

Decreases in Hispanic and non-Hispanic asthma mortality

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Background: Rates of death from asthma in the United States increased from 0.8 per 100,000 general population in 1977–1978 to 2.1 in 1994–1996, but they have decreased since then to 1.5 in 2001.

Objective: To investigate changes in asthma mortality among Hispanics in the United States.

Methods: Collection and graphing of data from the National Center for Health Statistics identifying asthma (*International Classification of Diseases, Tenth Revision* codes J45–J46) as the underlying cause of death in the 50 United States and the District of Columbia among Hispanics and non-Hispanics.

Results: Deaths from asthma among Hispanics decreased from 320 in 1999 to 274 in 2001, whereas deaths among non-Hispanics decreased from 4,324 to 3,976. Rates of death from asthma among Hispanics decreased from 1.0 per 100,000 general population in 1999 to 0.7 in 2001, whereas those for non-Hispanics decreased from 1.84 to 1.6. Rates have been much higher for non-Hispanic blacks than for non-Hispanic whites but have decreased for both. Death rates from asthma have been higher among Hispanic females than males but have decreased for both.

Conclusions: Asthma mortality in the United States has been decreasing since 1999 among Hispanics and non-Hispanics. These changes are consistent with better management of asthma.

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INTRODUCTION

Deaths from asthma in the United States increased from 1,674 in 1977 to 5,667 in 1996 but have decreased since then to 4,269 in 2001.^{1,2} Rates of death increased from 0.8 per 100,000 general population in 1977–1978 to 2.1 in 1994–1996, but they have decreased since then to 1.5 in 2001. Implementation in 1979 of the *International Classification of Diseases, Ninth Revision (ICD-9)* accounted only partly for the increase that began in 1979, and adoption of the *ICD-10* in 1999 explained only part of the subsequent decreases.² Mortality data for the Hispanic population have been available for the entire United States since only 1997 and most readily available for asthma only since 1999.² To investigate trends, I graphed asthma mortality data for Hispanic and non-Hispanic populations in the United States.

METHODS

The National Center for Health Statistics has supplied data from all the death certificates that have identified asthma (*ICD-10* codes J45–J46) as the underlying cause of death in the 50 United States and the District of Columbia, including rates of death from asthma and age-adjusted rates by Hispanic origin, race for the non-Hispanic population, and sex.^{2–4} Racial designations are those of the National Center for Health Statistics.

RESULTS

Deaths from asthma among Hispanics in the United States have decreased from 320 in 1999 to 274 in 2001, whereas deaths from asthma in the non-Hispanic population have decreased from 4,324 to 3,976 (Fig 1). Rates of death from asthma decreased for the Hispanic population from 1.0 per 100,000 general population in 1999 to 0.7 in 2001 and for the

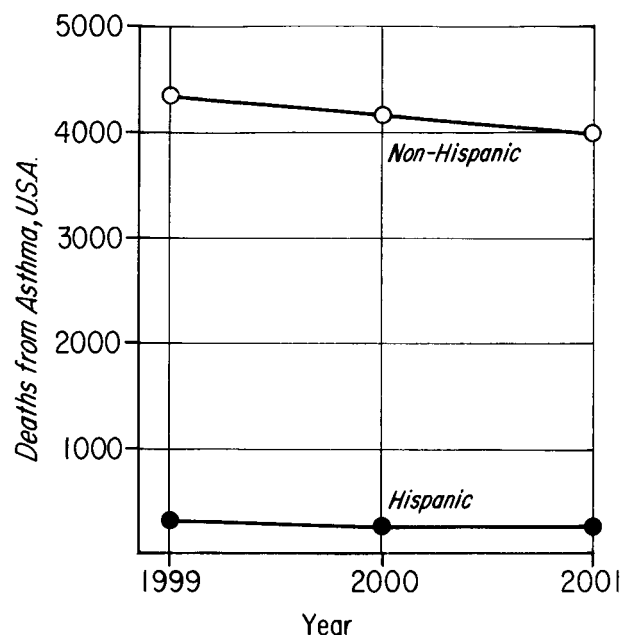


Figure 1. Deaths from asthma in Hispanic and non-Hispanic populations in the United States by year.

