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Challenges Between and Within Rural Minority Demographics

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ABSTRACT: Rural minorities in America are in poorer health compared to other demographics, as illustrated by deficits in several health metrics. Such deficits are great in magnitude and temporally persistent. Furthermore, the unrecognized diversity of rural areas means that these deficits affect a larger proportion of rural areas than conventional stereotype dictates. This review analyzes existing research to characterize the health of rural minorities, focusing on specific challenges and elucidating recurring themes that arise within and between minorities. Specific demographics were chosen for in-depth analysis based on prominence in nonmetropolitan areas, utility as case studies, and availability and quality of research. Population-specific analyses delineate themes that apply across demographics as well as challenges specific to each group, revealing the complexity of rural minority health. Analysis elucidates some key themes surrounding rural minority health. The invisibility of these demographics underlies many surface-level issues such as ineffective interventions and the underfunding of health organizations. Social context also plays a great yet underappreciated role in health, lending complexity to this issue through unique demographic-specific challenges. Above all, knowledge gaps are one of the most impactful and long-staying factors affecting rural minorities, impeding solutions and promoting disparity through ignorance on the part of both policymakers and providers.

INTRODUCTION

The poor health of rural communities is well-established in literature, vividly illustrated by consistently reduced scores in health metrics. One example is urban-rural discrepancies in life expectancy. From 2006 to 2009, residents of nonmetropolitan counties were expected to live 76.8 years compared to 78.8 years in metropolitan counties [1]. Compounding this disparity is its stagnation; urban lifespans have steadily increased over time, while rural lives have remained at their current length for decades [2]. Only half a year separated rural and urban lifespans from 1971 to 1974, but this gap quadrupled to 2.0 years from 2005 to 2009 [1]. Rural populations also have a higher prevalence of obesity than metropolitan populations [3,4]. With close ties to chronic, severe illnesses such as type 2 diabetes, high obesity rates imply poor health [5,6].

Rural mental health is challenged as well. In rural areas, all psychiatric disorders except for non-PTSD anxiety disorders are more prevalent [7]. Furthermore, from 1999 to 2016 in rural areas, drug overdose deaths increased by 749.4% and the suicide rate for those aged 25 to 64 years increased by 38.3% [8]. These statistics led the NIH to establish rural residents as a health-disparity population [9].

The healthcare struggles of rural areas are both distinct and difficult to overcome, rooted in the unique communities, cultures, and environments of a rural context. For instance, healthcare workers cite different obstacles in the workplace depending on their locality. Compared to urban providers, rural providers report struggling more with provider scarcities, finding continuing medical education, and staying compliant with the Health Insurance and Portability Accountability Act, a law that dictates acceptable usage and privacy protocols for medical records [10]. Rural culture is distinct as well, emphasizing family, traditionalism, trust, and independence. Cultural competence is paramount in rural health to gain patient trust, correctly and appropriately convey information, and foster accessibility [11]. However, proportionally few providers are recruited from rural backgrounds, promoting a cultural disconnect [12], facilitating the high patient-to-provider ratios that characterize rural healthcare [10]. Providers that fail to understand these values encounter community distrust and struggle to meet patient needs [13].

A defining struggle in rural health is long geographic distances. Compared to those in large metropolitan counties, five times as many rural households have no car and live further than a mile from a grocery store [1]. These vast distances spawn communication issues that hamper patient-provider contact, block cohesion between services, and damage efficiency, all of which limit healthcare access, making accessibility a prominent issue in rural health [14,15]. Rural providers, already few in number, are spread thin over vast distances; lower service demand due to diffuse populations particularly affects specialists, who cluster in urbanized areas to support their practice [16]. High business expenses minimize profit margins for rural providers as well [17]. Large metro counties have 263 specialists per 100,000 people whereas rural counties see only 30 per 100,000, contributing to reliance on primary care [16]. With greater dependence on primary care, rural areas also suffer from the nationwide shortage of general practitioners, where 25-30 providers serve 100,000 people in both urban and rural areas [16].

