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Racial and Ethnic Disparities in Potentially Preventable Hospitalizations, 2003

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Introduction

The quality of health care has been a focal point of both past and present U.S. health care policy, but significant disparities between whites and minorities persist.* One critical insight into health care quality is provided by the number of hospital admissions that could have been prevented had high quality primary and preventive care been provided. Higher rates of "preventable hospitalizations" identify areas where potential improvements in the health care delivery system and process of care can be made to improve health outcomes and decrease costs. Racial and ethnic differences in these rates may signal disparities in the quality of ambulatory care, as well as disparities in access to timely and effective treatment of certain conditions for specific populations.

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on the rate of hospitalization for conditions that might have been prevented with high quality primary and preventive care. Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators (PQIs) are used to develop hospitalization rates† for select chronic and acute conditions, as well as one birth outcome among four racial and ethnic groups—non-Hispanic whites, blacks (non-Hispanic), Hispanics, and Asian-Pacific Islanders (non-Hispanic). The results are presented as the hospitalization rate of the racial/ethnic group relative to the hospitalization rate for non-Hispanic whites. All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Findings

Racial and ethnic disparities in preventable hospitalizations for diabetes

Hospitalization rates for diabetes and diabetes complications varied considerably by race and ethnicity in 2003 (figure 1). When differences occurred, black and Hispanic individuals were consistently at

*National Healthcare Disparities Report, 2005. U.S. Agency for Healthcare Research and Quality. http://www.qualitytools.ahrq.gov/disparitiesreport/2005/browse/browse.aspx?id=5611

†Rates are adjusted by age and gender using the total U.S. population for 2000 as the standard population.

Highlights

- In 2003, racial and ethnic disparities existed in the rates of preventable hospitalizations, with blacks generally having the highest rates and Hispanics the second highest rates.
- The disparities were greatest for hospitalizations for chronic conditions such as diabetes, hypertension, and asthma. Compared with non-Hispanic whites, rates of admission for these conditions were about 3 to 5 times greater among blacks, and approximately 2 to 3 times greater among Hispanics.
- Compared with non-Hispanic whites, blacks had higher rates of preventable hospitalizations for 15 of 17 indicators, and Hispanics had higher rates of preventable hospitalizations for 14 of 17 indicators.
- Asians were less likely than non-Hispanic whites to be admitted for preventable hospitalizations, with 9 of 17 indicators being lowest in Asians.
- Blacks had the highest rates of preventable hospitalizations for all indicators related to diabetes and circulatory diseases. Hospitalization rates for hypertension and for diabetes without complications were 5 times higher for blacks than for non-Hispanic whites. Hospitalization rates for pediatric asthma, adult asthma, perforated appendix, dehydration, and low birth weight were also highest among blacks.
- Hispanics had the highest rates of admission for elderly asthma, pediatric gastroenteritis, and urinary tract infection.
- Admissions for asthma among patients 65 and older were 1.8 times more likely for Asians than for non-Hispanic whites—the only indicator where hospitalization rates were higher in Asians.

a higher risk for being admitted to the hospital, as compared with non-Hispanic whites. The rate of hospitalization for uncontrolled diabetes without complications was almost 5 times higher in blacks (relative rate of 4.98) and 3.6 times higher in Hispanics (relative rate of 3.56), as compared with non-Hispanic white patients. For long-term diabetes complications and a specific serious long-term complication—diabetes-related lower-extremity amputations—admission rates were higher among both blacks and Hispanics. Specifically, rates for blacks were 3.5 and 3.4 times higher, while admission rates for Hispanics were 2.9 and 2.8 times higher. Compared with non-Hispanic whites, hospitalization rates for short-term diabetes complications were 3.3 times higher in blacks, but only 1.3 times higher in Hispanics.

In contrast, rates of hospitalization were lowest among Asians for uncontrolled diabetes, diabetes-related lower-extremity amputations, and short-term diabetes complications. There were no differences in admission rates for long-term diabetes complications between Asians and non-Hispanic whites.

