

# Medical Surveillance Systems – Understanding Their Strengths and Weaknesses



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## Introduction

Between 2000-2007 the prevalence of asthma in Louisiana had similar trends and lower rates of asthma compared the national average.<sup>1</sup> However in 2008, the prevalence of asthma in Louisiana jumped upwards close to the national average.

The Louisiana Asthma Management and Prevention Program (LAMP) monitors the burden of asthma mostly through information obtained from the Louisiana Behavioral Risk Factor Survey (BRFSS).<sup>1</sup>

The Louisiana State Office of Public Health (OPH) monitors data from various sources to monitor the morbidity and mortality of different diseases of interest.

Louisiana Early Event Detection System (LEEDS) is a web-based reporting system that automatically processes hospital emergency department data to identify visits indicative of specific syndromes tracked by the OPH.<sup>3</sup>

Louisiana also provides disease surveillance reporting and assesses healthcare utilization with the Louisiana Hospital Inpatient Discharge Data (LAHIDD)<sup>2</sup>

## Aim

The Louisiana Department of Health and Hospitals purchased Emergency Room (LAER) data from SharCorps through the Louisiana Health Information Network (2010 and 2011).

We compared the LAHIDD and LAER data systems to assess the pros and cons of each system. Additionally, we wanted to determine if there were ways to strengthen the LEEDS surveillance system for asthma detection in Louisiana.

## References

- Hospitals DoHa. Louisiana LAHIDD Report 2003. <http://new.dhh.louisiana.gov/assets/oph/Center-S/healthstats/LAHIDD2003.pdf>.
- Hospitals DoHa. 2008 Louisiana Asthma Surveillance Report. 2010; <http://new.dhh.louisiana.gov/assets/oph/pcrh/asthma/LouisianaAsthmaBurdenReportMarch2010.pdf>, 2012.
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## Methods

Using the asthma ICD-9 codes, all individuals who had an asthma diagnosis in 2010 were selected from LAHIDD and LAER database systems. Data from the LAHIDD system was extracted and imported into an Excel file and later imported into SAS ver. 9.2 for analysis. The LAER data was extracted in a SAS format for further analysis.

Both data systems had similar demographic variables: age, sex, and race that were used for comparison.

Hospital coding were standardized following the LAHIDD data format.

Frequency distributions and Chi-square tests were done to assess the demographic differences between the LAHIDD and LAER database systems.

	ER Data Frequency (%)	LAHIDD Data Frequency (%)	Chi-Square P-value
Male	17,806 (39.4)	7,202 (35.4)	<0.0001
Female	27,390 (60.6)	13,134 (64.6)	
White	16,950 (37.5)	10,062 (49.5)	<0.0001
Black	24,289 (53.7)	7,148 (35.2)	
Asian or Pacific Islander	163 (0.4)	163 (0.8)	
Native American or Alaskan Native	180 (0.4)	150 (0.7)	
Other	1641 (2.7)	569 (2.8)	
Missing	2,219 (4.9)	2,245 (11.0)	
Age <1	2,174 (4.8)	1,710 (8.4)	<0.0001
1-4	3,960 (8.8)	1,610 (7.9)	
5-14	7,865 (17.4)	2,164 (10.6)	
15-24	7,741 (17.1)	1,819 (8.9)	
25-44	11,374 (25.2)	3,613 (17.8)	
45-64	8,159 (18.1)	5,333 (26.2)	
65+	3,925 (8.7)	4,085 (20.1)	

## Results

- In 2010, there were a total of 655,532 individuals diagnosed with asthma in the State of Louisiana; 69% were seen in the ER and 31% were admitted to the hospital.
- Females were more likely to be seen in the LAER and LAHIDD, 61% and 65% respectively.
- There were large disparities in race between the LAER and LAHIDD which was statistically significant, ( $\chi^2$  2,363, p-value <0.0001).
- Blacks were more likely to be diagnosed in the LAER verses being admitted to the hospital, 53% and 35% respectively; and Whites were more likely to be diagnosed in the hospital verses the ER, 50% and 38% respectively.
- There were disparities in age between LAER and LAHIDD which were statistically significant, ( $\chi^2$  3,662, p-value <0.0001).
- The ER diagnosed more asthma in the 25-44 and 45-64 year old groups, 25% and 18% respectively, and the least in <1 and >65 age groups, 5% and 9% respectively.
- LAHIDD diagnosed more asthma in age groups 45-64 and >65 year olds, 26% and 20% respectively, and the least in 1-4 and <1 year olds, both 8%.

## Conclusions

The 2008 Louisiana Asthma Surveillance Report (LASR) reported African Americans had the highest rate of asthma diagnoses between 2005 and 2008. These findings are comparable with the LAER data but in the LAHIDD hospitalization whites had the highest rate of asthma diagnoses in 2010, followed by blacks. The LASR also reported residents between the ages of 18-24 doubled in asthma diagnoses in 2008. These findings are similar to the percentage of asthma diagnoses in LAER but were different among those who were diagnosed with asthma in the hospitalization data, 17% versus 9% respectively. Another big disparity between the ER and hospitalization data was among the elderly with more asthma diagnoses in the hospital compared to the ER, 20% versus 9% respectively. These findings are probably related to the elderly having Medicare and can better afford the cost of hospitalization.

The issue of healthcare disparities is most likely being reflected between the two surveillance systems. When trying to analyze the burden of any disease, there must be an understanding of where the data was collected from and how generalizable it is to the population being analyzed.

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