

# Alzheimer's and Related Dementias Surveillance in Vermont

Data Pages

Division of Health Statistics & Informatics

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# Introduction: Alzheimer's and Related Dementias (ADRD) and Risk Factors

Dementia is a chronic neurodegenerative disease that can cause memory loss, affect a person's ability to function independently, and may eventually lead to death. The most common type of dementia is Alzheimer's. The experience of having Alzheimer's and Related Dementias or ADRD may impact the physical and emotional wellbeing of the individual, as well as their family, friends, and community. The purpose of these Alzheimer's and Related Dementias Surveillance Data Pages is to begin to understand the impact of ADRD on Vermonters by investigating the prevalence of ADRD, ADRD-related Emergency Department Visits and Hospitalizations, and ADRD-related mortality. We also focus the prevalence of two key risk factors for ADRD; subjective cognitive decline and traumatic brain injury. These data pages are a starting point for the Vermont Department of Health surveillance of ADRD data.

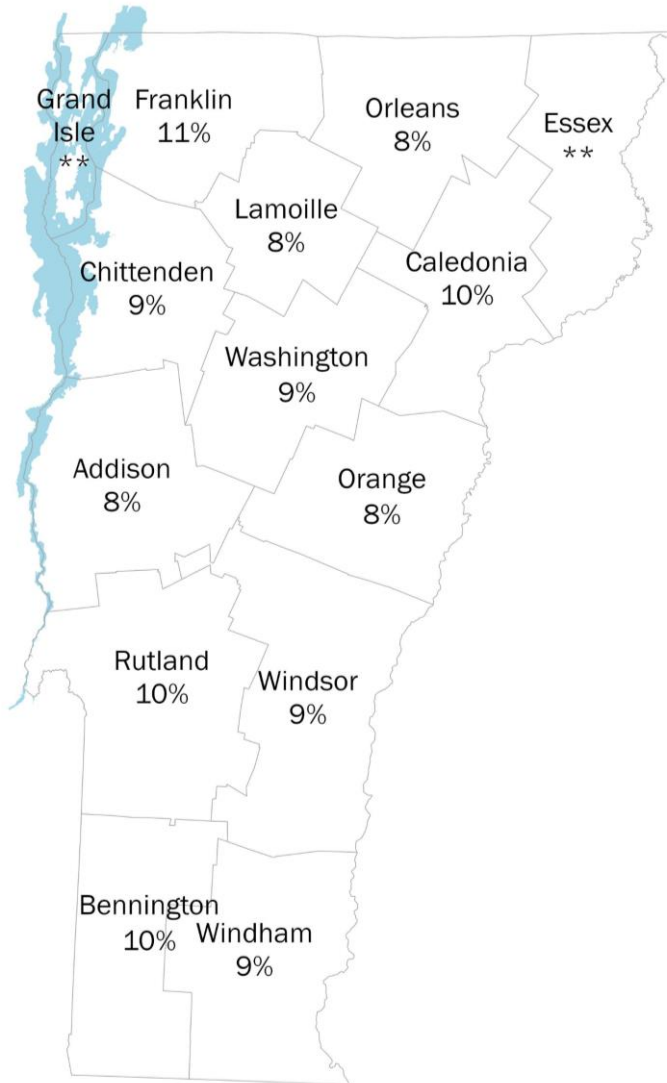
These Alzheimer's and Related Dementias Surveillance Data Pages used multiple data sources, including:

- 2020 Behavioral Risk Factor Surveillance System (BRFSS)
- 2016-2020 Vermont Vital Statistics
- 2016-2020 Vermont Uniform Hospital Discharge Data Set (VUHDDS)

# Vermont ADRD Overview

The prevalence of ADRD among Vermont residents and ADRD-related emergency department visits, hospitalizations, and mortality.

# Prevalence of Vermont Adults 65+ with ADRD

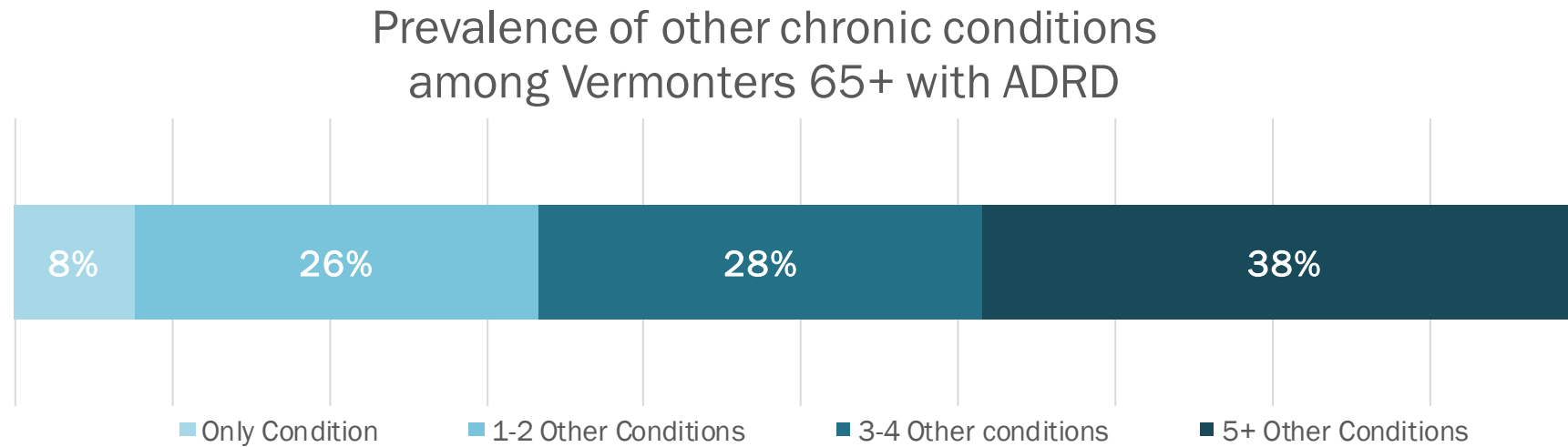


- In 2018, 9% of Vermonters 65+ on Medicare had an Alzheimer or related dementia diagnosis, ranging from 8% in Lamoille County to 11% in Franklin County.
- Among Vermonters 65+ that were on Medicare and Medicaid, 22% had an ADRD diagnosis.
- 3% of Vermonters younger than 65 years old and on Medicare had an ADRD diagnosis.
- Among Vermonters 65+ on Medicare, 10% of females and 8% of males had an ADRD diagnosis.

Source: Medicare fee for service data, 2018.

\*\* indicates suppressed data due to fewer than 11 people in county with a dementia diagnosis

# ADRD and Prevalence of Other Chronic Conditions

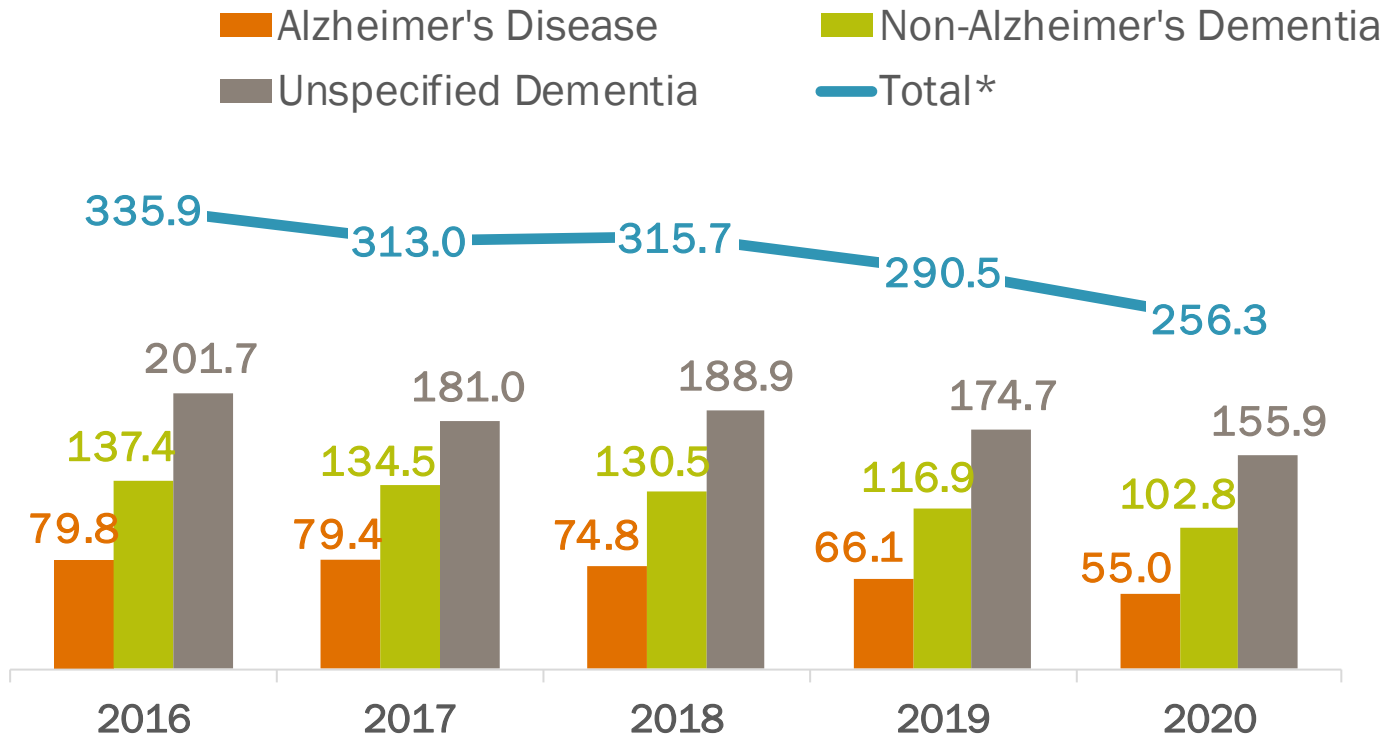


Source: Medicare fee for service data, 2018.

The Center for Medicare and Medicaid definition of an ADRD diagnosis can be found here: <https://www2.ccwdata.org/web/guest/condition-categories-chronic>

# Emergency Department Visits Among Vermonters With Any Diagnosis of ADRD

Number of ED Visits per 10,000 Vermont Residents 65+ Years Old Treated at Vermont Hospitals



Analysis included **any ADRD diagnosis** among Vermont residents 65 years and older treated at Vermont hospitals.  
 \*Numbers do not add to **total** due to some ED visits having multiple dementia-related causes.  
 Source: Vermont Uniform Hospital Discharge Data Set, 2016-2020.

