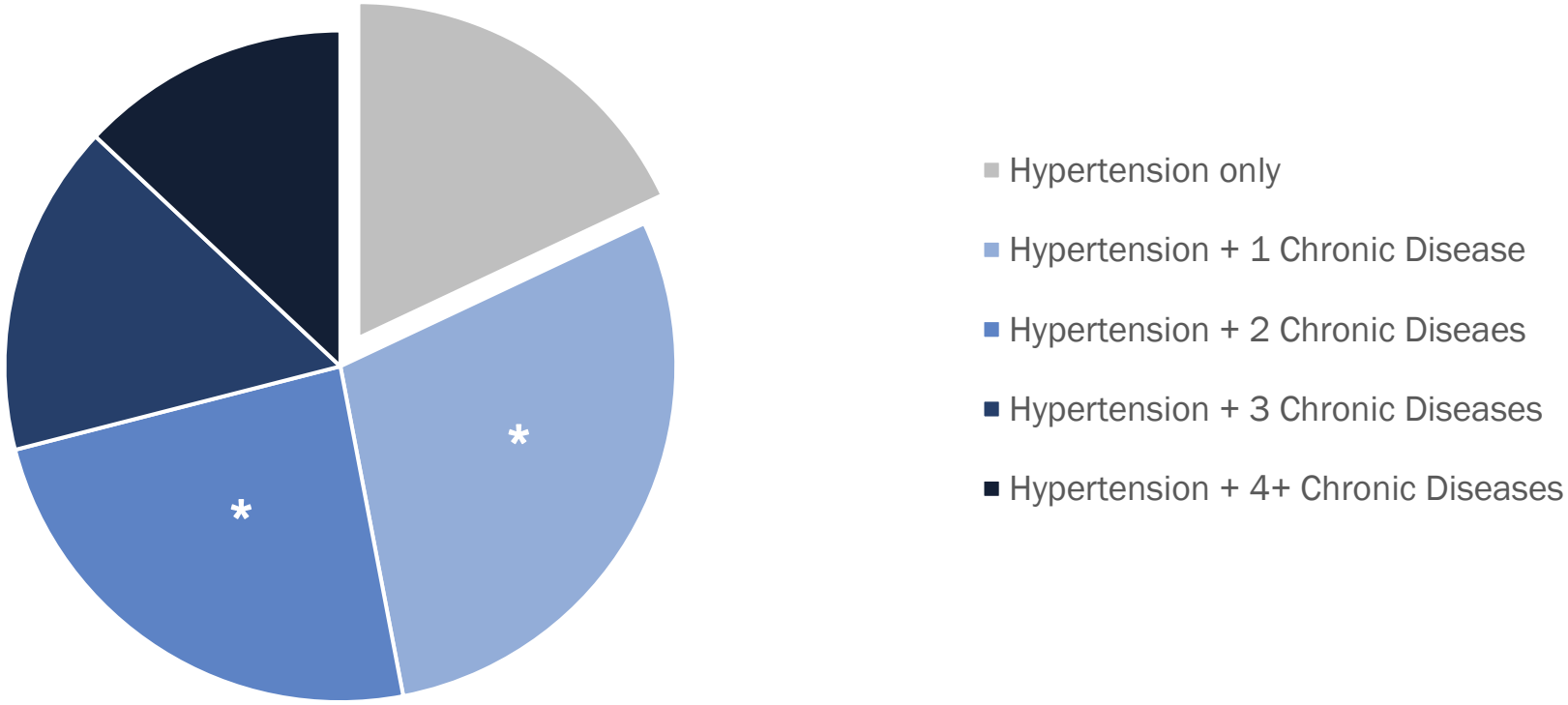
Adults **with hypertension** are significantly more likely to have a co-occurring chronic disease than those **without hypertension**. Rates of depression and asthma do not differ by hypertension diagnosis.



Source: VT BRFSS, 2019[1] & 2020[2].
~Excludes those whose form of cancer is skin cancer.

Multiple Chronic Diseases and Hypertension

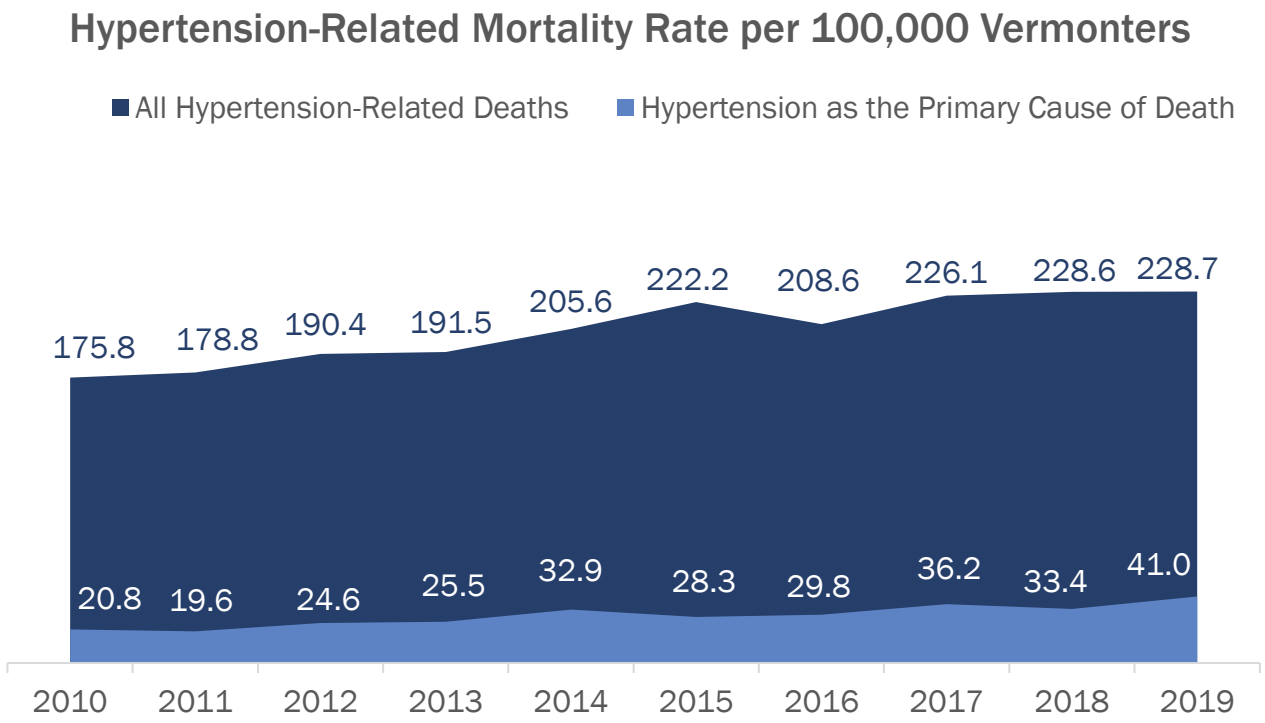
Adults with hypertension are significantly more likely to have hypertension plus **one** or **two** chronic diseases than hypertension alone or hypertension plus three or more chronic diseases.



Source: VT BRFSS, 2020.

Hypertension-Related Mortality

All hypertension-related deaths among Vermonters is significantly higher than **hypertension as the primary (principal) cause** for death. **This indicates that the burden of hypertension is as a contributing factor to disease.**



Source: VT Vital Statistics, 2010-2019.

- As a primary cause of death, hypertension increased from 2010 to 2019. The rate in 2019 (41.0 deaths for every 100,000 Vermonters) was statistically similar to that in 2017 and 2018 and statistically higher than all other years.
- All hypertension-related mortality has shown an overall ascending trend since 2010. The all-cause hypertension mortality rate in 2019 (228.7 deaths for every 100,000 Vermonters) was statistically higher than that in 2013 and earlier years, though statistically similar to 2014 to 2018.

Prediabetes

What is prediabetes? How many Vermont adults are being screened for high blood sugar and how many have prediabetes? What is the risk, management, burden and mortality for those who have it?

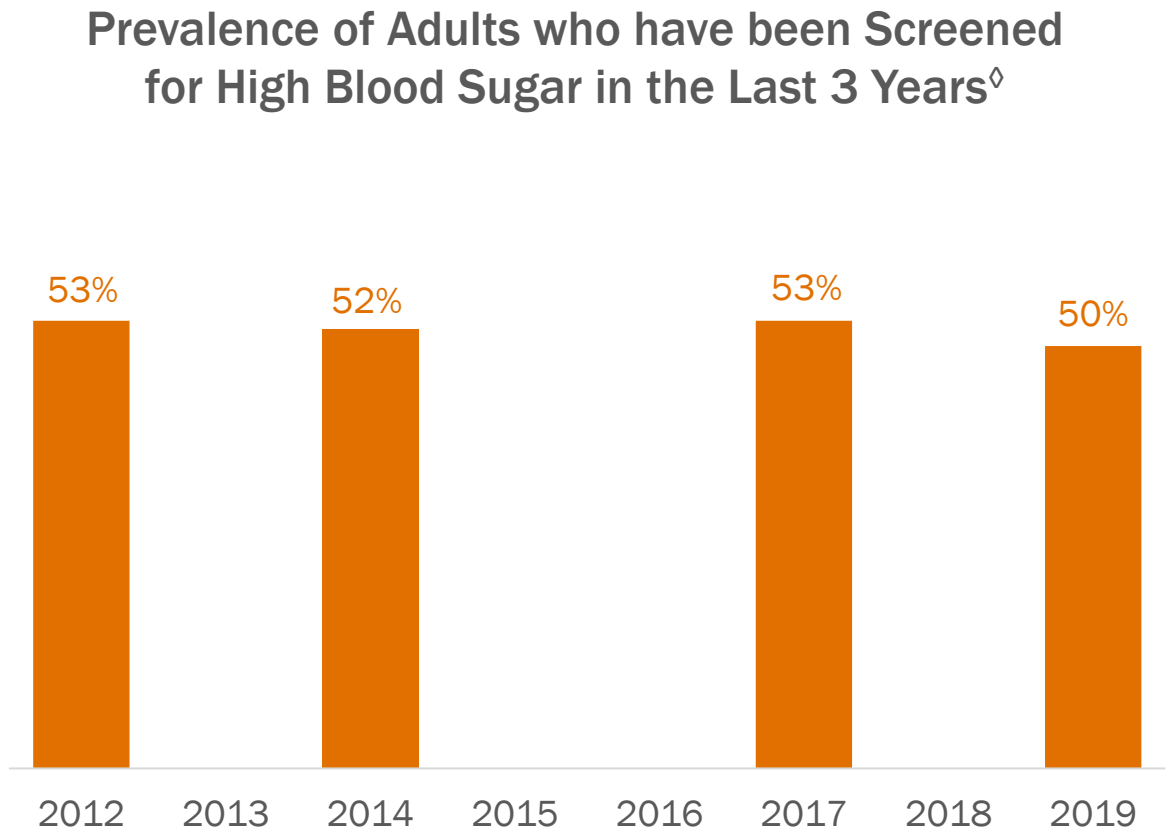
About Prediabetes

- Prediabetes, sometimes referred to as impaired blood glucose tolerance (IGT) or impaired fasting glucose (IFG), is classified by blood sugar levels that are higher than normal but not high enough to be diagnosed as diabetes.
- Prediabetes has no clear symptoms; However, some people will have some of the same symptoms or health complications of diabetes.
- Prediabetes places you at increased risk for developing type 2 diabetes and cardiovascular disease.
- Growing evidence indicates the health consequences associated with diabetes begin among those with prediabetes.

Source: American Diabetes Association, Diagnosing and Learning About Prediabetes. November 21, 2016.
Tabák AG et al. Prediabetes: A high risk state for developing diabetes. *Lancet*. 2012;379(9833):2279-2290.

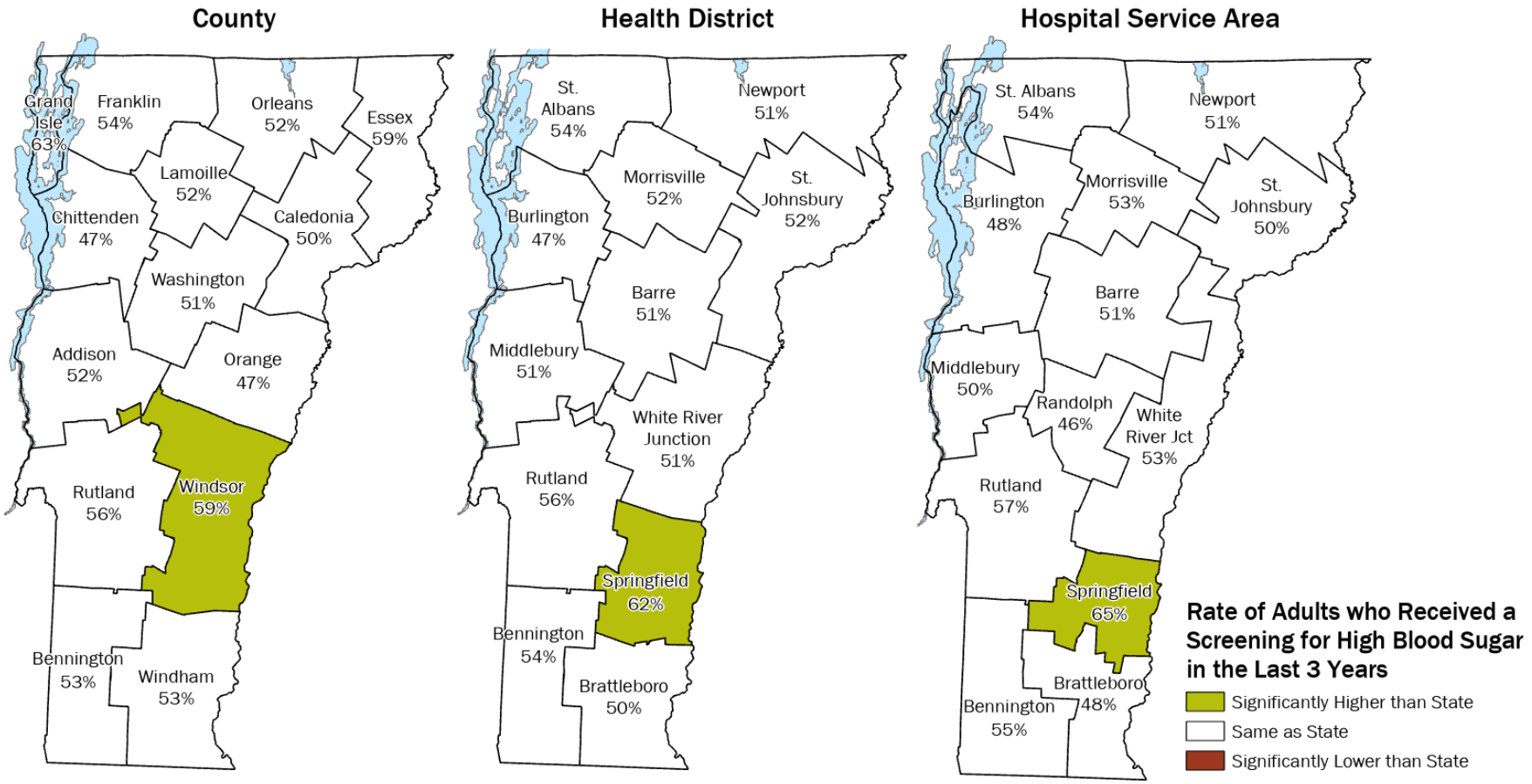
Screening for High Blood Sugar

- About half (50%) of Vermont adults in 2019 received screening for high blood sugar in the last 3 years.
- The rate of high blood sugar screenings has remained statistically stable since 2012.



Source: VT BRFSS, 2012-2019.
◊ Question only included periodically on the BRFSS survey. Data are not available for 2013, 2015, 2016, or 2018.

High Blood Sugar Screening by Subgeography



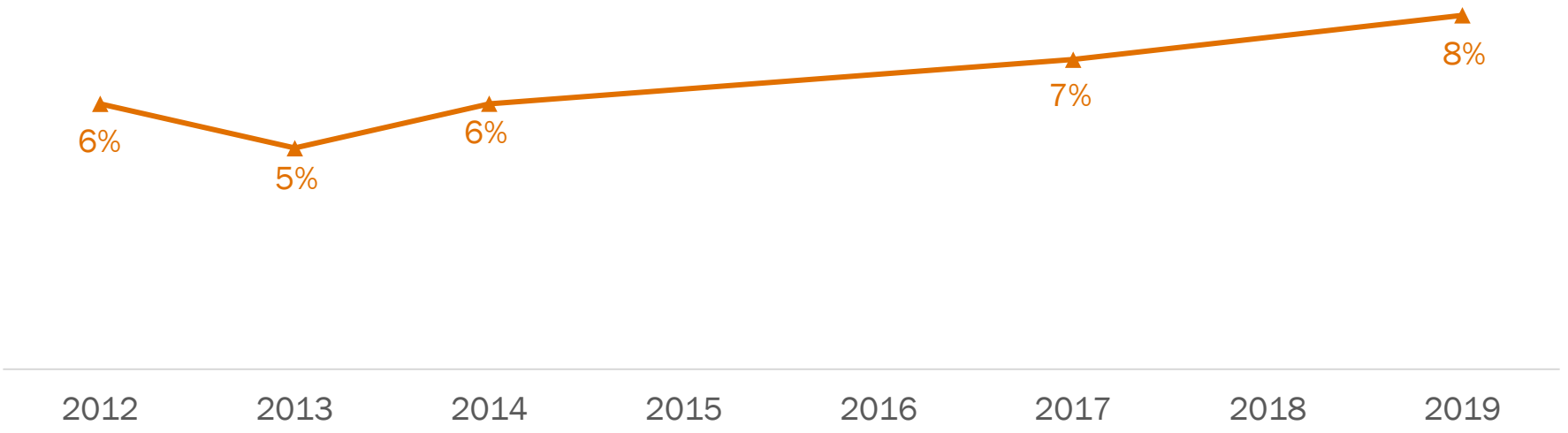
The rate of screening for high blood sugar in the last 3-years among Vermont adults is significantly higher in Windsor County and the Springfield Health District and Hospital Service Area (HSA) when compared to the state average.

Source: VT BRFSS, 2017 & 2019.

Adult Trend of Diagnosed Prediabetes

- The prevalence of diagnosed prediabetes among Vermont adults has been slowly ascending since 2013.
- The prevalence of diagnosed prediabetes in 2019 (8%) was statistically similar to 2017 but statistically higher than 2014.

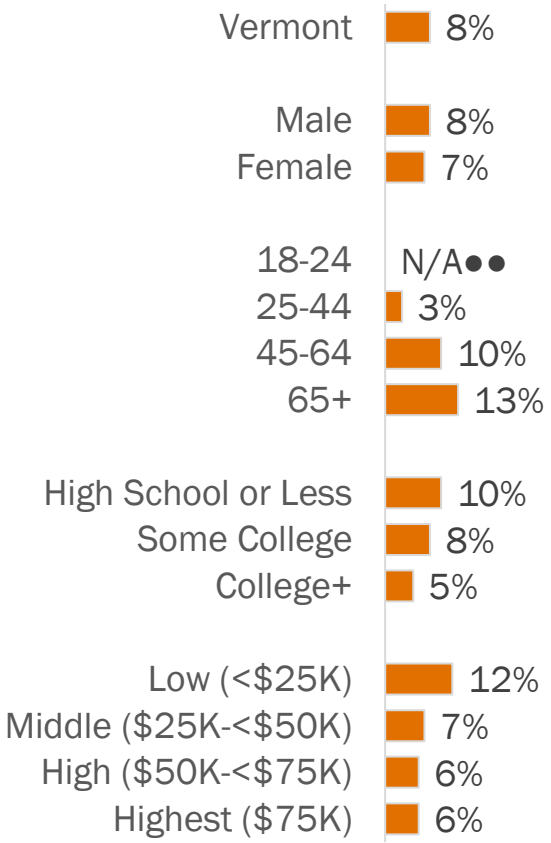
Prediabetes is an underdiagnosed condition. Therefore, the ascending trend may be more indicative of increased diagnosis of existing prediabetes rather than an increase in true new cases.



Source: VT BRFSS, 2012-2019.

Prediabetes Demographics

Prevalence of Adults with Diagnosed Prediabetes



Source: VT BRFSS, 2019.
●●Value suppressed because sample size too small or relative standard error is > 30.
[1] CDC. Prediabetes – Your Chance to Prevent Type 2 Diabetes. https://www.cdc.gov/diabetes/basics/prediabetes.html.

- Around one in twelve (8%)[α] Vermont adults or approximately 34,300 adults have ever been diagnosed with prediabetes.
  - Prediabetes is significantly more likely among:
    - Adults 45 years or older compared to those 25-44 years old.
    - Those with at some college or less education compared to those with a college degree or higher.
    - People in households with incomes less than $25,000 a year, compared to those making $25,000 or more.
- Around a third of U.S. adults are estimated to have prediabetes, where 80% don't know they have it.[1] Based on this, an additional 137,200 Vermont adults may have prediabetes and not know it.

