Disparities In Eye Clinic Patient Encounters Among Patients Requiring Language Interpreter Services

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Abstract

Background: Communication barriers are a major cause of health disparities for patients with limited English proficiency. Medical interpreters play an important role in bridging this gap, however the impact of interpreters on outpatient eye center visits has not been studied. We aimed to evaluate the impact of medical interpreters on eyecare patient encounters at a tertiary, safety-net hospital in the United States.

Methods: A retrospective review of patient encounter metrics collected by our electronic medical record was conducted for all encounters between January 1, 2016 and December 31, 2020. Patient demographics, primary language spoken, need for interpreter and encounter characteristics including new patient status, patient time waiting for providers and time in room were collected. We compared these patient visit times by interpreter use, with our main outcomes being time spent with ophthalmic technician, time spent with eye care provider, and time waiting for eye care provider. Interpreter services at our hospital are typically remote (via phone or video).

Results: A total of 202,895 patient encounters, of which 56,230 (27.7%) required an interpreter, were analyzed. After adjusting for patient age at visit and new patient status, patients requiring an interpreter spent between 1.7 to 4.5 minutes longer with the technician and 1.1 to 2.1 minutes with their ophthalmologist ($p<0.01$), dependent on language. Spanish speakers also spent on average 1.2 minutes longer waiting for their providers after the technician completely their work up than English speakers ($p<0.01$), but for other languages this difference was not significant. Limited English Proficiency patients with an interpreter needed were more likely to keep their appointment once it was made when compared to those patients not needing an interpreter, and more likely to have their allergies, problem list and medications reviewed during their visit.

Conclusions: Interpreters have a statistically significant impact on the eye clinic patient encounter, but less than we expected. Eyecare providers must be aware of this to prevent negative impacts on patient care. Equally important, healthcare systems should consider ways to prevent unreimbursed extra time from being a financial disincentive for seeing patients who require interpreter services.

Background

It has long been known that racial and ethnic disparities exist in access to medical care. [1–3] The Agency for Healthcare Research and Quality (AHRQ) reports annually on healthcare disparities. AHRQ data from 2019 showed racial and ethnic minorities receive worse care than white patients for 33 to 40% of quality measures (which includes private insurance coverage, access to specialist medical care, receiving routine preventative care such as influenza vaccine and pap smears). [4] Although many quality measures have improved over the past two decades, disparities persist and for some the gap has widened. [4] Among the many reasons for disparities in healthcare, communication barriers often secondary to limited English proficiency (LEP) are high on the list. [3] Language barriers can lead to poor understanding of diagnoses, poor treatment alliance between the patient and provider and suboptimal care with poorer health

outcomes. [5] LEP can trigger cognitive bias by providers, and may deter patients from presenting for help in a timely manner. In a study of migrant workers, perceived lack of interpreter was the number one barrier to accessing health care. [6] Prior studies of Emergency Room (ER) visits have reported that patients who don't speak English are 24% more likely to have an unplanned second ER visit within 3 days, [7] and in one study their average cost of an ER visit was around $40 more. [8]

If the language barrier is eased, many care disparities can also be reduced; for example, Jacobs et al. [9] reported a cost saving of $100/visit if the treating ER physician was bilingual in English and Spanish. Another study found that Hispanics who spoke English received the same care as non-Hispanic English speakers. [10] Certified interpreters have been suggested as a way to overcome language barriers, however their use varies dramatically. Blay et al. [11] reported variation in the use of interpreters from 16–71% depending on the hospital setting. The often cited reasons for not using a formal interpreter service are lack of availability, perceived time or budget constraints, or a lack of training in the use of interpreters. [11] Even if an interpreter is used, some studies suggests that practitioners and interpreters experience difficulties in their collaboration such as cross-cultural translation, emotional and interpersonal challenges, all of which can negatively affect services to patients with LEP. [12]