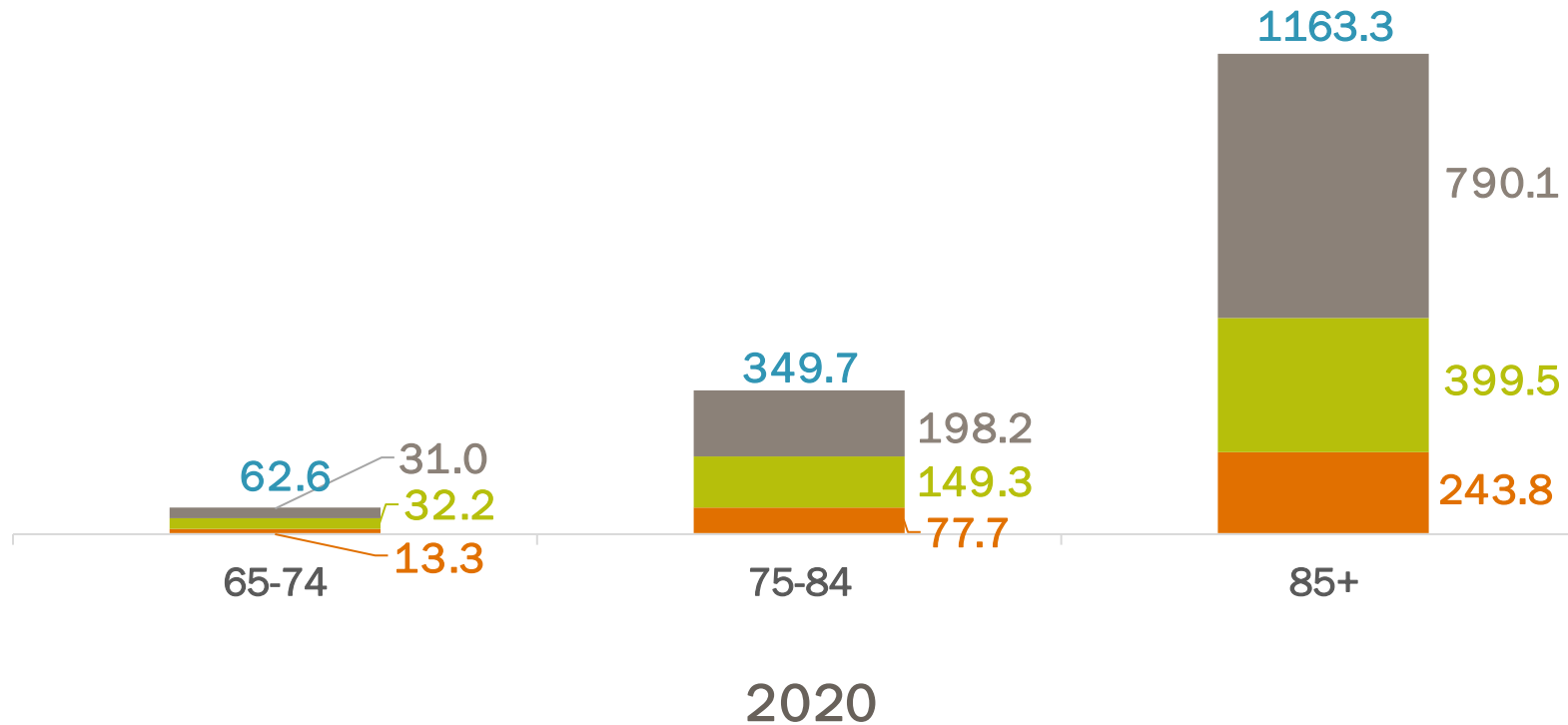
- In 2019 and 2020, there was a total of 3,633 and 3,310 ED visits among Vermonters 65+ with ADRD, respectively.
- There were significantly less ED visits among Vermonters 65+ with ADRD in 2020 than in 2019 and prior years.

Type of ADRD	Number of ED Visits	
	2019	2020
Alzheimer's	827	711
Non-Alzheimer's	1,462	1,328
Unspecified	2,184	2,014
<b>Total</b>	<b>3,633</b>	<b>3,310</b>

# Emergency Department Visits by Age Group Among Vermonters With Any Diagnosis of ADRD

Number of ED Visits per 10,000 VT Residents Treated at Vermont Hospitals

■ Alzheimer's Disease 
 ■ Non-Alzheimer's Dementia 
 ■ Unspecified Dementia



In 2020, the number of ADRD-related emergency department visits was 1163.3 per 10,000 Vermonters 85 years and older. This was 3 times more than Vermonters 75-84 and 19 times more than Vermonters 65-74.

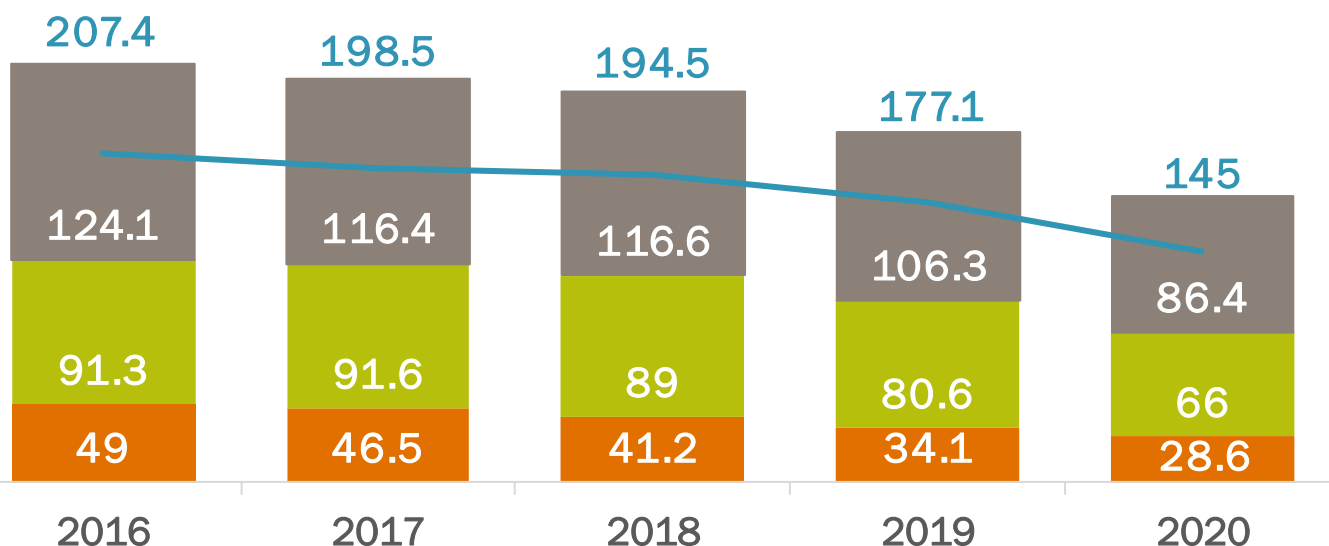
Analysis included **any ADRD diagnosis** among Vermont residents 65 years and older treated at Vermont hospitals.  
 \*Numbers do not add to total due to some ED visits having multiple dementia-related causes.  
 \*Source: Vermont Uniform Hospital Discharge Data Set, 2016-2020.  
 Vermont Department of Health



# Inpatient Hospitalizations Among Vermonters With Any ADRD Diagnosis

Number of Inpatient Hospitalizations per 10,000 Vermont Residents 65+ Years Old Treated at Vermont Hospitals

■ Alzheimer's Disease      ■ Non-Alzheimer's Dementia  
■ Unspecified Dementia      — Total\*



Source: Vermont Uniform Hospital Discharge Data Set, 2016-2020.

Analysis is among Vermont residents 65 years and older treated at Vermont hospitals for a non-elective admission type with an **ADRD ICD-10 code in any of the diagnostic codes.**

\*Numbers do not add to total due to some ED visits having multiple dementia-related causes.

Vermont Department of Health

- In 2019 and 2020, there was a total of 2,214 and 1,873 inpatient hospitalizations among Vermonters 65+ with ADRD, respectively.
- There were significantly less inpatient visits among Vermonters 65+ with ADRD in 2020 than in 2019 and prior years.

Type of ADRD	Number of Inpatient Visits	
	2019	2020
Alzheimer's	426	370
Non-Alzheimer's	1,008	852
Unspecified	1,329	1,116
<b>Total</b>	<b>2,214</b>	<b>1,873</b>

# Top 5 Diagnoses Among Those Hospitalized With a Diagnosis of ADRD

Top 5 New Admissions for All Diagnoses	Number (% of All Diagnoses)	Top 5 New Admissions for “Preventable” Diagnoses	Number (% of All Diagnoses)
Sepsis, unspecified	778 (7%)	Diseases of the respiratory system	1,538 (14%)
Urinary tract infection, unspecified	578 (5%)	Sepsis	1,109 (10%)
Pneumonia, unspecified	396 (4%)	Urinary tract infection	654 (6%)
Aspiration pneumonia	278 (3%)	Congestive heart failure	572 (5%)
Acute kidney failure, unspecified	278 (3%)	Chronic obstructive pulmonary disease	183 (2%)

- From 2016 – 2020, there were 11,106 non-elective inpatient hospitalizations among people with ADRD.
- The top 5 new admission diagnoses accounted for 22% of all hospitalizations.
- Approximately 38% of all hospitalizations are “preventable” and the top 5 new admission for “preventable” diagnoses accounted for 37% of all hospitalizations.

Source: Vermont Uniform Hospital Discharge Data Set, 2016-2020.

Analysis is among Vermont residents 65 years and older treated at Vermont hospitals for a non-elective admission type with an **ADRD ICD-10 code in any of the diagnostic codes**.

A “Preventable” Hospitalization is classified as a primary diagnosis ICD-10 code for one of the following illnesses: Cellulitis, Congestive heart failure, Chronic obstructive pulmonary disease, Dehydration/Electrolyte imbalance, Diseases of the respiratory system, Sepsis, and Urinary tract infection.