[α] This is likely an underestimate given that only 50% of adults have been tested for high blood sugar in the last 3 years (see page 47).

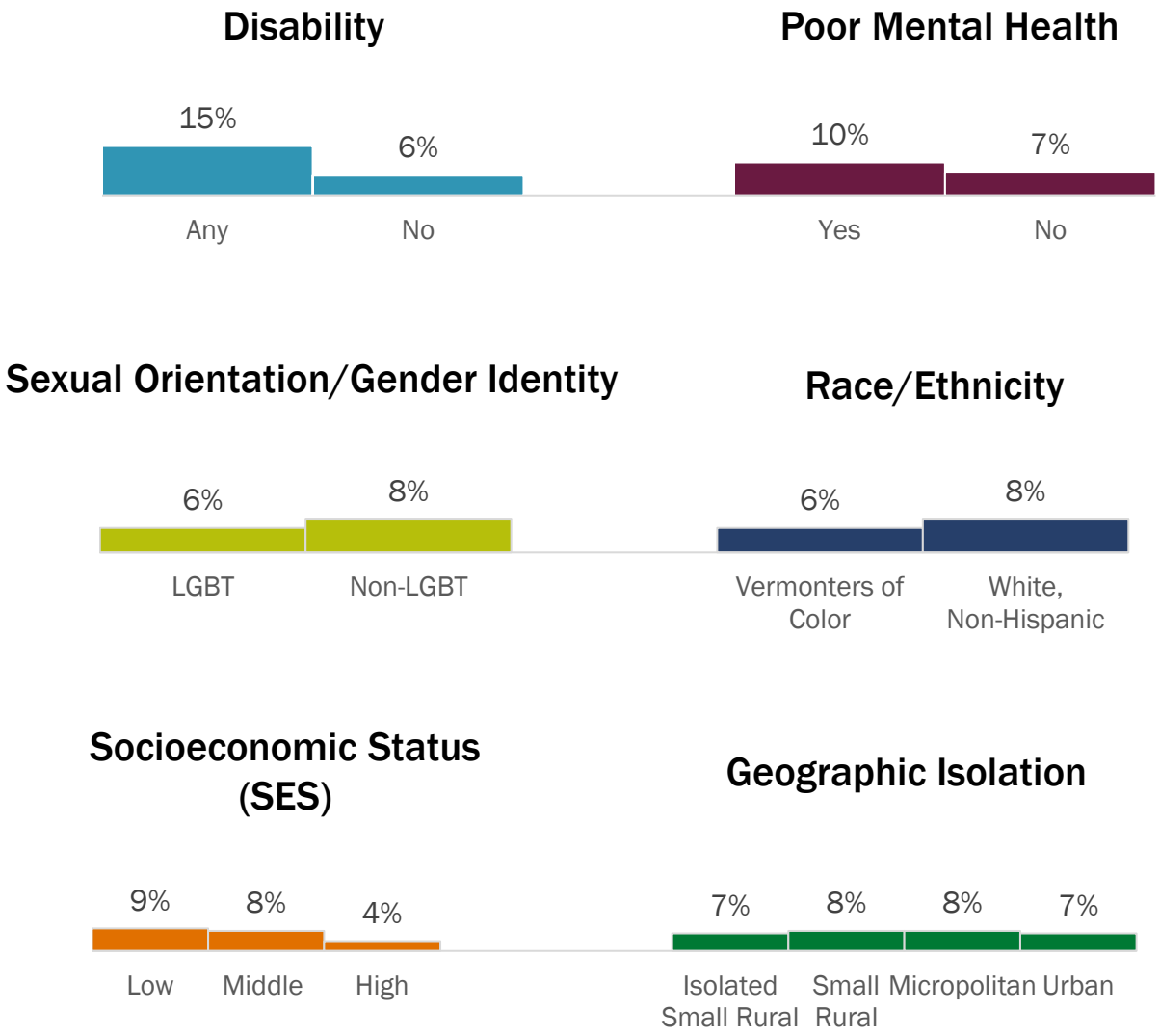
Health inequalities lead to varying impacts of prediabetes.

Prediabetes is significantly more likely among adults:

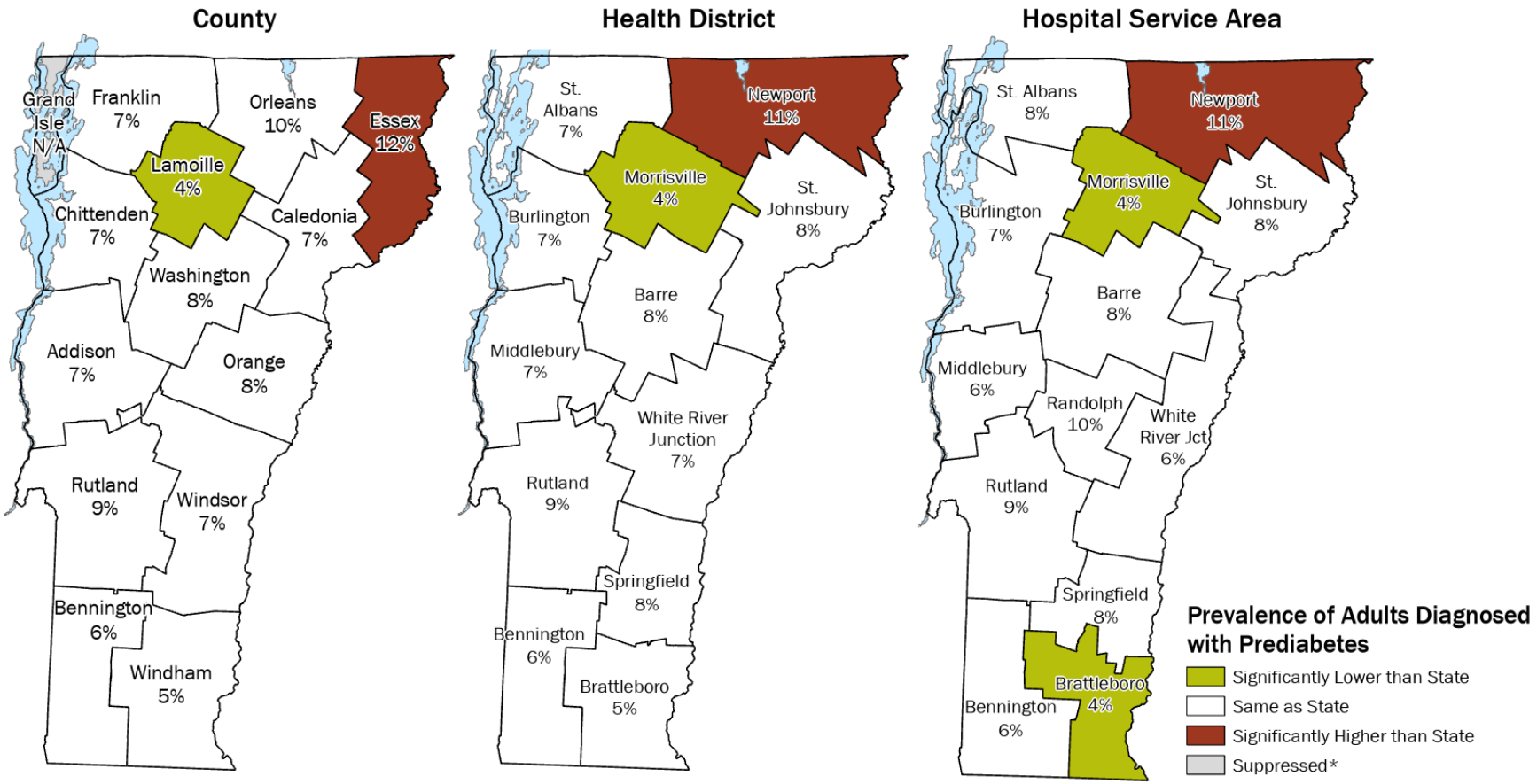
- With any disability.
- Living at a middle SES compared to a high SES.

Source: VT BRFSS, 2019.

Diagnosed Prediabetes Prevalence and Health Inequality



Diagnosed Prediabetes by Subgeography



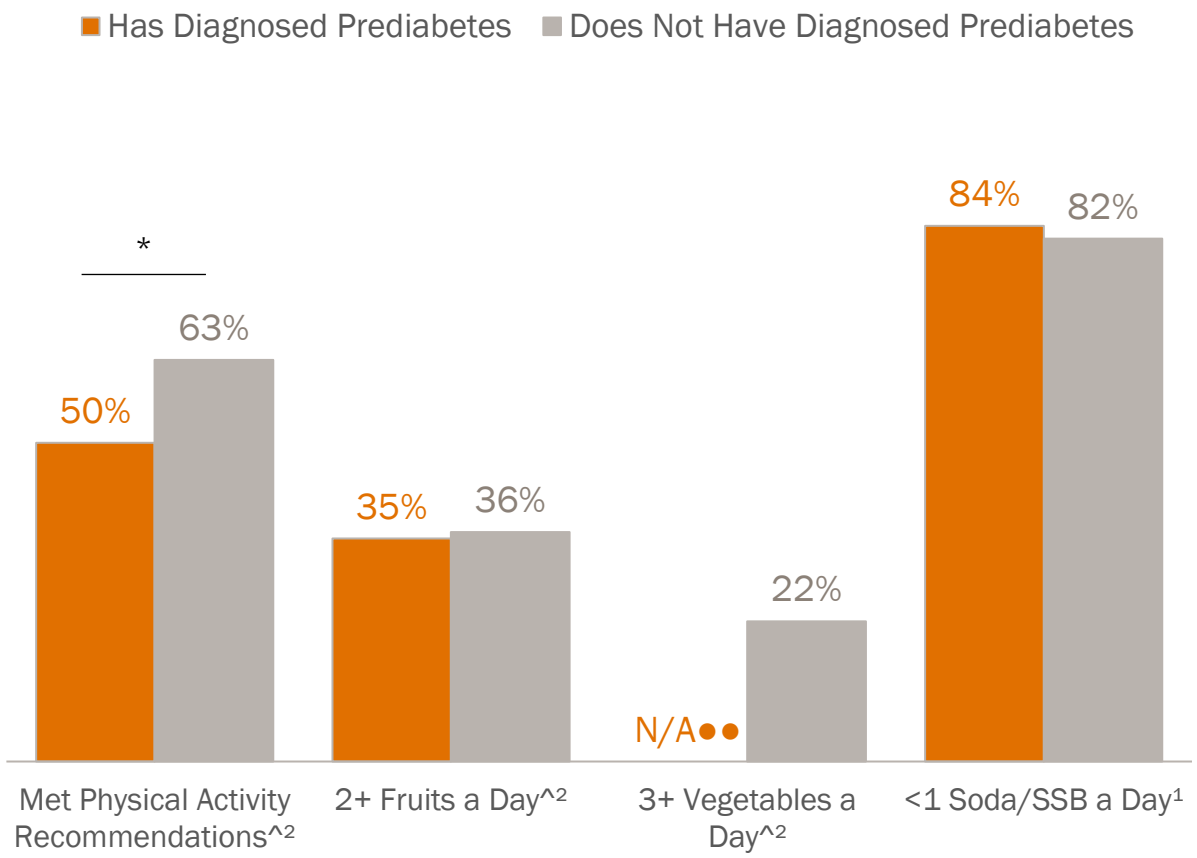
The prevalence of diagnosed prediabetes among Vermont adults is significantly lower in Lamoille County and the Morrisville Health District and the Morrisville and Brattleboro Hospital Service Areas (HSA) when compared to the state average. Diagnosed prediabetes was significantly higher in Essex County and the Newport Health District and HSA.

Source: VT BRFSS, 2017 & 2019.
*Value is suppressed due to small sample size or the relative standard error (RSE) is > 30.

Adults with diagnosed prediabetes are significantly <u>less likely</u> to get the recommended amount of aerobic physical activity than those who do not have diagnosed prediabetes.

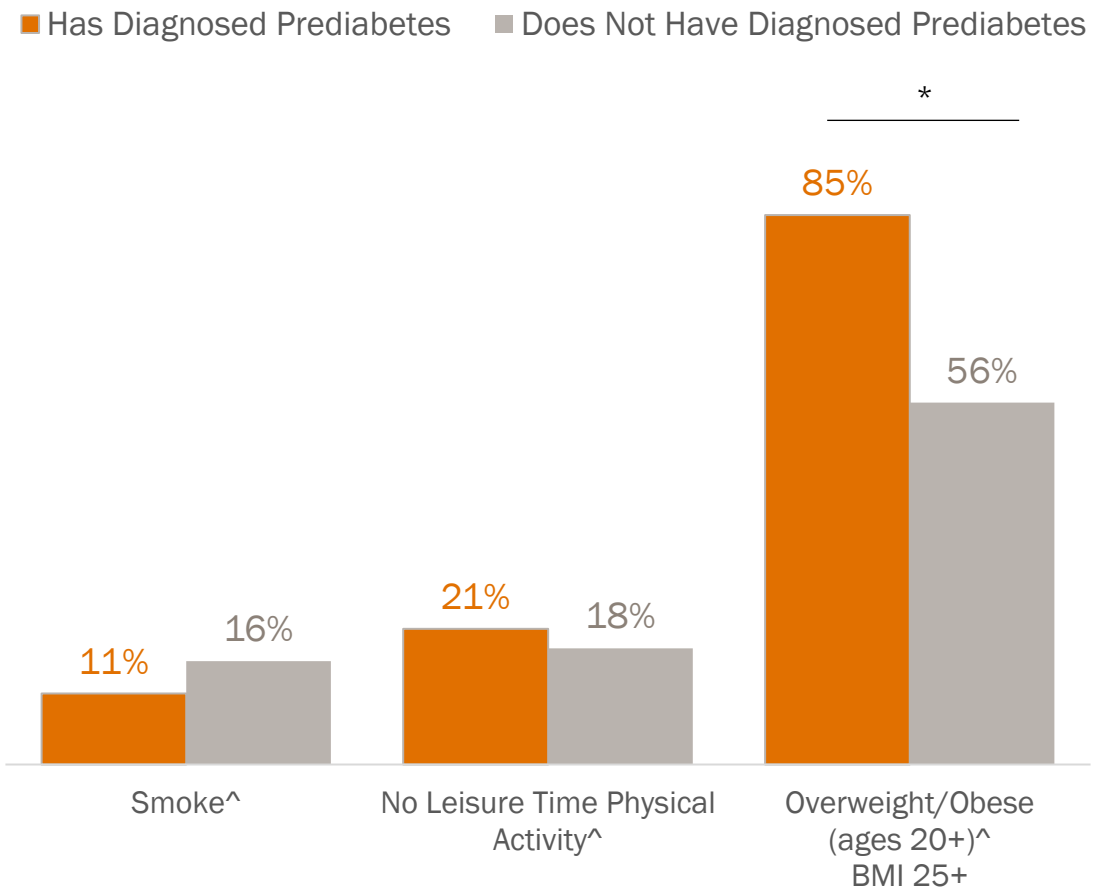
Actions or biological and community factors that are linked to a **lower** likelihood of developing or reducing disease are considered **protective** against disease.

Behaviors That Protect Against Developing Prediabetes



Source: VT BRFSS, 2017[1] & 2019[2].
^ Data are age-adjusted to the U.S. 2000 population.
●●Value suppressed because sample size too small or relative standard error is > 30.

Risk Factors for Developing Prediabetes



Source: VT BRFSS, 2019.
^ Data are age-adjusted to the U.S. 2000 population.

Adults with diagnosed prediabetes are significantly more likely to have a BMI classified as overweight/obese.

Actions or biological and community factors that are linked to a **higher** likelihood of developing or worsening disease are considered **risk factors** for disease.

Diagnosed Prediabetes and Healthcare Access

Vermont adults with prediabetes are:

Significantly more likely to **have a personal doctor** than those not diagnosed with prediabetes (96% vs. 84%).[2]

More likely to have **visited a doctor in the last year** compared to those not diagnosed with prediabetes (88% vs. 72%).[2]

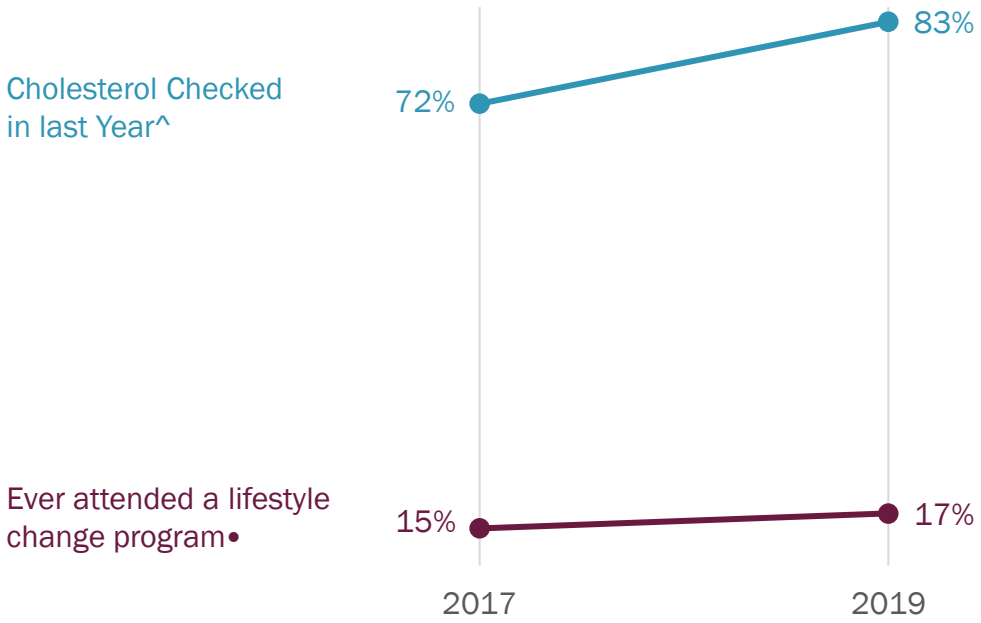
Significantly more likely to be covered by **public insurance*** (58% vs. 39%) while **significantly fewer** are covered by **private insurance** (41% vs. 57%) compared to those not diagnosed with prediabetes.[1]

*Medicare: 41% vs. 22% - Medicaid 12% vs. 14% - TRICARE/IHS 4% vs. 3%

Source: VT BRFSS, 2017[1] & 2019[2].

Management of Prediabetes

Vermont adults with diagnosed prediabetes **who had their cholesterol checked** or **ever attended a lifestyle program** trended upward from 2017 to 2019.

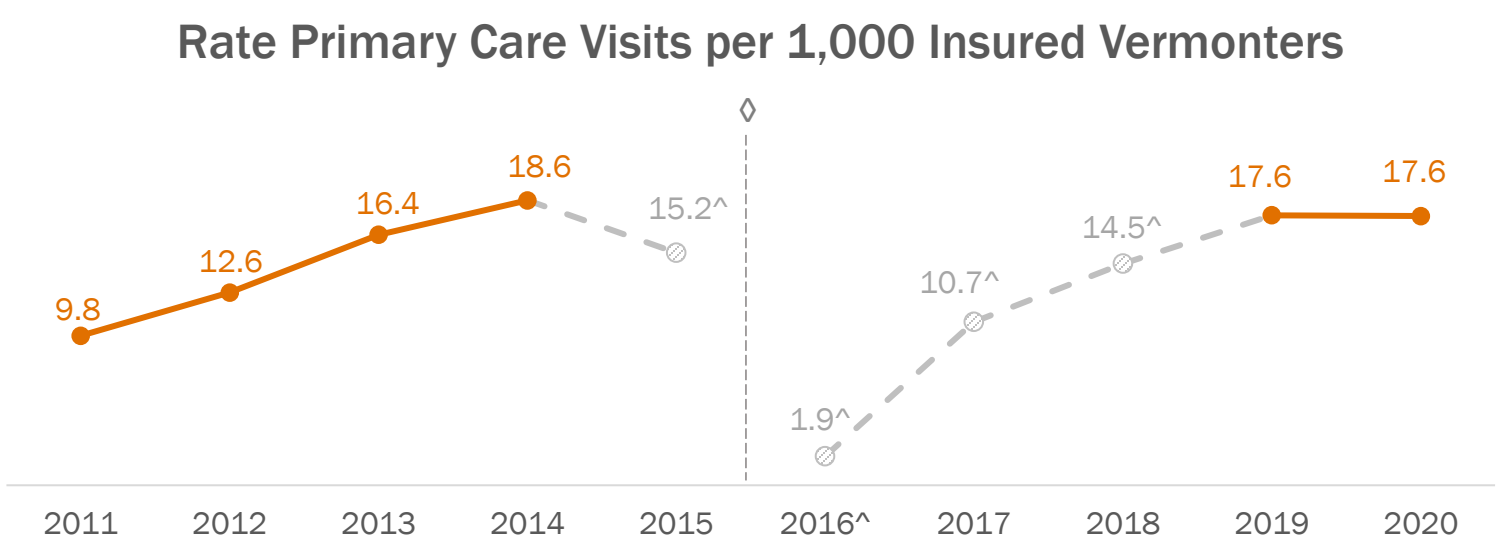


- The rate of adults 18 and older who had their cholesterol checked in the last year trended upward from 2017 (72%) to 2019 (83%)
- In 2019, 17% of adults diagnosed with prediabetes had ever participated in a lifestyle change program to improve their health or prevent diabetes. This is a slight increase from 2017 (15%).