Racial and ethnic disparities in preventable hospitalizations for circulatory diseases

In 2003, racial disparities were also pronounced for the treatment of circulatory diseases (figure 2). These disparities were highest in the hospitalization rates for hypertension. In fact, blacks were nearly 5 times more likely to be hospitalized for hypertension than were non-Hispanic whites. Hispanics were more than 2.4 times more likely than non-Hispanic whites to be hospitalized for hypertension.

The likelihood of hospitalization for congestive heart failure was also highest in blacks, whose rate of hospitalization was more than 2.5 times higher than the rate of hospitalization among non-Hispanic whites. Hispanics were 1.7 times more likely than non-Hispanic whites to be hospitalized for this condition. Racial disparities were less pronounced for angina without a procedure: admission rates were 1.5 and 1.7 times higher for Hispanics and blacks, respectively. The risk among Asians for angina without a procedure was 0.75 times the rate for non-Hispanic whites (25 percent lower).

Racial and ethnic disparities in preventable hospitalizations for chronic respiratory diseases

Rates of admission for respiratory diseases, such as asthma, also varied by race and ethnicity (figure 3). In 2003, the risk of hospitalization for adult and pediatric asthma was highest among blacks. For example, blacks were 3.8 times more likely to be admitted for pediatric asthma and 3.0 times more likely to be admitted for adult asthma, as compared with non-Hispanic whites. However, Hispanics had the highest rate of hospitalization for asthma among patients ages 65 and older. Asians were 1.8 times more likely to be hospitalized for asthma among the elderly, as compared with non-Hispanic whites—the only indicator where hospitalization rates were higher in Asians.

Conversely, the rate of admission for chronic obstructive pulmonary disease (COPD) was similar among non-Hispanic whites, blacks, and Hispanics. Asians were 0.4 times as likely as non-Hispanic whites (60 percent less) to be hospitalized for COPD.

Racial and ethnic disparities in preventable hospitalizations for acute conditions

Racial disparities existed, but were less pronounced, in preventable hospitalizations for acute conditions (figure 4). The rate of hospitalization for perforated appendix and dehydration was highest among blacks (1.2 and 1.3 times the rate among non-Hispanic whites for these respective conditions.) Hispanics had the highest rates of hospitalization for pediatric gastroenteritis and urinary tract infection, as compared with non-Hispanic whites. Hispanics were 1.3 times more likely than non-Hispanic whites to be hospitalized for pediatric gastroenteritis and 1.8 times more likely to be hospitalized for urinary tract infection. Compared with non-Hispanic whites, the likelihood of hospitalization for bacterial pneumonia was nearly 1.3 times higher in blacks and Hispanics. Asians had the lowest rates of hospitalization for urinary tract infection, dehydration, and bacterial pneumonia.

Racial and ethnic disparities in preventable hospitalizations for birth outcomes

In 2003, the rates of low-weight births (i.e., the rate of all newborn infants who weigh less than 2500 grams) were highest among blacks (figure 5). In fact, the likelihood of low-weight birth was 1.8 times higher in blacks, as compared with non-Hispanic whites. Low-weight births were 0.9 times as likely among Hispanics (10 percent less) than among non-Hispanic whites.

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2003 State Inpatient Databases disparities analysis file. This file is designed to provide national estimates on disparities using weighted records from a sample of hospitals with good reporting of race and ethnicity from the following 23 states combined: AZ, CA, CO, CT, FL, GA, HI, KS, MD, MA, MI, MO, NH, NJ, NY, PA, RI, SC, TN, TX, VA, VT, and WI. The sample is designed to approximate a 40 percent stratified sample of U.S. community hospitals with information on all their discharges. Sampling stratifiers include hospital region, bed size, ownership, teaching status, and urban/rural location. The sample includes about 14.5 million discharges from more than 1,700 hospitals.

The population bases for rates were obtained from Claritas, a vendor that compiles data from the U.S. Census Bureau. Claritas uses intercensal methods to estimate population subgroups (Claritas, Inc., 2002).