Citation: Maslow, Katie, and Joseph Ouslander. “Measurement of Potentially Preventable Hospitalizations.” Long-Term Quality Alliance, February 2012. <https://www.ltqa.org/ltqa-white-paper-offers-guidance-for-long-term-care-organizations-to-measure-preventable-hospitalizations-2/>.

# Top 5 Diagnoses Among Those With a Diagnosis of ADRD Readmitted to the Hospital Within 30 Days

Top 5 30-Day Readmissions for All Diagnoses	Number (% of Readmission Diagnoses)	Top 5 30-Day Readmissions for “Preventable” Diagnoses	Number (% of Readmission Diagnoses)
Sepsis, unspecified	85 (6%)	Diseases of the respiratory system	216 (15%)
Pneumonia, unspecified	52 (4%)	Sepsis	117 (8%)
Aspiration pneumonia	49 (3%)	Congestive heart failure	93 (7%)
Urinary tract infection, unspecified	47 (3%)	Urinary tract infection	54 (4%)
Acute kidney failure with tubular necrosis	43 (3%)	Chronic obstructive pulmonary disease	19 (1%)

- From 2016 – 2020, there were 1,412 non-elective inpatient hospitalizations readmissions within 30 days among people with ADRD. This accounts for 13% of all non-elective ADRD-related inpatient hospitalizations
- The top 5 new admission diagnoses accounted for 19% of all readmissions.
- Approximately 37% of all hospital readmissions are “preventable” and the top 5 new admission for “preventable” diagnoses accounted for 35% of all 30-day readmissions.

Source: Vermont Uniform Hospital Discharge Data Set, 2016-2020.

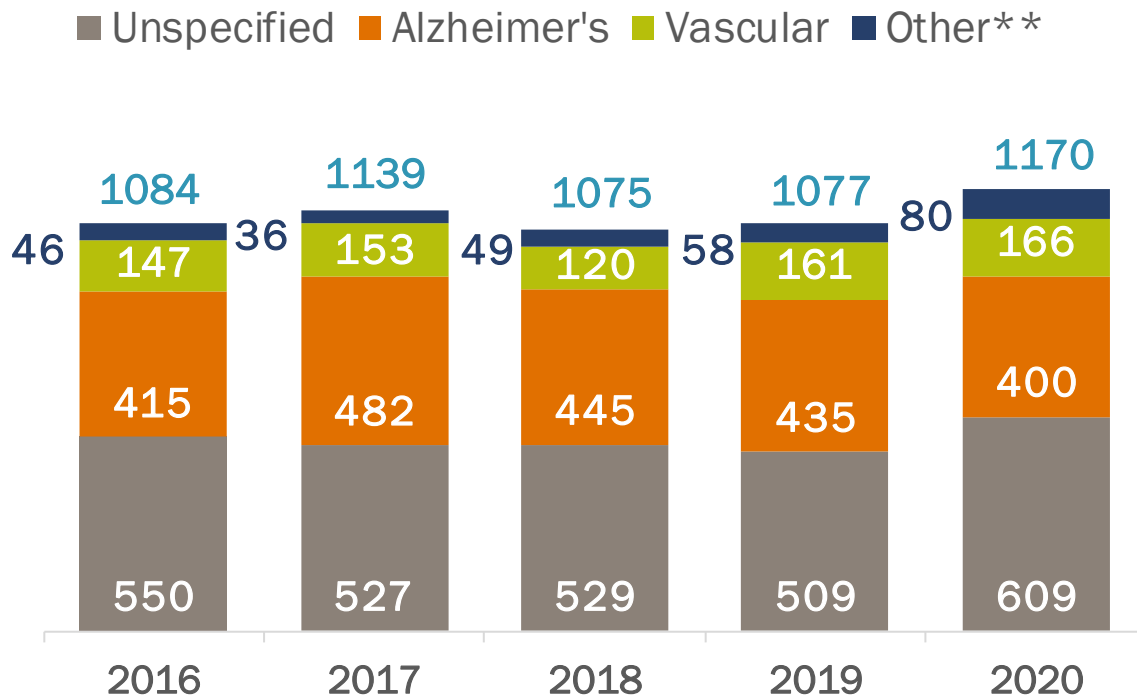
Analysis is among Vermont residents 65 years and older treated at Vermont hospitals for a non-elective admission type with an ADRD ICD-10 code in any of the diagnostic codes.

A “Preventable” Hospitalization is classified as a primary diagnosis ICD-10 code for one of the following illnesses: Cellulitis, Congestive heart failure, Chronic obstructive pulmonary disease, Dehydration/Electrolyte imbalance, Diseases of the respiratory system, Sepsis, and Urinary tract infection.

Citation: Maslow, Katie, and Joseph Ouslander. “Measurement of Potentially Preventable Hospitalizations.” Long-Term Quality Alliance, February 2012. <https://www.ltqa.org/ltqa-white-paper-offers-guidance-for-long-term-care-organizations-to-measure-preventable-hospitalizations-2/>.

# Alzheimer's Disease and Related Dementia Mortality

Number of Deaths With Any ADRD Cause Among Vermonters\*



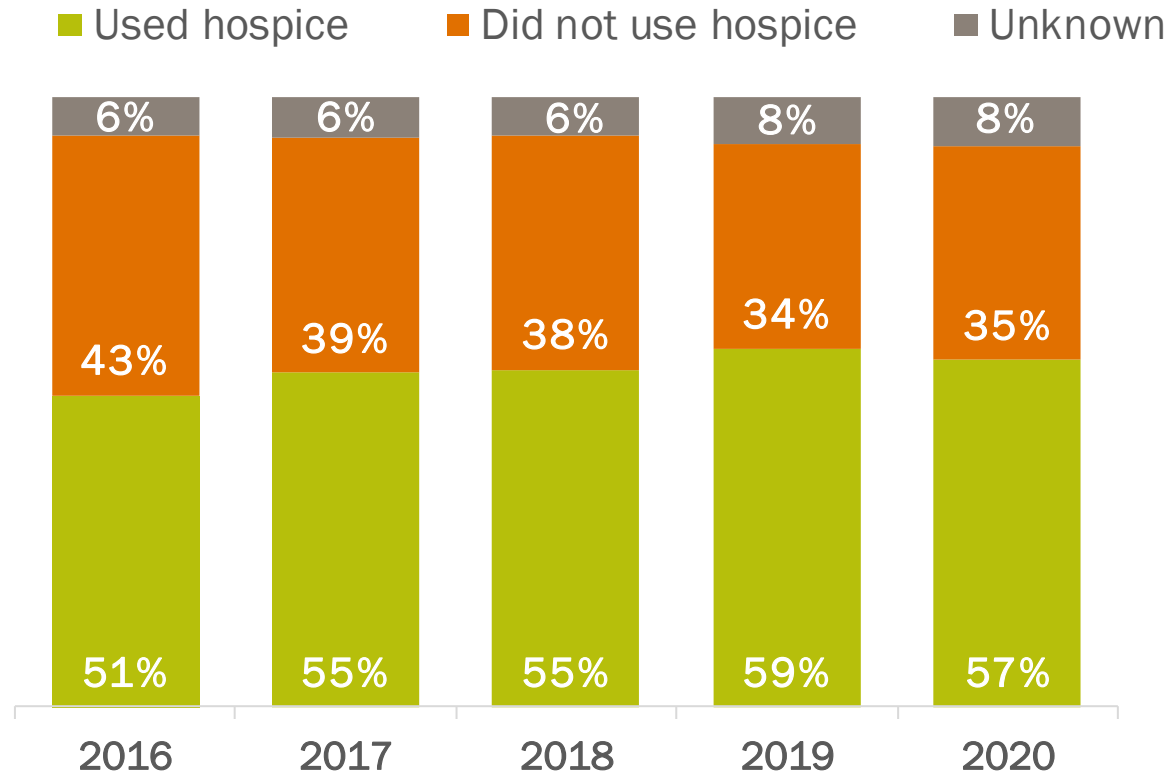
Source: VT Vital Statistics, 2016-2020, ADRD-related mortality code in any cause of death.  
 \*Numbers do not add to total due to some deaths having multiple dementia-related causes  
 \*\*Other type of dementia includes Dementia with Lewy Bodies and frontotemporal dementia  
 Methodology described here: [https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68\\_02-508.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr68/nvsr68_02-508.pdf)

- In the last 5 years, there were approximately 1,100 any cause ADRD-related deaths per year.
- Alzheimer's was the 5th leading cause of death in VT in 2020.
- In 2020, ADRD was the primary cause of death for 54% of all any cause ADRD-related deaths.

Primary Cause of Death	Number of Primary Cause Deaths, (% of All Deaths)	
	2019	2020
Alzheimer's	315 (72%)	280 (70%)
Vascular	62 (39%)	63 (38%)
Other	35 (60%)	55 (69%)
Unspecified	186 (37%)	238 (39%)
Total	598 (56%)	636 (54%)

# Hospice Use Prior to ADRD-related Deaths in Vermont

Percent of Hospice Utilization in 30 Days Prior to Death among Vermonters with ADRD

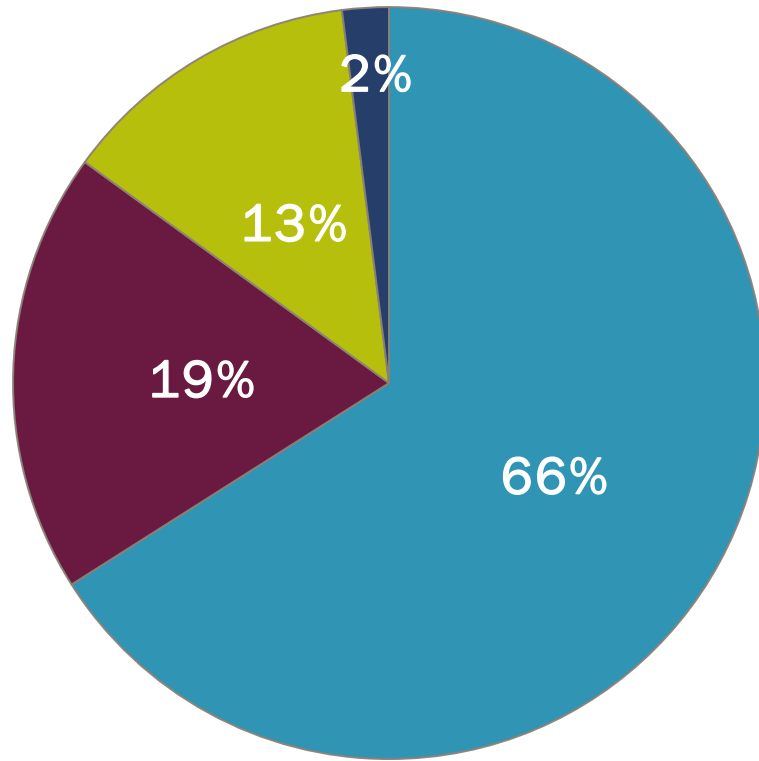


Hospice utilization among people with ADRD in 2019 was significantly higher than utilization in 2016, but utilization in 2020 was statistically similar to 2016.

