Hidden Disparities: How Language Influences Patients' Access to Cancer Care

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ABSTRACT

Background: Patients with limited English proficiency, a vulnerable patient population, remain understudied in the literature addressing cancer disparities. Although it is well documented that language discordance between patients and physicians negatively impacts the quality of patient care, little is known about how patients' preferred spoken language impacts their access to cancer care. **Patients and Methods:** Between November 2021 and June 2022, we conducted an audit study of 144 hospitals located across 12 demographically diverse states. Using a standardized script, trained investigators assigned to the roles of English-speaking, Spanish-speaking, and Mandarin-speaking patients called the hospital general information telephone line seeking to access care for 3 cancer types that disproportionately impact Hispanic and Asian populations (colon, lung, and thyroid cancer). Primary outcome was whether the simulated patient caller was provided with the next steps to access cancer care, defined as clinic number or clinic transfer. We used chi-square tests and logistic regression analysis to test for associations between the primary outcome and language type, region type, hospital teaching status, and cancer care requested. We used multivariable logistic regression analysis to determine factors associated with simulated patient callers being provided the next steps. **Results:** Of the 1,296 calls, 52.9% (n=686) resulted in simulated patient callers being provided next steps to access cancer care. Simulated non–English-speaking (vs English-speaking) patient callers were less likely to be provided with the next steps (Mandarin, 27.5%; Spanish, 37.7%; English, 93.5%; $P<.001$). Multivariable logistic regression found significant associations of the primary outcome with language spoken (Mandarin: odds ratio [OR], 0.02 [95% CI, 0.01–0.04] and Spanish: OR, 0.04 [95% CI, 0.02–0.06] vs English) and hospital teaching status (nonteaching: OR, 0.43 [95% CI, 0.32–0.56] vs teaching). **Conclusions:** Linguistic disparities exist in access to cancer care for non–English-speaking patients, emphasizing the need for focused interventions to mitigate systems-level communication barriers.

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Background

Despite a decline in cancer incidence and mortality rates in the United States, there continues to be an unequal burden of cancer among racial and ethnic minorities.[1,2] Prior work has demonstrated disparities in access to high-volume physicians, receipt of cancer treatment, and cancer-specific survival.[3–12] However, although the field of cancer disparities has grown, granular data on cancer care delivery continue to be derived from studies with predominantly English-speaking patients.

Patients with limited English proficiency (LEP) remain underrepresented in the literature addressing cancer disparities, even though there are >25 million LEP individuals in the United States, an increase of 80% since 1990.[13,14] Title VI of the Civil Rights Act of 1964 provides legal protection against discrimination on the basis of race, color, and national origin.[15,16] Unfortunately, LEP patients continue to encounter language barriers that significantly impact their ability to fully participate in their medical care as a result of multifaceted challenges in the implementation of national medical interpreting guidelines.[17–23] Although studies have examined how language discordance affects communication between patients and physicians,[24–30] less is known about patients' interaction with the healthcare system prior to evaluation by a physician and how factors such as LEP influence patients' access to cancer care.

Multidisciplinary cancer disparities research offers promise for increasing equitable access to high-quality cancer care. However, without an understanding of the systems-level barriers to access for LEP patients with cancer—a vulnerable and highly relevant population—our ability to design interventions to promote cancer health equity will be limited. To examine the impact of patients' spoken language on access to cancer care, we conducted an audit study in which trained investigators called the hospital general information telephone line as a patient seeking to access cancer care and spoke in 1 of the 3 most common spoken languages in the United States: English, Spanish, and Mandarin.[31] We hypothesized


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that linguistic variation exists in patients' access to cancer care, with non–English-speaking patients at greater risk for worse access.

Patients and Methods

Sampling Methods

To evaluate whether patients' ability to access cancer care differs across settings with different patient populations, we randomly identified 144 hospitals across 12 demographically diverse states. Based on the 2010 US census data, we defined high LEP regions to include states with >2 million LEP individuals, intermediate LEP regions to include states with 500,000 to 2 million LEP individuals, and low LEP regions to include states with <500,000 total LEP individuals but at least 1,000 Spanish-speaking and 1,000 Mandarin-speaking individuals. We selected 4 states within each region type (high LEP region: California, Florida, New York, Texas; intermediate LEP region: Arizona, Illinois, Massachusetts, New Jersey; low LEP region: Michigan, Missouri, Oregon, Pennsylvania).[13] We subsequently identified the 3 most diverse counties within each state based on the size of the county's LEP population.[13]

We obtained a comprehensive list of all hospitals located within the 36 counties of interest from the American Hospital Association Annual Survey Database. Based on information provided by each hospital's public-facing website, we excluded specialty hospitals aside from cancer care facilities (eg, heart institutes, orthopedic care hospitals), rehabilitation and long-term acute care hospitals, behavioral health facilities, hospitals serving restricted populations (eg, children's hospitals, Veterans Affairs, Indian Health Services), and hospitals that had closed. We classified a hospital as a teaching hospital if it was a hospital/health system member of the Association of American Medical Colleges.[32] We randomly subsampled each state's hospital list to ensure that an equal number of hospitals were included from each state, and we oversampled teaching hospitals, which are more likely to see a higher number of LEP patients compared with nonteaching hospitals.[33] The final sample included 144 hospitals, evenly distributed among 12 states (Figure 1).

Simulated Patient Call Protocol

Iterative pilot versions of the script with standardized responses, which were tested on hospitals not included in the sample, informed the development of the final script and protocol. All calls were made during standard business hours, Monday through Friday between 8:00 AM and 5:00 PM local time of the hospital. During the 8-month study period of November 8, 2021, through June 23, 2022, each hospital was contacted a maximum of 2 times per month.

