

JNHMA

Journal of the National Hispanic Medical Association

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JNHMA Editorial Board



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Introducing the Journal of the National Hispanic Medical Association: A Journal for Our Communities

Medicine in the 21st Century is complex. Our patients and our communities are facing multiple barriers to health. Our job as health professionals requires collaboration, compassion, and a commitment to betterment for our patients and for ourselves. That was the seed that gave birth to the Journal and the words that you are reading today.

NHMA members work to improve the health and well-being of Hispanic populations locally, regionally, and nationally through mentorship, education, healthcare delivery, and advocacy. As health professionals who care for Hispanic patients, we are committed to improving Hispanic health. If these words resonate with you, welcome! The Journal of the National Hispanic Medical Association (JNHMA) is for you. The JNHMA will provide a forum for idea sharing, research findings, and advocacy for our diverse Hispanic communities.

As a virtual link where members can engage to share unique perspectives and best practices, the JNHMA seeks to publish peer-reviewed articles that impact Hispanic health and looks forward to reviewing your contributions. JNHMA is an open-access journal published online to support universal access. Articles are reviewed and published on an ongoing basis. The articles may focus on clinical, educational, research, or community aspects of Hispanic health. It is our goal that the articles published within these virtual pages will advance knowledge to improve Hispanic health. We are intentionally not specialty specific. We acknowledge the importance of interprofessional teams in optimizing care for our patient population. We are committed to intergenerational growth and mentorship, as an investment in our children's future. We welcome studies across the full spectrum of clinical experience from health to illness and back. We encourage an understanding of translational research from bench to bedside and bedside to bench. We welcome insights from our communities that give real, on-the-ground perspectives to scientific knowledge gained. We consider health and illness to include multiple factors, including but not limited to, biological, emotional, social, cultural, and economic. The work presented in the Journal is expansive. The focus is narrow: Hispanic health.

During this year's NHMA Conference 2023, we welcome the Journal; we welcome you, the reader; and we welcome you, the writer.

Together, let's make a difference!

Sincerely,

The JNHMA Editorial Board

April 27, 2023

Dear Colleagues,

As the President and CEO of the National Hispanic Medical Association, I am proud to launch the first edition of the Journal of the National Hispanic Medical Association (JNHMA) during the NHMA 26th Annual Conference in Chicago, Illinois, on April 27, 2023. The realization of the JNHMA is a direct outcome of our mission to *empower Hispanic physicians to lead efforts to improve the health of Hispanic and other underserved populations in collaboration with Hispanic state medical societies, residents, medical students, and other public and private sector partners.*

The JNHMA is an academic resource dedicated to promoting research, knowledge, and advocacy for Hispanic physicians and other health professionals. It realizes NHMA's vision to be *the national leader in improving the health of our communities.*

I am proud of our Journal. It is an important part of our mission and vision as it provides a platform for scholars and researchers to share their work and advance our understanding of the unique healthcare challenges facing our physicians and our communities. These works will help to develop culturally relevant strategies to tackle the many health inequities that we face. The JNHMA will serve as a valuable resource for physicians, healthcare professionals, policymakers, and researchers by highlighting the many needs of our communities.

I would like to thank the NHMA team who has worked with me throughout the years to make this accomplishment a reality. If you are dedicated to improving the health of the Hispanic population, we encourage you to submit your articles to the JNHMA and become a part of this important effort. For more information, please visit nhmamd.org

Thank you for your support of the National Hispanic Medical Association. As we pursue our efforts to improve the health of our communities, we anticipate that the JNHMA will amplify our voices and bring us closer together.

Sincerely,

Elena Rios, MD, MSHP, MACP

President and CEO, National Hispanic Medical Association

Addressing COVID-19 Disparities Between Hispanic and Non-Hispanic White Populations of Arizona

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ABSTRACT

Introduction: The coronavirus disease (COVID-19) pandemic^{1,2} contributed to over 1.03 million deaths in the United States (U.S.) and 30,768 deaths in Arizona³. Nationwide, Hispanics are at increased risk for infection, hospitalization, and death, when compared to non-Hispanic White (NHW)⁴. Although Hispanic COVID-19 disparities are clear in the U.S., study of Hispanic COVID-19 disparities in Arizona are less clear.

Objective: To compare COVID-19 interventions and clinical outcomes between Hispanic and NHW populations in rural and urban healthcare settings of Arizona.

Methods: A retrospective cohort of COVID-19 patients from January 1, 2020 through June 17, 2022 admitted to hospitals affiliated with the Midwestern University Graduate Medical Education consortium were assessed. Data was abstracted to counterbalance NHW and minority patients by date of admission. Data collected included patient demographics, presenting symptoms, vital signs, laboratory values at the time of emergency department presentation, treatment modalities, and clinical outcomes.

Results: A total of 627 patients were analyzed with 31.7% (199/627) identifying as Hispanic, 41.8% (262/627) female, and 61.9% (388/627) allocated to the rural hospital group. No difference in mortality was seen in the rural or urban setting and there was no difference in administered COVID-19 therapeutics. Kaplan-Meier curves were parallel between Hispanic and NHW patients who survived COVID-19 with no difference in the length of stay (LOS) days. Kaplan-Meier curves differed between Hispanics and NHW patients who expired from COVID-19 with Hispanics at a greater LOS prior to mortality. Differences between Hispanic and NHW mortality patients included Hispanics presenting at a younger age, increased CRP elevations, and a greater delay between symptom onset and COVID-19 testing. Hispanics who expired were more likely to present with shortness of breath, hypoxia, and a documented bacterial infection during hospitalization as compared to Hispanics who survived.

Conclusion: Following admission, patients regardless of Hispanic or NHW identification, received equitable care in our Arizona subset which resulted in comparable rates of mortality. Hispanics initially presented at increased disease severity, which is suggestive of factors outside of the hospital, prior to admission, responsible for the disparities seen at the national level with variation between states.

1. Introduction

Individuals who identify as Hispanic represent a diverse population with Cuban, Mexican, Puerto Rican, Central or South American, or other Spanish descent, regardless of race⁵. Hispanics are among the fastest growing ethnic minority groups in the United States (U.S.), with a population growth in the U.S. of over 50 million since 1970⁶. Currently, over 62 million Hispanics reside in the U.S., representing approximately 20% of the total U.S. population and are estimated to represent one-quarter of the total U.S. population by the year 2050⁵⁻⁹.

Hispanics have historically struggled with inequities when pursuing medical care which has led to increased morbidity and mortality across disease processes^{5,7,9}. Compared to Non-Hispanic White (NHW), Hispanics experience 1.7x higher rates of diabetes mellitus, 2x higher rates of renal failure, 2x higher mortality in liver disease and 1x higher mortality in asthma^{5,7,10-14}. Individual agency when seeking healthcare for Hispanics is limited by a myriad of issues such as: language/cultural

barriers, immigration status, lack of health insurance coverage, health hazardous occupations, low-income status, and medical mistrust^{5, 7, 8, 15}. Hispanics often face disparate social determinants of health defined as lesser funding for education and school programs, lower access to healthy and affordable foods, and greater barriers to community health and exercise opportunities¹⁵.

Biases affect interactions between healthcare providers and their Hispanic patients which may contribute to altered quality of care and worse health outcomes¹⁵⁻¹⁷. Providers caring for Hispanics may be less likely to refer to specialty services due to an assumption that the patient is unable to afford additional services¹⁵. Hispanic patients are less likely to receive equivalent analgesia medication compared to NHW patients in the emergency department and are more likely to remain with untreated pain throughout cancer treatment^{15,18}. Hispanics have experienced significantly longer wait times compared to NHW for triage level 3 (urgent) and triage level 4 (semi-urgent) visits and a higher percentage of Hispanics remained unseen compared to NHWs at the top-coded wait time of 139 minutes¹⁹.

In 2020, the leading cause of death for Hispanics was COVID-19⁵. Hispanics in the U.S. are 1.5x more likely to be infected, 1.9x more likely to be hospitalized, and 1.7x more likely to die from COVID-19 compared to NHW²⁰. The specific factors responsible for the disproportionate burden of COVID-19 seen in Hispanics are less clear with a gap in the literature for the state of Arizona. As Arizona is the fifth state with the largest Hispanic population, it is imperative to analyze the COVID-19 disparities seen at the state level⁵. Further analysis of Hispanic COVID-19 disparities in Arizona may lead to the development of precise points of intervention at the preventative, diagnostic, and therapeutic levels for the improvement of Hispanic health⁷. Therefore, the purpose of this study was to compare COVID-19 interventions and clinical outcomes between Hispanic and Non-Hispanic White populations in rural and urban healthcare settings of Arizona.

2. Methods

Setting

The Midwestern University Graduate Medical Education consortium is an Accreditation Council for Graduate Medical Education accredited sponsoring institution which oversees nine residency programs across four medical centers and five hospitals in Arizona. The five hospitals participated in the study data collection and were classified as either primarily rural or urban serving dependent upon patient population and United States Department of Agriculture State level maps. Kingman Regional Medical Center (Mohave County), Canyon Vista Medical Center (Santa Cruz County), and Verde Valley Medical Center (Yavapai County) were denoted as rural hospitals. Mountain Vista Medical Center (Maricopa County) and Flagstaff Medical Center (Coconino County) were denoted as urban hospitals.

Protocol

All procedures were approved by the Midwestern University Institutional Review Board (IRB # AZ 1413) prior to data collection. A retrospective cohort of COVID-19 patients from January 1, 2020 through June 17, 2022 admitted to hospitals affiliated with the Midwestern University Graduate Medical Education consortium were assessed. Data was abstracted to counterbalance NHW and minority patients by date of admission. Data collected included patient demographics, presenting symptoms, vital signs, laboratory values at the time of emergency department presentation, treatment modalities, and clinical outcomes.

Statistical Analysis

Data was analyzed using Statistical Product and Service Solutions (SPSS), v. 27 (IBM Corp., Armonk, New York) and statistical significance was defined as $p \leq 0.05$. Patient demographics and outcomes were reported via descriptive statistics. Categorical variables were assessed using Chi-square analysis, and continuous variables were evaluated using the Mann-Whitney U test. Death free survival days were compared between Hispanic and NHW patients using a Kaplan Meier analysis with the Log-Rank test.

3. Results

A total of 627 patients were analyzed with 31.7% (199/627) identifying as Hispanic, 41.8% (262/627) female, and 61.9% (388/627) allocated to the rural hospital group. Overall, Hispanics were younger (56 [Hispanic] vs 69 years [NHW], $p < 0.001$), less likely to require oxygen (79.4% vs 86.7%, $p = 0.020$), and less likely to present with a prior history of chronic obstructive pulmonary disease (8.0% vs 16.1%, $p = 0.006$). No difference in mortality was seen (13.1% vs 17.8%, $p = 0.135$) (**Table 1**). In an urban setting, Hispanics were more likely to present with fever (55.1% vs 39.1%, $p = 0.024$), cough (64.3% vs 45%, $p = 0.007$), and dysosmia (18.5% vs 7.8%, $p = 0.024$), and no difference in mortality was observed (14.3% vs 17.2%,

p=0.584). In a rural setting, Hispanics were less likely to present with a prior history of chronic obstructive pulmonary disease (3.9% vs 18.5%, p<0.001) and no difference in mortality was noted (12.4% vs 18.1%, p=0.144).

Table 1. Patient demographics and disease burden by ethnicity

	<i>Total (N=627)</i>	<i>Hispanic(n =199)</i>	<i>Non-Hispanic White (n =428)</i>	<i>p-value</i>
<i>Age</i>	63.4 (52 – 76)	56 (44 – 68)	69 (58 – 77)	<0.001
<i>Urban</i>	38.1% (239/627)	35.2% (70/199)	39.5% (169/428)	0.301
<i>Rural</i>	61.9% (388/627)	64.8% (129/199)	60.5% (259/428)	0.301
<i>Male</i>	58.2% (365/627)	58.3% (116/199)	58.2% (249/428)	0.979
<i>Female</i>	41.8% (262/627)	41.7% (83/199)	41.9% (179/428)	0.979
<i>Smoker</i>	9.2% (58/627)	6.0% (12/199)	10.7% (46/428)	0.144
<i>Diabetes Mellitus</i>	31.1% (195/627)	33.2% (66/199)	30.1% (129/428)	0.446
<i>Hypertension</i>	51.8% (325/627)	50.3% (100/199)	52.6% (225/428)	0.589
<i>Congestive Heart Failure</i>	11.5% (72/627)	8.5% (17/199)	12.9% (55/428)	0.113
<i>Chronic / Obstructive Pulmonary Disease</i>	13.6% (85/627)	8.0% (16/199)	16.1% (69/428)	0.006
<i>Oxygen Requirement</i>	84.2% (528/627)	79.4% (158/199)	86.4% (370/428)	0.020
<i>COVID-19 Mortality</i>	16.3% (102/627)	13.1% (26/199)	17.8% (76/428)	0.135

There was no difference in administered therapeutics (steroids 83.4% vs 83.6%, p=0.943; anticoagulation 38.2% vs 36.4%, p=0.734; remdesivir 50.8% vs 51.9%, p=0.893; azithromycin 66.1% vs 68.0%, p=0.776; tocilizumab 5.5% vs 5.8%, p=0.878; convalescent plasma 23.6% vs 26.9%, p=0.409) between Hispanic and NHW (**Table 2**).

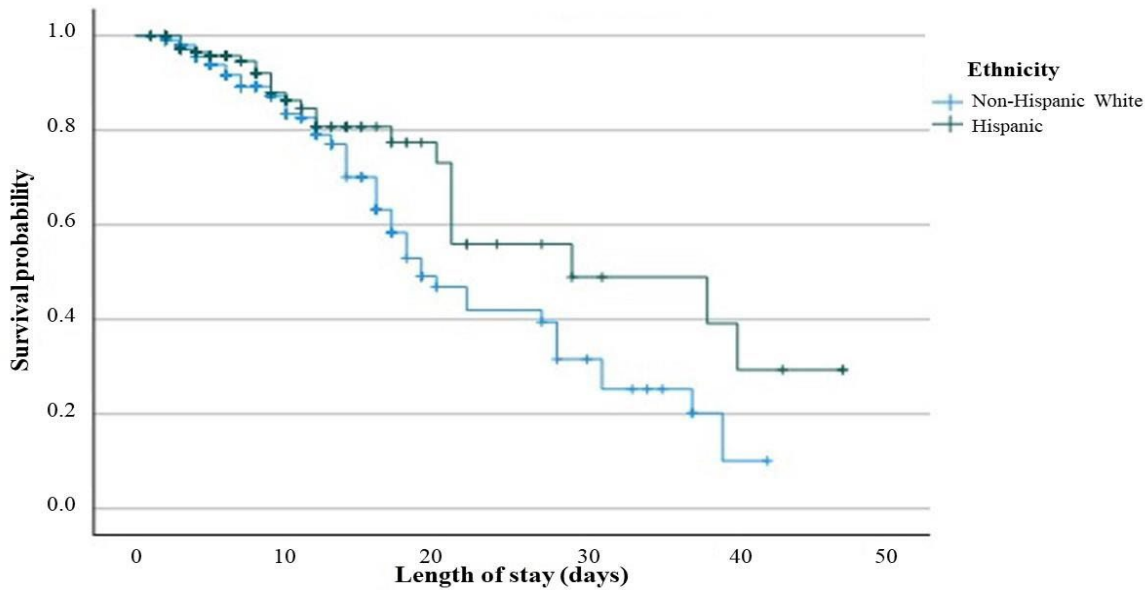
Table 2. Administered COVID-19 therapeutics by ethnicity

	<i>Total (N = 627)</i>	<i>Hispanic (n =199)</i>	<i>Non-Hispanic White(n =428)</i>	<i>p-value</i>
<i>Steroids</i>	83.6% (524/627)	83.4% (166/199)	83.6% (358/428)	0.943
<i>Anticoagulation</i>	37.0% (232/627)	38.2% (76/199)	36.4% (156/428)	0.734
<i>Remdesivir</i>	51.5% (323/627)	50.8% (101/199)	51.9% (222/428)	0.893
<i>Azithromycin</i>	67.5% (423/627)	66.3% (132/199)	68.0% (291/428)	0.776
<i>Tocilizumab</i>	5.7% (36/627)	5.5% (11/199)	5.8% (25/428)	0.878
<i>Convalescent Plasma</i>	25.8% (162/627)	23.6% (47/199)	26.9% (115/428)	0.409

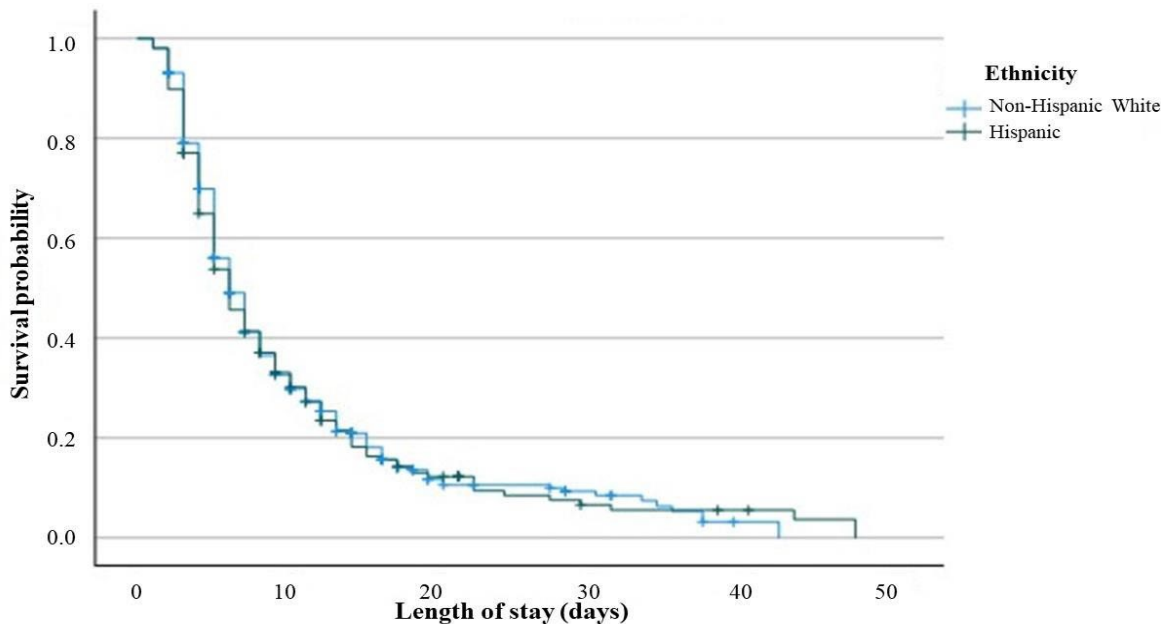
Kaplan-Meier curves were parallel between Hispanic and NHW patients who survived COVID19. There was no difference in the length of stay (LOS) days for COVID-19 survivors (median 6 vs 6, p=0.757) between the two groups. Kaplan-Meier curves differed between Hispanics and NHW patients who succumbed to COVID-19. Of those who expired, Hispanics had a greater LOS (29 vs 19, p=0.032) prior to mortality (**Figure 1**).

