How Far Are Patients Willing to Travel for Gastrectomy?

How far are patients willing to travel for gastrectomy?

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MINI ABSTRACT

Understanding patient travel patterns is crucial in regionalization of complex surgery. Most gastric cancer patients underwent gastrectomy at local hospitals with lower volumes; mortality data did not predict travel patterns. This reflects little regionalization of gastrectomy in California and suggests patient travel decisions are not strongly driven by outcomes data.

STRUCTURED ABSTRACT

Objective: To determine travel patterns for patients undergoing gastrectomy for cancer, and to identify factors associated with patient decision.

Summary Background Data: Support for regionalization of complex surgery grows, yet little is known about the willingness of patients to travel for care. Furthermore, utilization of quality data in patients' hospital selection processes is not well understood.

Methods: Analysis of the California Office of Statewide Health Planning and Development database from 1996 to 2009. Outcome measures included total distance traveled and rate of bypassing the nearest gastrectomy-performing hospitals. Multivariate analyses to identify predictors of bypassing local hospitals were performed.

Results: Total study population was 10,022. Majority (67.1%) of patients underwent gastrectomy at the nearest providing hospitals. Distance traveled to destination hospitals in California averaged 17.04 miles. Bypassing patients traveled approximately 16 miles beyond the nearest hospitals to receive care, selecting lower volume destination hospitals in 27.9% of cases. Annual gastrectomy volumes for nearest and for destination hospitals averaged 4.4 and 6.8 cases, respectively, and in-hospital mortality rates were 5.9% and 4.8%, respectively. Few patients (19.2%) sought care at teaching hospitals. Rural county residence significantly reduced the likelihood of bypass ($p<0.001$). High volume (>7 cases) and teaching status of destination hospitals (both $p<0.001$) were predictive of hospital bypass, though no significant association between mortality rate and bypass was identified.

Conclusions: The majority of gastric cancer patients underwent gastrectomy at providing hospitals nearest to home, reflecting little regionalization of gastrectomy in California. Patients' hospital selection appears not to be driven by outcomes data.

INTRODUCTION

There has been an increasing emphasis on the quality of US healthcare delivery in recent decades. Following documentation of widespread medical errors in the Institute of Medicine's 1999 report entitled *To Err is Human*, healthcare delivery systems throughout the nation began launching countless measures to improve quality of care.[1] Likewise, researchers began focusing their efforts on ascertaining the effects of these measures on quality improvement.[2-5] In an effort to establish accountability and achieve better quality improvement, various governmental and non-governmental groups have advocated for greater transparency, releasing data for review by the general public. This has ignited a proliferation of new quality measures and reporting initiatives over recent years, yet some have viewed this massive expanse of information to be overwhelming and difficult for the public to interpret.[6]

Transparency within public reporting fundamentally assumes that patients desire, and utilize, quality data when selecting healthcare providers. Yet there is limited evidence in the literature to support such beliefs.[7-9] In fact, several studies suggest that patients may consciously disregard such objective information when choosing where to receive care. Finlayson and colleagues, for instance, found that patients preferred to undergo high-risk surgery at local hospitals even in the face of markedly high mortality rates when compared to regionalized centers.[10] Much more research is therefore needed to understand to what extent, if at all, patients incorporate publicly available quality data into their decision-making processes.

Furthermore, assessing patients' willingness to travel to reach certain providers is especially important given recent policy discussions regarding regionalization of complex cancer care, as this would inevitably increase travel burden for patients.[11,12] There have been increasing calls to centralize the performance of complex procedures at high-volume centers, yet concern exists regarding the imposition of significant barriers to quality care access, especially for disadvantaged patient populations.[11,13] Interestingly, studies examining the travel patterns of cancer patients undergoing esophagectomy, pancreatectomy, and colorectal resections have concluded that many patients in fact travel past higher-volume centers to undergo surgery at low-volume hospitals.[11,12] This observation was noted despite the fact that there has been extensive

regionalization of complex cancer surgery over the past decade or so, and that such regionalization has resulted in increased travel distances for patients.

The goal of this study is to assess the travel patterns of patients undergoing gastrectomy for gastric cancer throughout the state of California. Specifically, we sought to determine whether patient travel patterns: (1) reflect growing regionalization of this procedure in California; (2) vary by socio-demographic factors; and (3) are linked to certain outcomes data, such as hospital procedural volume and mortality rates.

