

No Person Should Die of Asthma

Report Highlights

- In 2015 it is estimated **85,000** Montanans had current asthma.
- There were over **2,300** asthma ED visits in Montana in 2015.
- Approximately **13** Montanans died from asthma each year since 1999.

Upcoming Events

- Asthma Educator Institute, November 10-11, 2017, Billings, MT
- Spirometry Training, January 26, 2018, Billings, MT

For more information on Billings events contact Marcy Ballman
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- Big Sky Pulmonary Conference, March 15-17, 2018, Fairmont, MT

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Introduction

Deaths due to asthma are a rare but serious public health concern because they are preventable. Between 1999 and 2015, an average of 13 Montanans had an asthma-related death each year with an average of 17 years of potential life lost per death during that time frame.¹

Asthma is chronic inflammatory disease of the airway causing symptoms such as shortness of breath, tightness in the chest, coughing, and/or wheezing. Asthma affects approximately 85,000 people in Montana (MT).² More than 2,300 Montanans with asthma needed emergency treatment with over 400 asthma-related hospital stays in 2015.³

Understanding mortality in people with asthma is complicated. Asthma mortality has been associated with number of risk factors, which include history of near-fatal asthma requiring intubation and mechanical ventilation, hospitalization or emergency care visit for asthma in the past year, currently using or having recently stopped using oral corticosteroids, not currently using inhaled corticosteroids, poor adherence with asthma medications, not having or adhering to a written asthma action plan, and history of major psychosocial issues.⁴

Asthma-related deaths can be avoided through better asthma self-management, early diagnosis and medication adherence. Prevention strategies are provided as recommendations for clinicians and educators at the end of this report. This surveillance report summarizes asthma deaths that occurred in MT among resident from 1999 through 2015.

References

1. Montana Death Records, Vital Statistics Analysis Unit, Office of Epidemiology and Scientific Support, MT DPHHS.
2. Montana Behavioral Risk Factor Surveillance Survey. Office of Epidemiology and Scientific Support, MT DPHHS.
3. Montana Hospital and Emergency Department Discharge Data. Office of Epidemiology and Scientific Support, MT DPHHS.
4. D'Amato, Gennaro et al. "Asthma-Related Deaths." *Multidisciplinary Respiratory Medicine* 11 (2016): 37. *PMC*. Web. 28 June 2017.
5. Centers for Disease for Control and Prevention, Wonder, 1999-2015.
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Methods

Death records were used to identify MT residents who died in MT in the last seventeen years (1999-2015). The physician completing the death certificate can list one underlying (leading) cause of death and up to 20 other contributing causes. We flagged all records with underlying and contributing causes (total of 21 fields) that contained ICD-10 asthma codes J45. To conduct more in-depth analysis we coded asthma-related deaths into following categories:

- Chronic Obstructive Pulmonary Disease (COPD) (J44-J44.9)
- Influenza and pneumonia (J09-J18)
- Other chronic respiratory disease (J44, J47)

Decedents records where asthma was identified as a contributing cause of death were classified by their underlying cause, time and place of death, as well as other co-morbid conditions and demographic variables. Leading causes of death were classified into the following categories based on ICD-10 codes:

- Diseases of heart (I00-I09, I11, I13, I20-I51)
- Malignant neoplasms (cancer) (C00-C97)
- Chronic lower respiratory diseases (CLR) (J40-J47)
- Unintentional injuries (accidents) (V01-X59, Y85-Y86)

Population estimates for MT age-specific groups were obtained from the National Center for Health Statistics, 1999-2015. Age-specific asthma prevalence estimates were calculated from the Behavioral Risk Factor Surveillance Survey.

Years of Potential Life Lost (YPPL) is an estimate of premature mortality. It is computed as the difference between a person's age at death and age 65 for individuals who died before age 65. The YPPL was calculated using the underlying cause of death.

An age-specific mortality rate is a crude death rate for a specific age group.

An age-adjusted mortality rate was calculated to better illustrate indicators than unadjusted (crude) death rates. This calculation method illustrates changes in the risk of death over the years when the age distribution of the population is changing.

Underlying cause of death is the disease or injury that started the sequence of events resulting directly in death.