Figure 1. Kaplan-Meier for length of stay (LOS) days by ethnicity

A. Death free survival days for inpatients with COVID-19 mortality



B. Death free survival days for inpatients with COVID-19 survival



Between Hispanic and NHW mortality, Hispanics were younger (63 vs 72 years, $p=0.007$), displayed a higher CRP with a wider range (37 (IQR 17.6 – 125.6) vs 9 (IQR 3.1 – 14.9), $p<0.001$), and an increased delay between symptom onset and COVID-19 testing (7 vs 3 days, $p=0.013$) (Table 3).

Table 3. Demographics and clinical features between Hispanic and NHW mortality

	Total (N = 102)	Hispanic (n =26)	Non-Hispanic White (n =76)	p-value
Age	71.0 (63 – 80)	63 (54 – 72)	72 (64 – 80)	0.007
Male	64.7% (66/102)	65.4% (17/26)	65.5% (49/76)	0.933
Female	35.3% (36/102)	34.6% (9/26)	35.5% (27/76)	0.933

<i>Smoker</i>	9.8% (10/102)	0.0% (0/26)	13.2% (10/76)	0.124
<i>Diabetes Mellitus</i>	34.3% (35/102)	38.5% (10/26)	32.9% (25/76)	0.606
<i>Hypertension</i>	58.8% (60/102)	53.8% (14/26)	60.5% (46/76)	0.550
<i>Congestive Heart Failure</i>	14.7% (15/102)	15.4% (4/26)	14.5% (11/76)	0.910
<i>Chronic Obstructive Pulmonary Disease</i>	17.6% (18/102)	11.5% (3/26)	19.7% (15/76)	0.344
<i>Oxygen Requirement</i>	96.1% (98/102)	100.0% (26/26)	94.7% (72/76)	0.233
<i>Bilirubin (mg/dL)</i>	0.7 (0.5 – 0.9)	0.7 (0.1 – 1.3)	0.6 (0.4 – 0.8)	0.050
<i>AST (U/L)</i>	51.0 (25.0 – 77.0)	54.0 (16.5 – 91.5)	51.0 (28.0 – 74.0)	0.063
<i>ALT (U/L)</i>	36.0 (21.0 – 52.0)	50.0 (20.5 – 79.5)	33.5 (22 – 45.0)	0.082
<i>ALP (U/L)</i>	88.0 (63.0 – 113.0)	97.0 (32.4 – 161.6)	87.5 (64.7 – 110.2)	0.252
<i>LDH (U/L)</i>	553.0 (278.0 – 829.0)	568.0 (445.5 – 690.5)	528.5 (231.5 – 825.5)	0.656
<i>Protein (g/dL)</i>	7.1 (6.5 – 7.7)	7.2 (6.5 – 7.8)	7.1 (6.6 – 7.6)	0.922
<i>Albumin (g/dL)</i>	3.0 (2.4 – 3.7)	2.8 (2.2 – 3.3)	3.0 (2.3 – 3.6)	0.143
<i>CRP (mg/L)</i>	12.4 (2.4 – 22.4)	37.0 (17.6 – 125.6)	9.0 (3.1 – 14.9)	<0.001
<i>Symptom onset prior to testing (days)</i>	4 (1 – 7)	7.0 (4 – 10)	3.0 (1 – 7)	0.013

Hispanics who expired were more likely to present with shortness of breath (92.3% vs 71.7%, $p=0.036$), hypoxia (100% vs 76.3%, $p=0.005$), and a documented bacterial infection during hospitalization (46% vs 17.9%, $p<0.001$) as compared to Hispanics who survived (Table 4).

Table 4. Initial clinical presentation between Hispanic mortality and Hispanic survivors

	<i>Total (N = 199)</i>	<i>Hispanic Mortality (n = 26)</i>	<i>Hispanic Survivors (n = 173)</i>	<i>p-value</i>
<i>Fever</i>	45.7% (91/199)	34.6% (9/26)	47.4% (82/173)	0.245
<i>Cough</i>	65.3% (130/199)	69.2% (18/26)	64.7% (112/173)	0.753
<i>Dysosmia</i>	10.6% (21/199)	7.7% (2/26)	11.0% (19/173)	0.768
<i>Dysgeusia</i>	9.0% (18/199)	3.8% (1/26)	9.8% (17/173)	0.346
<i>Diarrhea</i>	16.6% (33/199)	7.7% (2/26)	17.9% (31/173)	0.156
<i>Chest Pain</i>	16.6% (33/199)	11.5% (3/26)	17.3% (30/173)	0.672
<i>Abdominal Complaints</i>	18.6% (37/199)	7.7% (2/26)	20.2% (35/173)	0.191
<i>Shortness of Breath</i>	74.4% (148/199)	92.3% (24/26)	71.7% (124/173)	0.036
<i>Oxygen Requirement</i>	79.4% (158/199)	100.0% (26/26)	76.3% (132/173)	0.005

Factors associated with death among Hispanics includes decreased oxygen saturation on presentation (84 (IQR 79-91) vs 93 (IQR 88-96), $p<0.001$), increased age (63 (IQR 55-72) vs 54 (IQR 42-67), $p=0.006$), high respiratory rate (25 (IQR 24-33) vs 20 (IQR 18-22), $p<0.001$), abnormal aspartate transaminase (AST) (54 (IQR 43-117) vs 40 (IQR 27-56), $p<0.001$), abnormal lactate dehydrogenase (568 (IQR 435-680) vs 391 (IQR 290-595), $p=0.033$), high CRP (37 (IQR 18-126) vs 9.7

(IQR 4.4-48.8), $p=0.005$), and high d-dimer levels (639 (IQR 2-2225) vs 1.6 (IQR 0.6-283), $p<0.001$) (Table 5). A combination of five variables (temperature, respiratory rate, oxygen saturation, age, and AST) was a significant predictor of mortality ($p=0.008$) with 40% sensitivity and 98.1% specificity.

Table 5. Laboratory values between Hispanic mortality and Hispanic survivors

	<i>Total (N = 199)</i>	<i>Hispanic Mortality (n = 26)</i>	<i>Hispanic Survivors (n = 173)</i>	<i>p-value</i>
<i>Bilirubin (mg/dL)</i>	0.6 (0.4 – 0.8)	0.7 (0.6 – 1.7)	0.6 (0.4 – 0.8)	0.007
<i>AST (U/L)</i>	43.0 (28.0 – 58.0)	54.0 (42.5 – 117.0)	40.0 (27.0 – 56.0)	<0.001
<i>ALT (U/L)</i>	35.0 (20.0 – 57.0)	50.0 (24.0 – 83.0)	32.5 (21.0 – 54.5)	0.042
<i>ALP (U/L)</i>	81.0 (68.0 – 107.0)	97.0 (64.0 – 193.2)	81.0 (68.0 – 105.0)	0.136
<i>LDH (U/L)</i>	409.0 (298.0 – 614.0)	568.0 (435.0 – 680.0)	391.5 (290.0 – 594.8)	0.033
<i>Protein (g/dL)</i>	7.4 (6.9 – 7.8)	7.2 (6.3 – 7.6)	7.4 (6.9 – 7.9)	0.039
<i>Albumin (g/dL)</i>	3.4 (2.8 – 4.0)	2.8 (2.2 – 3.4)	3.5 (2.9 – 4.0)	<0.001
<i>CRP (mg/L)</i>	13.7 (4.6 – 64.0)	37.0 (18.0 – 125.6)	9.7 (4.4 – 48.8)	0.005

4. Discussion

Prior analysis of Hispanic COVID-19 disparities in California, New York, and Texas, states ranked first, second, and fourth for largest Hispanic populations, are congruent with study findings seen in our cohort^{5, 21-22}. Hispanic COVID-19 patients were younger than non-Hispanic patients, initially presented with similar now-recognized COVID-19 respiratory symptoms, no difference in hospital treatment was observed, and no significant difference in COVID-19 mortality between Hispanic and non-Hispanic patients was found²¹⁻²². Although following admission there was no difference in administered therapeutics or mortality rates, there were differences between Hispanic and NHW deaths. In our sample, Hispanic mortality patients were younger, had higher CRP, and a greater delay between symptom onset and COVID-19 testing compared to NHW. This is suggestive of factors outside of the hospital, prior to admission, responsible for the disparities seen at the national level with variation between states. A potential pitfall towards COVID-19 recovery may include delayed care seeking secondary to medical mistrust and immigration policies.

Hispanics are reluctant to seek professional medical treatment until disease is severe which can be detrimental in COVID-19 as current guidelines recommend treatment within 5-days of symptom onset^{7, 12, 22}. Studies support a delay in timely diagnosis and treatment for Hispanics in other disease processes, including coccidioidomycosis²³. Prior examination of medical mistrust in ethnic groups with a Group-Based Medical Mistrust Scale revealed Hispanics scored 1.5x greater than NHW²⁴. Medical mistrust stems from decade's worth of exploitative medical research and treatment ranging from immoral, unethical human experiments in Guatemalan prisons in the 1940s to forced sterilization of Hispanic women in the 1970s to the present-day absence of quality medical care in immigrant detention centers²⁵⁻²⁷.

A growing body of evidence points towards exclusionary immigration policies as being harmful to health and Hispanics may be reluctant to seek care due to the fear of immigration policy enforcement^{9, 28}. As 50% of Hispanics are immigrants, a large proportion of Hispanics who are not U.S. citizens or legal residents may fear deportation in a climate riddled with anti-immigrant rhetoric^{10, 25, 29}. Avoidance of public programs for fear of harming their immigration status was reported by Hispanic immigrants which coincided with a 2x increased delay of needed medical care³⁰. This could have led to decreased utilization of COVID-19 monoclonal antibodies leading to increased hospitalization rates secondary to uninhibited viral replication³¹⁻³³. Institutional disenfranchisement may further underly this reluctance as Arizona proposed vaccine policies

prioritizing U.S. citizens and legal residents, a significant obstacle for undocumented Hispanics seeking protection with the COVID-19 vaccine²⁵.

The COVID-19 pandemic provided an additional lens to a longstanding issue of health inequity and the call to action is clear. Efforts must be made by healthcare providers to reduce health inequities in the Hispanic population by working with the community to gain trust, delivering culturally appropriate education regarding prevention and treatment services, and increasing the diversity of healthcare teams to allow for more culturally diverse care^{10,12}. *Promotoras/promotores*, Spanish for “community health workers”, are an example of a way to build trust and deliver health education as *promotoras(es)* are adept at utilizing their own social networks for community mobilization, including vaccine uptake during the COVID-19 pandemic³⁴⁻³⁵. Increasing the number of medical students who identify as Hispanic would create a diverse physician pool with an innate understanding of cultural nuances and mastery of a language that may more closely align with a patient’s preferred language^{12,35}.

Study limitations include sample size, number of health institutions evaluated, impact of COVID19 vaccination rates, infectious dose of COVID-19 strains, survey of individual opinion regarding belief and/or trust in the healthcare system, and perceived health concern of COVID-19. The intersectionality of the potential factors affecting Hispanic health, such as income status, language barriers, risk of infection, health insurance coverage, etc., are outside the scope of this study.

5. Conclusions

Although Hispanic COVID-19 disparities are reported at the national level, this is incongruent with our study subset of healthcare centers in Arizona. Upon admission, patients regardless of Hispanic or NHW identification, received equitable care which resulted in comparable rates of mortality. It is unclear if the novelty of medical treatment during the COVID-19 pandemic allowed for equitable care or if biases are less evident in Arizona compared to other states in the U.S. Given the presentation of Hispanics who succumbed to COVID-19 at increased disease severity per symptomology (dyspnea, oxygen requirement) and clinical values (elevated AST, ALT, CRP, LDH) future studies may analyze comorbidities not addressed in this study. It is debatable if an underlying asthma or liver disease diagnosis can be to blame for the heightened respiratory and hepatic abnormalities seen in Hispanic COVID-19 deaths of our sample, or if caused by acute COVID-19 changes.

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Higher Prevalence and Poorer Prognosis of EGFR Mutant Lung Adenocarcinoma in US Hispanics

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ABSTRACT

Introduction: Activating mutations in Epidermal growth factor receptor (EGFR) occur in approximately 15% White, 40-50% of Asian and 15% of Black patients with lung adenocarcinoma. However, its prevalence in the nearly 60 million U.S. Hispanics/Latinos has not been well characterized. Herein we evaluate EGFR mutation frequency in U.S. Hispanic/Latino patients with lung adenocarcinoma at an academic institute serving a large multi-ethnic area.

Methods: We queried our prospective database (2015-2019) for lung adenocarcinoma patients who underwent surgical resection and had routine mutational analysis by a targeted gene panel. We identified 768 patients and were able to stratify 668 patients by self-identified race/ethnicity. We compared demographics (chi-square) and survival (Kaplan-Meier).

Results: From 2015-2019, 668 patients met inclusion criteria and were evaluated for incidence of common targetable EGFR mutations. EGFR mutations were present in 30% of all patients with Hispanics/Latino experiencing an incidence of 35%, significantly more than non-Hispanic White patients, $p=0.019$. Overall survival at 3 years was not significantly different amongst racial/ethnic groups. However, in patients with EGFR mutations, **3-year** overall survival was significantly worse in Hispanic/Latino patients in comparison to non-Hispanic White patients (62% vs 96%, $p=0.021$). There was no difference in the pathologic stage or surgical procedure amongst racial/ethnic groups.

Discussion: Approximately one-third of U.S. Hispanics with lung adenocarcinoma displayed EGFR mutations which were associated with decreased overall survival compared to White and Asian patients. Increasing mutational analysis and investigation of biological differences of this growing ethnic group is essential for optimal targeted treatment strategies as well as in the design of future clinical trials.

1. Introduction

The Hispanic/Latino population of the United States represents a significant and growing segment of the total population¹. Projections suggest that this demographic will continue to increase, comprising an estimated 29% of the US population by the year 2060². Unfortunately, lung cancer is a significant health concern for this group, with Latino men experiencing the highest mortality rate amongst all cancers³. Additionally, Hispanic/Latino Americans face disparities in disease prevention, screening and outcomes, including poor survival rates and reduced likelihood of early diagnosis when compared to non-Hispanic White (NHW) patients⁴. These issues have prompted the American Lung Association's 2022 State of Lung Cancer report to call for urgent action to address these disparities and improve outcomes for Hispanic Americans.

In recent years, there has been major shifts in the treatment early-stage resectable lung cancer. One major advancement has been the use to targeted therapies due to the advancements and prevalence of tumor genomic analysis. Epidermal growth factor receptor (EGFR), a transmembrane protein that functions in growth factor signaling is the most well-known example of a targetable mutation non-small cell lung cancer (NSCLC), specifically lung adenocarcinoma with a remarkable response to Tyrosine kinase inhibitors (TKI). First becoming standard of care in advanced EGFR mutant positive disease, a randomized trial has now demonstrated remarkable increase in disease free and overall survival and is the gold standard in early-stage patients (Stage IB-IIA) after surgical treatment⁵⁻⁷. Importantly, the prevalence of EGFR mutations varies by race and ethnicity, with estimates ranging from 13-18% in non-Hispanic White patients to 60-75% in east Asian females without history of smoking⁸⁻¹⁰. However, the incidence of EGFR mutations in other races/ethnicities is unclear, due to lack of routine genetic testing, with certain ethnic and racial groups more likely to not be tested or included in clinical trials.

In the United States, a paucity of data exists regarding the incidence of EGFR mutations in Hispanic/Latino patients and its impact on survival. A multinational study of **5,738** samples from Latin America estimated the frequency of EGFR mutations in late-stage metastatic NSCLC was higher in NHW patients, with roughly 26% of cases carrying these mutations¹¹.

Interestingly, the incidence varied widely within each Country, with a suggestion that up to 90% of those with EGFR mutations have indigenous/Mestizo heritage¹². In this study, we sought to identify the incidence of EGFR mutations in a large, tertiary care center located in a densely populated and multicultural city and to examine the impact of these mutations on survival in the US Hispanic population with early-stage surgically resectable lung adenocarcinoma.