Less well-understood, however, are the obstacles faced by minorities within rural communities. Despite a common stereotype of ethnic homogeneity, rural areas are home to significant proportions of vulnerable demographics and host a unique demographic makeup. The distinctions between rural and urban healthcare are mirrored by the distinctions between rural minorities and the majority. Furthermore, this diversity is growing due to the growth of low-wage industries. The number of minorities in rural areas increased by 20% between 2000 and 2010, while the number of rural Whites remained largely the same [18]. Just as rural communities have unique needs, cultures, and contexts compared to metropolitan areas, so do individual minority groups. Issues that independently plague rural and minority populations overlap in the doubly-underserved rural minorities, damaging patient outcomes [19]. Understanding these growing demographics is critical to serving their unique healthcare needs.

Medicine that understands and addresses the impact of rural minority standing

is better able to reach these vulnerable populations. This review will first identify several prominent demographics of rural areas: the disabled, Native Americans, veterans, and elderly. These are explored as illustrative case studies due to their high rural prevalence and availability of research. Their distinguishing factors are highlighted and, as these separations are identified, the overarching themes that unite these demographics emerge. Common ideas, observations, and challenges throughout rural minority health research are then explored. Keynote research motifs include ongoing research gaps on both rural health and rural minorities, leading to unaddressed issues and uninformed, ineffective policy. This contributes to another recurring theme, the invisibility of rural minorities in both public policy and the research world; the enduring struggles of these demographics is testament to this. Finally, the powerful negative effects of overlapping minority statuses continuously appears throughout research. Concluding this review is an analysis of these research themes and current deficiencies in our knowledge of these complex demographics.

OVERVIEW OF RURAL MINORITY HEALTH

The rural-urban dichotomy in geography, culture, and historical context has been well-described with demonstrated, quantifiable impacts on health. However, distinctions between rural demographics are less recognized. For example, ethnic disparities in rural communities remain largely overlooked and undiscussed in literature [20]. Non-racial and non-ethnic demographic factors, such as the traits that define veteran, elderly, and disabled groups, are equally forgotten, rendering these groups invisible. Small population sizes and lack of representation in healthcare further obscure rural minorities, and underrepresentation of the rural perspective among medical providers and researchers encourage stereotypes of homogeneity. This melange of factors occludes the recognition of specific needs and contextual factors both in literature and in medical practice. This theme of unacknowledged distinctiveness underpins rural minority health research.

Such lack of recognition conceals the desperate status of rural minority health. A strong recurring theme in literature is how intersecting geographic and minority disadvantages damage patient outcomes. As medically-underserved groups make up great amounts of rural populations, substantial amounts of people suffer from these intersections. For example, spatial isolation and low healthcare accessibility disproportionately impact rural minorities compared to their urban counterparts or the rural majority [20,21].

Compounding these common challenges are the unique struggles of individual groups, such as the powerful yet cryptic effects of social and cultural contexts. Apostolopoulos et al. see syndemics as the defining factor of rural minority health, describing the pathogenic interaction of biological and social factors [22]. The effects of syndemics appear frequently in literature; even cursory reviews of rural minority research underscore their obvious strength. For example, among Black Americans, several struggles – structural racism, inequitable social, education, labor, and health policies, and economic – are linked to trauma, stress, and syndemics [22]. Rurally, research regarding the magnitude of hardship for minorities takes disproportionately little notice of these contextual effects. This invisibility amalgamates with other factors, such as high and increasing rates of rurally-concentrated poverty and high employment in dangerous industries like manufacturing, to injure rural minority health [23]. Furthermore, for non-white rural residents,

the white-dominated rural setting means that specific cultural needs and experiences find little understanding. Coethnic networks and communities are sparse due to diffuse populations, and culturally-intelligent resources are few and far between. A prime example is in the rural Native American community, which struggles with fragmented healthcare services, low funding, and lack of community support [16]. Unsurprisingly, its members experience remarkably poor health even compared to other rural underserved [2].

All of these factors combine to produce visible, quantifiable damage to health. Rural minorities have lower life expectancies, see higher mortality rates, rate their healthcare as lower quality, receive fewer preventative services, and suffer higher rates of chronic disease compared to their urban counterparts [6,24]. Table 1 summarizes health statistics in rural ethnic and racial demographics [20].