In ophthalmology, high-risk factors for eye disease and/or vision loss that have consistently been identified include increasing age, racial/ethnic minority, and low socioeconomic status.[13] Individuals cite trust, communication, and cost/lack of insurance as major barriers to accessing eye care.[14,15] In one patient focus group, 20% of the barriers to eyecare were comments on poor interactions with the eyecare provider due to communication failures.[13] In a study of a glaucoma clinic at a safety-net hospital in San Francisco, USA, difficulties related to medial interpretation made up 23% of the barriers to follow up care.[16] The same study suggested Latinos and Asian-Pacific Islanders were particularly affected by difficulties related to medical interpretation and long waiting times in the clinic.[16] Although the literature to date highlights the importance of communication and emphasizes LEP as a barrier to eyecare, our understanding of the influence of medical interpreters has not been well studied. As the foreign-born population of the United States is expected to grow, providers will continue to take care of LEP patients for the foreseeable future, thus it is vital for ophthalmologists to understand the impact that medical interpreters may have on their practice. In order to understand the influence of interpreters on the care received by eyecare patients, we undertook a retrospective review of data from patient visits to the Denver Health Eye Clinic, comparing characteristics of encounters where an interpreter was required to those without an interpreter.

Methods

The study received approval from the Colorado Multiple Institutional Review Boards and was conducted in accordance with the tenets set forth by the Declaration of Helsinki. A retrospective review of the characteristics of all patient encounters between January 1, 2016 to December 31, 2020 was conducted for the eye clinic of a safety-net hospital, Denver Health. Using Epic® (Verona, WI) electronic medical

record, the “Slicer Dicer” feature was used to generate reports of various patient or encounter features. We first selected all encounters within the eye clinic for our specified dates, then selected our variables of interest: patient age at visit, new patient status, primary language spoken, interpreter needed, primary financial class as well as encounter-specific variables such as time with technician or provider, time waiting for provider, and review of allergies, medications, and problem list. This data was then deidentified and securely transferred to statistical software for analysis.

Denver Health Medical Center is a large level-one trauma center and safety-net hospital in Denver, Colorado which provides emergency, primary and specialty care to all Denver residents, regardless of their ability to pay. The hospital sees a disproportionate share of Denver’s LEP patients, lower-socioeconomic and vulnerable populations. In 2018, Denver Health had almost 1 million patient visits; of these, 460,000 were visits by Hispanic patients, 271,000 were White/Caucasian patients, and 140,000 were Black patients.[17] The Denver Health Eye Clinic primarily uses phone or video interpreter services. For Spanish language services, there are dedicated Denver Health phone interpreters available during business hours, and for other languages, an independent translation service is utilized. If the lines to the dedicated Denver Health Spanish interpreters are busy, providers are redirected to the contracted provider. The majority of the front desk staff and ophthalmic technicians are bilingual in English and Spanish, and many of the providers have some proficiency in Spanish, however none of our eye care providers are certified in medical Spanish to provide healthcare services.

Statistical Analysis

Descriptive statistics were used to report comparisons by language spoken and interpreter needed for patient encounters. Linear regression analysis was used to estimate the change in time for the outcomes of interest (time with provider, time with technician, and time waiting for provider), adjusting for age and new patient status. We also accounted for the correlation of repeated visits by the same patients with general estimating equations. We excluded from analysis patients who had English listed as their primary language spoken and interpreter required (n=1,206), as this could include interpreter for hearing impairment. We also excluded patients with missing status of interpreter (n=241) and unknown language (n=820). A p-value <0.01 was considered statistically significant, and all analysis was conducted using SAS version 9.4 (Cary, North Carolina, USA).

Results

A total of 202,895 patient encounters occurred during our study period. Most patients spoke English as a primary language and the most common languages other than English were (in order of frequency) Spanish, Arabic, Amharic, Vietnamese, Russian, Nepali, French and Tigrinya (Table 1). For encounters where English was not the primary language spoken by the patient, 77.36% (56,230/72,685) required an interpreter. The percentage of visits where an interpreter was needed by language spoken is show in Figure 1. Table 2 compares patient demographics and encounter characteristics by language spoken

(Spanish or other) and whether an interpreter was needed. The average age at visit was between 38 and 57 years for all groups, with younger patients being less likely to require an interpreter than older patients.

Table 1
Language Characteristics of Patient Encounters.

Total Visits	**202,895**
Number of visits by language:	
English	130,210
Spanish	56,577
Arabic	2,879
Amharic	2,106
Vietnamese	1,363
Russian	1,235
Nepali	950
French	745
Tigrinya	719
Other	6,111
Interpreter Needed	56,230
Interpreter Not Needed	146,665

Table 2
Description of visits and comparisons by language grouping and use of an interpreter.