METHODS

Data Source

We performed an analysis of the California Office of Statewide Health Planning and Development (OSHPD) hospital discharge database from 1996 to 2009. As a department within the California Health and Human Services Agency, the OSHPD oversees the collection and dissemination of healthcare information from licensed practitioners and hospitals within California, resulting in complete capture of all hospital stays for California patients. These data are appropriately de-identified with encrypted ID assignments.

Cohort Selection

To define our population of interest, we utilized the *International Classification of Diseases, Ninth Revision* (ICD-9) diagnosis and procedure codes. We identified patients with a diagnosis of gastric cancer (ICD-9, 151.0–151.9) who subsequently underwent resection via either partial or total gastrectomy (ICD-9, 43.5–43.9).

A total of 15,741 patients were captured in our initial extraction based on inclusion criteria. We subsequently excluded 845 patients (5.4%) for whom no travel distance could be calculated. This excluded population was comprised of patients without California residential zip codes (homeless and out-of-state residents), California residents seeking care at out-of-state hospitals

(hospitals without California zip codes), and patients visiting hospitals with non-valid hospital IDs. An additional 4,563 patients were excluded for having undergone non-elective surgery. We also excluded 311 patients who were noted to bypass the hospitals nearest to their homes if those hospitals had not performed a gastrectomy in the year prior to patient presentation, as these were considered to be non-providing hospitals. A final cohort of 10,022 patients was available for this study.

Variable Selection and Outcome Measures

Patient-specific variables selected for analysis included age, race, sex, urbanicity of residing county, and insurance type. Hospital variables included teaching hospital status as well as annual volume and in-hospital, all-cause mortality for gastrectomy patients in the prior one year, assuming that patients cannot access and utilize relevant quality data pertaining to the year of presentation. Outcomes of interest were total straight-line distance traveled to reach destination hospitals, rate of bypassing providing hospitals (defined as hospitals performing gastrectomy in the year prior to presentation), differential distance (defined as the additional distance traveled by patients beyond the nearest hospital to reach destination hospitals), and rate of bypassing higher-volume centers to receive care at low-volume hospitals.

Distance and Bypass Rate Determination

Hospital street addresses were first geocoded using Texas A&M University Department of Geography geocoding service.[14] Utilizing the Haversine formula, one-way travel distance was determined by calculating the straight-line distance between the geographic centroid of all five-digit residential California zip codes and the geocoded location of every California hospital.[15] The nearest hospital assigned to each patient was then determined by the shortest straight-line distance between the patient's corresponding residential zip code and a given hospital location. Patients were defined as bypassing the nearest providing facility if their actual travel distances surpassed their shortest calculated travel distance. Differential distance was then calculated as the difference in distance between the destination and nearest hospitals. Lastly, we calculated the difference in case volumes between nearest and destination hospitals for bypassing patients to

determine the rate of bypassing higher-volume facilities among this group.

Statistical Methods

Using Stata statistical software, unadjusted analysis was performed for comparison of bypassing and non-bypassing patients using Chi-square and t-test for categorical and continuous variables, respectively. Multivariate analysis for identification of predictors of hospital bypass was conducted, controlling for patient demographics, hospital teaching status, prior year gastrectomy volume, and prior year mortality rates of destination and nearest hospitals.

RESULTS

Description of patient and hospital cohorts

Throughout California, 10,022 patients underwent gastrectomy for gastric cancer between 1996 and 2009. Table 1 displays key demographics and travel characteristics of the entire patient cohort as well as providing hospital characteristics. Briefly, most patients were white, male, between 65 and 80 years of age, residents of urban areas, and insured through Medicare. Most patients (67.1%) sought care at hospitals nearest to their homes, whereas 33.0% of patients bypassed the nearest providing hospital to receive care. The observed bypass rate remained relatively stable over the 14-year study period – rates in 1996 and 2009 were 33.8% and 33.0%, respectively, and ranged from 29.3% to 36.0%. Only 19.2% of patients sought care at teaching hospitals. Additionally, total distance traveled to reach a destination hospital averaged 17.04 miles. Annual hospital volumes for gastrectomy were low, averaging 5 cases per year. Very-low (<2 cases) and low (2-4 cases) volume designation was assigned to 250 and 178 hospitals, respectively, while medium (4-7 cases) and high (>7) volume designation was given to 190 and 133 hospitals, respectively (it should be noted that the provided number of hospitals in each volume category exceeds the total number of hospitals included in this study as annual hospital volumes and subsequent volume category designations shift during the study period). Average in-hospital mortality rates exceeded 5% among all hospitals, with increasing mortality rates observed as gastrectomy performance volume decreased.

