PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	DISPARITIES IN SELECTIVE REFERRAL FOR CANCER SURGERIES: IMPLICATIONS FOR THE CURRENT HEALTH CARE DELIVERY SYSTEM
AUTHORS	Sun, Maxine; Karakiewicz, Pierre; Sammon, Jesse; Sukumar, Shyam; Gervais, Mai-Kim; Nguyen, Paul; Choueiri, Toni; Menon, Mani; Trinh, Quoc-Dien

VERSION 1 - REVIEW

REVIEWER	Giorgio Gandaglia Urological Research Institute Vita-Salute San Raffaele University San Raffaele Scientific Institute Milan, Italy I currently collaborate with the corresponding author of this manuscript.
REVIEW RETURNED	04-Oct-2013

GENERAL COMMENTS	Sun et al. evaluated the role of race, insurance status, and other socioeconomic factors of the likelihood of receiving complex surgical oncological procedures in high-volume hospitals in the United States. The topic is timely and intriguing, the manuscript is well written, and the statistical analysis is the suitable one. Overall, the authors should be applauded for their effort to systematically analyze the racial, payer, and socioeconomical disparities for high-volume hospital utilization across complex surgical procedures within the United States. The authors should consider the following points: - Discussion: the authors should acknowledge the limitations related to the use of administrative data, such as errors in data collection, procedure classification, and coding (Jollis et al. Ann Intern Med 1993). - Table 1, line 6: “No. patients, %” should be removed. The authors indeed are reporting exclusively the proportion of patients for each surgical procedure, and not the absolute number of patients. - The graphs (Figure 1-3) are difficult to read and need a different format to be clearer.

REVIEWER	Beth Virnig University of Minnesota, USA
REVIEW RETURNED	19-Nov-2013

GENERAL COMMENTS	the abstract should talk about 'wealthier counties' rather than 'income' the results of this manuscript are a little surprising and should be better described. first, it looks from the tables as if about 25% of the sample was removed due to missing race. this is not stated in the methods but is implied by the differences between table 1 and table 2. some work should be included to describe the bias (if any) associated with missing race. second, the NIS contains information about several hospital characteristics that would facilitate interpretation. for example, teaching status, profit status, urban/rural location. these factors would round out the discussion. the discussion of selective referral is not supported by the analysis. it should be more clearly labeled as a hypothesis. but, one that would be supported if there were more attention paid to geographic adjustment.

REVIEWER	Amber Guth, MD NYU School of Medicine USA
REVIEW RETURNED	18-Dec-2013

GENERAL COMMENTS	Very interesting paper, however, as with all studies of this type, the assumptions made in developing the model can easily skew the results. For example, Medicare/Medicaid patients frequently treated at low volume hospitals--this may not represent their ability to identify high volume institutions (as the hysterectomy patients did) but may represent a different barrier, that of insurance participation by the "upper tier" surgeons performing the cases, as many of the private physicians restrict the type of insurance they accept (including Medicare) while the lower volume, probably community/municipal-based hospitals do not. Would ask authors to address this issue, which becomes a purely economic, and not racial, basis for divergence in access to care.

VERSION 1 – AUTHOR RESPONSE

Reviewer Name Giorgio Gandaglia
Institution and Country Urological Research Institute
Vita-Salute San Raffaele University
San Raffaele Scientific Institute
Milan, Italy
Please state any competing interests or state ‘None declared’: I currently collaborate with the corresponding author of this manuscript.

Sun et al. evaluated the role of race, insurance status, and other socioeconomic factors of the likelihood of receiving complex surgical oncological procedures in high-volume hospitals in the United States.

The topic is timely and intriguing, the manuscript is well written, and the statistical analysis is the suitable one. Overall, the authors should be applauded for their effort to systematically analyze the

racial, payer, and socioeconomical disparities for high-volume hospital utilization across complex surgical procedures within the United States.

We thank the Reviewer for this generous compliment.

The authors should consider the following points:
- Discussion: the authors should acknowledge the limitations related to the use of administrative data, such as errors in data collection, procedure classification, and coding (Jollis et al. Ann Intern Med 1993).

We thank the Reviewer for this comment. To comply, this limitation was inserted in the manuscript: Discussion (page 19): “Finally, the database used, although large and generalizable, inherits conventional limitations inherent of administrative cohorts, such as errors in data collection, procedure classification, and coding. [31]”

- Table 1, line 6: “No. patients, %” should be removed. The authors indeed are reporting exclusively the proportion of patients for each surgical procedure, and not the absolute number of patients.