	English	Spanish		Other Languages	
		No Interpreter Needed	*Interpreter Needed*	*No Interpreter Needed*	*Interpreter Needed*
Total Visits	130,206	11,737	44,838	4,718	11,390
Unique patients	34,524	3,536	10,666	1,336	2,495
%New patient visits	37.8%	40.5%[a]	31.9%[a,b]	38.4%	29.7%[a,b]
Average (SE) age at visit in years	47.2 (0.2)	38.2 (0.8)[a]	48.3 (0.4)[a, b]	42.8 (1.1)[a]	56.5 (0.7)[a,b]
Average (SE) time with technician in minutes	12.3 (0.1)	12.6 (0.2)	14.0 (0.1)[a,b]	13.0 (0.4)	15.1 (0.3)[a,b]
Average (SE) time waiting for physician in minutes	8.1 (0.1)	9.1 (0.2)[a]	9.3 (0.1)[a]	9.1 (0.3)[a]	8.9 (0.2)[a]
Average (SE) time with physician in minutes	8.0 (0.1)	8.2 (0.2)	9.1 (0.1)[a,b]	9.0 (0.4)[a]	9.7 (0.2)[a]
%AVS printed	34.8%	37.6%	41.5%[a,b]	38.7%[a]	41.7%[a,b]
%Allergies Reviewed	51.4%	56.7%[a]	59.5%[a,b]	57.5%[a]	58.6%[a]
%Problem List Reviewed	24.7%	26.0%[a]	28.9%[a,b]	26.7%[a]	28.0%[a]
%Medication List Reviewed	51.6%	56.9%[a]	59.7%[a,b]	58.0%[a]	59.0%[a]
%No show probability	30%	20%	16%[b]	20%	16%[b]

Abbreviations: Standard Error (SE); After Visit Summary (AVS); Financial (Fin)

[a]Significantly different compared to English p<0.01.

[b]Significantly different compared to no interpreter of the same language group, p<0.01.

[c]Missing for 7,673 records. Not tested for statistical comparisons.

	English	Spanish		Other Languages	
%Primary Fin Class[c]					
Commercial	11.4%	5.4%	3.6%	6.6%	2.0%
Correctional Care	3.0%	0.5%	0.1%	0.1%	0.2%
Fin Assist	2.2%	20.0%	34.2%	16.4%	23.0%
Medicaid	51.2%	53.6%	36.8%	64.5%	50.4%
Medicare	32.0%	19.8%	25.1%	12.3%	24.4%
Workers Comp	0.2%	0.7%	0.2%	0%	0%

Abbreviations: Standard Error (SE); After Visit Summary (AVS); Financial (Fin)

[a]Significantly different compared to English p<0.01.

[b]Significantly different compared to no interpreter of the same language group, p<0.01.

[c]Missing for 7,673 records. Not tested for statistical comparisons.

In patient encounters requiring an interpreter, the average time with the ophthalmic technician was 1.4 minutes longer for Spanish speakers and 2.1 minutes longer for other languages when compared to visits with speakers of the same language who did not require interpreters (Table 2). Spanish speakers who required an interpreter spent 1.2 minutes longer waiting for their provider compared to English speakers, and 1.1 minutes longer with their provider compared to English speakers. Spanish speakers who did not require an interpreter spent 1.0 minutes longer waiting for their provider and 0.2 minutes longer with their physician than English speakers. Patients requiring an interpreter were more likely to have their after-visit summary (AVS) printed as well as their allergies, medication and problem list reviewed. Patients requiring an interpreter were less likely to “no show” to their appointment than English speakers. They were also more likely to use our institution’s financial assistance program or Medicaid than have commercial insurance.

The results of our linear regression models are shown in Table 3. After adjusting for age at visit and new patient status, we found that in encounters where an interpreter was needed, the patients spent between 1.7 to 4.5 minutes longer with the technician compared to English speakers, and waited up to 1.2 minutes longer for their provider (Table 3). When the comparison group was changed to speakers of the same language who did not require an interpreter, many of these differences were no longer statistically significant; the only significant difference that remained was among Spanish speakers requiring an interpreter, who spent 0.6 minutes longer with their provider than Spanish speakers who did not require an interpreter (Table 4).

