Vaccinations Among Vermont Adults with Chronic Illness and Health Behaviors, 2020-2022

October 2024

Individuals with certain chronic illnesses and health behaviors are at higher risk for some vaccine-preventable diseases; vaccination is therefore particularly important among these populations. The annual Behavioral Risk Factor Surveillance System (BRFSS) Survey asks questions about vaccination status, as well as various health risk factors. This report shows vaccination rates among Vermont adults using BRFSS Survey data from 2020, 2021 and 2022 among those with and without known risk factors, including cardiovascular disease, respiratory disease, diabetes, current cigarette smoking and heavy drinking.

Many of the risk factors analyzed in this report are linked to other variables. To determine if these risk factors still significantly influence vaccination rates after accounting for these other variables, we conducted logistic regression analyses. In these analyses, we adjusted the odds ratios to account for sex and whether individuals had a routine doctor visit in the past year. This adjustment helps us isolate the effect of the risk factors on vaccination rates. For more information, see pages 8 through 10.

Sample Size by Year, 2020-2022*

	2022 Survey	2021 Survey	2020 Survey
Number of Respondents	8,800	6,600	6,500

Vaccinations included in the BRFSS Survey, 2020-2022

	2022 Survey	2021 Survey	2020 Survey
COVID-19		✓	
Influenza	✓	✓	✓
Pneumococcal	✓	✓	✓
Shingles			✓
Tetanus	✓		

*Counts are rounded to the nearest hundred.

History of vaccination in the BRFSS Survey is self-reported. The following vaccinations are included in this report:

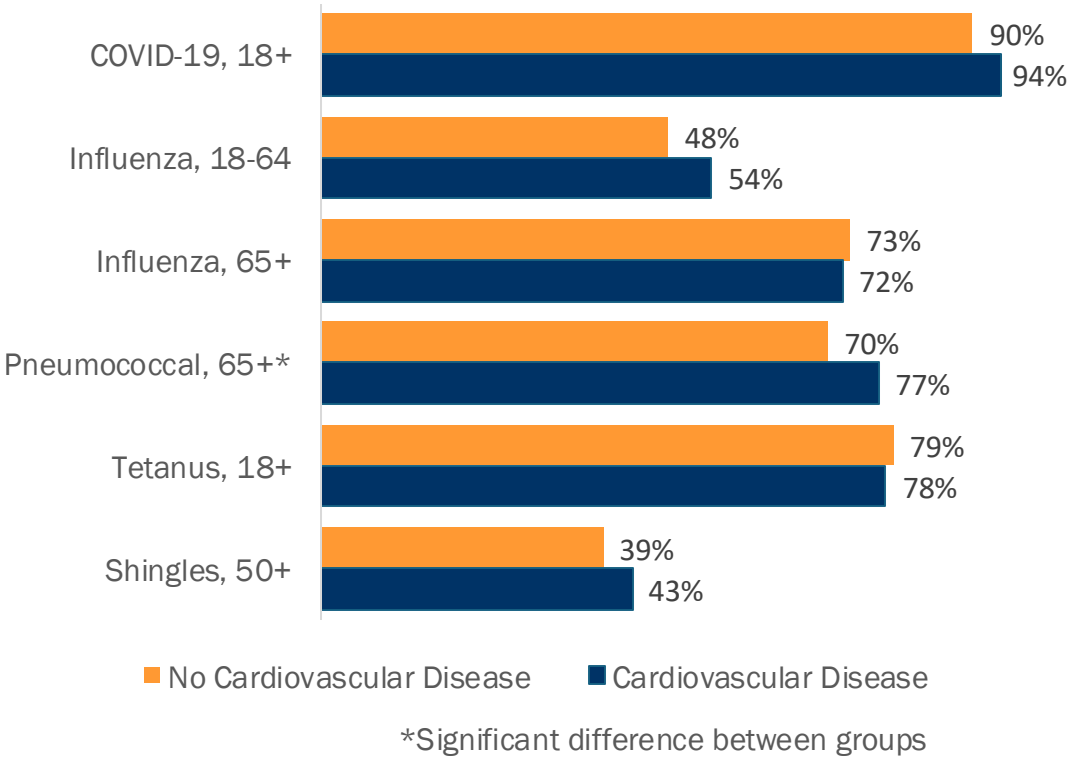
- **COVID-19 (2021) –** Individuals are considered vaccinated if they received any COVID-19 vaccination. This report only includes the first round of COVID-19 vaccines that were distributed in late 2020 and early 2021. COVID-19 vaccination questions were included in the BRFSS Survey from July 2021 to December 2021.
- **Influenza (2020-2022)** – Individuals are considered vaccinated if they received a flu shot or nasal spray in the last 12 months.
- **Pneumococcal (2020-2022) –** Individuals are considered vaccinated if they have ever received any pneumococcal vaccine.
- **Shingles (2020) –** Individuals are considered vaccinated if they have ever received a shingles vaccination. Only respondents 50 or older are asked about the shingles vaccination.
- **Tetanus (2022) –** Individuals are considered vaccinated if they have received a tetanus vaccination in the past 10 years, which may or may not include protection against pertussis.