Travel patterns by county

Figure 1 demonstrates the pattern of hospital bypass rates and total travel distances for patients throughout California counties. There was a higher likelihood of patients bypassing the nearest providing hospitals amongst residents of more urban and affluent counties, with the highest percentages of patients bypassing observed in Orange, Los Angeles, and San Francisco Counties. Conversely, hospital bypass rates were lowest amongst residents of rurally designated counties with some exceptions (Glenn, Tuolumne, and Tehama Counties) (Figure 1A). When assessing total travel distance to destination hospitals, an inverse relationship was seen with respect to bypass rate (Figure 1B). Residents of highly urban counties traveled relatively short distances compared to those living in rural areas. For example, San Francisco residents averaged approximately 3 miles of travel to reach providing facilities while residents of the more rural Lassen County traveled over 220 miles to receive care.

Patient and hospital cohort comparison based on bypass status

An unadjusted comparison of patient and hospital characteristics for patients bypassing the nearest hospital versus those presenting to the nearest hospital is outlined in Table 2. Overall, bypassing patients presented to teaching hospitals more often than their non-bypassing counterparts. Additionally, bypassers more frequently resided in urban regions and tended to be younger, of minority descent, and insured privately or under Medicaid. Destination facilities for bypassing patients reported higher volumes in the year immediately prior to presentation compared to hospitals treating non-bypassing patients, though there was no significant difference in in-hospital mortality rates. It is interesting to note, however, that 27.9% of bypassing patients actually traveled beyond the nearest hospital to receive care at a providing hospital reporting lower case volumes in the prior year.

Multivariate analysis for predicting patient travel patterns

Table 3 presents a multivariate analysis of factors associated with patients bypassing hospitals nearest to their homes. Annual gastrectomy volume and teaching status of both destination and

nearest gastrectomy-performing hospitals were associated with likelihood of patient bypass, while differences in in-hospital mortality rates between hospitals were found to be statistically non-significant. Destination hospitals in the high-volume performance range significantly increased the likelihood of patients bypassing the nearest hospital (O.R. 1.95 [1.62-2.34]; $p<0.001$), whereas as the nearest gastrectomy-performing hospitals in medium- or high-volume ranges were associated with a decreased likelihood of bypassing (O.R. 0.75 [0.64-0.86]; $p<0.001$, O.R. 0.50 [0.44-0.58]; $p<0.001$, respectively). Interestingly, though fewer patients presented to teaching hospitals within the entire cohort, hospital teaching status appeared to be a strong predictor of bypassing. Patients traveling to teaching hospitals were highly likely to bypass the nearest providing hospital (O.R. 3.81 [3.23-4.49]; $p<0.001$), but far less likely to bypass if the nearest hospital was a teaching hospital (O.R. 0.20 [0.16-0.24]; $p<0.001$). Patient factors found to be associated with bypass status included race and urbanicity of residing county. Asian patients were most likely to bypass the nearest providing hospital (O.R. 1.60 [1.40-1.83]; $p<0.001$), while residing in rural regions significantly reduced the likelihood of bypass (O.R. 0.15 [0.08-0.27]; $p<0.001$). Age, gender and insurance status did not impact the likelihood of patients bypassing the nearest hospital after controlling for other factors.

A separate linear regression analysis assessing for the predictors of total travel distance was also conducted (data not shown). Results of this analysis revealed that patients of all minority groups were significantly more likely to travel shorter distances. Additionally, hospital teaching status continued to be highly significant, with patients traveling 5.5 miles less if teaching hospitals were closer to home versus 8.7 miles farther if they bypassed to reach a teaching hospital. Lastly, medium- and high-volume status of the nearest gastrectomy-performing hospitals significantly decreased travel distance.

