

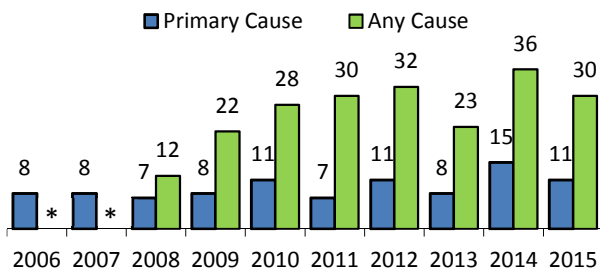
Introduction

Asthma is a chronic respiratory disease that causes inflammation of the airways and difficulty in breathing. Asthma can be exacerbated by numerous triggers such as allergens and smoke. In addition, respiratory depression and cognitive impairment by alcohol or substance use may inhibit the recognition of asthma symptoms and proper medication management. In 2015, 8% of total hospital charges related to asthma care involved substance use and accounted for more than \$10,000,000 of healthcare charges.¹ This data brief examines asthma exacerbations and concurrent substance use (alcohol use, marijuana use, and drug poisoning) among Vermonters. Data are presented on the number of asthma-related deaths, the prevalence of alcohol and marijuana use among Vermonters with current asthma, and the frequency of inpatient hospitalizations and emergency department (ED) visits related to asthma and substance use.

Deaths Due to Asthma in Vermont

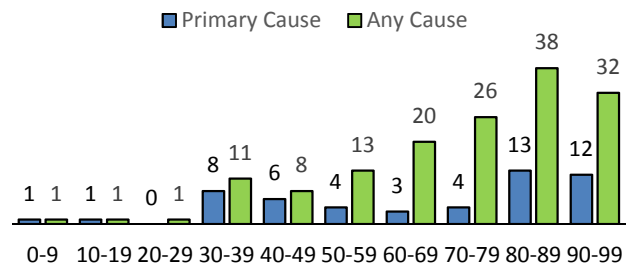
In the past ten years, 90 Vermonters have died with asthma being the primary cause of death and more than 165 with asthma as any cause of death. The number of deaths due to asthma has increased in recent years. The age at death due to asthma ranged from 0 to 99 years, with an average age of 71 years for asthma as a primary cause. Between 2011 and 2015, asthma was the primary cause of death of 30 females and 22 males. Fifty percent of these deaths were of individuals over 80 years of age. As age increased, asthma was more frequently a contributing cause of death. The number of deaths with a primary cause of asthma peaked at 15 in 2014, and substance use was a contributing cause of death in 3 of these cases.

Annual Deaths Due to Asthma among Vermonters



Source: Vermont Vital Records ², * Data not available

Number of Deaths Due to Asthma by Age (2011-2015)