Source: VT Vital Statistics, 2016-2020.

\*Other place of death includes emergency room or outpatient setting, hospice facility, out of state facility, and dead on arrival.

# Location of ADRD-Related Deaths in Vermont in 2020



- Nursing home/long term care/hospice facility
- Decedent's home
- Hospital setting
- Other\*

Most ADRD-related deaths in Vermont occur in nursing home or long care facility.

# Subjective Cognitive Decline Overview

The prevalence of subjective cognitive decline (SCD) among Vermont residents and health inequities that people with SCD may experience.

# About Subjective Cognitive Decline

- Subjective cognitive decline (SCD) refers to an individuals' perceived decline in memory or other cognitive abilities in relation to their previous level of performance.
  - In the 2020 BRFSS questionnaire, the question to assess SCD was “In past 12 months, have you experienced confusion or memory loss that is happening more often or is getting worse?”
- SCD may be an early indicator for future cognitive decline.
  - Fourteen percent of people with SCD followed for 4+ years received a dementia diagnosis.<sup>1</sup>
  - Memory complaints may begin up to 16 years before a dementia diagnosis.<sup>2</sup>
- While some individuals who report SCD show no evidence of objective cognitive impairment, SCD can still affect emotional and social functioning and overall quality of life.
- Greater insight into the prevalence of SCD in Vermont and disparities in this population may help future efforts to support individuals living with dementia.

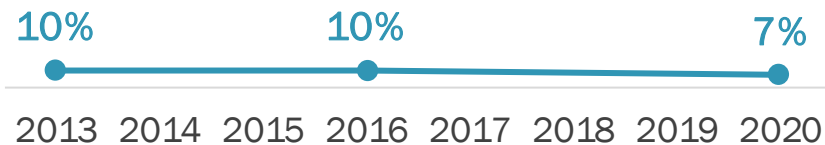
1. Mitchell, A. J., H. Beaumont, D. Ferguson, M. Yadegarfar, and B. Stubbs. “Risk of Dementia and Mild Cognitive Impairment in Older People with Subjective Memory Complaints: Meta-Analysis.” *Acta Psychiatrica Scandinavica* 130, no. 6 (December 2014): 439–51. <https://doi.org/10.1111/acps.12336>.
2. Verlinden, Vincentius J. A., Jos N. van der Geest, Renée F. A. G. de Bruijn, Albert Hofman, Peter J. Koudstaal, and M. Arfan Ikram. “Trajectories of Decline in Cognition and Daily Functioning in Preclinical Dementia.” *Alzheimer’s & Dementia: The Journal of the Alzheimer’s Association* 12, no. 2 (February 2016): 144–53. <https://doi.org/10.1016/j.jalz.2015.08.001>.



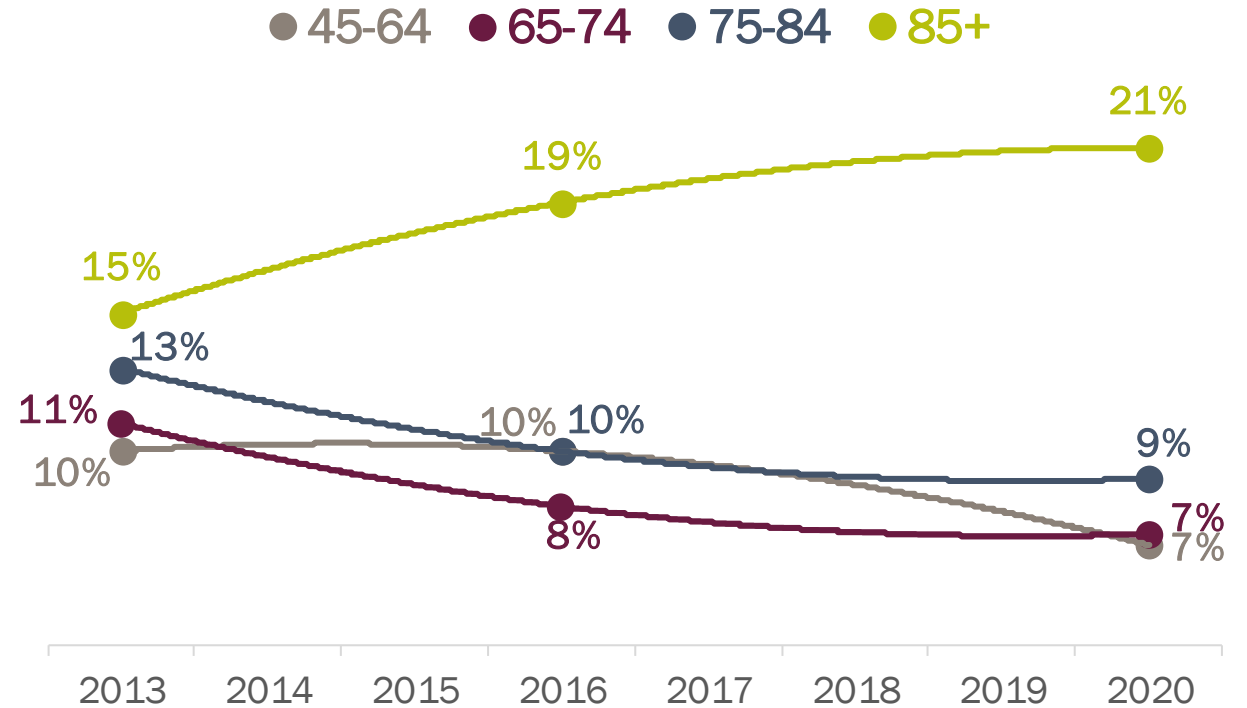
# Subjective Cognitive Decline Prevalence Over Time

- The prevalence of SCD in Vermont declined from 10% in 2013 to 7% in 2020.
- In 2020, adults 85 and older were statistically more likely to report SCD than adults younger than 85.
- Among adults 85 and older, the prevalence of SCD was not statistically different between 2013 and 2020.

Vermont Adults 45+ with SCD

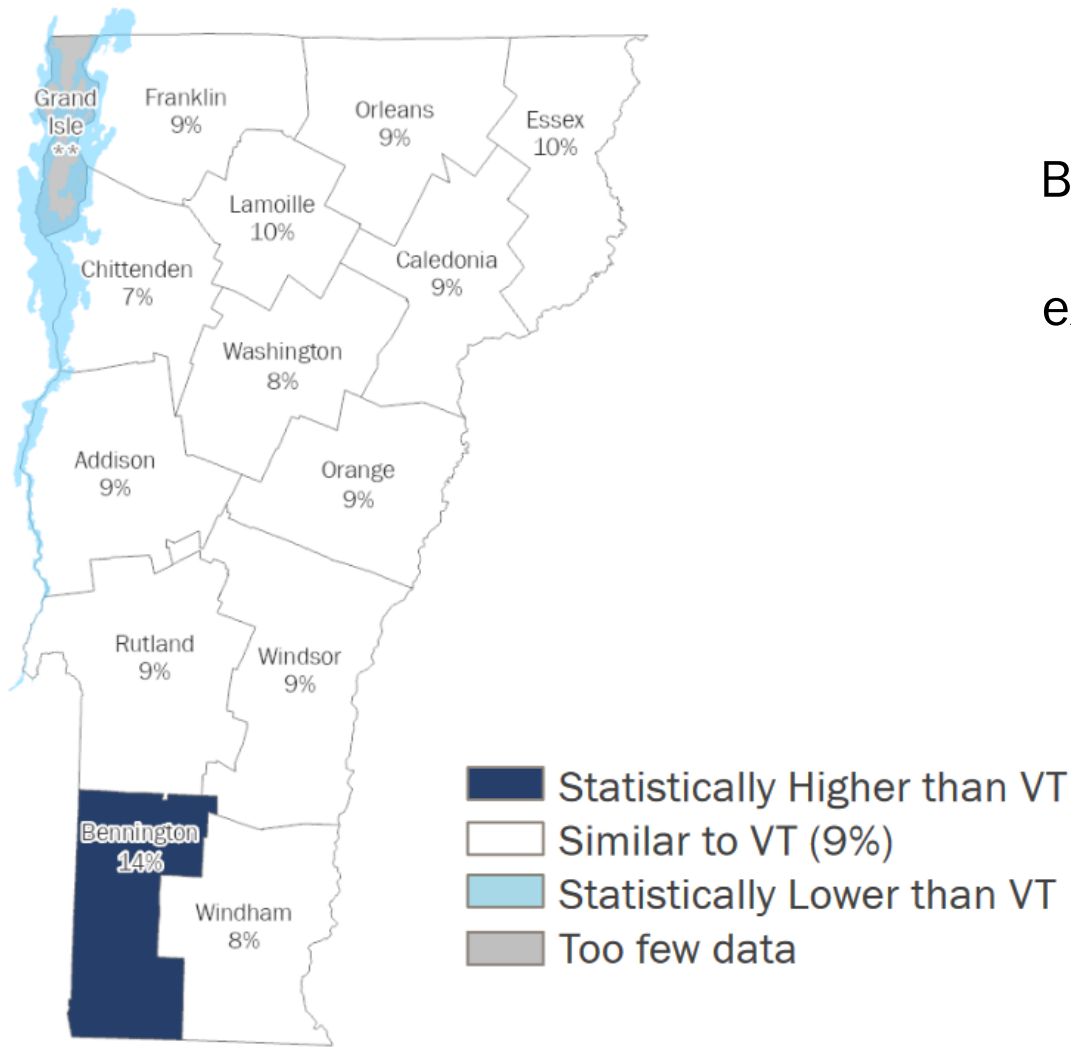


Prevalence of SCD in Vermont by Age Group from 2013 - 2020



Source: VT BRFSS, 2013 - 2020

# Vermont Adults 45+ With Subjective Cognitive Decline by County



Bennington county adults 45 and older (14%) are statistically more likely to report experiencing worsening confusion or memory loss in the past year, compared to Vermont overall.

