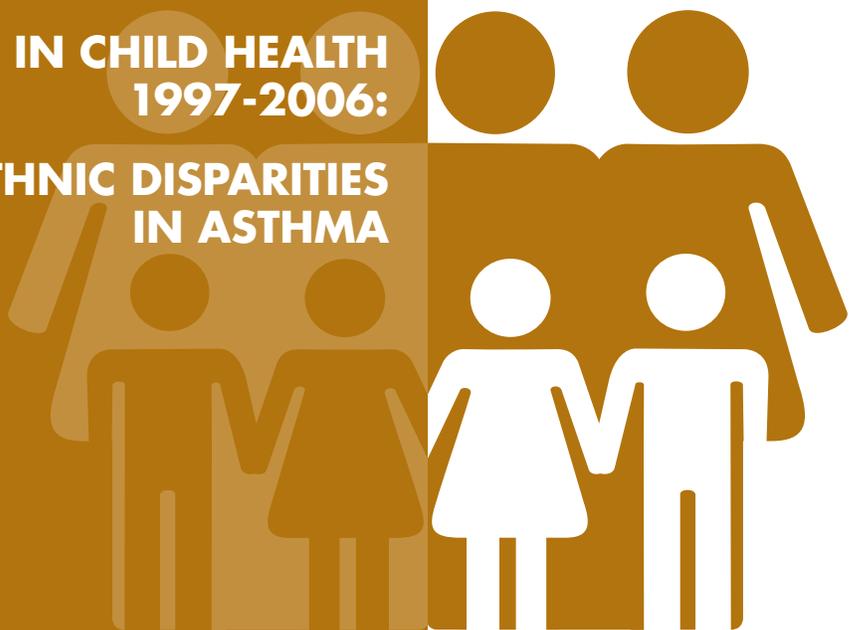


**TRENDS IN CHILD HEALTH
1997-2006:
ASSESSING RACIAL/ETHNIC DISPARITIES
IN ASTHMA**



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ANNA L. WHEATLEY**

APRIL 2009



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FOREWORD

The health of children is a direct reflection and a critical measure of a nation's overall quality of life. For that reason, the persistent disparities in child health indicators across racial and ethnic lines – such as the fact that asthma prevalence is highest among Latino children of Puerto Rican origin and among African American children – should raise concern in every American community. Our country can do and be better than this.

Promoting greater knowledge and understanding of these disparities is a key objective of the Joint Center for Political and Economic Studies, which, with generous support from the W.K. Kellogg Foundation, has analyzed data for selected indicators on the health of children and has examined trends over time (1997-2006). These indicators—specifically, low birthweight, rated health status, unmet dental care need, ADHD/ADD diagnosis, asthma diagnosis, learning disability diagnosis and activity limitation—provide insight into an array of factors that can influence health and quality of life throughout the lifespan.

The findings from this analysis are presented in a series of issue briefs, each of which highlights differences in health outcomes by race/ethnicity (for black, white and Hispanic children). In this brief, racial/ethnic disparities in asthma prevalence are explored.

I would like to extend a special thanks to Dr. Wilhelmina Leigh of the Joint Center and her research assistant, Anna L. Wheatley. Their work, along with that of many other Joint Center staff members, has produced a series of briefs that will prove invaluable to our national policymakers as they look to improve our health care system. In particular, we hope that the information herein will help them in their efforts to craft new policies and programs that will deliver the broadest possible benefits and, at the same time, have the greatest impact on expanding hope, opportunity and improving the quality of life for all Americans.

Ralph B. Everett
President and CEO
Joint Center for Political and Economic Studies

Asthma is the primary cause of emergency room visits, hospitalization and school absence among children (Currie 2005). This potentially life-threatening condition is one of the leading chronic childhood diseases, a major public health problem and a major cause of childhood activity limitation and disability in the United States (Akinbami 2006b). With diagnosis based on episodes of blocked airways, asthma affects a person's ability to breathe freely. Because it results both in direct medical expenses and indirect costs (e.g., limited ability to play, learn and sleep), asthma places a substantial burden on children and their families.

In 2005, 12.7 percent of all children under the age of 18 had been diagnosed with asthma at some point in their lives, and 70 percent of these children were reported as still having asthma (Akinbami 2006b). During the 1980s and 1990s, asthma prevalence increased to historically high levels, at which they have remained, particularly among low-income children of color (Akinbami and Schoendorf 2002; McDaniel, Paxson and Waldfogel 2006).

This brief examines the lifetime prevalence of asthma among children under the age of 18 who are African American, Hispanic or white. Differences between and similarities among the three groups of children are noted. Pair wise comparisons are made among the three racial/ethnic groups of children overall and between pairs of children of the various racial/ethnic groups in families with comparable sociodemographic characteristics.

