

## High Child Asthma Rates in Southeastern New Mexico

Asthma is a chronic inflammatory disease characterized by wheezing, coughing, breathlessness, and chest tightness resulting from the constriction of the airways. While the causes of the disease are unknown, asthma symptoms can be triggered by allergens (substances that cause an allergic response) or irritants (substances that irritate the nose or airways and provoke asthma symptoms). Common asthma triggers include animal dander, air pollution, dust mites, pollen, mold, tobacco smoke, exercise, and stress.

Asthma is a leading cause of missed school days, emergency department visits, and hospital admissions. While asthma affects people of all ages, it disproportionately affects young people. Approximately 64,000 children in New Mexico currently have asthma.<sup>1</sup> While asthma prevalence rates did not differ significantly by region, the state's southeast region had extremely high asthma hospital inpatient discharge rates and emergency department discharge rates.

### Methods

**Asthma Hospitalizations.** The New Mexico Health Policy Commission maintains the Hospital Inpatient Discharge (HID) database which includes all in-state non-federal state resident hospital discharges. Because discharges from Indian Health Service hospitals are not included in the data, Native Americans have been excluded from the analysis. All hospital data in this report define an asthma hospitalization based on the primary, or first-listed, diagnosis (ICD-9 codes 493.0-493.92). A personal identifier number in the data permit the calculation of the number of discharges per person. A source of admission variable informed whether an individual was admitted from the emergency room or from physician referral.

**Asthma Emergency Department Visits.** These data were collected from non-federal hospitals that have emergency departments (EDs) and include primary, or first-listed, diagnosis of asthma (ICD-9 codes 493.0-

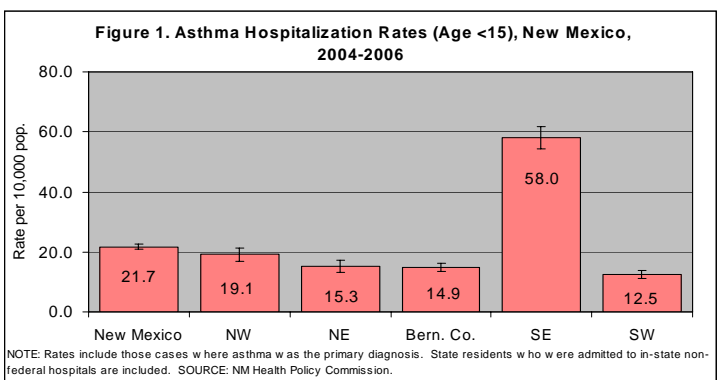
**Brad Whorton, Ph.D.**

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493.92). These data include those individuals who were admitted to the ED then discharged; they do not include those cases that were admitted as inpatients from the ED.

### Results

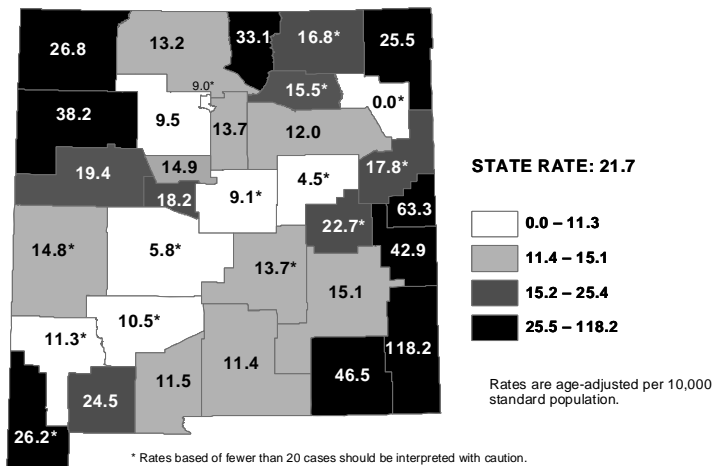
**Asthma Hospitalizations.** The primary asthma hospitalization rate for 2004-2006 for ages under 15 in NM was 21.7 per 10,000 population (Figure 1). All NM regional rates were below the state rate except for the southeast region, where the rate was more than twice the state rate at 58.0. The southeast region includes Harding, Quay, Curry, DeBaca, Roosevelt, Chaves, Lea, and Eddy counties. All other state regions had rates ranging from 12.5 to 19.1.