The rationale for contacting the hospital general information line is that it serves as the initial entry point for many individuals seeking to obtain information about hospital clinics and services and is thus a highly relevant site to evaluate cancer care access for patients. Furthermore, we examined access to care for colon and lung cancer, 2 of the 3 most common causes of cancer death for Hispanic and Asian patients, and thyroid cancer, the second most common cancer among Hispanic and Asian women in the United States.[34,35]

A total of 6 trained investigators (ie, 2 per language type) were assigned to the roles of English-speaking, Spanish-speaking, and Mandarin-speaking patients seeking to access cancer care. All simulated patient callers were female to reduce potential variation due to patient sex. In their respective assigned languages and following a standardized script, simulated patient callers asked for the telephone number of the clinic that treats "colon cancer," "lung cancer," and "thyroid cancer" in 3 separate calls. Although the standardized scripts were in each respective language, all simulated Spanish- and Mandarin-speaking patient callers started the telephone conversation using 2 English words, "Speak Spanish?" or "Speak Chinese?" respectively, to assist hospital general information personnel and to simulate a more common clinical scenario (Figure 2).

Each simulated patient caller used a pseudonym that they felt signaled the gender, racial, and ethnic identity of their role and that they felt comfortable using on the calls (eg, Laura Johns [English], Ana Gomez [Spanish], Mei Liu [Mandarin]). The script included standardized responses to common questions that they may be asked. If asked for the patient's address, callers provided a standardized house number and street name followed by a zip code located in 1 of the 3 largest cities in the state and no more than a 2-hour drive from the hospital.[36] If asked for the patient's insurance, callers provided 1 of the 2 most common preferred provider organizations for each state as determined from data aggregated from state-specific and national-level sources.[37] If asked for the diagnosing physician's name, callers provided 1 of the 10 most common surnames by race/ethnicity (Dr. Miller [for simulated English-speaking patient], Dr. Lopez [for simulated Spanish-speaking patient], and Dr. Li [for simulated Mandarin-speaking patient]).[38,39] For questions that the simulated patient callers were unable to answer, standardized "work-arounds" were developed (eg, if asked for specific insurance information, callers stated that they did not have their insurance card with them during the call). All calls were kept as short as possible. A telephone number provided by the Google Voice VoIP service allowed callers to provide a telephone number and to receive returned calls. All call information was entered in a REDCap online database upon completion of each call.

The University of Michigan Institutional Review Board deemed this study not regulated because it did not collect identifiable private information about individual members, employees, or staff of the organization that is the subject of this research.

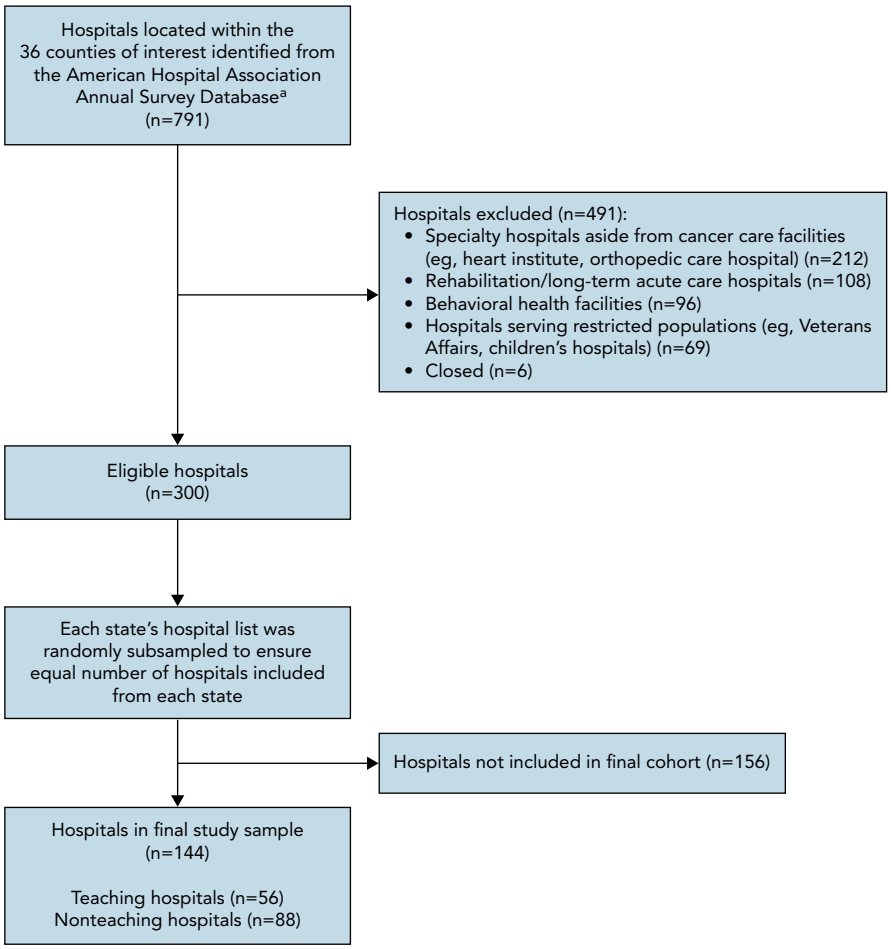

Figure 1. Flow diagram of hospital sampling. To evaluate if patients' ability to access cancer care differs across settings with different patient populations, we identified 144 hospitals, evenly distributed among 12 demographically diverse states.
[a]The 36 counties of interest comprised the 3 most diverse counties within each of the 12 states based on the size of the county's limited English proficient population (Arizona: Maricopa, Navajo, Pima County; California: Los Angeles, Orange, San Diego County; Florida: Broward, Miami-Dade, Palm Beach County; Illinois: Cook, DuPage, Kane County; Massachusetts: Essex, Middlesex, Suffolk County; Michigan: Oakland, Washtenaw, Wayne County; Missouri: Clay, Jackson, St. Louis County; New Jersey: Bergen, Hudson, Middlesex County; New York: Bronx, Kings, Queens County; Oregon: Clackamas, Multnomah, Washington County; Pennsylvania: Allegheny, Montgomery, Philadelphia County; and Texas: Dallas, Harris, Tarrant County).