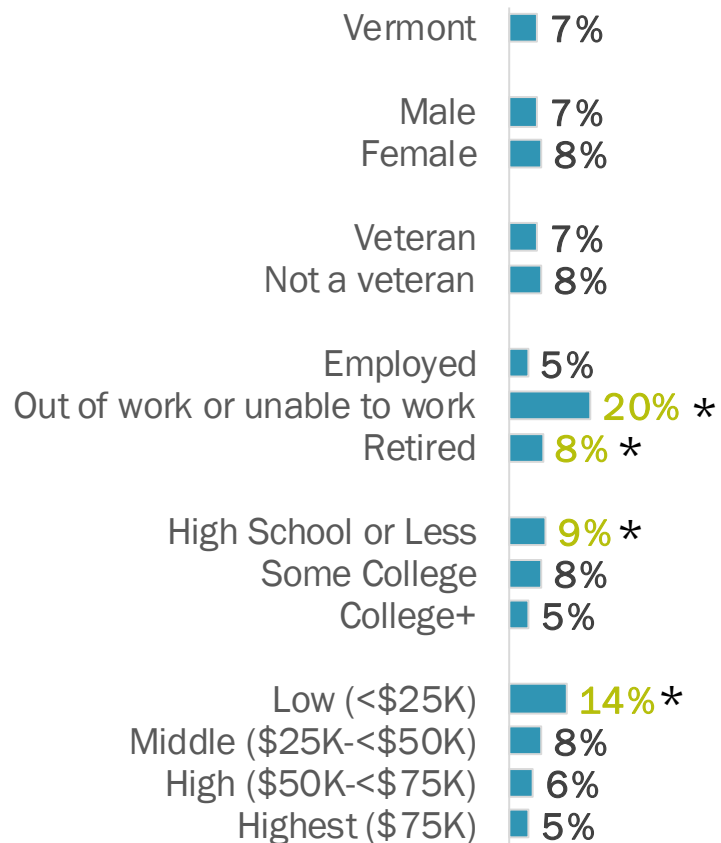
The proportion of adults 45 and older with subjective cognitive decline in all other reported counties is similar to Vermont.

Source: VT BRFSS, 2016 & 2020.

Vermont Department of Health

# Subjective Cognitive Decline Demographics

## Prevalence of SCD among Adults 45 and Older, 2020

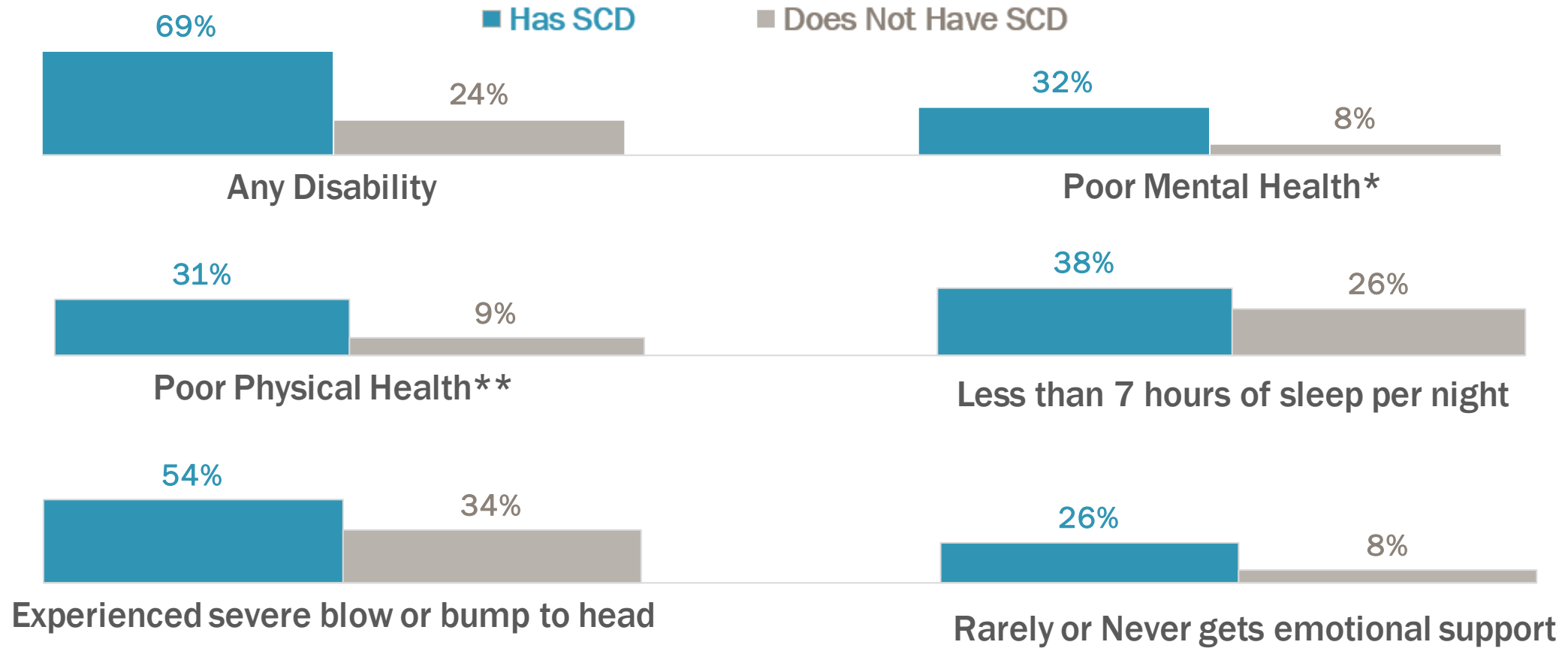


Source: VT BRFSS, 2020.

Green color and \* denotes statistical difference.

- SCD prevalence is significantly higher among those
  - out of work or unable to work and those retired compared to those employed.
  - with a high school degree or less compared to those with a college degree or higher.
  - in households with incomes less than \$25,000 a year, compared to those making \$75,000 or more.
- SCD prevalence is not significantly different
  - by sex.
  - by LGBTQ+ status.
  - among those who identified as Black, Indigenous, and/or People of Color (BIPOC).
  - by veteran status.

# Vermonters 45 Years and Older With SCD Are **Significantly More Likely** to Report Experiencing the Following Health Conditions:



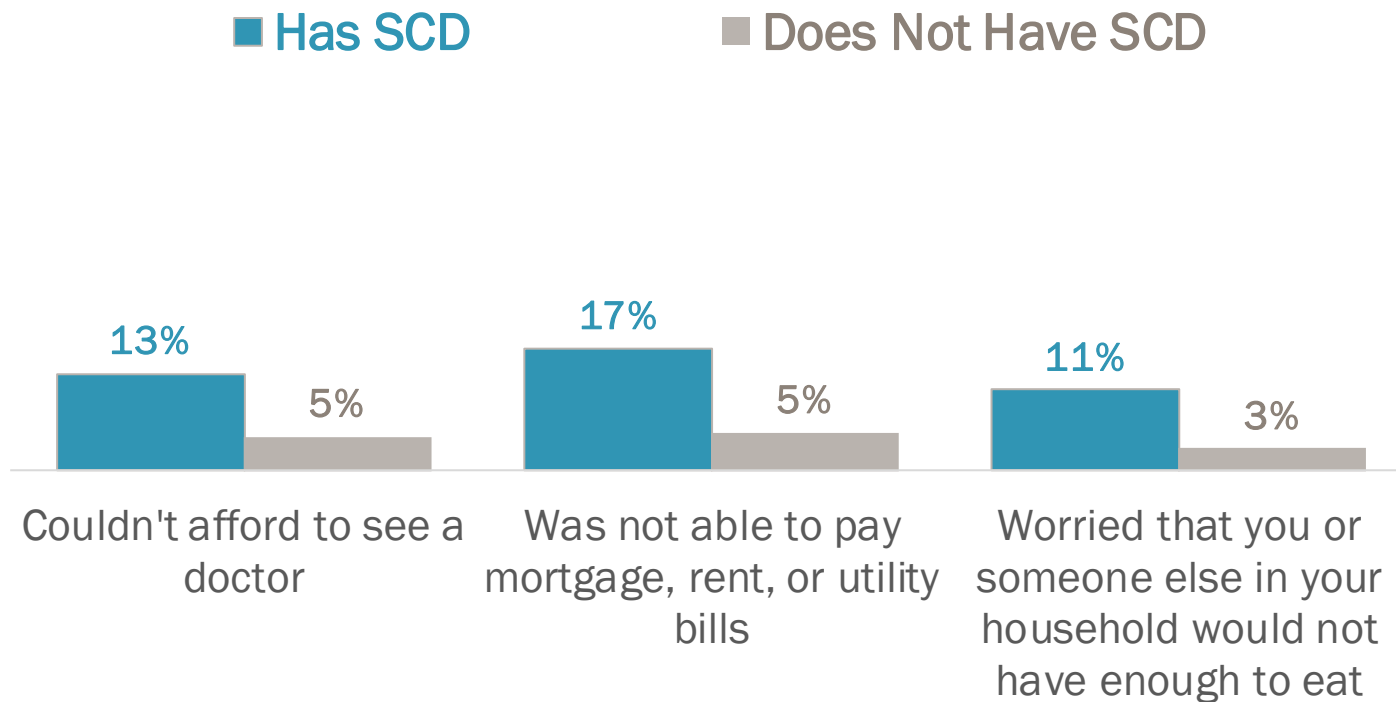
Source: VT BRFSS, 2020.

\*Defined as 14 or more days in the last 30 where mental health was reported as not good.

\*\*Defined as 14 or more days in the last 30 where physical health was reported as not good.

# Vermonters With SCD Are **Significantly More Likely to Report** Financial Insecurity

During the Past Year, Adults 45 and Older Reported the Following:



Source: VT BRFSS, 2020.

Social determinants of health, such as lack of access to healthcare and housing, are associated with a **higher** likelihood of developing or worsening certain diseases, including Alzheimer's and related dementias.

# Traumatic Brain Injury

Prevalence on traumatic brain injury (TBI) among Vermont residents and health inequities that people with a previous TBI may experience.

