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Changes in Rates and Modality of Interpreter Use for Pediatric Emergency Department Patients in the COVID-19 Era

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Background: As the COVID-19 pandemic continues, health care systems around the world have changed care delivery in significant ways. Racial and ethnic disparities have emerged for COVID-19 infection rates, morbidity, and mortality. Inequities in care and underutilization of interpretation for patients who use a language other than English (LOE) for care existed prior to this era. This study sought to evaluate interpreter use in a pediatric emergency department (ED) as changes associated with COVID-19 were implemented.

Methods: ED records were reviewed from December 1, 2019, to July 31, 2020. Patients were classified as having LOE if they preferred a language other than English and consented to interpretation. Statistical process control was used to analyze changes in interpreter use over time, relative to the onset of COVID-19–related operational changes. Beginning March 1, 2020, in-person interpreters were no longer available and staff were encouraged to communicate from outside the patient room when possible; this change served as the exposure of interest. Interpreter use for LOE patients, overall and by triage acuity level, was the study outcome.

Results: A total of 26,787 encounters were included. The weekly mean proportion of encounters that used interpretation for patients with LOE increased from 59% to 73% after the onset of COVID-19. This increase met criteria for special cause variation. Interpretation modality changed to being mostly by phone from previously by video or in-person.

Conclusion: Operational changes in the ED related to COVID-19 were associated with increased interpreter use. Possible explanations include lower patient volumes or changes in model of care that encouraged interpreter use by a variety of modalities.

The coronavirus 2019 (COVID-19) pandemic continues to spread across the globe and within the United States, causing significant morbidity and mortality.¹ Given that infection rates remain high in many areas in the United States,² and the spread of variants of the virus continues to evolve, the challenges associated with COVID-19 will likely be substantial for the foreseeable future.

Health care systems have had to adapt and evolve during this pandemic; for example, by adjusting operations to optimize infection control and preparing to care for increasing numbers of patients during a surge. In pediatric emergency departments (EDs) across the country, a paradoxical decrease in patient volume was reported during the pandemic as stay-at-home orders were implemented.³ For patients who did present to care, there were shifts in patient composition, with reports of increased acuity.⁴ Due to concerns for infection control and a nationwide shortage in personal protective equipment (PPE), ED operations also changed with regard to patient screening, throughput, cohorting, and evaluation.⁵

Racial and ethnic disparities within the spread and impact of COVID-19 have emerged as a major issue. This first

became apparent after a report from the Centers for Disease Control and Prevention (CDC) showed higher rates of hospitalization for Black and Latino populations.⁶ Studies now confirm that mortality rates are higher for Black, Indigenous, Latino, and Pacific Islander Americans with COVID-19 when compared to White Americans.⁷ Another study of mortality by county showed higher mortality in areas with a larger proportion of non-English-speaking individuals.⁸ Indeed, a review of the data shows that the prevalence and severity of COVID-19 is disproportionately worse for groups who are known to experience health disparities at baseline, and there is an urgent call to address this as a nation.⁹

It is well established that patients with a language for care other than English (LOE) experience poorer outcomes and many disparities in health care, including higher rates of complications, missed diagnoses, medical errors, and lower access to care.^{10–14} Professional interpretation can improve some of these disparities, but it is underutilized in many clinical settings in pediatrics. One such setting is the ED, with reported utilization for 45.4% to 55.8% of encounters in which another language is spoken by the patient.^{15,16} Since 2016 we have implemented a variety of quality improvement (QI) interventions to improve interpreter use in our pediatric ED, including increasing interpreter units and signage indicating interpreter need.

Given the current context and changes in our model of care associated with COVID-19, we aimed to analyze for associated changes in the use of professional interpretation for patients with LOE in our pediatric ED. We hypothesized that interpreter use would decrease with these operational changes, given provider preference for in-person interpretation¹⁷ and increased provider and staff stressors.