Table 3
Adjusted impact on time aspects of encounter for patients requiring an interpreter compared to English speakers.

Adjusted[a] change in time (minutes) for interpreter needed vs English speakers	**Spanish** β (SE)	**Arabic** β (SE)	**Amharic** β (SE)	**Vietnamese** β (SE)	**Russian** β (SE)
Time waiting to be roomed	-0.4 (0.2)	-1.0 (0.9)	1.7 (1.4)	-1.0 (1.2)	2.7 (1.2)
Time with technician	**1.7 (0.2)**	**2.4 (0.7)**	1.8 (0.9)	2.5 (1.3)	**4.5 (1.3)**
Time waiting for physician	**1.2 (0.1)**	0.1 (0.4)	1.0 (0.6)	1.0 (0.9)	1.9 (1.1)
Time with physician	**1.1 (0.1)**	**2.1 (0.6)**	0.2 (0.5)	0.01 (0.7)	1.1 (0.7)
Statistically significant (p<0.01) coefficients shown in bold.					
[a]Adjusted for age at visit and new patient visit.					

Table 4
Adjusted impact on time aspects of encounter for patients requiring an interpreter compared to speakers of the same language who did not require an interpreter.

Adjusted[a] change in time (minutes) for interpreter needed vs no interpreter needed for speakers of the same language	**Spanish** β (SE)	**Arabic** β (SE)	**Amharic** β (SE)	**Vietnamese** β (SE)	**Russian** β (SE)
Time waiting to be roomed	0.4 (0.4)	-1.2 (1.7)	2.7 (1.7)	0.6 (2.2)	3.8 (2.6)
Time with technician	0.7 (0.3)	1.5 (1.2)	0.9 (1.1)	-1.2 (2.3)	2.6 (1.8)
Time waiting for physician	0.1 (0.2)	-1.3 (0.9)	-0.5 (1.0)	0.4 (1.3)	-0.5 (2.2)
Time with physician	**0.6 (0.2)**	1.5 (1.0)	-1.1 (0.8)	-1.2 (1.4)	-1.0 (2.9)
Statistically significant (p<0.01) coefficients shown in bold.					
[a]Adjusted for age at visit and new patient visit.					

Discussion

Our study presents several important findings as the first paper to examine the impact of medical interpreters on eyecare visits. Patients needing an interpreter spent slightly longer with both their

ophthalmic technician and eye care provider compared to patients without an interpreter. The longer time could be accounted for by time waiting for an interpreter to be available, time for interpretation itself, and/or adjustments in communication strategies and behavior. The need for an interpreter had greater impact on time with technician than time with provider; this is intuitive since our technicians are required to collect more history (such as reviewing medication lists), and in our study LEP patients were more likely to have their allergies, medication list and problem list reviewed (although the data does not distinguish between review by provider or review by technician, this task is usually performed by the technician). The technicians are also often responsible for the initial refraction, which can be difficult even for English speakers. In this clinic, which sees many vulnerable populations, poor literacy may further contribute to this language barrier, making refraction as well as medical interpretation even more challenging. Unfortunately, literacy status is not routinely recorded in the EMR so this study could not adjust for this, which may have influenced the results. Interestingly, many of the differences in encounter times were not significant when speakers of the same language who did not require an interpreter were used as the comparison. This may be accounted for in part by the smaller sample size when dividing each language into two groups for comparison. However, it could also be that there are cultural differences, aside from language, which impact the encounter length.

We also showed that patients who need an interpreter spent more time waiting for their provider after the technician had completed their initial work-up, however the only language it reached statistical significance for was Spanish. Some possible explanations for this include providers prioritizing patients who do not need an interpreter, and/or dialing the number for an interpreter then moving on to do something else while waiting for the interpreter to come on the line. Fortunately, our data suggest that needing an interpreter or speaking a language other than English did not change the time waiting to be taken into an exam room. Long wait times are often cited as barriers for LEP patients seeking care,[16] one hypothesis for this could be that they are not prioritized in the waiting room since staff believe their visit will be more difficult or take longer. However, our data contradicts this, and suggests that if waiting room times are long, they are experienced equally by all patients in the clinic.