DISCUSSION

In this study, we found that the majority of patients undergoing gastrectomy for gastric cancer did so at hospitals nearest to their homes. We also found that non-bypassing patients received care at hospitals reporting significantly lower case volumes, while in-hospital mortality rates were not predictive of travel decisions for either bypassing or non-bypassing patients. These

findings suggest that a majority of patients may not consider hospital outcomes data in their selection of hospitals at which to receive gastric cancer treatment. Furthermore, our data suggest that many patients may be unwilling to travel significant distances to undergo gastrectomy at high-volume centers. Similarly, reluctance towards travel despite an increased likelihood of better outcomes has been documented in other fields. For instance, the failure of the No Child Left Behind Act of 2001 stemmed in part from the striking fact that parents and students were unwilling to transfer out of their neighborhood schools, even when faced with objective data demonstrating superiority of faraway schools and after being offered free transportation by the federal government to ease travel burden.[16] It is possible that patients may often view objective data as less meaningful in their decision-making than informal information sources, such as hospital reputation or personal experience.[17] Patients may even simply seek care based solely on the referral patterns of primary care providers or their medical oncologists. It should also be noted that data concerning procedural volume and outcomes measures, particularly hospital mortality data, might be difficult to access publicly. Lastly, cancer patients may choose to receive complex cancer care at hospitals near their homes to ease travel burden for themselves and for family members.

Notably, the small subset of patients choosing to bypass the nearest hospitals traveled an additional 16 miles with respect to differential distance, thus demonstrating willingness to travel significant distances to reach destination hospitals. Furthermore, these destination hospitals tended to be teaching hospitals with higher procedural volumes, and both hospital characteristics were found to be independent predictors of patients bypassing their local hospitals. These findings may suggest that factors such as hospital teaching status and volume are powerful drivers for that subset of patients who are willing to travel for care. However, it must be noted that almost 28% of these patients bypassed the hospitals nearest to home to instead undergo gastrectomy at destination hospitals reporting lower volume performance in the prior year. Likewise, Birkmeyer and colleagues found that approximately 25% of pancreatectomy and esophagectomy patients traveled past high-volume centers to undergo resections at lower volume hospitals.[12] It is unclear what drives this specific subset of patients, but this finding further supports our belief that outcomes data may not be a prioritized factor in some patients' travel decisions.

It is interesting to note that there is currently little regionalization of gastrectomy for gastric cancer in California. While the association between higher surgical case volumes and improved outcomes for gastrectomy has been well-known for some time,[13,18] little information has been published regarding the degree of regionalization of gastrectomy in the United States at present.[19] Here, we demonstrate that the vast majority of gastric cancer patients underwent gastrectomy at hospitals nearest to their homes. In addition, hospital bypass rates remained relatively stable over time, suggesting that there has not been an increasing trend towards regionalization either. In contrast, recent studies assessing the regionalization of complex surgical procedures indicated for other types of cancer resection, including pancreatectomy, esophagectomy, and colectomy, have documented increasing regionalization on state and national levels.[11,13,19-21] The reason for this apparent discrepancy between gastrectomy and other complex surgeries remains unclear.

Other reported findings of interest include the observation that a surprisingly small subset of patients presented to teaching hospitals to undergo gastrectomy despite a documented association between teaching hospital designation and improved outcomes following major surgery.[22-24] We also found that non-bypassing patients still traveled significant distances (nearly 15 miles) to reach the nearest providing hospitals. Similarly, Smith et al. found that patients undergoing gastrectomy for gastric cancer traveled 36 miles on average, although travel patterns in their study were assessed in a regionalized setting of the Mid-Atlantic region of the United States.[19] Therefore, our findings may represent some degree of baseline travel burden for patients considering the magnitude of travel distance required to reach even the nearest providing hospitals. Additionally, we found that patients in rural regions traveled significantly greater distances, an issue that has been previously reported for rural patients seeking other types of care.[25,26] This suggests that regionalization of gastrectomy would have the greatest negative impact upon rural residents, consistent with previously published findings.[11,12] We also demonstrated higher rates of hospital bypassing and markedly shorter travel distances among all minority patients when compared to white patients, even after controlling for urbanicity of residing counties. One possible explanation for this finding may be that a higher proportion of lower-volume hospitals are located within minority neighborhoods, thus necessitating minority

patients to bypass their local hospitals to receive care at higher-volume centers. Lastly, while Medicare beneficiaries often presented to local hospitals, privately insured patients and Medicaid patients tended to bypass local facilities. This may reflect broader acceptance of Medicare insurance by providing hospitals. Conversely, Medicaid or private insurance may be a limiting factor in hospital choice, thereby forcing these patients to bypass local facilities more frequently. Furthermore, private insurance may serve as a proxy for higher household incomes and thus greater financial flexibility in travel decisions.