2. Methodology

We performed a retrospective analysis of a prospectively maintained thoracic surgery database at our institution, approved by the Weill Cornell Institutional Review Board from 2015 to 2019. All patients included in the database provided written informed consent. Patients included in this analysis were all ages 18 or older, with diagnosis of lung adenocarcinoma and provided self-identification of race/ethnicity. Additionally, those that were included had routine mutational analysis by a targeted gene panel to evaluate for EGFR mutation present on exons 18-21. Included patients were divided by self-identified race/ethnicity into four groups, non-Hispanic White, Asian, Hispanic, and Black.

Basic demographics and clinical characteristics were compiled and compared between racial groups with non-Hispanic White patients as reference. Pathologic stage is presented in concordance with the American Joint Committee on Cancer TNM Staging system, 8th edition. Categorical variables were compared using Chi-Squared or Fisher Exact tests, where appropriate. Continuous variables were compared with Mann Whitney U testing and presented as median with interquartile range. Overall and disease-free survival were evaluated at 3-years utilizing the Kaplan-Meier Method and compared between groups using Log-Rank test. All statistical analysis was performed using IBM SPSS version 25 (SPSS Inc., Chicago, IL), with statistical significance evaluated at the 0.05 alpha level.

3. Results

From 2015 to 2019, 1035 patients were identified at our center that underwent surgical resection of lung cancer. 768 underwent resection for lung adenocarcinoma with 668 patients providing self-identified race/ethnicity and routine mutational analysis on resection specimens. Patients identifying as non-Hispanic White predominated the analysis representing 66% (442/668) of patients, with Hispanic patients accounting for 8% (55/668) (**Table 1**). Hispanic patients in comparison to non-Hispanic White patients had median age of 69 (63 – 75) vs 72 (66 – 78), $p=0.054$, were predominantly female, 62% (33/55) vs 61% (266/442), $p=0.860$ and had a history of smoking 59% (31/55) vs 83% (362/442), $p<0.001$. The pathologic stage distribution and surgical procedure were similar between racial groups (**Table 1**). EGFR mutations were present in 30% (200/668) of all patients with those self-identifying as Asian containing the greatest proportion of EGFR mutations at 66% (82/121) vs Hispanic, 35% (19/55), 20% (10/50) of Black patients and 20% (89/442) of non-Hispanic White patients.

Overall survival was not significantly different at 3 years amongst racial/ethnic groups without stratification for EGFR mutational status. With a median follow up of 24.4 months, Hispanic patients with EGFR mutations had worse 3-year overall survival than non-Hispanic White patients and Asian patients (62% vs 96% vs 90%, $p=0.021$ & 0.075 respectively) (**Figure 1A**). In patients without EGFR mutations, Hispanic patients had similar 3-year overall survival to non-Hispanic White, and Asian patients (**Figure 1B**).

4. Discussion

In this study, we investigated the incidence of targetable EGFR mutations and their impact on survival in Hispanic/Latino patients with surgically resectable lung adenocarcinoma in a single institution analysis. We found that the frequency of targetable EGFR mutations in Hispanic/Latino patients was 35% of Hispanic patients, which was significantly higher than in NHW patients. While unadjusted 3-year overall survival rates were similar across different racial and ethnic groups, we observed that Hispanic patients with an EGFR mutation exhibited worse 3-year overall survival than NHW counterparts, indicating that the presence of EGFR mutations may lead to poorer prognosis in Hispanic/Latino patients even with similar pathologic staging.¹³

The incidence of EGFR mutations in lung adenocarcinoma varies based on race and ethnicity, with the highest incidence reported in non-smoking Asian females¹³. In contrast, the incidence of EGFR mutations in Hispanic patients in Latin

<i>Table 1</i>	<i>White (n=442)</i>	<i>Hispanic (n=55)</i>	<i>Asian (n=121)</i>	<i>Black (n=50)</i>
Characteristic				
<i>Median age, IQR</i>	72 (66 – 78)	69, (63 – 75)	68, (62 – 74)	67, (62 – 73)
		p=0.054	p<0.001	p=0.001
<i>Gender, Female</i>	266 (61%)	33 (62%)	55 (45%)	34 (68%)
		p=0.860	p=0.001	p=0.335
<i>Smoking, Yes</i>	362 (83%)	31 (59%)	54 (45%)	42 (84%)
		p<0.001	p<0.001	p=0.862
EGFR Mutation Frequency	89 (20%)	19 (35%)	82 (66%)	10 (20%)
		p=0.019	p<0.001	p=0.994
Procedures				
<i>Sub-lobar resection</i>	166 (38%)	18 (30%)	33 (27%)	16 (32%)
<i>Lobectomy</i>	266 (60%)	36 (68%)	86 (71%)	34 (68%)
<i>Pneumonectomy</i>	7 (2%)	1 (2%)	2 (2%)	0 (0%)
		p=0.589	p=0.132	P=0.470
Pathology stage				
<i>Path stage 0/IA/IB</i>	334 (76%)	42 (80%)	84 (72%)	39 (78%)
<i>Path stage IIA/IIB</i>	42 (9%)	5 (9%)	18 (15%)	4 (8%)
<i>Path stage IIIA/IIIB</i>	54 (12%)	5 (9%)	12 (10%)	5 (10%)
<i>Path stage IV</i>	8(2%)	1 (2%)	4 (3%)	2 (4%)
		p=0.937	P=0.275	p = 0.628

America ranges from 8 and 35%, reflecting the genetic and cultural diversity of the region¹³. Recent research has shed new light on the influence of germline genetics on EGFR mutation frequency among those with Native

American/Indigenous ancestry¹⁴. This study found that the correlation between ancestry and increased mutation frequency in the EGFR gene was stronger at the local genome level than the global genome level, indicating that germline genetics may play a role in the risk of EGFR-mutant lung cancer among those with Native American/Indigenous ancestry¹⁴.

In the United States, the Hispanic population in New York City is highly diverse, with the majority identifying with Dominican/Caribbean heritage and approximately 16% identifying with Mexican heritage¹⁵. Data on the incidence of EGFR mutations in patients from the Dominican Republic/Caribbean are scarce, but a study of 1,417 Mexican patients reported a similar incidence of 36.7%, mirroring the findings within this study¹¹.

This finding is surprising given the phenomenon known as the "Hispanic paradox," in which Hispanic/Latino patients have shown statistically significant better overall survival in most cancers, including lung cancer, stage for stage than non-Hispanic White and Black patients in previous literature¹⁶. However, the worse prognosis observed in Hispanic patients with EGFR mutations in this cohort is unclear. Nonetheless, limited representation of the Hispanic population in lung cancer clinical trials due to limited access and research centers is a critical issue, as differences in survival and quality of life may exist between patients treated in the community oncology center versus those treated in clinical trials^{17,18}. Factors such as lack of health insurance, **healthcare providers** unfamiliar with societal recommendations on genetic testing, and patients' misconceptions about biomarker testing may contribute to the disparities in outcomes¹⁹. Previous studies have shown that Hispanic/Latino patients have similar response rates to TKI therapy as non-Hispanic White patients, with response rates of 60% compared to 75%^{19,20}. Therefore, treatment is appropriate and should be available to all EGFR mutant NSCLC patients. To ensure equitable care for Hispanic/Latino patients, access to mutational analysis and subsequent TKI therapy must remain a priority for all stages of NSCLC. Further enrollment in clinical trials and community engagement is critical to overcome the aforementioned obstacles and ensure equitable care for Hispanic/Latino patients.

Limitations

The study presented here recognizes certain limitations that must be considered when interpreting its results. Firstly, although our institution is located in a highly diverse metropolitan area, the number of Hispanic patients included in our cohort is relatively small. Secondly, the surgical database used in this study is potentially subject to selection bias, as it only includes NSCLC patients deemed suitable for surgical resection, and therefore may not represent the entire population of patients with EGFR mutations. Additionally, the adjuvant treatments received by patients, such as TKI inhibitors and

chemotherapy, are not known in our cohort. Lastly, although the use of a **three-year** follow up endpoint **which** provides **valuable** information **not previously** available, it still represents a limited endpoint.

Tables and Figures

Baseline Demographics and Clinical Characteristics

Figure 1. Overall Survival by EGFR mutational status.

Figure 1A: Overall Survival for EGFR (mutation)

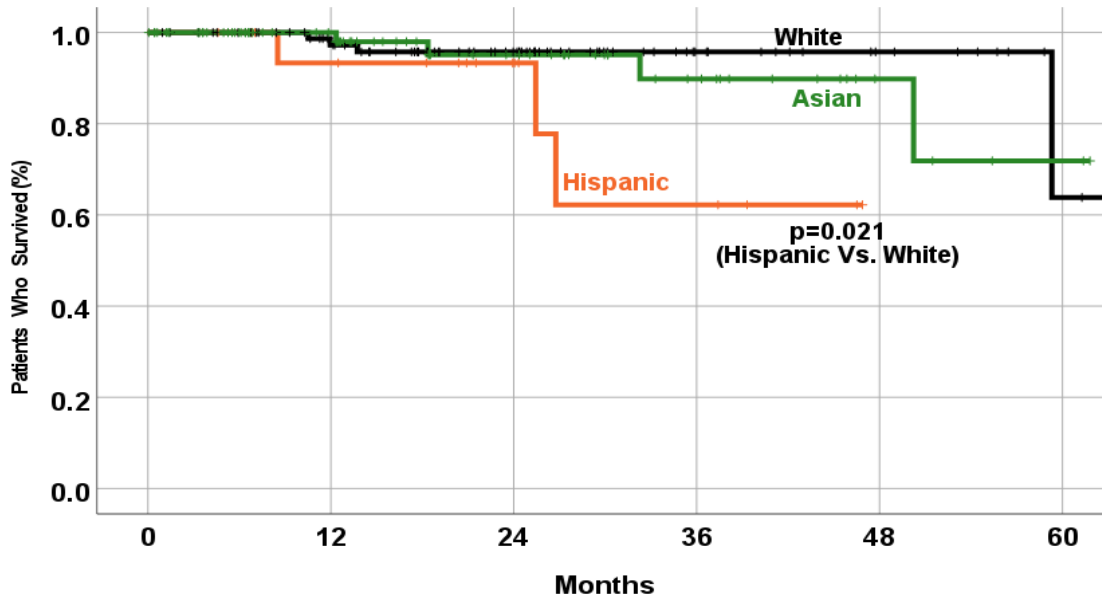
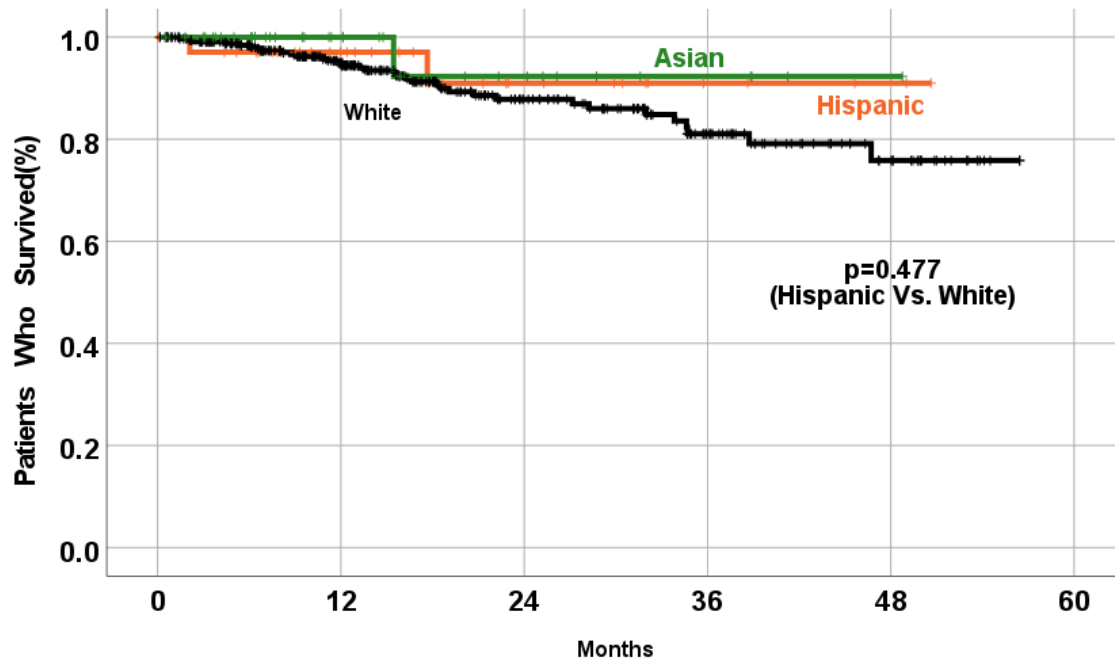


Figure 1B: Overall Survival for EGFR (wild type)



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A Call for the Professionalization of Medical Language Education to Prevent Misuse of Limited Language Skills and Ad hoc Interpretation

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ABSTRACT

In an increasingly global society, medical language courses present an opportunity to teach physicians the clinical communication skills needed to provide high quality care for patients who speak non-English languages. Yet, despite a growing number of medical language programs, most courses are missing the professional framework that typically characterizes medical education.

Specifically, a lack of standardized proficiency assessment and feedback, paired with unclear institutional guidelines around interpretation and bilingual care, paves the way for communication errors and disparities in healthcare for linguistic minorities. Within the context of the hierarchy in medicine, medical trainees are potentially vulnerable to overstepping the limits of their language ability in an effort to impress their supervising physicians or to save time by attempting to communicate with patients on their own using partial language skills instead of seeking a medical interpreter. In this commentary, the authors use the case of medical Spanish in the United States to provide a framework for the professionalization of non-English language education in medical education settings, identifying three key opportunities: (1) equip learners to accurately self-assess language skills, (2) provide individualized performance feedback to learners, and (3) develop clear institutional policies regarding safe use of bilingual skills and partnership with medical interpreters.

1. Introduction

In today's society, the language in which clinicians train may not reflect the range of languages spoken by a country's population. For example, in Lebanon, although the most widely spoken language is Arabic, all seven of the medical schools in the country teach in either French or English.¹ In Canada, 22.8% of the population speaks French, 75.4% speak English, and 17.9% are bilingual (English- and French-speaking).² As of 2021, out of seventeen total Canadian medical schools, three provide instruction solely in French, three in English and French, and the remaining eleven in English only.³ In the United States (US), Spanish is by far the most common language spoken among the 61 million residents who speak a language other than English at home, of whom 25 million report having limited English proficiency (LEP).⁴ After Spanish, the most common languages spoken in the US are Chinese (Mandarin and Cantonese), Vietnamese, and Korean.⁵ Yet, all accredited medical schools in the US teach and assess learner skills in English only. The mismatch between language of professional instruction and population language needs presents a challenge to effective communication and patient care.

The lack of specialized training, standardized examination and licensing, and a profession-wide code of ethics regarding use of non-English languages for communication with patients (without a medical interpreter) leaves physicians and trainees to determine for themselves whether and how to use such language skills in their work. As a result, even medical professionals with some bilingual skills may not be consistently equipped to provide safe, effective care for patients speaking non-English languages.

Self-motivated students and clinicians may seek opportunities to learn or improve medical language skills. For example, many medical schools in the US offer medical Spanish opportunities, largely due to student demand. In a survey of 125 US medical schools published in 2021, 78% reported offering a medical Spanish course, though only 21% met basic curricular standards such as faculty educators, curricular structure, and learner assessment.⁶ Although such courses have arisen to meet the growing need for competent Spanish-language communication in healthcare, their content and design vary widely and may lack features essential to achieving this goal.

In this commentary, we provide a framework for the professionalization of medical language education in non-English languages, using published literature and our own experience regarding medical Spanish in the US. We call on medical school administration and students themselves to professionalize medical language education. We present three key recommendations: (1) equipping learners to self-assess language skills, (2) providing individualized performance feedback to learners, and (3) developing clear institutional policies regarding safe use of bilingual skills and partnership with medical interpreters. These strategies highlight the role of medical education in preparing clinicians for providing equitable care to linguistically diverse patient populations.⁴

2. Proficiency Assessment of Language Skills

Medical students in the US with second language skills are often asked to serve as ad hoc medical interpreters, stepping in to “help” their English-speaking supervisors or colleagues communicate with Spanish-speaking patients in clinical settings.⁶ “Ad hoc interpreter” refers to a person who is called on to interpret but has not received specialized training or certification to do so. Even after completing a medical Spanish course, medical students who step into this role are serving as ad hoc interpreters because medical Spanish courses do not (and should not) teach the specific skill of interpretation. Medical students and physicians who take medical language courses are not preparing to serve as interpreters but rather to provide language-concordant care. Importantly, to teach language-concordant care, courses must teach not only the language itself, but also *when* and *how* to use it responsibly. In other words, it is essential for students and physicians with non-English language skills to understand their limitations in a language and how to effectively work with a professional medical interpreter.