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non-Hispanic population from 1.84 in 1999 to 1.6 in 2001 (Fig 2). Rates for non-Hispanic whites decreased from 1.5 in 1999 to 1.4 in 2001, and rates for non-Hispanic blacks decreased from 3.4 in 1999 to 3.1 in 2001. Rates of death from asthma in Hispanic females and males decreased from 1.3 and 0.8 in 1999 to 1.0 and 0.5 in 2001, respectively (Fig 3).

Age-adjusted rates of death correct for changes in the age distribution of the population by calculating from the age-specific rates the rates that would have prevailed in the standard population with the same age distribution as that of the United States in 2000 (with an overall older age distribution than that of the Hispanic population). Age-adjusted rates of death from asthma in Hispanics have decreased from 1.7 in 1999 to 1.4 in 2001, and those in non-Hispanics have decreased from 1.7 in 1999 to 1.5 in 2001. Rates of death from other chronic lower respiratory diseases (*ICD-10* codes J44 and J47) in Hispanics also have decreased, from 7.0 in 1999 to 6.0 in 2001, with decreases in non-Hispanics from 40.6 in 1999 to 40.0 in 2001.^{2,3}

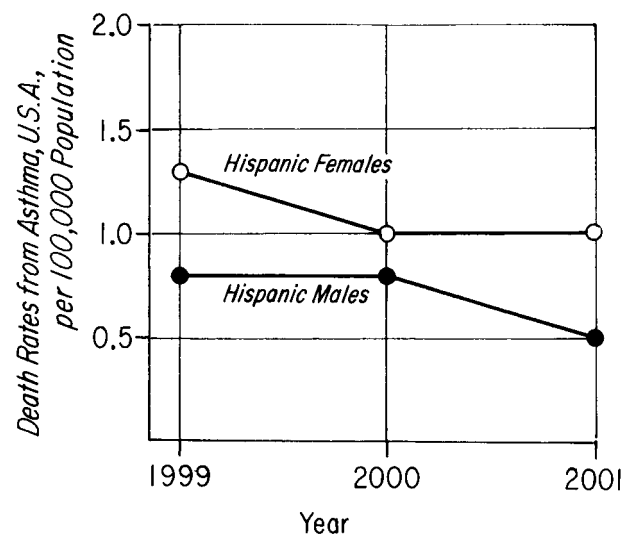


Figure 3. Rates of death from asthma in Hispanics in the United States by sex and year.

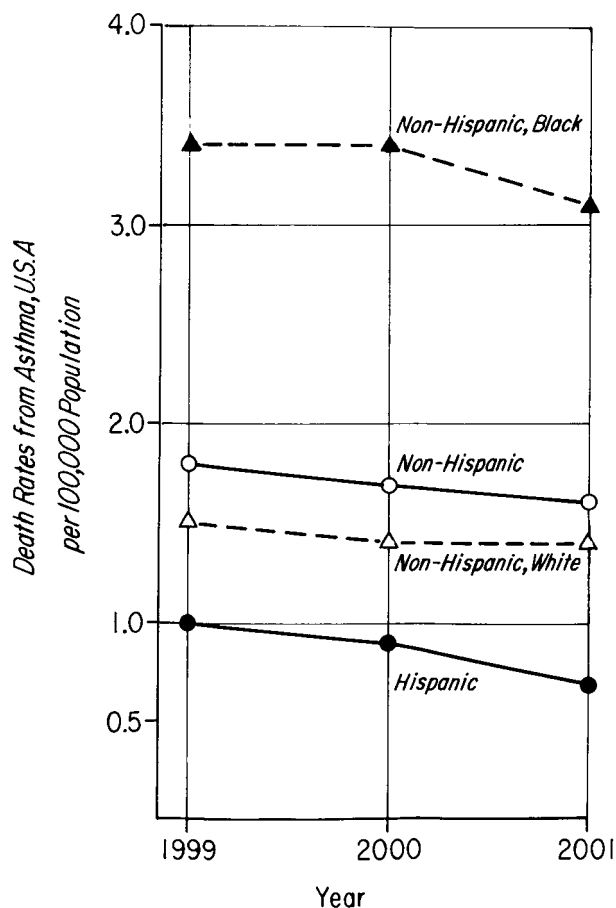


Figure 2. Rates of death from asthma in Hispanic and non-Hispanic populations in the United States by year and in non-Hispanic populations by race.

