



Letter

Longitudinal trends in asthma health care use in Southern Nevada

Asthma, a chronic respiratory disease, affects nearly 300 million people worldwide.^{1,2} Nationwide, 25.7 million people were estimated to have asthma in 2010, increasing from 20.3 million in 2001.³ Approximately 10.6 million physician office visits, 2.1 million emergency department (ED) visits, and 479,300 hospitalizations associated with asthma occurred in the United States during 2009.³ National costs of asthma in 2007 were estimated at \$56 billion.⁴

To lower asthma health care costs, it is essential to understand which subgroups of asthma patients use ED and hospitalization resources more than other subgroups. Historically, children, females, and black persons have higher rates of ED visits and hospitalizations associated with asthma.³ We are unaware of any studies that have examined asthma-related health care use in the state of Nevada. The purposes of this study were to summarize longitudinal trends of asthma health care use by treatment setting and to identify demographic subgroups using these settings disproportionately for asthma care in Nevada.

Data used for this study included patients treated at the University Medical Center of Southern Nevada (UMC), a local county teaching hospital with a chain of clinics throughout the greater Las Vegas area. The UMC serves uninsured and insured patients throughout Clark County, Nevada, and has ED, inpatient hospitalization, urgent care (Quick Care), and primary care treatment

settings. Institutional review board approval was obtained through the institutional review board of the UMC and the University of Nevada, Las Vegas, Human Subjects Committee. Exempt approval was granted because of data deidentification.

Patient visits for all causes, including asthma, from any of those settings or locations between 2000 and 2008 were abstracted for analysis. The proportion of asthma care relative to all-cause use within each setting was assessed across years. Analysis was conducted by race, age, sex, and insurance status to determine whether subgroups exhibited different use patterns in asthma care across time. To determine whether there were statistical trends in the proportion of asthma visits out of all-cause visits across time, the Cochran-Armitage test for trend was performed using SAS statistical software, version 9.3 (SAS Institute Inc, Cary, North Carolina). A total of 276,664 all-cause inpatient hospitalizations, 672,505 ED visits, 738,606 primary care (PC) visits, and 2,207,244 urgent care visits were analyzed between 2000 and 2008. The proportion of asthma health care use of all-cause visits decreased across time: for 2000 vs 2008 for inpatient hospitalizations, 2.68% vs 1.78% ($P < .001$); PC visits, 2.87% vs 2.8% ($P < .001$); and urgent care visits, 2.63% vs 1.8% ($P < .001$) (eFig 1). ED visit use for asthma care increased over time, but the finding was not statistically significant (2.26% vs 2.67%, $P = .15$). Subgroup analyses revealed differences by