BACKGROUND

When non-Hispanic black children, Hispanic children and non-Hispanic white children overall are compared, non-Hispanic black children are most likely to have received an asthma diagnosis. When data for Hispanic subgroups are used, however, this pattern changes. According to 2005 data, children of Puerto Rican origin are the most likely of all children to have a lifetime asthma diagnosis (22 percent), followed by non-Hispanic black children (13 percent) and white children (11.3 percent) (Akinbami 2006a).

Rates associated with more severe asthma outcomes (i.e., emergency department visits, hospitalizations and deaths) are notably higher for African American children than for other groups. (Estimates of these rates are unreliable for Puerto Rican children and are not reported in this brief). According to 2003-2004 data, the rates of asthma-related emergency department visits, hospitalizations and deaths for African American children exceed those for white children by 260 percent, 250 percent and 500 percent, respectively (Akinbami 2006a). In particular, the death rate for African American children was 9.2 per one million during this period, compared to only 1.3 per one million for white children (Akinbami 2006b).

Despite scientific advances that have improved understanding of the effects and treatment of asthma, little is known about its causes. While a variety of environmental agents (e.g., allergens, infections, weather changes and irritants, such as cigarette smoke and pollutants) have been identified as triggering asthma symptoms, much of the uncertainty surrounding the condition is related to the "mystery of its development" (Akinbami 2006a). In other words, it is unclear why some individuals become asthmatic and others do not. As such, exploring the possible causes of disparities that exist in asthma prevalence and other asthma-related indicators presents a particular challenge.

A large body of research (e.g., Akinbami et al. 2005; Litonjua et al. 1999; McDaniel, Paxson and Waldfogel 2006; Smith et al. 2005) has attempted to explain both the racial/ethnic differences in asthma prevalence and the increase in asthma prevalence over time. Though several factors have been associated with the development of asthma, research has yet to identify the causal agent. For example, asthma severity and prevalence have been linked to parental income and to educational and health-related behaviors, as well as to access to and use of medical care and health insurance. Several studies have also explored the links among factors such as urban residence, birthplace (particularly among Latino populations) and birthweight (Aligne et al. 2000; Brooks et al. 2001; Cohen et al. 2007; Lara et al. 2006; Nepomnyaschy and Reichman 2006). The relationship between low birthweight



and asthma is particularly intriguing given the large gaps between the prevalence of low-weight births among African American women and among Puerto Rican women when compared to white women (Martin et al. 2007).

Aside from the uncertainty surrounding the causes and risk factors for asthma, there is also speculation about the correspondence between reports of asthma diagnosis by family members and actual asthma prevalence (Akinbami et al. 2005). In particular, parental reporting of asthma diagnosis among black children may underestimate the asthma prevalence for this group that would be indicated by morbidity and mortality data (from hospital/medical records and vital statistics reports). Differences in health care utilization also are thought to influence the likelihood of asthma diagnoses. Proponents of this hypothesis point out that black children are more likely than white children to visit the emergency room rather than to receive consistent care from a given provider who may wait to observe chronic symptoms before making a diagnosis of asthma. This pattern also could contribute to a wider gap in asthma diagnosis between African American children and white children when based on reports by parents than warranted by actual asthma prevalence.

METHODOLOGY

This brief uses the definition of lifetime asthma diagnosis—i.e., whether a child had ever been diagnosed with asthma, as reported by a survey respondent—from the National Health Interview Survey (NHIS). Non-Hispanic white (white) children, non-Hispanic black (black) or African American children and Hispanic children under age 18 are compared on asthma prevalence thus measured for the years 1997 through 2006. The NHIS provides data for the major Hispanic subpopulations (Mexican American, Puerto Rican and Cuban) as well as for all Hispanic subpopulations combined. Data for Hispanic subpopulations are not used in this analysis, however, because of small sample sizes in each year between 1997 and 2006. Thus, the data analyzed for Hispanic children consider children of the various Latino subpopulations as a single group.