Outcome Measures

The primary outcome was whether the simulated patient caller was provided with the next steps to access cancer care (yes/no). We defined the next steps to access cancer care to include the scenario in which the simulated patient caller was (1) provided with a telephone number for the presumed clinic that provides the requested care, or (2) transferred to a clinic/department that was presumed to provide the requested care. As part of the data collection protocol, we recorded the duration of each call.

Statistical Analyses

We generated descriptive statistics for all variables. ANOVA was performed to compare the mean duration of the telephone calls by language type. We used chi-square tests and logistic regression analysis to test for univariate associations between the primary outcome and the following variables: language type (English, Spanish, Mandarin), region type (high, intermediate, low LEP region), hospital teaching status (teaching, nonteaching), and cancer care requested (colon, lung, thyroid). Clinically relevant variables were entered into the multivariable logistic regression analysis to determine factors independently associated with the primary outcome (simulated patient callers provided the next steps to access cancer care). Furthermore, we performed stratified analyses by region type and hospital teaching status. We report odds ratios (ORs) and corresponding 95% confidence intervals based on the logistic regression models, with $P<.05$ considered statistically significant.

All statistical analyses were performed using R, version 4.2.1 (R Foundation for Statistical Computing).

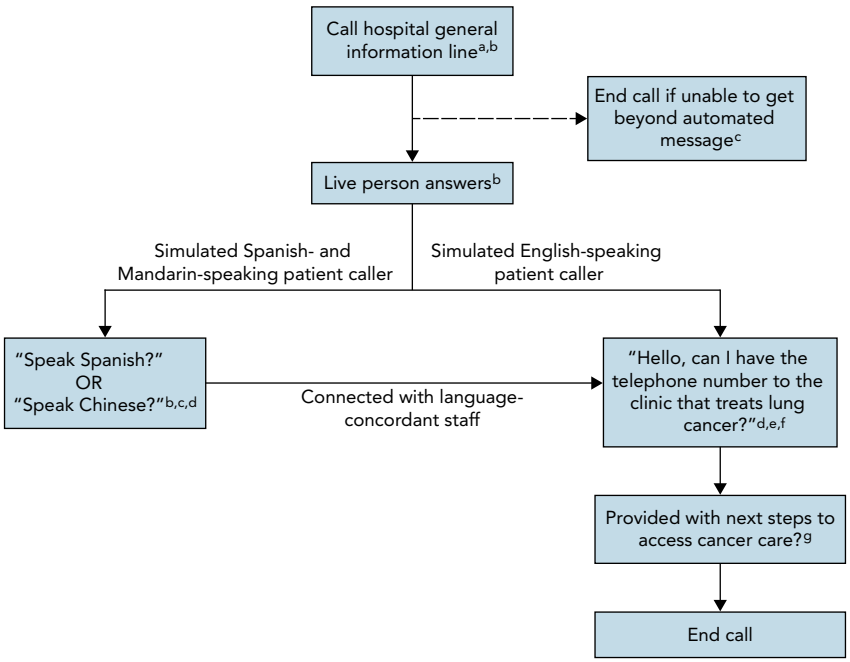

Figure 2. Standardized call script for simulated patient callers.
[a]The hospital telephone number was obtained from the American Hospital Association database and cross-referenced with the telephone number on the hospital's public-facing website.
[b]The simulated patient callers ended the call if they were on hold for >30 minutes at any point during the telephone call.
[c]If the call was forwarded to an automated voice message, the simulated patient callers did not enter input unless there were language-concordant instructions. If the automated voice message repeated on loop for >5 minutes without being transferred to a live person, the simulated patient callers ended the call.
[d]The simulated patient callers ended the call if they were told "No" by the hospital general information personnel 3 times.
[e]In 3 separate calls, with each hospital contacted no more than a total of 2 times per month, simulated patient callers asked for the telephone number of the clinic that treats "colon cancer," "lung cancer," and "thyroid cancer."
[f]The simulated Spanish-speaking and Mandarin-speaking patient callers spoke the same script in their respective languages.
[g]We defined the next steps to access cancer care to include the scenario in which the simulated patient caller was provided with a telephone number for presumed clinic that provides the requested care or transferred to a clinic/department that was presumed to provide the requested care.

Results

A total of 1,296 calls were completed, evenly distributed among the 3 language types (n=432 for each of English, Spanish, and Mandarin), region types (n=432 for each of high, intermediate, and low LEP region), and cancer care requested (n=432 for each of colon, lung, and thyroid cancer). Of the 1,296 calls, 61.1% (n=792) of calls were made to nonteaching hospitals. A total of 52.9% (n=686) of calls resulted in simulated patient callers being provided with the next steps to access cancer care.

Outcome of Calls to Hospital General Information Telephone Line

Figure 3 shows the percentage of simulated patient callers who were provided with the next steps to access cancer care by language of caller. Among the 686 total calls in which simulated patient callers were provided with the next steps to access cancer care, the mean [SD] duration of the telephone call was greater for non–English-speaking callers (English, 2.25 [2.07] minutes; Spanish, 5.42 [4.28] minutes; Mandarin, 7.45 [4.51] minutes; $P<.001$).