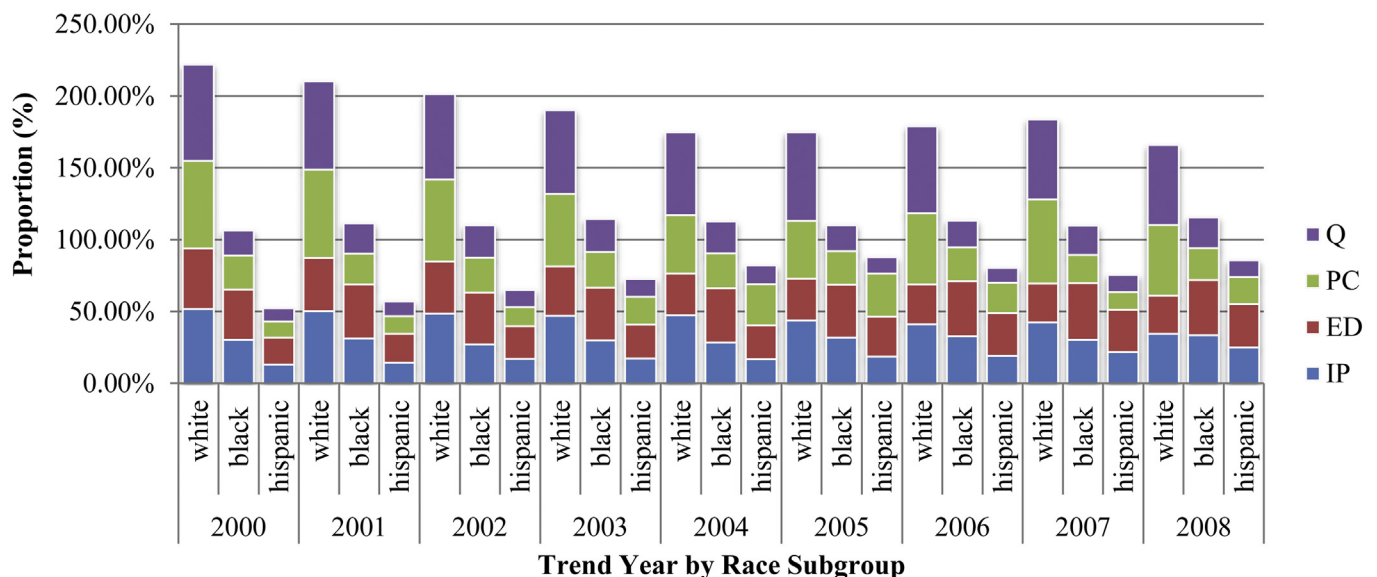


Figure 1. Patterns of asthma health care use by race were assessed in 2000 to 2008. The percentage of each setting indicates the contribution of each value to the total across all race subgroups. ED indicates emergency department; IP, inpatient hospitalization; PC, primary care; Q, urgent care.

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age, race, sex, and insurance type. Those aged 0 to 17 years increased use for asthma in the ED across time ($P = .008$), yet those aged 18 to 64 years were less likely to use the ED ($P = .05$), with a significant increase in PC use ($P < .001$), urgent care use ($P < .001$), and inpatient hospitalizations ($P = .003$) (eFig 2). For those 65 years and older, there was a significant decrease in ED use ($P < .001$) and a significant increase in asthma inpatient hospitalizations ($P = .003$), PC visits ($P < .001$), and urgent care visits ($P < .001$) for asthma care. Male and female patients increased use in PC across time ($P < .001$) (eFig 3). White persons had a significant decrease in all asthma use settings ($P < .001$), whereas black persons and Hispanics had increased rates of being hospitalized and visiting the ED ($P < .05$) (Fig 1). Asian Pacific Islanders were more likely to be hospitalized ($P = .01$), whereas American Indians had significant decreases in urgent care use ($P < .001$). Male children aged 0 to 17 years had decreases in PC and urgent care use ($P < .001$), whereas adult mean aged 18 to 64 years had increased PC ($P < .001$) and urgent care use ($P < .001$). Males 65 years and older had decreased ED use ($P = .006$), increased PC use ($P = .004$), and increased urgent care use ($P < .001$). Younger female patients had significant decreases in inpatient hospitalizations ($P < .001$), PC use ($P < .001$), and urgent care use ($P < .001$) and an increase in ED use ($P < .001$). Women aged 18 to 64 years had decreased ED use ($P = .002$), increased PC use ($P < .0001$), and increased urgent care use ($P < .001$). Females 65 years and older were more likely to be hospitalized ($P = .01$) and to use PC ($P = .006$) and urgent care services ($P < .001$), yet their ED use decreased ($P = .03$). Those with commercial medical insurance had a decrease in all types of asthma use: inpatient hospitalization ($P < .001$), ED use ($P < .001$), PC use ($P < .001$), and urgent care use ($P = .02$) (eFig 4). Those who were uninsured had a significant increase in asthma hospitalizations ($P < .001$) but a decrease in all other types of use ($P < .05$).