The above measures do not necessarily indicate whether an individual would be considered up to date on vaccinations per the Advisory Committee on Immunization Practices (ACIP) recommendations.

Cardiovascular Disease

People are considered to have chronic cardiovascular disease if they have a history of myocardial infarction (heart attack), stroke or coronary heart disease. Approximately 9% of Vermont adults in 2022, 8% of Vermont adults in 2021, and 8% of Vermont adults in 2020 report ever being diagnosed with cardiovascular disease.

Vaccination Rates by Cardiovascular Disease, 2020-2022



Key Points

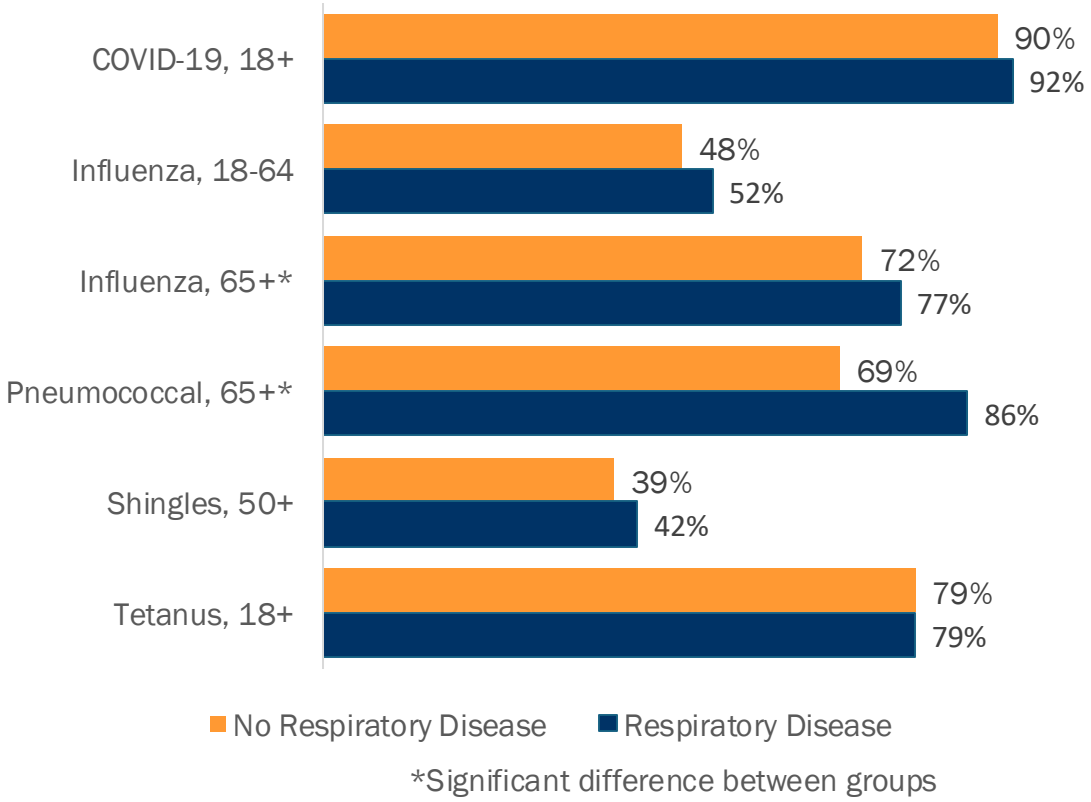
- People in Vermont 65+ with chronic cardiovascular disease have higher pneumococcal vaccination rates (77%) than those without chronic cardiovascular disease (70%).
- When adjusting for sex and whether a respondent had a routine doctor visit in the past year, those 65 and older with chronic cardiovascular disease have 1.5 times the odds of pneumococcal vaccination (1.5 OR) in the 65+ age group compared to those without cardiovascular disease.
- COVID-19, influenza, tetanus, and shingles vaccination rates do not significantly differ between those with and without chronic cardiovascular disease.

Pneumococcal, 65+
Higher

Respiratory Disease

People are considered to have chronic respiratory disease if they currently have asthma or have ever been diagnosed with chronic obstructive pulmonary disease (COPD). Approximately 17% of Vermont adults in 2022, 16% of Vermont adults in 2021, and 15% of Vermont adults in 2020 report chronic respiratory disease.