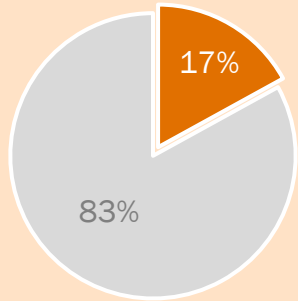
Source: VT BRFSS, 2017 & 2019.
^ Data are age-adjusted to the U.S. 2000 population.
• Includes programs such as the National Diabetes Prevention Program, YMCA Diabetes Prevention Program, Curves Complete, Weight Watchers, or other similar program.

Primary Care Visits for Prediabetes

- For every 1,000 insured Vermonters in 2020, 17.6 had a primary care visit related to prediabetes (11,500 visits among 8,369 people).
- The rate of primary care visits for prediabetes among insured Vermonters was statistically similar from 2019 to 2020. The rate was significantly lower than in 2014.
- On average, there were 1.4 primary care visit per insured person for prediabetes in 2020, similar to 2019.
- Changes in billing rules in federal fiscal year 2016 resulted in reduced ability to detect visits for prediabetes due to the lack of a billable code, which can be seen by the dashed calendar years. However, prediabetes became billable again in fiscal year 2017 leading to a recovery in the ability to detect visits for this condition in subsequent years.^



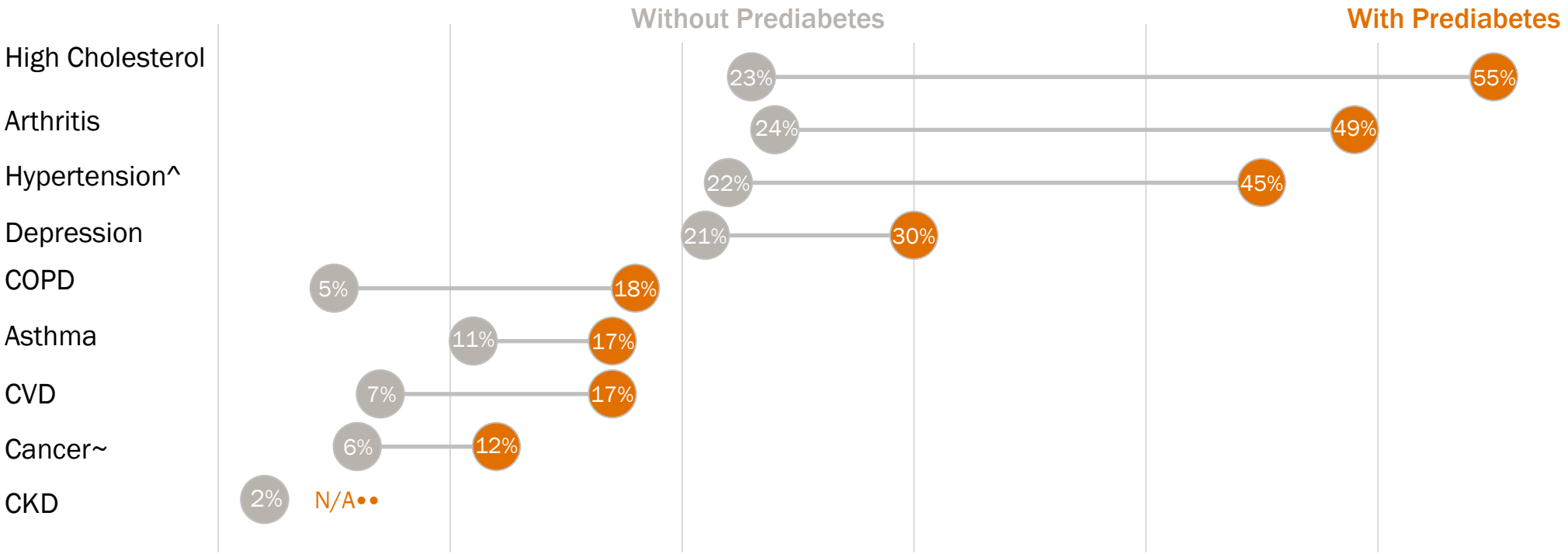
More than one in six (17%) prediabetes-related primary care visits in 2020 were **telehealth** visits



Source: GMCB VHCURES, 2011-2020 – extract 3005 – extracted 10/26/22.
◊ Comparisons 2015 and earlier to post-2015 should be made with caution due to changes in the number of private payers submitting to VHUCRES beginning in 2016.
^ Billing rules changed from 2015 to 2016 when coding went from International Classification of Disease (ICD), 9th revision, clinical modification (ICD-9-CM) to ICD-10-CM making prediabetes non-billable. It returned to billable status in federal fiscal year 2017 making the rates for 2015, 2016, and likely 2017 and 2018, underestimates of the actual rate of visits for prediabetes.
Statistical comparisons were performed using Z-scores.

Prediabetes and Prevalence of Co-Occurring Chronic Disease

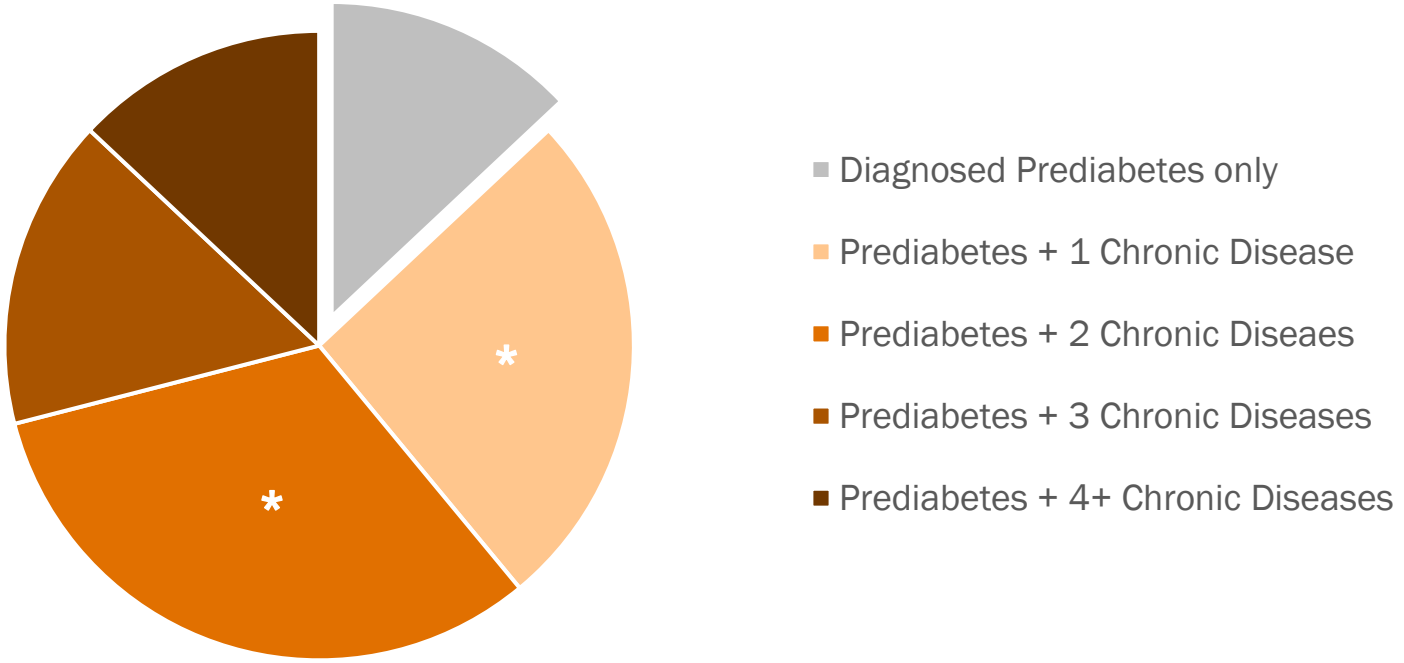
Adults **with prediabetes** are significantly more likely to have a co-occurring chronic disease than those **without prediabetes**. Rates of asthma do not differ by prediabetes diagnosis.



Source: VT BRFSS, 2019.
^ Data are age-adjusted to the U.S. 2000 population.
~Excludes those whose form of cancer is skin cancer.
••Value suppressed because sample size too small or relative standard error is > 30.

Multiple Chronic Diseases and Diagnosed Prediabetes

Adults with prediabetes are significantly more likely to have prediabetes plus **one** or **two** chronic diseases than prediabetes alone.



Source: VT BRFSS, 2019.

Cardiovascular Disease (CVD)

What is CVD? How many Vermont adults have it? What is the risk, management, burden and mortality for those who have it?

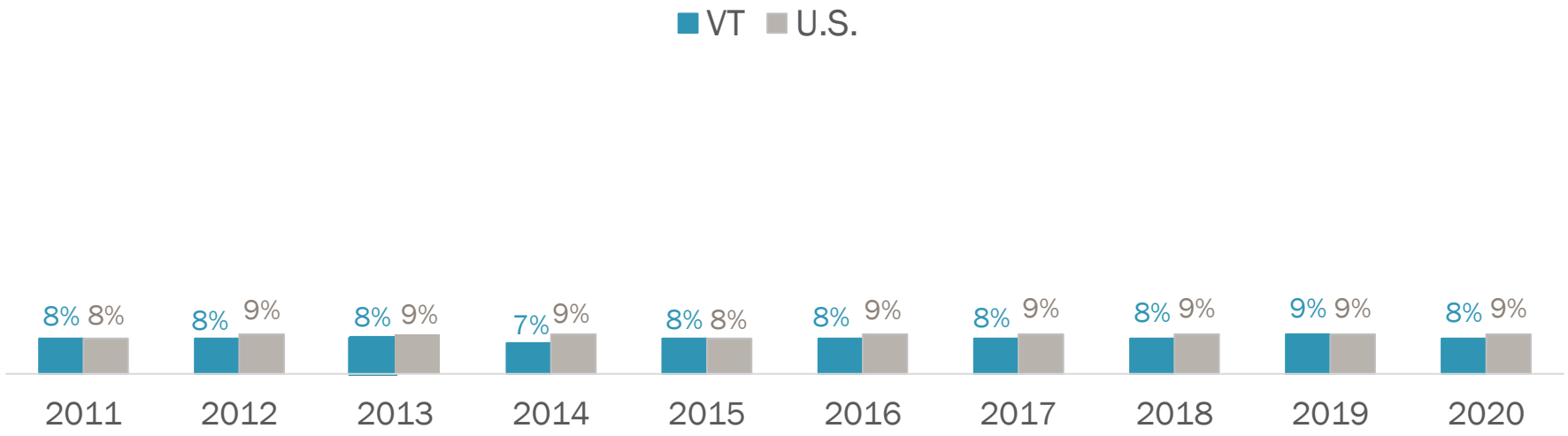
About Cardiovascular Disease (CVD)

- CVD is a term that refers to several types of heart conditions, including coronary heart disease, heart attack, and stroke.[1]
- Certain things can increase the risk of CVD including: several health conditions, lifestyle, age, and family history.
  - Almost half of Americans[1] and over half of Vermonters[2] have at least one of the key risk factors for CVD: High blood pressure (hypertension), high cholesterol, or smoking.
  - Other health conditions and behaviors that can lead to CVD are diabetes, overweight and obesity, poor diet, physical inactivity, and excessive alcohol use.[1]
- CVD is one of the leading causes of death in the U.S.[1] and in Vermont[3].

Source: [1]Centers for Disease Control and Prevention, Heart Disease, July 30, 2019.
[2]VDH. Cardiovascular Disease Risk. https://www.healthvermont.gov/sites/default/files/documents/pdf/HS_brfss_cvd_risk.pdf.
[3]Vermont Vital Statistics 2020.

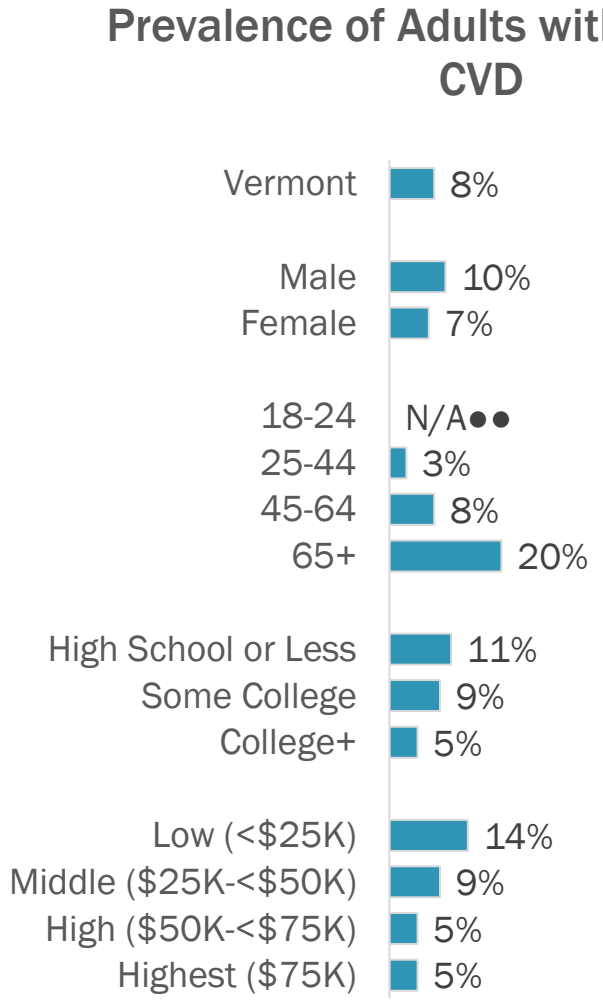
Adult Trend of Cardiovascular Disease (CVD)

- The prevalence of CVD in Vermont has remained stable and statistically unchanged from 2011 through 2020.
- This includes 4% who had been diagnosed with coronary heart disease (CHD), 4% who had a heart attack, and 3% who had a stroke in 2020.
  - The rates of CHD, heart attack and stroke are similar to previous years.
- Vermont adults in 2020 (8%) were significantly less likely to have CVD than U.S. adults overall (9%).



Source: VT BRFSS, 2011-2020.

CVD Demographics



- Around one in twelve (8%) or approximately 42,200 adult Vermonters, have ever been diagnosed with CVD.
- CVD is significantly more likely:
  - Among men.
  - With advancing age.
  - Among those with some college or less education compared to those with a college degree or higher.
  - Among those living in households with incomes less than $25,000 a year, compared to those making $25,000 or more.

Source: VT BRFSS, 2020.
●●Value suppressed because sample size too small or relative standard error is > 30.

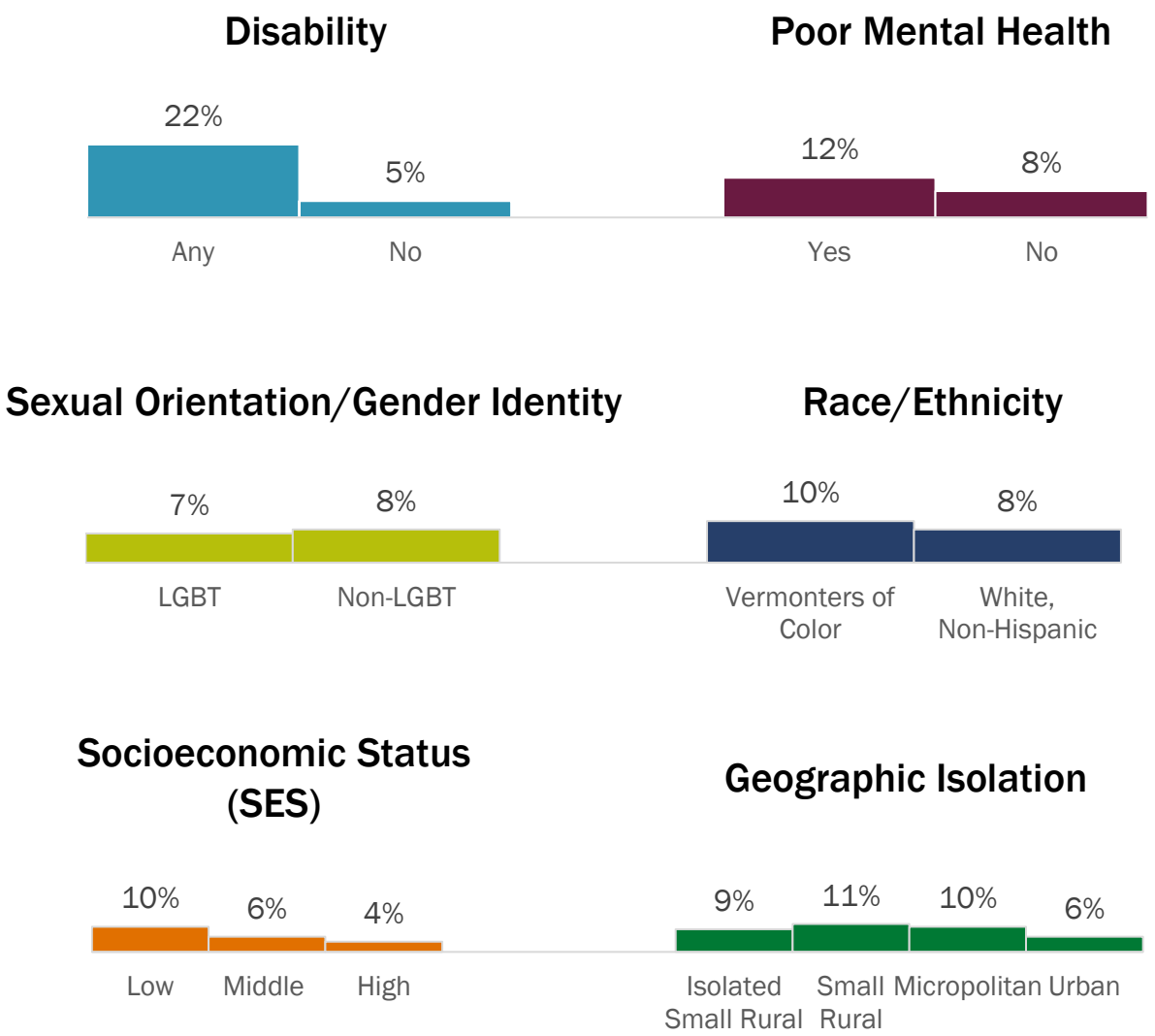
Health inequalities lead to varying impacts of CVD.

CVD is significantly more likely among adults:

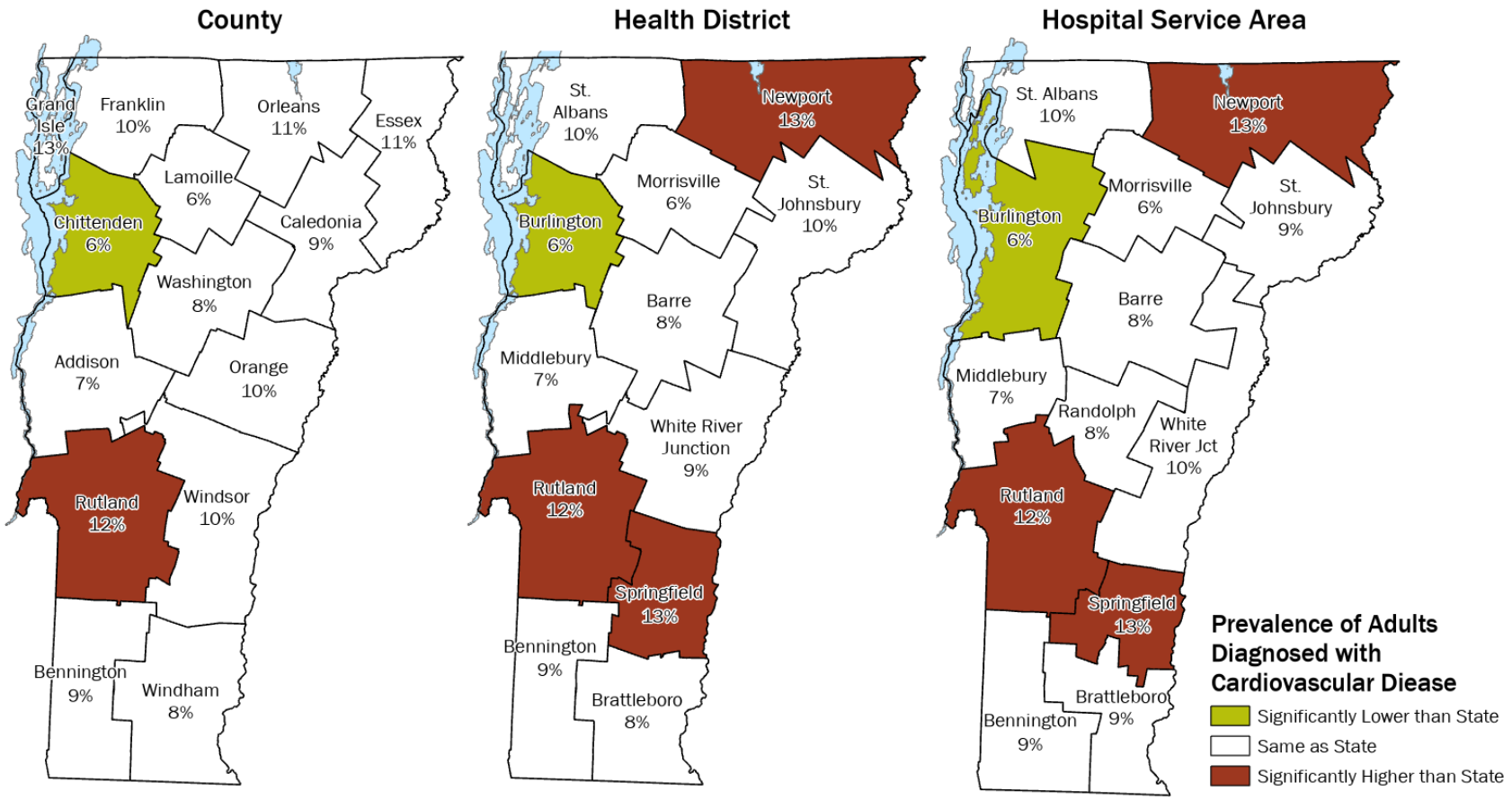
- With any disability.
- With poor mental health.
- Living at a low SES compared to a high SES.
- Living in isolated small rural, small rural, or micropolitan settings compared to urban settings.