Based on the 2021 national survey of medical Spanish curricula at US medical schools by Ortega et al, 79% of medical schools that allowed students to use Spanish in the clinical setting permitted their students to do so without an assessment of language competency.⁶ In the absence of policies regulating language use in the clinical setting, medical students and institutions may perceive completion of medical Spanish coursework as the equivalent of approval to serve as a bilingual medical student or as an interpreter. Paired with the lack of institutional restriction on student use of unassessed language ability, this paves the way for ad hoc interpretation or use of inadequate language skills. This is problematic because medical Spanish courses often include students with multiple levels of Spanish proficiency, so it follows that students who complete the course will have variable levels of communication skills in the target language. Medical Spanish, and communication skills in any language, should be treated as a graduated competency for which progressive skill mastery will be achieved by individual learners at different points.⁶ Furthermore, despite the prevalence of medical Spanish education, courses vary in rigor and pedagogy. A standardized, evidence-based curriculum including standardized patient (SP) encounters for learner assessment and routine program evaluation has been proposed.⁸

In addition to formative and summative language proficiency assessments incorporated in medical Spanish curricula, we propose that medical students interested in using non-English language skills in patient care should be taught to periodically self-assess their medical language skills. These self-reported skills should be verified through objective, standardized, and validated assessments prior to use in patient care, given that self-assessment alone has been shown to have variable accuracy, particularly in the intermediate proficiency ranges.⁹⁻¹² Table 1 provides both formative and summative evaluation suggestions for proficiency assessment implementation. These recommendations may be applied to the multilingual training of medical professionals across the world in languages other than the primary language of instruction at their medical institutions.

Moreover, it is important to recognize that communication skills extend beyond language alone, and encompass aspects of non-verbal communication, culturally acceptable behaviors, interpersonal trust, and variations in health/lifestyle preferences and practices. Hence, evaluating the progress of clinicians who wish to use a non-English language in patient care should involve a multifaceted approach. The National Council on Interpreting in Health Care provides a recommended process for the evaluation of professional medical interpreters and includes accuracy, respect, and cultural awareness.¹⁵ Such a multifaceted approach could be modified and evaluated as a comprehensive guide to assessing students and physicians’ readiness for language-concordant care.

3. Individualized Feedback

Prior study has found that US physicians with lower levels of Spanish proficiency report more frequent use of ad hoc interpreters as compared to those with intermediate and advanced proficiency.¹⁶ Further, students and physicians may be unaware that professional interpreters are available, may find them difficult to access, or may not be trained in effectively

partnering with them.¹⁸ All medical students and physicians should be taught to properly identify their language skills and limitations as well as to work with professional medical interpreters. Through individualized feedback, medical Spanish learners may improve self-awareness of language strengths and limitations. For example, students who achieve advanced proficiency may be encouraged to pursue formal credentialing as a bilingual physician in order to provide direct patient care in a non-English language (without a medical interpreter).

In addition to standardizing curricula and student self-assessment processes, educators should also provide language learners with intentional and explicit feedback regarding the limits of their language abilities, including advice on how to use their medical second language in clinical settings, if at all.

Consider the case of a hypothetical medical student, Alex, who last studied Spanish for four years in high school in the US. She enrolls in medical Spanish in her first year because she is greatly motivated to help underserved patients. By the end of the course, she can understand the main idea of most clinical conversations in Spanish and is pleased to be paired with a bilingual Spanish-speaking physician for her clinical preceptorship. Alex regularly observes her mentor conducting visits in Spanish and understands the main points of each encounter. At the end of one such visit, the physician asks Alex to go back into the room and remind the patient to pick up her prescription. Alex says to the patient, “*Recojo la receta de la farmacia,*” to which the patient replies “*Muy bien, gracias.*” While Alex meant to say, “*Recoja la receta,*” meaning the patient should pick up the prescription, she mistakenly conjugated in the first-person present tense, saying to the patient, “I will pick up the prescription from the pharmacy.” This simple conjugation error could lead to severe consequences for the patient, especially as many immigrants are not familiar with the pharmacy or prescription system in the US to obtain medication. In this scenario, Alex has taken a role in patient care beyond her medical Spanish abilities and risked the possibility of patient harm, despite her good intentions and efforts to serve Spanish-speaking patients.

This scenario is not far-fetched. In our personal experiences, we have been placed in the position of serving as bilingual providers or as ad hoc interpreters in clinical settings. This has occurred not only in medical school, but also while volunteering in hospitals as high school and undergraduate students. Like Alex in the hypothetical scenario, most medical students have not been given formal education on the potential for patient harm in language discordant situations. In the absence of regulation and education, students are left to rely on the judgment of attending physicians and other staff who may request that they speak in Spanish. Sometimes, even when students do not feel comfortable in a given patient scenario, they may feel obligated to accept in order to avoid disappointing supervisors and also to save time or “try their best” for the patient, who is typically grateful for even the smallest efforts to communicate in their language.

In general, students of intermediate and lower competency levels should work with a professional medical interpreter during patient interactions.[18] For those with intermediate proficiency, progressive language development could be encouraged through shadowing bilingual care team members, such as physicians and interpreters, and through additional opportunities for medical language study¹⁹. Students of beginner proficiency levels could be directed to opportunities for improving their fundamental skills in the target language, such as basic language courses, informal practice in non-clinical settings, and immersion experiences.²⁰ Additionally, medical students should be empowered to recognize when they are not ready to provide medical care in a particular language as well as to turn down inappropriate requests for ad hoc interpretation (Table 2).

Returning to the hypothetical case, individualized feedback for Alex would be best provided immediately after the encounter to maximize learning. The bilingual supervising physician could directly observe Alex when she interacts with the patient in Spanish. When noticing the conjugation error, the physician can gently interrupt, address the patient and clarify the intended message that in fact the patient should pick up the prescription from the pharmacy. The supervisor then asks the patient to repeat back what they understood to be the next steps in getting their medications after the visit. Following the encounter, the physician and Alex should debrief about the visit. The supervisor and trainee can each share what went well and what could have been improved about the communication. In doing so, the supervisor can point out the miscommunication and they can jointly discuss how the error was repaired and how a similar mistake could be avoided or repaired in the future.

4. Institutional Policies around Interpretation and Bilingual Care

Medical language courses do not occur in isolation. US medical students and physicians who enroll in medical language education practice in a clinical environment that exposes them to a linguistically diverse patient population. For this reason,

it is necessary to pay attention to institutional policies and practices, such as the availability and accessibility of professional medical interpreters, which can either help or hinder students/physicians from providing language-appropriate care.

Although participation in medical Spanish educational opportunities is optional at most medical schools, formal training in the ability to provide appropriate care to culturally and linguistically diverse populations should be required for all future physicians to ensure equitable care regardless of the patient's preferred language.¹⁸ Currently, these skills are not prioritized in student skill assessment in US undergraduate medical education. Most, if not all, Objective Structured Clinical Examinations involve only English-speaking SPs, never evaluating a medical student's ability to assess the need for an interpreter, navigate effective clinician-patient communication in language-discordant situations, or work with a professional interpreter. Global linguistic competency skills benefit all students, regardless of their language abilities.¹⁸

These skills include how to understand one's own language skills, how to communicate properly with patients during interpreter-mediated encounters, how to recognize signs that an interpreter may be editing or omitting messages and how to act with cultural competency and humility.²² Intercultural communication skills, the role of cultural health practices and beliefs, and a comprehensive approach to communication are imperative to culturally and linguistically effective care. We call on medical schools to implement and emphasize global linguistic competency instruction throughout clinical skills and communication courses for all medical students, outside of optional non-English language courses that may be offered at school.

In the US, the infrastructure to implement these changes exists, both in the medical education curriculum and at an institutional level. Medical schools already implement patient safety training, including an introduction to privacy laws, technology security, and basic life support when first-year students begin orientation. Global linguistic competence could be introduced at these pre-clinical sessions, with practical components added later as students prepare for clinical clerkships. Table 1 presents examples for implementing institutional policies aligned with the professionalization of non-English language use in patient care.

5. Conclusions

To promote the professionalization of medical language education, we propose the following framework. First, students should be guided in developing awareness of their own level of proficiency at the beginning and end of a medical language course using standardized self-assessment tools. Second, this self-assessment should be complemented by reliable, standardized assessments such as SP encounters and used to provide individualized guidelines for language use, allowing students to improve or use their language ability without compromising patient safety. Individualized feedback for students should focus on enhancing their ability to self-assess strengths and limitations and promote the professional use of language by holding clinicians to an appropriately high standard of service for all patients. Finally, institutional policies addressing interpretation and bilingual medical care are necessary to set professional expectations for all healthcare providers, including students. These recommendations for medical schools and medical trainees serve as a general framework for the professionalization of medical education in languages different from the language of primary instruction across the world.

While institutional change to incorporate these recommendations will require time and partnership with medical education faculty and administration, we call on our fellow students and educators to start with their own multilingual education efforts, such as existing electives, workshops, and clubs. Both student and faculty leaders can and should incorporate education about the consequences of ad hoc interpretation to ensure students recognize the limits of their language proficiency and the progressive nature of second language mastery. Most importantly, giving all medical students and physicians, regardless of language ability, guidance to appropriately channel their enthusiasm for high-quality patient care will empower them to best advocate for, listen to, and serve all patients and communities. Our patients deserve nothing less.

Table 1. Opportunities for Professionalization of Medical Language Skills and Example Strategies for Implementation

Opportunity for Professionalization	Example Strategies for Implementation
Proficiency Assessment	<ul style="list-style-type: none"> • Schedule periodic self-assessments using the Interagency Language Roundtable scale modified for physicians[13] (e.g., every 6-12 months throughout medical training) • Conduct assessments by faculty and SPs[14] after observed patient/SP encounters for medical language students and any other students who wish to provide medical care in a non-English language • Consider third-party assessment options, such as the phone-based Clinician Cultural and Linguistic Assessment or the Physician Oral Language Observation Matrix[23]
Individualized Feedback	<ul style="list-style-type: none"> • Faculty provides learners with text/verbal feedback from faculty and SPs regarding performance in SP encounters • Learners complete guided self-reflections regarding strengths and limitations following SP encounters • Learners complete guided self-reflection following any clinical experience with non-English language-speaking patients (e.g., clerkships, shadowing, study abroad)
Institutional Policies around Interpretation and Bilingual Care	<ul style="list-style-type: none"> • Review/create institutional policies regarding use of medical students as ad hoc interpreters • Review/create institutional policies regarding qualification of medical students/physicians to provide direct care in a language other than English • Educate all students and faculty about institutional policies and procedures for requesting a medical interpreter and for using non-English language skills • Teach students to appropriately address/decline requests to serve as ad hoc interpreters • Diversify the institution’s pool of SPs to include racial, ethnic, cultural, and linguistic diversity to assess all students’ abilities to communicate with patients who speak non-English languages

Abbreviations: SP, Standardized Patient

Table 2. Common Challenges Encountered by Medical Students with Skills in Non-English Languages and Recommended Strategies to Address Them

Challenge	Recommended Strategies
How to prepare to participate in clinical experiences with potential exposure to patients who speak non-English languages	<ul style="list-style-type: none"> • Inform yourself of the linguistic and cultural characteristics of the patient population and ask about what educational components will be offered by your medical school to prepare you to care for this population. • Understand your institution’s methods and policies for requesting medical interpreters (e.g., onsite interpreter, video, or phone system options; how to request an interpreter including urgent/emergent requests; who can call an interpreter). • Inquire about the clinic’s practices regarding medical interpreters when starting a clinical clerkship and offer to provide this information yourself if needed. • Investigate educational options offered by your medical school to increase your language and cultural skills in the target non-English language.
How to respond to a request to serve as a medical interpreter	<ul style="list-style-type: none"> • Use your knowledge of institutional methods and policies for requesting a medical interpreter, request the interpreter yourself. • Offer to explain what you have learned regarding the interpreter request process while mentioning the benefits of using a professional interpreter. • If the requester declines your offer to contact interpreter services and insists on you interpreting, make an effort to understand why the requester is reluctant to involve professional interpreter services. • Politely explain that you are unable to provide high-quality interpretation. For example, “I know the interview process takes longer with an interpreter in the mix. Unfortunately, my Spanish skills in a clinical setting are limited and would not help speed up the process, and I am worried that it could harm the patient.” • Politely explain, if applicable, that you are qualified as a bilingual medical student and could directly interview the patient in Spanish but that you are not qualified as an interpreter and could therefore not provide that service.

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Characterizing the Digital Divide in the Latinx Community of Central Virginia

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ABSTRACT

Historically, Latinx communities in the United States (US) have had some of the lowest levels of internet access and use in comparison to other minority groups. In order to develop a better understanding of how the digital divide impacts the Latinx community of Central Virginia, we conducted a telephone survey of 39 Latinx participants. Survey questions were related to both technology access and technology use. We found that older participants were significantly less likely to have home internet connection than younger participants and significantly less likely to use email. In addition to providing insight on technology-related needs of the Latinx community of Central Virginia, we hope our research may serve as a foundation for advocacy efforts to increase technology access as well as technology education resources for Latinx communities nationwide.

1. Introduction

The digital divide, or the gap between those with access to the internet and those without, has been a sociological issue for members of low income and underserved communities throughout the last two decades^{1,2}. The COVID-19 pandemic exacerbated the effects of the digital divide because many in-person services moved to virtual formats in order to control the spread of disease³. In response to this, broadband internet access has been increasingly considered a new social determinant of health⁴. This is because it impacts each of the six previously conceived social determinants of health (economic stability, the health care system, neighborhood and physical environment, education, food, and community and social context) as well as a newly conceived domain: access to credible information⁵. For this reason, it has become increasingly important to characterize the digital divide at the national and local levels.

Among Latinx nationwide, a lack of access to technology has been clearly demonstrated. A 2016 analysis of US Census data revealed that 32.5% of Latinx Americans do not have a desktop or laptop computer at home compared to only 19.1% of white Americans. Additionally, it was reported that 22.7% of Latinx do not have an internet subscription, compared to 16.1% of whites⁶. The Pew Center has reported even more severe disparities in internet access, with 35% of Latinx compared to 20% of whites lacking home broadband internet⁷. Among Latinx Americans, certain demographic factors have been found to impact internet use such as age, birthplace, and English language proficiency^{8,9}.

It is important to recognize that technology and internet *access*, which can be considered the first-level digital divide, does not encompass the full depth of the disparities that exist. There is growing awareness of a second-level digital divide, which encompasses the different ways in which individuals take advantage of, or use, technology. The second-level digital divide is relevant because it suggests that even if every individual in the US had access to technology, there would still be disparities in the benefit gained from the internet.

The second-level digital divide can be evaluated through engagement with “capital enhancing” activities, or using the internet to increase “human, financial, political, social, and cultural capital”^{10,11}. Examples of capital enhancing activities include searching for employment opportunities, consulting informational health resources, and becoming more informed politically. These activities are distinguished from entertainment, because they are more likely to provide upward mobility opportunities. It has been shown that individuals with higher education and more advanced technology skills are more likely to visit capital enhancing websites¹⁰. This suggests that investments in improving access to technology for underserved populations may not be sufficient without adequate investment in education.

Telemedicine, or “the use of electronic information and communications technologies to provide and support health care when distance separates the participants”¹², became increasingly relevant during the COVID-19 pandemic, and involves both the first and second levels of the digital divide. This is because for a patient to engage in telemedicine, they must not

only have access to technology and reliable internet, but they must also possess a sufficient level of digital literacy. It is likely that during the pandemic, with the suspension of the majority of in-person medical visits, many members of the Latinx community and other underserved populations were unable to access health care¹³. This is supported by an analysis of medical records of almost 3,000 patients needing cardiovascular care during the pandemic, which found that non-English-speaking patients were associated with an over 50% lower use of telemedicine¹⁴.

The COVID-19 pandemic, and the heightened importance of online connection during this time, motivated our current study, which aims to evaluate both the first and second levels of the digital divide in the Latinx community of Central Virginia, specifically within the Blue Ridge Health District. This health district includes the counties of Albemarle, Fluvanna, Greene, Louisa, and Nelson as well as the City of Charlottesville. There are approximately 13,400 Latinx individuals in the health district, making up 5.1% of the population¹⁵. By characterizing the local digital divide, there can be specific resource allocation to narrow the divide as well as minimize its negative impacts on health and wellbeing for the local Latinx population.

2. Methods

IRB approval for this study was obtained by the University of Virginia Institutional Review Board for Social and Behavioral Sciences before recruitment began (IRB-SBS Protocol 3848). A total of 39 participants, who self-identify as Latinx or Hispanic and live in the Blue Ridge Health District, were recruited from phone calls by investigators. The investigators randomly called numbers gathered from a prior study completed by LHI (Latino Health Initiative) at the University of Virginia. Additionally, interest flyers for the study were displayed in restaurants and stores frequented by Latinx patrons as well as on LHI social media. These flyers did not end up recruiting many participants but may have advertised the legitimacy of the study throughout the community.

We created a telephone-based questionnaire to collect data about the local digital divide. The questionnaire was available in both English and Spanish, and the Spanish version underwent multiple stages of cultural validation and adaptation with Spanish speaking community health workers, who work with LHI, to ensure the accuracy and clarity of the translation. Investigators were instructed to read survey questions verbatim, however could provide further explanation of any given question at the request of the participant.

All of the calls were completed in Spanish between February and April 2021. Participants were informed of the goals of the study and of benefits and risks to participating. They provided oral consent over the phone, which was documented by our investigators. The questionnaire typically lasted between 30 and 45 minutes and was completed entirely over the phone. If any amount of the survey was completed, participants were sent a \$15 gift card and a study information sheet in the mail.

The survey instrument consisted of 51 questions, both quantitative and qualitative, in five sections (see Appendix for full questionnaire). The first section consisted of demographic questions including age, gender, country of birth, educational attainment, occupation, and English language proficiency. English language proficiency was based on a scale of one to five, where one represents no knowledge of English, two represents “limited” English proficiency, three was explained as, “I understand what is said to me but have trouble communicating back”, four was explained as, “I can communicate and understand most things but lack fluidity when speaking English”, and five represents English fluency.

The second section asked questions relating to technology access, such as smartphone and computer access for each member of an individual’s household and whether or not they have Wi-Fi in the home. The third section asked questions about technology use, such as social media use and experience with video telemedicine. The fourth section asked about community resource utilization and the fifth section asked about additional social determinants of health, like insurance coverage and annual income.