Vaccination Rates by Respiratory Disease, 2020-2022



Key Points

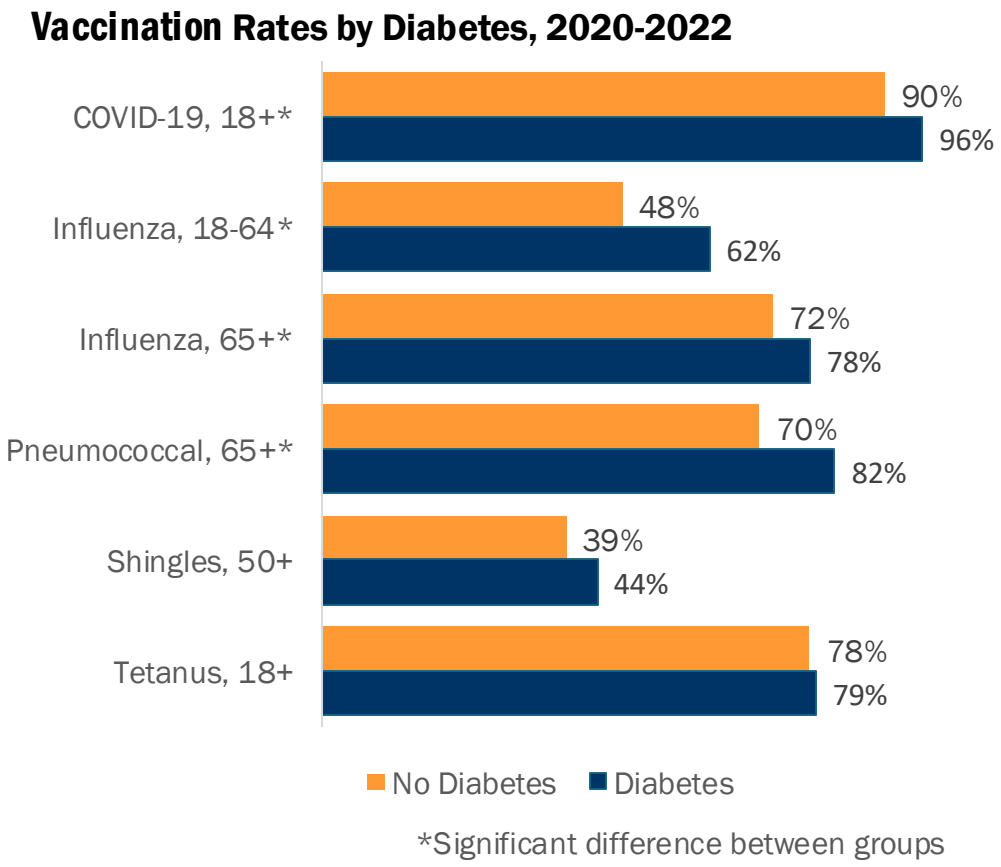
- People in Vermont 65+ with chronic respiratory disease have higher influenza and pneumococcal vaccination rates than those without chronic respiratory disease.
- When adjusting for sex and whether a respondent had a routine doctor visit in the past year, compared to those without chronic respiratory disease, those with chronic respiratory disease have:
  - 1.3 times the odds of influenza vaccination among those age 65+.
  - 2.5 times odds of pneumococcal vaccination among those aged 65+.
- Among those aged 18-64, influenza vaccination rates do not significantly differ between those with and without chronic respiratory disease.
- COVID-19, tetanus, and shingles vaccination rates do not significantly differ between those with and without chronic respiratory disease.

Influenza, 65+
Higher

Pneumococcal, 65+
Higher

Diabetes

Approximately 8% of Vermont adults in 2022, 9% of Vermont adults in 2021, and 8% of Vermont adults in 2020 have diabetes. These estimates include both Type 1 and Type 2 diabetes. Those reporting diabetes only during pregnancy (gestational diabetes) were not considered to have diabetes for the purpose of this analysis.



Key Points

- People in Vermont with diabetes have higher COVID-19, influenza, pneumococcal vaccination rates than those without diabetes.
- When adjusting for sex and whether a respondent had a routine doctor visit in the past year, compared to those without diabetes, those with diabetes have:
  - 2.1 times the odds of COVID-19 vaccination among those aged 18+.
  - 1.5 times the odds of influenza vaccination among those aged 18-64.
  - 1.3 times the odds of influenza vaccination and 2 times the odds of pneumococcal vaccination among those aged 65+.
- Tetanus and shingles vaccination rates do not significantly differ between those with and without diabetes.