METHODS

Context

This study took place in an academic freestanding children's hospital ED with approximately 60,000 annual patient visits. Data on interpreter use in the ED are routinely tracked and reviewed by interpreter services and ED leadership. Options for professional interpretation at baseline included by phone, by video, or by use of our in-person staff interpreters (Spanish only) from 2:00 P.M. to 12:00 A.M. daily. During these hours, our in-person Spanish interpreters are dedicated to the ED and co-located with clinical staff for rapid utilization. There are 12 video units available for the ED that can be wheeled into patient rooms when needed. Typically, they then remain in the room throughout the patient encounter. Phone interpretation was accessed via a dual-handset phone mounted on the wall of each patient room or by calling from any phone outside the room. Video and in-person interpretation were the baseline modalities most commonly used, while phone interpretation was typically available as a backup or for uncommon languages.

The first case of community spread of COVID-19 reported in our region was in a pediatric patient seen at our hospital on February 28, 2020. Due to concerns about exposure to COVID-19, in-person interpretation was temporarily halted on March 1, and providers could use phone and video only. In an effort to minimize staff exposure to patients and families and preserve PPE, the ED administration encouraged most interactions with patients to occur by phone from outside the patient room beginning March 1. Patient registration, medication reconciliation, history, diagnosis education, and updates were all completed by calling into the patient room and, for families with LOE, using a phone interpreter. Staff then entered the room to examine the patient and obtain samples as needed. A phone or video interpreter could be used for those interactions as needed. Patients were also allowed to have only one caregiver enter the ED with them, and other family members were required to wait outside. These altered standards for interacting with patients and families continued through July 2020 due to extreme PPE shortages.

QI interventions to increase the use of interpretation had been ongoing in our ED. In 2017 we improved the identification of families who preferred a language other than English and provider notification of language for care using door signage. We also increased the number of video inter-

preter units available 24 hours a day. In 2019–2020 there were no new interventions, only the monitoring of follow-up data. Immediately before the onset of COVID-19, we were planning a follow-up intervention to provide data on interpreter use as well as reminders to staff. However, beginning March 1, 2020, operations shifted dramatically in our ED, and the intervention was halted to focus on the COVID-19 response.

Definition of LOE

Patients were asked on arrival to the ED, "What is your preferred language for care today?" If the answer was a language other than English, a subsequent question was asked: "Can we provide interpretation?" The answers to these two questions are recorded in the medical record. If patients do not speak any English, a video unit is present with the triage nurse where they can point to their language for care. Because we do not assess language proficiency, we have recently updated our terminology from "limited English proficiency" or LEP to "language other than English" or LOE. In this study, patients with LOE requested a language other than English and did not decline interpretation.

Measures

We reviewed data from patient encounters from December 1, 2019, to July 31, 2021. Our exposure of interest was the time frame when ED process changes were made due to the COVID-19 pandemic, with dates prior to March 1 considered as baseline, and dates on or after March 1 considered as within the new COVID-19 model of care. For patients with LOE, we analyzed the overall proportion receiving any interpretation during their ED visit. Receipt of interpretation is determined from vendor billing data (for phone and video interpretation) or by an order in the medical record for in-person interpretation. Because of the known changes in ED acuity during the pandemic, we also analyzed subgroups of our population by triage acuity level, using the Emergency Severity Index (ESI), in which numbers 1 to 5 represent highest to lowest acuity. Finally, we reviewed overall ED patient volumes and the use of different interpretation modalities during the study period. Given the patterns of remote interpreter use at baseline (very low use of telephone and moderate to high use of exclusive video interpretation), we examined encounters with *any* telephone interpreter use and those exclusively using video interpretation separately over time.

Analysis

Patient characteristics for both LOE and EP (English preference) groups were summarized using descriptive statistics during baseline and after the new model of care. All time-related analyses were completed using statistical process control (SPC) to evaluate variation in processes over time. We used control charts to distinguish variation due