Our study found that patients aged 0 to 17 years had significantly increased ED use for asthma treatment across time compared with those aged 18 to 64 years. Primary care visits, urgent care visits, and hospitalization use were also primarily used by children compared with those aged 18 to 64 years, consistent with other findings.^{5,6} Our study also found the highest hospitalization rates among black persons; various studies support this finding of increased health care use for asthma among minorities. Black persons were found more likely to have asthma and 2.5 times more likely to require asthma-related ED visits and hospitalizations.⁷ Among black children, increased asthma prevalence explains increased ED use, yet mortality has increased between 2001 and 2010.⁸ In addition, we found young females had decreased asthma hospitalizations and primary and urgent care use but increased ED visits. Everage et al⁹ reported the similar findings that women consistently had higher hospitalization rates and ED visits than their male counterparts. Our study found a significant decrease in use for all types of insurance carriers and all settings. Other studies also found that people covered by Medicaid or without health insurance had higher risks of hospitalization for asthma.^{7,10}

Limitations of this study include the inability to account for repeated visits and lack of generalizability to other regional populations. Subgroup analysis by race, sex, and age is a study strength. The population examined in this study parallels the nationwide

trends for asthma health care use. Public health and clinical interventions are needed for asthma control and management among high-risk subgroups using the ED and inpatient settings as their main source of care.

Acknowledgment

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Supplementary Data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.anai.2014.10.010>.