Influenza, 18-64 Higher

Influenza, 65+ Higher

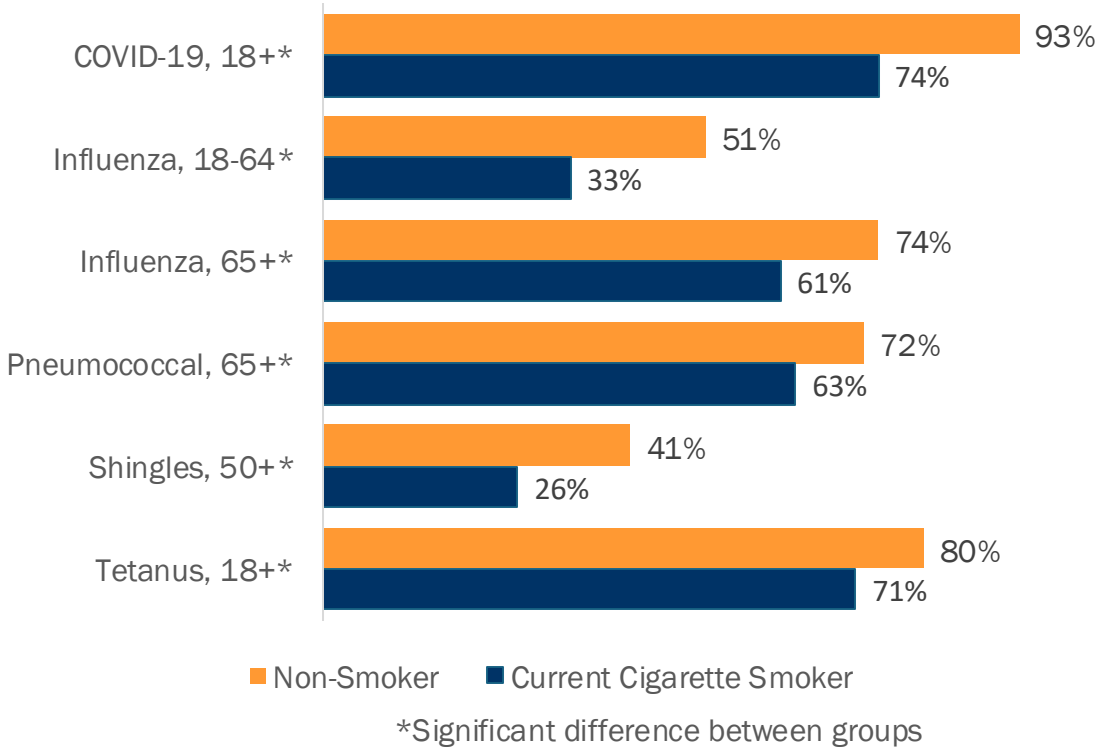
Pneumococcal, 65+ Higher

COVID-19, 18+ Higher

Current Cigarette Smoking

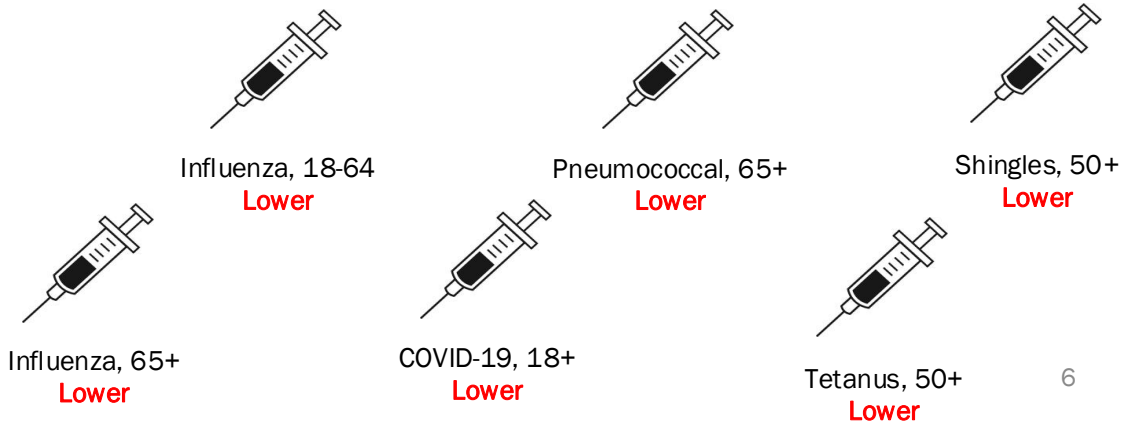
Approximately 13% of Vermont adults in 2022, 15% of Vermont adults in 2021, and 13% of Vermont adults in 2020 report currently smoking cigarettes. Former smokers and those who have never smoked are grouped together as non-smokers. For this report, those who only report smoking marijuana or using vape products are not considered to smoke cigarettes.