The map of primary asthma hospitalizations for children less than 15 years of age (Figure 2) shows county rates grouped into quartiles with those counties with the highest rates in black. The four highest rates were for counties in the southeast region. The highest hospitalization rate was in Lea County with a rate of 118.2 discharges per 10,000 population, which is more than five times higher than the state rate of 21.7. Curry County has the second highest rate at 63.3, followed by Eddy County (46.5) and Roosevelt County (42.9). Other counties with high rates include McKinley

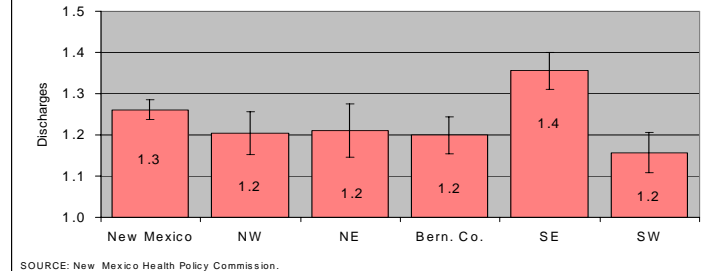
County (38.2), Taos County (33.1), and San Juan County (26.8). The southeast region also had the highest rate of asthma hospitalizations among all other age groups (Figure 8 on back page).

**Figure 2. Asthma Hospitalization Rates (Age <15), New Mexico, 2004-2006**



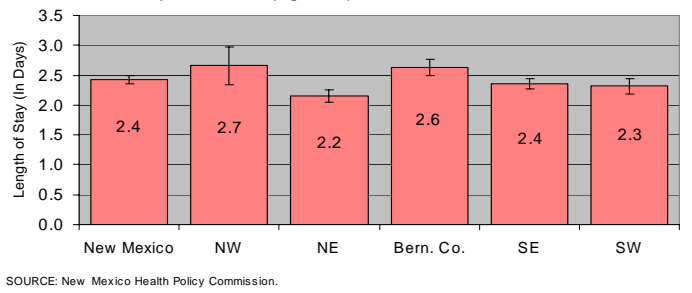
The average number of primary asthma hospital discharges per person for those under age 15 in NM from 2001 through 2006 was 1.3 discharges per person (Figure 3). This number was significantly higher in the state's southeast region (1.4) meaning that this region had more repeat hospital visits compared to all others. The state's southwest region had a significantly lower average number of discharges per person (1.2) compared to the state number.

**Figure 3. Average Number of Asthma Hospital Discharges per Person (Age <15), New Mexico, 2001-2006**



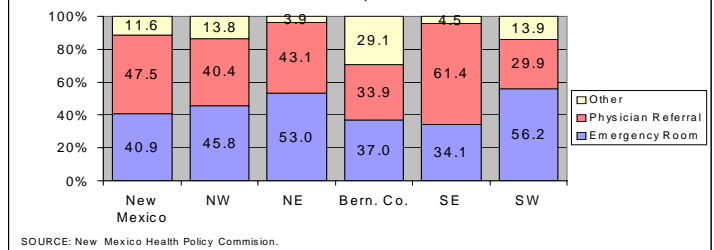
The average length of stay for a primary asthma hospitalization for those under 15 in NM was 2.4 days, which was the same for the southeast region (Figure 4). The average length of stay in the state's northeast and southwest regions was shorter, while Bernalillo County and the northwest region had longer lengths of stay. However, among all patients regardless of age, the southeast region had a significantly shorter length of stay (2.8 days), which was also the shortest of any region, than that of the state (3.1 days).

**Figure 4. Average Length of Stay for Primary Asthma Hospitalizations (Age <15), New Mexico, 2001-2006**



There were differences in the source of youth primary asthma hospital admissions by region (Figure 5). In NM, 40.9% of hospital admissions came from the emergency department, while 47.5% were admitted on the basis of physician referral. The remaining 11.6%, with an other admission source, include transfers from other medical facilities which is the largest component of "other." The southeast region had a much larger portion of its patients (61.4%) admitted through physician referral and a smaller portion (34.1%) admitted from the emergency room. In all other regions, admission from the emergency room constituted the largest component of primary asthma hospitalizations. Bernalillo County had the largest "other" component (29.1%) reflecting the fact that it receives more hospital transfers than elsewhere in the state. The findings were similar when primary asthma hospitalizations of all ages are included.