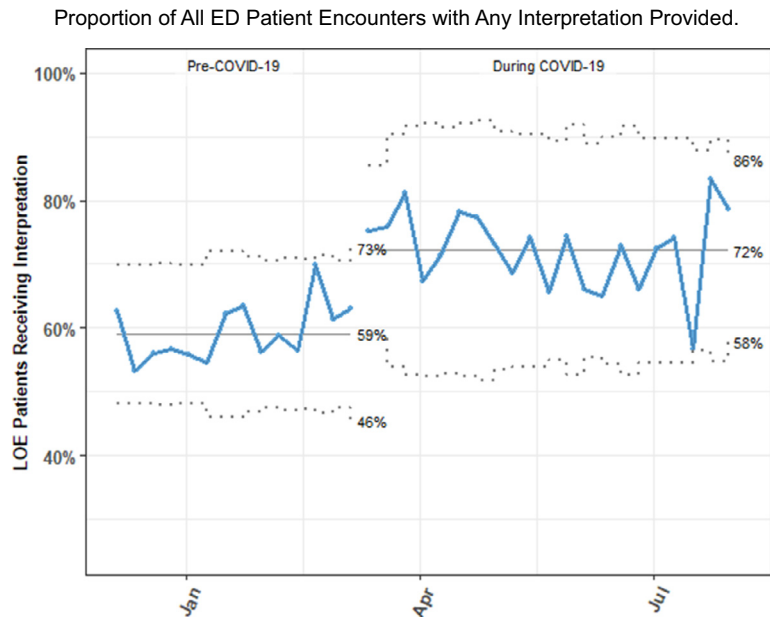


Figure 1: This p-chart displays the proportion of all emergency department (ED) patient encounters with any interpretation provided before and during the COVID-19 pandemic. LOE, language other than English.

to common causes and special assignable causes for our entire study period. We selected p-charts, given the data to be analyzed were proportions over time. A control chart contains a centerline and upper and lower control limits, which are statistically defined. We used standard established rules from the *Health Care Data Guide* to identify special cause variation.¹⁸ We used the qicharts2 package in R, version 4.0.0 to create control charts.^{19,20}

Ethical Considerations

This study was approved by our institution's Institutional Review Board.

RESULTS

We reviewed data for 26,787 ED patient encounters from December 1, 2019, to July 31, 2021. Patients and families with LOE represented 12.8% of ED encounters ($n = 3,440$). Patient characteristics before and after the change in model of care are summarized in [Table 1](#). During the baseline period (December 1, 2019, to February 29, 2020), on average, interpretation (involving a professional interpreter, either in person or remote) was used at least one time during the ED visit in 59% of encounters with LOE patients and families. After the COVID-19–related changes in model of care beginning March 1, 2020, this increased to 73% of LOE encounters overall ([Figure 1](#)). This change met criteria for special cause variation with a point outside the upper control limit. When analyzed by subgroup, there was a trend toward increased interpreter use for higher-acuity patients with an ESI of 1 to 2 ([Figure 2](#)), but this did not meet criteria for special cause variation. For patients with

an ESI of 3 to 5, any interpreter use increased from a baseline of 58% to 73% of encounters on average ([Figure 3](#)), also meeting criteria for special cause variation with points outside the upper control limit.

There were significant changes in the interpretation modality used. Prior to March 1, the majority of patients received video and in-person interpretation. After the changes in model of care, in-person interpretation decreased to none, as our staff interpreters were no longer working on site. Video-only interpretation decreased from 56% to 17% of encounters in which interpretation was used ([Figure 4](#)), and encounters in which any phone interpretation was used increased from being rarely used at 18% to 81% ([Figure 5](#)).

DISCUSSION

The overall use of professional interpretation during encounters with families with LOE in our pediatric ED increased from 59% to 73% with the onset of the COVID-19 pandemic, contrary to our hypotheses. When analyzed by subgroup according to triage acuity, the change met criteria for special cause variation in patients presenting with moderate and lower-acuity complaints (ESI 3–5); there was a trend toward increase for higher-acuity patients as well (ESI 1–2). In a previous study in our ED, lower triage acuity was associated with less interpreter use,¹⁶ so this change represents a particularly impactful increase.