Several limitations of the current study are noted. Calculating straight-line travel distance fails to account for geographic barriers that might increase actual driving distances, though prior research has shown that these differences are largely inconsequential for non-emergent hospital travel.[27] Additionally, volume and mortality data were analyzed at the hospital level, thus making it difficult to understand how patient travel decisions were influenced by individual surgeons' outcomes. Lastly, our study reflects travel patterns within a single state and as such our findings are not generalizable on a national scale. Yet the OSHPD database, with its 100% capture of patients in California, is also perhaps this study's greatest strength. Similar studies assessing travel patterns and regionalization impacts have utilized hospital or healthcare systems-wide databases or national databases with partial capture, such as Medicare or the National Inpatient Sample, thereby excluding a proportion of the relevant patient population.[12,19,20] Of note, 43% of our study population is comprised of non-Medicare patients, which would otherwise be overlooked in a Medicare study. Similar studies using statewide healthcare data in several major regions are still required to confirm these results on a national level.

Our study has important implications. Firstly, it highlights travel burden as a potential barrier to care, an important consideration in any discussion regarding regionalization. It also raises the question of the potential effectiveness of public reporting of outcomes data, though it is unclear how quality-reporting methods and the perceptions of them have evolved over 14 years. Finally, our study, which surmises patient decision by analyzing patient action and thus resembles the methods of behavioral economists, may ideally be complemented by future studies involving surveying representative groups of various demographic populations. Such survey studies would help to further develop an understanding of the relevance of outcomes data in patient decision-

making by (1) establishing a baseline of patient knowledge regarding outcomes data and (2) by directly inquiring as to how these data factor into patient travel decisions with respect to personal preference or experience. Such complementary studies harbor the potential to provide invaluable insight into the relationship between public reporting and patient choice.

CONCLUSIONS

The majority of gastric cancer patients (67%) underwent gastrectomy at providing hospitals nearest their homes. Given that this rate did not significantly change over time, this likely reflects little regionalization of gastrectomy for gastric cancer in California. Though hospital teaching status and case volume may predict likelihood of bypass, mortality data has no association with patients' selection of providing facilities, suggesting that patient decision does not appear to be strongly driven by outcomes data. Further studies in this field are needed to directly gauge public awareness of outcomes data and to then elucidate the true impact of these data upon travel distances and regionalization.

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TABLES

Table 1: Patient and hospital characteristics for gastric cancer patients undergoing gastrectomy between 1996 - 2009

Patient Characteristics (*n* = 10,022)	***n* (%)**
Total distance traveled* (mean [SD])	17.04 (37.60)
Bypassing nearest providing hospital	3,302 (32.95)
Treated at teaching hospital	1,926 (19.22)
Age (years)	
< 65	3,740 (37.32)
65-80	4,891 (48.80)
> 80	1,391 (13.88)
Race	
White	5,112 (51.30)
Black	619 (6.21)
Hispanic	1,896 (19.03)
Asian	2,125 (21.32)
Gender	
Male	6,168 (61.54)
Female	3,854 (38.46)
Residing county	
Urban	9,796 (97.74)
Rural	226 (2.26)
Insurance	
Self-pay	81 (0.82)
Medicaid	757 (7.67)
Medicare	5,545 (56.17)
Private	3,489 (35.34)
Destination Hospital Characteristics	***n* (%)**
Annual gastrectomy volume (mean [SD])	5.11 (5.06)
In-hospital mortality rate (mean [SD])	5.61% (15.69)
In-hospital mortality rate by volume designation	
Very Low (<2)	6.34% (22.10)
Low (2-4)	5.95% (13.49)
Medium (4-7)	5.45% (11.17)
High (>7)	4.56% (6.79)

*All distances are expressed in miles.