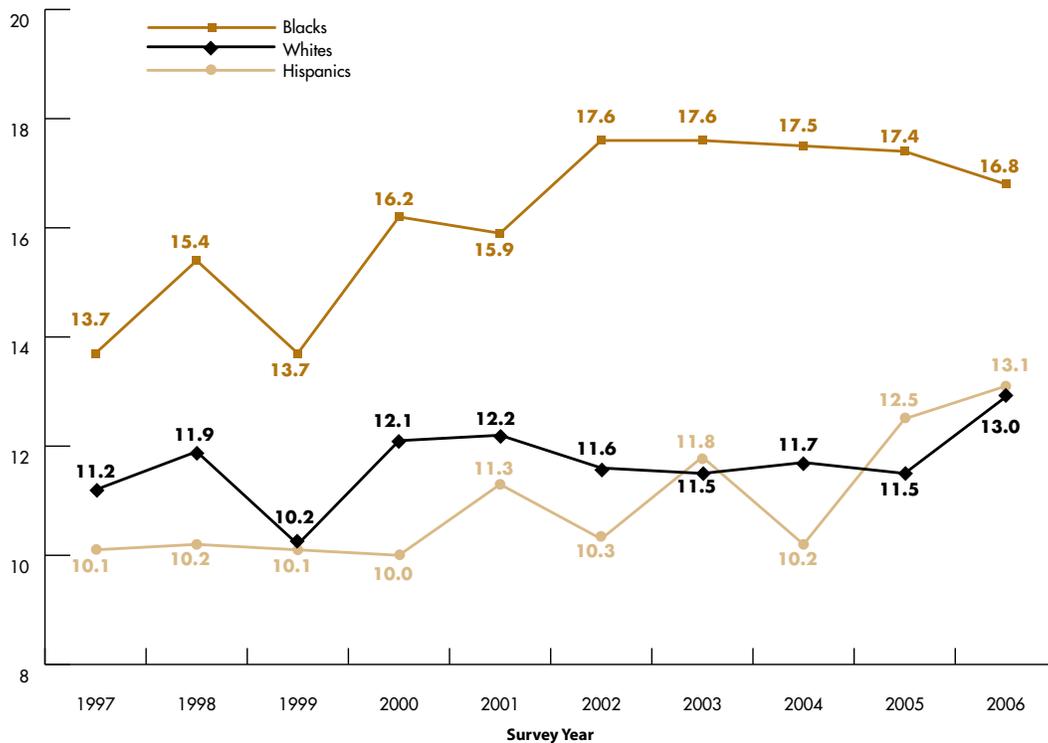
In each year between 1997 and 2006, comparisons of the percent of children who had ever been diagnosed with asthma were made first between children belonging to a pair of racial/ethnic groups as a whole. Then, to examine the ways in which differences in sociodemographic (i.e., socioeconomic, familial and demographic) characteristics are associated with differences in the prevalence of asthma between children belonging to pairs of races/ethnicities, children in families with characteristics corresponding to the following nine sociodemographic variables were compared.

- Region of residence—Northeast; North Central; South; and West
- Legal marital status (of householder)—Married; or Widowed, divorced, separated, never married or unknown
- Family type—Married-couple; Single-parent
- Educational attainment (of householder/spouse)—Less than high school; High school; Some college; Bachelor’s degree or higher
- Employment status (of household)—Zero-earner household; Single-earner household; Two-earner household
- Poverty status (of household or individual)¹—At or above poverty threshold; Below poverty threshold
- Private health insurance coverage status (of child)—Not covered; Covered

¹ The federal poverty threshold is determined by the U.S. Census Bureau, which uses a set of “money income” thresholds that vary by family size and ages of the members to determine who is in poverty. The official poverty thresholds are updated annually for inflation using the Consumer Price Index for All Urban Consumers (CPI-U). For example, in 2006, the poverty threshold for a family of four, including two related children under age 18, was \$20,444. If a family of this composition has an income below this threshold, they are officially considered to be in poverty (U.S. Census Bureau 2008).



Figure 1
Children who have ever been diagnosed with asthma,
by race/ethnicity, 1997-2006
(Percent)



Source: Joint Center tabulations of data from the National Health Interview Survey (NHIS)

- Medicaid coverage status (of child)—Not covered; Covered
- Health insurance coverage status (of child)—Not covered; Covered

These nine sociodemographic variables include a total of 23 categories and thus provide 23 subgroups of children for comparison.

The significance of gaps in the prevalence of asthma diagnosis between black children and white children, between Hispanic children and white children and between black children and Hispanic children was assessed using t-tests of differences of proportions with 90-percent confidence intervals.² The difference in asthma prevalence among children of the various racial/ethnic groups was determined to be significant if the gap was significant in at least seven years (out of the 10 years, 1997 through 2006). The term “indeterminate” is used to characterize gaps that are neither statistically significant nor statistically insignificant in a majority of years during the study period.

² For additional information about the tests of significance conducted at both the 90-percent confidence level and the 95-percent confidence level, contact Wilhelmina Leigh at wleigh@jointcenter.org.