After data collection was completed, quantitative data analysis was performed with Fischer’s exact test. Qualitative data was also reviewed.

3. Results

Demographics

Our sample of Latinx in the Blue Ridge Health District was 59% female and 41% male, with the majority between 30 and 64 years of age. The entire sample was born outside of the US. There was a wide range in the number of years lived in the

US. The majority of participants reported between 7 and 12 years of schooling, while about a third reported only 6 or less years of schooling. The most common professions among participants were housekeeping and construction and maintenance. Over a third of our sample was not employed at the time of the survey, which may have been higher than expected due to job loss during the pandemic. Only 17.9% of our sample reported having health insurance.

Only 7.7% of participants self-reported an advanced level of English language proficiency, meaning they can communicate most things in English but lack fluidity. The rest of our participants reported either no English proficiency, limited proficiency, or an intermediate level, defined as that they can understand most things but have some difficulty communicating responses. No one in our sample self-reported being fluent in English. All demographic data can be found in Table 1.

Technology Access

Almost every participant (97%) owned a personal smartphone with internet connectivity, while only about a quarter owned a home computer. Of the participants with a smartphone, over half were “smartphone only” users, meaning they had no other device with internet connectivity besides their phone. The majority of participants had internet connection in their home, but some relied exclusively on their cell phone data plan for internet access, and one participant had no internet access at all. These results can be found in Table 2.

There were no statistically significant differences in access to a home computer across demographic factors due to the small sample size, however there were a few trends. Younger participants as well as those who immigrated to the US longer ago and reported higher levels of English proficiency were more likely to own a home computer. Additionally, males were more likely to report having access to a computer than females. This is presented in Table 3.

Younger participants were statistically more likely to have home internet access compared to participants 50 and older (p=0.0057, Fischer’s exact test).

Additionally, females were significantly more likely to have home internet connection than males (p=0.0332, Fischer’s exact test). No significant differences in home internet access were found based on years lived in the US, English proficiency, or years of schooling. This can be found in Table 4.

In response to the question, “How much difficulty, in terms of cost, have you had in maintaining active cell phone services and Wi-Fi?”, which measures the cost burden and cost prioritization of technological services, over half of participants with a Wi-Fi or phone plan (60.5%) reported that they always make all payments on time for these services, and therefore have had consistent access to their phone and the internet. The other participants (39.5%), however, reported they have had to at least temporarily delay payments or cancel their plan.

After dividing respondents into “high cost burden” and “low cost burden” groups, based on those that have ever delayed payments or canceled their plan vs. those that have always maintained active technology services, there were no statistically significant differences based on age, gender, English proficiency, or years of schooling, but there were some trends. Of participants that have lived in the US for 10 or fewer years, 50% were in the “high cost burden” group, while only 36% of participants that have lived in the US for 11 or more years fell into the “high cost burden” group. Over half (52.4%) of participants under 50 years of age fell into the “high cost burden” group vs. only 27.8% of those 50 years and older. More males (56.3%) than females (30.4%) fell into the “high cost burden” group.

Technology Use

The most interesting finding in relation to our sample’s use of technology was that over half of participants did not have an email address or do not use their email. Refer to Table 5 for these results. When asked, “If you do not use email, explain why not,” most replied simply that they had no reason to use email, while a few said that they did not know how to set it up. A larger number of participants reported using WhatsApp and Facebook.

There was a significant difference in email use based on age. **Two thirds of participants between 18 and 49 (66.7%) used email compared to less than a third (27.8%) of those 50 and older (p=0.0248, Fischer’s exact test).** There were no other statistically significant differences in email use between groups, however in our sample females were more likely to use email along with participants who had immigrated more recently, reported less English proficiency, and had more years of schooling. This is presented in Table 6.

All but one participant reported being able to “communicate with another person over video” via either their cell phone or computer. This would be a prerequisite for the ability to engage with video telemedicine. It was found that 20.5% of participants have had experience with video telemedicine, and of those with telemedicine experience, most had a positive experience (62.5%), and none had a negative experience. By narrowing the sample to include only participants with a primary care physician (53.8%), the telemedicine experience rate increases to 38.1%.

Out of the participants that have a primary care doctor from the University of Virginia, less than half (46.7%) said that they are familiar with UVA MyChart and have used it before. For reference, UVA MyChart is “a personalized, secure way to access portions of your medical information and to communicate with your physician online.”

Over half of the participants (61.5%) reported engaging in some form of online health education (including any website from a google search, trusted websites, and social media). There were no statistically significant differences in engagement in online health education between demographic groups, however there were some trends. Of participants 18 to 49, 71% engaged in online health education compared to only 50% of participants ages 50 and older. Only 46% of participants with 0 to 6 years of education reported using online health resources compared to 72% of participants with 7 or more years of education.

4. Discussion

On the most fundamental aspect of the digital divide, internet access, our data revealed that a large majority of our sample, about 85%, have home Wi-Fi connections. This is extremely promising, and is 24% higher than what was found among Latinx in a national study by the Pew Center⁷. This suggests that the digital divide in the Blue Ridge Health District, specifically in terms of access to internet, may be smaller than in other parts of the country. Another promising statistic is that 97% of our sample owns a smartphone. Smartphones have significantly contributed to narrowing the digital divide in the US, as it has been shown nationally that rates of smartphone usage are nearly equal among Latinx, Black, and white Americans⁷.

On the other hand, our sample was found to have much lower rates of home computer access than Latinx nationally: 23% versus 57%. This implies that the majority of Latinx in this district may not be able to take advantage of the more advanced technological services that function better on computers than smartphones.

Interestingly, one participant commented during her interview that her home Wi-Fi connection and her child’s computer are provided by a school program. Since this information was provided voluntarily, and was not specifically asked as a survey question, it is possible other participants also have internet or computer access through their child’s school system. It is important to recognize that as these children age out of the school system, these families may lose internet and computer access.

The theory of technology maintenance relates to this idea, and describes how even though low-income individuals may own technological devices, their ability to maintain connected to the internet may be tenuous. This can be due to a variety of reasons, such as cost barriers of continuing to pay for a data service plan or problems with broken hardware. In our sample, 39.5% of participants reported they have had to at least temporarily delay payments or cancel their phone or internet plan at some point. Nationally, it was found that Blacks and Latinx are approximately twice as likely to have canceled or paused their smartphone services in comparison to whites¹⁶. Therefore, focusing on technology access, without considering the financial burdens of sustaining a connection to the internet, may miss an important aspect of the digital divide¹⁷.

Overall, the most significant finding from this study was that older individuals, those 50 and over, were less likely to have home internet connection than younger individuals. These findings are similar to previous research done on internet access among Latinx Americans^{8,18}. Another striking discovery was the low rate of email use among participants, especially among participants over 50, which relates to the second-level digital divide. This is noteworthy because email is an important tool to communicate with schools, employers, and healthcare professionals. We found limited outside research on email access and the digital divide with which to compare this finding.

Older participants were also less likely to use the internet for health education than younger participants. This further suggests that the digital divide most intensely impacts older community members. Among Latinx nationally, English literacy has been found to be a positive predictor of internet use and health information seeking online, while speaking Spanish at

home was found to be negatively correlated with online health information seeking^{19,20}. Higher educational attainment has also been associated with increased online health information seeking²¹.

Only 20% of our sample has ever engaged in telemedicine, likely affected by the fact that only about half of our sample has a primary care physician. When isolating participants with a primary care physician, over a third have had experience with telemedicine. It is challenging to compare these statistics to national data because in 2021 the Department of Health and Human Services asked about telemedicine usage “in the previous four weeks”, which was between 20 and 25% among most demographic groups including Latinx²².

In the context of the limited English language proficiency of our sample, an interesting comment from a participant that has engaged with telemedicine as a Spanish speaker was that, while his overall experience was fine, speaking with medical specialists was particularly challenging because of a lack of medical knowledge on the part of the interpreter and the potential for miscommunication of important information. This is an example of a language barrier to healthcare for non-English speakers. The negative impact of this type of miscommunication between the interpreter and the patient has been shown to be detrimental to patient care. In addition to the errors in explaining complex medical terminology, interpreter services may also contribute to miscommunication via misplaced cultural sensitivity, general translation problems, and failure to create trust in the doctor-patient relationship²³.

Overall, the most significant findings of our study suggest that older Latinx have less access to technology and lower information technology skills than younger Latinx community members, which may limit their opportunity to improve their socioeconomic status, health and wellbeing. This suggests that the greatest benefit for the Latinx community may be achieved by focusing technology access and education resources towards older individuals.

Limitations

A significant limitation of this study was that we were unable to conduct in-person interviews due to the COVID-19 pandemic and IRB requirements for research during this time. This means that every participant we interviewed had to have a functioning phone, thus selecting a potentially more resourceful sample out of the greater population. Another possible area of selection bias was that individuals with the least knowledge about technology may have declined to participate in the study due to discomfort in answering these types of questions.

Additionally, the small sample size of 39 does limit the generalizability of the data for the entire Blue Ridge Health District, which was the goal of the study. The data may be more generalizable for the Latinx population in the city of Charlottesville specifically, as this is where most participants reported living.

Of the recorded demographic data, the numbers of years lived in the US stood out the most from expected results. There were no US-born participants in our sample, compared to the 56% of Latinx in Virginia that are US-born²⁴. The lack of US-born Latinx in our sample probably relates to the fact that the recruitment process was via LHI networks, which works with a large number of underserved Latinx immigrants. There were also only a limited number of participants reporting that they have lived in the US for five or less years, which may be due to the fact that more established residents are more willing to participate in community engagement work and less established residents are either less motivated or more fearful to engage. Therefore, while our data may be representative of Latinx immigrants with the potential to have experienced greater levels of acculturation, our data may be limited in capturing the technological challenges of Latinx immigrants of most recent arrival who are less assimilated to US culture, as well as US-born Latinx.

It is also important to note that our population of Latinx in the Blue Ridge Health District may be unique from other Latinx populations throughout the US. The presence of the University of Virginia (UVA), and more specifically the UVA School of Medicine, has contributed to a consistent stream of resources and student volunteers in the community. For example, in part due to the significant effort of organizations such as the UVA Latino Health Initiative (LHI), over 93% of eligible Latinx in the health district, compared to only 71% of white individuals, received at least one dose of the COVID-19 vaccine²⁵. This impressive statistic demonstrates the connectedness of the Latinx community to health resources, which may potentially counteract some of the isolating effects of the digital divide. Even within the district, our data may be affected by participation bias, as recruitment calls were made using a phone list from a previously conducted cardiovascular health program by LHI.

Future Directions

Our study has generated important findings that should be examined in a larger sample with in person surveys and with geographic representation of the population in question.

Moving forward, the results of our survey do suggest that the greatest efforts should be made towards improving technology access and education for older Latinx individuals, as they were found to be the least likely to have access to home internet and be least likely to use email. Providing training in how to set-up and use email, specifically tailored to older Latinx individuals, would be of great benefit. This may allow them to communicate better with health professionals and other services. While these advances are being made, however, it is likely that text messages and Facebook posts would be the ideal methods of communication for many Latinx individuals. It is important for healthcare professionals and for school systems to be aware of the low rates of email usage, and that these types of messages may not be able to reach Latinx individuals in the area.

Additionally, efforts should be made to help improve the English language proficiency of Latinx Americans. This would allow for better communication with healthcare professionals and would also help to close the digital divide.

Overall, these types of surveys can help community and governmental organizations most appropriately allocate resources to address not only disparities in technology access but also in the use of technology. As the first-level of the digital divide continues to narrow in this country, more efforts will need to be made towards expanding technology education, such as email training. Narrowing the first and second levels of the digital divide will improve the health of underserved groups both directly, through improving their ability to access health information and communicate with healthcare professionals, as well as indirectly, through reducing the impact on other social determinants of health.

Table 1: Description of Sample

Gender	n	%
Male	16	41.0
Female	23	59.0
Country of Birth		
Mexico	24	61.5
El Salvador	8	20.5
Other	7	17.9
United States	0	0
English Language	n	%
None	5	12.8
Limited	13	33.3
Intermediate	18	46.2
Advanced	3	7.7
Fluent	0	0
Age	n	%
18-29	2	5.1
30-49	19	48.7
50-64	13	33.3
65+	5	12.8
Years Lived in US	n	%
0-5	4	10.5
6-10	6	15.8
11-15	10	26.3
16-20	8	21.1
21+	10	26.3
Years of Schooling	n	%
0	3	7.89
1-6	10	26.3
7-12	22	57.9
13+	3	7.89
Employment	n	%
Housekeeping	10	25.6
Construction & Maintenance	6	15.4
Food service	2	5.1
Automotive service	2	5.1
Other	5	12.8
Unemployed	14	35.9

Table 2: Technology and Internet Access

Personal Smartphone	%
Yes	97.4
No	2.56
Home Computer	%
Yes	23.1
No	76.9
Personal Tablet	%
Yes	17.9
No	82.1
Home Internet	%
Yes	84.6
No	15.4

Table 3: Computer Access Stratified by Demographic Data

Computer Access	(%)
Gender	
Male	31.3
Female	17.4
Age	
18-49	23.8
50+	16.7
Years Lived in U.S.	
0-10	10.0
11+	25.0
English Proficiency	
None to Limited	11.1
Intermediate to Advanced	33.3
Years of Schooling	
0-6	23.1
7+	24.0

Table 4: Internet Access Stratified by Demographic Data

Home Internet Access	(%)
Gender	
Male	68.8
Female	95.7
Age	
18-49	100.0
50+	66.7
Years Lived in U.S.	
0-10	90.0
11-20	100.0
>20	50.0
English Proficiency	
None to Limited	88.9
Intermediate to Advanced	81.0
Years of Schooling	
0-6	84.6
7+	88.0

Table 5: Communication and Social Media Platforms

Email Address	%
Yes	48.7
No	51.3
WhatsApp	%
Yes	74.4
No	25.6
Facebook	%
Yes	79.5
No	20.5

Table 6: Email Use Stratified by Demographic Data

Email Use	(%)
Gender	
Male	31.3
Female	60.9
Age	
18-49	66.7
50+	27.8
Years Lived in U.S.	
0-10	70.0
11+	39.3
English Proficiency	
None to Limited	66.7
Intermediate to Advanced	33.3
Years of Schooling	
0-6	38.5
7+	56.0

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Appendix

(Survey Questionnaire)

Digital Divide in the Latino Community

Part I: Demographic and Epidemiological Information

Instructions: This section has questions about yourself. This information is useful so we can understand the population that participates in the digital divide survey. Please answer the questions to the best of your ability.

Interview performed via: phone _____ video call _____

Just to confirm, are you, yourself of Hispanic or Latino origin or descent?

(If necessary: such as Mexican, Puerto Rican, Cuban, Dominican, Central or South American, Caribbean or some other Latin American background.) Yes No

1. Participant's name: _____

2. Phone number: _____

3. Email: _____

4. Mailing address: _____

(For mailing monetary compensation)

5. Gender identity (circle one): Male Female Other (specify, optional): _____

6. Age: _____

7. Country of birth: _____

8. What is the highest level of education that you have completed (here or in another country)? _____

9. Current job: _____

(For example: in an office, work from home)

10. How well do you speak and/or understand English (on a scale of 1 to 5):

1. None

2. Limited

3. I understand what is said to me but have trouble communicating back

4. I can communicate and understand most things but lack fluidity when speaking English

5. I understand/speak English as well as I understand Spanish

11a. What language(s) do you speak in the home? Spanish English Both Other

11b. Are you interested in improving your English? Yes No

11c. Do you rely on someone in your life (ex: family member) to help you communicate in English? Yes/No

12. From this list of illnesses, which ones apply to you currently?

Diabetes

Heart disease

Kidney disease

Cancer

High blood pressure

High cholesterol

Respiratory disease

Major physical injury

Liver disease/cirrhosis

Asthma

13. What are the three health-related problems that you worry about most or that you want to learn more about?

Examples: Dental Care, Access to Medications, Reproductive Health, Injury, Cost of Medical Care, Chronic Illness, Trusting Doctors, COVID-19, Other Infectious Diseases, Mental Health

14. How many days during the past month have you felt:

Depressed _____

Anxious _____

Stressed _____

Or other comment about mental health:

Part II: Technology Access

15. Fill out the following table in reference to the members of the participant's household, including themselves:

How many people live in your home, and how old are they?

Age	Gender (M/F/Other, indicate)	Do they have a personal computer with internet access? (Si/No)	Do they have a cell phone with internet connection? (Si/No)	Do they have a tablet with internet connection? (Si/No)
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(Indicate if the technology is provided by the school for their child)

16a. Do you have access to Wi-Fi at home? Yes No

16b. If you have Wi-Fi, does it come from a company or is it connected to your cell phone plan? Company Cell phone plan

17. What is the quality of your Wi-Fi connection at home? Poor Fair Good Excellent

18. Are you able to communicate with another person over video from your computer?

Yes No

19. Are you able to communicate with another person over video from your smartphone?

Yes No

20a. How much do you pay each month for phone services for your family? _____

20b. How do you pay for your cell phone services?