Figure 4 summarizes the simulated patient callers' experience of calling the hospital general information line seeking to access cancer care, with a focus on the barriers that prevented callers from being provided with the next steps to access cancer care. Simulated English-speaking patient callers were provided with the next steps to access cancer care in 93.5% (n=404) of calls, told "no" or hung up on in 1.6% (n=7) of calls, disconnected inadvertently in 2.3% (n=10) of calls, told that the requested information could not be provided in 2.5% (n=11) of calls, and on hold for >30 minutes in none of the calls.

Simulated Spanish-speaking patient callers were provided with the next steps to access cancer care in 37.7% (n=163) of calls, were told "no" or hung up on in 29.6% (n=128) of calls, were disconnected inadvertently or because the automated message required input but did not provide instructions in Spanish in 15.3% (n=66) of calls, encountered barriers at the level of interpreter services in 11.1% (n=48) of calls, were told that the requested information could not be provided in 5.3% (n=23) of calls, and were on hold for >30 minutes in 0.9% (n=4) of calls.

Simulated Mandarin-speaking patient callers were provided with the next steps to access cancer care in 27.5% (n=119) of calls, were told "no" or hung up on in 41.4% (n=179) of calls, were disconnected inadvertently

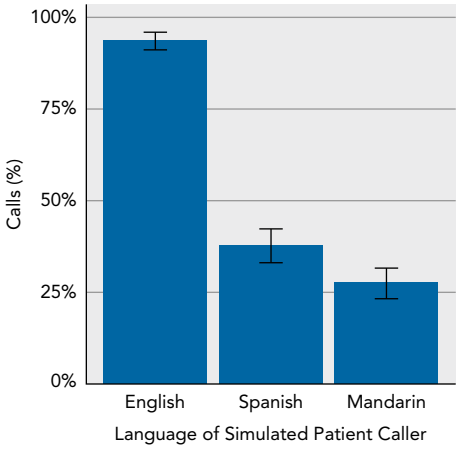

Figure 3. Percentage of calls in which simulated patient callers were provided with the next steps to access cancer care. Simulated English-speaking, Spanish-speaking, and Mandarin-speaking patient callers were provided the next steps to access cancer care in 93.5% (95% CI, 91.2%–95.8%), 37.7% (95% CI, 33.2%–42.3%), and 27.5% (95% CI, 23.3%–31.8%) of calls, respectively.

or because the automated message required input but did not provide instructions in Mandarin in 12.7% (n=55) of calls, encountered barriers at the level of interpreter services in 15.3% (n=66) of calls, were told that the requested information could not be provided in 0.9% (n=4) of calls, and were on hold for >30 minutes in 2.1% (n=9) of calls.

Factors Associated With the Next Steps to Access Cancer Care Provided

Table 1 displays the provision of the next steps to access cancer care based on language spoken, region type, hospital teaching status, and cancer care requested. Univariate chi-square analyses showed that the simulated patient caller was less likely to be provided with the next steps to access cancer care if they were non–English-speaking ($P<.001$) and if they were contacting a nonteaching hospital ($P<.001$). Sensitivity analysis excluding calls that ended prior to the simulated patient caller obtaining language-concordant information (new total analytic cohort of 778 calls) similarly found that simulated patient callers were less likely to be provided with the next steps to access cancer care if they were non–English-speaking (Spanish, 76.2% and Mandarin, 90.2% vs English, 93.5%; $P<.001$) and if they were contacting a nonteaching hospital (nonteaching, 85.3% vs teaching, 92.0%; $P=.01$) (supplemental eTable 1, available with this article at JNCCN.org).

Multivariable logistic regression found significant associations of the primary outcome (simulated patient callers provided the next steps to access cancer care) with language type and hospital teaching status (Table 2). Simulated non–English-speaking patient callers had lower odds of being provided with the next steps to access cancer care (Spanish: OR, 0.04 [95% CI, 0.02–0.06]; Mandarin: OR, 0.02 [95% CI, 0.01–0.04]) compared with English-speaking patient callers. Calls to nonteaching hospitals also had lower odds of providing simulated patient callers with the next steps to access cancer care (OR, 0.43 [95% CI, 0.32–0.56]). Sensitivity analysis excluding calls that ended prior to the simulated patient caller obtaining language-concordant information yielded similar results, with simulated Spanish-speaking patient callers and calls to nonteaching hospitals having lower odds of being provided with the next steps to access cancer care (OR, 0.21 [95% CI, 0.12–0.34] vs English-speaking callers; and OR, 0.41 [95% CI, 0.25–0.67] vs calls to teaching hospitals). However, speaking Mandarin was no longer found to be associated with lower odds of being provided with the next steps to access cancer care (OR, 0.58 [95% CI, 0.29–1.20]) (supplemental eTable 2).