Table 2: Unadjusted comparison of patient and hospital characteristics based on hospital bypass status

Patient Characteristics		**Treated at Nearest Providing Hospital *n* (%) (*n* = 6,720)**	**Bypassed Nearest Providing Hospital *n* (%) (*n* = 3,302)**	***P*-value**
Total distance traveled* (mean [SD])		14.89 (32.74)	21.42 (45.63)	< 0.001
Differential distance* (mean [SD])		N/A	16.23 (43.66)	
Bypassed higher-volume hospital		N/A	922 (27.92)	
Treated at teaching hospital		1,092 (16.25)	834 (25.26)	< 0.001
Age (years)				
	< 65	2,373 (35.31)	1,367 (41.40)	
	65-80	3,338 (49.67)	1,553 (47.03)	< 0.001
	> 80	1,009 (15.01)	382 (11.57)	
Race				
	White	3,716 (55.58)	1,396 (42.57)	
	Black	392 (5.86)	227 (6.92)	< 0.001
	Hispanic	1,229 (18.38)	667 (20.34)	
	Asian	1,197 (17.90)	928 (28.30)	
Gender				
	Male	4,176 (62.14)	1,992 (60.33)	0.08
	Female	2,544 (37.86)	1,310 (39.67)	
Residing county				
	Urban	6,507 (96.83)	3,289 (99.61)	< 0.001
	Rural	213 (3.17)	13 (0.39)	
Insurance				
	Self-pay	44 (0.66)	37 (1.14)	
	Medicaid	436 (6.58)	321 (9.89)	< 0.001
	Medicare	3,870 (58.41)	1,675 (51.60)	
	Private	2,276 (34.35)	1,213 (37.37)	
Destination Hospital Characteristics		**Treated at Nearest Providing Hospital *n* (%)**	**Bypassed Nearest Providing Hospital *n* (%)**	***P*-value**
Annual gastrectomy volume (mean [SD])		4.40 (4.32)	6.80 (6.20)	< 0.001
In-hospital mortality rate (mean [SD])		5.94% (16.72)	4.82% (12.85)	0.15

*All distances are expressed in miles.

Table 3: Multivariable analysis of patient and hospital characteristics as predictors for bypassing nearest providing hospital

Patient Characteristics		**O.R.**	**95% C.I.**	***P*-value**
Total distance traveled (miles)		1.006	1.005 – 1.007	< 0.001
Age (years)				
	< 65	*reference*		
	65-80	0.93	0.80 – 1.09	0.37
	> 80	0.83	0.69 – 1.00	0.06
Race				
	White	*reference*		
	Black	1.23	1.01 – 1.50	0.04
	Hispanic	1.15	1.00 – 1.32	0.05
	Asian	1.60	1.40 – 1.83	< 0.001
Gender				
	Male	*reference*		
	Female	1.04	0.95 – 1.14	0.41
Residing county				
	Urban	*reference*		
	Rural	0.15	0.08 – 0.27	< 0.001
Insurance				
	Self-pay	*reference*		
	Medicaid	0.88	0.52 – 1.49	0.64
	Medicare	0.71	0.42 – 1.19	0.19
	Private	0.76	0.46 – 1.26	0.29
Destination Hospital Characteristics		**O.R.**	**95% C.I.**	***P*-value**
Annual gastrectomy volume				
	Very Low (<2)	*reference*		
	Low (2-4)	1.18	0.93 – 1.49	0.18
	Medium (4-7)	1.10	0.90 – 1.33	0.34
	High (>7)	1.95	1.62 – 2.34	< 0.001
In-hospital mortality rate†		0.97	0.92 – 1.02	0.31
Teaching hospital status		3.81	3.23 – 4.49	< 0.001
Nearest Hospital Characteristics		**O.R.**	**95% C.I.**	***P*-value**
Annual gastrectomy volume				
	Very Low (<2)	*reference*		
	Low (2-4)	0.88	0.73 – 1.05	0.15
	Medium (4-7)	0.75	0.64 – 0.86	< 0.001
	High (>7)	0.50	0.44 – 0.58	< 0.001
In-hospital mortality rate†		1.03	0.99 – 1.06	0.11
Teaching hospital status		0.20	0.16 – 0.24	< 0.001

O.R., odds ratio; C.I., confidence interval.

