Comparison of Healthcare Service Utilization By Language and Refugee Status

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Introduction

- 2,000+ non-English non-Spanish (NENS)-speaking refugees and immigrants arrive in Colorado annually[11]
- Refugees and immigrants have less access to healthcare, health insurance, primary care, mental health, immunizations, and preventative health screenings[3-6,11-14,16-23,28,34,36,41,44,47,52,54]
- Barriers to healthcare access include limited English proficiency (LEP), cultural practices, health literacy, fear of stigmatization, and transportation[3,6,13,17,19,24]
- Refugees also have increased disease burden due to poor living conditions and disease exposure prior to arrival[15,24] and are more susceptible to developing chronic illnesses due to changes in diet and lifestyle once living in the United States (U.S.)[8,10]
- Few previous studies exploring immigrant health and health disparities have addressed the needs of NENS populations, and even fewer have explored health disparities for specific NENS languages[6,18,20-21,23,32,50-51]

Objective

- To compare emergency department (ED) and urgent care (UC) utilization and hospitalization by language and refugee status

Hypotheses

- *Hypothesis 1:* ED and UC utilization and hospitalization will differ by language.
- *Hypothesis 2:* ED and UC utilization and hospitalization will differ by refugee status.

Methodology

- Retrospective observational cohort study, using administrative data, of 81,462 patients, ages 0-99 years, seen in the Denver Health ED and UC centers or hospitalized at Denver Health in 2019
- Languages spoken by ≥75 patients were included as separate language categories; all other languages were classified as "Other" (exception: Sign Language)
- As refugee status was not available in the Denver Health administrative data, patients with a previous refugee screening at the Denver Health Refugee Clinic were classified as refugees
- **Outcome Measures:**
  - *ED and UC utilization*
    - Number of 2019 acute care visits (ED and UC visits)
      - Recurrent acute care visits: >1 visits in 2019
      - Excessive acute care visits: : >4 visits in 2019
  - *Hospitalizations*
    - Number of 2019 hospitalizations
      - Recurrent hospitalizations: >1 in 2019

Data Analysis

Univariate analysis:
- Chi square tests compared categorical variables with categories collapsed as needed to address sparse cells
- For continuous variables, used Wilcoxon Signed Rank for 2-group comparisons and the Kruskal-Wallis for >2-group comparisons

Multiple logistic regression analysis:
- Compared recurrent acute care visit utilization and hospitalizations by language and refugee status[1,39-40]
- Multiple logistic regression analyses included all potential confounders, all variables with significant differences in the univariate analysis, and variables considered clinically significant

Results

Table 1.1. Demographic and Clinical Characteristics of Patients in the Denver Health Emergency Department or Urgent Care or Hospitalized, Ages 0-99 Years, By Preferred Language in 2019

	Amharic n = 270	Arabic n = 455	English n = 65,577	French n = 150	Nepali n = 99	Russian n = 111	p-value
Gender (%)							
Female	63.3	55.8	46.3	56.0	56.6	62.2	<0.0001
Male	36.7	44.2	52.8	44.0	43.4	36.9	
Transgender/Other	0.0	0.0	0.8	0.0	0.0	0.0	
Not Disclosed	0.0	0.0	0.1	0.0	0.0	0.9	
Race/ Ethnicity (%)							
Native American	0.0	0.2	1.4	0.0	0.0	0.0	<0.0001
Asian	0.7	24.1	1.7	2.0	87.9	6.3	
Black	94.1	25.4	16.0	82.7	1.0	0.0	
Latino/a	0.0	0.0	32.6	0.0	0.0	0.0	
Pacific Islander	0.0	0.0	0.2	0.0	1.0	0.0	
Other	4.5	23.0	1.6	3.3	8.1	6.3	
Unknown	0.0	0.0	0.3	0.0	0.0	0.0	
White	0.7	27.4	46.1	12.0	2.0	87.4	
Median Age in Years [IQR]	36.0 [8.0 – 51.0]	33.0 [10.0 – 53.0]	32.0 [22.0 – 48.0]	31.5 [15.0 – 49.0]	35.0 [10.0 – 48.0]	60.0 [31.0 – 73.0]	<0.0001
Refugee (%)	2.2	6.8	0.0	1.3	4.0	2.7	<0.0001
Insurance (%)							
None/Discount	31.1	35.6	31.3	40.0	28.3	30.6	<0.0001
Private	7.0	4.6	18.0	7.3	7.1	9.9	
Public	61.9	59.8	50.6	52.7	64.7	59.5	
Employed (%)	47.8	40.2	56.0	36.7	44.4	55.9	<0.0001
High Medical Complexity (%)	1.6	4.3	4.1	2.4	3.8	1.5	0.26
Primary Care Physician (%)	87.4	73.0	47.0	65.3	80.8	64.9	<0.0001
Median Years Followed in the Denver Health System [IQR]	5.0 [1.0 – 10.0]	3.0 [1.0 – 6.0]	5.0 [0.0 – 16.0]	3.0 [0.0 – 8.0]	6.0 [2.0 – 8.0]	3.0 [0.0 – 9.0]	<0.0001