There are several potential reasons for the increase in interpreter use after March 1, 2020, including decreased patient volumes and changes to the model of care and interpretation modalities. ED volumes decreased, and if

	Pre-COVID-19		During COVID-19		All Patients, N (%) (N = 26,787)
	LOE (n = 1,934)	EP (n = 11,378)	LOE (n = 1,506)	EP (n = 11,967)	
Age in Years, Median (IQR)	5.0 (2.0–10.1)	4.9 (1.7–11.0)	5.6 (1.8–11.5)	6.3 (2.1–12.9)	5.5 (1.9–11.9)
Sex					
Male	1,026 (53.1)	6,026 (53.0)	816 (54.2)	6,126 (51.2)	13,996 (52.2)
Female	908 (46.9)	5,352 (47.0)	690 (45.8)	5,840 (48.8)	12,790 (47.7)
Unknown	0 (0.0)	(0.0)	0 (0.0)	1 (0.0)	1 (0.0)
Language					
English	11 (0.6)	10,911 (95.9)	7 (0.5)	11,634 (97.2)	22,563 (84.2)
Spanish	1,243 (64.3)	198 (1.7)	925 (61.4)	158 (1.3)	2,524 (9.4)
Somali	121 (6.3)	66 (0.6)	80 (5.3)	43 (0.4)	310 (1.2)
Vietnamese	88 (4.6)	16 (0.1)	65 (4.3)	10 (0.1)	179 (0.7)
Amharic	65 (3.4)	34 (0.3)	69 (4.6)	19 (0.2)	187 (0.7)
Cantonese	81 (4.2)	13 (0.1)	24 (1.6)	2 (0.0)	120 (0.4)
Mandarin	62 (3.2)	13 (0.1)	39 (2.6)	11 (0.1)	125 (0.5)
Arabic	31 (1.6)	18 (0.2)	37 (2.5)	5 (0.0)	91 (0.3)
Tigrinya	29 (1.5)	10 (0.1)	35 (2.3)	8 (0.1)	82 (0.3)
Russian	19 (1.0)	17 (0.1)	35 (2.3)	11 (0.1)	82 (0.3)
Other	184 (9.5)	82 (0.7)	190 (12.6)	66 (0.6)	524 (2.0)
Interpretation Mode					
None	801 (41.4)	11,230 (98.7)	448 (29.7)	11,806 (98.7)	24,287 (90.7)
Video Only	662 (34.2)	90 (0.8)	215 (14.3)	48 (0.4)	1,015 (3.8)
Multiple Types	241 (12.5)	20 (0.2)	487 (32.3)	50 (0.4)	798 (3.0)
In Person Only	198 (10.2)	27 (0.2)	27 (1.8)	3 (0.0)	255 (1.0)
Phone Only	32 (1.7)	11 (0.1)	329 (21.8)	60 (0.5)	432 (1.6)
ESI					
1 - Critical	7 (0.4)	62 (0.5)	13 (0.9)	75 (0.6)	157 (0.6)
2 - Emergency	297 (15.4)	3,254 (28.6)	292 (19.4)	3,570 (29.9)	7,413 (27.7)
3 - Urgent	672 (34.8)	4,768 (41.9)	677 (45.0)	6,060 (50.7)	12,178 (45.5)
4 - Non-Urgent	851 (44.0)	2,835 (24.9)	454 (30.2)	1,979 (16.6)	6,119 (22.9)
5 - Minor	107 (5.5)	452 (4.0)	68 (4.5)	267 (2.2)	894 (3.3)
Payer					
Medicaid/Healthy Options	1,697 (87.7)	4,986 (43.8)	602 (88.7)	2,021 (39.5)	9,306 (48.7)
Commercial	159 (8.2)	5,924 (52.1)	44 (6.5)	2,846 (55.7)	8,974 (47.0)
Self-Pay	75 (3.9)	313 (2.8)	30 (4.4)	138 (2.7)	557 (2.9)
Other Government	3 (0.2)	154 (1.4)	3 (0.4)	105 (2.1)	265 (1.4)
PMCA					
Nonchronic	1,343 (69.5)	7,114 (62.5)	701 (62.8)	4,355 (55.8)	13,514 (60.8)
Noncomplex Chronic	314 (16.2)	2,258 (19.9)	179 (16.0)	1,529 (19.6)	4,280 (19.3)
Complex Chronic	276 (14.3)	2,006 (17.6)	236 (21.1)	1,915 (24.6)	4,433 (19.9)
Admitted to Inpatient	213 (11.0)	2,071 (18.2)	265 (17.6)	2,590 (21.6)	5,139 (19.2)