†The corresponding results for in-hospital mortality rates have been adjusted to reflect relevant changes per 10% increase in mortality.

FIGURE

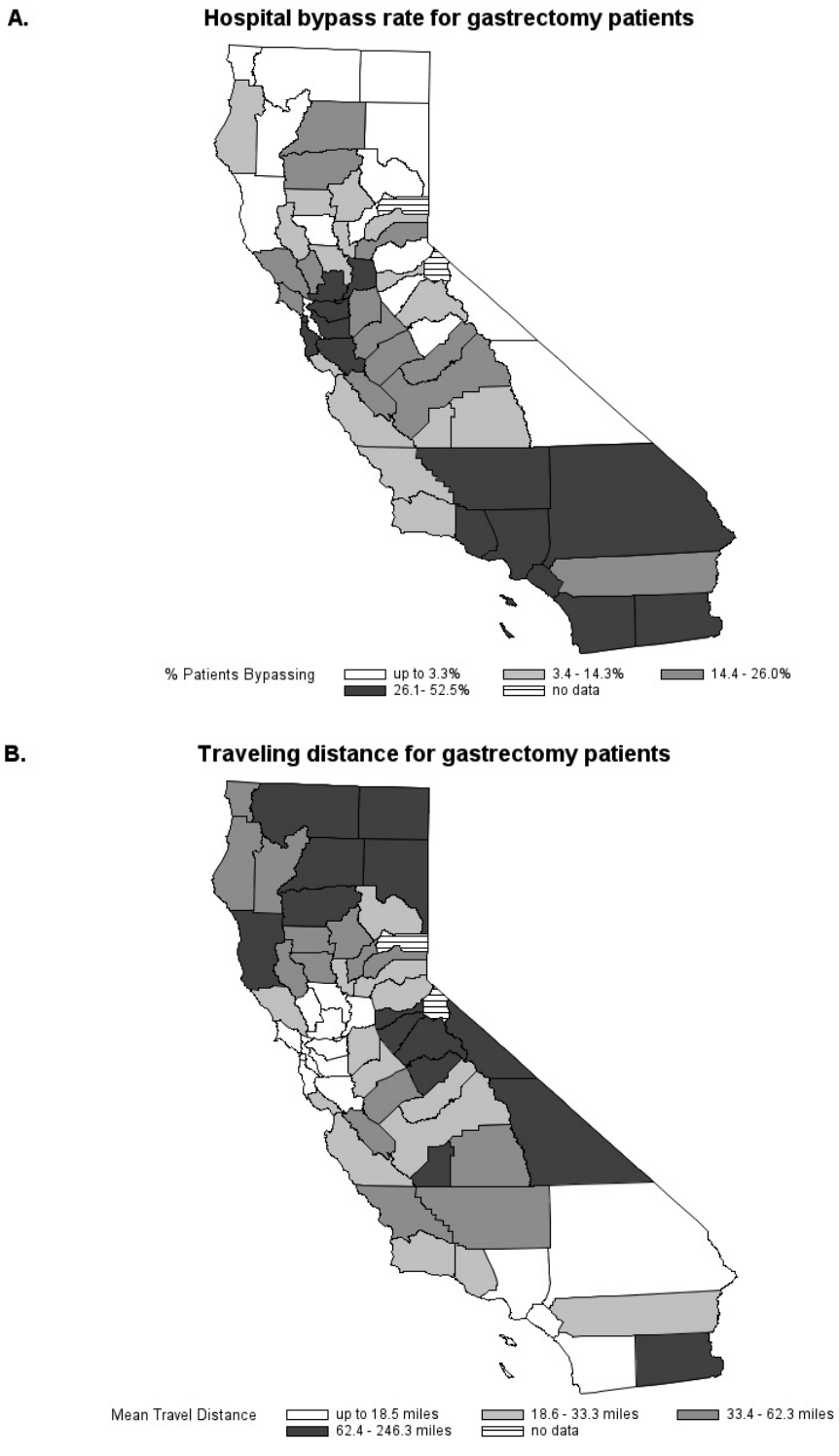

Figure 1: Patient travel patterns by California county. (A) rate of patient bypass of closest gastrectomy-performing hospitals; (B) patients' total travel distance to reach destination hospitals to undergo gastrectomy.