Pay as you go / Contract Other

21. How much difficulty, in terms of cost, have you had in maintaining active cell phone services and Wi-Fi?

From the four options, indicate which applies to you:

- I always have cell phone services and Wi-Fi coverage
- I've had to delay some payments occasionally
- I've had to cancel my plan or stop making payments
- I don't have a cell phone or Wi-Fi plan

Part III: Technology Use

22. Which, if any, social media platform(s) do you use on a regular basis (select all that apply)?

- Facebook
- WhatsApp
- Twitter
- Instagram
- Snapchat
- Other: _____
- None
- Which one do you prefer? _____

23. What resource(s) do you use for health education (select all that apply)?

- Trusted websites (ex: UVA Health, CDC, NIH, Mayo Clinic, etc.)
- Any website from a Google search
- Social Media
- Print materials from the clinic or health system
- Family and friends
- Your doctor/nurse
- Other: _____
- None

24. What electronic means do you use to communicate with others (select all that apply)?

- Text messages or phone calls
- WhatsApp messages or calls
- Social media platform (direct messaging, like FB messenger)
 - If yes, which one(s)?
- Video calls (ex: Facetime, Skype, Zoom, WhatsApp)
 - If yes, which one(s)?
- Email
- Other:
- None
- Which one do you prefer?

25a. Do you have access to your email on your cell phone? Yes No

25b. If you do not use email, explain why not:

26. When you have a technology-related problem or question, what do you do?

- Ask child for help
- Ask other relative for help
- Search for answers online
- Wait until someone else addresses the problem
- Call the company or another professional
- Other: _____

27a. If you have or have had a child in school virtually, do you feel that the school has supported you adequately in setting up for your children's remote learning?

Yes No N/A

27b. Do you have sufficient time and resources to support your child with remote learning? Yes No N/A

27c. Additional comments on virtual learning (challenges, helpful resources, etc.):

28a. Have you, yourself, participated in online learning? Yes No

28b. If you have not participated in online learning, why not (select one or more)?

- I am too busy with work
- I am too busy with taking care of home and/or children
- My home environment would not be good for online learning (ex: too loud)
- I am unsure how to use the technology needed for online learning
- I do not have interest in online learning
- Other: _____

29a. Do you have access to UVA MyChart (MyChart is an online storage platform for medical information with the ability to communicate with physicians)? Yes No

29b. If you have access to UVA MyChart, have you used it? Yes No

If you haven't used it, why not?

29c. Have you ever tried calling the UVA Medical Center? Yes No

29d. If yes, how was your experience communicating with them as a Spanish speaker?

Excellent / Good / Adequate / Bad

29e. Additional comments about calling UVA Medical Center:

30a. Do you have any experience with video telemedicine? Yes No

30b. If you have used telemedicine, what has been your experience with it? Excellent / Good / Adequate / Bad

30c. Additional video telemedicine comments:

31. What is the longest video you would watch about an important health-related topic?

- I would not watch a health-related video
- 0 - 2 minutes
- 2 - 5 minutes
- 5 - 10 minutes

- 10 - 15 minutes
- 15 - 20 minutes
- 20 + minutes

32. Do you listen to the radio on a regular basis? Yes No
 33. Would you listen to a 30 minute Spanish radio program once per week?
 Yes No Depends on the topic
 34. Would you watch a 30 minute Spanish program on Facebook Live once per week?
 Yes No Depends on the topic

Part IV: Community Resource Us

35. Are you aware of the UVA Latino Health Initiative (LHI)? Yes No
 If Yes, how do you interact with the LHI?
 36. Are you aware of Sin Barreras? Yes No
 If Yes, how do you interact with Sin Barreras?
 37. Are you aware of Creciendo Juntos? Yes No
 If Yes, how do you interact with Creciendo Juntos?
 38. Are you aware of the Women’s Initiative? Yes No
 If Yes, how do you interact with the Women’s Initiative?
 39. What community resources do you need most right now?
 40. What community resources have been most helpful to you and your family recently?

Part V: Social Determinants of Health Questions

Check the box next to any statement that is true:

41. Do you have a primary care doctor? _
 • If you have one,
 • Is it from UVA? Yes No
 • The Free Clinic? Yes No
 • Other _____

If you don’t have a regular doctor or clinic, where do you go when you are sick?

42. How many times have you visited your primary care provider in the past 12 months?
 43. Do you have health insurance? (note: UVA Financial Screening does not count as health insurance for this question) Yes No
 44. How many times have you been hospitalized in the past 12 months?
 45. How many times have you been to the emergency room in the past 12 months? ___
 COVID-19 Experience:
 46. What is your opinion about the COVID-19 testing in the community?
 47. What do you think about the experience of the Latino community with COVID-19?
 48. Did you lose employment or have a reduction of income during the pandemic? Yes No
 49. This question is optional: What was your total family income in 2019?

- Under \$10,000
- \$10,000 - \$20,000
- \$20,000 - \$30,000
- \$30,000 - \$40,000
- \$40,000 - \$50,000
- \$50,000 - \$75,000
- \$75,000 - \$100,000
- More than \$100,000
- Prefer not to answer

50. For how many years have you lived in the United States? ____
 51. Would you be willing to be reached in the future to answer additional questions that can help us better serve your community? Yes No
 For interviewer only -
 Any additional notes or interesting comments that came up: _

The Importance of Supporting Lactation in the Workplace

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In 2019 the Accreditation Council for Graduate Medical Education (ACGME) updated its Common Program Requirements to include requirement I.D.2.c), which supports lactation at work. The requirements state institutions must provide “clean and private facilities for lactation that have refrigeration capabilities, with proximity appropriate for safe patient care”.³ The FLSA (Fair Labor Standards Act) had already placed some protections for lactation, employers included under the FLSA must provide lactating persons protected time and space for up to a year.⁴ And in 2022 the FLSA was amended to include the Providing Urgent Maternal Protections (PUMP) Act. The PUMP act expands lactation support to cover more workers, states that employers must provide space that is not a bathroom, allow for reasonable break times, and protections against harassment or retaliation regarding lactation time.^{4,5} These rules and regulations are critical to supporting women and parents in the workplace and creating an equitable and diverse environment.

As primary caregivers, mothers¹ are often delayed in their professional advancement, committing time and energy to the management of family and house. By taking on the primary caregiver role, there is less time for professional development, academic or scholarly pursuits and activities that translate to promotion. Fathers experience a different set of barriers in this transition, this can include harassment and humiliation for seeking accommodation for parental leave or choosing to co-manage household and family. These continued cycles of the historical gendered parenting structure no longer work in a household where both parents work fulltime.

Mothers that choose to return to work, with the intention to provide breastmilk to their infant, are faced with a common set of barriers. Choosing to breastfeed and pump is a hard decision for any amount of time, but it is so critical to the health of both mother and baby. The health benefits include immunities for the infant, better mental health and attachment outcomes, reduced postpartum depression (Hispanic mothers are two times more at risk for this) and lower risk for breast and ovarian cancers.^{1,11} Correlations exist between these benefits and the duration of breastfeeding and providing breastmilk. Hispanic (48.4%), Black (35%) and Native American (37.3%) mothers have a higher percentage of stopping breastfeeding by six months than White (52.3%) or Asian (71%) mothers.¹¹ Barriers at work are often the reasons that mothers stop pumping and breastfeeding early. Time and access to adequate lactation space are at the top of the list but also included are stress (reducing milk production) and fear of harassment, judgement or humiliation.¹

Women represent a small percentage, less than 10%, of leadership roles in medicine, beginning in the division leadership to C-Suite, with decreasing rates as roles elevate.⁹ Inside of that 10% of leadership less than 1% identify as Hispanic, Latina, Spanish or Hispanic/Multiple Race.¹⁰ One of the barriers to leadership for women is having children, as they often assume the primary caregiver role for children and household.⁹ The joy and obligation of having a family mean that women are continuously penalized in their professions for seeking a healthy balance of both. This call to action is that healthcare institutions must advocate for protecting women that choose both and create spaces that allow for those individuals seeking promotion, seniority, and leadership.

At my institution, the University of Kansas School of Medicine, and in my role as a wellness officer for Graduate Medical Education (GME), we have determined that it is vital to meet the recommendations and legal standards but that we work to exceed them. Our institution has dedicated lactation rooms; they are on every floor in patient care areas and administrative

¹ The author would like to recognize that the term “mother” is a binary gendered term and that there are preferred terms such as ‘birthing parent’ that are more inclusive but not yet part of common nomenclature.

spaces. The problem becomes that in a healthcare setting and as part of a care team, creating a planned schedule for pumping every 3-4 hours is complicated.

Our institution decided to try something different; we gave our residents top-of-the-line wireless quiet pumps and mini-fridges for a year without expectations on how they use the equipment.⁶ They don't have to pay for the pumps or the fridges out of pocket; they just return them to us when finished. We started with three pumps and five mini-fridges and are now up to 16 pumps and seven mini-fridges; we have served over 36 trainees with our program in three years. Our residents have reported they feel more supported, and most were able to reach or exceed their pumping goals. This along with our robust wellness program are impacting our wellness and burnout data reported by our residents through our annual wellness survey.

We have conducted this survey since 2015 and using the single burnout question from the mini z our data has reflected consistently higher rates of burnout in our female cohort compared to our male cohort. In October 2019 our female residents reported 5.3% higher burnout than male cohorts. Our 2022 data shows that burnout is statistically insignificant between genders (38% in females and 39% in males), of note we transitioned in 2022 to the Maslach scale for burnout. Our female cohort of residents has increased in our institution from 33% (2019) to 39% (2022). We have residents reaching out to us before they start training to secure a pump, and they trust us with their concerns and bring ideas to us for how we can improve the experience for others. Currently, we are working on finishing a pumping handbook for residents, securing computers for our lactation rooms; we created a quarterly education series for residents planning their families to build a network and resources. Our future goals include easier access to cold storage and backup supplies for pumping needs.

In addition, the state of Kansas and others are providing paid parental leave access. Our GME Office is seeing more of both men and women taking time to bond with their newborn. So far in the 2023 academic year, we have 52 reported parental leaves requested, 19 women and 33 men; before this, we rarely saw men take leave for a newborn. Reducing the stigma for men to take time off to bond with their newborn is critical to the family unit. In addition, another unexpected benefit we have seen at our institution is that programs are adapting schedules to accommodate parental leave as a given, which adds to the reduction of stigma regarding parental leave during training. To support both parents, we also began a quarterly parenting series to provide a space for new parents to talk with other physician parents and content experts around topics such as fertility, mental and sexual health, financial and benefit planning for families and workers' rights.

Institutions that look for a more inclusive environment for parents, starting with planning a family, can build on the success of these initiatives. Creating structures supports flexible schedules (to accommodate childcare schedules), **flexibility regarding tenure and promotion, recognition of soft skills, benefit penalizations for workers classified as "part-time", as well as training to support career advancement and balance.** More women in medicine mean that there are more women mentors, and innovators conducting research and leading from the intuitive skills learned from parenting. Primary caregivers bring a specific set of skills with them to leadership, such as coaching, communication, compassion, and flexibility, ideal skills for transformational leadership in our increasingly diverse workforce.⁸

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Promoting Health Equity for the Hispanic Population through Improved Access to Malnutrition Screening and Intervention

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ABSTRACT

Malnutrition can lead to worse health outcomes and inequities. The risk for malnutrition is higher in communities of color, young children, and older adults. This Commentary defines malnutrition and its impacts as well as the impacts of health equity on nutrition and nutrition access. Also included are recommendations and practice tips specific to identification and intervention for malnutrition. The Commentary concludes by summarizing a physician action plan to address improved nutrition quality via improved access to nutrition care.

1. Introduction

Good nutrition is fundamental for health. What is less recognized is that malnutrition can contribute to worse health outcomes¹ and health inequities.² Malnutrition is often underrecognized by physicians, which may reflect limited medical education on nutrition.³ In one cross-sectional survey of medical, surgical, and obstetrical interns, 71% reported they believed medical school had not sufficiently exposed them to clinical nutrition.⁴ All segments of the population may be at risk for malnutrition, but the threat is higher in communities of color and in young children and older adults, particularly those of lower socio-economic status. The objectives of this Commentary are to define malnutrition, its potential impacts, and prevalence as well as describe the impact of health equity on nutrition and nutrition care access, including food insecurity. The Commentary also identifies current malnutrition and food insecurity screening and intervention recommendations, particularly for children (<18 years of age) and older adults (≥65 years of age). Finally, the Commentary outlines a physician action plan for improved malnutrition care for the Hispanic population.

2. Definition of Malnutrition and Its Impacts

Defined broadly, malnutrition refers to deficiencies, excesses, or imbalances in intake of energy and/or nutrients. It includes undernutrition (such as stunting, wasting, underweight, and micronutrient deficiencies/insufficiencies) and overweight, obesity, and diet-related noncommunicable diseases.⁵ Pediatric malnutrition is categorized by etiology as non-illness related (behavioral, socioeconomic or environmental factors) or illness related (acute or chronic) that result in nutrient imbalance, decreased intake and/or delivery.⁶ Similarly, there are etiologic-based definitions of adult malnutrition; these consider both time and degree of inflammatory response in an acute or chronic illness or injury⁷ and are termed disease-related malnutrition. In older adults, two conditions frequently related to malnutrition are sarcopenia and sarcopenic obesity, which are characterized by progressive loss of muscle mass and strength/physical function with age.⁸

Diagnosing and documenting malnutrition in clinical practice requires a multidisciplinary approach with standardized tools. Patients are first screened for malnutrition risk and a nutrition assessment (which may include a nutrition-focused physical exam⁹) is then completed for those at risk. If a nutrition assessment identifies malnutrition or risk for malnutrition, the diagnosis should be recorded in the medical record. The American Society for Parenteral and Enteral Nutrition (ASPEN) and Academy of Nutrition and Dietetics (Academy) have recommended specific characteristics for the identification of pediatric¹⁰ and adult⁷ malnutrition. Indicators used to identify pediatric malnutrition are related to:

Food/nutrient intake
Assessment of energy/protein needs
Growth parameters
Weight gain velocity
Mid-upper arm circumference
Handgrip strength¹⁰

Adult malnutrition indicators are similar; the ASPEN/Academy recommend malnutrition should be suspected if two or more of the following characteristics are present in adult patients:

Insufficient energy intake
Unintentional weight loss
Decreased muscle mass
Decreased subcutaneous fat
Fluid accumulation
Decreased functional status (e.g. hand grip strength⁷)

ASPEN offers Pediatric Care Resources¹¹ and a Malnutrition Solution Center¹² that include screening and assessment tools and their scoring, care pathways, and patient education materials, as well as resources specific to care settings and patient populations.

Nutrition is critical to support growth, development, basic metabolism, immunity, and other body systems and thus malnutrition can have multiple health impacts (Table 1). Current evidence also suggests that nutrition status, whether positive or negative, can have correspondingly positive or negative impacts on organ systems involved in body homeostasis and development, thereby influencing the health risks of both children and adults.¹³ Analysis and analytic modeling of US Medicare administrative claims data have shown the value of nutrition and its potential for reducing Medicare spending. These studies have included how nutrition support therapy positively impacts hospital-acquired infections and health outcomes in critically ill patients¹⁴ and in-hospital complications and lengths of hospital stay in patients with gastrointestinal cancer.¹⁵

Young children (15-19)	Adults (20-27)
Increased mortality	Increased mortality
Increased complications	Increased complications, such as incidence of healthcare-acquired conditions (including pressure ulcers)
Delayed wound healing, increased Infections	Delayed wound healing, increased infections
Increased morbidity	Increased morbidity, decreased respiratory function, cardiac function
	Functional loss, muscle wasting, increased risk for falls
Increased hospital length of stay	Increased hospital length of stay
	Higher hospital readmission rates
Increased treatments/procedures, costs	Higher treatment costs
Decreased quality of life	Decreased quality of life
Poor attention and cognition	
Decreased motor and communication skills development	
Altered homeostasis and metabolic dysregulation	

Table 1: Malnutrition-related impacts on growth, development, and health outcomes

3. Prevalence of Malnutrition

Malnutrition is common across all ages, care settings and is a long-standing public health issue.²⁸ The condition can include undernutrition and overweight/obesity and at the population level there is also recognition of the double burden of malnutrition, for example in pediatrics overweight/obesity along with stunting/wasting are seen as interconnected.²⁹

4. Pediatric and Adult Malnutrition in the Community

Globally, 194 million children under age 5 have been estimated to be stunted (too short for age) or wasted (too thin for height) and nearly 40 million overweight/obese.³⁰ In the outpatient setting, 5-10% of the pediatric population is at risk for failure to thrive/undernutrition.³¹ The United States Census Bureau uses the term Hispanic or Latino to refer to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race.³² Malnutrition research in the US Hispanic population is limited and there is a need for further nutrition care and health disparities research.³³ Yet research by Iriart et al provides evidence that for US Hispanic children the proportion of stunting is three times the proportion of non-Hispanic White children.³⁴ Further, these researchers documented that Hispanic children

living at lower socioeconomic levels experience a higher prevalence of stunting compared to children who are not at lower socioeconomic levels.³⁵ They concluded ethnicity/race and social determinants of health had a direct impact on malnutrition risk.

Disease-related malnutrition is believed to be prevalent among the general US adult population³⁶ with up to 1 out of 2 older adults either at risk of becoming or currently malnourished.³⁷ Hispanic race/ethnicity has been significantly associated with high nutrition risk scores in community-living older adults.³⁸ Another study found US Hispanics had the highest prevalence of sarcopenia and sarcopenic obesity compared to other groups.³⁹

5. Pediatric and Adult Malnutrition in Clinical Care Settings

Since the early 1970s malnutrition has been documented as a common pediatric condition as well as a contributor to prolonged hospitalizations and increased morbidity.⁴⁰ Today 6-51% of hospitalized pediatric patients are diagnosed with malnutrition⁶ however, many remain undiagnosed. Encouragingly, US hospital diagnosis rates for pediatric malnutrition have improved from 3.9% in 2012 to 6.4% in 2019,⁴¹ in part because of efforts to prioritize malnutrition screening, assessment, diagnosis, and intervention training. Malnutrition prevalence in hospitalized pediatric intensive care patients has been documented as highest in US Hispanic children (42.5%) compared to prevalence rates among Caucasian children and African American children of 29.4% and 19.6%, respectively.³⁵

In considering adult malnutrition in care settings, a Congressional Research Service Report documented “malnutrition affects 35-60% of older residents in long term care facilities and as many as 60% of hospitalized older adult patients.”⁴² In addition, malnutrition occurs in 20-50% of adult patients on hospital admission⁴³ but as in pediatric care, it often remains unrecognized. Malnutrition is documented in less than 9% of hospital stays⁴⁴ and 1% of emergency department visits.⁴⁵ There is little data specific to malnutrition in US Hispanic hospitalized adults.