The complex aggregation of social, cultural, and geographic factors generates the current healthcare plight of rural minorities. "Health outcomes are inexorably linked to ZIP code, are notably worse for the millions who live in rural and underserved communities and are further compounded by health disparities common among racial and ethnic groups." [21] Interventions to address social determinants of health are equally as important as secondary prevention and treatment efforts yet remain underutilized in policy due to poor recognition of these determinants. [25] Research is limited for all rural minorities, but available literature reveals the distinctive qualities of each group as well as overarching patterns that unite them. Understanding the interplay of unique challenges and broader factors will allow for more powerful interventions in these underserved communities.

NATIVE AMERICANS

Native Americans exemplify the struggles of rural minorities, experiencing some of the poorest health outcomes in America despite their intimate ties to rural land: in 2010, 29% of Native Americans lived in rural areas compared to 15% of the U.S. population [26]. Furthermore, where other rural ethnicities have experienced gradual but measurable gains in healthcare access and quality, lingering historical biases and social factors continue to negatively affect Native American health [27].

Notably, rural Native Americans suffer one of the highest risks of maternal and infant mortality in the U.S [21,28], high rates of mental illness, stress [27], substance abuse [29], and suicide [24], and damaged mental well-being as well [4]. Native Americans also suffer higher mortality rates of preventable disease. Per 100,000 people, pneumonia and influenza kill 26.6 Native Americans per year versus 15.1 for all races, and heart disease kills 194.7 Native Americans as opposed to 179.1 for all races [29]. Unsurprisingly, the rural-urban disparity in life expectancy is exaggerated for Native Americans, where a gap of 11 years stands between metropolitan and nonmetropolitan Indigenous lifespans [1]. Economic obstacles hinder Native healthcare, as well: 33% of rural Native Americans report recent problems accessing healthcare, and 28% recently experienced major problems paying medical bills. High costs do not indicate high quality, either, as 28% of rural Native Americans reported recent problems with quality of healthcare [30].

Perhaps one of the greatest issues faced by this group is healthcare fragmentation. "Services and support for health and social programmes are typically fragmented in Indigenous populations… Fragmentation results in the isolation of symptomatic issues—addiction, suicide, fetal alcohol syndrome, poor

housing, and unemployment—followed by the design of stand-alone programmes to try to manage each issue separately." [31] Fragmentation is bred by chronic underfunding, small populations, and long geographic distances [32], and as a population known for its small size and economic hardship, Indigenous health is the paragon of such fractionation. Fragmented healthcare services interrupt cohesion between services, leading to poor outcomes, inaccessibility, and inefficient resource use [33]. The Indian Health Service (IHS), which only provides non-comprehensive health insurance and experiences chronic underfunding, suffers extensively from fractionation [29]. As many rural American Indians/Alaska Natives receive healthcare through the IHS (approximately 1.5 million of 4.1 million Native Americans [34]), a great number of rural Indigenous encounter fractionated, underfunded healthcare: 46% of American Indian/Alaskan Natives receiving care through the IHS experienced funding shortfalls and subsequent reductions in healthcare [29].

More factors than just the IHS affect rural Native American healthcare, such as stark socioeconomic status. Compared to the total U.S. population, Native Americans working full-time earned less and were more likely to live in poverty compared to non-Hispanic whites [26]. There are also substantial differences between the experiences of rural Native Americans and whites not only in healthcare discrimination, but also in police treatment, racial violence, and housing [30]. Health outcomes are not produced in a vacuum; social factors influence healthcare at all levels, from policymaking to patient-provider interactions, to generate palpable impacts [21,25]. Rural Black and Hispanic Americans suffer the same pattern, where structural racism influences health to damage outcomes [35]. From the poorer healthcare outcomes across all rural ethnic minorities, we see how minority standing in majority-white rural areas affects patient outcomes. Interventions in rural Indigenous healthcare struggle to address these. Prominently, even the introduction of the IHS, specifically created to address Native American healthcare, made little change in Native American healthcare over time [29]. Other interventions outside of the IHS are primarily targeted at individuals and communities [63]. While helpful, the greater systemic pressures on rural Native Americans remain, thus no substantial, national change in Indigenous health has been accomplished.

Rural Native Americans' twice-erased status in locality and ethnicity contributes to their current healthcare struggles. Thus, the healthcare effects of such a unique context are forgotten. As indigeneity is an inherently social and cultural concept, poor Indigenous health is rooted in cultural factors such as loss of community, lack of land connection, and feelings of spiritual, emotional, and mental disconnectedness [31]. This disconnection is a great mental burden: the rural Indigenous experience the highest suicide rate out of all rural demographics, double that of rural whites and twelve times that of rural African- and Asian-Americans [24]. The fractionated state of rural Native healthcare mirrors this disconnection. Overall, the rural Indigenous have not received the benefit of medical advancements, leading to stagnated improvement in health [21].