FINDINGS

Over the 1997-2006 period, on average 16.2 percent of black children, 11.1 percent of Hispanic children and 11.7 percent of white children had ever been diagnosed with asthma (**Figure 1**). Overall, black children were more likely than both Hispanic children and white children to have ever been diagnosed with the ailment. Hispanic children and white children were equally likely to have been diagnosed with asthma.

Gaps by Sociodemographics

Though black children as a group were more likely than white children as a group to have been diagnosed with asthma, black children in only four sociodemographic subgroups are also more likely than their white counterparts to have been diagnosed with asthma (**Table 1**). Black children and white children are equally likely to have been diagnosed with asthma, when comparisons are made within a larger number (nine) of sociodemographic subgroups. For the remainder of the within-sociodemographic-subgroup comparisons (10 of 23 subgroups), the relationship between asthma diagnosis among black children and asthma diagnosis among white children is indeterminate.

Table 1
Black-White Differences in Asthma Diagnosis by Sociodemographic Variables

Sociodemographic Variables	Findings
Region of residence: North Central	Black children who live in the North Central are more likely than white children who live in the North Central to have been diagnosed with asthma.
Poverty status: at or above poverty threshold	Black children who live in families with incomes at or above the poverty threshold are more likely than white children in this same type of family to have been diagnosed with asthma.
Medicaid coverage status: not covered	Black children who are not covered by Medicaid are more likely than white children who are not covered by Medicaid to have been diagnosed with asthma.
Any health insurance coverage status: covered	Black children who are covered by any form of health insurance are more likely than white children who are covered by any form of health insurance to have been diagnosed with asthma.

The nature of differences is indeterminate in Hispanic-white and black-Hispanic comparisons within several sociodemographic subgroups as well. The large number of inconclusive relationships—due, in part, to large fluctuations in sample sizes from year to year during the study period—is indicative of the special challenge presented by analysis and discussion of factors associated with asthma prevalence.

Both for group comparisons overall and for comparisons of the majority of the sociodemographic subgroups included in this study, Hispanic children and white children are equally likely to have been diagnosed with asthma. In the few cases when Hispanic children and white children are not equally likely to have been diagnosed with asthma, the relationship between the frequency of asthma diagnosis for Hispanic children and for white children is indeterminate. In particular, the relationship between asthma prevalence is indeterminate when Latino children and white children in the following subgroups are compared:

residing in the Northeast, residing in the West, householder/spouse is married, family type is married-couple, not covered with private health insurance, not covered with Medicaid and not covered with any health insurance.

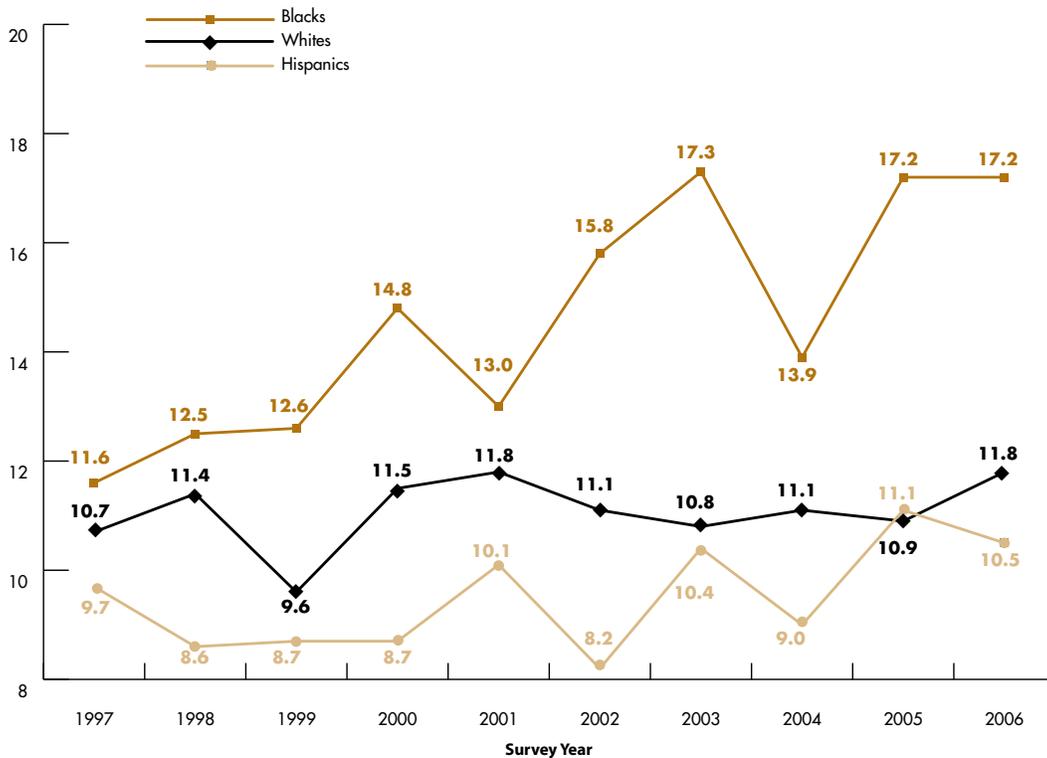
On the other hand, when black children and Hispanic children are compared, blacks are more likely than Hispanics to have been diagnosed with asthma in many of the sociodemographic subgroups (**Table 2**).

