Montana Chronic Disease Prevention & Health Promotion Bureau

Chronic Disease Surveillance Report

Asthma Emergency Department Visits:

Variation in acute asthma exacerbations

Introduction

While the statewide asthma surveillance system has monitored asthma prevalence, hospitalizations, and deaths for many years, only recently has emergency department (ED) visit data become available. Asthma ED visits represent urgent but often less severe exacerbations than asthma hospitalizations. Additionally, the greater incidence of ED visits each year relative to asthma hospitalizations allows a more detailed examination of asthma burden than has previously been possible. In this report, we examine the rate of asthma ED visits for various population sectors as well as seasonal and regional variation. Knowledge of regional asthma variation can help inform how resources are distributed.

Some acute exacerbations can be prevented by asthma management through regular medical evaluation, use of recommended pharmacologic therapy, treatment of co-morbid conditions, elimination of environmental triggers, and intensive patient and family education, such as is recommended by the Expert Panel Report (EPR-3) Guidelines.[1] Additionally, the rate of ED visits in an area may be influenced by factors such as outdoor environmental quality, access to primary care facilities, and others.

Methods

The Montana Hospital Discharge Data System reports ED data from participating hospitals on a yearly basis. Data files from 2010 through 2013 were compiled and analyzed. Records with a primary diagnosis of ICD-9-CM 493 were defined as asthma visits. Admission day, age, sex, and ZIP-code of residence were abstracted from each record. Population files and ZIP-code of patient residence were used for geographic analysis. For risk-based rates, the asthmatic population was estimated using weighted point prevalence estimates from the Behavioral Risk Factor Surveillance System.[2] Analyses were limited to visits by Montana residents.

Geographic variation in rates of asthma ED visits was assessed through kernel density estimation applied to ZIP-code area rates.[3,4] Regions with high rates were identified through hot spot analysis using the Getis-Ord local statistic.[5]

ED visit data was provided by the Montana Hospital Association.

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January 2015

Clinical Recommendations

- Ensure all asthma patients receive education in asthma symptoms, triggers, medication adherence, and inhaler technique at each office visit in order to prevent ED visits.
- When treating a patient in the ED, ensure a follow-up visit with a primary care provider is scheduled.
- Monitor young male asthma patients as they tend to be at higher risk for asthma ED visits than young females and adults.
- Be aware of seasonal variation in risk for asthma exacerbations. Among children, rates are higher in spring and fall.
- For CME-approved assistance in training ED personnel in providing evidence-based asthma self-management education upon discharge for patients with asthma exacerbations, contact the Montana Asthma Control Program.

Upcoming Events

- Feb. 19: Asthma Webinar: Spirometry www.dphhs.mt.gov/Asthma/webinars
- Feb. 26-28: Big Sky Pulmonary Conference www.umt.edu/sell/cps/bigskypulmonary

Montana Asthma Control Program

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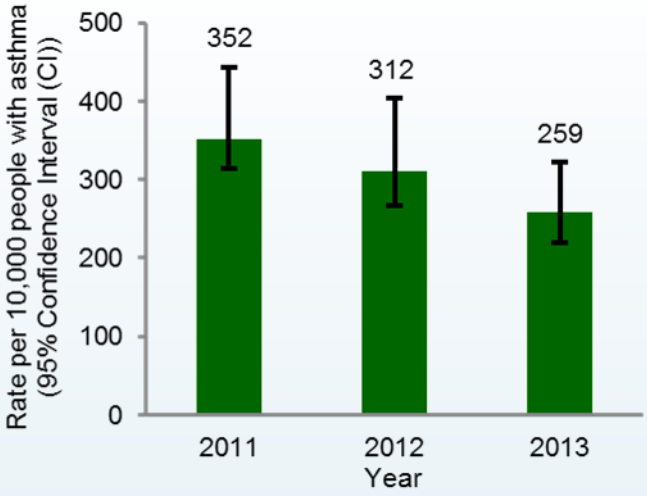
Asthma ED Visit Trends

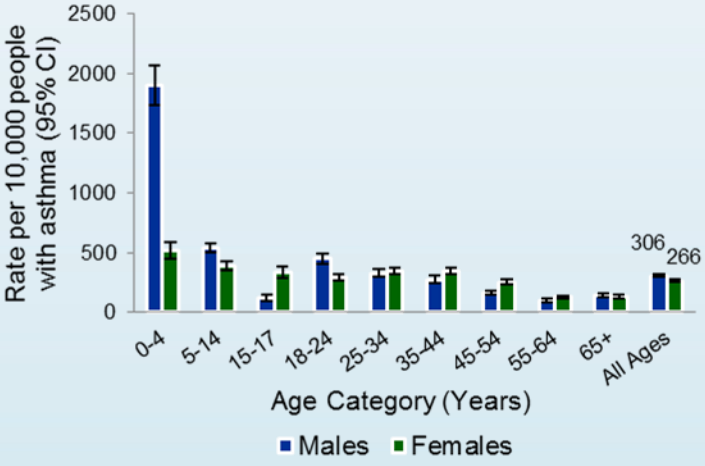
Figure 1. Rate of asthma ED visits in the estimated population with asthma, MT, 2011-2013



Monitoring the rates of ED visits over time and by population group can help in targeting program activities to demographics with the highest asthma burden.