Definitions

Community hospitals

Community hospitals are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). Community hospitals include OB-GYN, ENT, orthopedic, cancer, pediatric, public, and academic medical hospitals. They exclude long-term care, rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals, but these types of discharges are included if they are from community hospitals.

Unit of analysis

The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in one year will be counted each time as a separate "discharge" from the hospital.

Prevention Quality Indicators

The Prevention Quality Indicators (PQIs) are part of a set of AHRQ Quality Indicators (QIs) developed by investigators at Stanford University and the University of California under a contract with AHRQ. The PQIs are a set of measures that can be used with hospital inpatient discharge data to identify quality of care for "ambulatory care-sensitive conditions." These are conditions for which good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. PQI rates can also be affected by other factors, such as disease prevalence.

This Statistical Brief is based on PQI Version 2.1, revision 3. This PQI version includes measures for hospital admission rates for the following 16 ambulatory care-sensitive conditions:

- Lower-extremity amputations among patients with diabetes (a specific, serious, long-term complication of diabetes)
- Diabetes, long-term complications (i.e., chronic conditions such as renal, visual, neurological, and circulatory disorders, including lower-extremity amputations)
- Diabetes, short-term complications (i.e., acute conditions such as diabetic ketoacidosis, hyperosmolarity, and coma)
- Uncontrolled diabetes without complications
- Angina without procedure
- Hypertension
- Congestive heart failure
- Pediatric asthma
- Adult asthma
- Chronic obstructive pulmonary disease
- Pediatric gastroenteritis
- Perforated appendix
- Urinary tract infections
- Dehydration
- Bacterial pneumonia
- Low-birth weight

In addition, this Statistical Brief includes the adult asthma PQI rate for persons ages 65 and above, which is labeled "elderly asthma."

Further information on the AHRQ QIs, including documentation and free software downloads, is available at http://www.qualityindicators.ahrq.gov/index.htm. This Web site includes information on the new version of the PQIs, Version 3.0a. It also includes information on the new Pediatric Quality Indicators (PDIs), which includes the hospital admission rate measures for pediatric asthma and pediatric gastroenteritis.

Diagnoses

Admission rates are based on principal diagnosis for all measures except diabetes-related lower-extremity amputations, perforated appendix, and low-weight births. For these three PQIs, counts are included in the numerators if the condition of interest is indicated in any diagnosis field. Diagnoses are identified using codes of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM).

Reporting of race and ethnicity

Race and ethnicity measures can be problematic in hospital discharge databases. Some states do not collect information on race/ethnicity from hospitals, and within states that collect the information, some hospitals do not code race and ethnicity reliably. The 2003 State Inpatient Databases disparities analysis file was limited to 23 states, and to hospitals within those states with good reporting of race and ethnicity.

Data on Hispanics are collected differently among the states and also can differ from the Census methodology of collecting information separately on race (white, African American, Asian, American Native) and ethnicity (Hispanic, non-Hispanic). State data organizations often collect Hispanic ethnicity as one of several categories that include race. Therefore, for multistate analyses, HCUP creates the combined categorization of race and ethnicity for data from states that report ethnicity separately. When a state data organization collects Hispanic ethnicity separately from race, HCUP uses Hispanic ethnicity to override any other race category to create an Hispanic category for the uniformly coded race/ethnicity data element, while also retaining the original race and ethnicity data. This Statistical Brief reports the HCUP uniform coding of race/ethnicity for the following categories: white, non-Hispanic; black, non-Hispanic; Asian-Pacific Islanders, non-Hispanic, and Hispanic.

Admission rate populations

The populations used to calculate admission rates vary by type of condition. Diabetes, circulatory diseases, adult asthma, and chronic obstructive pulmonary disease include individuals 18 years and older. Pediatric asthma includes children less than 18 years of age. Elderly asthma includes individuals ages 65 and older. Bacterial pneumonia, dehydration, urinary tract infections, and perforated appendix include individuals of all ages; low-weight births include neonates only. Denominator populations for all PQIs, except perforated appendix and low-weight births, are derived from 2000 U.S. population data. The PQIs for perforated appendix and low-weight births use the number of hospitalizations for appendicitis and newborns, respectively, in the denominators, rather than U.S. population data. All PQIs are adjusted for age and gender.