Source: VT BRFSS, 2020.

CVD Prevalence and Health Inequality



Cardiovascular Disease by Subgeography



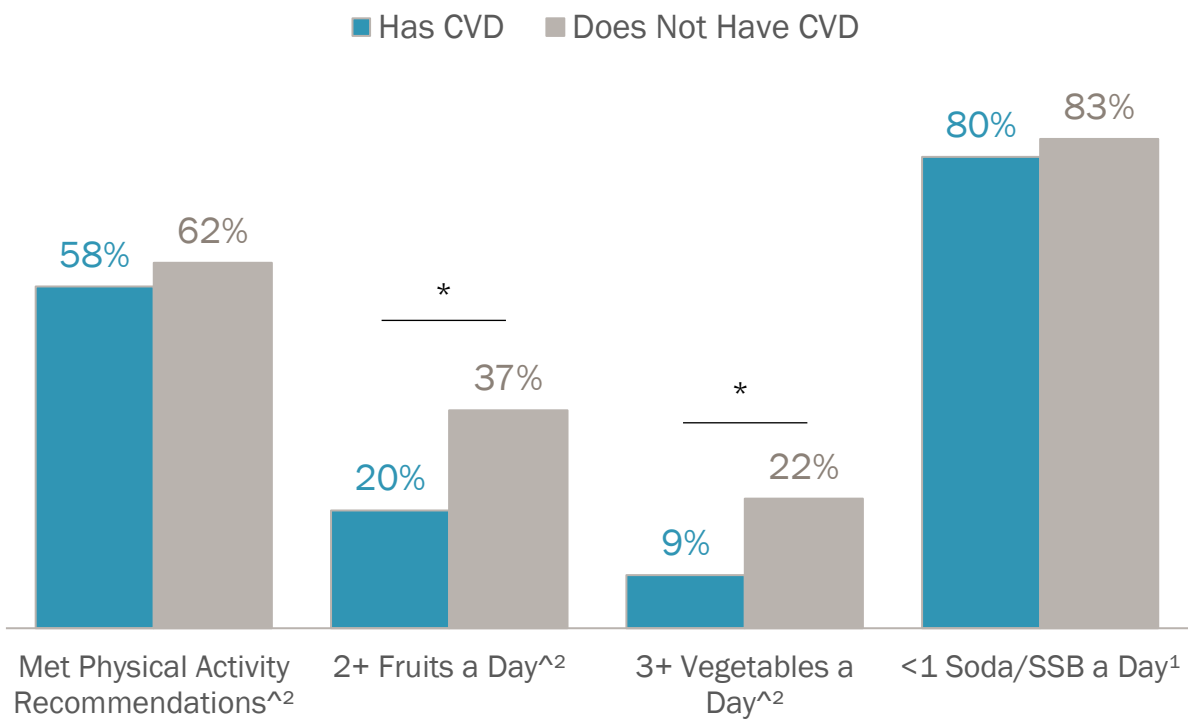
The rate of CVD is significantly higher than the state average in Rutland County and the Rutland, Springfield, and Newport Health Districts and Hospital Service Areas (HSAs). CVD prevalence is significantly lower than the state average in Chittenden County and the Burlington Health District and HSA when compared to the state average.

Source: VT BRFSS, 2019 & 2020.

Adults with CVD are significantly <u>less likely</u> to get the recommended amount of daily fruit and vegetables than those who did not have CVD.

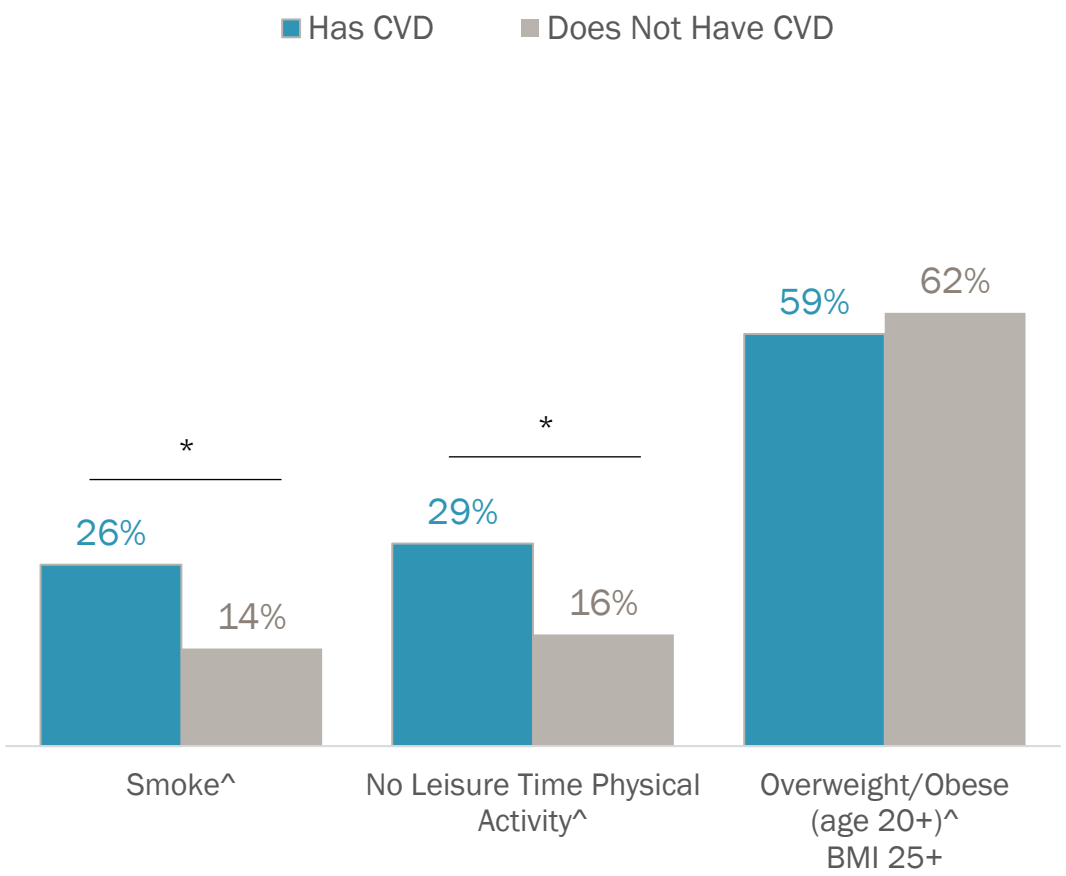
Actions or biological and community factors that are linked to a **lower** likelihood of developing or reducing disease are considered **protective** against disease.

Behaviors That Protect Against Developing CVD



Source: VT BRFSS, 2017[1] & 2019[2].
^ Data are age-adjusted to the U.S. 2000 population.

Risk Factors for Developing CVD



Source: VT BRFSS, 2020.
^ Data are age-adjusted to the U.S. 2000 population.

Adults with CVD are significantly more likely to smoke or have no leisure time physical activity.

Actions or biological and community factors that are linked to a **higher** likelihood of developing or worsening disease are considered **risk factors** for disease.

Cardiovascular Disease and Healthcare Access

Vermont adults with hypertension are:

Significantly more likely to **have a personal doctor** than those not diagnosed with CVD (92% vs. 84%).[2]

More likely to have **visited a doctor in the last year** compared to those not diagnosed with CVD (88% vs. 71%).[2]

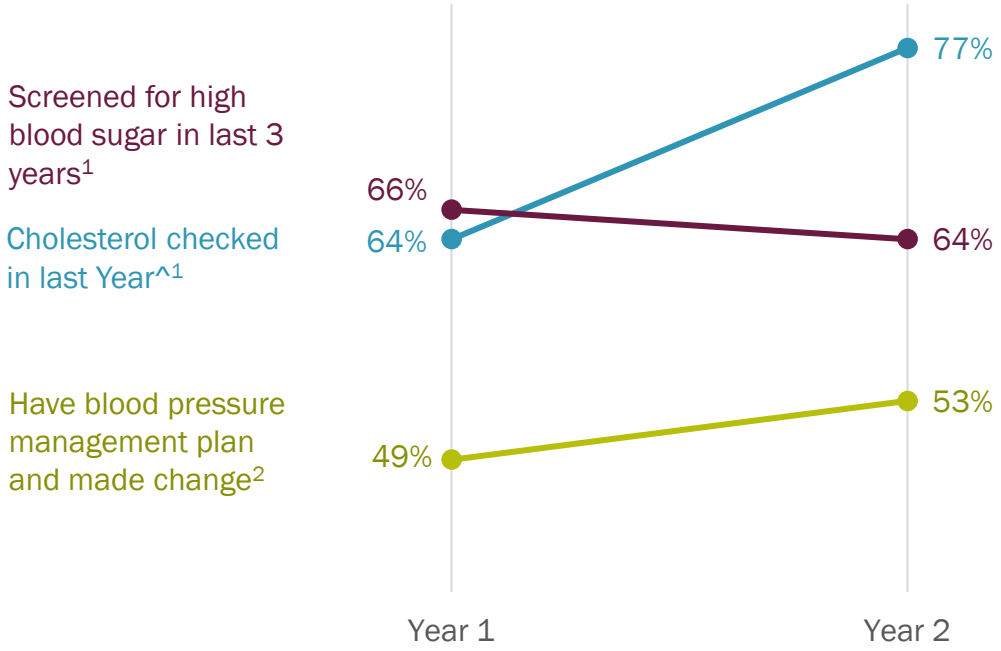
Significantly more likely to be covered by **public insurance*** (74% vs. 40%) and **fewer** by **private insurance** (23% vs. 58%) compared to those not diagnosed with CVD.[1]

*Medicare: 58% vs. 24% - Medicaid 12% vs. 12% - TRICARE/IHS 5% vs. 3%

Source: VT BRFSS, 2018[1] & 2019[2].

Other Management Strategies for CVD

Vermont adults diagnosed with CVD who have **been screened for high cholesterol** as well as who **have a blood pressure management plan and made changes because of it** have trended upward in recent years.

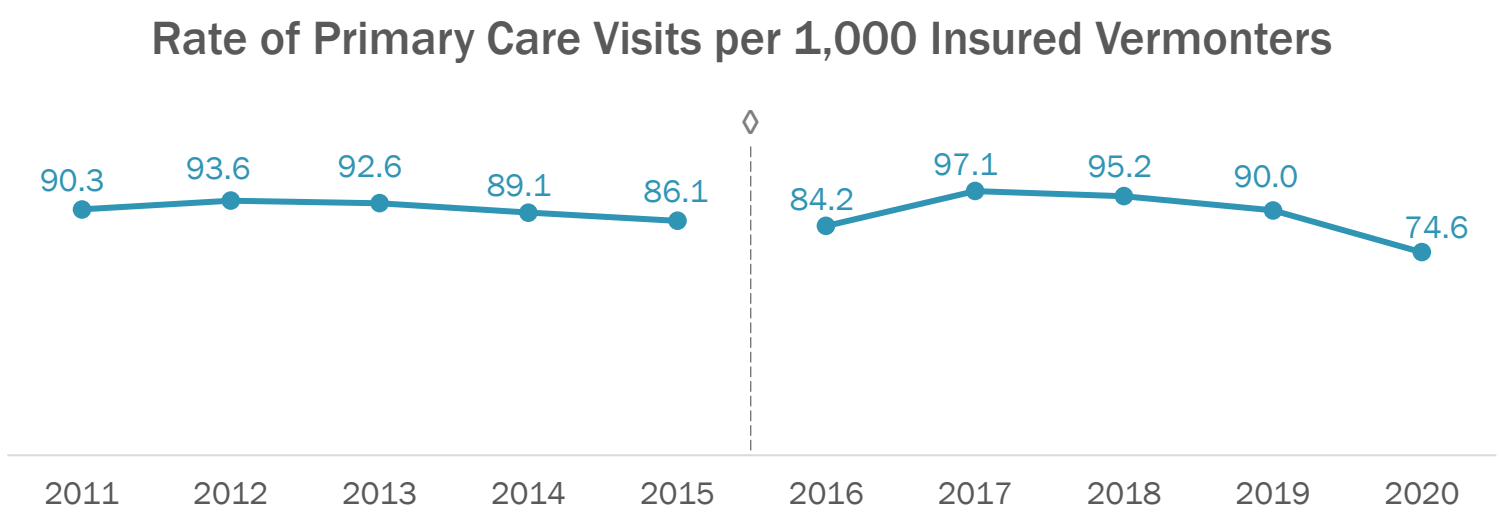


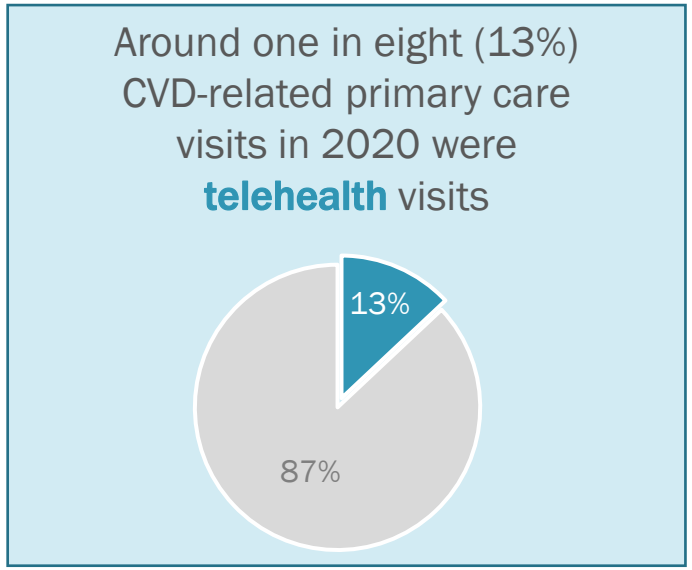
Source: VT BRFSS, 2017 & 2019[1], 2019 & 2020[2].
^ Data are age-adjusted to the U.S. 2000 population.
Differences between years shown are not statistically significant.

- The rate of adults 18 and older with CVD who had their cholesterol checked in the last year trended upward from 2017 (64%) to 2019 (77%).
- The rate of adults with CVD who have been screened for high blood sugar in the last 3 years decreased slightly from 2017 (66%) to 2019 (64%).
- Among adults with CVD and hypertension, the proportion with a blood pressure management plan who have made lifestyle changes increased from 2019 (49%) to 2020 (53%). This change is not statistically significant. (See page 74 for comorbidity prevalence)

Primary Care Visits for Cardiovascular Disease (CVD)

- For every 1,000 insured Vermonters, 74.6 had a primary care visit related to CVD in 2020 (48,832 visits among 22,176 people).
- The rate of primary care visits for CVD among insured Vermonters was statistically different from 2019 to 2020 and was significantly lower than 2016 rate. The rate of primary care visits changed significantly between each year 2016-2020. The decrease in the rate of primary care visits in 2020 is likely due to decreased healthcare visits during the COVID-19 pandemic.
- On average, there were 2.2 primary care visits per insured person for CVD in 2020, somewhat similar but slightly lower than the 2019 average of 2.4 per person.



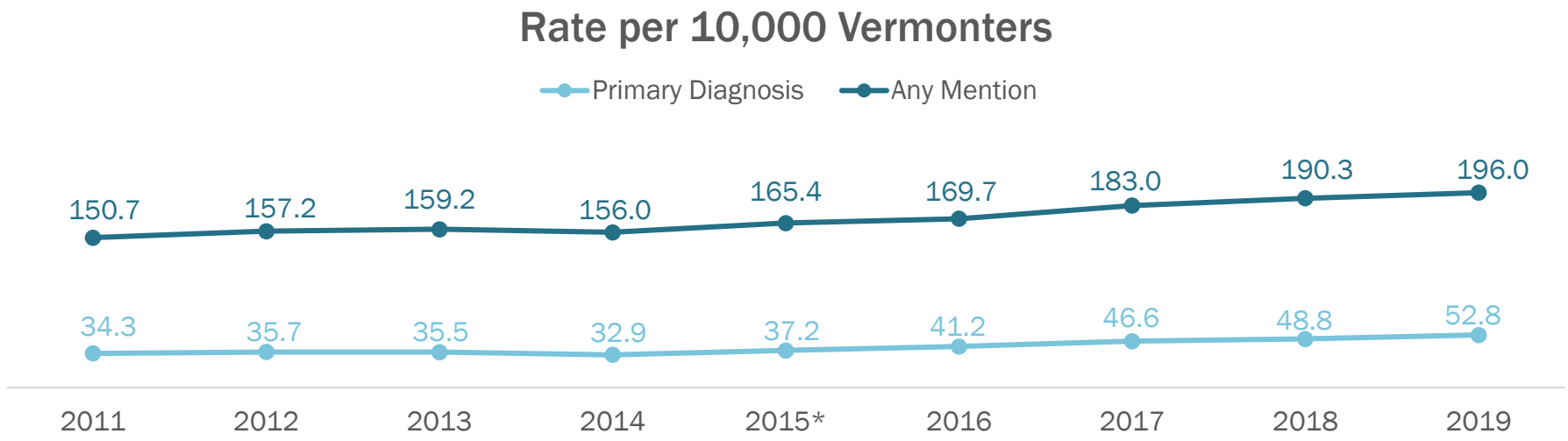


Source: GMCB VHCURES, 2011-2020 – extract 3005 – extracted 10/26/22.
◊ Comparisons 2015 and earlier to post-2015 should be made with caution due to changes in the number of private payers submitting to VHUCRES beginning in 2016.
Statistical comparisons were performed using Z-scores.

CVD-Related Hospital Discharges

There were 25.1 hospital discharges with a primary diagnosis of CVD for every 10,000 Vermonters (3,297 discharges) in 2019. The trend of CVD has been rising since 2014 and is significantly higher than previous years.

Hospital discharges with any mention of CVD are statistically higher than the rate of visits as a primary diagnosis and have been steadily rising since 2014. In 2019, there were 196.0 discharges with any mention of CVD for every 10,000 Vermonters (12,232 visits). The 2019 rate is statistically higher than all years since 2014.