The pervasive stereotype of rural communities as homogenous oversimplifies them, rendering the diverse experiences of ethnic and racial constituents invisible. Such invisibility affects healthcare at all levels, from public health initiatives and funding to patient-provider interactions. This invisibility is woven throughout rural health research, not just among the Native American population. Other

rural health researchers have commented on the difficulty of finding high-quality samples, trends, and pre-existing research. The issues dogging the unseen rural Indigenous -- economic, social, and cultural, not just in healthcare -- have halted improvement in their health as others advance.

DISABILITY

Rural populations have markedly high proportions of disability. Compared to metropolitan adults, rural adults are 9% more likely to report having any disability, 24% more likely to report having more than one disability [36], and are more likely to have hearing or vision loss [4]. Low workforce participation and economic constraints facilitate the high rates of poverty experienced by disabled households [37]. Despite the substantial presence of disability in rural areas, the rural disabled are a rare topic in healthcare research [21].

Accessibility frames the daily lives of disabled people. In a healthcare context, disability management and quality of life are contingent on accessible, high-quality care, as the disabled community requires more health services than abled persons [38]. Thus, rural scarcity of both specialty and primary care, a necessity in the lives of many disabled people, disproportionately impacts this population.

Geographic inaccessibility defines rural areas, where vast distances between services make car travel essential. As driving requires well-functioning sight, hearing, cognitive ability, and mobility, many disabled people cannot drive long distances and struggle to access care. Provider scarcities build only more obstacles, as many disabled people struggle to locate specialist care for disability-specific services [38]. The vacuum of nonurban specialty care impacts the health of the rural disabled, who need these services most. Rural residents rely heavily on primary care providers as well, even to manage conditions largely overseen by specialists [12]. Regardless of the fact that primary care cannot provide the same services as a specialist, the shortage of rural primary care inordinately affects the rural disabled, for whom consistent access to healthcare is critical. Low socioeconomic status magnifies the effect of provider scarcity. Many disabled adults (42.0%) depend on Social Security Disability Insurance or Supplemental Security Income as well, including services such as Medicare [38]. As these public programs pay around half of what private insurance pays practitioners [39], providers have less incentive to care for rural disabled, further limiting care options. Financial barriers also impede access to care: working-age adults with disabilities are much more likely than those without to report inability to pay medical bills, problems paying medical bills, and not accessing care due to cost [38].

A recurring theme throughout rural minority healthcare is the numerous overlaps between marginalized populations. Few demographics exemplify this better than rural disability. Non-White populations [37] and veterans experience higher rates of disability and veterans have high rates of disability as well [40]. The elderly often encounter disability as they age, and healthcare obstacles in these separate populations frequently overlap, as in transportation struggles, high incidence of poverty, and dependence on public programs. Overall, frequent overlaps with underserved groups results in rural disability generating more destitute outcomes.

Disability and rurality have a close relationship that directly affects healthcare and quality of life. Several layers of inaccessibility hinder rural health, from financial to geographic, and the overlap of disability status with other individual factors lends further com-

plexity to rural disabled healthcare. However, research into the rural disabled is noticeably lacking despite a critically underrepresented status. For example, the interplay of disability with other minority standings is known in only very broad, general trends. Financial impacts remain understudied as well. Further research to characterize rural disability is needed to fully understand its effects and its intersections with other groups.

VETERANS

Rurality and veteranship are closely tied, with approximately 4.7 million veterans currently living in rural and highly rural areas [41]. Unsurprisingly, the issues that plague rural healthcare merge with veteran-specific traits to damage rural veteran health, resulting in low health-related quality-of-life scores for rural veterans compared to their nonrural counterparts [42]. Institutional underfunding and high intrinsic rates of disability are some of the prominent factors affecting the health of rural veterans.