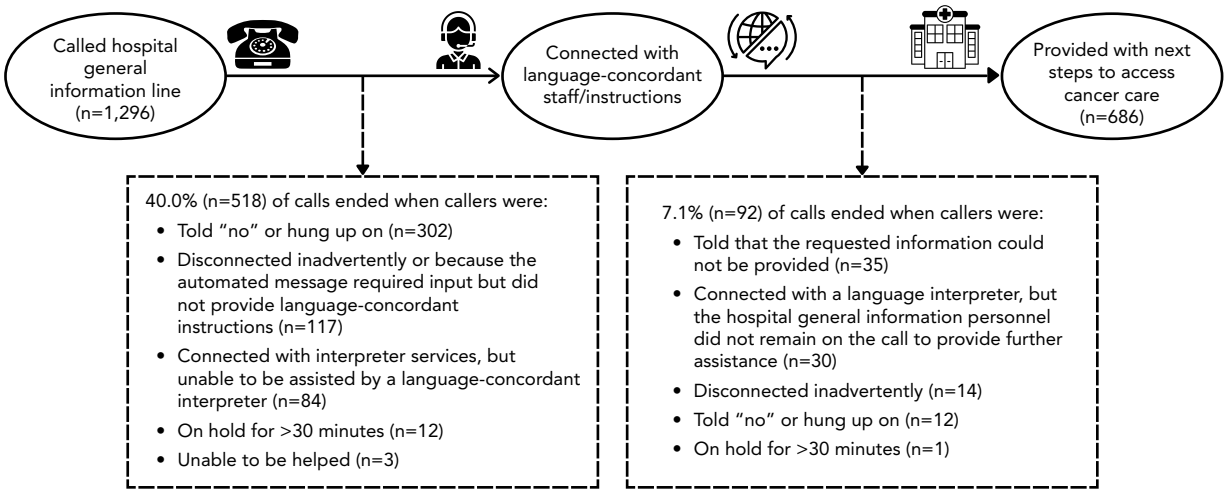

Figure 4. Schematic of simulated patient callers' experience of calling the hospital general information telephone line seeking to access cancer care.

Table 1. Provision of Next Steps to Access Cancer Care

	Next Steps Provided n (%)	Next Steps Not Provided n (%)	*P* Value[a]
Total, n	686	610	
Language			<.001
English	404 (93.5)	28 (6.5)	
Spanish	163 (37.7)	269 (62.3)	
Mandarin	119 (27.5)	313 (72.5)	
Region type[b]			.47
High LEP region	238 (55.1)	194 (44.9)	
Intermediate LEP region	228 (52.8)	204 (47.2)	
Low LEP region	220 (50.9)	212 (49.1)	
Hospital teaching status			<.001
Teaching	310 (61.5)	194 (38.5)	
Nonteaching	376 (47.5)	416 (52.5)	
Cancer care requested			.47
Colon	220 (50.9)	212 (49.1)	
Lung	238 (55.1)	194 (44.9)	
Thyroid	228 (52.8)	204 (47.2)	

Abbreviation: LEP, limited English proficiency.
[a]Univariate chi-square analysis.
[b]High LEP regions included states with >2.0 million LEP individuals. Intermediate LEP regions included states with 0.5–2.0 million LEP individuals. Low LEP regions included states with <0.5 million total LEP individuals, but at least 1,000 Spanish-speaking and 1,000 Mandarin-speaking individuals.

Table 2. Factors Associated With Simulated Patient Callers Being Provided With Next Steps to Access Cancer Care

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Language		
English	Ref	Ref
Spanish	0.04 (0.03–0.07)	0.04 (0.02–0.06)
Mandarin	0.03 (0.02–0.04)	0.02 (0.01–0.04)
Region type[a]		
High LEP region	Ref	Ref
Intermediate LEP region	0.91 (0.90–0.93)	0.84 (0.61–1.19)
Low LEP region	0.85 (0.83–0.86)	0.80 (0.57–1.12)
Hospital teaching status		
Teaching	Ref	Ref
Nonteaching	0.57 (0.45–0.71)	0.43 (0.32–0.56)
Cancer care requested		
Colon	Ref	Ref
Lung	1.18 (0.90–1.55)	1.30 (0.93–1.82)
Thyroid	1.08 (0.82–1.41)	1.12 (0.80–1.58)

Abbreviations: LEP, limited English proficiency; OR, odds ratio.
[a]High LEP regions included states with >2.0 million LEP individuals. Intermediate LEP regions included states with 0.5–2.0 million LEP individuals. Low LEP regions included states with <0.5 million total LEP individuals, but at least 1,000 Spanish-speaking and 1,000 Mandarin-speaking individuals.

Stratified analysis showed significant associations between language type and the outcome within each stratum of region type (Table 3). Notably, the impact of language on outcome was most pronounced in the low LEP regions (Spanish: OR, 0.008 [95% CI, 0.002–0.02]; Mandarin: OR, 0.008 [95% CI, 0.002–0.02] vs English). The effect of language was similar within hospital teaching status strata.

Discussion

Our study provides actionable insights into existing linguistic disparities in cancer care access due to systems-level barriers present prior to evaluation by a physician. In our study, simulated Mandarin-speaking and Spanish-speaking patient callers were provided with the next steps to access cancer care in only 27.5% and 37.7% of the calls, respectively, significantly less than the 93.5% of calls in which English-speaking patient callers were provided with the next steps to access cancer care ($P<.001$). For the 686 calls in which the next steps to access cancer care were provided, the mean duration of the telephone call was greater for the simulated non–English-speaking patient callers.

Our findings are consistent with, but more alarming than, results from a 2005 audit study conducted by the New York City Comptroller's Office in which simulated Spanish-speaking patient callers contacted the hospital general information telephone line and, speaking only in Spanish, requested the telephone number for one of the hospital's clinics (ie, outpatient medical clinic, obstetrics/gynecology clinic).[40] Of the 51 New York City hospitals contacted, the simulated Spanish-speaking patient caller was provided with a telephone number in 62.7% (n=32) of calls.[40] The difference in study outcomes may, in part, be due to our study including both simulated Spanish-speaking and Mandarin-speaking patient callers, including more geographically diverse hospitals, and focusing specifically on cancer care.