Relative rates

Adjusted relative rates are calculated by dividing the minority group adjusted hospitalization rate by the non-Hispanic white adjusted hospitalization rate. Minority groups that have higher hospitalization rates than non-Hispanic whites have a relative rate greater than 1.0, while those with hospitalization rates lower than non-Hispanic whites have a relative rate less than 1.0. A relative rate equal to 1.0 describes hospitalization rates among minority groups and non-Hispanic whites that are similar. A relative rate significantly less than 1.0 or greater than 1.0 may signal disparities in the quality of and access to preventive care. However, these statistically significant relative rates may also be affected by differences in disease prevalence (e.g., differences in the rates of diabetes in non-Hispanic whites and minority groups). Therefore, differences in preventable hospitalization rates may be used to identify areas that require more intensive study regarding potential problems in health care quality and access.

About the SID

The HCUP State Inpatient Databases (SID) are hospital inpatient databases from data organizations participating in HCUP. The SID contain the universe of the inpatient discharge abstracts in the participating HCUP states, translated into a uniform format to facilitate multistate comparisons and analyses. Together, the SID encompass almost 90 percent of all U.S. community hospital discharges in 2003. The SID can be used to investigate questions unique to one state; to compare data from two or more states; to conduct market area variation analyses; and to identify state-specific trends in inpatient care utilization, access, charges, and outcomes.

About HCUP

HCUP is a family of powerful health care databases, software tools, and products for advancing research. Sponsored by the Agency for Healthcare Research and Quality (AHRQ), HCUP includes the largest all-payer encounter-level collection of longitudinal health care data (inpatient, ambulatory surgery, and emergency department) in the United States, beginning in 1988. HCUP is a Federal-State-Industry Partnership that brings together the data collection efforts of many organizations—such as State data organizations, hospital associations, private data organizations, and the Federal government—to create a national information resource.

For more information about HCUP, visit http://www.hcup-us.ahrq.gov/.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Arizona Department of Health Services
California Office of Statewide Health Planning & Development
Colorado Health & Hospital Association
Connecticut Integrated Health Information (Chime, Inc.)
Florida Agency for Health Care Administration
Georgia GHA: An Association of Hospitals & Health Systems
Hawaii Health Information Corporation
Illinois Health Care Cost Containment Council and Department of Public Health
Indiana Hospital & Health Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Department for Public Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Division of Health Care Finance and Policy
Michigan Health & Hospital Association
Minnesota Hospital Association
Missouri Hospital Industry Data Institute
Nebraska Hospital Association
Nevada Division of Health Care Financing and Policy, Department of Human Resources
New Hampshire Department of Health & Human Services
New Jersey Department of Health & Senior Services
New York State Department of Health
North Carolina Department of Health and Human Services
Ohio Hospital Association
Oregon Office for Oregon Health Policy and Research and Oregon Association of Hospitals and Health Systems
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina State Budget & Control Board
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems

Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health & Family Services

For additional HCUP statistics, visit HCUPnet, our interactive query system at www.hcup.ahrq.gov.

References

For more information on HCUP and the AHRQ Quality Indicators, please refer to the following publications:

AHRQ Quality Indicators—Guide to Prevention Quality Indicators: Hospital Admissions for Ambulatory Care Sensitive Conditions. Online. February 20, 2006. U.S. Agency for Healthcare Research and Quality. http://www.qualityindicators.ahrq.gov/downloads/pqi/pqi_guide_v30a.pdf

Kruzikas D. T., Jiang H. J., Remus D., et al. *Preventable Hospitalizations. Window Into Primary and Preventive Care, 2000.* HCUP Fact Book No. 5. Online. September 2004. U.S. Agency for Healthcare Research and Quality. http://www.ahrq.gov/data/hcup/factbk5/factbk5.pdf