LOE, patients with a language for care other than English; EP, patients who have an English preference; IQR, interquartile range; ESI, Emergency Severity Index, indicating triage acuity, with 1 indicating highest acuity; PMCA, Pediatric Medical Complexity Algorithm, based on three years' worth of diagnosis codes.

providers have less time pressure this may affect the likelihood that they would use interpretation. In our ED, interpretation has been more likely used during the times of day with lower patient volumes, supporting the idea that lower patient volumes are associated with increased interpreter use.¹⁶ However, if having more time was the only reason, we would have expected to see the use of video interpretation increase or stay the same, because video is the preferred and most commonly used modality by providers and there was no access to in-person interpretation after March 1.¹⁵ By contrast, video interpreter use decreased while phone use increased. Thus, the decrease in patient volumes alone does not fully explain our findings.

Another potential explanation for the increase in interpretation is related to our change in model of care due to COVID-19, with more communication occurring by phone from outside the room. It is possible that lack of face-to-face interactions with families with LOE necessitated more interpreter use. Another contributing factor may have been the lack of additional family members present who may have provided interpretation. Although using ad hoc interpreters is not our standard of care due to risk of errors and omissions,²¹ there are situations in which families request it and bring family members with the expectation they will interpret. With the restriction on the number of caregivers, this may have been less prevalent.

Proportion of Higher-Acuity Patient Encounters with Any Interpretation Provided

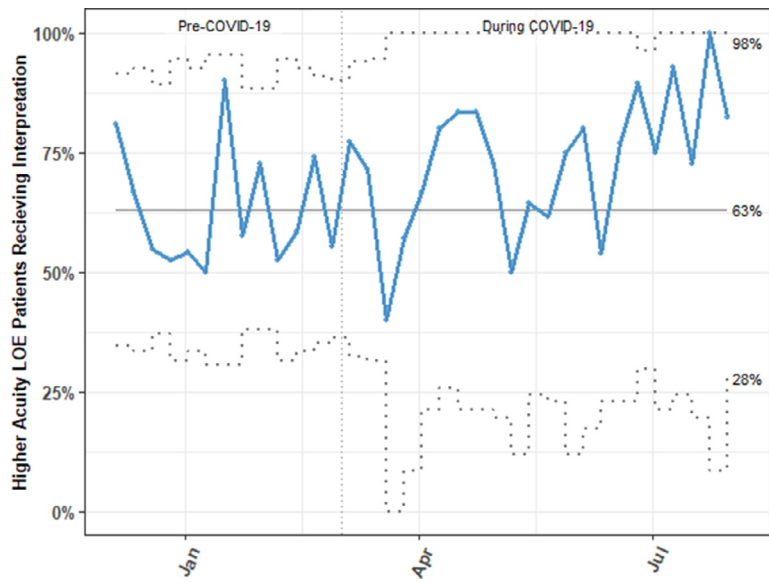


Figure 2: This p-chart shows the proportion of higher-acuity (ESI 1,2) patient encounters with any interpretation provided before and during the COVID-19 pandemic. LOE, language other than English; ESI, Emergency Severity Index.