Similar to the struggles of the IHS, the Veterans Health Administration (VHA) has seen regionalization and cutting of rural services due to small service populations and limited finances [7,43]. Dilute service populations require the establishment of large referral regions and, as a result, VHA tertiary care referral centers tend to be located in urban areas even if many clients are rurally-located [43]. This creates referral systems that are geographically separated from patients. For veterans, this disconnection exacerbates foundational issues in rural healthcare, generating long travel times and augmenting the lack of specialty care. As illustrated in the rural Indigenous, fractionation and defunding of healthcare is common among the rural underserved and damages healthcare outcomes.

As found above, disability frequently intersects with other minority statuses to impact health, exemplified by the high rates of disability among veterans. 29% of veterans are classified by the US government as having a service-connected disability [40] compared to the general disability rate of 4.3% [44]. Service-connected disabilities include physical maladies as well as mental illness, with mental illness being a defining veteran's issue. Of veterans utilizing Veterans Affairs health services, 21.8% are diagnosed with post-traumatic stress disorder and 17.4% are diagnosed with depression, proportions much higher than in civilians [44]. High disability rates affect more than just health, contributing to, for example, high rates of household poverty. 13.19% of disabled veterans are in poverty compared to 5.51% of non-disabled veterans, damaging quality of life and introducing financial barriers to healthcare [37].

Mental illness is a prominent veteran struggle due to traumatic experiences and military culture discouraging the use of behavioral healthcare. Veteran suicide rates increased by 15% for men and 35% for women from 2001 to 2010 [45]. Rural veterans struggle even more: physical and mental health scores are far lower for nonurban veterans compared to urban veterans, showing the larger burden of mental illness for rural veterans [7]. The lack of care sensitive to veterans' particular needs and context, such as for mental health, fuels these struggles. If rural healthcare is sparse in general, there are less informed on the specific circumstances of veterans. Military culture, with values of strength and independence, impacts how veterans approach healthcare; effective healthcare for veterans is sensitive to these cultural considerations and the distinct obstacles veterans face [40].

Though veteranship holds unique contextual considerations for healthcare, recurring challenges across minorities impact

this population. Demographic-specific healthcare organizations struggle to support diffuse rural populations, demonstrated in rural Native Americans with the IHS and in veterans with the VHA. Similarly, the lack of veteran-specific care echoes the cultural gaps that impact the rural Indigenous. Predominately white providers struggle with the specific issues surrounding the Indigenous; metropolitan providers struggle to fully appreciate rural culture; the effects of military culture often go unrecognized by civilian providers. Military values emphasize "the physical and mental well-being of soldiers, as well as their independence and self-reliance…" discouraging veterans from seeking healthcare [40]. Nonmilitary providers unaware of these considerations thus struggle to reach veterans. Coupled with rural obstacles to care, there is little incentive for veterans to pursue healthcare, facilitating health disparity.

Rural veterans, by virtue of both their locality and life experiences, represent a deeply underserved population. Thinly-spread health services, lack of funding, high disability and poverty rates, poorly-defined referral areas, and care uninformed on military culture combine to generate uniquely poor health circumstances for rural veterans. This mixture of struggles incorporates wider issues in rural health and unique contextual obstacles. The poorer health of veterans, reflected in high suicide rates and reduced quality of life, is rooted in many different factors, difficult to untangle from each other but powerful in their combined effect.

ELDERS

Quiet, idyllic, and slow-paced, rural locales make popular retirement destinations. 25% of the rural population is age 65 or older, though the elderly constitute 12% of the U.S. population [48]. More Americans are reaching retirement age and increasing this proportion, foreshadowing growth of current issues with provider shortages [49]. The effects of this shortage are compounded by the intensive healthcare needs of elderly patients. The medical intricacy of aging merges with issues in service access and provider shortages to establish the elderly as a medically vulnerable population. Rural geography and overlaps with other minority statuses only exacerbate these issues.

Elderly patients benefit from specialty healthcare that is trained in complex and aged patient care [48,50]. However, a drastic shortage in geriatricians is developing, especially in rural areas [51]: for example, 56% of geriatric fellowship spots remained unfulfilled in the 2015 Main Residency Match of the National Resident Matching Program [52]. Rural elders thus suffer not just from broad deficiencies in rural specialty care, such as cardiology for age-related heart disease, but for a demographic-specific specialty trained in their specific needs. Mental health is also severely underemphasized in the elderly. Social and spatial isolation plague the rural elderly [49], yet psychological services to cope with such loneliness are scarce [54]. Suicide risk increases significantly after age 65, and 18% of completed suicides in 2019 were by older Americans [55]. Aside from specialty care, rural elders encounter pronounced challenges in primary care access, such as physical frailty and long geographic distances [5]. Compounding this hardship is insufficient public transportation in rural areas [17].