# About Traumatic Brain Injury

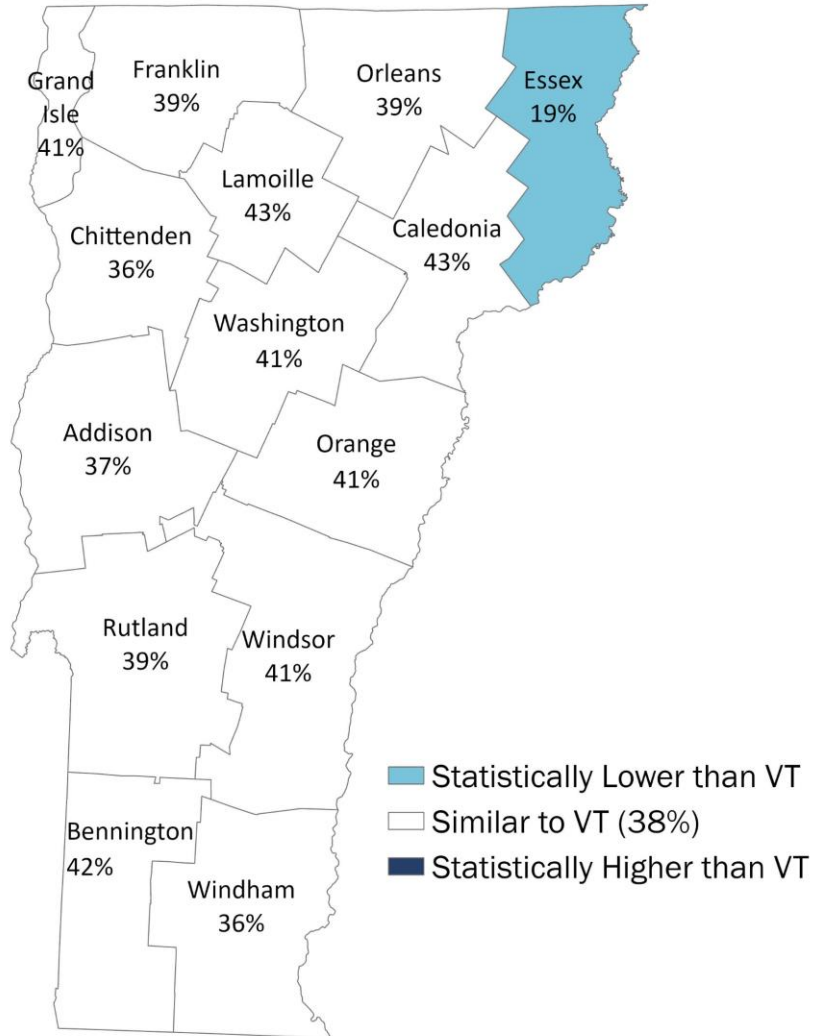
- A Traumatic Brain Injury (TBI) is an injury that affects how the brain works.
  - To assess TBI in Vermont, the question on the 2020 BRFSS questionnaire was: *“In your lifetime, have you ever experienced a bump, blow, or jolt to the head that caused you to feel dazed, confused, or lose consciousness?”*
- Head injuries can increase the risk of dementia, especially if they are severe or occur repeatedly.
  - Individuals were almost twice as likely to be diagnosed with dementia if they had a prior mild traumatic brain injury.<sup>1</sup>
  - A TBI may also lower the age of onset of neurocognitive decline symptoms.<sup>2</sup>
- Greater insight into the prevalence of TBI in Vermont and disparities in this population may help future efforts to support individuals living with dementia.

## Sources:

1. Snowden, Taylor M., Anthony K. Hinde, Hannah M. O. Reid, and Brian R. Christie. “Does Mild Traumatic Brain Injury Increase the Risk for Dementia? A Systematic Review and Meta-Analysis.” *Journal of Alzheimer’s Disease: JAD* 78, no. 2 (2020): 757–75. <https://doi.org/10.3233/JAD-200662>.

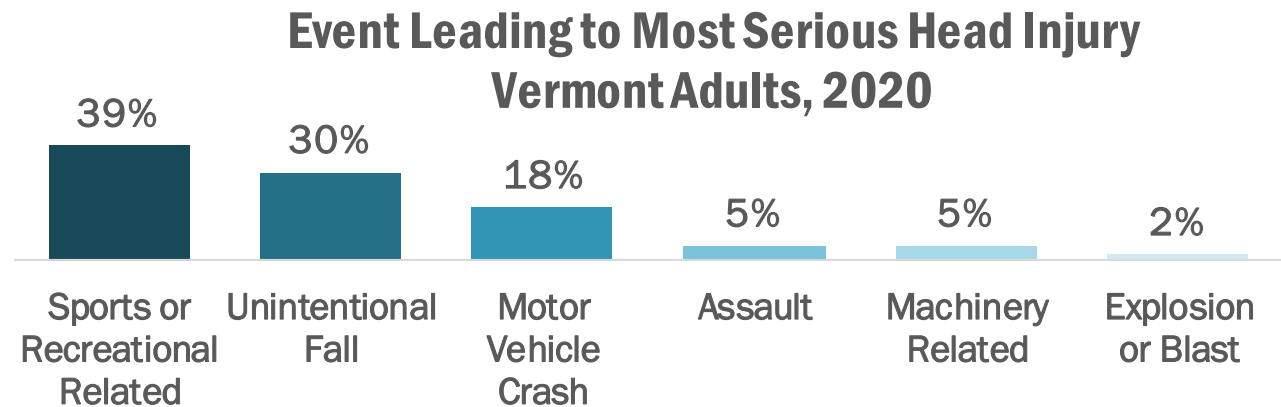
2. Mendez, Mario F. “What Is the Relationship of Traumatic Brain Injury to Dementia?” *Journal of Alzheimer’s Disease: JAD* 57, no. 3 (2017): 667–81. <https://doi.org/10.3233/JAD-161002>.

# TBI Prevalence in State and by County



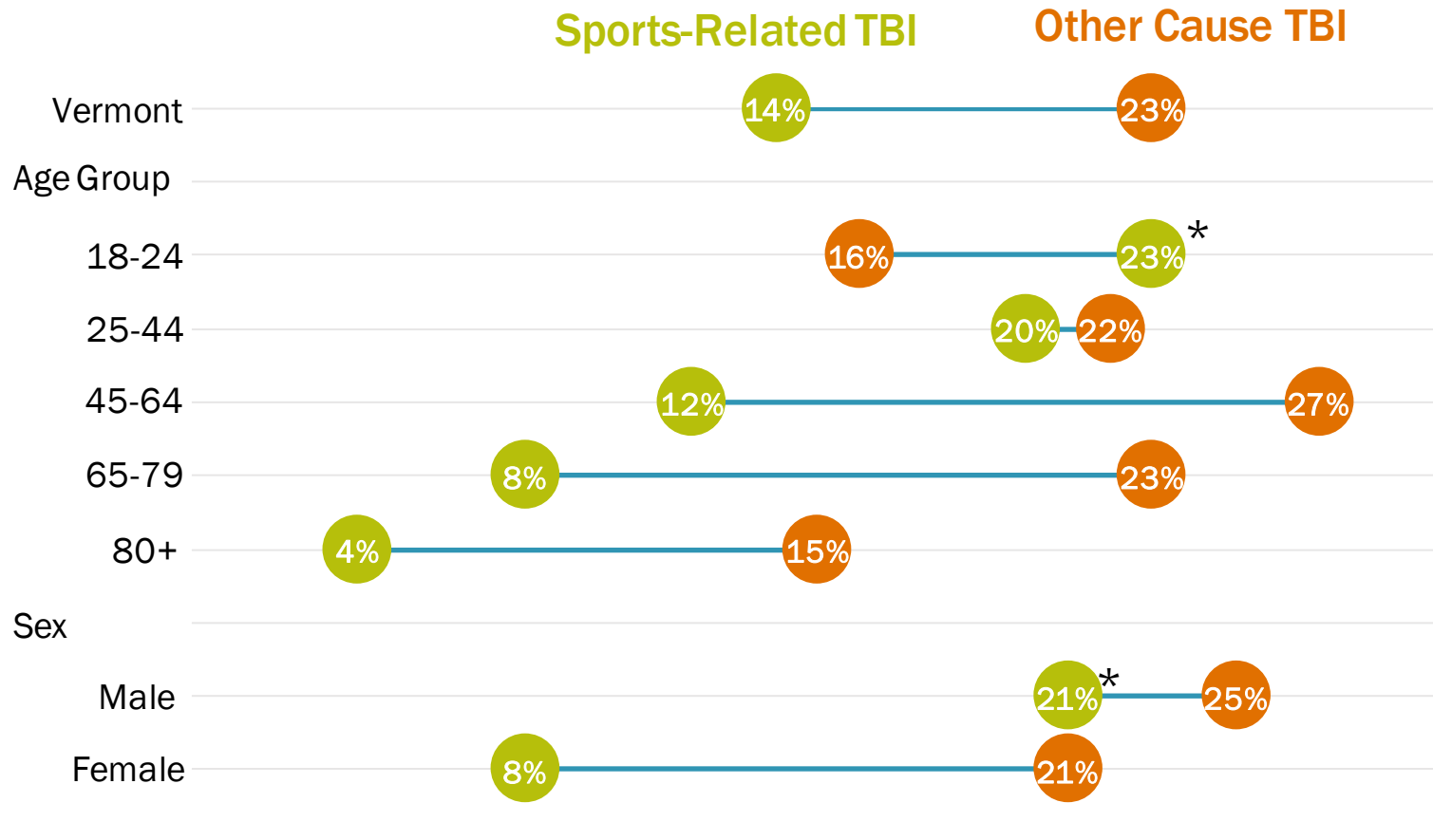
Almost four in ten Vermont adults say they have ever experienced a traumatic brain injury (38%). Essex County adults (19%) are statistically less likely to report ever experiencing a traumatic brain injury, compared to Vermont overall.

Sports or recreational related events account for 39% of TBIs while unintentional fall account for 30%.