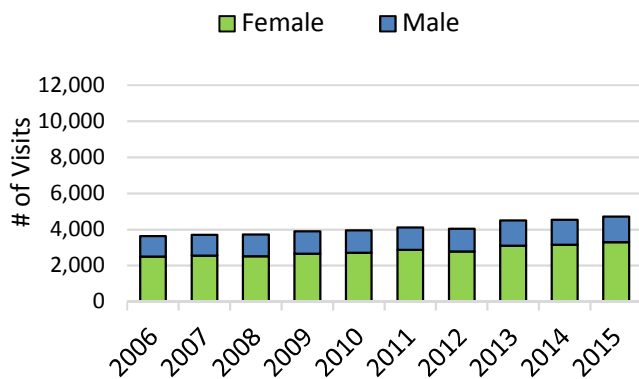
Source: Vermont Vital Records ²

Hospital Care for Asthma

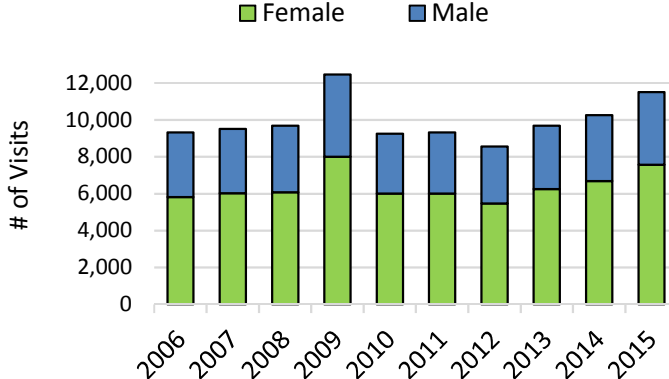
The number of inpatient hospitalizations that included asthma as a diagnosis increased throughout recent years. In 2006, there were 3,644 hospitalizations and steadily rose to 4,718 in 2015. The average length of stay for a hospitalization involving asthma was 5 days. In 2015, there were 11,511 ED visits for asthma which was a 12% increase from 2014. In general, the number of ED visits for asthma was 2.5 times the number of inpatient hospitalizations for asthma. A patient who entered the hospital via the ED and was subsequently hospitalized was only represented in the inpatient count. Hospital-based care for asthma was more frequent among women than men and accounted for 69% of these hospitalizations and 65% of ED visits. Hospitalizations for asthma were most common among Vermonters 55-64 years of age, while ED visits were most common among those 25-34. The major primary payers for asthma hospitalizations were Medicare (43%), Medicaid (29%), and private insurance (25%). Medicaid was the most frequent primary payer of ED visits for asthma (43%) followed by private insurance (25%) and Medicare (24%).

Among Vermonters with current asthma, 50% indicated they had private insurance, 22% were insured by Medicaid, 22% by Medicare, 3% by military insurance, and 3% other or none (BRFSS, 2014). These data demonstrate that Vermonters with asthma who are insured by Medicaid or Medicare have increased use of clinical care for their asthma compared to those with other types of insurance.

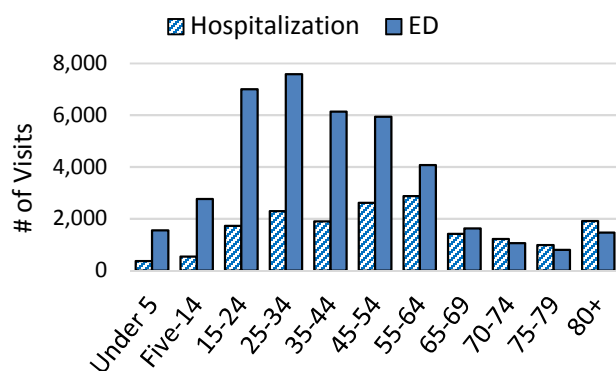
**Hospitalizations for Asthma
Dx1-Dx20, VUHDDS**



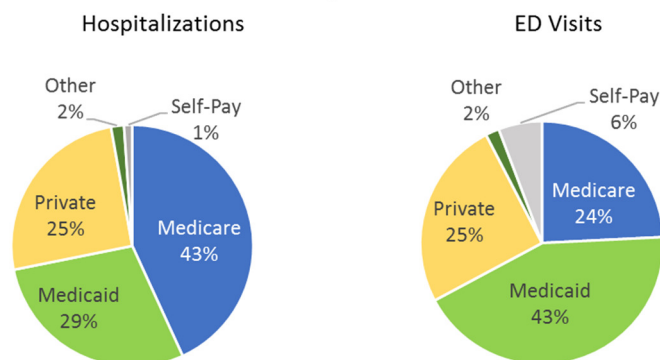
**ED Visits for Asthma
Dx1-Dx20, VUHDDS**