**Figure 5. Asthma Hospitalization Source of Admission (Age <15), New Mexico, 2001-2006**



**Asthma Emergency Department Visits.** The emergency department data show the same pattern as the hospital inpatient discharge data. The state's primary asthma emergency room discharge rate for those under 15 was 45.4 per 10,000 population (Figure 6). The southeast region rate (89.1) was almost twice the state rate, while the northwest and northeast regions as well as Bernalillo County had rates that ranged from 35.0 to 39.4. The rate for the state's southwest region was somewhat higher (45.9) than these regions' rates but was similar to the state's rate.

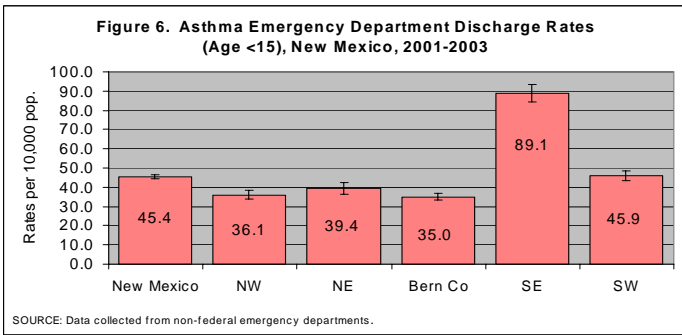
be contributing to the high asthma rates; however, more study is needed before a link can be made.

Finally, asthma medical practice in the Southeast could be contributing to the region's high asthma hospitalization and emergency department visit rates. Several possibilities exist. Physicians and hospitals may be treating asthma as an acute illness rather than as a chronic disease to be managed. One reason why physicians may refer more to hospitals may be that they do not have nebulizers in their offices. Also, patient asthma education may be in need of improvement. Another reason for the high asthma rates may be that hospitals in the region may have less stringent admission criteria compared to hospitals elsewhere in the state. Further investigation, including a review of medical charts, is necessary to determine the causes so that effective, targeted interventions can be implemented.

Possible interventions to reduce the burden of asthma include increased and improved patient education, the increased use of written asthma action plans, more health care provider training on the National Asthma Education and Prevention Program guidelines, and review of pediatric asthma standards of care in hospitals and emergency departments. Linkage of asthma health outcome data with outdoor air quality data is needed to determine whether environmental factors are playing a significant role. Greater involvement of regional industry to improve air quality or greater regulation to improve air quality may be needed.

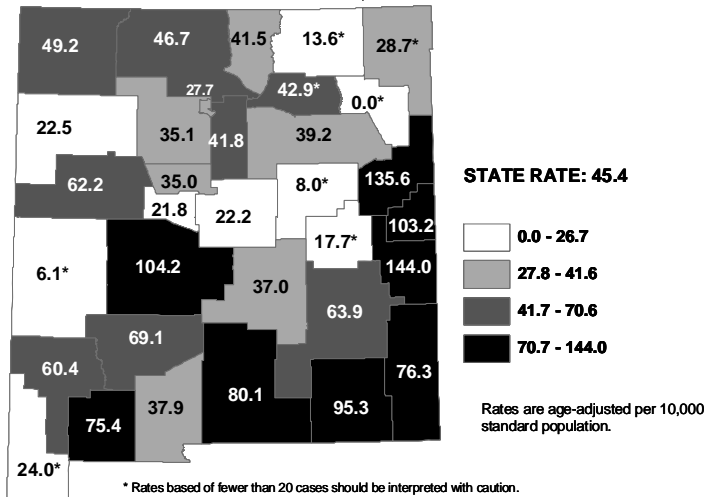
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Five of the top seven counties for asthma emergency department rates for those under 15 years were in southeastern New Mexico (Figure 7). Roosevelt County had the highest rate (144.0)—more than triple the state rate, followed by Quay County (135.6), Socorro County (104.2), Eddy County (95.3), Otero County (80.1), and Lea County (76.3).