Proportion of Lower-Acuity Patient Encounters with Any Interpretation Provided

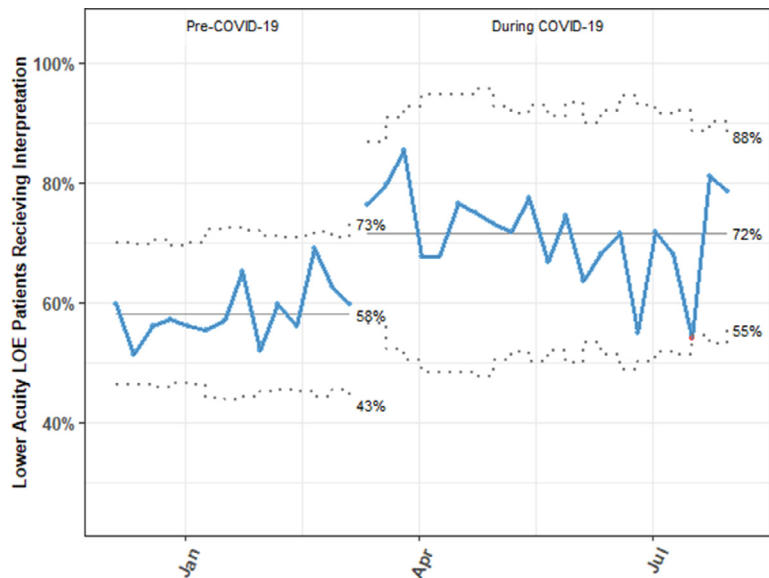


Figure 3: This p-chart shows the proportion of lower-acuity (ESI 3,4,5) patient encounters with any interpretation provided before and during the COVID-19 pandemic. LOE, language other than English; ESI, Emergency Severity Index.

During the COVID-19 era in our study, in addition to more overall interpretation, we found substantial changes in interpreter modality used. There was a decrease in video and in-person interpretation and a large increase in phone interpretation use. This is despite previous work documenting a strong provider preference for video over phone interpretation, and significantly increased interpreter use when providers were assigned to use video rather than phone interpretation.²² The previous findings were in the context of

providers and nurses communicating with families face-to-face, and recorded visits revealed the use of English in patient rooms even with families who preferred another language.²³ We suspect that this increase in interpretation is better explained by the emphasis on communication happening from outside the door of the patient's negative pressure room. Staff would be unable to enter the room and communicate with the families in English to obtain answers to their questions and, instead, were required to call in from

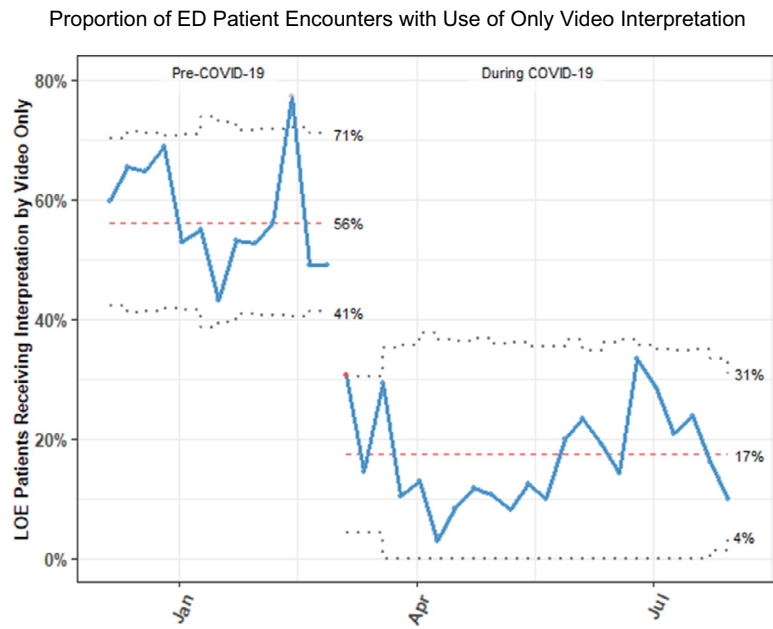


Figure 4: This p-chart displays the proportion of emergency department (ED) patient encounters with the use of only video interpretation before and during the COVID-19 pandemic. LOE, language other than English.