**Healthcare for Asthma by Age
Dx1-Dx20, VUHDDS 2012-2015**



**Primary Payer of Healthcare for Asthma
Dx1-Dx20, VUHDDS 2012-2015**

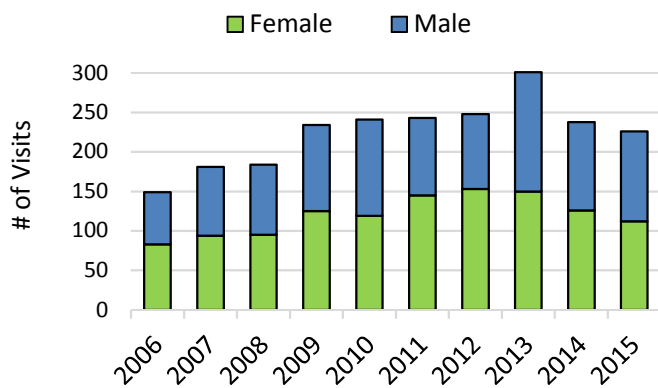


Asthma and Alcohol

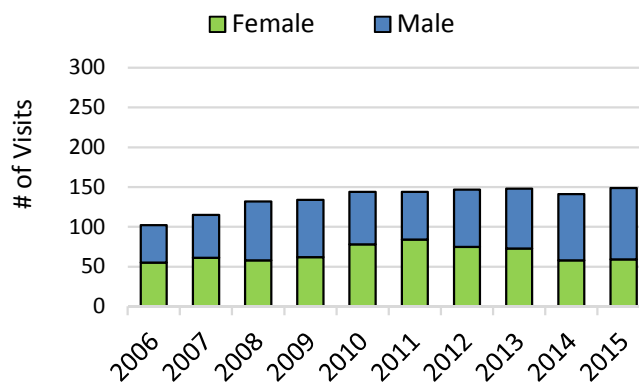
Alcohol and components in alcoholic beverages such as sulfites or histamines are common asthma triggers. Therefore, for those with asthma, drinking alcoholic beverages may exacerbate asthma symptoms. Among Vermonters with current asthma, 48% consumed alcohol in the past 30 days which was significantly less than the rate among those without asthma (62%). In 2015, 6% of Vermonters with asthma reported heavy alcohol consumption (defined as >14 drinks per week for men or >7 drinks per week for women) and 14% reported binge drinking (defined as 5 or more drinks on one occasion for men or 4 or more drinks for women). The rate of binge drinking among men with asthma was significantly higher than among women (23% vs. 10%, BRFSS 2015). In 2015, 30% of all high school students reported using alcohol in the last 30 days, 16% had recently binge drank, and 12% reported drinking before age 13 (YRBS).

Alcohol was a contributing factor in 6% of all hospitalizations and 1.5% of all ED visits for asthma (2011-2015). The number of hospitalizations for asthma with concurrent alcohol use peaked in 2013 and has decreased in recent years, while ED visits for asthma and alcohol use have remained steady since 2010. Asthma exacerbations occurring with alcohol use typically required a greater level of treatment as there was an increased proportion of hospitalizations to ED visits as compared to asthma care without concurrent alcohol use. In addition, those hospitalized for asthma and alcohol use had an average length of stay of 6 days, which was one day longer than the average asthma hospitalization. Women accounted for approximately half of this clinical care for asthma and alcohol use (53% of inpatient stays and 46% for ED visits). Vermonters 45-54 years of age had the highest number of hospitalizations and ED visits for asthma and alcohol use. ED visits for asthma and alcohol use were also prominent among younger adults (15-34 year olds). Medicaid was the primary payer for more than forty percent of hospitalizations (44%) and ED visits (45%) for asthma and alcohol use and Medicare was the payer for 35% of hospitalizations and 26% of ED visits. Private insurance paid approximately one in five hospitalizations (16%) and ED visits (21%) for asthma and alcohol use while self-pay and other payers accounted for the remainder of the charges.

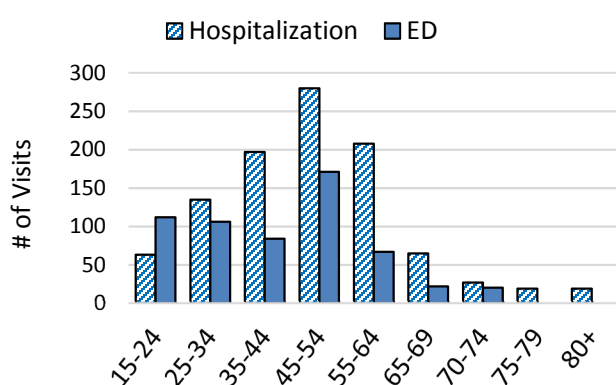
**Hospitalizations for Asthma and Alcohol Use
Dx1-Dx20, VUHDDS**



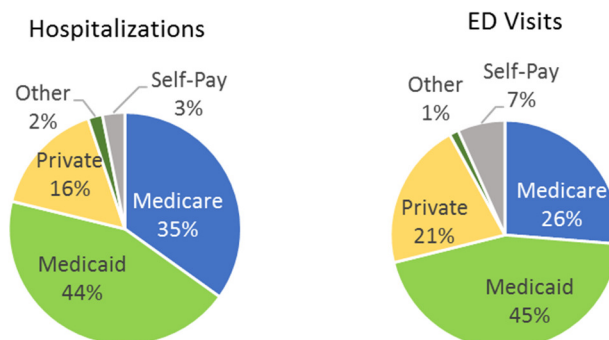
**ED Visits for Asthma and Alcohol Use
Dx1-Dx20, VUHDDS**



