

ABSTRACT

# Asthma patterns in Boston emergency department visits for children age five and under

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**Objective**

The objective of this study is to report on the use of syndromic surveillance data to describe seasonal patterns of asthma and health inequities among Boston residents, age five and under.

**Introduction**

The burden of asthma on the youngest children in Boston is largely characterized through hospitalizations and self-report surveys.<sup>1</sup> Hospitalization rates are highest in Black and Hispanic populations under age five. A study of children living in Boston public housing showed significant risk factors, including obesity and pest infestation, with less than half of the study population being prescribed daily medication.<sup>2</sup>

Information on asthma visits for children ≤5 years old was requested by the Boston Public Health Commission Community Initiatives Bureau. The information is being used to establish a baseline for an integrated Healthy Homes Program that includes pest management and lead abatement. There is limited experience in using syndromic surveillance data for chronic disease program planning.

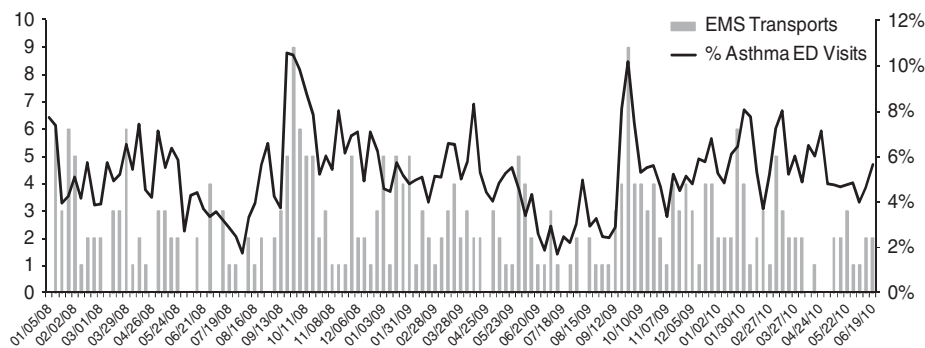
**Methods**

The Boston syndromic surveillance system receives demographics, chief complaints, and disposition. To assess asthma visits in the emergency departments (ED) from 1 January 2008–19 June 2010, an asthma syndrome was built to catalog the following key words (and appropriate variations) from the chief complaint field: asthma, reactive airway disease, and wheezing. This was then restricted to all Boston residents, ages five and under, and compared with all ED visits of the same ages and residency. Syndrome counts were further stratified by race/ethnicity, geographic neighborhoods, gender, and disposition.

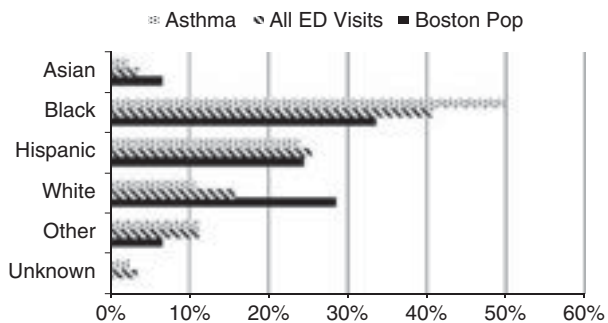
Boston Emergency Medical Service transports coded as likely asthma in the electronic trip sheet for Boston residents, ages five and under were also obtained.

**Results**

Asthma ED visits occurred in a seasonal pattern in Boston with highest levels of activity in September to early October in both 2008 and 2009 (max = 10.6% of all visits for week ending 20 September 2008), and was correlated with an increase in Emergency Medical Service transports ( $R^2 = 0.23$ ). (Figure 1).



**Figure 1** Weekly percent asthma of all Boston ED visits ≤ 5 years old (line) overlaid with weekly count of EMS transports for asthma patients ≤ 5 years old (bars), 1 January 2008–19 June 2010.



**Figure 2** Race/ethnicity distribution of ED visits for asthma, and for all visits compared with Boston population  $\leq 5$  years old, 1 January 2008–19 June 2010. Fifty percent of asthma patients are Black, 41% of all ED patients are Black, 34% of the age-specific Boston population are Black (2000 Census).

From 1 January 2008–19 June 2010, Black children were nearly twice as likely to present to an ED for an asthma syndrome visit compared with White children (odds ratio (OR) = 1.84 (1.65, 2.06)); Hispanic children were 40% more likely (OR = 1.40 (1.24, 1.57)) than White children to present at an ED for an asthma visit. Males accounted for 64% of all asthma syndrome visits compared with 54% for all ED visits. Between 29 November 2009 and 19 June 2010, 25% of the ED asthma syndrome visits required hospitalization. (Figure 2).

## Conclusions

The Boston Public Health Commission syndromic surveillance system provided information on ED asthma syndrome visits for children  $\leq 5$  years old. Seasonal patterns in asthma syndrome visits correlated with Emergency Medical Service data with peak activity in September. Environmental triggers including returning to school (either patients or siblings) may be associated with increased activity in September. A flexible chief complaint coding system with the availability of demographic information that included race/ethnicity was essential to providing timely baseline information for program planning.

## Acknowledgements

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## References

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- 2 Levy J, Welker-Hood LK, Clougherty JE, Dodson RE, Steinbach S, Hynes HP. Lung function, asthma symptoms, and quality of life in public housing in Boston: a case-series analysis. *Environ Health* 2004;3:13.