This study found that LEP patients were more likely to keep an appointment once it had been made. It is possible this reflects lack of interpreter use by front desk staff. For example, patients may not want to call again once an appointment has been made. Another possible explanation is that LEP patients were more likely to receive their After Visit Summary (AVS) than English speakers, and this AVS includes their next appointment time. Prior studies have suggested even when interpreters are used in a clinic by nursing staff and providers, patients will often try and “get by” at the front desk without an interpreter.[18] Like our technicians, almost all of our clinic schedulers are bilingual in Spanish and English. However, this does not help patients who speak a language other than Spanish or English, and the effect was seen for both Spanish and other languages. This suggests that there may be other factors contributing, such as value placed on the appointment or cultural differences.

Limitations

Our study has several limitations. First, patients self-identify their primary language and whether they need an interpreter or not. In our study, almost ¼ of patients whose primary language was not English did not require an interpreter. This could result an underestimation of effect if patients falsely identify their primary language as English (for example to avoid perceived provider bias). Additionally, if a patient denies need for an interpreter it raises the question of whether some patients with limited fluency in English may not understand details of all discussions or risks of surgery, but are embarrassed to admit this lack of understanding which could affect quality of care. Alternatively, patients sometimes come to their appointments with English-speaking relative family or friends, and prefer to have their companion translate for them, which is not recorded typically. Prior studies have reported that interpreter utilization changes with how they are offered: "In what language do you prefer to receive your medical care?" appears to be mostly likely to result in appropriate interpreter utilization.[19] Second, our EMR only records whether an interpreter was needed, we cannot to be sure that a qualified medical interpreter was used for the entire visit in every case where it was needed. Also, these results highlight the impact of primarily remote interpreters as are found in our clinic, and results may be different than in person interpreters. Although one study during the COVID-19 pandemic reported no difference between remote and in person interpreters,[20] it has not been widely examined. Finally, most of our technicians are bilingual in English and Spanish which could have impacted our results for time with technician for Spanish speakers. The data collection method we used does not specify which technician took part in the encounter and so we are unable to account for bilingual staff. This is an important area for future studies to examine as prior reports suggest significant cost savings with bilingual staff,[9] and it is likely to impact time as well.

In addition to understanding the impact of bilingual staff, our study raises the question of whether the same care is being delivered if the visit is only 60 seconds longer and it takes an average of 16 seconds[21] to get an interpreter on the line. This average phone waiting time for an interpreter is reported by the interpreter service contracted by our hospital and is likely a generous estimate. Nonetheless, it seems unlikely that the provider is communicating the same amount of information to the patient through an interpreter using only 44 extra seconds of time as compared to a visit without an interpreter. This an important point that future studies must evaluate. Further, it is still to be determined whether this difference is associated with patient outcomes or satisfaction, and these are significant questions that should be also targeted by future research.

Conclusions

Overall, our study suggests there are discrepancies between encounters with and without an interpreter that are unlikely to be explained by interpretation time alone. It appears providers may adjust their communication strategies when patients require an interpreter. Sometimes this may be beneficial, such as being more likely to provide written instructions in an after visit summary, however adjusting communication strategies to aim for similar appointment lengths may lower the standard of care delivered to patients requiring an interpreter. Although health care organizations that receive federal funding are mandated to provide language services to LEP patients,[22] the US healthcare system does not

specifically provide additional resources to hospitals and practices to care for LEP patients. This puts the financial burden of any additional unreimbursed time with LEP patients on hospitals and practices. This could create a financial disincentive to spend additional time with LEP patients. To prevent this from happening, a conversation regarding expectations and resources for LEP patients must be started with all stakeholders. For the time being, providers must be conscious of adjusted behaviors and communication strategies for LEP patients and ensure it does not impact patient care. As the cultural and linguistic diversity of the United States continues to grow, engaging our health care system to deliver care effectively across language barriers is an essential investment in our future.

List Of Abbreviations

Limited English Proficiency (LEP), Agency for Healthcare Research and Quality (AHRQ), Emergency Room (ER), After Visit Summary (AVS)

Declarations

Ethics approval and consent to participate: The study received approval from the Colorado Multiple Institutional Review Boards and was conducted in accordance with the tenets set forth by the Declaration of Helsinki. A waiver of informed consent was granted by Colorado Multiple Institutional Review Boards and no identifiable data is presented.