DISCUSSION

Interpretation of these data is complicated by the diversity of the Hispanic population. Hispanic mortality data include people of any race and many different heritages. Hispanics were an estimated 13% of the population of the United States in 2001.² An estimated 66% of the Hispanic population was of Mexican origin, 9% Puerto Rican, 4% Cuban, and 21% other Hispanic (Fig 4).² Asthma prevalence and mortality have differed among Hispanics of different heritage. Asthma mortality has been highest in Hispanics of Puerto Rican ancestry and lowest in those of Mexican heritage (Table 1).⁵

Differences in asthma mortality rates among different populations can be due to differences in the prevalence of asthma, genetic differences, environmental differences, or differences in availability or utilization of medical care. The prevalence of asthma in 2002 was higher in Puerto Ricans than in residents of the remainder of the United States and

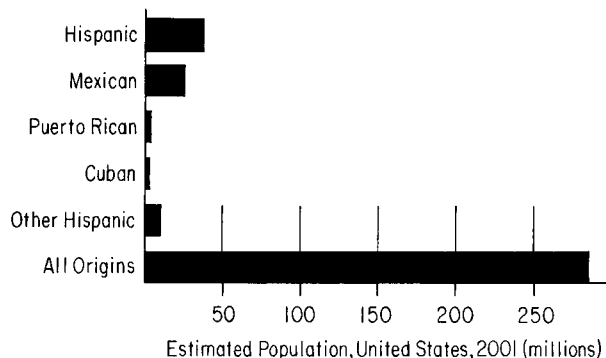


Figure 4. Estimated population according to specified Hispanic origin, United States, 2001.²

Table 1. Annual Asthma Mortality, United States, 1990–1995*

	Crude rate	Age-adjusted rate†
Hispanic		
Mexican American	0.58	0.92
Cuban American	2.30	1.58
Puerto Rican	3.18	4.09
Other	1.23	1.56
Non-Hispanic		
White	1.93	1.47
Black	3.60	3.81
Other	1.56	1.95

* Per 100,000 general population.⁵

† Adjusted to the 1970 standard US population.

territories as determined by the Behavioral Risk Factor Surveillance System, a random-digit-dialed telephone survey of the noninstitutionalized, civilian US population 18 years and older in the 50 states, the District of Columbia, Guam, Puerto Rico, and the US Virgin Islands.⁶ Lifetime prevalence was reported to range from a low of 8.6% in South Dakota to a high of 19.6% in Puerto Rico. The prevalence of current asthma was reported to range from a low of 4.7% in the US Virgin Islands to a high of 11.5% in Puerto Rico. Overall, the median rates for the 54 reporting areas were 11.9% for lifetime asthma and 7.6% for current asthma.⁶

Further details were reported from 17 states, the District of Columbia, and the US Virgin Islands, including current asthma among 5.0% of Hispanics compared with 11.6% of Hispanics in Puerto Rico.⁶ Current asthma was reported by 9.3% of non-Hispanic blacks and by 7.6% of non-Hispanic whites in these 19 areas.⁶ This high prevalence of asthma among Puerto Ricans agrees with data from the Hispanic Health and Nutrition Examination Survey of 1982 through 1984, which found a lifetime prevalence of asthma in 20.1% of Puerto Rican children 6 months through 11 years of age in New York, NY, compared with 8.8% of Cuban children in Miami, FL, and 4.5% of Mexican American children in the Southwest.⁷ Current prevalence was reported in 11.2% of the Puerto Rican children, 5.2% of the Cuban children, and 2.7% of the Mexican American children. The Second National Health and Nutrition Examination Survey of 1976 through 1980 found a prevalence of current asthma in 5.9% of non-Hispanic black children and in 3.3% of non-Hispanic white children, with lifetime prevalences of 9.1% and 6.4%, respectively.⁷

