



Examining Racial and Ethnic Disparities in Care at High-Volume Hospitals

Studying the impact of different service providers on racial and ethnic disparities and outcomes

SUMMARY

From May 2004 to December 2005, a team of researchers (based for most of the project at the [Urban Institute](#)) examined:

- Whether patients in four states chose to receive treatment at hospitals that provide high-volumes of procedures and services for which high volumes are associated with better outcomes
- Differences among racial and ethnic minorities and Whites in the New York City area in the use of hospitals treating high volumes of patients with procedures and services for which high volumes are associated with better outcomes

Key Findings

The researchers reported findings in four articles published in peer-reviewed journals:

- Despite recommendations for greater use of high-volume hospitals, there was only limited movement to those hospitals between 1995 and 2002.
- Changes in patient awareness about volume-sensitive procedures led to a reduction in the importance of distance and market fragmentation¹ in hospital use for several procedures and services.
- Racial and ethnic minority patients in Greater New York City were less likely than White patients to use high-volume hospitals for most of the procedures measured.
- Racial and ethnic minority patients in Greater New York City were less likely than White patients to be operated on by high-volume surgeons at high-volume hospitals.

¹ Market fragmentation is the degree to which multiple hospitals offer the same procedures and services. Fragmented markets tend to have more, but low-volume, hospitals. Consolidated markets tend to have fewer, but high-volume, hospitals.

Funding

The Robert Wood Johnson Foundation (RWJF) provided two grants totaling \$343,467 to support this *unsolicited* project.

CONTEXT

In 2002, the Institute of Medicine (IOM) report, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, summarized the findings from a long list of studies documenting disparities in the delivery of health care services for different racial and ethnic groups.

The report found that these disparities persist even when controlling for factors such as socioeconomic background and insurance status.

At the same time, numerous studies had documented the relationship between volume and outcome.² Patient outcomes are better for many conditions when hospitals and physicians who care for the patients have experience with high volumes of procedures and services to treat such conditions.

A team of researchers at the [New York Academy of Medicine](#) posited that one reason for disparities in health care delivery and outcomes among ethnic and racial groups might be their differences in the use of hospitals and surgeons considered to be high volume.

RWJF's Interest in This Area

In response to the IOM report, RWJF focused grantmaking efforts on developing an understanding of the many complex factors contributing to disparities and determining those that are most amenable to change.

One consideration for improving quality of care, especially among minority groups, is the relationship between the volume of services the hospital provides, whether minorities use those hospitals, and improvements in the quality of care related to those services.

² Dudley RA, Johansen KL, Brand R, Rennie DJ and Milstein A. "Selective Referral to High-Volume Hospitals: Estimating Potentially Avoidable Deaths." *Journal of the American Medical Association*, 283(9): 1159–1166, 2000. Available [online](#).

Halm EA, Lee C and Chassin MR. "Is Volume Related to Outcome in Health Care? A Systematic Review and Methodologic Critique of the Literature." *Annals of Internal Medicine*, 137(6): 511–520, 2002. Abstract available [online](#).

This project, which started in May 2004, aligned with the Foundation’s Disparities Team³ strategic objective to reduce racial/ethnic disparities in the care of target diseases by 2008.

THE PROJECT AND ITS FINDINGS

The study included two components: one used data from Arizona, Florida, New Jersey, and Wisconsin to determine factors influencing whether patients chose to receive care at high-volume hospitals, and one explored whether there are racial and ethnic disparities in the use of high-volume hospitals in the Greater New York City area.

Bradford H. Gray, PhD, headed the research team and directed the work, first at the New York Academy of Medicine and then at the Urban Institute in Washington.

The Study of Patients in Arizona, Florida, New Jersey, and Wisconsin

Researchers used the State Inpatient Databases (SID) files of the [Health Care Cost and Utilization Project \(HCUP\)](#) at the federal Agency for Healthcare Quality and Research to study patients hospitalized in Arizona, Florida, New Jersey, and Wisconsin. They examined data provided during 1995–1996 and in 2001–2002 for 13 procedures and services for which research had demonstrated a positive relationship between volume and patient outcomes:

- Three types of cancer surgery: breast, colorectal, and lung
- Four cardiovascular services: myocardial infarction admission, coronary artery bypass graft, coronary angioplasty, and carotid endarterectomy
- Three orthopedic procedures: hip fracture repair, total hip replacement, and total knee replacement
- Two prostate procedures: open prostatectomy and transurethral prostatectomy
- HIV/AIDS services

Researchers also explored whether changes in consumer awareness and the hospital markets (fragmentation, consolidation, and competition) during this period affected the use of high-volume hospitals for these services.

Findings

Project researcher Karl Kronebusch, PhD, reported findings on changes in use of high-volume hospitals over time in an article published in *Medical Care Research and Review* in 2009:⁴

³ The work of the Disparities Team was combined with that of its Quality Team as the Quality/Equality Team.