**Figure 7. Asthma Emergency Department Discharge Rates (Age<15), New Mexico, 2001-2003**



## Discussion

Although further study is needed in order to be certain as to what is driving the high rates in southeast NM, these and other data indicate that the high asthma rates may be due to three factors: behavioral, environmental, and medical practice factors. The region's relatively high chronic disease death rates, high levels of children who are either obese or overweight, and greater everyday exposure to second-hand smoke indicate that behavioral factors are involved.<sup>2</sup> Outdoor air quality may also be playing a role. Studies elsewhere show an association between living in an area with high levels of air pollutants and increased asthma medical visits,<sup>3</sup> while other studies find an association between living in areas of large animal confinements and asthma medical visits.<sup>4</sup> The presence of oil and gas drilling and refining as well as dairy feedlots could

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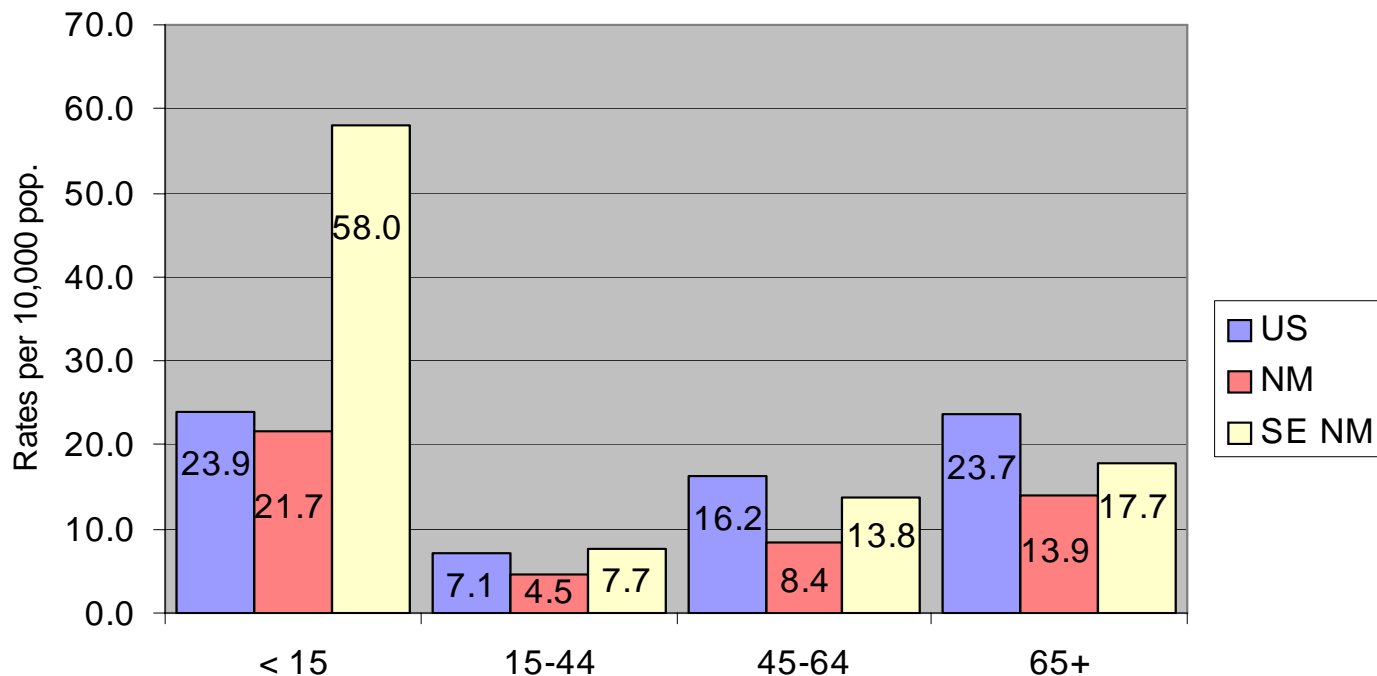
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**Figure 8. Asthma Hospitalization Rates by Age Group, United States (2006) and NM and Southeastern NM (2004-2006)**



NOTE: US rates are 2006; NM & SE NM rates are 2004-2006 average. Native Americans are excluded from NM & SE NM rates. Sources: National Health Statistics Report, No. 5, July 30, 2008; NMHPC