# Prevalence of Sport-Related and Other Cause TBI: Age and Sex

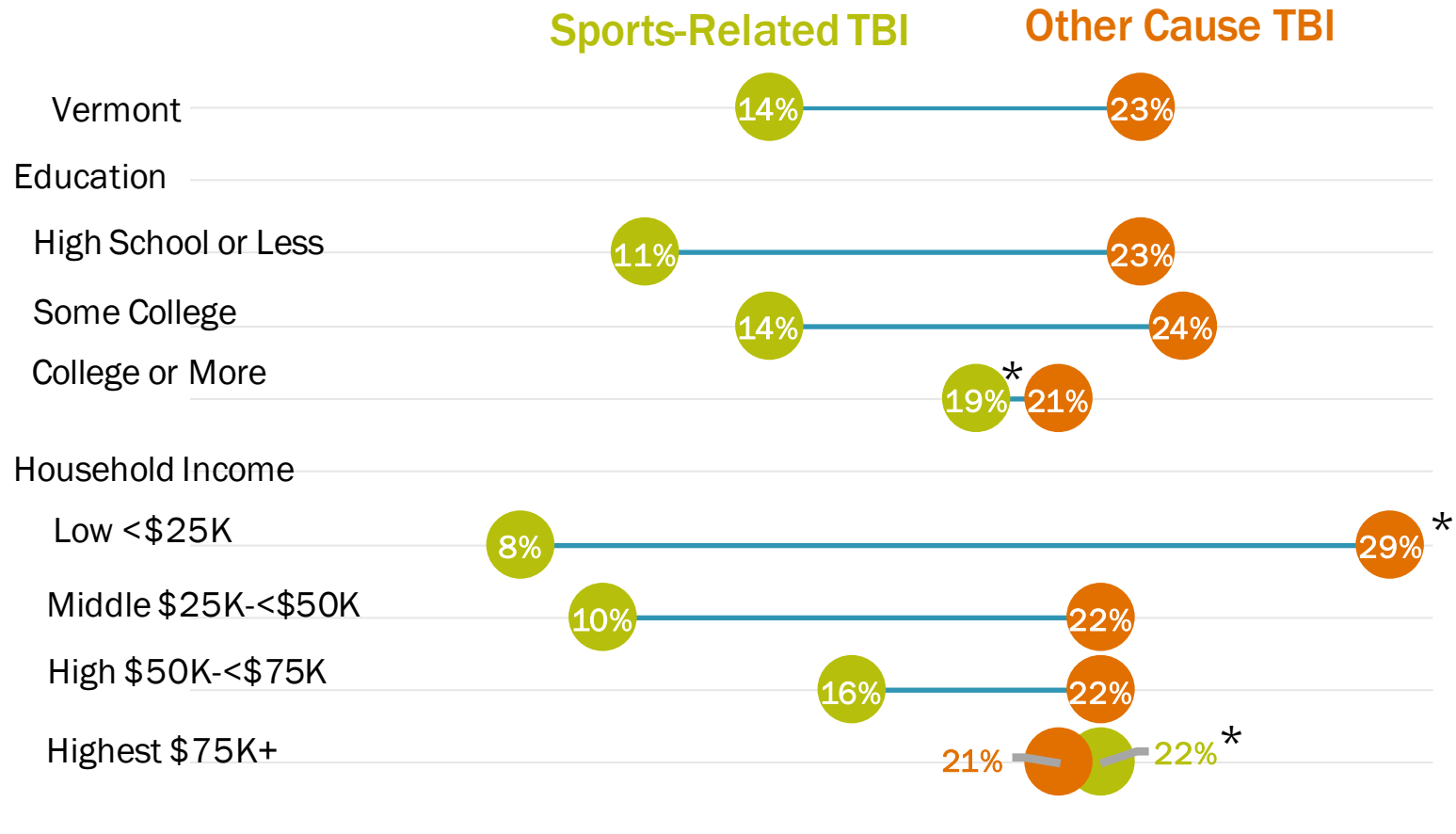


- In 2020, 14% of Vermont adults reported ever experiencing a *Sports-Related TBI* and 23% reported experiencing an *Other Cause TBI*.
- Adults 18-24 years old were more likely to report a *Sports-Related TBI* compared to adults 45 years and older.
- Adult males were more likely to report a *Sports-Related TBI* than females, but males had a similar prevalence of *Other Cause TBI*.

Source: VT BRFSS, 2020.

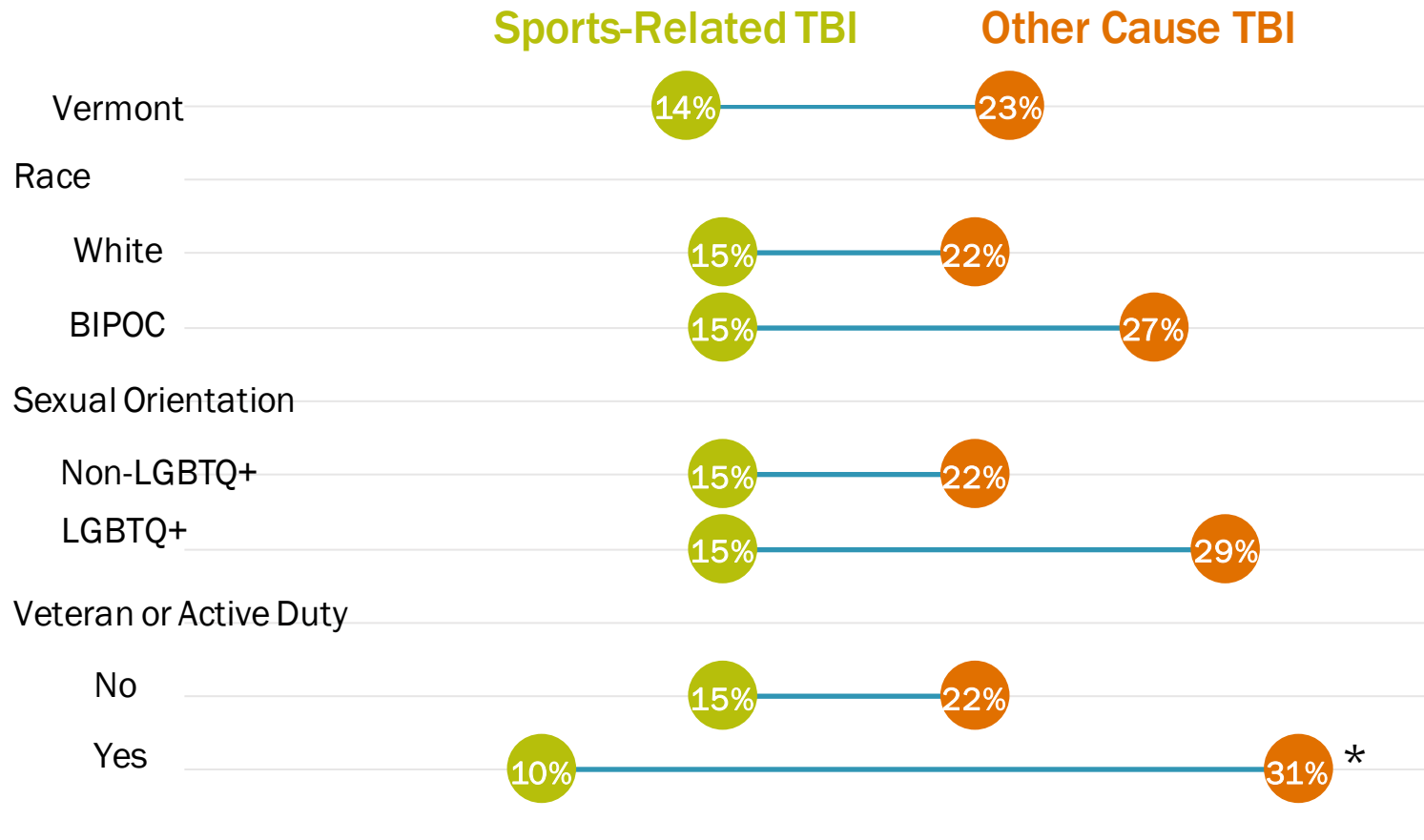
Other Cause TBI includes unintentional fall, motor vehicle crash, assault, machinery related, and explosion or blast.

# Prevalence of Sport-Related and Other Cause TBI: Education and Income



- Adults who graduated from college are more likely to have a *Sport-Related TBI* than adults who attended high school or less.
- Adults in a low household income are more likely to report an *Other Cause TBI* compared to adults in the highest household income.
- Adults in a high or highest household income are more likely to report a *Sports-Related TBI* than adults in a low household income.