We removed the line as suggested.

- The graphs (Figure 1-3) are difficult to read and need a different format to be clearer.

We modified Figures 1-2 to Tables 4–5. Figure 3’s format was kept as is, similar to previous studies that relied on forest plots to characterize large amounts of odd ratios.

Reviewer Name beth virnig
Institution and Country University of Minnesota, USA
Please state any competing interests or state ‘None declared’: None declared

the abstract should talk about 'wealthier counties' rather than 'income'

We thank the Reviewer for the suggestion. To comply, we made sure to imply that income was an ecological variable, and not patient-specific variable in the abstract:

“Insurance providers and county income levels varied differently according to patients’ race. Most whites resided in wealthier counties, regardless of insurance types (private/Medicare), while most blacks resided in less wealthy counties (≤24,999$), despite being privately insured. In general, whites, privately insured, and those residing in wealthier counties (≥45,000$) were more likely to receive surgery at high-volume hospitals, even after adjustment for all other patient-specific characteristics. Depending on the procedure, some disparities were more prominent, but the overall trend suggests a collinear effect for race, insurance type, and county income levels.”

the results of this manuscript are a little surprising and should be better described. first, it looks from the tables as if about 25% of the sample was removed due to missing race. this is not stated in the methods but is implied by the differences between table 1 and table 2. some work should be included to describe the bias (if any) associated with missing race.
We thank the Reviewer for this comment. To comply, the following specification was inserted in the manuscript:
Methods (page 9): “Given that approximately 25% of patients had unknown race, we chose not to exclude these patients from the entire cohort so as not to reduce any bias. That being said, stratified bivariate analyses omitted its consideration as it would be difficult to interpret and properly comment

on patients with missing race information."

second, the NIS contains information about several hospital characteristics that would facilitate interpretation. for example, teaching status, profit status, urban/rural location. these factors would round out the discussion.
We thank the Reviewer for the suggestion. To comply, the following passage was added to the Discussion section of the manuscript:
Discussion (page 16): "Taken together, our data convincingly demonstrate that blacks/Hispanics, non-privately insured, and low-income individuals were significantly more likely to be treated at low-volume hospitals. This occurred in the majority of the examined scenarios. This implies that racial, insurance, and income-related disparities affect access to treatment at high-volume hospitals. Limited access to treatment at high-volume hospitals is ultimately linked to limited access to academic centers, hospitals located in the urban setting, hospitals with better bedsize capacity, and increased market concentration, since high-volume hospitals are often characterized with such features. [23 30] Such patterns of care have shown to result in suboptimal outcomes according to the practice-makes-perfect hypothesis. Therefore, these access-related disparities should be addressed to ensure optimal outcomes."

the discussion of selective referral is not supported by the analysis. it should be more clearly labeled as a hypothesis. but, one that would be supported if there were more attention paid to geographic adjustment.
We thank the Reviewer for this suggestion. To comply, the following passage has been added to the Discussion of the manuscript:
Discussion (page 18): "Further efforts are needed to reduce disparities in access to high-volume hospitals across the nation. Such practice has been described as selective referral, which according to previous studies, may result in more optimal post-surgical complications and mortality. [9 32] Whilst this remains a mere hypothesis, not practically proven to be effective, its theoretical application has been tested and recommended for some surgeries [32]. However, if public health policymakers were to adopt the implementation of selective referral, they may be confronted with several challenges."

Reviewer Name Amber Guth, MD
Institution and Country NYU School of Medicine
USA
Please state any competing interests or state 'None declared': None declared

Very interesting paper, however, as with all studies of this type, the assumptions made in developing the model can easily skew the results. For example, Medicare/Medicaid patients frequently treated at low volume hospitals--this may not represent their ability to identify high volume institutions (as the hysterectomy patients did) but may represent a different barrier, that of insurance participation by the "upper tier" surgeons performing the cases, as many of the private physicians restrict the type of insurance they accept (including Medicare) while the lower volume, probably community/municipal-based hospitals do not. Would ask authors to address this issue, which becomes a purely economic, and not racial, basis for divergence in access to care.
We thank the Reviewer for the suggestion. To comply, the following passage was inserted in the discussions section of the manuscript:
Discussion (page 19): "Primarily, due to the retrospective nature of the database, as well as limited information captured, it was not possible to know why patients were not able to access high-volume hospitals. For example, some physicians due to restrictions on insurance types are unable to accept Medicare and Medicaid patients, which would ultimately represent a different type of barrier, not necessarily related to patient-directed discrimination, but merely for economical reasons."