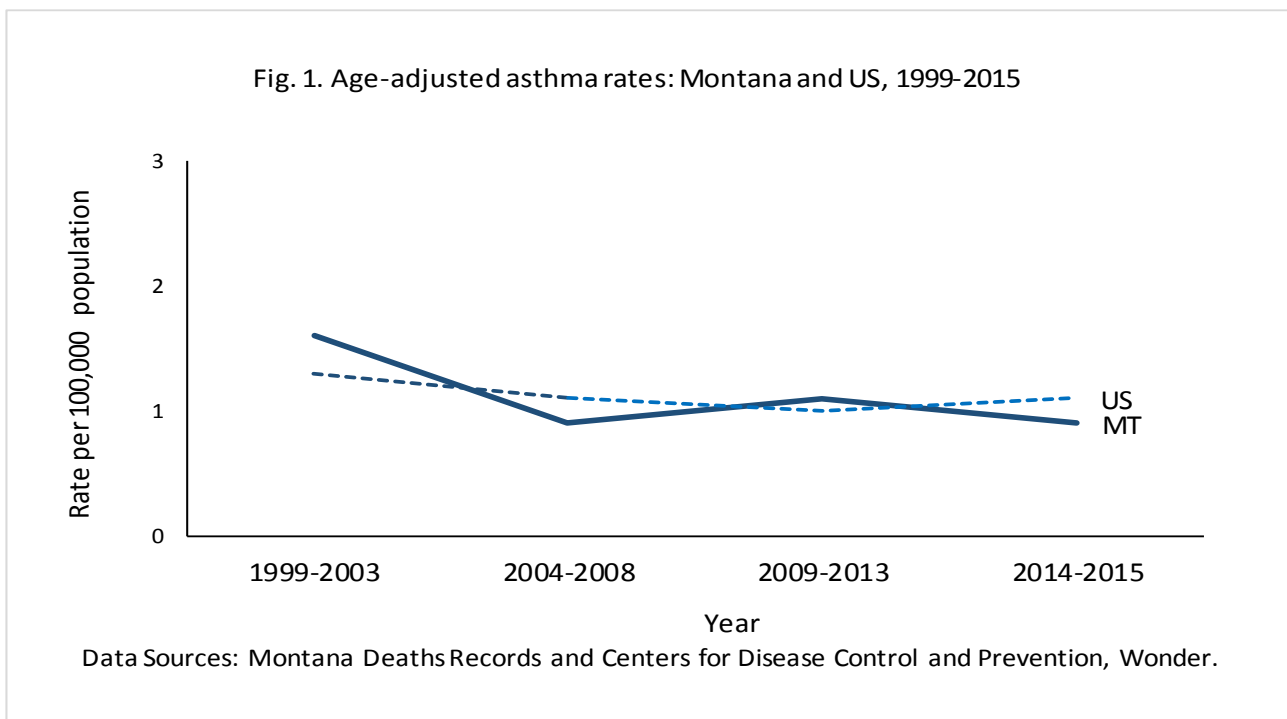
Contributed cause (multiple cause of death) can also be assigned and include diseases or injuries which contributed to death in an ordered listed on the death certificate.

ICD (International Classification of Diseases) provides rules for uniformed system of coding and classifying causes of death.

Asthma Deaths, Overall Findings

From 1999 through 2015 a total of 143,945 deaths were registered in MT. Asthma-related deaths accounted for 0.4% of all MT deaths. In the 17 year period, asthma was listed as an underlying cause of death on 200 (35.5%) death certificates with an additional 364 (64.5%) death certificates on which asthma was listed as contributing cause of death for a total of 564 asthma-related deaths.

MT's age-adjusted asthma death rate dropped from 1.7 deaths per 100,000 in 1999 to 1.0 deaths per 100,000 in 2015 [Fig. 1]. Since 2012, MT's age-adjusted asthma death rate has trended downward, compared to US's death rate trending upwards during the same time period.^{3,5}



Asthma Deaths Ranking among Chronic Lower Respiratory Diseases Deaths

Asthma is classified under the chronic lower respiratory diseases (CLRD) category. Out of all deaths from CLRD (18,748) between 1999 and 2015, the top ranking CLRD cause were deaths attributed other chronic pulmonary (0.3%), followed by asthma and bronchitis deaths, respectively (0.2%). There were no reported deaths from emphysema.