**Healthcare for Asthma & Alcohol Use
by Age, Dx1-Dx20, VUHDDS 2012-2015**



Primary Payer of Healthcare for Asthma & Alcohol Use, Dx1-Dx20, VUHDDS 2012-2015

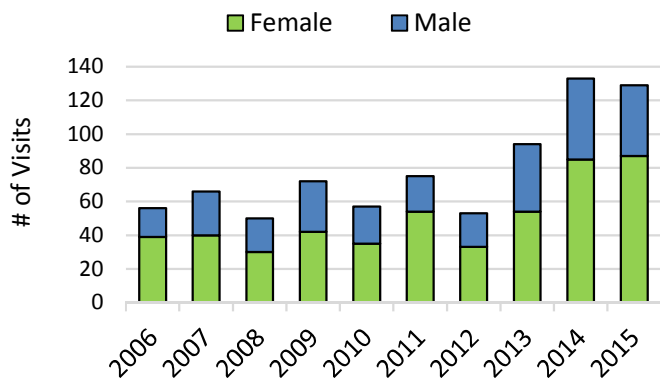


Asthma and Marijuana

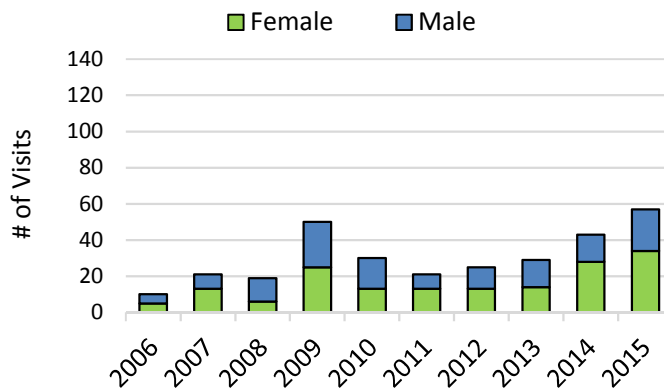
Little is known regarding the impact of marijuana use on asthma control and severity, though inhaled particulates generally aggravate asthma. As Vermont and nearby states have taken steps to decriminalize marijuana use, much remains unknown regarding how legalization of marijuana use may impact individual's health, particularly those with respiratory diseases, and the healthcare system. In 2015, 11% of all adult Vermonters and 22% of high school youth reported using marijuana in the last 30 days (BRFSS & YRBS). Adult Vermonters with current asthma used marijuana at same rate as the statewide rate (11%; BRFSS). Among the Vermont population, males use marijuana at higher rates than females (Adult: 15% vs. 7%; Youth: 24% vs. 21%). Marijuana use among adults with asthma followed a similar trend (Male: 14%; Female: 9%), though these rates were not significantly different. Marijuana use was highest among younger adults (27% among those 18-24 years old) and decreased steadily with increasing age. Marijuana use among those with asthma also followed this decreasing trend with age.

Between 2012 and 2015, marijuana use was a contributing factor in 2% of hospitalizations and less than 1% of ED visits for asthma. Hospitalizations and ED visits for asthma and marijuana use have increased in recent years. Each year a greater number of people were hospitalized for asthma and marijuana use than treated solely in the ED. Sixty-three percent of these hospitalizations and 57% of ED visits for asthma and marijuana use were among women. Vermonters 15-34 years of age had the highest number of hospitalizations and ED visits for asthma and marijuana use. Medicaid was the primary payer for 60% of hospitalizations and over half (52%) of the ED visits involving asthma and marijuana use, followed by Medicare (19% of hospitalizations and 28% of ED visits) and private insurance (13% of hospitalizations and 16% of ED visits).

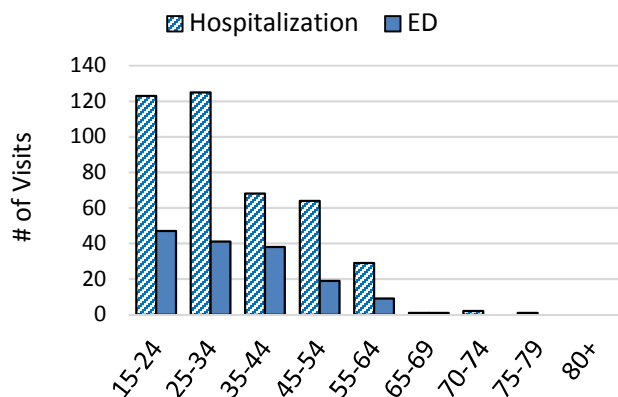
Hospitalizations for Asthma and Marijuana Use, Dx1-Dx20, VUHDDS