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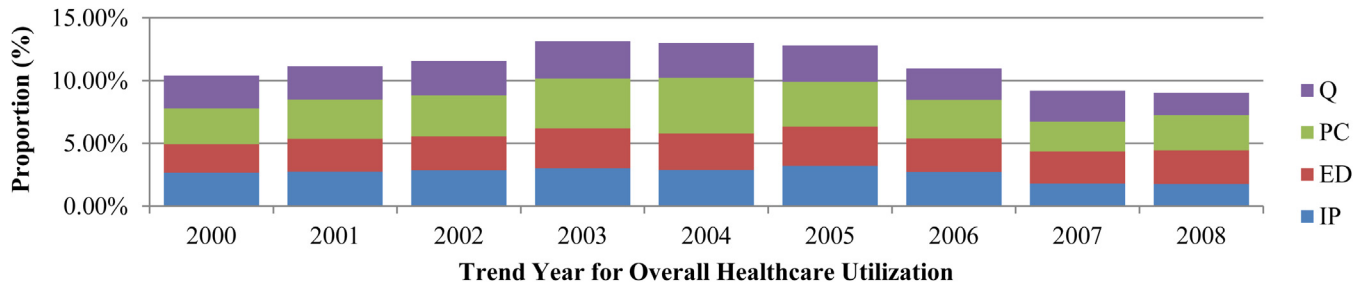
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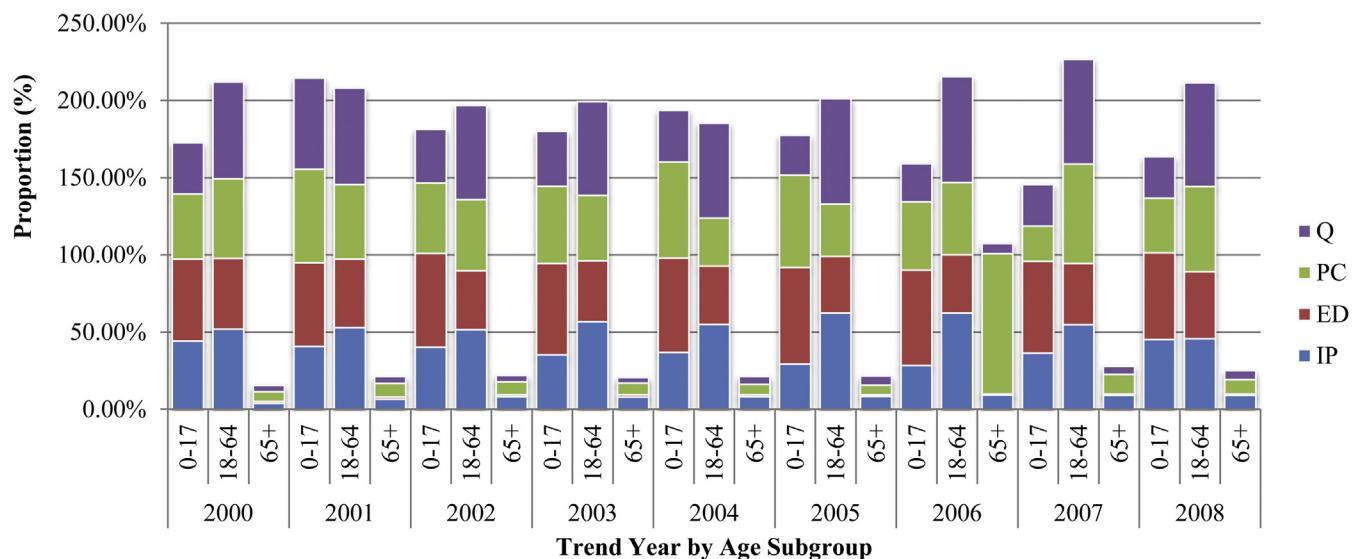
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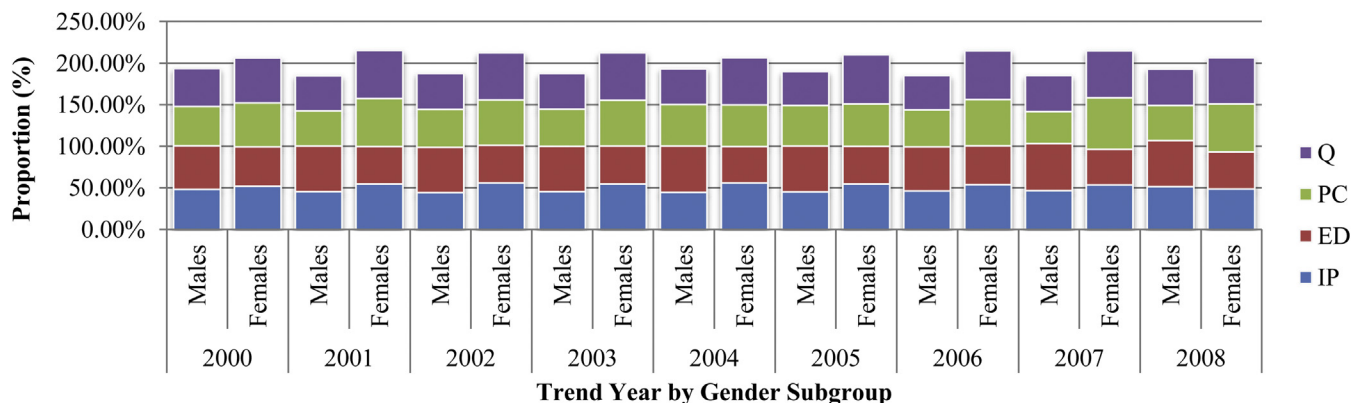
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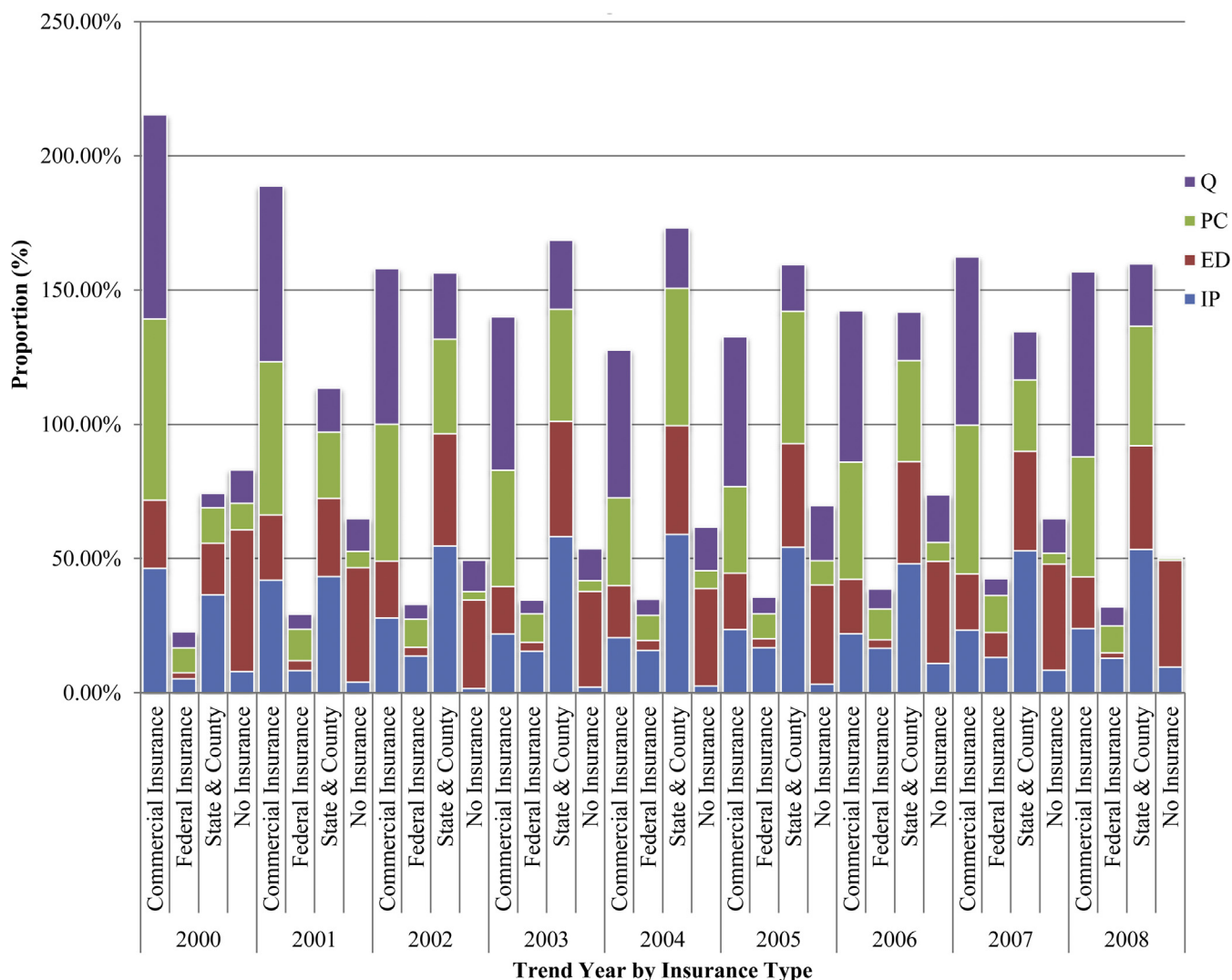
eFigure 1. Patterns of asthma health care use by setting, were assessed in 2000 to 2008. The percentage of each setting indicates the contribution of each value to the total across time. ED indicates emergency department; IP, inpatient hospitalization; PC, primary care; Q, urgent care.



eFigure 2. Patterns of asthma health care use by age were assessed in 2000 to 2008. The percentage of each setting indicates the contribution of each value to the total across all age subgroups. ED indicates emergency department; IP, inpatient hospitalization; PC, primary care; Q, urgent care.



eFigure 3. Patterns of asthma health care use by sex were assessed in 2000 to 2008. The percentage of each setting indicates the contribution of each value to the total across all sex subgroups. ED indicates emergency department; IP, inpatient hospitalization; PC, primary care; Q, urgent care.



eFigure 4. Patterns of asthma health care use by insurance were assessed in 2000 to 2008. The percentage of each setting indicates the contribution of each value to the total across all insurance subgroups. ED indicates emergency department; IP, inpatient hospitalization; PC, primary care; Q, urgent care.