Table 2
Black-Hispanic Differences in Asthma Diagnosis by Sociodemographic Variables

Sociodemographic Variables	Findings
Region of residence: South	Black children who live in the South are more likely than Hispanic children who live in the South to have been diagnosed with asthma.
Region of residence: West	Black children who live in the West are more likely than Hispanic children who live in the West to have been diagnosed with asthma.
Marital status: Married	Black children in families in which the marital status of the householder is married are more likely than Hispanic children in this same type of family to have been diagnosed with asthma.
Family type: Married-couple	Black children in married-couple families are more likely than Hispanic children in this same type of family to have been diagnosed with asthma.
Educational attainment: less than high school	Black children in families in which the educational attainment of the householder/spouse is less than high school are more likely than Hispanic children in this same type of family to have been diagnosed with asthma.
Employment status: single-earner household	Black children in single-earner households are more likely than Hispanic children in single-earner households to have been diagnosed with asthma.
Poverty status: at or above poverty threshold	Black children in families with incomes at or above the poverty threshold are more likely than Hispanic children in this same type of family to have been diagnosed with asthma.
Private insurance coverage status: not covered	Black children who are not privately insured are more likely than Hispanic children who are not privately insured to have been diagnosed with asthma.
Medicaid coverage status: not covered	Black children who are not covered by Medicaid are more likely than Hispanic children who are not covered by Medicaid to have been diagnosed with asthma.
Any health insurance coverage status: not covered	Black children who are not covered by any form of health insurance are more likely than Hispanic children who are not covered by any form of health insurance to have been diagnosed with asthma.
Any health insurance coverage status: covered	Black children who are covered by any form of health insurance are more likely than Hispanic children who are covered by any form of health insurance to have been diagnosed with asthma.



Figure 2
Children in married-couple families who have ever been
diagnosed with asthma,
by race/ethnicity, 1997-2006
(Percent)



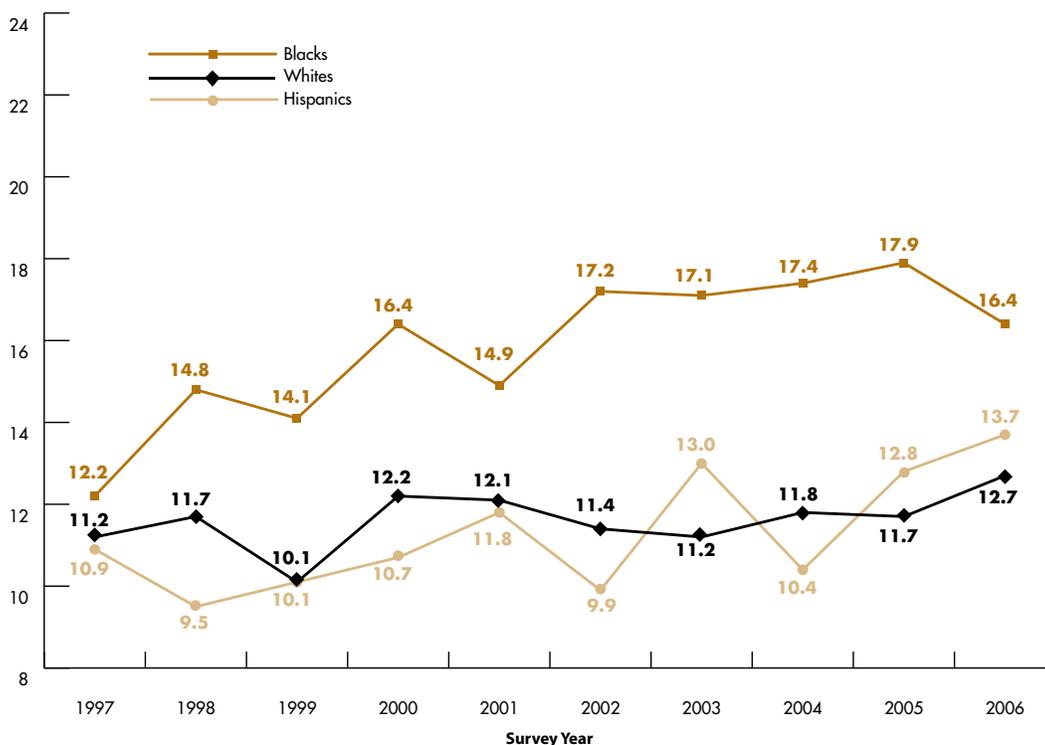
Source: Joint Center tabulations of data from the National Health Interview Survey (NHIS)