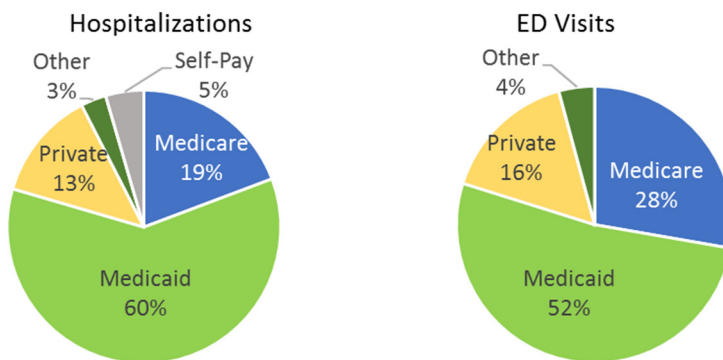
ED Visits for Asthma and Marijuana Use Dx1-Dx20, VUHDDS



Healthcare for Asthma & Marijuana Use by Age, Dx1-Dx20, VUHDDS 2012-2015



Primary Payer of Healthcare for Asthma & Marijuana Use, VUHDDS, Dx1-Dx20, 2012-2015

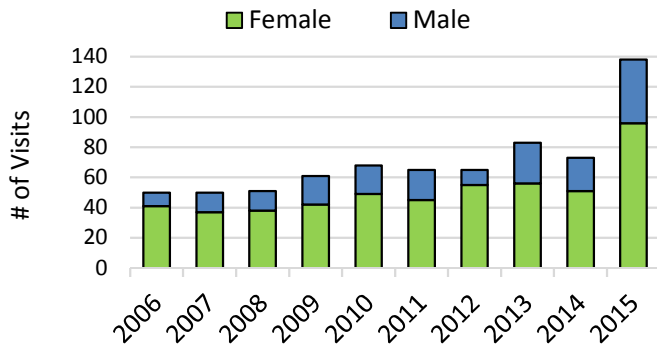


Asthma and Poisoning by Drugs

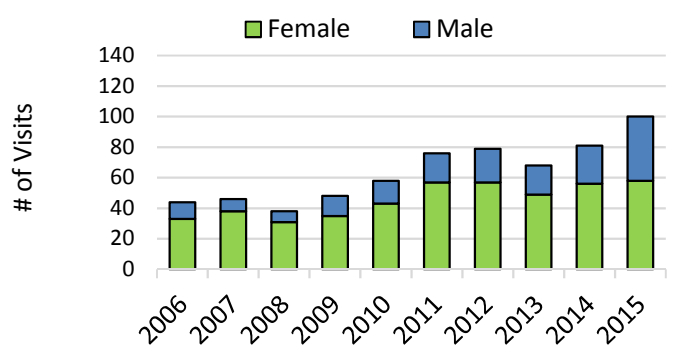
Between 2012 and 2015, drug poisoning was a contributing factor in 2% of hospitalizations and 1% of ED visits for asthma. The number of hospitalizations and ED visits for asthma and drug poisoning has been steadily increasing in recent years. In 2015, there were at 138 hospitalizations and 100 ED visits. Clinical care for asthma and drug poisoning was equally distributed between hospitalizations and ED visits. Women accounted for 70% of these hospitalizations and 67% of ED visits. The majority of hospitalizations and ED visits were distributed across people 15 to 54 years of age. Three percent of ED visits and hospitalizations for asthma with concurrent drug poisoning occurred among individuals less than 15 years of age and likely reflect accidental poisoning by medications available within the household. Medicaid was the primary payer for over forty percent of drug poisoning hospitalizations (41%) and ED visits (43%) while Medicare was the primary payer for over one third (33-39%). The remainder of care for asthma and drug poisoning was paid by private insurance (17-18%) and self pay or other payers (3-6%).

Opioid use (excluding heroin) accounted for 16% of hospitalizations and 10% of ED visits for asthma and drug poisoning, while heroin use accounted for few (3%) inpatient stays and 12% of ED visits for asthma and drug poisoning.