The lower likelihood of simulated patient callers being provided with the next steps to access cancer care when calling nonteaching hospitals likely reflects differential access to language-based resources. In a national survey of 861 hospitals in the United States, the Health Research and Educational Trust and the National Health Law Program reported that nonteaching hospitals had fewer resources available for providing patients with language services. Specifically, nonteaching hospitals were

Table 3. Relationship Between Simulated Patient Callers' Language Type With Next Steps to Access Cancer Care

	Next Steps Provided n (%)	Next Steps Not Provided n (%)	OR (95% CI)
Stratified by Region Type			
High LEP region			
English	130 (90.3)	14 (9.7)	Ref
Spanish	65 (45.1)	79 (54.9)	0.09 (0.05–0.16)
Mandarin	43 (29.9)	101 (70.1)	0.05 (0.02–0.09)
Intermediate LEP region			
English	133 (92.4)	11 (7.6)	Ref
Spanish	57 (39.6)	87 (60.4)	0.05 (0.03–0.11)
Mandarin	38 (26.4)	106 (73.6)	0.03 (0.01–0.06)
Low LEP region			
English	141 (97.9)	3 (2.1)	Ref
Spanish	41 (28.5)	103 (71.5)	0.008 (0.002–0.02)
Mandarin	38 (26.4)	106 (73.6)	0.008 (0.002–0.02)
Stratified by Hospital Teaching Status			
Teaching hospital			
English	165 (98.2)	3 (1.8)	Ref
Spanish	80 (47.6)	88 (52.4)	0.02 (0.003–0.05)
Mandarin	65 (38.7)	103 (61.3)	0.01 (0.003–0.03)
Nonteaching hospital			
English	239 (90.5)	25 (9.5)	Ref
Spanish	83 (31.4)	181 (68.6)	0.05 (0.03–0.08)
Mandarin	54 (20.5)	210 (79.5)	0.03 (0.02–0.04)

Abbreviation: LEP, limited English proficiency.

less likely than teaching hospitals to report the availability of staff interpreters (66% vs 76%), external interpretation agencies (61% vs 87%), language-based telephonic services (89% vs 99%), and bilingual nonclinical staff (70% vs 90%) (all $P<.05$).[33] This discrepancy in the availability of resources may in part be due to nonteaching hospitals being less likely to receive reimbursement for language services than teaching hospitals (2% vs 10%; $P<.05$).[33] In addition, nonteaching hospitals were less likely to use census data (45% vs 58%; $P<.05$) or to collect information from patients about their primary language (41% vs 66%; $P<.05$) to assess the language needs of its community.[33] Thus, more work is needed to explore effective and cost-efficient strategies to improve the availability of language-based services in hospitals, especially ones that serve a significant LEP patient population.

LEP patients with cancer are an underrepresented and understudied patient population. Thus, studies such as this one are needed to improve our understanding of linguistic barriers to cancer care access. Strengths of our study include the focus on the 3 most common spoken languages in the United States and on 3 cancer types that are highly relevant to the patient populations that speak those languages,[31,34,35] and the inclusion of hospitals from 12 demographically diverse states. The multiple sensitivity analyses performed were another strength of the study, although the new cohort was smaller and therefore it is possible that some of the subsequent results were no longer statistically significant due to a smaller cohort size.

Some potential limitations should be noted. First, we only assessed responses from the hospital general information telephone line, and as such, the findings do not reflect the type or quality of cancer care a patient may receive once seen and treated at the hospital. However, the audit survey methodology mirrors the patient experience of seeking to access cancer care. Second, our study findings may not be generalizable to all non–English-speaking patients with cancer. It is likely that patients who speak other less commonly spoken non-English languages or who reside in regions with a very small LEP population (ie, LEP population of <120,000 in the state) face even greater barriers to accessing cancer care than those identified in our study. Third, our study does not capture the complexities of hospital call center workflows, and thus, we are limited in our ability to ascertain the reasons behind the observed outcomes of the telephone calls. Thus, future qualitative work is needed to explore differences in hospital call center workflows and their relationship to cancer care access.

In the United States, Hispanic and Asian patients experience a disproportionate burden of disease from colon, lung, and thyroid cancer, and both the Hispanic and Asian populations have the highest rate of LEP (35%).[41] Although communication with patients who speak a non-English language in the healthcare setting is understandably more challenging and often requires more time,[42,43] 40% of calls ended prior to the simulated patient caller being connected with a language-concordant staff or provided with language-concordant information. Our study highlights the important yet understudied systems-level barriers that contributes to disparities in access to cancer care. Thus, although interventions focused on improving communication between physicians and LEP patients in the postdiagnosis stages are necessary, it is not adequate to fully address cancer disparities. Because disparities in cancer care for LEP patients start prior to the physician–patient visit, there is a critical need for interventions focused on improving access to cancer care for these patients. To address barriers at the level of the hospital general information telephone line and interpreter services, hospital general information telephone lines that default to an automatic message should connect callers to a live person when no input is entered, instead of disconnecting; hospitals that serve a significant LEP patient

population should have automatic messages that provide instructions in non-English languages; and workflows can be revised so that hospital general information personnel do not hang up on callers prior to determining the reason for the call, and remain on the phone when connecting callers to a language interpreter, especially when an external language services agency is used. Implementation of these interventions would have potentially addressed a large proportion of calls in which simulated patient callers were not provided the next steps to access cancer care in our study.

Conclusions

Our study findings identified significant systems-level barriers that non–English-speaking patients may encounter when attempting to access cancer care, well before they see a physician for treatment of their cancer. It is essential that we take a critical look at our healthcare system and engage in efforts to mitigate these communication barriers that disproportionately impact the health of vulnerable patient populations with cancer. All patients with cancer should have access to high-quality medical and surgical care, regardless of English language proficiency.