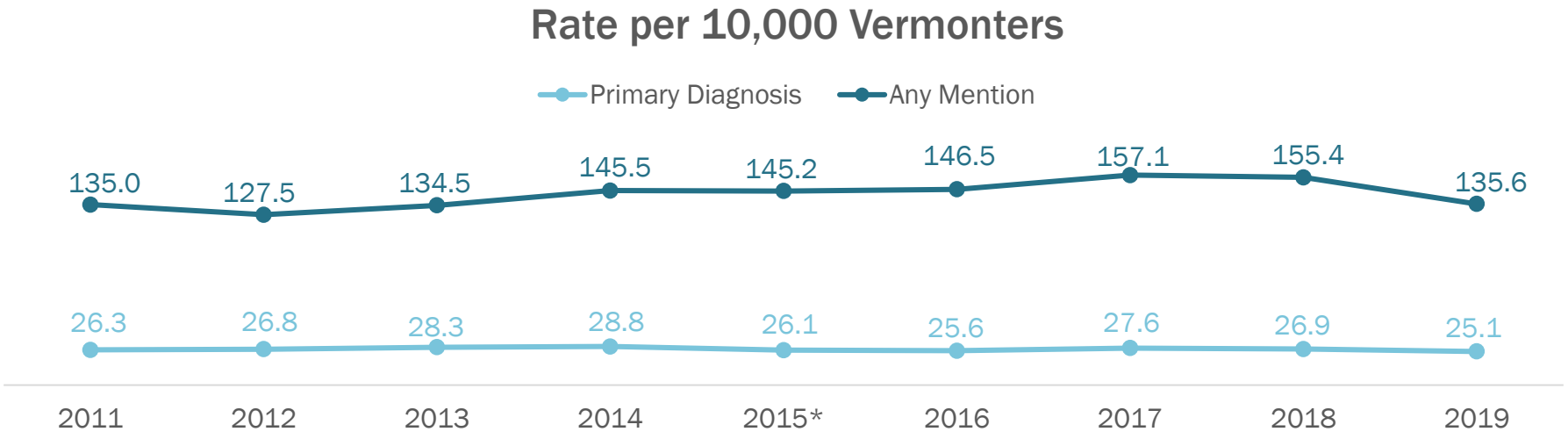


Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include hospitalizations for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.

Cardiovascular Disease-Related Emergency Department (ED) Visits

There were 25.1 ED visits with a primary diagnosis of CVD for every 10,000 Vermonters (1,568 visits) in 2019. The rate of ED visits with a primary diagnosis of CVD has remained statistically unchanged since 2015 and is statistically lower than 2014.

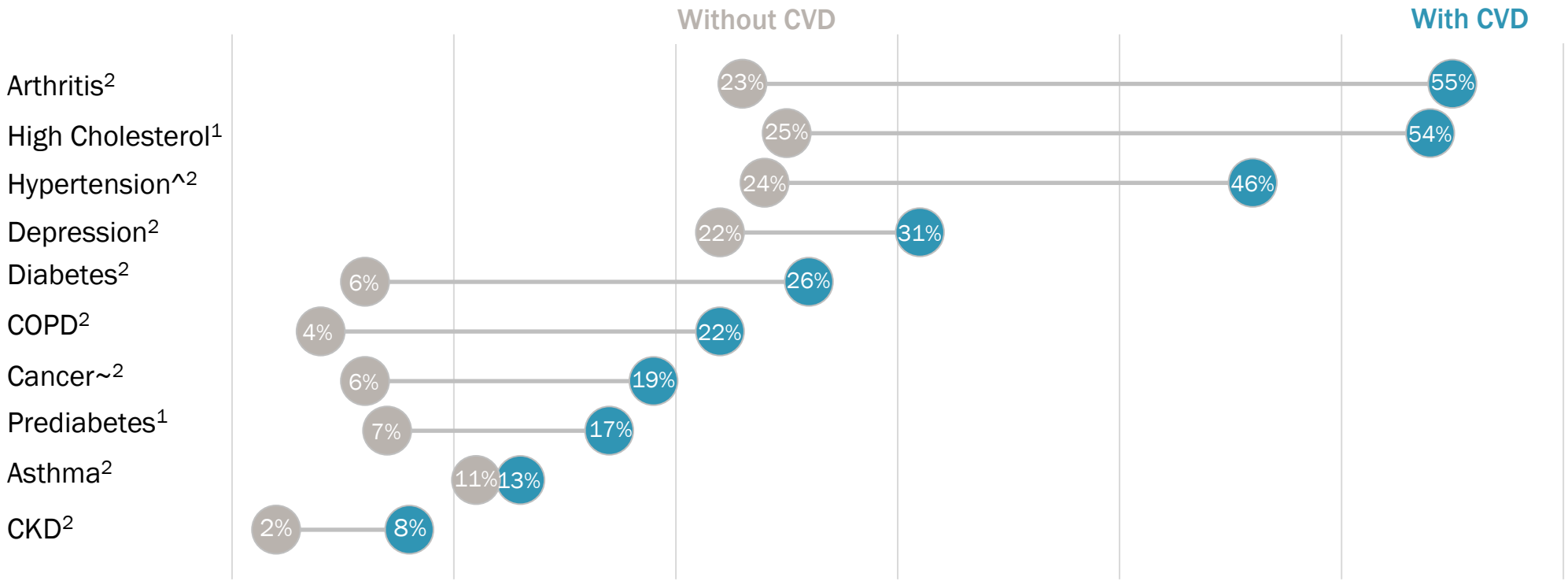
ED visits with any mention of CVD are statistically higher than the rate of visits of CVD as a primary diagnosis. In 2019 there were 135.6 ED visits with any mention of CVD for every 10,000 Vermonters (8,464 visits). Visits with any mention of CVD have been descending since 2017. The 2019 rate is statistically lower than all years since 2014.



Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include ED visits for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.

CVD and Prevalence of Co-Occurring Chronic Disease

Adults **with CVD** are significantly more likely* to have a co-occurring chronic disease than those **without CVD**. Rates of asthma do not differ significantly by CVD diagnosis.

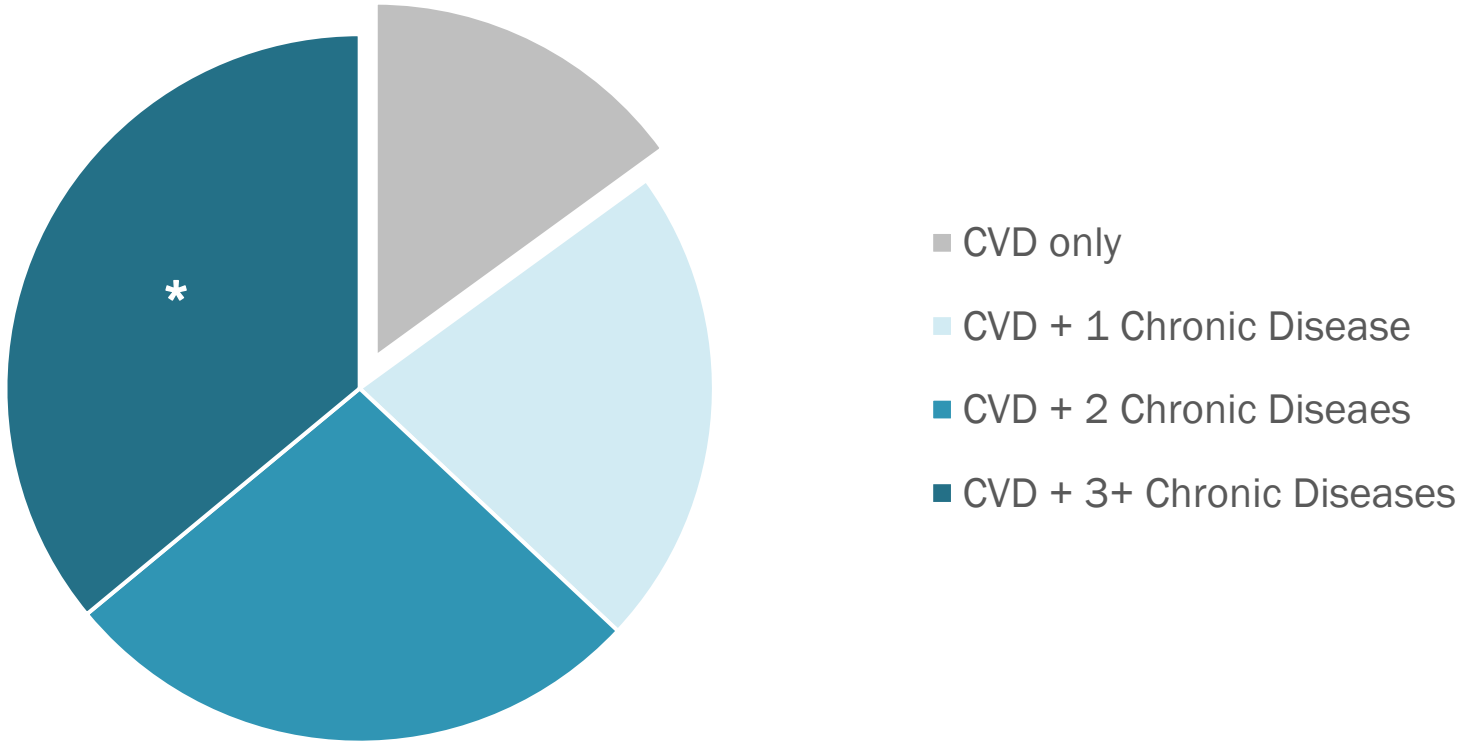


*All differences are statistically significant except for that between asthma.

Source: VT BRFSS, 2019[1] & 2020[2].
^ Data are age-adjusted to the U.S. 2000 population.
~Excludes those whose form of cancer is skin cancer.

Multiple Chronic Diseases and Cardiovascular Disease

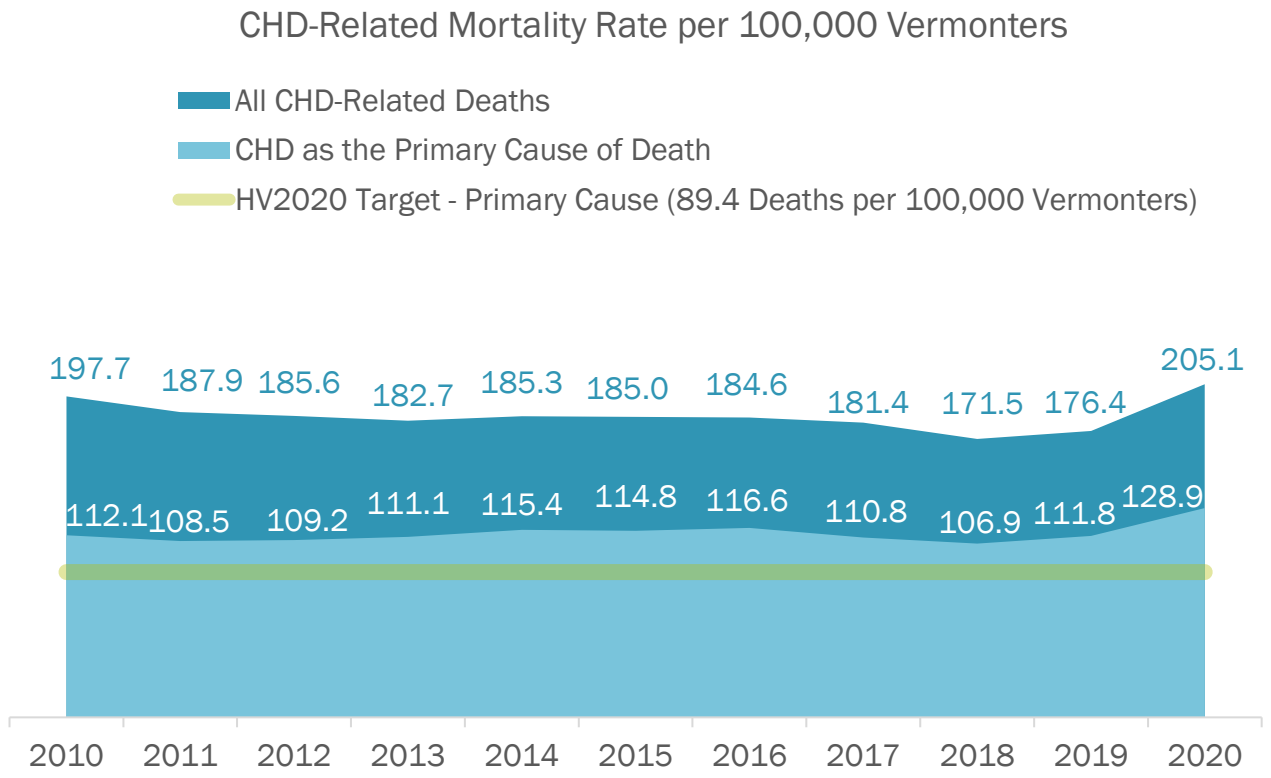
Adults with CVD are significantly more likely to have CVD plus three or more chronic diseases than CVD alone or CVD plus one or two chronic diseases.



Source: VT BRFSS, 2020.

Coronary Heart Disease (CHD)-Related Mortality

All CHD-related deaths among Vermonters is significantly higher than **CHD as the primary (principal)** cause for death. **This indicates that the burden of CHD is as a contributing factor to disease.**

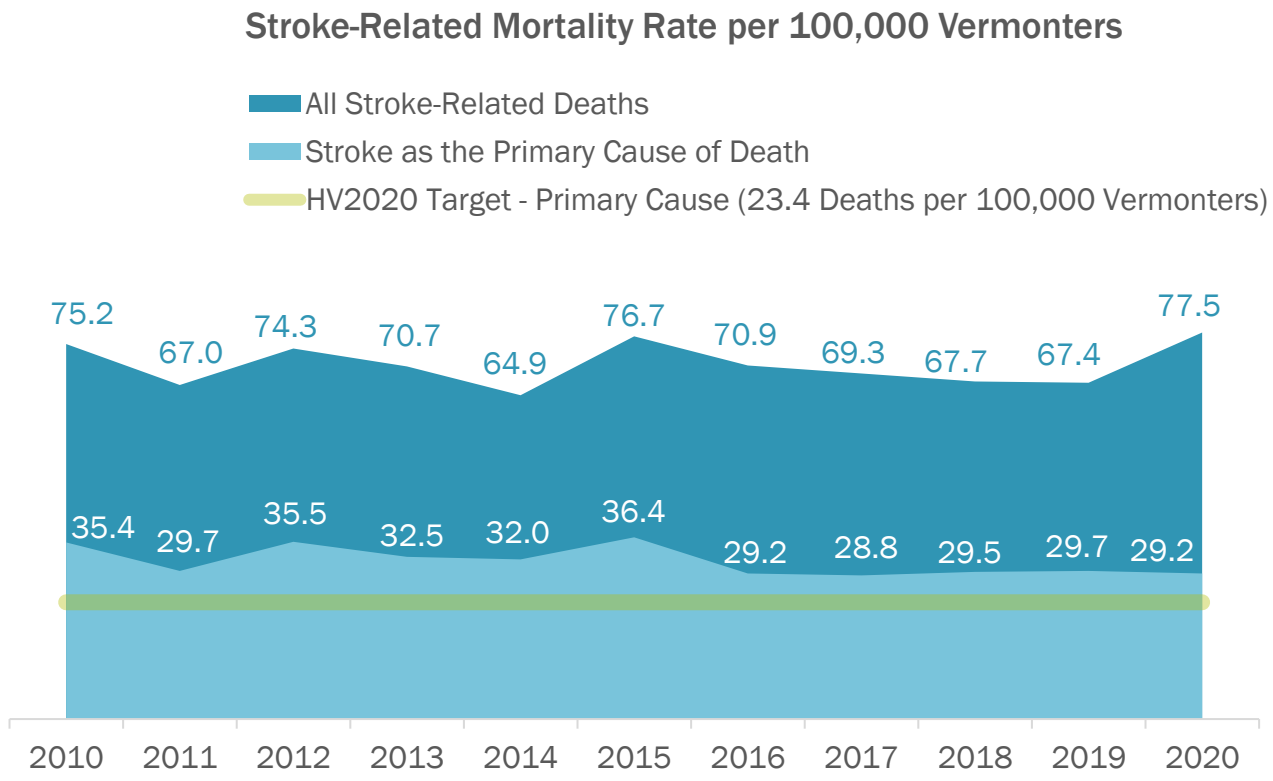


Source: VT Vital Statistics, 2011-2020.
Data are age-adjusted to the U.S. 2000 population.

- As a primary cause of death in 2020, CHD is statistically similar to 2019 but statistically higher than 2010.
- Though the trend of primary and all-cause mortality rates reversed from 2018 to 2019, this change was not statistically significant However, the 2020 rate is statistically higher than 2018.
- In 2020, CHD as a primary cause of death (128.9 deaths for every 100,000 Vermonters) was above the Healthy Vermonters 2020 target of 89.4 deaths for every 100,000 Vermonters.

Stroke-Related Mortality

The **all stroke-related** mortality rate among Vermonters is significantly higher than **stroke as the primary (principal)** cause for death. **This indicates that the burden of stroke is as a contributing factor to disease.**



Source: VT Vital Statistics, 2011-2020.
Data are age-adjusted to the U.S. 2000 population.
[1]CDC. Preventing Stroke Deaths: Progress Stalled. *Vital Signs*. September, 2017.

- As a primary cause of death, stroke rates:
  - Steadily descended from 2012 through 2014, with an increase noted in 2015. This increase followed national trends in stalling progress of previously declining stroke mortality reported among states.[1]
  - Began to descend again from 2015 to 2017 but began to reverse between 2017 and 2018 before beginning to descend again in 2020. Rates are statistically similar.
- All cause stroke-related mortality descended from 2015 to 2019 then increased in 2020. Rates are statistically similar.
- Stroke as a primary cause of death in 2020 remains above the Healthy Vermonters 2020 target of 23.4 deaths for every 100,000 Vermonters.

Diabetes

What is diabetes? How many Vermont adults have it? What is the risk, management, burden and mortality for those who have it? What is the incidence of gestational diabetes and end-stage renal disease (ESRD)?

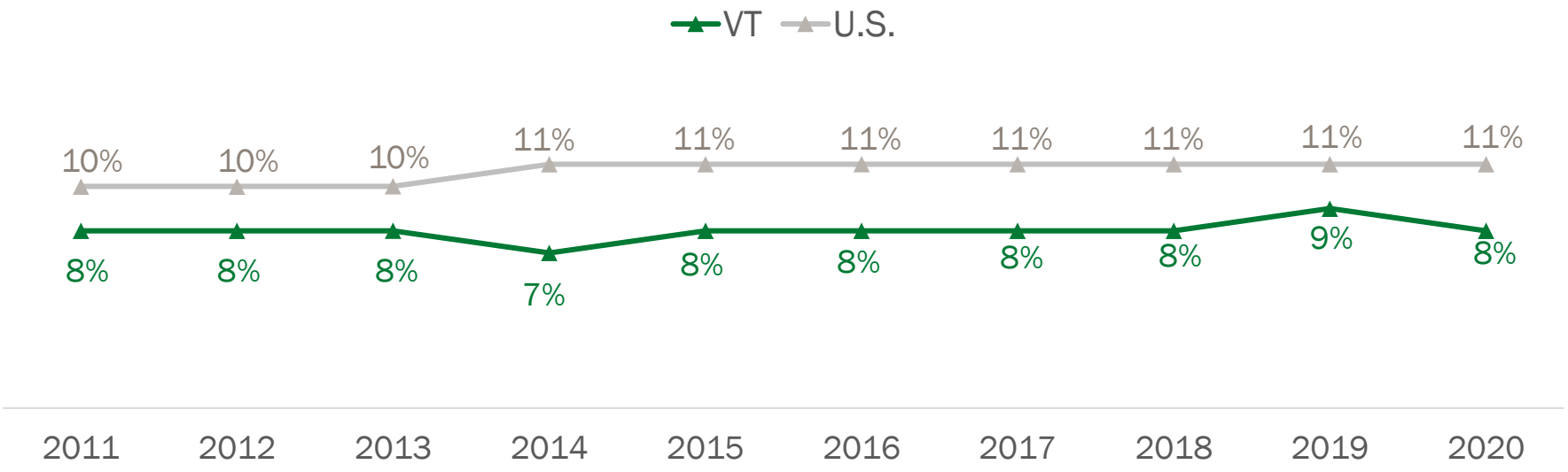
About Diabetes

- Diabetes is a chronic disease in which the body does not make enough insulin or properly use the body's insulin.
  - With **Type 1** diabetes, the body is unable to produce insulin. Type 2 diabetes is the most common form of diabetes, where the body does not use its insulin properly. **Type 2** diabetes, can usually be prevented through lifestyle changes.
- Symptoms may include: Frequent urination, excessive thirst and appetite, fatigue, blurred vision, slow-healing wounds, weight loss, and numbness/tingling in hands/feet.
- Over time, excess glucose in the blood can damage the eyes, kidneys, nerves, or heart leading to serious health complications.

Source: American Diabetes Association, Diabetes Overview, 2022.