Care that would circumvent these physical barriers, such as home-based support services, is lacking. Limited provider availability, inadequate transportation, poor telecommunications access (i.e. poor Internet and technological literacy in elders), and low caregiver

recruitment and retention plague these services [14,17]. The same issues that haunt all of rural healthcare impact home health, damaging the health of rural elders who need these services most.

Socioeconomic factors also impact the elderly. High poverty rates in rural elders introduce financial barriers to care. Compared to urban areas, rural elders have lower incomes and are more likely to be below the poverty line. Although they are more likely to own their homes, those homes are more likely to be substandard [55]. Greater reliance on Medicaid and Social Security may also limit provider options [55]. Long distances to work or support services only worsen financial issues. Overall, vast distances may impose insurmountable barriers to healthcare, employment, prescriptions, or social services for rural elders [56].

As American lifespans stretch longer and more retirees seem to seek calm, idyllic towns and views, healthcare in the rural elderly will only become more important. These elders, however, will find only sparse healthcare services, whether in primary care, specialty care, or home health. Frequent intersections with other marginalized statuses mar the health outcomes of rural elderly as well. For example, 56% of the 2.8 million rural veterans enrolled in the VHA are over the age of 65 [57]. Furthermore, the proportion of ethnic and racial minority groups among the American elderly is expected to rise sharply in coming years: the percentage of elderly non-Hispanic whites is expected to drop from 78% in 2014 to 55% in 2060 [49]. Throughout rural health, overlapping circumstances facilitate poor outcomes, and rural elders follow the same pattern [56]. Little research has been completed about these overlaps, however, leaving a number of unanswered questions.

ONGOING KNOWLEDGE GAPS

The experiences of rural minorities are important to consider in rural health due to the surprising heterogeneity of rural areas. Factors that independently affect minority and rural populations overlap to damage healthcare quality and access. The intricacy and significant numbers of rural minorities make them critical aspects of rural areas, yet are often overlooked. Current research into rural minority health highlights unique challenges of each demographic and implies universal challenges that unite them. Some overarching patterns include the magnification of extant rural health issues for minorities, socioeconomic obstacles, and underfunded programs for specific demographics. Of these patterns, persistent invisibility in their own communities and healthcare itself is the most consistent and impactful. Such invisibility camouflages the impact of rural minority standing on health, causing it to be overlooked and understudied.

Large, ongoing gaps in our knowledge unify rural minority research, with rural Native Americans being a prime example of these gaps. The Indigenous are a group already poorly-understood, with the rural Indigenous only doubly so. Small samples and inconsistencies in research methods, such as how tribes and ethnic groups are merged, make the Indigenous difficult to research and contribute to the lack of literature surrounding them [33]. Baldwin et al. report that, even for a basic measure such as mortality rate, “few studies have reported [American Indian/Alaska Native] mortality nationally and stratified by residence location.” [58] Other minorities suffer the same invisibility. For the disabled community, little is known about disability prevalence and types of disability by urbanization level [36]. For rural elders, demographic-specific issues such as elder mistreatment are known

to be understudied, and such issues affect rural elders even more due to geographic obstacles in knowledge and intervention efforts [49]. As for veterans, there is little information on current suicide rates, let alone historical trends, who make up great proportions of rural areas [45]. Multiple-minority demographics are doubly affected by these gaps and remain chronically understudied.

Knowledge gaps are particularly wide in rural minority mental health. This is deeply concerning for a number of reasons. As both rural and minority populations experience separate shortages in mental health services, a poor understanding of these overlaps is deeply detrimental [15]. Jensen et al. argue that rural areas require stronger interventions to overcome mental health deficits, as the combination of a distinct culture and strong, established barriers to behavioral health care damage accessibility and quality [59]. They echo King et al. who, in reference to rural Native Americans, argue that further research into social determinants of health will form better interventions [31]. Across demographics and healthcare specialties, research agrees that a broad lack of research makes effective solutions difficult to form.