INFLUENCE OF SOCIODEMOGRAPHICS

Region of Residence

As **Table 1** shows, among children who live in the North Central region, blacks are more likely than whites to have been diagnosed with asthma during the study period. As shown in **Table 2**, among children who live in the South and among children who live in the West, black children are more likely than Hispanic children (who live in the same region) to have been diagnosed with asthma. These findings should be interpreted with caution, however, as many of the factors that affect asthma prevalence may also vary by region (Akinbami 2006b). Examples of these factors include the likelihood of accurate diagnosis and the composition of the population in a region. In other words, racial/ethnic differences in asthma prevalence by region may be confounded by population characteristics that are not fully disclosed on the surface—especially with respect to Latino children.

Figure 3
Children in families at or above poverty threshold who
have ever been diagnosed with asthma,
by race/ethnicity, 1997-2006
(Percent)



Source: Joint Center tabulations of data from the National Health Interview Survey (NHIS)

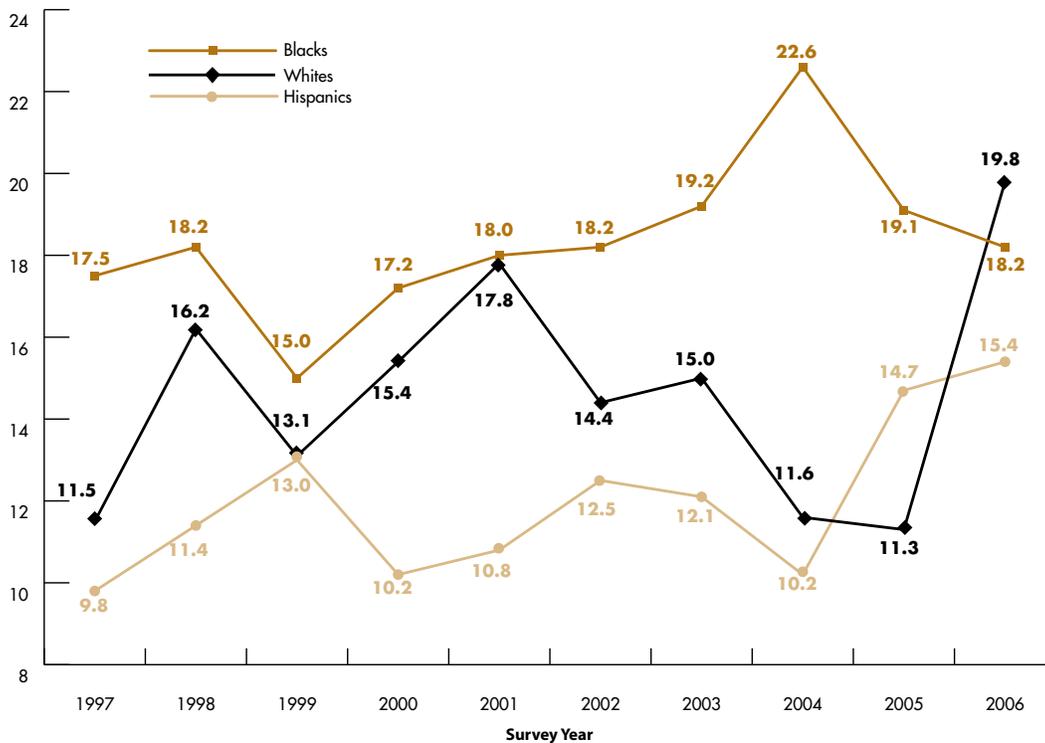
For example, when comparing children who live in the Northeast, African American children and Hispanic children as groups are equally likely to have been diagnosed with asthma. When Hispanic subgroups are isolated in other studies of asthma prevalence by race/ethnicity, however, Puerto Rican children have the highest rates of diagnosis. The fact that the Puerto Rican population tends to be concentrated in the Northeast may increase asthma prevalence for all Hispanic children in that region, so that the rate for all black children does not exceed the rate for all Hispanic children there (as it does in the South and the West).