6. Impact of Health Equity on Nutrition and Nutrition Care Access

Health equity gives all people, regardless of race, education, gender, identity, sexual orientation, disability, or geography, the individual resources, and opportunities to reach overall health.⁴⁶ Nutrition and nutrition care access are social determinants of health and are important for health equity, as outlined in the 2022 White House Conference on Hunger, Nutrition, and Health. This 2022 Conference was a milestone because it was the first time in over 50 years that the White House had hosted such a Conference. The Conference’s call to action—which includes integrating nutrition and health—will be far-reaching with the potential to significantly impact the future frameworks and policies that define US government food and nutrition programs and how they may support underserved populations.⁴⁷

Ending nutrition care access disparities was a primary focus of the 2022 White House Conference *National Strategy*,⁴⁸ more broadly advancing health equity is part of the US Centers for Medicare and Medicaid (CMS) quality strategy.⁴⁹ In recent years, CMS has begun to include nutrition in its quality programs. Weight assessment and nutrition counseling for children and adolescents was in the initial core set of children’s health care quality measures for Medicaid and the Children’s Health Insurance Program (CHIP)⁵⁰ and have continued to remain in the core set for more than a decade.⁵¹ CMS in 2021 approved nutrition risk assessment as part of a health equity-related improvement activity for office-based physicians and clinicians reimbursed under the Merit-based Incentive Payment System (MIPS).⁵² In 2022, CMS adopted the Global Malnutrition Composite Score as a health equity-focused measure in its Inpatient Hospital Quality Reporting Program for 2024 reporting.⁵³ While CMS quality metrics are generally not reported by race, ethnicity, or socioeconomic factors, CMS’ inclusion of nutrition and malnutrition-related measures in its quality programs will increase provider attention on the importance of identifying and addressing malnutrition⁵⁴ and initiating malnutrition quality improvement.⁵⁵

Closely linked to the issues of nutrition and nutrition care access is food insecurity. The United States Department of Agriculture defines food insecurity as a household-level economic and social condition of limited or uncertain access to adequate food.⁵⁶ Food insecurity is associated with low dietary quality in children⁵⁷ and adults⁵⁸ and can contribute to malnutrition.⁵⁹ It is for this reason that it is recommended that clinicians screen for both food insecurity risk as well as malnutrition risk.⁶⁰

The 2022 White House Conference *National Strategy*,⁴⁸ described multiple impacts of food insecurity and diet-related diseases on individual and societal costs, including poorer mental and overall health as well as increased healthcare costs. Food insecurity is an ongoing problem for the US Hispanic population who is 2.5 times more likely to experience food

insecurity than white non-Hispanic Americans.⁶¹ For Hispanic households with children, food insecurity is over 14% compared to less than 5% in non-Hispanic counterparts with children.⁶² Food insecurity has been associated with poorer health outcomes in Hispanic adults, including increased risk of Type 2 diabetes⁶³ and serious psychological distress.⁶⁴

 *Practice tip: physicians can help improve the US Hispanic population’s access to nutrition care and equity by recognizing food insecurity as a risk factor for malnutrition.*

7. Identification of and Intervention for Malnutrition and Food Insecurity

Identifying and intervening for malnutrition with evidence-based nutrition support can positively impact clinical outcomes, including through enhanced survival. It is in this context of improved outcomes and survival that nutrition care is now viewed as a human right.⁶⁵ The disconnect between potentially high rates of malnutrition/risk for malnutrition but low rates of malnutrition diagnosis should be given priority, including in the US Hispanic population, and addressed by implementing recommended malnutrition and food insecurity screening, assessment, documented diagnosis, and intervention practices.

8. Screening for Malnutrition and Food Insecurity

In the clinical setting two common, validated tools for screening for malnutrition in young children are the Pediatric Yorkhill Malnutrition Score (PYMS), and Pediatric Nutrition Screening Tool (PNST), due to their high sensitivity.⁶⁶ The Malnutrition Screening Tool (MST) is recommended to screen adults for malnutrition regardless of patient age, medical history, or setting.⁶⁷ The MST is a simple screening tool (addressing weight loss and appetite) that is designed to quickly identify potential malnutrition and can be included in the EMR.⁶⁸⁻⁶⁹ Once patients are identified as at risk for malnutrition, they should be referred to a registered dietitian nutritionist (RDN).⁷⁰ The RDN can complete a nutrition assessment--instrumental for a malnutrition diagnosis--and implement a nutrition care plan which may include evidence-based medical nutrition therapy.

The Hunger Vital Sign™ is a 2-question, validated tool for screening for household food insecurity in families with children and it is readily being incorporated into electronic medical records (EMRs).⁷¹ The tool has been shown to be effective for pediatric food insecurity screening across multiple care settings, including in emergency departments,⁷² primary care,⁷³ and clinics serving low-income families.⁷⁴ The Hunger Vital Sign™ screening tool has also been found to be highly sensitive and specific for screening older adults for food insecurity.⁷⁵ Most food insecurity screening programs are still in the early stages of linking food insecurity screening and interventions with health outcomes. Effective tracking will likely require integration within EMR systems or using Fast Healthcare Interoperability Resources (FHIR) technology to allow exchange of patient data between multiple data collection systems⁷⁶ In addition, since systematically identifying and addressing social needs such as food insecurity have not traditionally been part of medical practice there can be barriers to successful implementation.⁷⁷ Table 2 describes some of the reported barriers to food insecurity screening and intervention and potential strategies to overcome them, although none of the strategies are specific to the Hispanic population.

Barriers	Strategies to Help Overcome Barriers	Resources
Patient dignity, comfort	<ul style="list-style-type: none"> • Use motivational interviewing/explain reasoning for food insecurity screening • Include food insecurity screening questions as part of the initial nursing intake exam • Use a written or electronic questionnaire for food insecurity screening vs face-to-face interaction • Strengthen provider communication, cultural sensitivity, and empathy • Involve patients in food insecurity interventions as part of the care planning process 	<p>Screening</p> <ul style="list-style-type: none"> • https://frac.org/aaptoolkit • https://childrenshealthwatch.org/public-policy/hunger-vital-sign/ • https://malnutritionquality.org/food-insecurity-and-nutrition-risk-screening-resources/ • http://seniorhealthandhunger.org/
Limited staff time, resources	<ul style="list-style-type: none"> • Embed food insecurity screening into existing EMR screening workflows • Integrate food insecurity referral/resource platforms for government enrollment sites/community organizations into EMR processes • Embed social workers into clinical teams or partner with community specialists to facilitate referral/follow-up • Train all staff on food insecurity screening/interventions to spread workload 	<ul style="list-style-type: none"> • Community Partnerships • www.rootcausecoalition.org/ • https://prapare.org/ • https://www.phi.org/our-work/issues/nutrition-food-security/ • Research • https://sirenetwork.ucsf.edu/

Limited staff buy-in, engagement	<ul style="list-style-type: none"> Initiate pilot test to reveal clinical prevalence of food insecurity and its links to clinical conditions and interventions; provide education highlighting results of pilot and community resources available Provide continuing medical education and case studies on food insecurity and health outcomes Provide skill-building exercises and written scripts to aid in conveying empathy Provide clinical algorithms to facilitate care processes 	
Limited patient and staff knowledge of resources, community organizations	<ul style="list-style-type: none"> Provide active referrals/warm handoffs to community-based organizations Provide assistance in navigating benefits applications Make referrals to multiple food resources Provide written handout/card with local food resources referral information Provide on-site emergency food boxes/food pantry to address immediate needs Maximize use of technology to facilitate information exchange between healthcare provider and community organizations and promote bidirectional communication 	

Figure 2: Reported barriers, strategies, and resources for food insecurity screening and intervention in health care settings^{76,78-84}

9. Interventions for Malnutrition and Food Insecurity

Acute care interventions for pediatric malnutrition include early detection, diagnosis, and treatment.¹⁰ In the community setting, pediatricians have a significant role in early identification and treatment of malnutrition. The three steps to consider for addressing pediatric malnutrition are 1) recognize and intervene by rapidly implementing nutrition support which may include standard or specialized diet; oral nutrition supplements (ONS) (e.g. to increase protein and energy); enteral nutrition; parenteral nutrition; and/or supplementation of vitamins, minerals, amino acids and/or bioactive metabolites, 2) tailor interventions to specific medical conditions, and 3) include a comprehensive discharge plan.⁸⁵ One study assessing the impact of ONS in children found a significant cost savings of \$56 million annually due to decreased hospital stay and hospital costs.⁸⁶ ONS has also been used in pediatric patients to help support catch up growth and has demonstrated significantly better growth outcomes.⁸⁷

For older adults, ONS with dietary advice is recommended to intervene for malnutrition.⁸⁸ Nutrition-focused quality improvement programs (QIPs) in the hospital setting that included systematic malnutrition screening on admission and provision of oral nutrition supplements have been associated with reduced readmissions and length of stay⁶⁸ and cost-savings of over \$4.8 million.⁸⁹ One of the broadest clinical, nutrition-focused QIP efforts to date is the Malnutrition Quality Improvement Initiative (MQii) which developed and launched clinical quality measures and an on-line toolkit specific to malnutrition. Pivotal to the MQii’s work is the “ability of interdisciplinary health teams to uptake, adopt, launch, and implement necessary quality-driven improvements through the MQii within their health care delivery system environment.”⁹⁰ Implementing the MQii in the acute care setting provides the foundation for continuing malnutrition care post discharge.⁹¹

Community-based interventions for malnutrition and food insecurity (whether individuals have one or both conditions) for young children and older adults include connecting individuals and their families with nutrition-assistance programs and local nutrition service providers and resources (Table 3).

Program	Eligible Population	Type of Assistance	Resources
Federal Programs			
Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)	Low-income pregnant, postpartum, breastfeeding women; infants; children up to age 5 who are at nutrition risk	Benefits to purchase specific foods	United States Department of Agriculture (USDA) website with search function by program, state, region:
National School Lunch Program (NSLP)	Low -income children	Low-cost or free lunches in public or nonprofit private schools	

School Breakfast Program (SBP)	Low -income children	Low-cost or free breakfasts in public or nonprofit private schools	https://www.fns.usda.gov/fns-contacts?f%5B1%5D=program%3A32
Summer Food Service Program (SFSP)	Low-income children/teens	Free healthy meals and snacks through community providers	
Supplemental Nutrition Assistance Program (SNAP)	Low-income households, including those with children and older adults	Benefits to purchase foods through participating retailers	
Child and Adult Care Food Program (CACFP)	Children (up to age 12) enrolled in a qualifying childcare program; adults who are physically/ mentally impaired or adults aged 60+ enrolled in adult day care program	Prepared meals provided in nonresidential childcare program or adult day care center	
Commodity Supplemental Food Program (CSFP)	Low-income adults aged 60+	Monthly supplemental package of shelf-stable foods and refrigerated cheese	
Senior Farmers' Market Nutrition Program (SFMNP)	Low-income households of adults aged 60+	Benefits to purchase locally grown fruits/vegetables from farmers' markets, roadside stands, community agriculture programs	
Home-delivered nutrition program (such as Meals on Wheels)	Adults aged 60+	Prepared meals delivered to homebound participants	Meals on Wheels website with search by zip code: https://www.mealsonwheelsamerica.org/find-meals Federal Administration on Community Living online eldercare locator with search by zip code, city, state to identify local agencies providing home delivered meals: https://eldercare.acl.gov/Public/Index.aspx
Congregate Nutrition Program	Adults aged 60+	Prepared meals provided in group settings, such as senior centers	Federal Administration on Community Living online eldercare locator with search by zip code, city, state to identify local agencies providing congregate meals: https://eldercare.acl.gov/Public/Index.aspx
Medicare Medical Nutrition Therapy Benefit	Adults enrolled in Medicare with diabetes or kidney disease or recent kidney transplant	Nutrition assessment and counseling	Medicare explanation of benefit: https://www.medicare.gov/coverage/nutrition-therapy-services
Medicare Advantage Home Delivered Meals following Hospital Discharge	Various, depending on Medicare Advantage program's defined eligibility requirements	Hot and/or frozen meals for specified time-period following hospital discharge	Benefit may vary by local provider, contact Medicare Advantage provider
Community Programs			
Medically Tailored Meal Providers	Various, depending on local provider's defined eligibility requirements	Disease-specific hot and/or frozen meals	Food is Medicine Coalition website with local providers listed by state: https://www.fimcoalition.org/partners
Food Pantries and Food Banks	Various, depending on local provider's defined eligibility requirements	Fresh and/or shelf-stable foods	Feeding America website with search function by zip code, state to find local food banks: https://www.feedingamerica.org/find-your-local-foodbank

Table 3: US Federal and local food and nutrition programs and resources

Clinicians should consider and address structural factors that can impede access to food resources for lower-income populations such as lack of awareness about programs, confusion about eligibility, and stigma.^{78,84} Potential strategies to help address these and other barriers are outlined in Table 2. There may also be factors unique to the US Hispanic population to consider, including concerns about citizenship⁹² and differences in reporting food insecurity among Latino fathers and mothers.⁹³ There appears to be limited research specific to adapting malnutrition and food insecurity risk and intervention programs for the Hispanic population. However, studies on determinants of food insecurity among Hispanic households⁹⁴ and adaptation of nutrition education programs for Hispanic populations⁹⁵ offer several insights. These include consideration of:

Individual factors (i.e. gender, age, intergenerational poverty, education, transportation, Acculturation, immigration status, language)

Interpersonal factors (i.e., household composition, social support, cultural beliefs)

Organizational factors (i.e., interagency collaboration, structure, communication)

Community factors (i.e., food deserts, stigma)

Public policy/societal factors (i.e., nutrition assistance programs and food resources⁹⁴⁻⁹⁵).

Further, it has been identified that power and social inequalities must be addressed prior, during, and after interventions to best meet minority populations' needs and improve the quality of nutrition education and services⁹⁵ they receive.



***Practice tip:** physicians can help improve the US Hispanic population's access to nutrition care and equity by viewing nutrition care as a human right and working with the interdisciplinary care team to implement appropriate nutrition interventions and connect individuals and their families with nutrition-assistance programs and local nutrition service providers.*

10. Physician Action Plan to Improve Malnutrition Care

Physicians can play a pivotal role in addressing malnutrition and promoting health equity through improved access to nutrition care (Figure 1). This starts with understanding the barriers to quality nutrition care, particularly for groups at risk like young children and older adults in the Hispanic population. In the clinical setting, physicians often lead and support nutrition support teams.⁹⁶ Physicians have also been specifically called on to champion recognition of and intervention for malnutrition, with the increased awareness that while malnutrition and its complications are not “never events,” lack of “provider recognition of risk and absence of efforts to minimize it should be.”⁹⁷ This advocacy could in part take the form of working to ensure the needs of the Hispanic population are addressed as the broader community of nutrition stakeholders implements actions from the 2022 White House Conference *National Strategy*.⁴⁰ Earlier in this Commentary, it was identified there is a limited focus on nutrition in medical training.³ Thus, learning about the fundamentals of nutrition and malnutrition and food insecurity screening and interventions is important to support effective nutrition care. The many tools and resources identified in this Commentary provide a starting point for self-education, although further research is needed to identify how these tools and resources can best support Hispanic patients specifically. Finally, communicating with administrators about the benefits of malnutrition quality improvement can increase provider attention on why it is critical to identify and address malnutrition,⁵⁵ particularly for underserved populations.

Physician Action Plan to Address Malnutrition

- Fundamental requirements of appropriate nutrition during fed, starved, stress, and inflammatory states (both acute and chronic)
- Available screening and assessment tools for malnutrition and food insecurity risk identification
- Appropriate malnutrition and food insecurity interventions across care settings
- Need to consult with nutrition support teams and refer patients to registered dietitian nutritionists for medical nutrition therapy

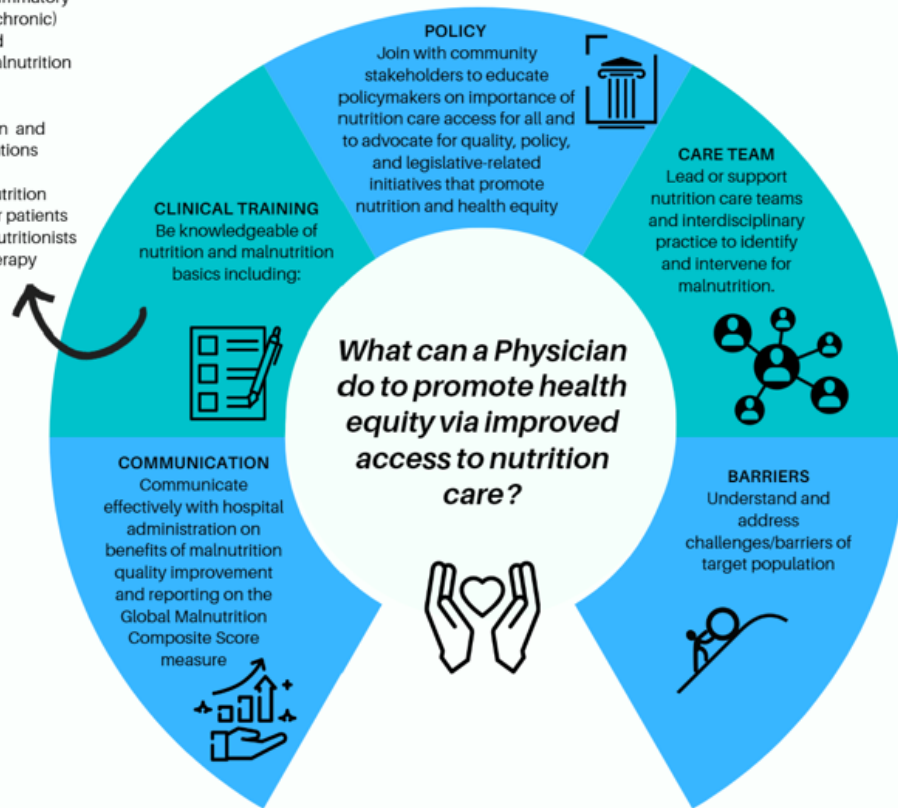


Figure 1: Physician leadership is essential to improve nutrition care access and address malnutrition in the US Hispanic population.

