

# Asthma Outcomes and Physician Language Ability in an Urban, Minority Cohort

*Lisa Diamond*

## A. Study Purpose and Rationale

In 2002, it was estimated that approximately 20 to 30 million people in the United States were affected by asthma.<sup>1,2,3,4</sup> In New York City, one in eight adults report that they have been diagnosed with asthma at some point in their life.<sup>5</sup> Asthma is more prevalent among minorities and people with low incomes.<sup>6,7</sup> Nationwide, non-Hispanic blacks are affected at a rate 29% higher than non-Hispanic whites, and asthma prevalence rates for Hispanics fall between these two groups.<sup>8</sup> In New York City, however, Hispanic adults have the highest prevalence rates of current asthma.<sup>9</sup>

In 2002, an estimated 11.9 million Americans had an asthma attack, about 60% of the total population of people with asthma. Asthma attacks are more common in children, and asthma attack rates are highest in non-Hispanic blacks.<sup>10</sup> In 2002, over 2.9 million Hispanics were diagnosed with asthma and 1.1 million of them reported an asthma attack within the past year.<sup>11</sup> Since 1990, the rest of the United States has seen a decrease in asthma morbidity and mortality but New York City has seen a disproportionate increase.<sup>12</sup> In 2000, the asthma hospitalization rate in New York City was 3.36 per 1000 and children were almost twice as likely to be hospitalized for asthma compared to children in the US as a whole. Also in 2000, there were 204 deaths due to asthma in NYC, with 69% of these occurring in people 45 years old and older. The hospitalization rates for adults in lower-income areas were 20.9 per 1000 compared to 3.62 per 1000 in higher income areas. The hospitalization rate for asthma in Washington Heights was 4.91 per 1000.<sup>13</sup> Studies have shown that Hispanics of Caribbean origin, a large concentration of whom live in Washington Heights, may have higher asthma prevalence than other Hispanic asthma subgroups.<sup>14,15</sup>

In 2001, there were 11.3 million visits to physician offices for asthma and in 2002, there were 1.9 million visits to Emergency Departments attributed to asthma.<sup>16</sup> The approximated economic cost of asthma is \$14 billion annually, including \$4.6 billion in lost productivity. The estimated annual cost of asthma-related inpatient hospital services is over \$4 billion.<sup>17</sup>

One of the goals of Healthy People 2010 was to decrease asthma-related deaths, hospitalizations, ER visits and life limitations for those affected.<sup>18</sup> Preventing ER visits and hospital admissions for asthma is one measure of successful management of asthma in the primary care setting. Many asthma-related hospitalizations, ER visits, and missed work and school days could be avoided if patients have appropriate medications and management.<sup>19,20</sup> For example, a 2003 study showed that only 69.7% of patients with persistent asthma were getting inhaled steroids, an accepted strategy for management of this severity of asthma. Inhaled steroids were shown in one study to confer a 45% reduction in repeat ED visits.<sup>21</sup> Another study investigating the quality of chronic asthma care showed that asthmatics were receiving only 54% of recommended quality indicators, including medications and education from their physicians.<sup>22</sup>

In addition, racial disparities specific to asthma care have been noted.<sup>23</sup> According to the 2002 National Health Disparities Report, the Hispanic population in the United States is currently over 35 million (12.5% of the population).<sup>24</sup> About 47 million people speak a language other than English at home. Almost half do not speak English very well.<sup>25</sup> Several studies have shown decreased satisfaction and adherence with recommended therapies among Spanish-speaking patients, as well as improvement in these outcomes with the use of Spanish-speaking physicians and/or professional translators.<sup>26, 27, 28, 29</sup> Black and Hispanic patients are less likely to report that their health care provider explains things in a way that they can understand. The same has been shown for lower income adults of all races, lower educational level, and the uninsured.<sup>30</sup>

This study is being designed to determine whether the patients of Spanish-speaking physicians have lower Emergency Room visits and hospitalizations compared to the patients of non-Spanish speaking physicians.

## B. Study Design and Statistical Analysis

This is a prospective, longitudinal, observational study, which will determine the effect of having a Spanish-speaking physician on asthma ER visits and hospitalizations. The data will be analyzed from the entire WebCIS dataset, which includes outpatient visits at the Associates in Internal Medicine (AIM) clinics, ER visits, and hospitalizations. The study period will begin 1/1/2001 until 12/31/2003, which corresponds to the dates used for a pilot study using similar measurements and outcome variables, but which used a different data source.