Vaccination Rates by Current Cigarette Smoking, 2020-2022



Key Points

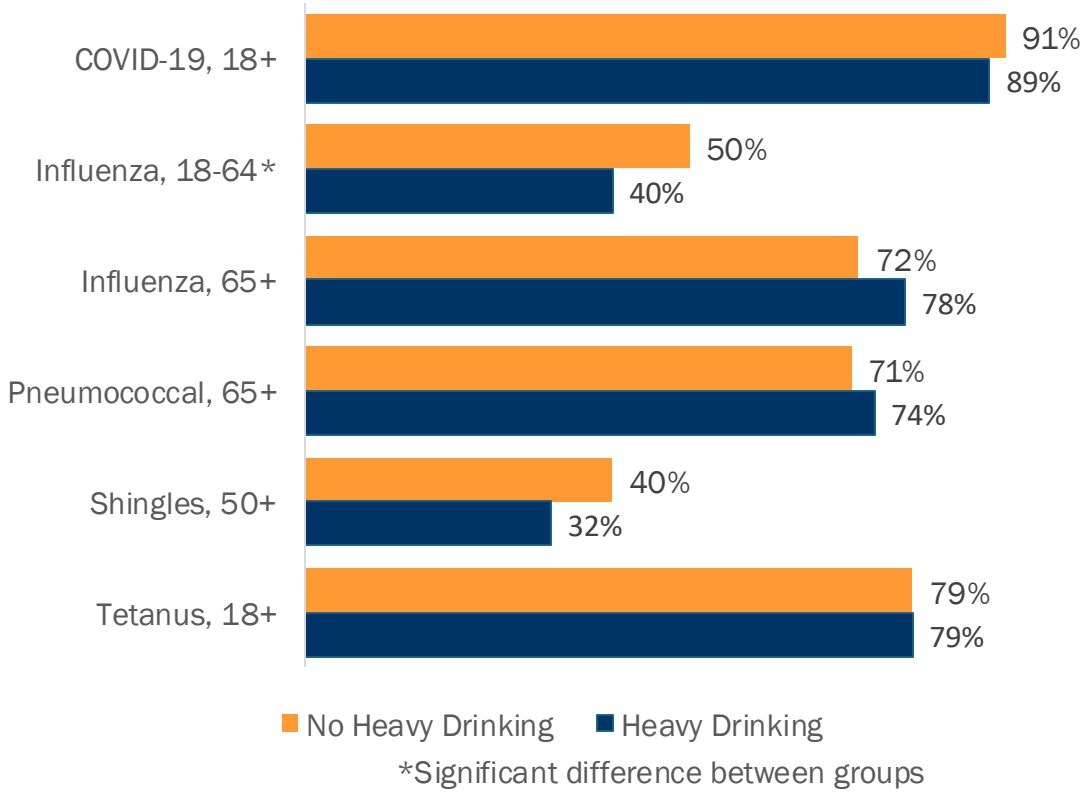
- Compared to those who do not currently smoke cigarettes, those who currently smoke cigarettes have lower rates of all vaccinations.
- When adjusting for sex and whether a respondent had a routine doctor visit in the past year, compared to those who do not currently smoke cigarettes, current cigarette smokers have:
  - 0.7 times the odds of tetanus vaccination and 0.2 times the odds of COVID-19 vaccination among those aged 18+.
  - 0.5 times the odds of influenza vaccination among those aged 18-64.
  - 0.5 times the odds of influenza vaccination and 0.6 times the odds of pneumococcal vaccination among those aged 65+.
  - 0.5 times the odds of shingles vaccination among those aged 50+.



Heavy Drinking

For this report, heavy drinking is defined as more than two drinks per day for males and more than one drink for females. Approximately 10% of Vermont adults in 2022, 9% of Vermont adults in 2021, and 10% of Vermont adults in 2020 report heavy drinking.

Vaccination Rates by Heavy Drinking, 2020-2022



Key Points

- Among those aged 18-64, influenza vaccination rates are lower among those who report heavy drinking. In this age group, when adjusting for whether a respondent had a routine doctor visit in the past year, those who report heavy drinking have 0.7 times the odds of influenza vaccination.
- Among those aged 65+, influenza vaccination rates do not differ significantly between those who do and do not report heavy drinking.
- COVID-19, pneumococcal, tetanus, and shingles vaccination rates do not significantly differ between those who do and do not report heavy drinking.