- **Despite recommendations for greater use of high-volume hospitals, only limited changes were evident between 1995 and 2002.** For five services (breast and colorectal cancer surgery, hip fracture repair, total knee replacement, and open prostatectomy) less than half of patients received care at high-volume hospitals, and for several services (for example, transurethral prostatectomy, AIDS/HIV, and coronary artery bypass graft) there was a surprising decline in the proportion of procedures and services received at high-volume hospitals.
- **It is unclear why patient behavior has changed only modestly for most services, and causal mechanisms are still not apparent.** Possible reasons for patients' behavior include:
 - Willingness and ability to seek out and use different hospitals
 - Reliance on physicians for advice about where to obtain care
 - Limited understanding of the value of high-volume providers for certain procedures
 - Preference for obtaining care locally
 - Entry or exit of hospitals in the market

Kronebusch reported findings on patient responses to information about the value of high-volume hospitals, and the influence of changes in the hospital market (such as distance to high-volume hospitals and the presence of local hospitals), in an article published in the *Journal of Health Politics, Policy and Law* in 2009.⁵

- **Modest changes consistent with increased interest in quality care occurred for some services, but others saw more local-seeking care or little change.**
 - Changes in patient awareness about volume-sensitive procedures led to a reduction in the importance of distance and market fragmentation in hospital use for several services (coronary angioplasty, lung cancer surgery, and HIV/AIDS treatment). This is consistent with the hypothesis that more information and changes in referral patterns would lead to greater use of high-volume hospitals.
 - For some services, for example total knee replacement and open prostatectomy, distance became a greater deterrent over time and the presence of closer, although lower-volume hospitals, was more likely to result in patients using fewer high-volume facilities.

⁴Kronebusch K. "Assessing Changes in High-Volume Hospital Use: Hospitals, Payers, and Aggregate Volume Trends." *Medical Care Research and Review*, 66(2): 197–218, 2009. Abstract available [online](#).

⁵Kronebusch K. "Quality Information and Fragmented Markets: Patient Responses to Hospital Volume Thresholds." *Journal of Health Politics, Policy, and the Law*, 34(5): 777–827, 2009. Abstract available [online](#).

- Factors such as proximity to high-volume hospitals and changes in demand for procedures affect patient choices. For example:
 - HIV/AIDS patients sought high-volume hospitals even if those hospitals were not the closest ones. But, as HIV/AIDS hospitalizations declined over time, some high-volume hospitals no longer met the volume threshold, making the next high-volume hospital even farther away. In these cases, the greater distance led to an overall decrease in high-volume hospital use.
 - Knee replacement patients sought care at closer hospitals, even if those were not high-volume hospitals. Knee replacement surgeries rose by 40 percent, thereby increasing the average volume at many hospitals providing this service. This increased the likelihood that the closest hospital was also a high-volume hospital, thereby increasing the use of high-volume hospitals.

Limitations

Kronebusch noted some limitations of the study:

- The data were drawn from only four states, although the states were selected to capture a diverse range of people and a variety of hospital markets.
- The data do not include information about individual or family income or educational level of the patient, although researchers used zip code-level income and educational attainment.
- The data do not record the amount of information patients have or the process by which they make decisions.
- There are uncertainties about the association between volume and outcomes—it is possible that knowledgeable patients and physicians choose high quality hospitals, thereby increasing volume at those hospitals.
- There are other volume-sensitive services not studied because sample sizes in the four states were too small for reliable estimates or because there were no high-volume hospitals in these states for those services

The Study of Patients in Greater New York City

Researchers examined differences among racial and ethnic minorities and Whites living in the Greater New York City area in their use of hospitals that provide a high volume of services and procedures for identified conditions. They wanted to determine whether White patients with these conditions were more likely to be treated by high-volume hospitals and high-volume surgeons.

Researchers used New York's [Statewide Planning and Research Cooperative System](#) hospital discharge data from 1995–1996 and 2001–2002, and examined 17 procedures

and services for which research had documented a positive relationship between high volume and patient outcomes:

- Five types of cancer surgery: breast, colorectal, gastric, lung, and pancreatic
- Six cardiovascular services: acute myocardial infarction admission, coronary artery bypass graft, coronary angioplasty, abdominal aortic aneurism repair, carotid endarterectomy and pediatric cardiac surgery
- Three orthopedic procedures: hip repair, total hip replacement, and total knee replacement
- Two prostate procedures: open and transurethral prostatectomy
- AIDS services

Findings

Gray and his colleagues reported the following key findings about use of high-volume hospitals from their analysis of the 17 procedures and services in an article published in *Inquiry* in 2009.⁶ Reported findings focus on the 2001–2002 data.