Family Structure

Analysis of the disparities in asthma prevalence by the two characterizations of family structure—family type and marital status—shows that family structure is associated with racial/ethnic differences in asthma prevalence among children. Asthma prevalence differs notably by family type (i.e., single-parent versus married-couple) and by marital status (i.e., married versus widowed, divorced, separated, never married or unknown).



Figure 4
Children in families below poverty threshold who have
ever been diagnosed with asthma,
by race/ethnicity 1997-2006
(Percent)



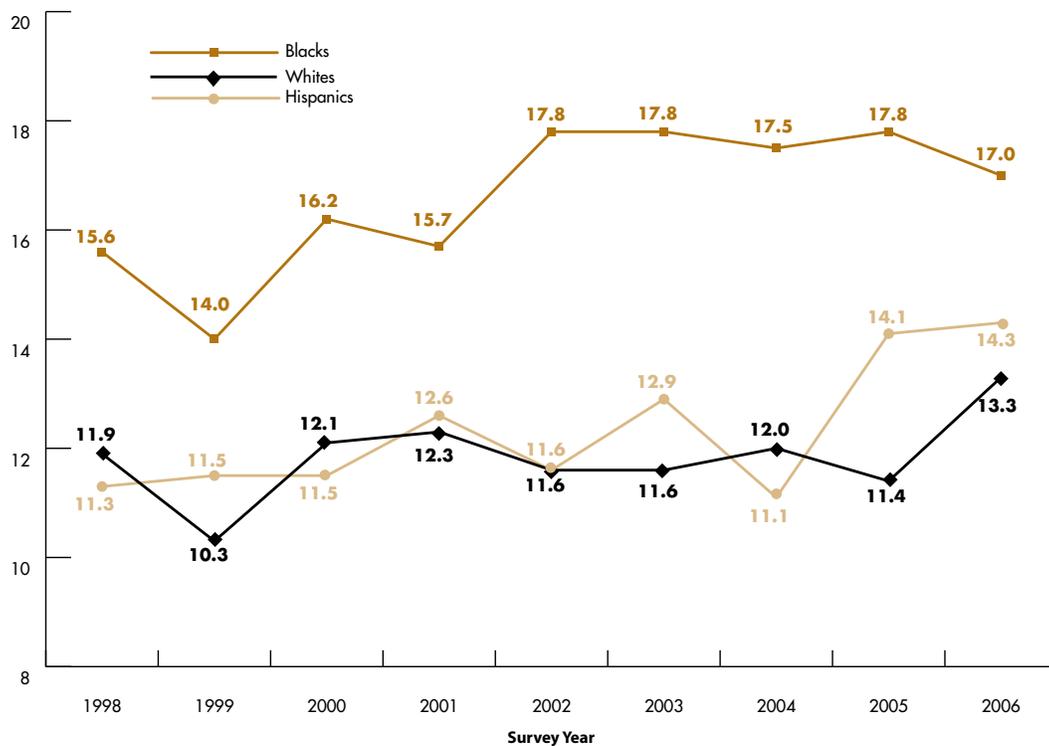
Source: Joint Center tabulations of data from the National Health Interview Survey (NHIS)

By family type, children in each of the three racial/ethnic pairs who live in families headed by a single parent are equally likely to have been diagnosed with asthma. Comparing children who live in married-couple families yields somewhat different results, however. When comparing children in married-couple families, black children are more likely than Hispanic children to have been diagnosed with asthma (**Figure 2**). In comparisons of white children with Hispanic children and of black children with white children, the relationship between the diagnosis rates is indeterminate.

Comparing asthma prevalence for children by the marital status of their family's householder—i.e., married versus widowed, divorced, separated, never married or unknown—yields similar results to the comparison by family type. When comparing children in families in which the householder's marital status is anything other than married, children in each of the three racial/ethnic pairs are found to be equally likely to report an asthma diagnosis. Among children in families whose householder reports the marital status of married, however, results differ by race/ethnicity. Black children are more likely than Hispanic children to have been diagnosed with asthma. In comparisons of white children with Hispanic children and of black children with white children, the relationship between the diagnosis rates is indeterminate.



Figure 5
Children covered by any form of health insurance who have
ever been diagnosed with asthma,
by race/ethnicity, 1998-2006
(Percent)



Source: Joint Center tabulations of data from the National Health Interview Survey (NHIS)

Poverty

Among families with incomes at or above the federal poverty threshold, black children are more likely than Hispanic children to have been diagnosed with asthma. Black children with incomes at or above the federal poverty threshold are also more likely than white children in this same sociodemographic subgroup to have received an asthma diagnosis (**Figure 3**). When comparing children with incomes *below* the poverty threshold, however, black children and white children are equally likely to have been diagnosed with asthma (**Figure 4**). In comparisons of black children with Hispanic children among families with incomes below the poverty threshold, the relationship between the diagnosis rates is indeterminate.