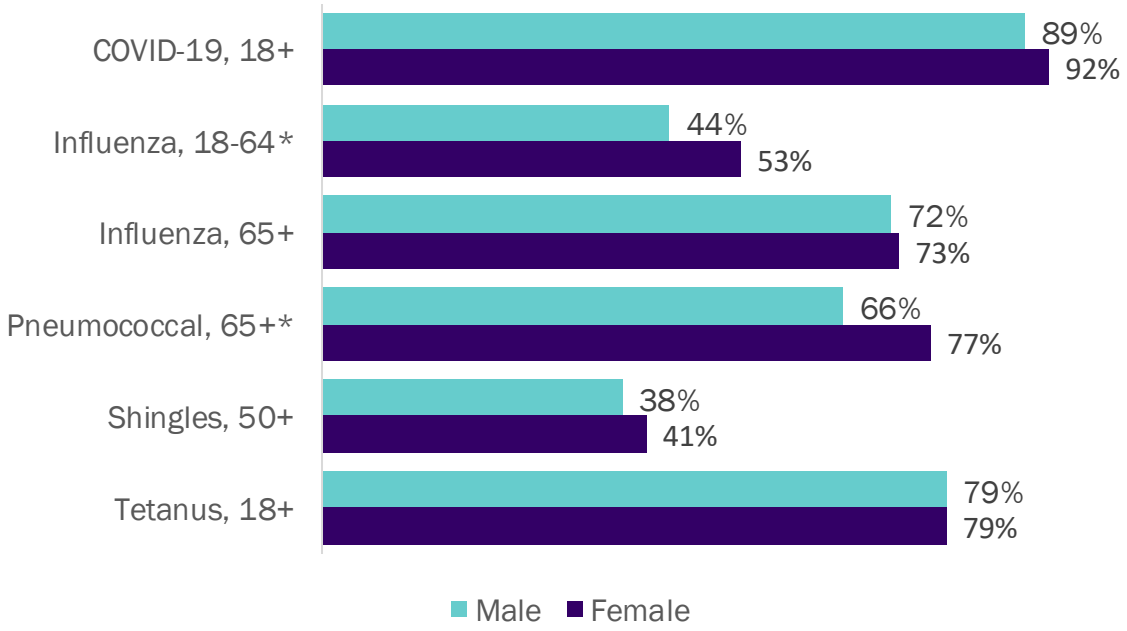
Influenza, 18-64
Lower

Impact of Sex and Routine Doctor Visits on Vaccination Rates

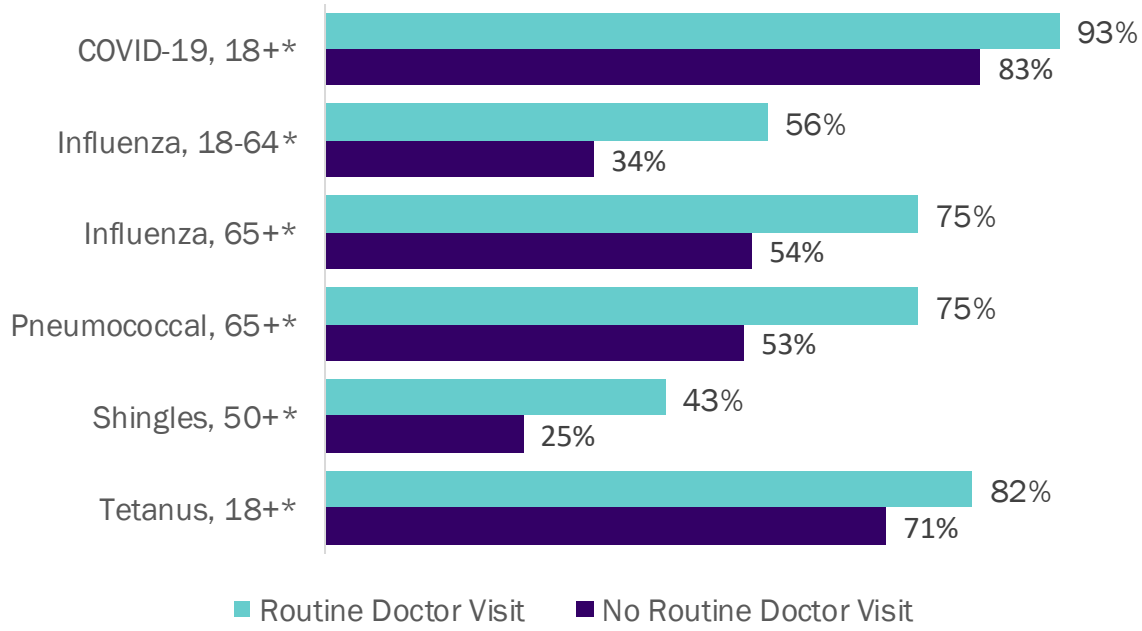
In some cases, sex is associated with higher or lower vaccination rates. Among those aged 18-64 years, females have **higher** influenza vaccination rates than males. However, among those aged 65+ years, influenza rates are statistically similar between males and females. Among those aged 65+ years, females have a **higher** rate of pneumococcal vaccination than males. Rates of COVID-19 vaccination, shingles vaccination, and tetanus vaccination are statistically similar between males and females.

Having had a routine doctor visit in the past year was associated with **higher** rates of all vaccinations.