Figure 1. Percentages of Acute Care Visits and Hospitalizations for Patients, Ages 0-99 Years, Seen at Denver Health in 2019 by Preferred Language

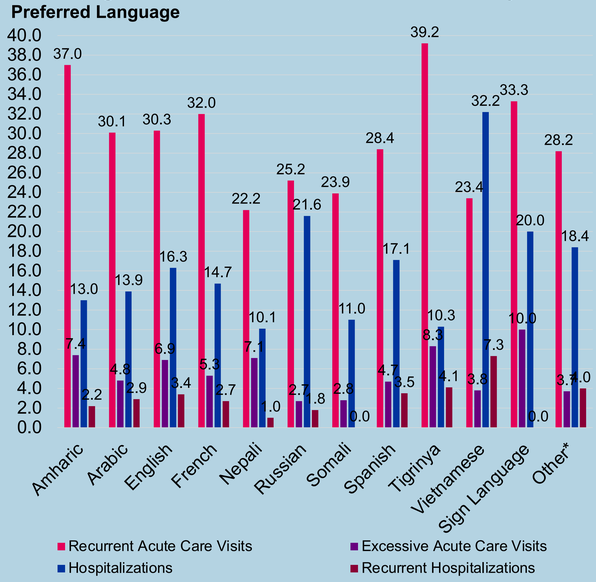


Table 1.2. Demographic and Clinical Characteristics of Patients in the Denver Health Emergency Department or Urgent Care or Hospitalized, Ages 0-99 Years, By Preferred Language in 2019 Cont

	Somali n = 109	Spanish n = 13,337	Tigrinya n = 97	Vietnamese n = 261	Sign Language n = 60	Other n = 936	p-value
Gender (%)							
Female	56.0	52.0	55.7	54.0	45.0	57.1	<0.0001
Male	44.0	47.8	44.3	46.0	53.3	42.8	
Transgender/Other	0.0	0.2	0.0	0.0	1.7	0.1	
Not Disclosed	0.0	0.0	0.0	0.0	0.0	0.0	
Race/ Ethnicity (%)							
Native American	0.0	0.1	0.0	0.0	0.0	0.0	<0.0001
Asian	0.0	0.0	0.0	95.4	6.7	47.5	
Black	95.4	0.2	95.9	0.0	8.3	27.1	
Latino/a	0.0	98.2	0.0	0.0	40.0	2.4	
Pacific Islander	0.0	0.0	0.0	0.0	0.0	0.9	
Other	3.7	0.4	3.1	1.2	3.3	8.0	
Unknown	0.0	0.1	0.0	0.	0.0	0.3	
White	0.9	1.0	1.0	3.5	41.7	13.8	
Median Age in Years [IQR]	31.0 [16.0 – 44.0]	34.0 [13.0 – 50.0]	34.0 [10.0 – 54.0]	48.0 [13.0 – 65.0]	34.0 [21.5 – 51.0]	34.0 [10.0 – 59.0]	<0.0001
Refugee (%)	6.4	0.1	10.3	0.0	0.0	5.6	<0.0001
Insurance (%)							
None/Discount	15.6	47.6	25.8	18.4	30.6	31.0	<0.0001
Private	4.6	6.2	6.2	5.8	9.9	7.2	
Public	79.8	46.2	68.0	75.9	59.5	61.9	
Employed (%)	38.5	50.9	43.3	51.7	71.7	41.1	<0.0001
High Medical Complexity (%)	1.8	4.5	5.9	5.1	3.3	3.9	0.76
Primary Care Physician (%)	74.3	67.7	84.5	65.1	58.3	67.1	<0.0001
Median Years Followed in the Denver Health System [IQR]	9.0 [3.0 – 14.0]	8.0 [1.0 – 16.0]	5.0 [1.0 – 9.0]	5.0 [1.0 – 11.0]	7.5 [2.0 – 19.5]	2.0 [0.0 – 8.0]	<0.0001

Table 3. Adjusted and Unadjusted Odds Ratios for Recurrent Acute Care Visits and Hospitalizations for Patients, Ages 0-99 Years, by Preferred Language, Refugee Status, and Language Groups