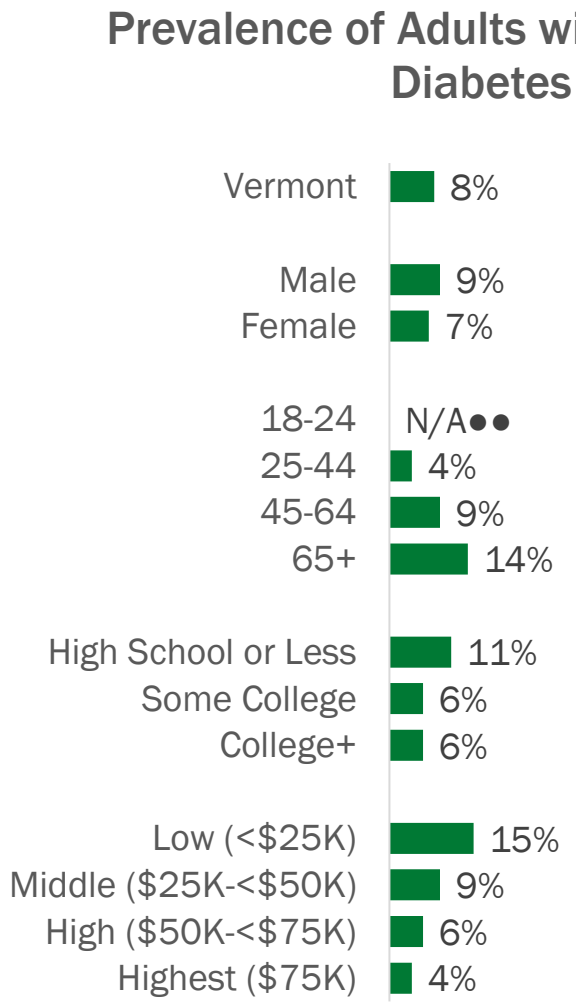
Adult Trend of Diabetes

- The prevalence of diabetes in Vermont remained stable and statistically unchanged from 2011 through 2020.
- The prevalence of diagnosed diabetes among VT adults in 2020 was 8%, significantly lower than U.S. adults (11%).



Source: VT BRFSS, 2011-2020.

Diabetes Demographics



- Around one in twelve (8%) or approximately 40,100 adult Vermonters have ever been diagnosed with diabetes.
- Diabetes is significantly more likely:
  - With advancing age.
  - Among those with a high school or less education compared to those with at least some college or higher education.
  - Among those living in households with incomes less than $25,000 a year, compared to those making $25,000 or more.
    - Those in households making $25,000 to $50,000 a year were significantly more likely to have diabetes than those making $75,000 or more a year.18

Source: VT BRFSS, 2020.
●●Value suppressed because sample size too small or relative standard error is > 30.

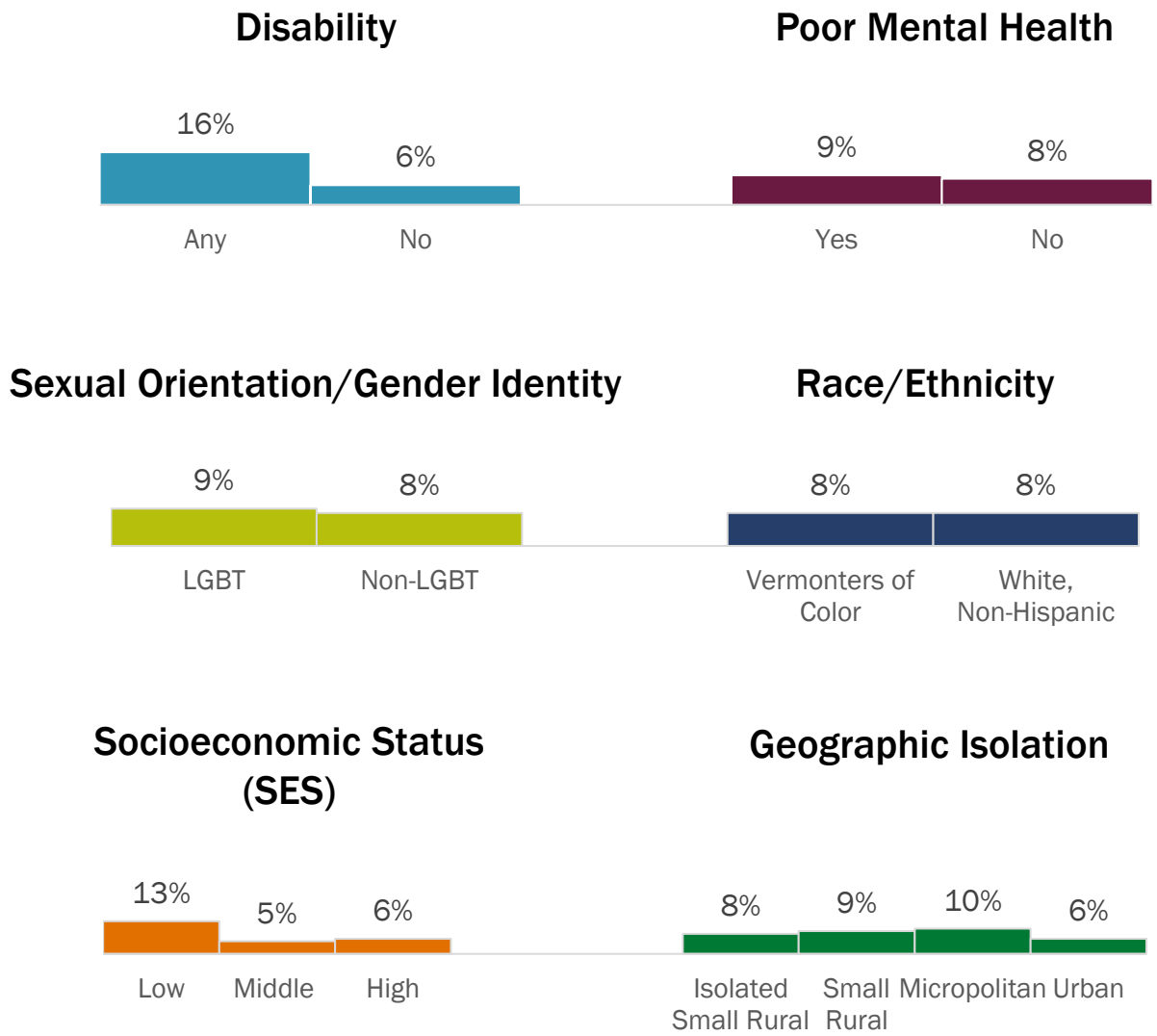
Health inequalities lead to varying impacts of diabetes.

Diabetes is significantly more likely among adults:

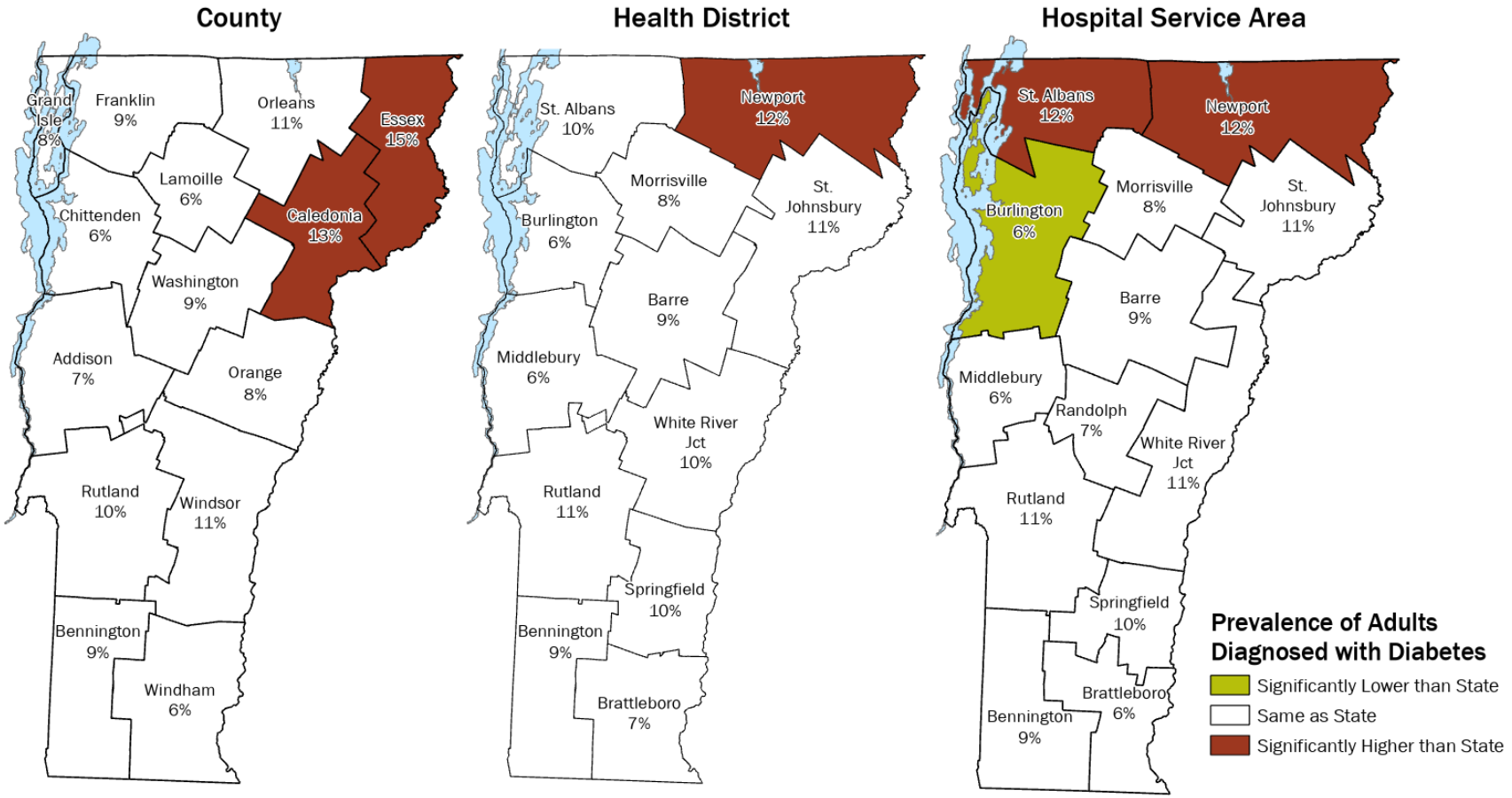
- With any disability.
- Living at a low SES compared to a middle or high SES.

Source: VT BRFSS, 2020.

Diabetes Prevalence and Health Inequality



Diabetes by Subgeography



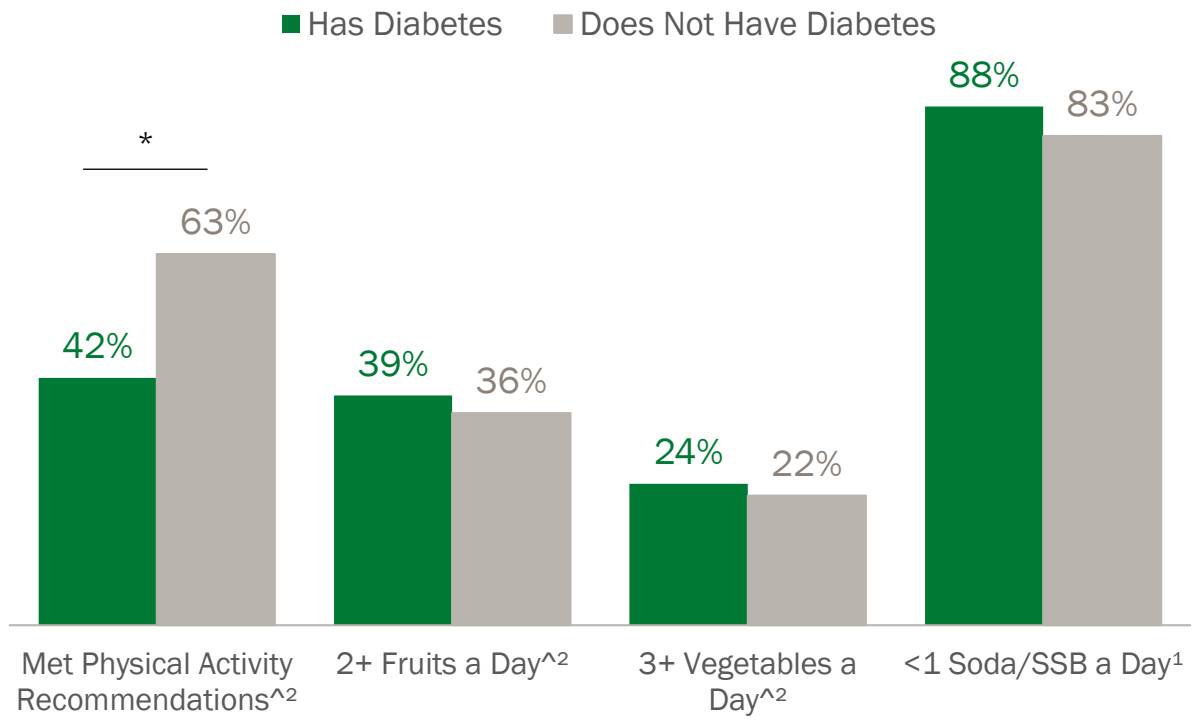
The prevalence of diabetes is significantly higher in Caledonia and Essex Counties and the Newport Health District as well as the Newport and St. Albans and Hospital Service Areas (HSA) when compared to the state average. Diabetes prevalence is significantly lower than the statewide average in the Burlington HSA.

Source: VT BRFSS, 2019 & 2020.

Adults with diabetes are significantly less likely to get the recommended amount of weekly aerobic physical activity than those who did not have diabetes.

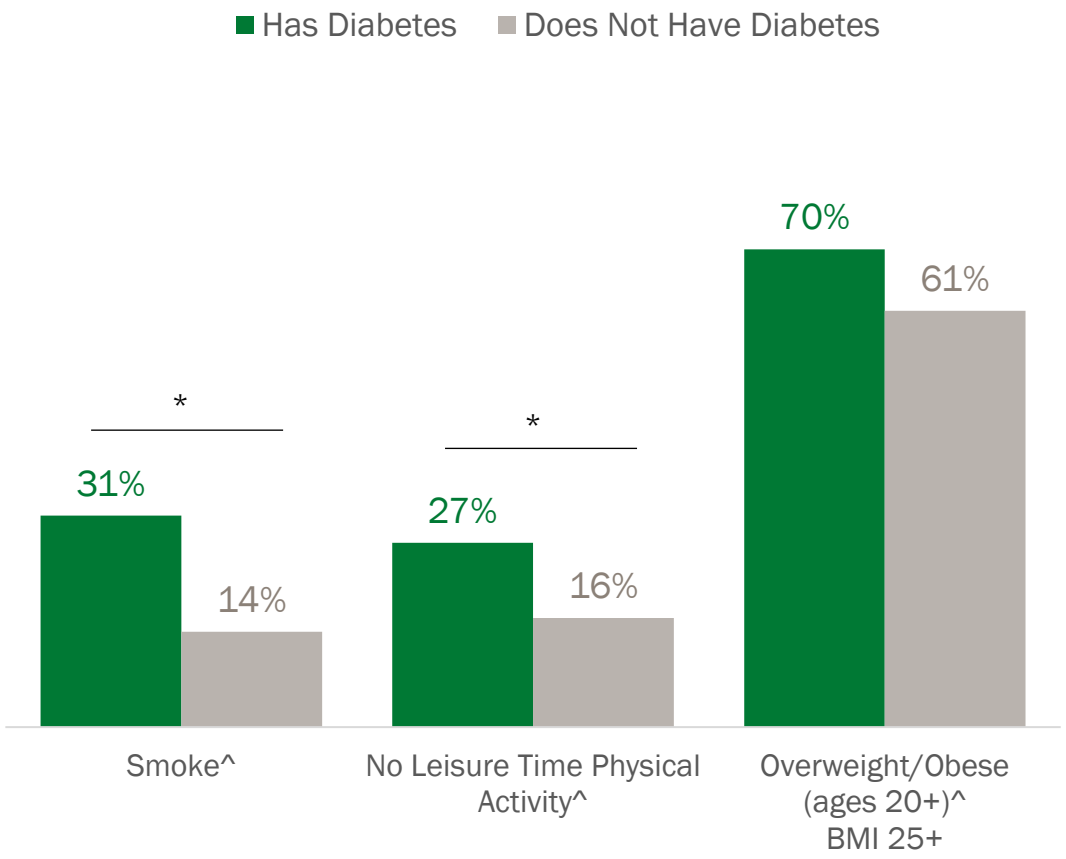
Actions or biological and community factors that are linked to a **lower** likelihood of developing or reducing disease are considered **protective** against disease.

Behaviors That Protect Against Developing Diabetes



Source: VT BRFSS, 2017[1] & 2019[2].
^ Data are age-adjusted to the U.S. 2000 population.

Risk Factors for Developing Diabetes



Source: VT BRFSS, 2020.
^ Data are age-adjusted to the U.S. 2000 population.

Adults with diabetes are significantly more likely to smoke or have no leisure time physical activity.

Actions or biological and community factors that are linked to a **higher** likelihood of developing or worsening disease are considered **risk factors** for disease.

Diabetes and Healthcare Access

Vermont adults with diabetes are:

Significantly more likely to **have a personal doctor** than those not diagnosed with diabetes (98% vs. 84%).[2]

More likely to have **visited a doctor in the last year** compared to those not diagnosed with diabetes (93% vs. 70%).[2]

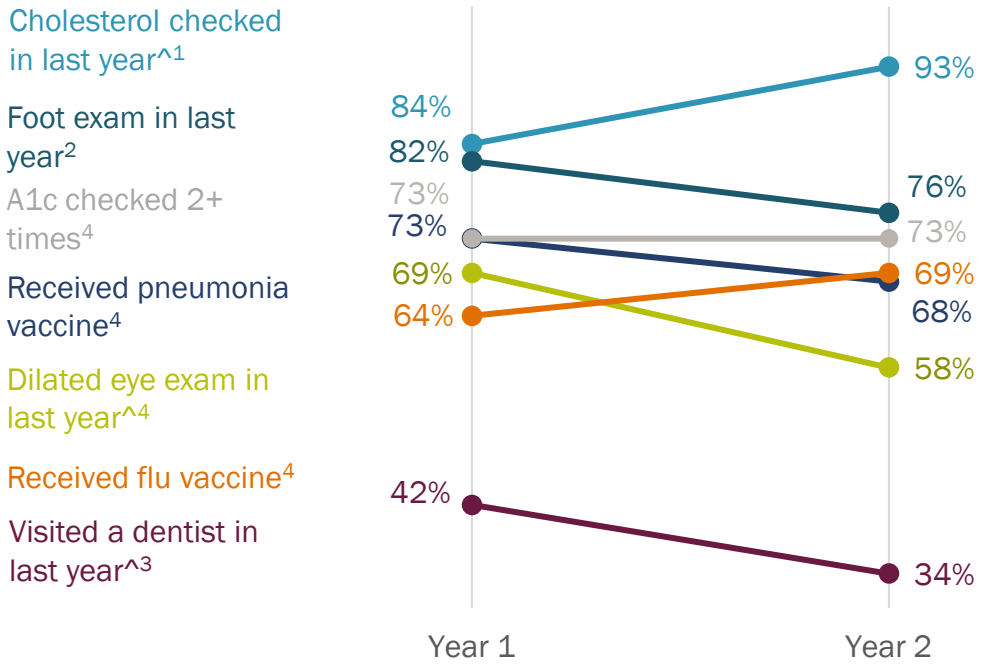
Significantly more likely to be covered by **public insurance*** (65% vs. 40%) and **significantly fewer** by **private insurance** (33% vs. 58%) compared to those not diagnosed with diabetes.[1]

*Medicare: 52% vs. 24% - Medicaid 10% vs. 13% - TRICARE/IHS 3% vs. 3%

Source: VT BRFSS, 2018[1] & 2020[2].

Provider Management of Diabetes

Vermont adults diagnosed with diabetes who have **been screened for high cholesterol** and **received an annual flu vaccine** trended upward.



Source: VT BRFSS, 2017 & 2019[1]; 2017 & 2020[2]; 2018 & 2020[3]; 2019 & 2020[4].
^ Data are age-adjusted to the U.S. 2000 population.
Differences between years shown are not statistically significant.

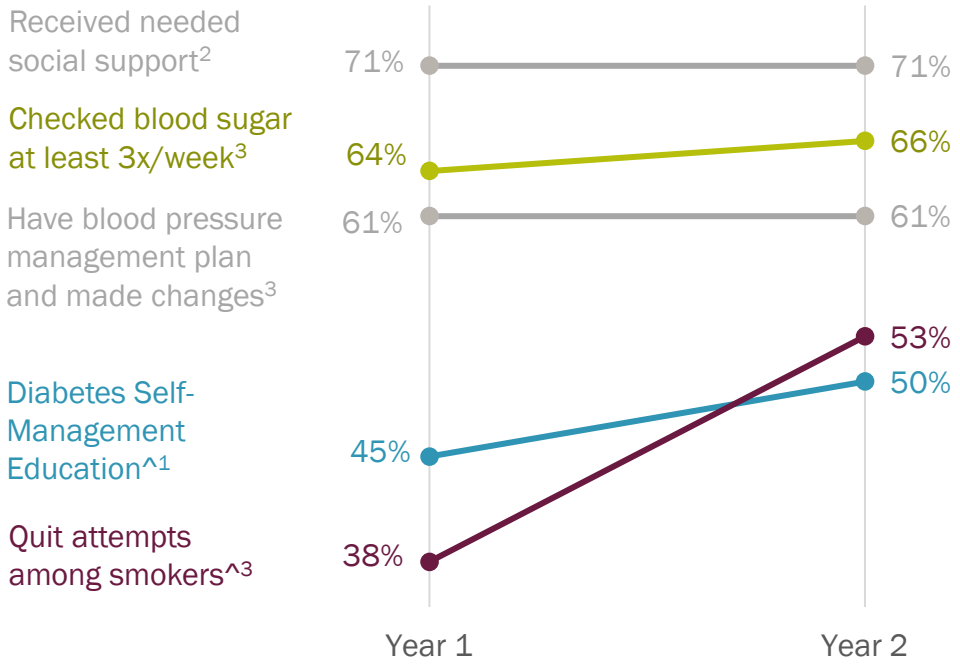
- Nearly three in five (58%) Vermont adults with diabetes received an annual dilated eye exam in 2020, down from 69% in 2019 – moving the rate back below the Healthy Vermonters 2020 target of 60%.