Vaccination Rates by Sex



Vaccination Rates by Routine Doctor Visit in Past Year



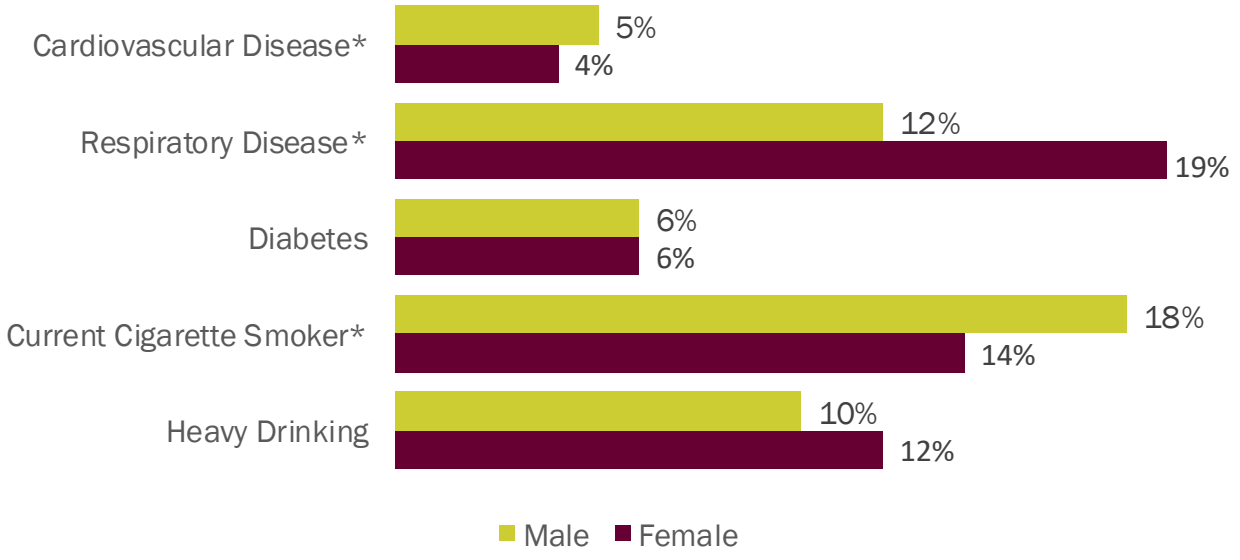
*Significant difference between groups

Sex and Chronic Illness and Health Behaviors

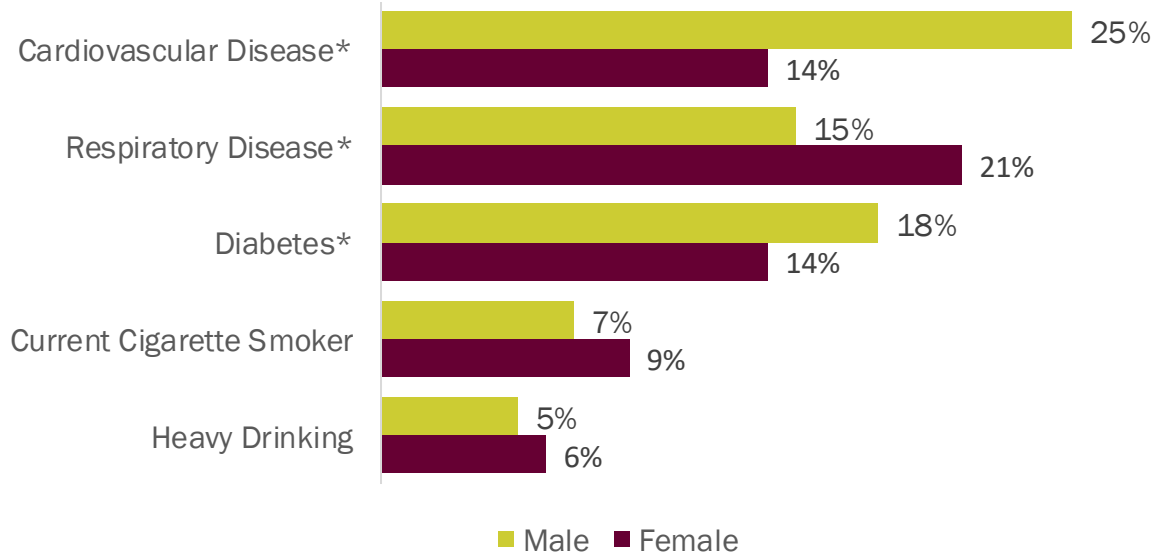
Rates of some chronic illnesses and health behaviors differ by sex.

Among both those aged 18-64 years and those aged 65+ years, males have a higher likelihood of cardiovascular disease, while females have a higher likelihood of respiratory disease. Among those aged 65+ years, males have a higher likelihood of diabetes. Among those aged 18-64 years, males are more likely to be current cigarette smokers.

Percentage of Vermont Adults Aged 18-64 Years with Chronic Illnesses and Health Behaviors, by Sex



Percentage of Vermont Adults Aged 65+ Years with Chronic Illnesses and Health Behaviors, by Sex