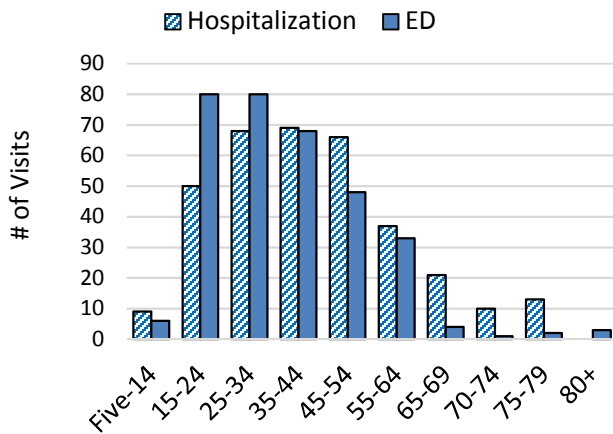
Hospitalizations for Asthma and Drug Poisoning, Dx1-Dx20, VUHDDS



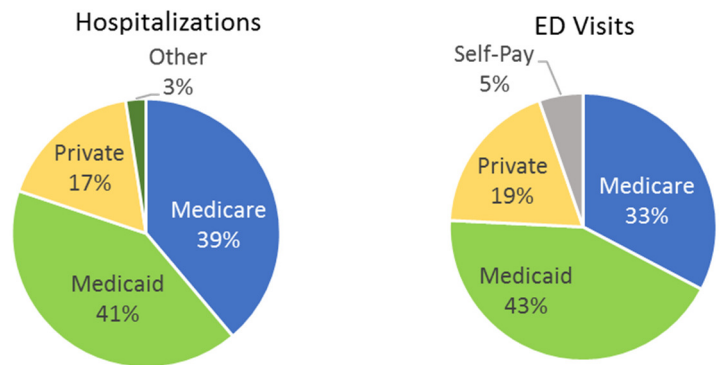
ED Visits for Asthma and Drug Poisoning, Dx1-Dx20, VUHDDS



Healthcare for Asthma & Drug Poisoning by Age, Dx1-Dx20, VUHDDS 2012-2015



Primary Payer of Healthcare for Asthma & Drug Poisoning, Dx1-Dx20, VUHDDS 2012-2015



Summary

Substance use is a significant contributing cause of asthma-related clinical care and is likely to increase the level of care required to treat an asthma exacerbation. This is evidenced by a shift from a greater proportion of care being provided solely in the ED for asthma exacerbations among the Vermont population to a greater number of asthma exacerbations requiring hospitalization among those with asthma who also use substances. This was particularly evident for asthma exacerbations with concurrent alcohol or marijuana use.

Though women are known to have higher rates of asthma and higher utilization of healthcare services for asthma, a more equal distribution of healthcare visits across males and females was observed for asthma and alcohol related care. Binge drinking is common among Vermont men with asthma (23%) and may contribute to an increased proportion of men receiving care for asthma and alcohol use as compared to the distribution for all asthma care.

Among those also using marijuana or nonprescribed drugs, hospitalizations for asthma were more frequent among younger Vermonters (15-34 years of age) as compared to the typical age distribution of clinical care for asthma. Healthcare providers who treat young adults with asthma should assess risk of asthma exacerbation with substance use and communicate the increased risk and severity of asthma exacerbations with substance use.

Data presented here show that government insurers such as Medicaid and Medicare are the primary payers for the majority of hospital care for asthma and the proportion of asthma care paid by Medicare/Medicaid is even higher among those with concurrent substance use.

The Vermont Asthma Program is working to reduce the burden of asthma among all Vermonters. For more information regarding guideline-based care for asthma including home visiting, use of CPT codes for asthma education provided by a certified asthma educator, smoking cessation supports including counseling and free nicotine replacement therapy, or resources for home visiting please contact the Vermont Asthma Program. For resources related to alcohol or drug abuse contact Vermont's Alcohol and Drug Abuse Program.

Resources to Reduce the Burden of Asthma among Vermonters

- ① Find support for you or a loved one with alcohol or drug addiction: <http://www.healthvermont.gov/alcohol-drugs/help>
- ② Vermont Asthma Program: <http://healthvermont.gov/prevent/asthma/index.aspx>
- ③ Physician's Guide to Managing and Diagnosing Asthma: http://www.nlm.nih.gov/guidelines/asthma/asthma_qrg.pdf

For More Information

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Data Sources and Notes

- ¹ Does not include tobacco use.
- ² Vermont Vital Statistics System, 2015 data are preliminary.
- ³ Behavioral Risk Factor Surveillance System (BRFSS).
- ⁴ Vermont Uniform Hospitalization Discharge Dataset (VUHDDS).
- ⁵ Youth Risk Behavior Survey (YRBS).

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