Quantifying the Potential Economic Benefits of Health Equity in Connecticut: Disparities in Hospital Charges and Costs among Blacks and Hispanics Compared to Whites, 2005-2012

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Background

- The direct costs of racial and ethnic disparities are estimated at over $230 billion in the United States.[1]
- Reducing health disparities may ultimately reduce costs associated with acute care; however such benefits are poorly quantified at the state level.

Objectives

- To quantify the economic impact due to differences in hospitalization frequency and hospitalization severity among Hispanic or Latino (Hispanic) and Black or African American (Black) population compared to the White population in Connecticut in 2012.
- To determine trends in excess charges from 2005 to 2012 related to disparities in hospitalization frequency and hospitalization severity among the Hispanic and Black population in Connecticut.

Methods

- **Data Sets and Sources**
  - Connecticut's Acute Care Hospital Inpatient Discharge Database (HIDD) containing patient-level demographic and billing data for all non-federal acute care hospitals in the state. Newborn, birth, and pregnancy-related hospitalizations were excluded.
  - The official annual July 1 population estimates were used for the denominator of the hospital discharge rates.
  - The annual Ratio of Cost to Charge (RCC), published by the Connecticut Office of Health Care Access, was used to estimate cost.
  - Charges and costs were adjusted using the US Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U) for hospital and related services.
- **Analysis:** We expanded upon methodology previously developed by the Maryland Office of Minority Health and Health Disparities.[2]
  - Hospital discharge rates per 100,000 were calculated by dividing the number of hospital discharges by mid-year population estimates for each racial and ethnic group within ten age strata.
  - The ratio of minority group hospital discharge rate to White discharge rate and attributable risk ((ratio-1)/ratio) were calculated for each age strata and then multiplied by the age group's total charges and summed. This sum was the difference in frequency of hospitalization between the minority group and White group (frequency disparity).
  - To calculate the severity disparity, the overall average charge of Whites was subtracted from the overall average charge of the minority group. The difference was multiplied by the overall White discharge rate.
  - The total disparity (excess) in hospital charges was the sum of the frequency and severity disparity.
  - The cost of the total disparities was calculated by multiplying the total disparity by the annual RCC.
  - The annual total charges and costs of the disparities were adjusted to 2012 dollars using the CPI-U. Joinpoint Regression Program was used for the time trend analysis.

Findings

Population Description

There were 312,953 hospitalization records related to the studied races and ethnicities in 2012. Mean age was 60.1±22.6 (0-111) years. Data included 164,697 females (52.6%). Length of hospitalization ranged from 1 to 521 days with a median of 3 days. Mean and median hospital charges were $38,665 and $24,303, respectively. Data by race and ethnicity are summarized in table 1.

Table 1. Patients characteristics hospitalized in Connecticut (2012)

Characteristics	White (n=244,202)	Black or African American (n=38,330)	Hispanic or Latino (n=30,421)
Age (years), mean ± SD	63.5 ± 21.4	50.4 ± 21.9	44.6 ± 23.0
Female, n (%)	128,217 (52.5)	20,871 (54.5)	15,609 (51.3)
Median hospital charges ($)	24,585.0	25,353.5	20,916.0
Length of hospital stay >6 days*, n (%)	54,295 (22.2)	9,593 (25.0)	6,048 (19.9)
Insurance status, n (%)			
Public payer	169,549 (69.8)	29,111 (76.3)	23,769 (78.7)
Private payer	69,137 (28.5)	8,041 (21.1)	4,919 (16.3)
Other	4,101 (1.7)	1,000 (2.6)	1,518 (5.0)

*Length of hospitalization in the upper quartile

Disparity in 2012

- The frequency disparity in charges for Blacks and Hispanics relative to Whites were $601 and $139 million, respectively. Values related to severity disparity were $32 and $-32 million, respectively.
- The total excess hospital charges for Blacks and Hispanics relative to Whites were $633 and $107 million, respectively.
- In 2012, the total excess hospital costs for Blacks and Hispanics relative to Whites were $218 and $39 million, respectively (Given the RCC=0.36 in 2012). (Figure 1)

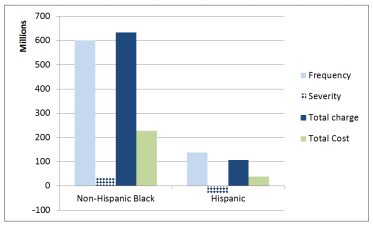

Figure 1. Frequency, severity, and total racial disparities in hospital charges of minorities compared to Whites in Connecticut. (2012)

Findings (Continued)

- The 25-74 years old age group had the highest total excess in hospital charges for Blacks ($295.8 million) and Hispanics ($73.6 million). Blacks 55-74 year olds had the second highest total excess in hospital charges ($216.9 million); Among Hispanics, those aged 0-24 years had the second highest excess charges ($32.9 million).

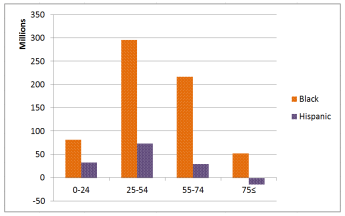

Figure 2. Total disparity in hospital charges compared with Whites by age group in Connecticut (2012)

- From 2005-2012, the excess CPI-U adjusted hospital charges associated with Blacks increased significantly from $433.2 to $632.8 million (P=0.003) (Figure 3). The trends of excess cost among Blacks ($184.4 to $218.9 million) and the excess charges and cost among Hispanics did not reach statistical significance.

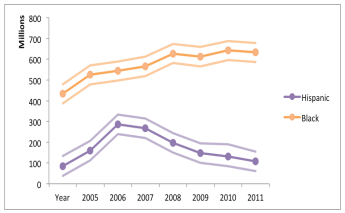

Figure 3. Trend of total disparity in CPI-U adjusted hospital charges in Connecticut from 2005-2012. (with confidence limits)

Conclusions

- Excess hospital charges are associated with Hispanics and Blacks compared with Whites. The rise in excess hospital charges was significant for Blacks.
- Our analysis contributes to quantifying the economic impact of health disparities, and suggests substantial savings could be realized through disparity reduction.
- Regression analysis adjusting for demographic and hospitalization characteristics are underway.

References

1.LaVeist, Thomas A., Darrell Gaskin, and Patrick Richard. Estimating the economic burden of racial health inequalities in the United States. International Journal of Health Services 41.2 (2011): 231-238.
2.David A. Mann MD, PhD. Cost of Disparity Analysis & Using Disparity Data for Policy presented on May 14, 2013 at the Connecticut DPH.