In other words, among children in families with higher incomes, as among children in all families, black children experience higher levels of asthma prevalence than either white children or Hispanic children. In families who live below the poverty threshold, however, the prevalence of asthma diagnosis for white children is not significantly different from that of black



children, and the relationship between Hispanic children and black children is indeterminate. In addition, the rates of asthma prevalence for both white children and black children in families with incomes below the poverty threshold are generally higher than the rates of prevalence for white children and black children who live at or above the poverty threshold, respectively (Figure 3 and Figure 4).

Health Insurance

Health insurance coverage seems to be an influential variable with respect to racial/ethnic differences in lifetime asthma prevalence. Specifically, black children and white children covered by Medicaid are equally likely to have been diagnosed with asthma. This contrasts with the comparison for black children and white children overall, in which black children as a group are more likely than white children as a group to have been diagnosed with asthma. The nature of differences between black children and Hispanic children covered by Medicaid is indeterminate. Significant differences are found, however, when comparing children who are *not* covered by Medicaid (i.e., either uninsured or covered by forms of insurance other than Medicaid). Among children who are not covered by Medicaid, black children are more likely than both white children and Hispanic children to have been diagnosed with asthma.

Black children are also more likely than both white children and Hispanic children to have been diagnosed with asthma when comparisons are made among children who are covered by any form of health insurance (Figure 5). Thus, black children and white children covered by Medicaid are equally likely to have been diagnosed with asthma, while black children and white children covered by any form of health insurance are not. This suggests that additional information is needed to better understand whether this distinction is due to differences between populations covered by various forms of insurance (i.e., low-income populations served by public health insurance versus higher-income populations served by private health insurance) and/or to differences in actual prevalence.

IMPLICATIONS

While the data suggest an overall black/white disparity in asthma prevalence, the nature of differences is much less clear when analyzed jointly by race/ethnicity and by sociodemographics. In only four of the sociodemographic subgroups are black children more likely than white children to have been diagnosed with the ailment. In a greater number of sociodemographic subgroups, black children and white children are equally likely to have been diagnosed with asthma. In nearly all of the family subgroups in which children are equally likely to have received an asthma diagnosis, children share a relatively “lower” or disadvantaged sociodemographic characteristic. For example, black children and white children are equally likely to have been diagnosed with asthma when comparing children in families whose householder/spouse has educational attainment of high school completion or less. The rates of asthma prevalence for black children and white children also are not significantly different from one another when comparing children with each of the following characteristics: in families with income below the poverty threshold, in single-parent households and covered by Medicaid. At the same time, black children are more likely than white children (in the same sociodemographic subgroup) to have been diagnosed with asthma when comparing children in families with income at or above the poverty threshold and children who are covered by any form of health insurance.

While the data suggest that white children and Hispanic children overall are equally likely to have received an asthma diagnosis, these findings should be interpreted with an awareness of differences that exist *within* the Hispanic population. As noted in the background section of this brief, 22 percent of Puerto Rican children had ever been diagnosed with asthma in 2005 (Akinbami 2006a). During the same year, the lifetime prevalence among Mexican American children was only 7.3 percent compared to 8.9 percent among all Hispanic children and 11.3 percent among non-Hispanic white children. The difference between the asthma

prevalence of Puerto Rican children (22 percent) and non-Hispanic white children (11.3 percent) is noteworthy, while the difference between asthma prevalence for all Hispanic children (8.9 percent) and all non-Hispanic white children (11.3 percent) is not. Thus, when analyzing asthma for Latino children, additional data need to be examined to get a complete understanding of disparities.

This discussion of these findings mirrors the uncertainty surrounding the causes and development of asthma. The underlying data for asthma and the indeterminate nature of differences for many of the cross tabulations together suggest that asthma is a health outcome that requires particular attention to sort out the complicated relationships among race/ethnicity and sociodemographic factors.



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Dr. Wilhelmina A. Leigh, a senior research associate at the Joint Center for Political and Economic Studies since 1991, conducts research in the areas of income security, housing and health. Prior to joining the Joint Center, she was a principal analyst at the U.S. Congressional Budget Office and worked for the Bureau of Labor Statistics, U.S. Department of Labor; the U.S. Department of Housing and Urban Development; the Urban Institute; and the National Urban League Research Department. She received her PhD in economics from the Johns Hopkins University and her AB, also in economics, from Cornell University.

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