Asthma Deaths, by Sex and Race

With respect to sex, there were no statistically significant differences in age-adjusted asthma rates between females (1.3 per 100,000 (95%CI: 1.1-1.5)) and males (0.9 per 100,000 ((95%CI: 0.7-1.2)). Whites accounted for over 95% of all asthma-related deaths.^{6,7}

Asthma Deaths, by Age-Specific Group

Age-specific asthma mortality rates were significantly lower for all age groups compared to age-specific deaths rates from all-causes [Table 1]. The mortality rates from asthma were significantly higher (16.1/100,000) for those aged 65 years and older compared to younger age group (1.7/100,000) who died from asthma. As the population ages, the prevalence of mortality regardless of diseases will rise. However, research suggest that older adults suffer disproportionately from asthma and airway disease with the majority of those dying from asthma over 55 years of age.⁶

Given that asthma deaths are preventable, these data show that more needs to be done to prevent premature deaths from asthma.

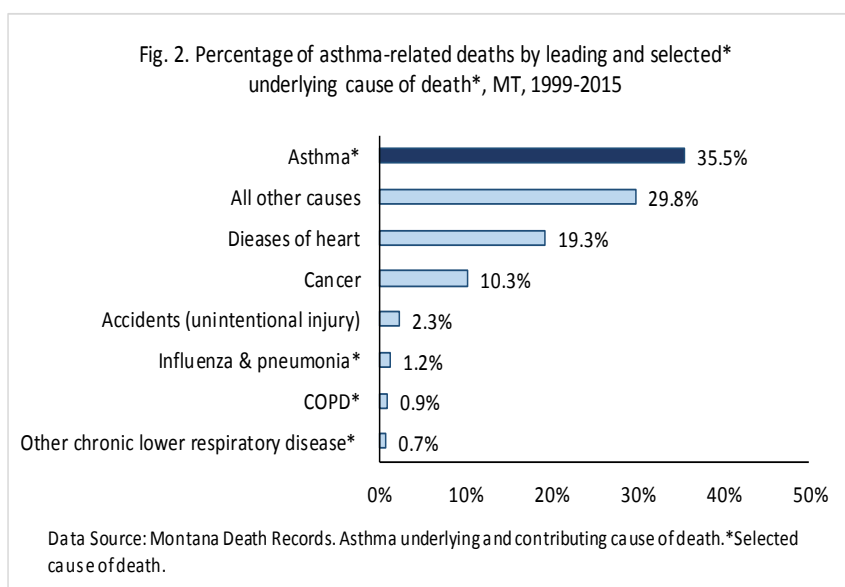
Table 1. All-cause and asthma-related death rates, by age-specific groups, MT, 1999-2015

Age group (years)	Total deaths	All cause mortality rate per 100,000 population	Asthma deaths	Asthma mortality rate per 100,000 population
0-17	2,105	55.1	3	*
18-64	33,320	328.6	176	1.7
65 and older	108,519	4,534.6	385	16.1
Total	143,944	880.4	564	3.5

Data Sources: Montana Death Records. Asthma underlying and contributing cause of death. For reliability reasons, rates for events <20 were not calculated.