- **Racial and ethnic minority patients were significantly less likely to use high-volume hospitals for most of the procedures measured.**
 - Black patients were significantly less likely than White patients to use a high-volume hospital for all services except AIDS, for which Black patients were more likely to use a high-volume hospital. Researchers noted: “The differences were most pronounced among cancer surgeries and cardiovascular procedures, averaging over 20 percentage points between Blacks and Whites for these 11 services.”
 - Hispanic patients were significantly less likely than Whites to use high-volume hospitals in 15 of the 17 services. They were more likely to use high-volume hospitals for AIDS treatment. The difference for angioplasty was not significant.
 - Asian patients were less likely than Whites to use high-volume hospitals for 13 services. Differences for acute myocardial infarction admissions, angioplasty, carotid endarterectomy, and AIDS were not significant.
 - There were predictors of high-volume hospital usage other than race or ethnicity. These include:
 - Proximity to a high-volume facility. Greater distance reduced likelihood of high-volume hospital use for 14 services.

⁶ Gray BH, Schlesinger M, Siegfried SM and Horowitz E. “Racial and Ethnic Disparities in the Use of High-Volume Hospitals.” *Inquiry*, 46(3): 322–338, 2009. Abstract available [online](#).

- Age of patient. Older patients were less likely to use high-volume hospitals for 11 services, such as coronary artery bypass graft and breast cancer surgery.
 - Socioeconomic characteristics of the patient’s neighborhood. Patients from higher education and income neighborhoods were more likely to use high-volume hospitals for half of the services.
- Racial and ethnic disparities in the use of high-volume hospitals existed for services for which admissions were unplanned (acute myocardial infarction and hip fracture) but also for services that are generally planned (cancer surgery and hip and knee replacement).

Researchers analyzed 2001–2004 discharge data from the same New York hospitals for 10 surgical procedures. Findings from that analysis were published in a 2010 article in *Archives of Surgery*.⁷

- **Racial and ethnic minority patients were less likely than White patients to be operated on by a high-volume surgeon at a high-volume hospital.**
 - Black patients were less likely to be operated on by a high-volume surgeon at a high-volume hospital and more likely to be treated by a low-volume surgeon at a low-volume hospital for nine of the 10 procedures.
 - Hispanic patients were less likely to be operated on by a high-volume surgeon at a high-volume hospital for four of the 10 procedures and more likely to be treated by a low-volume surgeon at a low-volume hospital for five of the 10 procedures.
 - Asian patients were likely to be operated on by a high-volume surgeon at a high-volume hospital for five of the 10 procedures and more likely to be treated by a low-volume surgeon at a low-volume hospital for three of the 10 procedures.

Limitations

Researchers reported limitations of this analysis:

- Data on patients’ race and ethnicity were those provided by hospitals, which had differing procedures for recording the information.
- Hospitals that fall only slightly below the high-volume threshold are treated the same as hospitals that fall well-below the threshold.
- The study was limited to hospitals in the New York City metropolitan area and does not include New York City patients who sought care outside that area.
- Some procedures for which there appear to be large disparities were excluded because their prevalence was too low for analysis.

⁷Epstein AJ, Gray BH and Schlesinger M. “Racial and Ethnic Differences in the Use of High-Volume Hospitals and Surgeons.” *Archives of Surgery*, 145(2): 179–186, 2010. Available [online](#).

Conclusion

Gray wrote the following about the research: “A substantial degree of racial/ethnic sorting occurs in where people obtain care. Differences in care received may be due to where people get care; [it] cannot be assumed that differences result from people being treated differently in the same care sites. [The] policy implication is that quality improvement at institutions that serve disproportionately minority populations is a strategy that could have disproportionate benefit for minorities, thus potentially reducing disparities both in treatment and in health status.”

Communications Results

The researchers’ findings were published in four peer-reviewed journal articles as noted above. See the [Bibliography](#) for more information about the articles.

LESSONS LEARNED

1. **Do not underestimate the difficulty of trying to compare hospital data from multiple states.** Each state’s data had some distinctive coding requirements and were difficult to make completely comparable; efforts to do so took longer than expected. In addition, not all the states used the same volume thresholds to determine whether hospitals were high volume; states’ definitions of distance to a high-volume hospital varied; and states differed in the extent to which minority populations were concentrated in specific areas. (Project Director)

AFTERWARD

The study concluded after researchers published the journal articles.

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Grant ID #s 49138, 52899

Program area: Quality/Equality

BIBLIOGRAPHY

(Current as of date of the report; as provided by the grantee organization; not verified by RWJF; items not available from RWJF.)

Article

Journal Article

Epstein AJ, Gray BH and Schlesinger M. “Racial and Ethnic Differences in the Use of High-Volume Hospitals and Surgeons.” *Archives of Surgery*, 145(2): 179–186, 2010. Available [online](#).

Gray BH, Schlesinger M, Siegfried SM and Horowitz E. “Racial and Ethnic Disparities in the Use of High-Volume Hospitals.” *Inquiry*, 46(3): 322–338, 2009. Abstract available [online](#).

Kronebusch K. “Assessing Changes in High-Volume Hospital Use: Hospitals, Payers, and Aggregate Volume Trends.” *Medical Care Research and Review*, 66(2): 197–218, 2009. Abstract available [online](#).

Kronebusch K. “Quality Information and Fragmented Markets: Patient Responses to Hospital Volume Thresholds.” *Journal of Health Politics, Policy and Law*, 34(5): 778–827, 2009. Abstract available [online](#).