	Recurrent Acute Care Visits [95% CI]		Hospitalizations [95% CI]	
	Unadjusted Odds Ratios	Adjusted Odds Ratios	Unadjusted Odds Ratios	Adjusted Odds Ratios
Preferred Language				
English (ref)	--	--	--	--
Amharic	1.4 [1.1, 1.7]	1.0 [0.7, 1.4]	0.8 [0.5, 1.1]	0.8 [0.5, 1.3]
Arabic	1.0 [0.8, 1.2]	0.9 [0.7, 1.2]	0.8 [0.6, 1.1]	0.7 [0.5, 1.0]
French	1.1 [0.8, 1.5]	1.1 [0.7, 1.8]	0.9 [0.6, 1.4]	1.7 [1.02, 2.9]
Nepali	0.7 [0.4, 1.1]	0.4 [0.2, 0.9]	0.6 [0.3, 1.1]	0.6 [0.3, 1.4]
Russian	0.8 [0.5, 1.2]	0.6 [0.3, 1.1]	1.4 [0.9, 2.2]	1.1 [0.6, 2.0]
Somali	0.7 [0.5, 1.1]	0.5 [0.3, 0.98]	0.6 [0.4, 1.2]	0.5 [0.2, 1.1]
Spanish	0.9 [0.9, 0.95]	0.9 [0.9, 0.97]	1.1 [1.0, 1.1]	1.6 [1.5, 1.7]
Tigrinya	1.5 [1.0, 2.2]	1.8 [1.04, 3.3]	0.6 [0.3, 1.1]	0.8 [0.4, 1.6]
Vietnamese	0.7 [0.5, 0.9]	0.6 [0.4, 0.8]	2.4 [1.9, 3.2]	2.0 [1.4, 2.8]
Sign Language	1.2 [0.7, 2.0]	0.8 [0.3, 1.8]	1.3 [0.7, 2.4]	1.6 [0.7, 3.8]
Other[d]	0.9 [0.8, 1.0]	0.8 [0.7, 1.0]	1.2 [0.98, 1.4]	1.1 [0.9, 1.4]
Refugee Status[c]				
Non-Refugee (ref)	--	--	--	--
Refugee	1.2 [0.8, 1.7]	0.6 [0.3, 1.0]	0.6 [0.4, 1.1]	0.4 [0.2, 0.8]
Language Group				
English (ref)	--	--	--	--
Spanish	0.9 [0.9, 0.95]	0.9 [0.9, 0.97]	1.1 [1.01, 1.1]	1.6 [1.5, 1.7]
NENS[a]	1.0 [0.9, 1.0]	0.8 [0.7, 0.9]	1.1 [0.98, 1.2]	1.1 [0.9, 1.2]

- **Nepali, Somali, Vietnamese, and Spanish speakers as well as NENS speakers as a group had lower odds of recurrent acute care visits compared to English speakers**
- **Tigrinya speakers had higher odds of acute care visits compared to English speakers**

Figure 2. Percentages of Acute Care Visits and Hospitalizations for Patients, Ages 0-99 Years, Seen at Denver Health in 2019 By Refugee Status

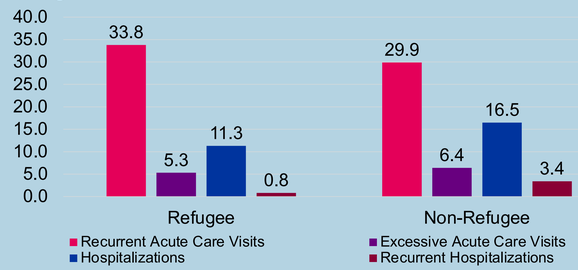
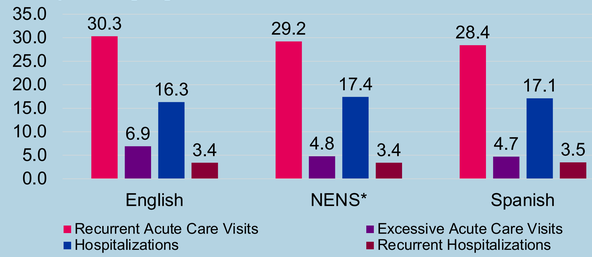


Figure 3. Percentages of Acute Care Visits and Hospitalizations for Patients, Ages 0-99 Years, Seen at Denver Health in 2019 By Grouped Languages



- **Refugees had lower odds of being hospitalized compared to English speakers**
- **French, Spanish, and Vietnamese speakers had higher odds of being hospitalized compared to English speakers**

Conclusions

- Refugee, asylum seeker, and immigrant populations are not all the same and population-specific disparities may be missed when they are grouped together in one category
- Socioeconomic determinants of health play a large role in a populations' use of higher acuity resources and should continue to be part of interventions to improve healthcare system utilization for high-risk populations (e.g. NENS-speaking and refugee populations)

Limitations

- Retrospective cohort study design allowed for exploration of associations but not causality
- Study may not be generalizable as it was conducted at one safety net health system with large refugee and immigrant populations, predominately publicly insured or uninsured patients, and more NENS-speaking resources than most institutions
- Possibility of errors in collection of administrative data

Future Directions

- Further explore the potential health disparities of specific NENS-speaking and refugee populations and design interventions, based on these findings, to address specific populations' needs
- Compare this data to data during and after the COVID-19 pandemic to investigate how the pandemic affects specific high-risk populations (e.g. NENS-speaking and refugee populations) which could ultimately help inform responses to future global events and humanitarian efforts

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Ethical Statements: The COMIRB approved this study (Protocol ID: 20-2947). A waiver of consent was requested for the secondary data analysis