ER visits and hospitalization rates by physician will be used as the primary outcome variable. The variable will be constructed by taking the total number of ER visits and hospitalizations in a physician's panel divided by the number of patients with asthma in that physician's panel. The outcome variable will allow us to analyze those patients with ER visits and hospitalizations for asthma during the study period and to identify predictors of variation in these rates. Using a physician-based outcome variable allows for pooling of the patients in a given physician's panel, thus reducing the impact of asthma severity as a confounding variable. The outcome variable construct is as follows:

$$\frac{\text{Total number of asthma-related ER visits and hospitalizations in a physician's patient panel}}{\text{Number of patients with asthma in the physician's panel}} = \text{Asthma visit rate by Physician}$$

During the study period (1/1/2001 until 12/31/2003), there were 172 AIM providers, including 43 attendings (who see approximately 60% of AIM patients) and 129 residents. Assuming that approximately 50% of the providers speak Spanish, an unpaired t-test was used to determine the effect size. Given the known sample size of 86 in each group, and assuming a standard deviation of ER visits and hospitalizations across subjects of 0.5, an effect size of 0.21 can be detected between ER visit and hospitalization rates for Spanish speaking physicians and non-Spanish speaking physicians.

ER visits will be identified using the WebCIS data to identify patients for whom an International Classification of Diseases code for asthma (ICD9 = 493.00-493.92) was used as the primary diagnosis. Hospitalizations for AIM patients with asthma will be identified by the appropriate Diagnosis Related Groups code for asthma (DRG = 088, 096-098) during the study period.

Physician language ability will be coded by the principal investigator, Alex Montero, MD, who will use interpreter log books and institutional knowledge to rate each physician's Spanish speaking ability on a five point scale (from no Spanish at all to native Spanish speaker). Bivariate analyses will be performed on all of the variables, to identify factors associated with ER visits and hospitalizations. These variables will be analyzed using either unpaired t-tests or ANOVA, depending on the variables in question. For example, the Spanish speaking variable is categorical but may not have a normal distribution. The data can be analyzed using the five categories and an ANOVA test or, alternatively, the data from this variable may be dichotomized, to compare physicians without any Spanish at all to physicians with some Spanish. The independent variable is physicians' Spanish-speaking ability. Secondary variables to be analyzed are other physician variables, such as physician training status (attending vs. resident), physician gender, and adherence to published asthma guidelines (ordering pulmonary function tests, referral to a pulmonologist, and prescription of appropriate medications by severity of asthma). Patient variables will also be analyzed, such as asthma severity, educational level, and insurance status. Multivariate analyses of factors related to ER visits and hospitalizations will be performed using multiple regression, to determine how much variation in ER visit/hospitalization rates can be explained by the predictors.

**C. Study Procedure**

Asthma patients seen at the AIM clinic during the study period will be identified in WebCIS by ICD9 code (ICD9 = 493.00-493.92). This way, asthma patients of all severities can be included in the study. All data will be obtained from the WebCIS database. In order to determine a particular physician's panel, the Cadence computer scheduling program will be linked with WebCIS data to sort patients by provider. Once these data are linked, identifying information, such as medical record numbers, will be stripped from the data prior to analysis by the investigators. Data to be collected from the WebCIS record are as above.

**D. Study Drugs**

N/A

**E. Medical Device**

N/A

**F. Study Questionnaires**

N/A

**G. Study Subjects**

Inclusion criteria:

- Patients seen at least twice at AIM East or AIM West
- At least one WebCIS diagnosis of asthma (ICD9 = 493.00-493.92)
- Average of two clinic visits per year during the study period (1/1/01 – 12/31/03)

Exclusion criteria:

- Patients with comorbid diagnoses which can confound an asthma admission (e.g. COPD, CHF, restrictive lung disease, sarcoidosis)
- Patients on systemic steroids for other conditions

**H. Recruitment of Subjects**

Subjects will be identified by using WebCIS to find all asthma patients at AIM with ICD9 codes indicating asthma.

**I. Confidentiality of Study Data**

The data will be available only to study investigators and it will be maintained in a secure location.

**J. Potential Conflict of Interest**

N/A

**K. Location of the Study**

Associates in Internal Medicine clinic, as discussed above.

**L. Potential Risks**

Patients will not incur any foreseeable risk associated with this study.

**M. Potential Benefits**

Patients will not incur any direct benefits from this study.

**N. Alternative Therapies**

N/A

**O. Compensation to Subjects**

N/A

**P. Costs to Subjects**

N/A

**Q. Minors as Research Subjects**

N/A

**R. Radiation or Radioactive Substances**

N/A

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