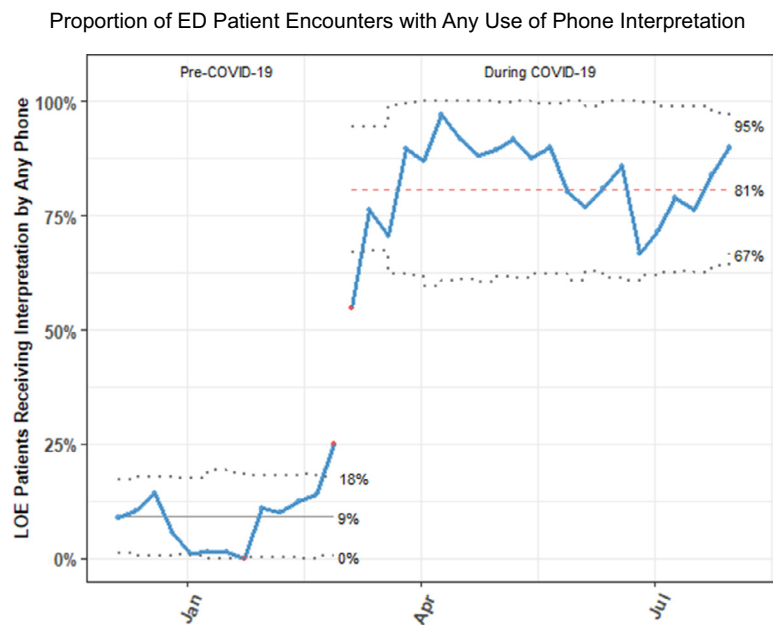


Figure 5: This p-chart shows the proportion of emergency department (ED) patient encounters with any use of phone interpretation before and during the COVID-19 pandemic. LOE, language other than English.

outside the room and use interpretation. The model of care during COVID-19 has included all types of staff, so the increase in interpretation use could have also been by administrative staff, pharmacists, or social workers who may have entered the room to ask questions briefly prior to the change.

Precisely why the transition to more communication occurring remotely (via telephone) would encourage interpreter use cannot be determined from this study, but stud-

ies of provider decision making on interpreter use provide some possible insight. Providers have reported trying to “get by” without an interpreter, particularly when the planned communication was considered relatively simple.²⁴ In these situations, providers rely on parent or provider nonproficient language skills and body language and assessing parent comprehension based on visual cues such as smiling and nodding. We suspect that the absence of face-to-face communication for many interactions may have removed some

of the visual cues providers were relying on without interpretation, and thus prompted them to use an interpreter more frequently. The fact that we saw the greatest increase in interpreter use among the patients with the lowest levels of acuity supports that notion, as those may be the encounters for which a provider is most likely to try to get by without an interpreter. Further study will be required to test this hypothesis, but it may have important implications for improving interpreter use more generally (by intervening in the provider decision-making process) and offer insight into the provision of interpretation modalities. One important conclusion from these data is that having access to a variety of modalities for professional interpretation is important in a clinical setting where unexpected changes and barriers may occur. A phone interpreter may be more quickly available for a short conversation depending on the number of video units present and the availability of in-person interpreters in the clinical setting. There may be differences in the languages available depending on the video or phone vendors and hour of the day. The goal remains to provide interpretation for all interactions with a family during their ED encounter in their preferred language for care, and having a variety of options may ultimately help to increase the amount of interpretation that patients and families receive. Future research could address these issues more directly by asking health care staff and families about their experience with interpretation.

Limitations

As with any analysis of aggregate data over time, it is not possible to analyze specific encounters, and there may be incomplete data or misclassification. We also cannot assign causation to a temporal association. However, the timing of the changes to our model of care beginning March 1, 2020, was associated with both an increase in interpreter use and changes in modality that may account for the increase. Our study could not assess the quality of interpretation or patient and family comprehension, just whether professional interpretation was provided. We therefore cannot comment on the potential gaps in quality compared to our usual interpretation options, which include in-person staff interpreters. In addition, an encounter was considered to have used professional interpretation if it was used for any part of the visit, but important communication may still have occurred without interpretation, and we do not know how much interpretation was used. It is therefore hard to gauge the overall impact on communication quality and equity, with more frequent use of a less effective interpreter modality. We also do not know if the interpretation was occurring for nursing, providers, or other staff during the encounter. Although there had been QI work to improve interpreter use in the ED prior to the onset of the pandemic, all such work was paused March 1, making that an unlikely explanation for our findings.

CONCLUSION

As our ED model of care has changed during the onset of the COVID-19 pandemic, we have seen a concurrent increase in interpreter use for patients with LOE. The shift to more communication via phone interpretation from outside the room was associated with increased interpretation overall in the ED setting. These findings have important implications for understanding decisions regarding interpreter use, how the availability of multiple modalities can affect its use, and methods to increase interpreter use in the future.

Conflicts of Interest. All authors report no conflicts of interest.

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