- Several other provider-led diabetes management strategies also trended down in recent years. For example, those who:
  - Had a health professional check their feet for sores or irritations in the last year went from 82% in 2017 to 76% in 2020.
  - Received a pneumonia vaccine went from 73% in 2019 to 68% in 2020.
  - Visited an oral healthcare provider in the last year went from 42% in 2018 to 34% in 2020.

- The rate of adults diagnosed with diabetes who had their cholesterol checked in the last year increased from 2017 (84%) to 2019 (93%). Similarly, those who received the annual flu vaccine trended up from 2019 to 2020 (64% vs. 69%, respectively).

Adult Self-Management of Diabetes

Diabetes self-management education, **attempts to quit smoking**, and **checking blood sugar at least three times a week** increased among Vermont adults with diabetes.

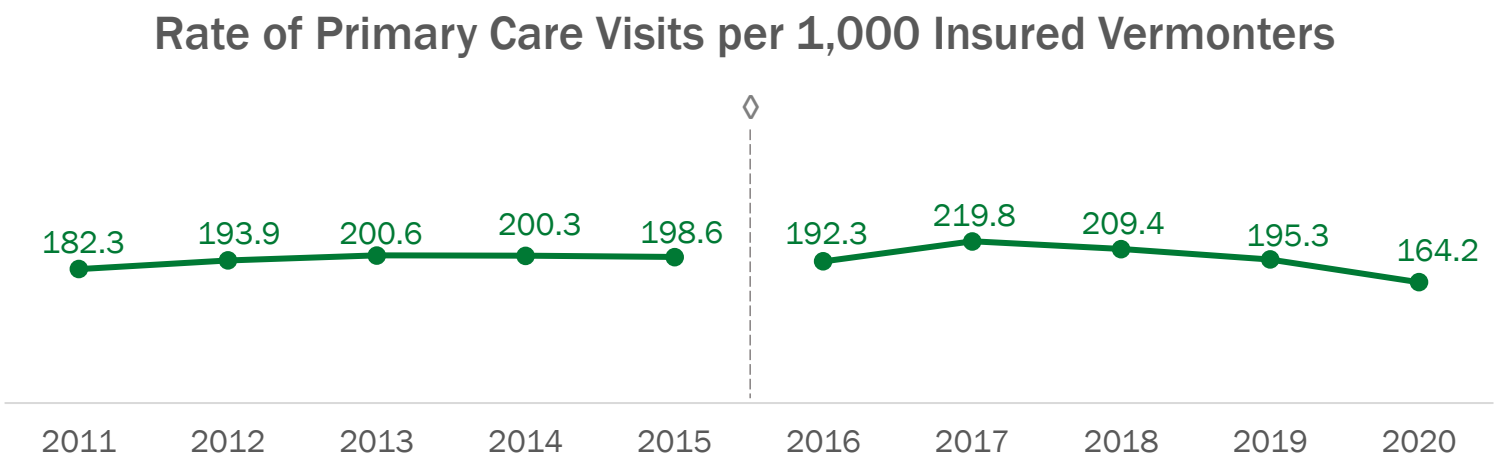


Source: VT BRFSS, 2017 & 2020[1]; 2018 & 2020[2]; 2019 & 2020[3].
^ Data are age-adjusted to the U.S. 2000 population.
Differences between years shown are not statistically significant.

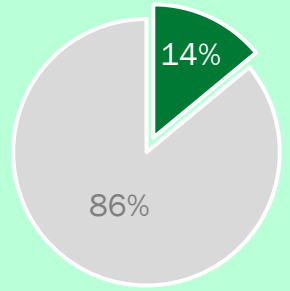
- Over half (53%) of adults diagnosed with diabetes who used tobacco in 2020 attempted to quit, trending up from the 38% who did in 2019.
- Half (50%) of adults diagnosed with diabetes in 2020 had ever attended diabetes self-management education, a rise from the 45% who ever had in 2017. This remains below the Healthy Vermonters 2020 target of 60%.
- Two-thirds (66%) of adults diagnosed with diabetes checked their blood sugar at least three times a week in 2020, a slight increase from the 64% who did in 2019.
    - In 2019, 64% of adults with diabetes reported having their blood sugar checked by a healthcare provider in the last 3 years.
- Three in five (61%) adults diagnosed with diabetes and hypertension in 2020 had a plan to manage their blood pressure and had made lifestyle changes, similar to 2019 (see page 92 for comorbidity prevalence).
- Seven in ten (71%) adults with diabetes felt they had received the social support they needed in 2020, similar to 2018.

Primary Care Visits for Diabetes

- For every 1,000 insured Vermonters, 164.2 had a primary care visit related to diabetes in 2020 (107,483 visits among 34,605 people).
- The 2020 rate was significantly lower than all previous years 2016-2019. Additionally, the rate of diabetes-related primary care visits from 2016-2020 significantly changed each year from the preceding year. The steeper drop in the rate of primary care visits in 2020 is likely influenced by decreased healthcare visits during the COVID-19 pandemic.
- On average, there were 3.1 primary care visits per insured person for diabetes in 2020, similar but slightly lower than the 2019 average of 3.5 per person.



One in seven (14%) diabetes-related primary care visits in 2020 were **telehealth** visits

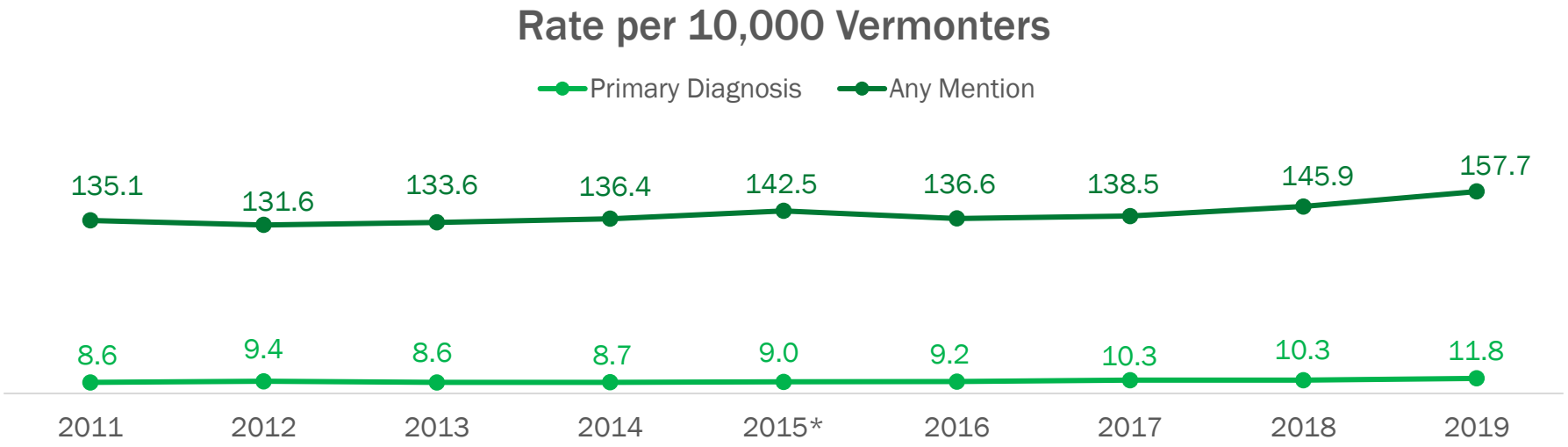


Source: GMCB VHCURES, 2011-2020 – extract 3005 – extracted 10/26/22.
◊ Comparisons 2015 and earlier to post-2015 should be made with caution due to changes in the number of private payers submitting to VHUCRES beginning in 2016.
Statistical comparisons were performed using Z-scores.

Diabetes-Related Hospital Discharges

There were 11.8 hospital discharges with a primary diagnosis of diabetes for every 10,000 Vermonters (734 discharges) in 2019. The rate of diabetes hospital discharges has been slowly rising since 2013. The 2019 rate is significantly higher than 2016 and earlier but statistically similar to 2017 and 2018.

Hospital discharges with any mention of diabetes are statistically higher than the rate of discharges as a primary diagnosis. In 2019 there were 157.7 discharges with any mention of diabetes for every 10,000 Vermonters (9,839 discharges). The rate of hospital discharges for any mention of diabetes have been ascending since 2016. The 2019 rate is statistically higher than all reported years.

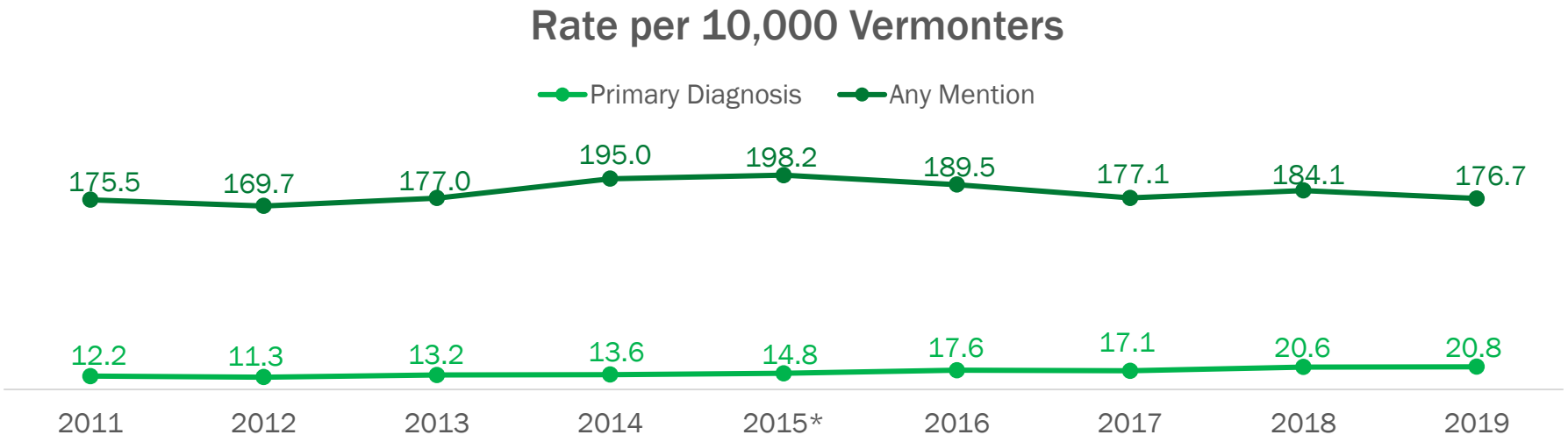


Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include hospitalizations for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.

Diabetes-Related Emergency Department (ED) Visits

There were 20.8 ED visits with a primary diagnosis of diabetes for every 10,000 Vermonters (1,301 visits) in 2019. The rate of ED visits with a primary diagnosis of diabetes has steadily ascended since 2012. The rate of diabetes as a primary diagnosis is statistically similar to 2018 but is statistically higher than 2017 and earlier.

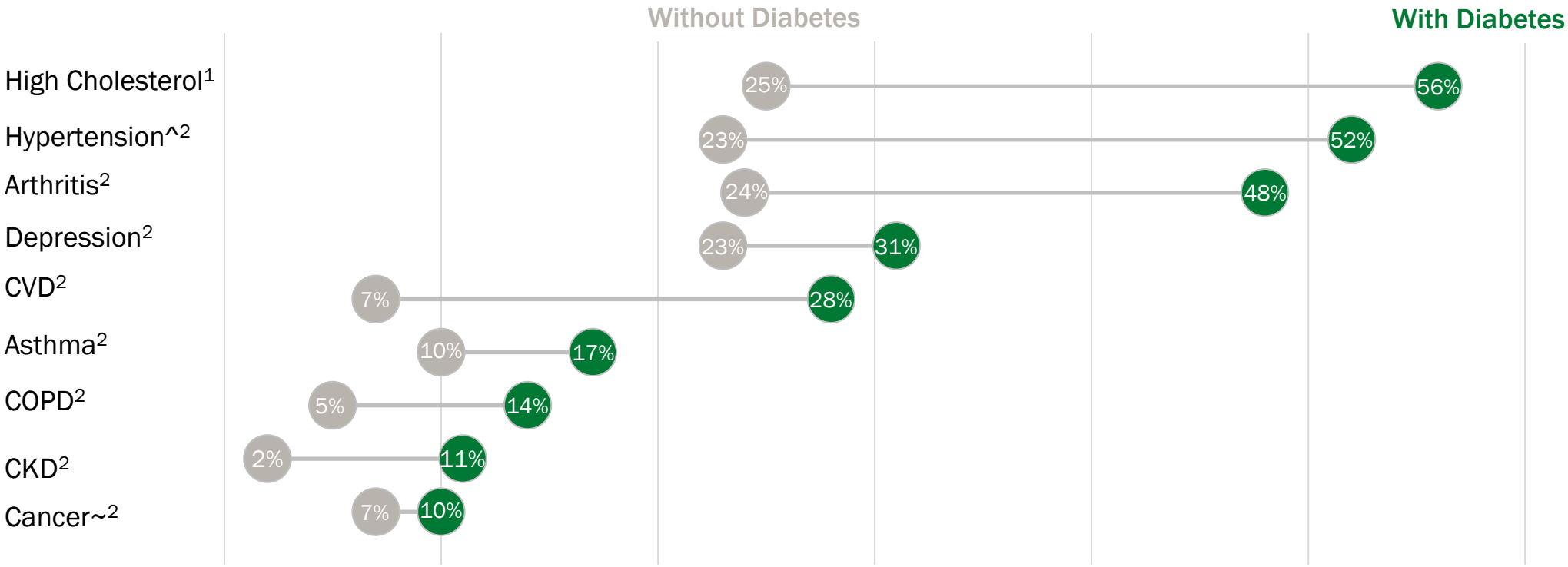
ED visits with any mention of diabetes are statistically higher than the rate of visits as a primary diagnosis. In 2019 there were 176.7 ED visits with any mention of diabetes for every 10,000 Vermonters (11,027 visits). The rate of ED visits with any mention of diabetes has fluctuated in recent years but overall has descended from 2015. The 2019 rate is statistically lower than 2018 but similar to 2017.



Source: Vermont Uniform Hospital Discharge Data Set (VUHDDS), 2011-2019.
Data represent Vermonters seen at Vermont hospitals and does not include ED visits for Vermont residents who sought care at a facility in a neighboring state.
*Diagnosis coding was changed from using ICD-9-CM to ICD-10-CM in the 4th quarter of 2015 and may be the cause of changes seen in that year.

Diabetes and Prevalence of Co-Occurring Chronic Disease

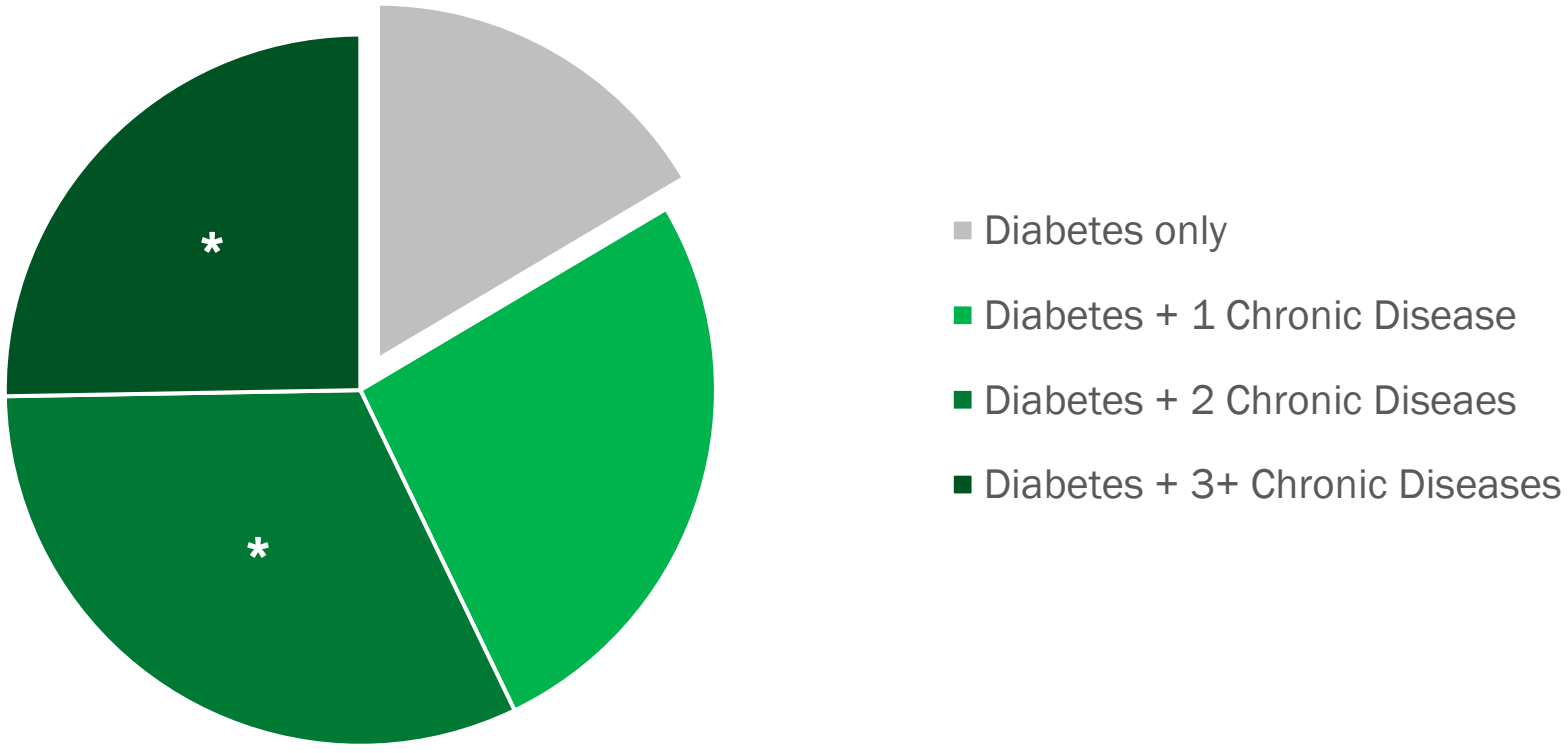
Adults **diagnosed with diabetes** are significantly more likely to have a co-occurring chronic disease than those **without diabetes**. Rates of asthma do not differ by diabetes diagnosis.



Source: VT BRFSS, 2019[1] & 2020[2].
^ Data are age-adjusted to the U.S. 2000 population.
~Excludes those whose form of cancer is skin cancer.