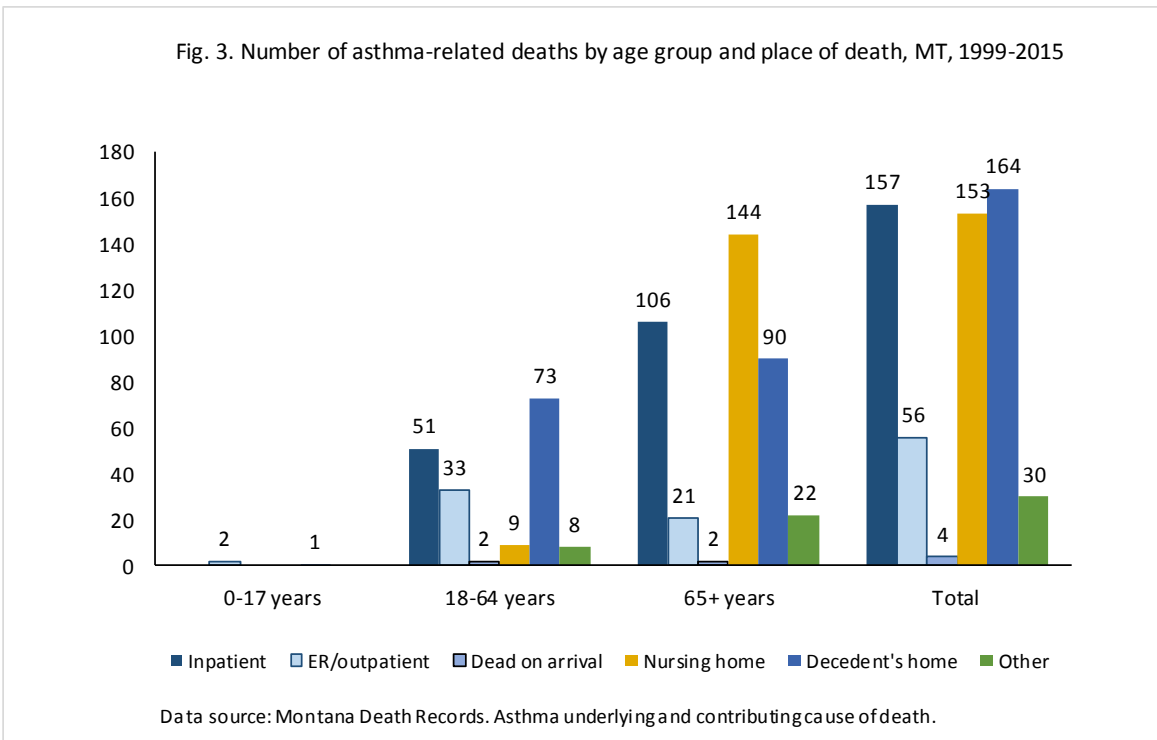
Asthma Deaths, by Leading Cause of Death

Among all asthma-related deaths, asthma was more commonly (35.5%) the underlying cause of death than diseases of the heart, cancer or unintentional injuries [Fig. 2]. In contrast, other chronic lower respiratory disease were least (0.7%) prevalent underlying cause of death among all asthma deaths. Asthma was the direct cause of death in about one-third of all asthma-related deaths. These findings demonstrate the need for continued improvement in asthma management and care.



Place and Time of Death

All asthma-attributed children deaths (n=3) occurred in the hospital or in the emergency room (ER) [Fig. 3]. Adults aged 18-64 years most often died in their home (n=73) whereas those aged 65 years and older more often died at a nursing home. The majority of all asthma deaths occurred at the decedent's home (29.1%), hospital (27.8%), or nursing home (27.1%). Most of the asthma deaths occurred between 7 am and 10 pm (61.5%) [data not shown].



Conclusion

The decline in MT's asthma-related deaths suggests better asthma control and management attributed to education and better medical care, especially the introduction of new asthma medications which may have prolonged people's lives.⁷

Previous research had identified key preventable factors in the majority of asthma deaths. Those include: 1) insufficient education of patients on recognizing risk and actions needed for people with poorly controlled asthma, 2) inadequacies in the correctness and timing of asthma diagnosis, and 3) poor classification of severity and treatment.⁴

Deaths from asthma are often preventable with aggressive intervention by those with asthma, healthcare providers, home visitors, and certified asthma educators. These results suggest that accurate asthma diagnosis and management can prevent from further developing health complications or resulting in premature asthma-related death.

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Recommendations for Clinicians and Educators

1. Refer patients to the Asthma Home Visiting Program (MAP) and Certified Asthma Educators. These programs have been proven effective in preventing or delaying asthma-related complications, respectively. Find these programs in your community at dphhs.mt.gov/publichealth/chronicdisease or by calling 1-844-MTHLT4U (1-844-684-5858).
2. Educate patients on their risk factors and the actions they can take to control their asthma and manage their symptoms when their asthma is not adequately controlled. Develop a written asthma action plan for each person with asthma to guide their self-management. Templates are available from the Asthma and Allergy Foundation of America at www.aafa.org or the American Lung Association at LUNG.org.
3. Diagnose asthma and classify severity and treatment accurately according to the guidelines, such as those from the National Asthma Education and Prevention Program Expert Panel Report 3 (EPR-3 Guidelines). The Asthma Care Quick Reference for Diagnosing and Managing Asthma is available at www.nhlbi.nih.gov.
4. Contact the Montana Asthma Control Program to request educational materials and/or training in diagnosing and managing asthma, spirometry, and emergency department protocols. Email us at asthmainfo@mt.gov, visit www.dphhs.mt.gov/asthma, or call using the number above.
5. People with asthma are more likely to have serious health problems from getting the flu. The CDC recommends for those with asthma to receive flu vaccination every year.

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