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References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2020. CA Cancer J Clin 2020;70:7–30.
2. U.S. Centers for Disease Control and Prevention. Leading cancer cases and deaths, all races/ethnicities, male and female, 2017. Accessed November 1, 2022. Available at: https://gis.cdc.gov/Cancer/USCS/DataViz.html
3. National Cancer Institute. Cancer disparities. Accessed November 1, 2022. Available at: https://www.cancer.gov/about-cancer/understanding/disparities
4. Epstein AJ, Gray BH, Schlesinger M. Racial and ethnic differences in the use of high-volume hospitals and surgeons. Arch Surg 2010;145:179–186.
5. Birkmeyer JD, Stukel TA, Siewers AE, et al. Surgeon volume and operative mortality in the United States. N Engl J Med 2003;349:2117–2127.
6. Sosa JA, Mehta PJ, Wang TS, et al. Racial disparities in clinical and economic outcomes from thyroidectomy. Ann Surg 2007;246:1083–1091.
7. Chen DW, Haymart MR. Disparities research in thyroid cancer: challenges and strategies for improvement. Thyroid 2020;30:1231–1235.
8. Bach PB, Cramer LD, Warren JL, et al. Racial differences in the treatment of early-stage lung cancer. N Engl J Med 1999;341:1198–1205.
9. Harari A, Li N, Yeh MW. Racial and socioeconomic disparities in presentation and outcomes of well-differentiated thyroid cancer. J Clin Endocrinol Metab 2014;99:133–141.
10. Shugarman LR, Mack K, Sorbero ME, et al. Race and sex differences in the receipt of timely and appropriate lung cancer treatment. Med Care 2009;47:774–781.
11. Bach PB, Schrag D, Brawley OW, et al. Survival of blacks and whites after a cancer diagnosis. JAMA 2002;287:2106–2113.
12. White A, Joseph D, Rim SH, et al. Colon cancer survival in the United States by race and stage (2001-2009): findings from the CONCORD-2 study. Cancer 2017;123(Suppl 24):5014–5036.
13. United States Census Bureau. Detailed languages spoken at home and ability to speak English for the population 5 years and over: 2009-2013. Accessed September 15, 2021. Available at: https://www.census.gov/data/tables/2013/demo/2009-2013-lang-tables.html
14. Zong J, Batalova J. The limited English proficient population in the United States in 2013. Accessed November 1, 2022. Available at: https://www.migrationpolicy.org/print/15316#
15. National Health Law Program. Your civil rights to health care. Your rights under Title VI of the Civil Right. Accessed April 3, 2023. Available at: https://healthlaw.org/resource/your-civil-rights-to-health-care-your-rights-under-title-vi-of-the-civil-right
16. Perkins J, Youdelman M. Summary of State Law Requirements: Addressing Language Needs in Health Care. National Health Law Program; 2008.
17. Weiss L, Bauer T, Hill C, et al. Language as a Barrier to Health Care for New York City Children in Immigrant Families: Haitian, Russian and Latino Perspectives. New York Academy of Medicine; 2006. Available at: http://resource.nlm.nih.gov/101499211
18. Ahn J, Abesamis-Mendoza N, Ho-Asjoe H, et al. Community health needs & resource assessment: an exploratory study of Chinese in NYC. Accessed November 2, 2022. Available at: https://med.nyu.edu/sites/default/files/asian-health2/chnra_chinese_0.pdf
19. Simon MA, Tom LS, Taylor S, et al. 'There's nothing you can do … it's like that in Chinatown': Chinese immigrant women's perceptions of experiences in Chicago Chinatown healthcare settings. Ethn Health 2021;26:893–910.
20. Pippins JR, Alegría M, Haas JS. Association between language proficiency and the quality of primary care among a national sample of insured Latinos. Med Care 2007;45:1020–1025.
21. Diamond LC, Wilson-Stronks A, Jacobs EA. Do hospitals measure up to the national culturally and linguistically appropriate services standards? Med Care 2010;48:1080–1087.
22. Ortega P, Shin TM. Language is not a barrier—it is an opportunity to improve health equity through education. Accessed April 3, 2023. Available at: https://www.healthaffairs.org/content/forefront/language-not-barrier-opportunity-improve-health-equity-through-education
23. Taira BR, Kim K, Mody N. Hospital and health system-level interventions to improve care for limited English proficiency patients: a systematic review. Jt Comm J Qual Patient Saf 2019;45:446–458.
24. Betancourt JR, Renfrew MR, Green AR, et al. Improving patient safety systems for patients with limited English proficiency: a guide for hospitals. Accessed November 2, 2022. Available at: https://www.ahrq.gov/sites/default/files/publications/files/lepguide.pdf
25. Divi C, Koss RG, Schmaltz SP, et al. Language proficiency and adverse events in US hospitals: a pilot study. Int J Qual Health Care 2007;19:60–67.