*Significant difference between groups

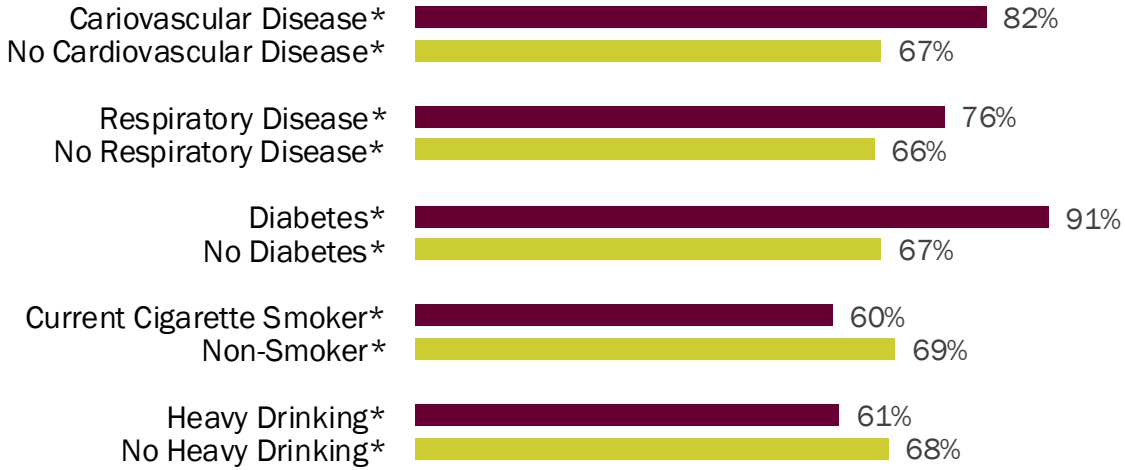
Routine Doctor Visits and Chronic Disease and Health Behaviors

In many cases, chronic illnesses and health behaviors are associated with the likelihood that an individual has visited the doctor in the past year.

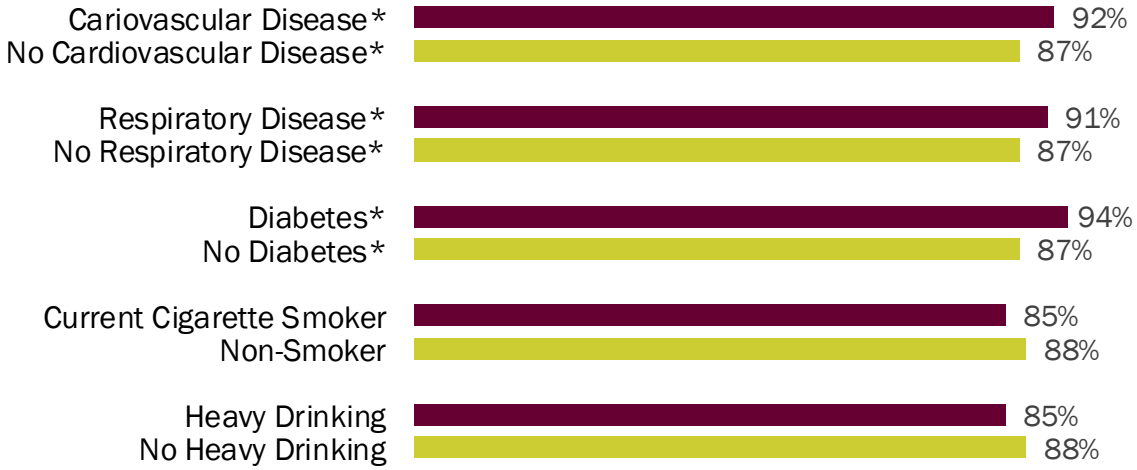
Among Vermont adults aged 18-64 years, those with cardiovascular disease, respiratory disease, or diabetes are **more likely** to have had a routine doctor visit in the past year compared to those without the given chronic illness. In that same age group, those who smoke cigarettes or drink heavily are **less likely** to have had a routine doctor visit in the past year.

Among Vermont adults aged 65+, those with cardiovascular disease, respiratory disease, or diabetes are **more likely** to have had a routine doctor visit in the past year compared to those without the given chronic illness. In this age group, there was no association between a checkup and smoking or heaving drinking.

Percentage of Vermont Adults Aged 18-64 Years with Routine Doctor Visit in Past Year by Chronic Illness and Health Behaviors



Percentage of Vermont Adults Aged 65+ Years with Routine Doctor Visit in Past Year by Chronic Illness and Health Behaviors



*Significant difference between groups

Data Notes

Odds ratios are a measure showing how closely an outcome (vaccination) is associated with a risk factor. An odds ratio of 2 does, for example, does not mean that those with a risk factor are twice as likely as those without the risk factor to be vaccinated.

More information about the BRFSS Survey can be found here.

Sex in the BRFSS Survey is self-reported as male or female. Respondents may report their sex assigned at birth. For respondents in which sex assigned at birth is not reported, screening questions are used to determine sex.

Information about vaccinations and routine doctor visits in the BRFSS Survey is self-reported and is not confirmed by chart review.

Some potential covariates could not be included in this analysis due to small sample sizes and suppression rules. Results are suppressed in cases where the raw count of a cell is below 5 respondents, or when the relative standard error (RSE) is below 30%.

The Vermont Department of Health recognizes the many social, economic and environmental inequities which drive the data in this report. We are working to incorporate data reflective of these lived experiences among all Vermonters. As BRFSS is a telephone survey, those with disabilities affecting their ability to complete a telephone survey (e.g. hearing loss, communication difficulties) may not be well represented in these data and this report.

For more information: AHS.VDHVaccinationData@vermont.gov