Multiple Chronic Diseases and Diabetes

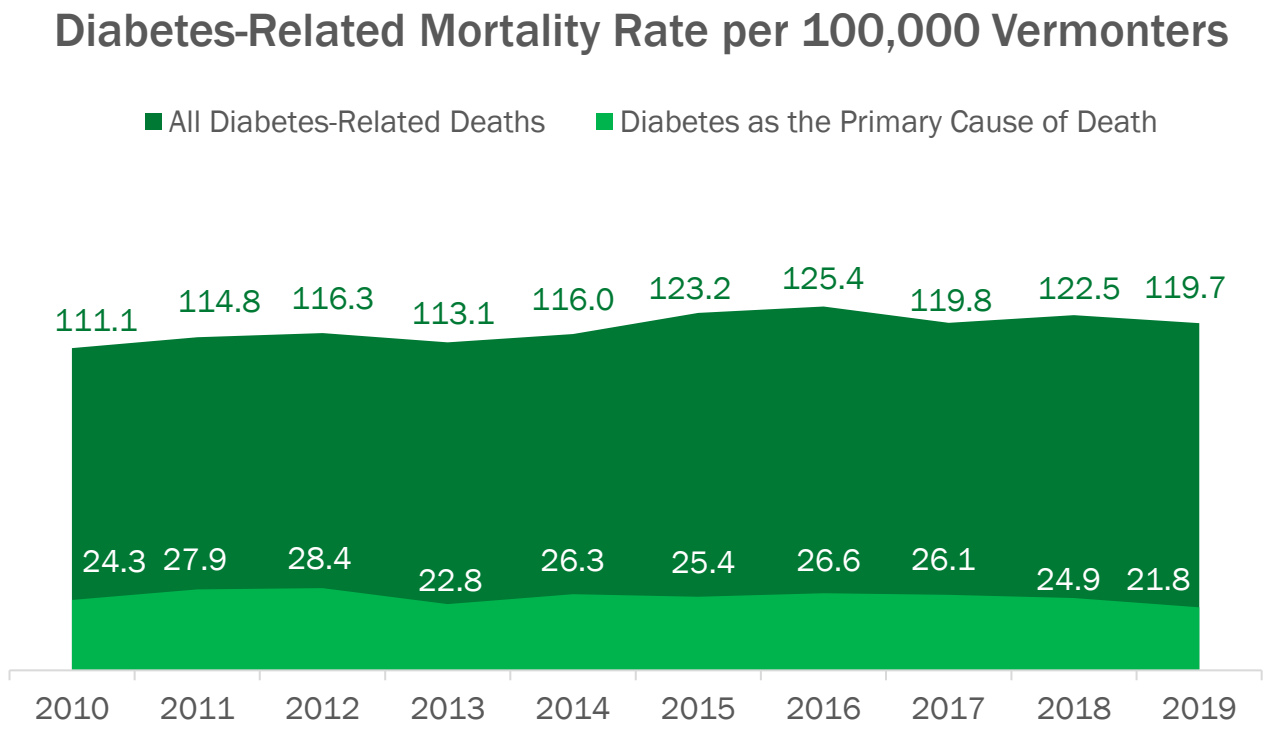
Adults diagnosed with diabetes are significantly more likely to have diabetes plus **two** or **more** chronic diseases than diabetes alone.



Source: VT BRFSS, 2020.

Diabetes-Related Mortality

All diabetes-related deaths among Vermonters is significantly higher than **diabetes as the primary cause (principal)** cause of death. **This indicates that the burden of diabetes is as a contributing factor to disease.**



- As a primary cause of death, diabetes is statistically unchanged from 2010 to 2019.
- Though prone to fluctuation in recent years, *all diabetes-related deaths* is statistically unchanged from 2010 to 2019.

Source: VT Vital Statistics, 2010-2019.

Diabetes

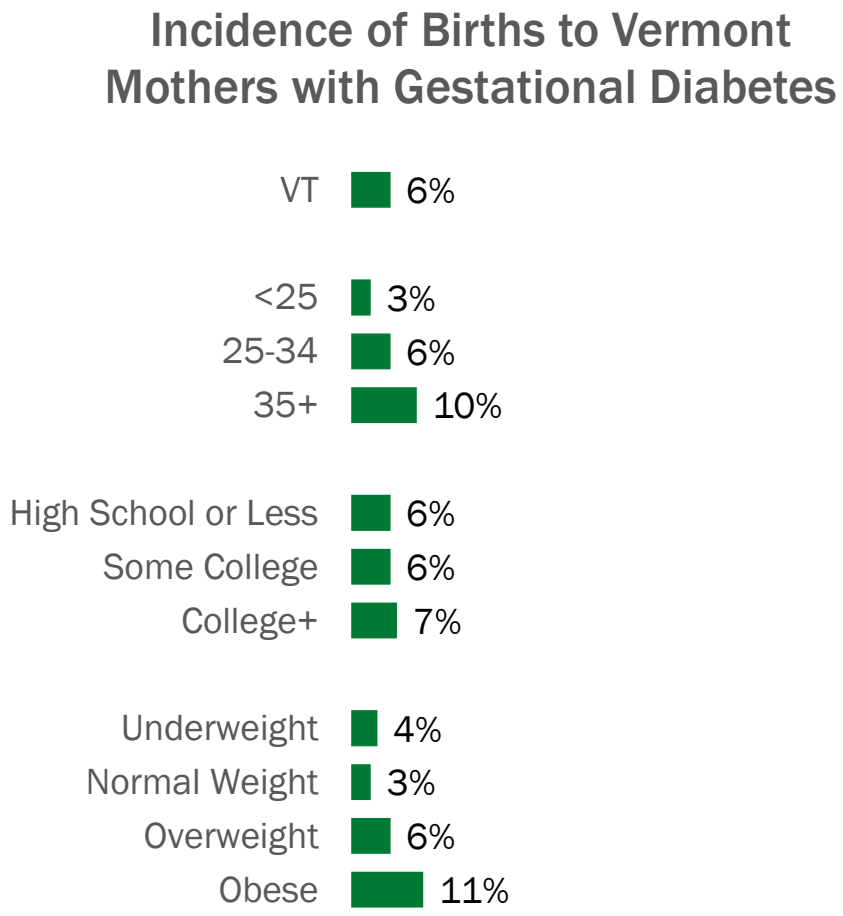
Gestational Diabetes

Gestational Diabetes

- Gestational diabetes is a condition with high blood sugar in the diagnostic range for diabetes that develops during pregnancy and usually reverses to normal blood sugar after pregnancy. It can cause pregnancy complications and increases the risk of developing diabetes later in life for the mother.
- During pregnancy, usually around the 24th week, many women may develop high blood glucose levels due to insulin resistance. This is known as gestational diabetes.
  - Little is known about the exact cause of gestational diabetes but, it is believed that the hormones that help the baby develop also block the action of insulin, known as insulin resistance, in the mother's body.
- Proper management of blood glucose levels during pregnancy is essential to the health of mother and baby.

Source: American Diabetes Association, Gestational Diabetes, February 16, 2022.

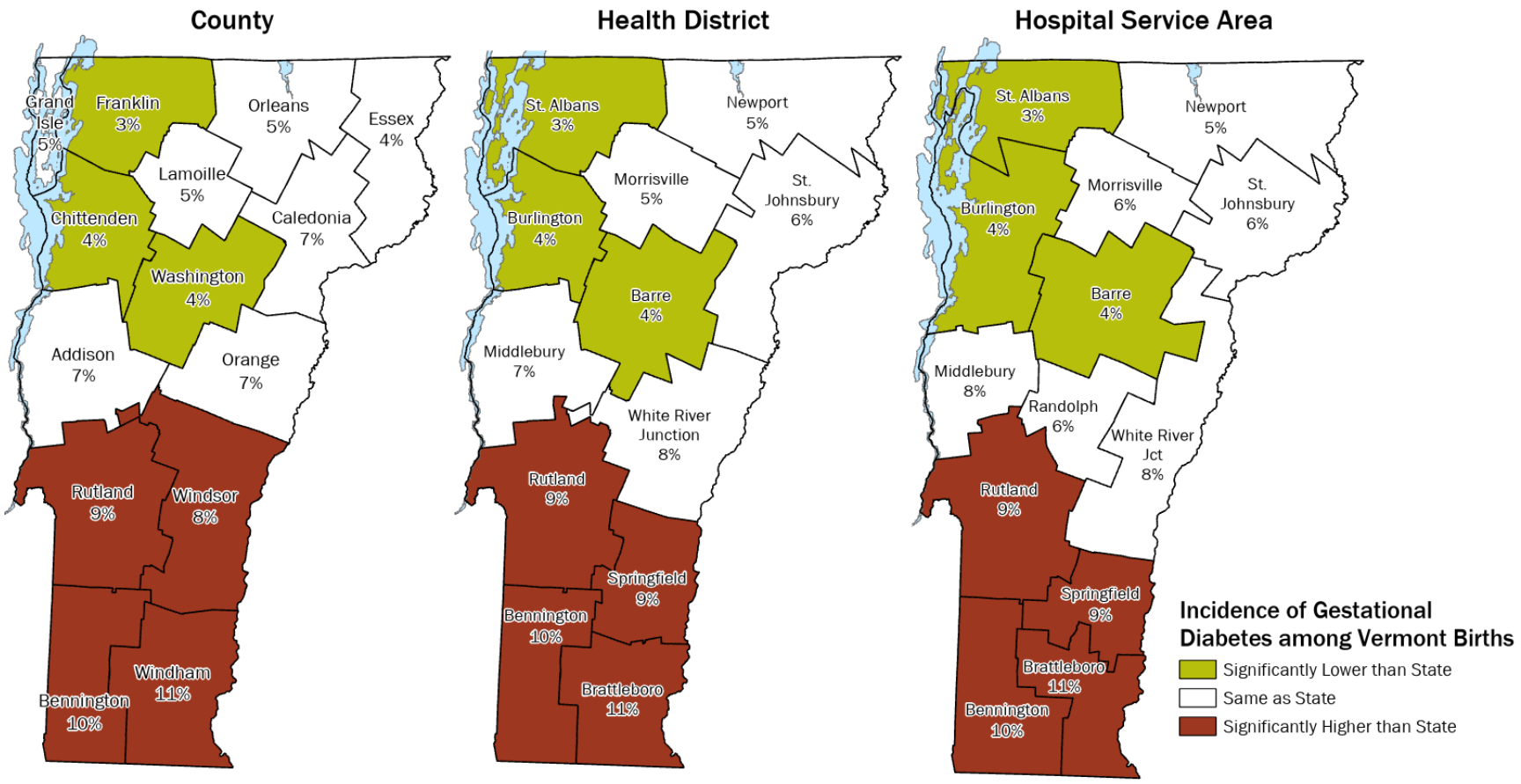
Gestational Diabetes Demographics



Source: Vermont Vital Statistics, 2019.

- Six percent of births in Vermont were to mothers with gestational diabetes in 2019 (represents 334 births).
  - Births to mothers with gestational diabetes significantly increase with advancing age of the mother.
  - Mothers are more likely to have gestational diabetes if they are obese compared to any other weight status. Those who are overweight are also significantly more likely to have gestational diabetes than those of a normal weight.

Incidence of Gestational Diabetes by Subgeography

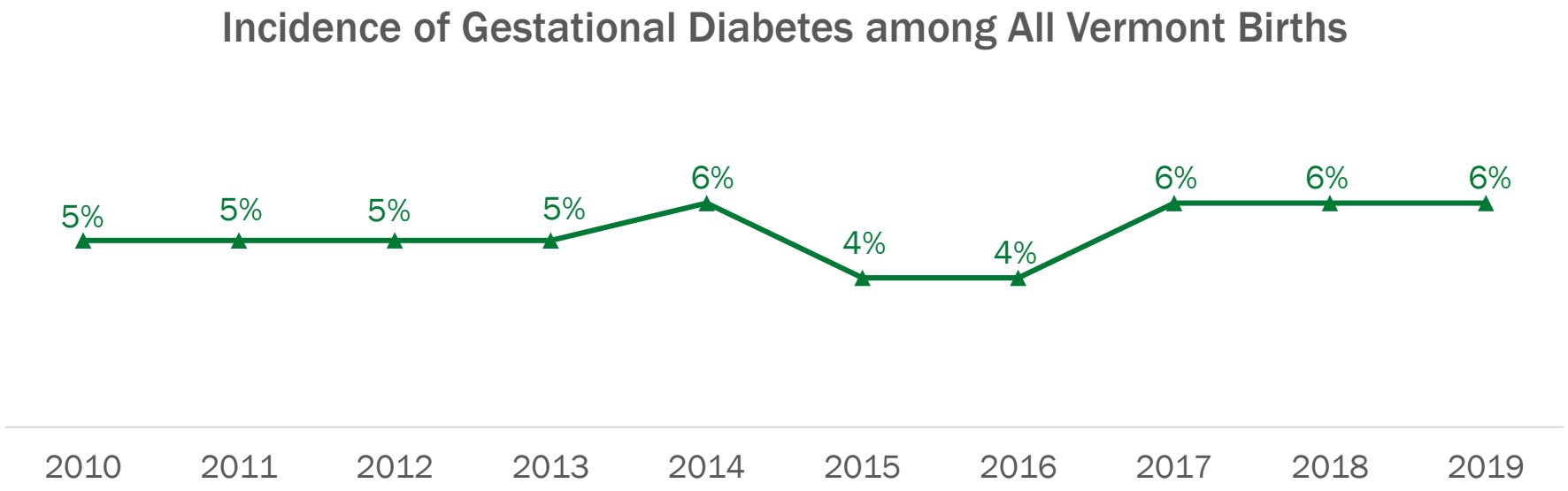


The incidence of gestational diabetes is significantly higher in Bennington, Rutland, Windham, and Windsor Counties and the Burlington, Bennington, Rutland, Springfield and Brattleboro Health Districts as well as the Rutland, Bennington, Springfield, and Brattleboro Hospital Service Areas (HSA) when compared to the state average. Incidence is significantly lower in Chittenden, Franklin, and Washington Counties and the Burlington, Barre, and St. Albans Health Districts and HSAs.

Source: Vermont Vital Statistics, 2017-2019.

Trend of Gestational Diabetes among All Vermont Births

The incidence of births to mothers with gestational diabetes was stable and unchanged from 2017 through 2019. Gestational diabetes incidence among births to Vermont mothers in 2019 (6%) is statistically higher than 2016 (4%).



Source: Vermont Vital Statistics, 2010-2019.

Diabetes

End-Stage Renal Disease (ESRD)

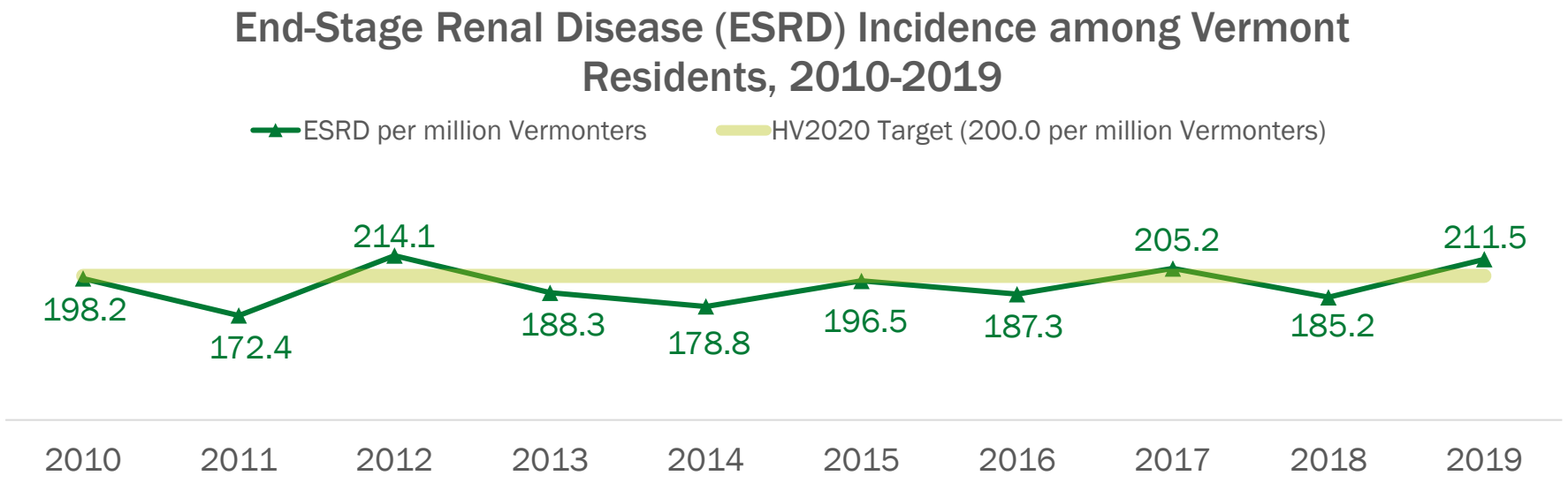
End-Stage Renal Disease (ESRD)

- ESRD is the final stage (Stage 5) of Chronic Kidney Disease and also known as end-stage renal failure or late chronic renal insufficiency.
  - Chronic Kidney Disease is caused by diabetes-related nephropathy (kidney damage from excess blood sugar), hypertension (high blood pressure), glomerular diseases (various types of kidney diseases), inherited/congenital kidney diseases, poisons, and trauma to the kidneys.
- Those experiencing ESRD will typically have 10-15% of normal kidney function.
- ESRD symptoms include: anemia, headache, fatigue, weakness, nausea, vomiting, thirst, muscle cramps/twitching/numbness in limbs, high blood pressure, poor digestion, decreased urinary output, and mental symptoms (lowered alertness, trouble concentrating, seizures).

Source: CDC. Chronic Kidney Disease Initiative, Prevention and Risk Management. March, 2021.

New Cases of ESRD

- The rate of new cases of ESRD among Vermonters as of 2019 was 211.5 cases for every one million Vermonters. The rate rose from 185.2 cases for every million Vermonters in 2018 and is above the rates from 2013 and 2017 as well. However, these differences are not statistically significant.
- As shown below, ESRD incidence is generally descending but does fluctuate with regularity. Additional years of data are needed to identify whether the increase is a normal fluctuation or an ascending trend.
- After meeting the Healthy Vermonters 2020 (HV2020) target of 200.0 cases for every million Vermonters in 2018, ESRD incidence in 2019 moved back above the HV2020 target. However, the rate has consistently remained below the 2009 baseline of 227.3 cases per million Vermonters (data not shown).



Source: U.S. Renal Data System, 2010-2019.

Data Sources and Notes

Behavioral Risk Factor Surveillance System (BRFSS): Vermont tracks risk behaviors using this telephone survey of non-institutionalized adults. The results are used to plan, support, and evaluate health promotion and disease prevention programs. Since 1990, Vermont, along with the 49 states and three territories has participated in the BRFSS with the Centers for Disease Control and Prevention (CDC). Approximately 7,000 Vermonters are randomly and anonymously selected annually. An adult (18 or older) in the household is asked a uniform set of questions. The results are weighted to represent the adult population of the state.

Youth Risk Behavior Survey (YRBS): Every two years since 1993, the Vermont Department of Health's Division of Alcohol and Drug Abuse Program, and the Agency of Education's Coordinated School Health Programs have sponsored the YRBS. The YRBS measures the prevalence of behaviors that contribute to the leading causes of death, disease, and injury among Vermont youth in grades 6-12. The YRBS is part of a larger effort to help communities increase the “resiliency” of young people by reducing high-risk behaviors and promoting healthy behaviors.

United States Renal Data System (USRDS): The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) funds the USRDS which is a national data system collecting, analyzing, and distributing information about chronic kidney disease (CKD) and end-stage renal disease (ESRD) in the United States. Data are received by USRDS through collaboration with the Centers for Medicare & Medicaid Services (CMS), United Network for Organ Sharing (UNOS), and ESRD networks. Data are made available publicly through the USRDS.

Data Sources and Notes

Vermont Vital Statistics: The Vermont Department of Health vital statistics system tracks Vermont births and deaths. The Department of Health also receives extracts for Vermont resident births and deaths that occur in other states which allows the Department to do statistical analyses of vital events involving all Vermont residents, including those events which occurred outside of the state. Underlying cause of death refers to the condition listed as the first mortality code, indicating it was the primary (principal) cause resulting in death. All deaths related to a condition refers to when it is listed as any of the twenty possible mortality codes.

Vermont Uniform Hospital Discharge Data Set (VUHDDS): Hospital and emergency department discharge data are collected from in-state hospitals and from hospitals in bordering states. A primary diagnosis of a condition refers to when that condition is listed as the first diagnosis code. Any mention of the condition refers to when the condition in question is listed as any of the twenty available diagnosis codes. Patients admitted to the hospital from the emergency department are included in the hospital discharge data set and are not included in the emergency department data set. Due to delays in data delivery from hospitals in neighboring states, VUHDDS analyses in this document are restricted to Vermonters seen at Vermont hospitals.

Green Mountain Care Board (GMCB) Vermont Health Care Uniform Reporting and Evolution System (VHCURES): Vermont's All-Payer Claims Database that contains most medical and pharmacy claims and eligibility data for Vermonters insured by an insurance provider (public or private) who reports to the State of Vermont. Due to various laws and regulations, employer sponsored insurance claims for employers with fewer than 200 employees do not have to report into VHCURES. As a result of this, and the fact that medical care that did not generate an insurance claim do not appear here, data generated from VHCURES are estimates of healthcare utilization among insured Vermonters. **All analyses, conclusions, and recommendations provided here from VHCURES are solely those of the Department of Health and not necessarily those of the GMCB.** For VHCURES analyses, a disease-related encounter is one in which the condition specific diagnosis code(s) are listed as the primary reason for the visit or a contributing factor for the primary reason.

For Additional Information Visit…

Vermont Diabetes Prevention

https://www.healthvermont.gov/wellness/diabetes
https://www.myhealthyvt.org/

Data: https://www.healthvermont.gov/health-statistics-vital-records/surveillance-reporting-topic/diabetes

Vermont Cardiovascular Disease Prevention

https://www.healthvermont.gov/wellness/heart-disease
https://www.myhealthyvt.org/workshop/high-blood-pressure/
https://www.healthvermont.gov/wellness/you-first-providers

Data: https://www.healthvermont.gov/health-statistics-vital-records/surveillance-reporting-topic/cardiovascular-disease

3-4-50 Vermont: Drive Down Chronic Disease

https://www.healthvermont.gov/3-4-50

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