26. Cheng EM, Chen A, Cunningham W. Primary language and receipt of recommended health care among Hispanics in the United States. J Gen Intern Med 2007;22(Suppl 2):283–288.
27. Wilson E, Chen AH, Grumbach K, et al. Effects of limited English proficiency and physician language on health care comprehension. J Gen Intern Med 2005;20:800–806.
28. Green AR, Nze C. Language-based inequity in health care: who is the "poor historian"? AMA J Ethics 2017;19:263–271.
29. Kim EJ, Kim T, Paasche-Orlow MK, et al. Disparities in hypertension associated with limited English proficiency. J Gen Intern Med 2017;32:632–639.
30. Barwise AK, Nyquist CA, Espinoza Suarez NR, et al. End-of-life decision-making for ICU patients with limited English proficiency: a qualitative study of healthcare team insights. Crit Care Med 2019;47:1380–1387.
31. Deshmukh A. The most commonly spoken language in every U.S. state (besides English and Spanish). Accessed September 15, 2021. Available at: https://www.visualcapitalist.com/most-common-language-spoken-in-the-u-s-map/
32. Association of American Medical Colleges. AAMC hospital/health system members. Accessed September 15, 2021. Available at: https://members.aamc.org/eweb/DynamicPage.aspx?webcode=AAMCOrgSearchResult&orgtype=Hospital%2FHealth%20System
33. Hasnain-Wynia R, Yonek J, Pierce D, et al. Hospital language services for patients with limited English proficiency: results from a national survey. Accessed September 15, 2021. Available at: https://healthlaw.org/wp-content/uploads/2018/09/HRET.Language.Services.pdf
34. Miller KD, Goding Sauer A, Ortiz AP, et al. Cancer statistics for Hispanics/Latinos, 2018. CA Cancer J Clin 2018;68:425–445.
35. Torre LA, Goding Sauer AM, Chen MS Jr, et al. Cancer statistics for Asian Americans, Native Hawaiians, and Pacific Islanders, 2016: converging incidence in males and females. CA Cancer J Clin 2016;66:182–202.
36. United States Census Bureau. City and town population totals: 2010-2019. Accessed September 15, 2021. Available at: https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-cities-and-towns.html#tables
37. KFF. Market share and enrollment of largest three insurers – large group market. Accessed September 15, 2021. Available at: https://www.kff.org/other/state-indicator/market-share-and-enrollment-of-largest-three-insurers-large-group-market
38. Powell K. Top 100 most common last names in the United States. Accessed September 15, 2021. Available at: https://www.thoughtco.com/most-common-us-surnames-1422656
39. Name Census. Most common Asian and Pacific Islander last names in the United States. Accessed September 15, 2021. Available at: https://namecensus.com/last-names/common-asian-and-pacific-islander-surnames/
40. Getting in the door: language barriers to health services at New York City's hospitals. Accessed September 15, 2021. Available at: https://comptroller.nyc.gov/wp-content/uploads/documents/jan10-05_geting-in-the-door.pdf
41. Ramakrishnan K, Ahmad FZ. State of Asian Americans and Pacific Islanders series: a multifaceted portrait of a growing population. Accessed September 15, 2021. Available at: http://aapidata.com/wp-content/uploads/2015/10/AAPIData-CAP-report.pdf
42. Bregio C, Finik J, Baird M, et al. Exploring the impact of language concordance on cancer communication. JCO Oncol Pract 2022;18:e1885–1898.
43. Roter DL, Gregorich SE, Diamond L, et al. Loss of patient centeredness in interpreter-mediated primary care visits. Patient Educ Couns 2020;103:2244–2251.

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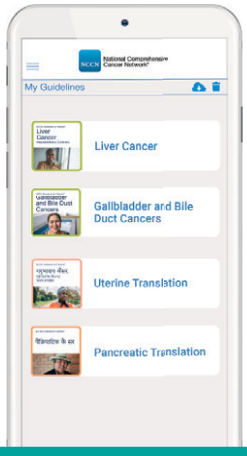

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Supplemental online content for:

Hidden Disparities: How Language Influences Patients' Access to Cancer Care

Debbie W. Chen, MD; Mousumi Banerjee, PhD; Xin He, MD, MBA; Lesley Miranda; Maya Watanabe, BS; Christine M. Veenstra, MD, MSHP; and Megan R. Haymart, MD

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eTable 1. Provision of Next Steps to Access Cancer Care: Sensitivity Analysis

	Next Steps Provided n (%)	Next Steps Not Provided n (%)	Univariate Chi-Square Analysis
Total, n	686	92	
Language			<0.001
English	404 (93.5)	28 (6.5)	
Spanish	163 (76.2)	51 (23.8)	
Mandarin	119 (90.2)	13 (9.9)	
Region type[a]			0.01
High LEP region	238 (86.9)	36 (13.1)	
Intermediate LEP region	228 (84.8)	41 (15.2)	
Low LEP region	220 (93.6)	15 (6.4)	
Hospital teaching status			0.01
Teaching	310 (92.0)	27 (8.0)	
Nonteaching	376 (85.3)	65 (14.7)	
Cancer care requested			0.04
Colon	220 (84.3)	41 (15.7)	
Lung	238 (91.5)	22 (8.5)	
Thyroid	228 (88.7)	29 (11.3)	

Abbreviation: LEP, limited English proficiency.
[a]High LEP regions included states with >2.0 million LEP individuals. Intermediate LEP regions included states with 0.5–2.0 million LEP individuals. Low LEP regions included states with <0.5 million total LEP individuals, but at least 1,000 Spanish-speaking and 1,000 Mandarin-speaking individuals.

eTable 2. Factors Associated With Simulated Patient Callers Being Provided With Next Steps to Access Cancer Care: Sensitivity Analysis

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Language		
English	Ref	Ref
Spanish	0.22 (0.13–0.36)	0.21 (0.12–0.34)
Mandarin	0.63 (0.32–1.30)	0.58 (0.29–1.20)
Region type[a]		
High LEP region	Ref	Ref
Intermediate LEP region	0.84 (0.82–0.87)	0.79 (0.47–1.32)
Low LEP region	2.22 (2.14–2.31)	2.01 (1.06–3.95)
Hospital teaching status		
Teaching	Ref	Ref
Nonteaching	1.98 (1.25–3.23)	0.41 (0.25–0.67)
Cancer care requested		
Colon	Ref	Ref
Lung	2.02 (1.17–3.54)	2.23 (1.27–4.04)
Thyroid	1.47 (0.88–2.46)	1.58 (0.93–2.73)

Abbreviations: LEP, limited English proficiency; OR, odds ratio.
[a]High LEP regions included states with >2.0 million LEP individuals. Intermediate LEP regions included states with 0.5–2.0 million LEP individuals. Low LEP regions included states with <0.5 million total LEP individuals, but at least 1,000 Spanish-speaking and 1,000 Mandarin-speaking individuals.