A large survey of Connecticut families disclosed asthma prevalences of 18.4% in Hispanic children younger than 18 years (mainly Puerto Rican), 11.3% in black children, and 7.4% in non-Hispanic whites.⁸ Socioeconomic status and environmental tobacco smoke exposure did not account for the differences. A survey of 5- to 7-year-old schoolchildren in San Juan, Puerto Rico, found that 43.2% of those attending public schools and 39.4% of those attending private schools had had physician-diagnosed asthma, and 32.6% and 23.7%,

respectively, had current asthma.⁹ More frequent emergency department visits, admissions to the hospital, and absenteeism among those attending public schools suggested that socioeconomic status might be a risk factor. Latinos living in the same neighborhood in Brooklyn, NY, reported quite different prevalences of current asthma: 5.3% in Dominicans and other Latinos compared with 13.2% in Puerto Ricans.¹⁰ Location, household size, and educational attainment did not explain this difference, implicating genetic factors.

Asthma has been not only more prevalent but also more severe in Puerto Ricans than in Mexicans with asthma, as indicated by worse airway obstruction, less responsiveness to inhaled albuterol use, more frequent hospital admissions, and earlier age at onset of asthma.¹¹ Some of these differences are partly accounted for by ethnic-specific pharmacogenetic differences in response to albuterol.¹² Genomewide screens for asthma-susceptibility loci and for atopy, defined by skin sensitivity to common inhalants, have implicated multiple chromosomal regions in combinations that may differ among Hispanic Americans, African Americans, and European Americans.^{13,14}

Mexican Americans born in the United States are more likely to report ever having had asthma than those born in Mexico. Analysis of data from the National Health and Nutrition Examination Survey of 1988 to 1994 disclosed a lifetime prevalence of asthma in 7% of those born in the United States compared with 3% of those born in Mexico.¹⁵ National Health Interview Surveys of 1997 through 2001 disclosed a lifetime prevalence of asthma in 8.1% of those born in the United States but in only 2.5% of those born in Mexico.¹⁵ These observations suggest that changes in lifestyle or environmental exposures after immigration affect the prevalence of asthma.

Disparities in asthma mortality rates raise the question of differences in management, although rates of death from asthma have been lower in Hispanics (except for Puerto Ricans) than in whites. Analysis of 1994 Massachusetts Medicaid data for children 2 to 18 years of age disclosed 3,676 children with persistent asthma, of whom only 12% had seen an asthma specialist in the previous year.¹⁶ The Hispanic children were 39% less likely than the white children to have seen such a specialist. Although there were no differences in the frequency of prescription of anti-inflammatory drugs in these children, a 1996 to 1998 community survey of asthmatic children in Connecticut and Massachusetts found significantly less use of inhaled corticosteroids among the Hispanic children vs the white children.¹⁷ The Third National Health and Nutrition Examination Survey of 1988 to 1994 identified a significant association between use of the Spanish language and inadequate treatment for “moderate or severe asthma” as defined by no use of inhaled corticosteroids, cromolyn, or theophylline within the previous month.¹⁸ Analysis of data from the Third National Health and Nutrition Examination Survey revealed that Mexican American children had less health care access and use than non-Hispanic

white and black children even after controlling for socioeconomic status and health insurance status.¹⁹

Consensus guidelines for the diagnosis and management of asthma released in 1991,²⁰ modified in 1997,²¹ and further modified in 2002²² have all emphasized the value of inhaled corticosteroids in the effective management of asthma. Increased sales of inhaled corticosteroids and leukotriene antagonists and long-acting β -adrenergic agonists have been associated with stabilization and subsequent decreases in asthma mortality rates in the United States.²³ Regardless of the causes of racial and ethnic differences in asthma mortality rates, the recent decreases in all populations in the United States are most likely due to improvements in management.

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