Steiner, C., Elixhauser, A., Schnaier, J. The Healthcare Cost and Utilization Project: An Overview. *Effective Clinical Practice* 5(3):143–51, 2002

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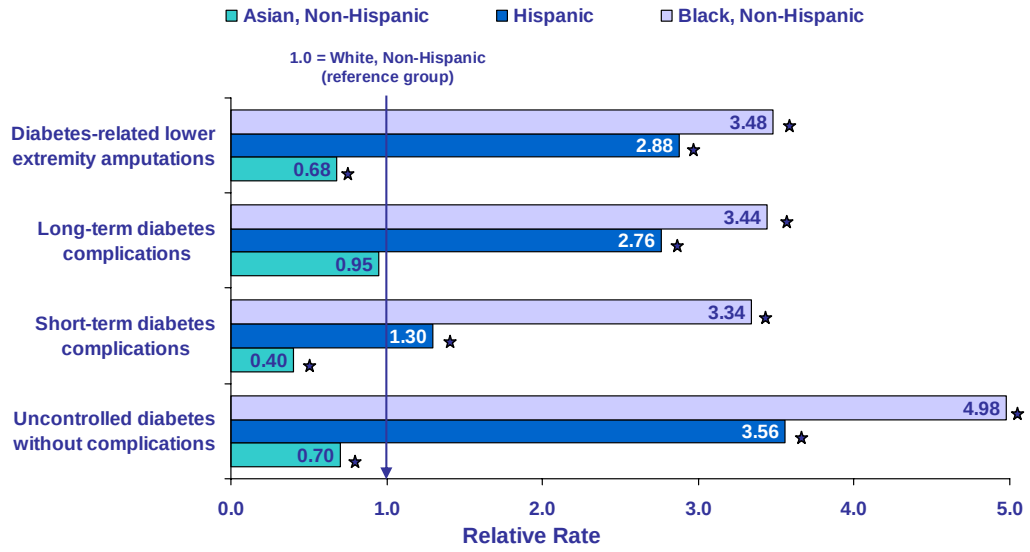
AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

Irene Fraser, Ph.D., Director
Center for Delivery, Organization, and Markets
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850

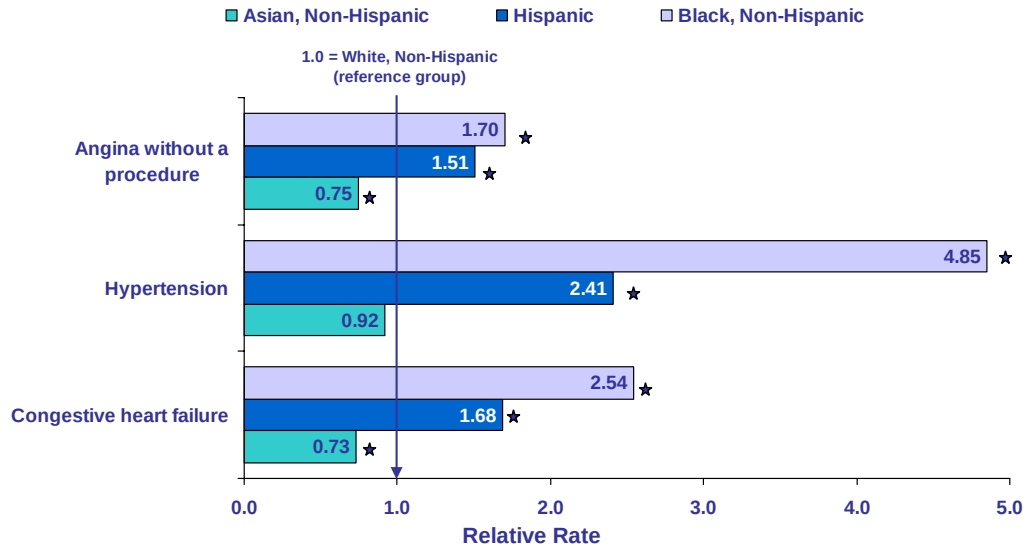
Figure 1. Potentially preventable hospitalization rates for diabetes among minorities relative to whites, risk adjusted, 2003



★ Significant at $p \leq 0.05$

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases, disparities analysis file, 2003. This file is designed to provide national estimates on disparities using weighted records from a sample of hospitals from the following 23 states: AZ, CA, CO, CT, FL, GA, HI, KS, MD, MA, MI, MO, NH, NJ, NY, PA, RI, SC, TN, TX, VA, VT, and WI.