11. Conclusion

One pillar of the 2022 White House Conference is to integrate nutrition and health, specifically to “Prioritize the role of nutrition and food security in overall health—including disease prevention and management—and ensure that our health care system addresses the nutrition needs of all people.”⁴⁸ For the US Hispanic population, physician leadership is essential to help make this a reality. It starts with an understanding of health inequity and food insecurity and their impact on malnutrition as well as an awareness that adequate nutrition and quality nutrition care includes more than assuring food access. Tools and resources exist to identify and intervene for malnutrition and food insecurity, yet additional research is needed on how to adapt these specifically for the needs of the Hispanic population. Ultimately it is the individual practitioner’s recognition of nutrition as part of routine clinical care and multimodal treatment that will make the biggest difference in helping advance health equity through improved access to nutrition care for the Hispanic population. By so doing, practitioners will assure that not only the right nutrition is accessible, but also provided in an effective and efficient manner to the right individual, in the right way, and at the right time.

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Dreams Deferred: United States Policies that Shape Undocumented Immigrant Youth

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ABSTRACT

Undocumented children in the U.S. are an especially vulnerable population. Government policy often dictates the benefits and services that undocumented children may access. Undocumented children can attend free K-12 education and while there is no federal law that prohibits enrollment in higher education, their access to in-state tuition and financial aid limits opportunities. In most cases undocumented children will be unable to be employed or be licensed (i.e., professional license, driver's license), the main exception being those protected by Deferred Action by Childhood Arrivals (DACA). At present, undocumented children struggle for health access cannot enroll in insurance coverage under the Affordable Care Act (ACA). Currently policies are being discussed at the federal level that could either benefit or harm undocumented children. Here we review the major federal policies in the U.S. that impact the lives of undocumented children, including education, employment and health access. Physicians can utilize this information to better approach these patients.

1. Introduction

Undocumented youth are children and young adults that lack either U.S. citizenship or other forms of legal status. It is estimated that there are 1.1 million undocumented minors in the U.S.^{1,2}. Immigration to the U.S. by youth may not occur by their own volition, but rather be part of a larger family decision³. Some may not even realize they were brought to the U.S. until they are young adults^{3,4}.

Undocumented youth may have equal opportunities to the average American early in life, yet the gulf becomes more apparent as they near adulthood³⁻⁵. As the undocumented child matures, they face a complex web of constraints on opportunity dictated by federal, state, and institutional policies⁵⁻⁹. Hurdles will frequently underscore their limitations and coming to understand their “illegal” status may be an emotionally difficult experience⁴. Although there is a high degree of diversity and variability in the background of undocumented youth, core to their identity is their immigration status¹⁰. Undocumented people cannot be legally employed, travel freely, have access to federal aid, have access to government documentation that is critical for livelihood in the U.S., among others^{6,11}. All of this imposes sizable implications on the undocumented youth's well-being, self-worth, and opportunities.

A fundamental question that the many ask regarding the undocumented population is, “Why can't they just become legal?”¹². The short answer is that there is no clear path to do so. Legal immigration in the U.S. is a complex and individualized topic. Factors that may influence an individual's ability to adjust their status range from how they entered the U.S., their country of origin, sponsorship by a naturalized relative, or having undergone extreme circumstances (e.g., victims of criminal activity)¹². Undocumented youth are often brought to the U.S. at a young age and therefore cannot control many of these factors^{3,4}. As per the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), undocumented immigrants are counter-intuitively penalized for leaving U.S., even if this is necessary as part of adjusting to a lawful immigration status¹³. This process is even more difficult for undocumented youth that entered the U.S. unlawfully (e.g., not using a VISA), even when this unlawful action was committed as minors before they had the capacity to consent. Currently there is no consistent or streamlined pathway for permanent U.S. residence, with options like sponsorship by a relative potentially taking decades to process^{14,15}. In the past decade, the most viable option has been protection under DACA, but even this has severe limitations^{8,16-18}.

The DREAM Act and DACA have been key components of the identity of undocumented youth, at least in public perception^{6,19}. “Dreamers” are those individuals that would adjust their status under The DREAM Act, legislation that was first introduced in 2001 but has never been approved by Congress^{20,21}. The DREAM Act would provide legal status and a pathway to U.S. citizenship for those that meet a stringent set of criteria. Undocumented youth may also be “DACAdmented”, named after DACA which is an executive branch memorandum signed by President Obama in 2012 that granted renewable deferral from deportation¹⁷. During the 2010s, DACA was often synonymous with undocumented youth as many were able to achieve a semblance of normality via this policy¹⁷. Officially DACA does not confer a legal status, but it does provide a Social Security Number (SSN) and an Employment Authorization Document (EAD)²². An SSN and EAD are key for major

components of normal life in America, such as obtaining lawful employment, a driver's license, and other countless processes that require a government ID. Approximately 825,000 individuals have been granted DACA²³ since the program's inception.

DACA was upheld unchanged until its rescission in 2017 by the Department of Homeland Security (DHS) under the Trump administration^{16,18}. The fragility of DACA was due to being an executive branch memorandum and not legislation by Congress. DACA's rescission led to a years-long legal battle that culminated in the Supreme Court of the United States (SCOTUS)^{8,24}. Ultimately, SCOTUS sided with DACA but soon after the DHS made crucial changes to DACA that limited its benefit to undocumented individuals. At present only those with DACA can renew on two-year intervals, while those that did not come of age prior to DACA's challenges are unable to apply. These changes have left approximately 200,000 undocumented youth without the protections as they come of age²⁵. All these factors have implications for the education, employment, and health of young undocumented immigrants.

2. Education of undocumented youth

It is estimated that there are 600,000 undocumented students in K-12²⁶. It is possible for undocumented youth to have a childhood comparable to most Americans, at least during K-12 education. The Family Educational Rights and Privacy Act (FERPA) protects the data of undocumented children by making it unlawful to share their immigration status to non-school personnel²⁷. Organizations like Immigration Customs Enforcement (ICE) will not target schools outside of exceptional circumstances²⁸. Due to this, schools are theoretically a haven for undocumented children. Furthermore, the Supreme Court ruling in *Plyler v. Doe* stated that undocumented children cannot be discriminated by schools unless there is a substantial benefit²⁹. Undocumented students can therefore expect privacy and rights at least until they graduate high school. That said, undocumented children still face many challenges, in large part due to their immigration status and that of their parents^{4,30}. It has been estimated that only about 40% of undocumented students do not complete high school, a rate very similar to their citizen peers⁴. Of those that do earn a high school diploma, approximately only half attend college, with that number dropping further towards college graduation⁴. It must be noted that no federal law in the U.S. prohibits undocumented students from enrolling in higher education.

Two of the most influential policies on the autonomy of undocumented youth results from IIRIRA and Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), passed under the Clinton administration^{13,31}. These policies had multiple major implications, especially as related to higher education of the undocumented. Under the IIRIRA, it became unlawful for states to offer in-state college tuition to undocumented students unless this was extended to out-of-state residents. Under the PRWORA, it became unlawful for federal aid to be granted undocumented students. This included not just grants and scholarships but also loans, which extended to graduate education and prior to DACA made it nearly impossible for undocumented students to consider options like attending medical school^{32,33}. Furthermore, the PRWORA dictated that U.S. states could not provide state financial aid for higher education unless the individual state passed a law to supersede this policy.

The barriers created by IIRIRA and PRWORA compound to create a heavily unfavorable situation for undocumented youth pursuing higher education. This is in addition to undocumented students and their parents often being in economically unfavorable conditions^{2,4}. There was a silver lining though in that neither the IIRIRA nor the PRWORA outright prohibited undocumented students from attending higher education^{13,31}. In addition, the wording of the IIRIRA and PRWORA could be interpreted by states and higher education programs in a range of ways. While some states use both policies as the bedrock to deny higher education to the undocumented, throughout the 1990s to 2010s more progressive states passed laws that would facilitate this^{34,35}. Even now there is a nation-wide patchwork of policies at the level of states and individual universities³⁶.

One of the major policies relevant to education of undocumented youth is DACA. While DACA did not provide a lawful status, it did confer an EAD and SSN^{8,17}. The EAD allowed undocumented youth to be legally employed, which was even more important in states or programs that denied financial aid. An EAD also gave a means to exercise the skills and degrees obtained by the undocumented. The SSN was key for enabling further documentation, such as obtaining driving licenses. Students could use their EAD and SSN to relocate to regions in the U.S. that were more favorable to their higher education pursuits. Less tangible but arguably important is that DACA became a recognized status for undocumented youth. DACA status could be adopted in administrative and institutional procedures (e.g., prior to DACA it may not have been possible for undocumented students to specify their status on enrollment applications). DACA could now be an easily recognizable status usable for advocacy, further extending representation and benefits to undocumented students.

Nevertheless, there were obstacles that DACA was not made to overcome. Even with DACA, undocumented students could

not be provided with federal financial aid as per the PRWORA³¹. Certain graduate education paths (e.g., medical school) were still difficult, given that these assume that applicants can access federal financial aid^{32,33,37}. Despite its shortcomings and temporary nature, DACA was a highly effective and influential policy for the education of undocumented youth. By extension, its repeal and continued challenge in the courts have been major blows to the undocumented community²⁴.

3. Employment of undocumented youth

Despite a higher degree of assimilation, undocumented youth share many of the challenges of other undocumented immigrants^{4,30}. Given access to K-12 and higher education, undocumented youth are likely to have higher skills (e.g., English proficiency) than their parents, yet the limitations of their status can force them into the same job pool⁴. In the absence of work authorization, undocumented youth must be employed in jobs with little or no administrative oversight (e.g., cash jobs)^{30,38}. This leaves undocumented youth vulnerable to exploitation, lack of work opportunities, and benefits². Further difficulties can be linked to a lower socioeconomic status that makes it more difficult to acquire the soft skills needed to be hired, retain a job or be promoted^{4,30}.

One of the greatest benefits to the undocumented youth workforce in the last decade was DACA^{8,17,18}. The SSN and EAD afforded by DACA allowed undocumented youth to be legally employed. Undocumented youth could access jobs that they were previously disallowed to have even when they had the appropriate skills or qualifications^{8,17}. Undocumented youth were less likely to be threatened based on their immigration status, and thus could better access and advocate for workers' rights and benefits^{30,38}. In certain states, they could apply for driver licenses which would further facilitate employment, commuting, and relocation³⁹.

An erroneous critique of DACA is that it allowed undocumented people to take advantage of government benefits. With DACA, undocumented people still cannot access welfare (i.e., TANF), federal financial aid, ACA insurance, unemployment benefits, nor social security^{11,40}. There is evidence that undocumented immigrants pay taxes but cannot access a wide range of government benefits, resulting in a net gain for the nation^{11,23}. Rather DACA made the productivity and their contribution to this country more transparent. It has been reported that DACA recipients hold 343,000 jobs in essential industries⁴¹. DACA recipients are estimated to own 68,000 homes in the U.S., pay \$6.2 billion in federal taxes, and \$3.3 billion in state and local taxes each year⁴¹.

A further benefit of DACA is that it facilitated education and licensing^{33,42}. DACA recipients can legally work concurrently while pursuing their education. DACA was the basis for specialized training, such as undocumented physicians being employed by medical residency programs^{32,43}. Multiple states have permitted that DACA recipients apply for and be licensed in fields like law, medicine, nursing, among others⁴⁴. In short, DACA expanded the career possibilities for undocumented youth to near parity with U.S. citizens.

As expected, the challenges to DACA and its partial reinstatement resulted in significant hardship for undocumented youth. Simply put, the loss of DACA means that undocumented youth would no longer be employed legally and would likely lose their jobs. At present, DACA can be renewed on a two-year basis which means that undocumented youth must live their life two years at a time. Sadly, the situation is even more dire for undocumented youth that would apply to DACA for the first time. New applications are not presently allowed, and so a new generation of undocumented youth must come of age without the option of legal employment²⁴.

4. Healthcare of undocumented youth

Undocumented youth face acute and chronic healthcare challenges, in large part due to limited access to health insurance^{45,46}. The PRWORA restricted access of undocumented immigrants to Medicaid⁴⁷. Furthermore, undocumented individuals, including those with DACA, are barred from Medicare and the ACA Marketplaces⁴⁸. The Children's Health Insurance Program (CHIP) is not available to the undocumented in many states^{45,49}. Undocumented immigrants may access health insurance through their employers, but this is prevented by all the challenges of finding appropriate employment described in the previous section⁴⁶. Undocumented immigrants may purchase health insurance outside of ACA marketplace, but their limited income may prevent this.

Federal law requires hospitals to stabilize patients in a medical emergency, including the undocumented^{50,51}. Limited Medicaid can be extended to undocumented immigrants for emergency services⁵². Healthcare systems may also extend sliding scale or waive fees for undocumented patients. These options are not ideal and result in delayed care and unattended

ailments in the undocumented population. Of note is that six states (California, Illinois, Massachusetts, New York, and Washington), plus Washington D.C., extend healthcare services to undocumented children⁴⁶.

Another factor that undocumented youth must content with is the mental toll of their status⁵³. U.S., anti-immigrant rhetoric and policy can result in depression, stress, and anxiety in undocumented children⁵⁴. For example, the “Zero Tolerance” enacted by the Trump administration resulted in families (including children) being detained at the U.S.-Mexico border, in some cases placed in cages, which was often reported on the media and viewable by undocumented youth⁵⁵. Surveillance and policing of communities by the U.S. Immigration and Customs Enforcement (ICE) and the Customs and Border Protection (CBP, i.e., border patrol) can also strain the mental health of undocumented children^{56,57}. Once aware of their status, undocumented youth must content with its implications the well-being of themselves and their family⁴. As these children come of age, they face the mental, physical, and emotional toll of being undocumented compounded by the challenges of adulthood^{13,4,30}.

While much uncertainty is present in the lives of undocumented youth, there are resources that physicians can use to improve the care of undocumented youth. For example, “Sanctuary Doctoring” is a clinical method that outlines steps to approach and treat the undocumented, in addition to making available educational resources for the clinician and patient⁵⁸. The American Academy of Pediatrics has published a tip sheet and toolkit to support immigrant children in addition to resources for pediatricians^{59,60}. Clinicians treating undocumented youth should ideally adopt psychological support, education, and legal resources as a standard of care. In addition, clinicians can advocate for humane immigration legislation by directly contacting their elected officials, bringing attention to advocacy in their medical associations, and contacting their health system’s government relations department.

5. Conclusion

It can be argued that optimism for undocumented youth peaked with the advent of DACA and until the mid-2010s^{8,17}. The years of the Trump administration were marked with increased restrictions and hostility, primarily in the attempts to rescind DACA^{16,18}. The election of President Biden and his immigration platform renewed optimism for undocumented youth, but so far, no major progress has occurred^{23,61}.

Early in his administration, President Biden restored DACA via executive order⁶². President Biden also presented a plan for the 11 million undocumented immigrants in the U.S., which includes a pathway to citizenship which intended to fast-track DACA recipients and extend protections to those without DACA⁶¹. Furthermore, attempts to pass the DREAM Act occurred once again at the end of 2022⁶³. These policies would have been life-changing for undocumented youth but unfortunately neither gained approval by Congress. Even worse is that DACA continues to be challenged in the courts; on October 5th, 2022, the appeals court agreed that state challenges to DACA were valid and that President Obama’s creation of DACA was not lawful²⁴. Consequently, the Biden administration has made efforts to defend DACA, but many believe these judicial challenges will eventually prevail⁶². As of early 2023, the Department of Homeland Security (DHS) continues to process DACA renewal applications but cannot approve new applications²⁴.

While approving immigration legislation has been an ongoing issue for decades, we must consider what can be a permanent solution to this issue^{12,64}. Immigration policy in the U.S. is arguably “broken”, requiring immigrants to meet not just a high degree of requirements but wait decades or else languish in limbo⁶⁵. Historically immigration legislation in the U.S. is oriented in reverse, fixing the problem after it has occurred without attention to how the problem will inevitably reoccur. After each major immigration overhaul in the past, the undocumented immigration population will accumulate again for 20 or 40 years until legislation is passed again. The optimal solution is for the United States to enact forward-looking immigration reform that is sustainable, enforceable, and fair. This is especially relevant for undocumented youth, who can be assets to this nation if given the opportunity. In the absence of a permanent and sustainable legislative solution, undocumented youth may suffer preventable damage to their education, employment, and health.

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