- The rate of ED visits among people with asthma is a correlate of asthma severity and control, rather than asthma prevalence.
- There was an overall decrease in asthma ED visits from 2607 to 2188 between 2010 and 2013.
- Among people with asthma, there was no significant change in the rate of ED visits during this time. (Figure 1)
- The most recent national estimates of asthma ED visit rates are more than three times the rate in Montana.[6, 7]

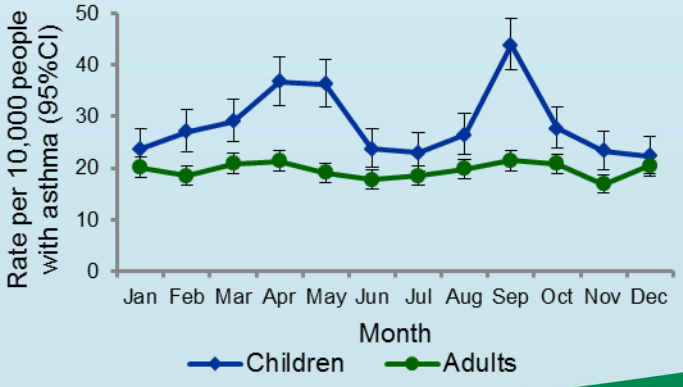
Figure 2. Rates of asthma ED visits by age and gender in the estimated population with asthma, MT, 2011-2013



The variation in ED visit rates with age differs between males and females. (Figure 2)

- While the prevalence of asthma is greater among females than males,[8] the rate of ED visits among people with asthma was 15% greater among males than females, suggesting poorer asthma control.
- Among males with asthma, the ED visit rate was highest among children and decreased with age.
- Among females with asthma, the ED visit rate varied little up to age 54, followed by a decline.
- These patterns are similar to those seen in national estimates.[2]

Figure 3. Rate of asthma ED visits per month in the



Overall, ED visit rates were higher in spring and fall. (Figure 3)

- This seasonal variation is greater among children (aged 0-17 years) than adults (aged 18+ years).
- Among children, months April, May, and September had significantly higher than average rates while July, November and December had lower than average rates.
- Among adults, no month had a significantly higher than average rate and November had a lower than average rate.

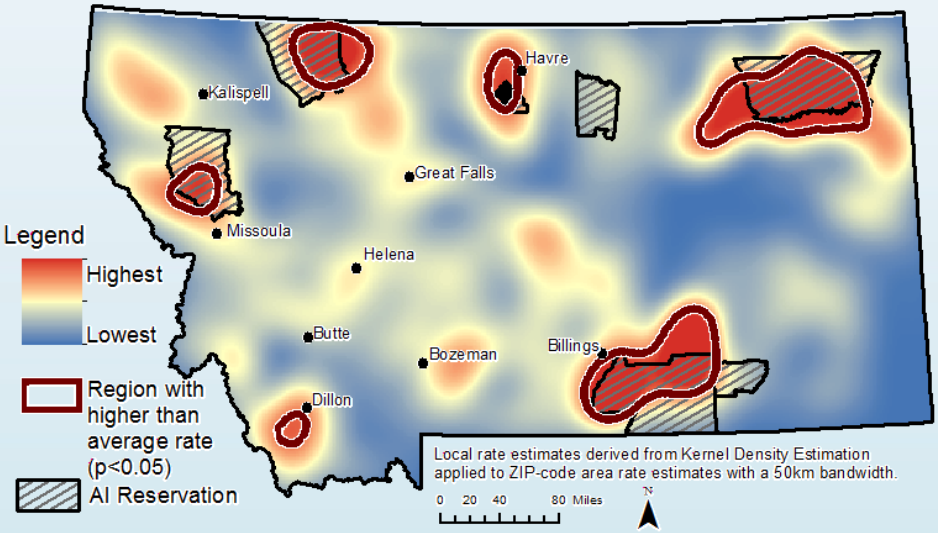
Geographic Variation in Asthma ED Visit Rates

Geographic variation in the asthma ED visit rate was assessed to help identify regions with disproportionately high asthma burden. (Figure 4)

- The rate varied substantially throughout the state. Counties in the highest quartile of ED visit rates had 351 ED visits per 100,000 persons, over 2.5 times the rate as counties in the lowest quartile.
- Six regions were identified that had ED visit rates significantly higher than the state average ($p<0.05$). Five of these overlapped with American Indian reservations.
- While American Indians have a higher asthma prevalence compared to Whites in Montana,[8] a previous study of Montana data found asthma was not independently associated with race, but was due to disproportionate exposure to risk factors for asthma among American Indians including obesity, low household income, and smoking.[9]
- While the large cities in Montana appear to have higher rates than other regions, the difference in rates was not statistically significant.

Knowledge of the variation in rates between geographic areas can help direct the attention of the Montana Asthma Control Program toward areas that have higher asthma burden. Monitoring local changes in these rates can provide evidence for the effectiveness of area-specific efforts to decrease asthma burden.

Figure 4. Local asthma ED visit rates per 100,000 persons, Montana, 2010-2013



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Clinical Recommendations

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- **When treating a patient in the emergency department, ensure a follow-up visit with a primary care provider is scheduled.**
- **Monitor young male asthma patients as they tend to be at higher risk for asthma ED visits than young females and adults.**
- **Be aware of seasonal variation in risk for asthma exacerbations. Among children, rates are higher in spring and fall.**
- **Contact the Montana Asthma Control Program for information about our CME-approved "Treating asthma in the ED" training.**

Report Highlights: Asthma Emergency Department Visits

- Analysis of newly available Emergency Department (ED) discharge data.
- Asthma ED rates by year (2011-2013), age group, sex, and month of occurrence.
- Geographic assessment of asthma ED visit rates throughout the state.

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