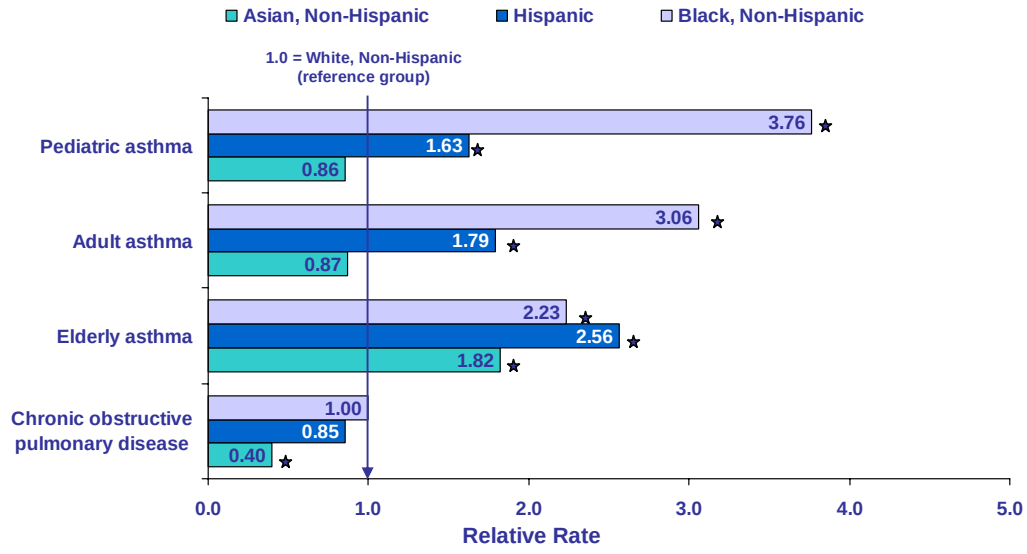
Figure 2. Potentially preventable hospitalization rates for circulatory diseases among minorities relative to whites, risk adjusted, 2003



★ Significant at $p \leq 0.05$

Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases, disparities analysis file, 2003. This file is designed to provide national estimates on disparities using weighted records from a sample of hospitals from the following 23 states: AZ, CA, CO, CT, FL, GA, HI, KS, MD, MA, MI, MO, NH, NJ, NY, PA, RI, SC, TN, TX, VA, VT, and WI.

Figure 3. Potentially preventable hospitalization rates for chronic respiratory diseases among minorities relative to whites, risk adjusted, 2003