Consent for publication: Not applicable.

Availability of data and materials: The data that support the findings of this study are available from the corresponding author but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request.

Competing interests: The authors declare that they have no competing interests.

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Authors' contributions: Study design (LM, JP, KC, LS, CI), data collection (LM, CI), data analysis (JP), manuscript preparation (LM, JP, ZG, MW, KC, LS, CI). All authors read and approved the final manuscript.

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Figures

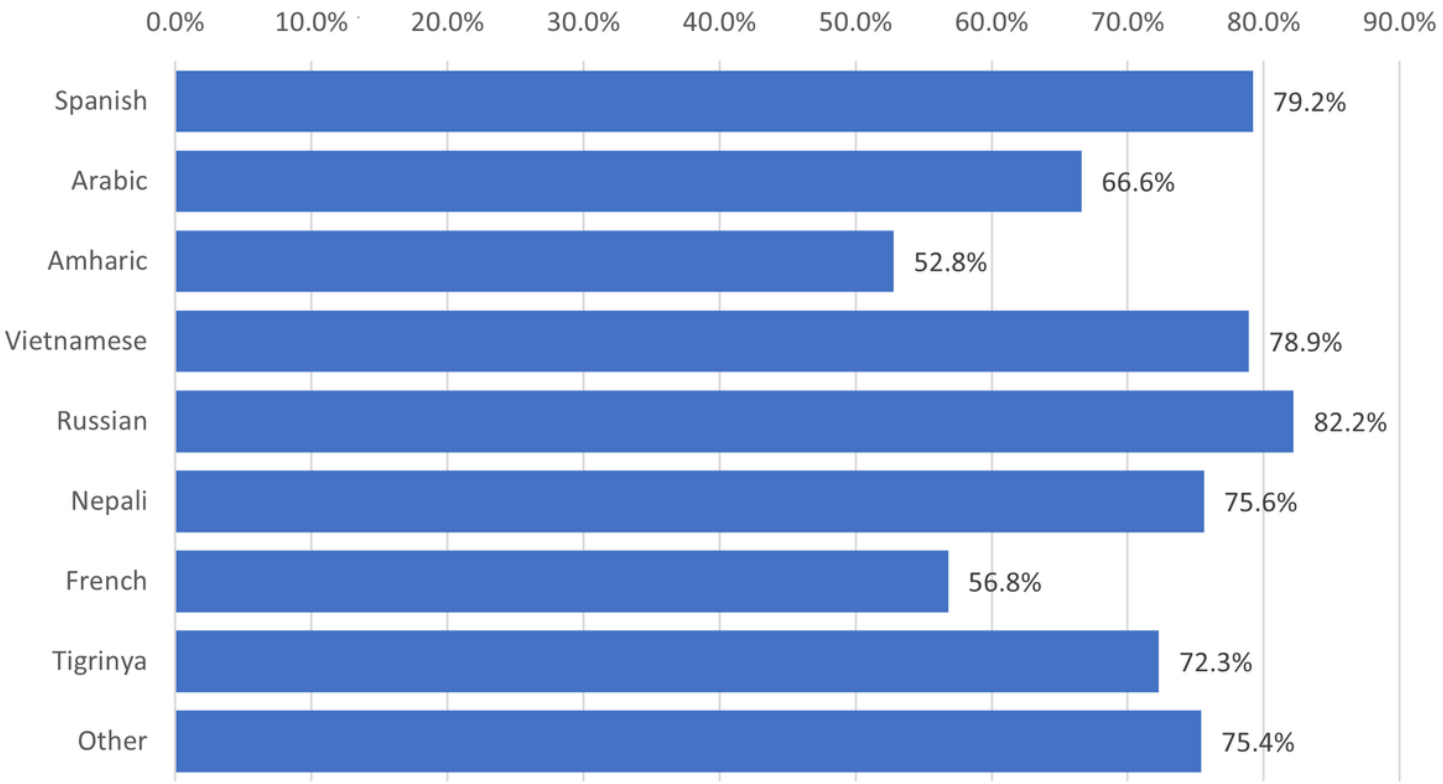

Figure 1

Percentage of visits where an interpreter was needed by primary language.