# Prevalence of Sport-Related and Other Cause TBI: Race, Sexual Orientation, and Disability Status

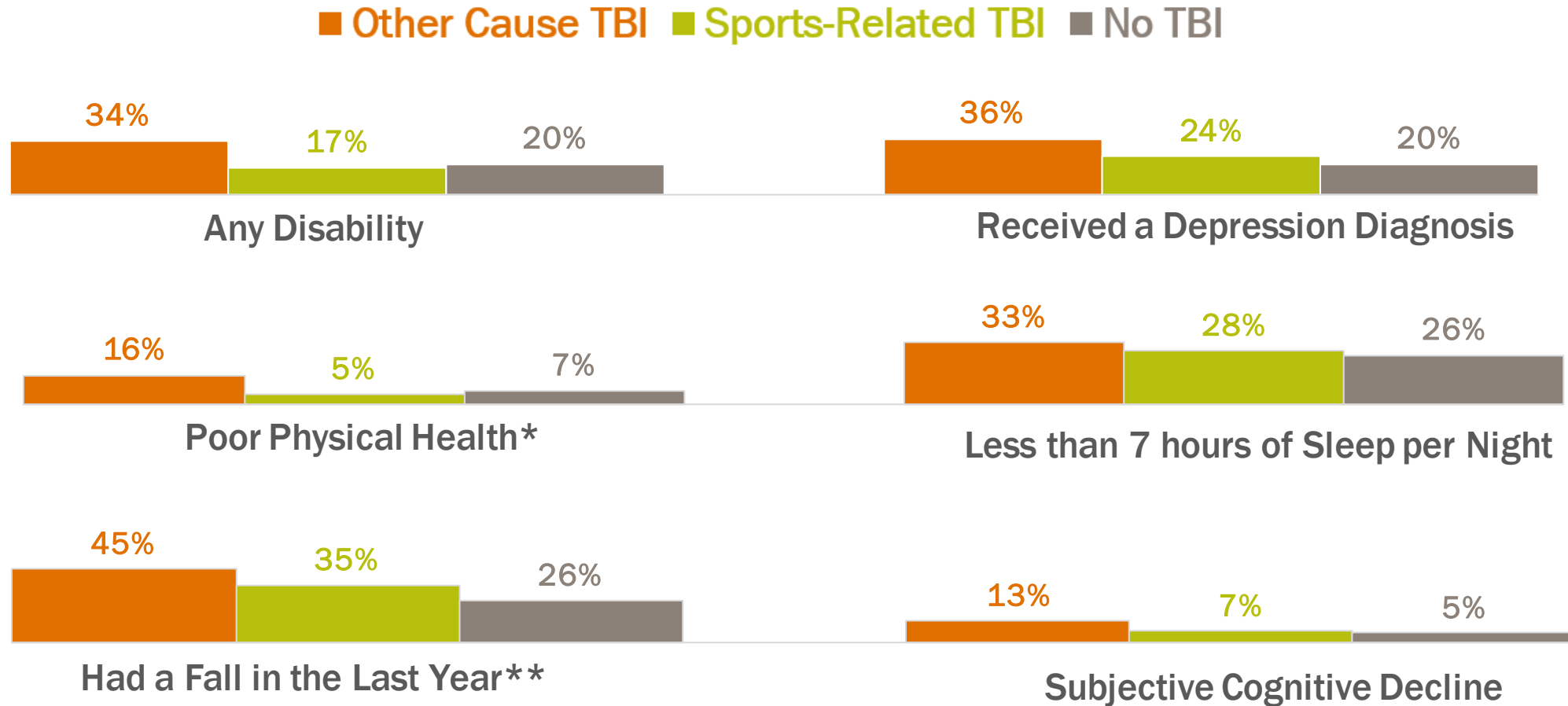


- Adults that are a veteran or active duty in the military were more likely to have an *Other Cause TBI* compared to Vermont adults that are not veterans or active duty.
- There was not a statistical difference in *Sports-Related* or *Other Cause TBI* by race or sexual orientation.

Source: VT BRFSS, 2020.

Other Cause TBI includes unintentional fall, motor vehicle crash, assault, machinery related, and explosion or blast.

# Vermonters who Experienced an **Other Cause TBI** Are Significantly More Likely to Report Experiencing the Following Health Conditions:



Source: VT BRFSS, 2020.

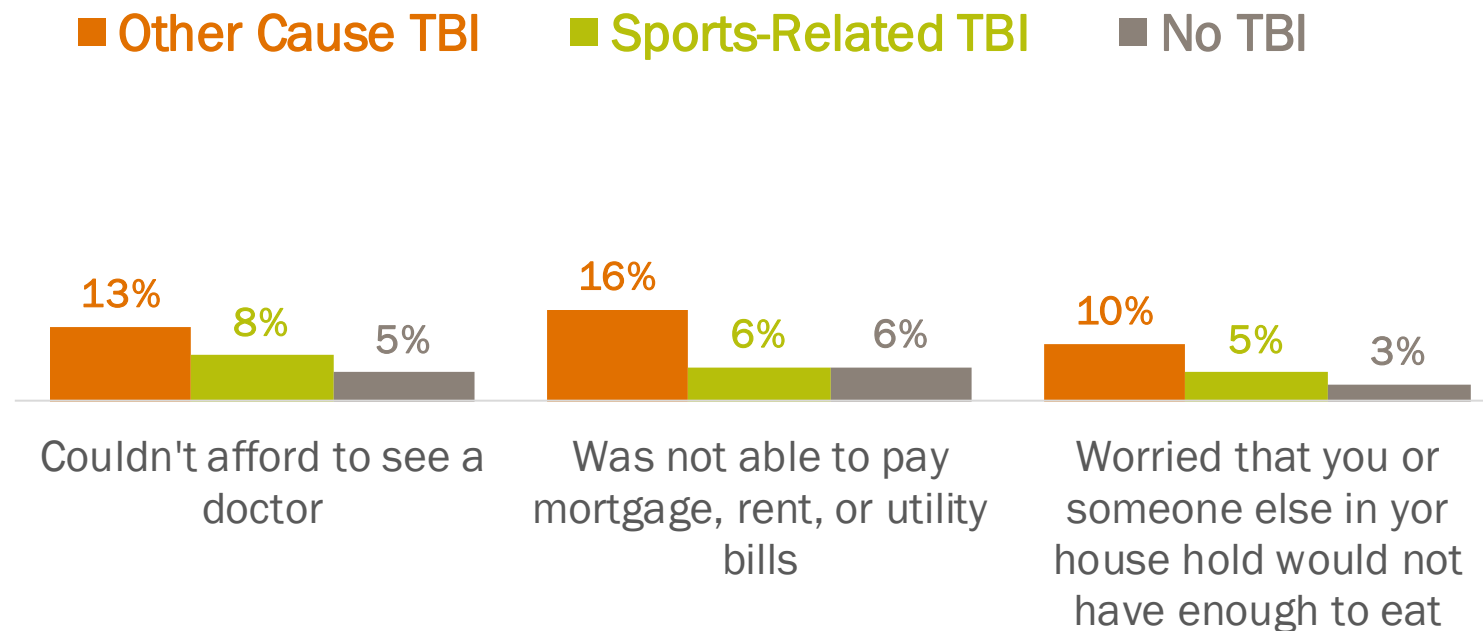
\*Defined as 14 or more days in the last 30 where physical health was reported as not good.

\*\*Only asked among Vermonters 45 years and older.

Other Cause TBI includes unintentional fall, motor vehicle crash, assault, machinery related, and explosion or blast.

# Adults With an **Other Cause TBI** Are Significantly More Likely to Report Financial Insecurity

During the Past Year, Vermont Adults Reported the Following:



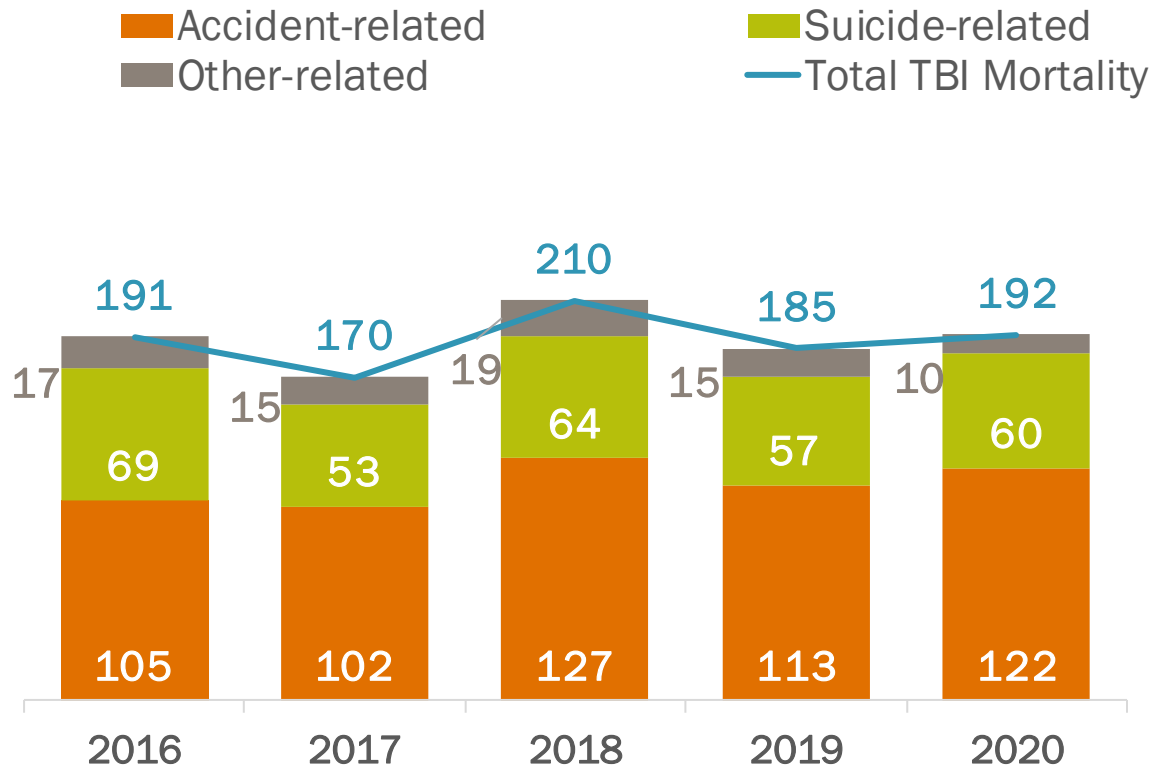
Social determinants of health, such as lack of access to healthcare and housing, are associated with a **higher** likelihood of developing or worsening certain diseases, including Alzheimer's and related dementias.

Source: VT BRFSS, 2020.

Other Cause TBI includes unintentional fall, motor vehicle crash, assault, machinery related, and explosion or blast.

# TBI-related Deaths in Vermont

Number of TBI Deaths among Vermonters



Deaths were included if the record included an injury-related ICD-10 code and a TBI-related ICD-10 code in any of the causes of death. Additional information about the methods can be found here: <https://www.cdc.gov/traumaticbraininjury/pdf/TBI-surveillance-report-2018-2019-508.pdf>  
 Source: VT Vital Statistics, 2016-2020.  
 Vermont Department of Health

Cause of Accident (2020)	Number of Deaths (%)
Unintentional Falls	74 (61%)
Motor-Vehicle Related	38 (31%)
Other	10 (8%)

- Between 2016-2020, approximately 60% of the TBI deaths were accident-related.
- In 2020, 61% of accident-related TBI deaths were due to a fall and 31% were due to a motor vehicle.

# Data Sources

**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.

**Vermont Vital Statistics:** The Vermont Department of Health vital statistics system tracks Vermont births and deaths. The Department of Health also receives abstracts 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 is listed as the first mortality code, indicating it was the primary cause leading to 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. Only Vermont residents were included in this analysis. 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.



## Learn more about Brain Health & Dementia in Vermont:

Brain Health & Dementia Program:

<https://www.healthvermont.gov/wellness/brain-health>

Vermont Action Plan for Alzheimer's Disease, Related Dementias & Healthy Aging:

<https://www.healthvermont.gov/sites/default/files/documents/pdf/hpdp-brain-health-action-plan.pdf>

Risk Factors for Subjective Cognitive Decline in Vermonters Data Brief (2016):

<https://www.healthvermont.gov/sites/default/files/documents/pdf/HSVR-BRFSS-SubjectiveCognitiveDecline-DataBrief.pdf>

Traumatic Brain Injury Program: <https://asd.vermont.gov/services/tbi-program>

For more information about the presented data contact:

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