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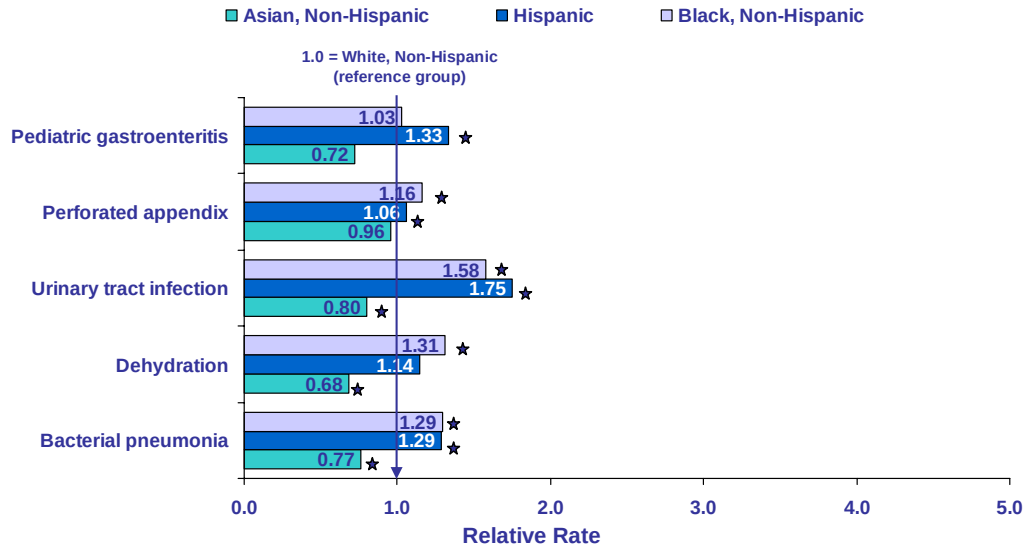
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases, disparities analysis file, 2003. This file is designed to provide national estimates on disparities using weighted records from a sample of hospitals from the following 23 states: AZ, CA, CO, CT, FL, GA, HI, KS, MD, MA, MI, MO, NH, NJ, NY, PA, RI, SC, TN, TX, VA, VT, and WI.

Figure 4. Potentially preventable hospitalization rates for acute diseases among minorities relative to whites, risk adjusted, 2003



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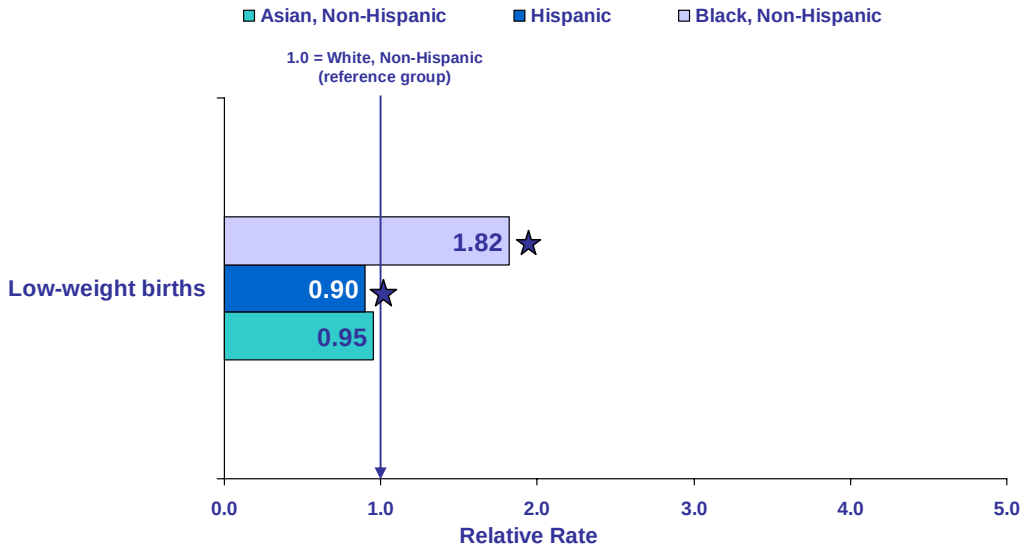
Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases, disparities analysis file, 2003. This file is designed to provide national estimates on disparities using weighted records from a sample of hospitals from the following 23 states: AZ, CA, CO, CT, FL, GA, HI, KS, MD, MA, MI, MO, NH, NJ, NY, PA, RI, SC, TN, TX, VA, VT, and WI.

Figure 5. Potentially preventable hospitalization rates for birth outcomes among minorities relative to whites, risk adjusted, 2003



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Source: Agency for Healthcare Research and Quality, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, State Inpatient Databases, disparities analysis file, 2003. This file is designed to provide national estimates on disparities using weighted records from a sample of hospitals from the following 23 states: AZ, CA, CO, CT, FL, GA, HI, KS, MD, MA, MI, MO, NH, NJ, NY, PA, RI, SC, TN, TX, VA, VT, and WI.