More broadly, research into rural healthcare itself is lacking. Many studies are limited to phone surveys or analyses of aggregated hospital data, a shaky choice of data collection considering the rapid closures of rural hospitals [60] and rural dependence on small clinics and private practices. General consensus holds that rural health is poorer than that in urban areas, but large-scale studies in specific health indicators are scarce. For example, even as the US has defined increasing life expectancy as a key goal [61], few studies analyze rural-urban life expectancy disparities and factors affecting lifespan. Literature examining the plight of rural specialty care is also diffuse. Cyr et al. find an "...insufficient understanding of differences in facilitators and barriers between U.S. urban versus rural specialty care. While conceptual frameworks exist to guide these efforts... none specifically focus on US urban versus rural specialty care." [62] A lack of research leaves the details of rural health unexplored.

The depth and persistence of these knowledge gaps may render interventions in rural minority health ineffective. For example, Apostolopoulos et al. identify several common yet low-leverage interventions (e.g., self-management education) often employed in rural communities that generate underwhelming results [22]. Our thready understanding of rural areas, frequently informed by stereotypes and assumptions, obscures more effective solutions. Thus, the health of the rural underserved stagnates and declines.

Previous literature unanimously agrees that rural communities and their substituent minority groups are distinct from both urban populations and each other. Each demographic has particular needs, values, and problems influenced by unique contextual and cultural factors; however, research has not fully studied the effect of intersecting minority statuses. Such research gaps preclude a complete understanding of the unique context of minorities, impeding the implementation of solutions to uplift individual demographics and rural communities as a whole. A richer understanding of the rural minority experience -- their unique, defining factors, their prevalence, and their historical context -- will illuminate effective solutions and additional factors to bridge the gap between them and their urban counterparts. Targeted research into rural minorities is a direct pathway to this deeper understanding. As shown in literature, there are several unanswered questions about the specific challenges rural minorities face, occluding effective solu-

tions. There is a wealth of information still to be gained about these highly complex, incredibly interesting groups. Greater research efforts will increase public awareness and direct effective interventions, creating decisive changes to overcome these ongoing challenges.

FIGURES

Metric	Black %	Hispanic %	Native American %	White %
Health status: fair or poor	28.8*	28.4*	28.9*	18.5
Frequent physical distress	15.9*	13.9	19.6*	13.3
Frequent mental distress	13.9*	11.2	17.1*	12.5
Could not see a doctor in the post 12 months due to cost	24.5*	23.1*	19.1*	15.0
Have at least one personal doctor/provider	73.2*	61.5*	63.7*	78.6

Table 1. Health Metrics of Rural Demographics, Reporting Period 2012 - 2017
Selected data concerning healthcare access and health of rural demographics. * indicates significant difference from non-Hispanic white. Adapted from James et al.

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REFERENCES

[1]. G. Singh, M. Siahpush, Widening rural–urban disparities in life expectancy, U.S., 1969–2009. Am. J. of Preventive Medicine 46.2, E19-E29 (2014).

[2]. J. Saint Onge, S. Smith., Demographics in rural populations. Surg. Clin. North Am. 100.5, 823-833 (2020).

[3]. K. Matthews et al., Health-related behaviors by urban-rural county classification — United States, 2013. MMWR Surveill. Summ. 66.5, 1-8 (2017).

[4]. J. Schiller, J. Lucas, J. Peregoy, Summary health statistics for U.S. adults: National Health Interview Survey, 2011. Vital Health Stat. 10.256, 1-218 (2011).

[5]. J. Dixon, “The effect of obesity on health outcomes.” Mol. Cell. Endocrinol. 316.2, 104-108 (2010).

[6]. America’s Health Insurance Plans, “Serving Rural America: How Health Insurance Providers Break Down Barriers to Ensure Access to Care.” (AHIP Reports, 2019).

[7]. A. Wallace, W. Weeks, S. Wang, A. Lee, L. Kazis, Rural and urban disparities in health-related quality of life among veterans with psychiatric disorders. Psych. Serv. 57.6, 851-856 (2006).

[8]. S. Woolf, H. Schoomaker, Life expectancy and mortality rates in the United States, 1959-2017.” JAMA 322.20, 1996-2016 (2019).

[9]. National Institute of Health, “NIH health disparities strategic plan and budget: Fiscal years 2009-2013.” (National Institute of Health, 2009). Available from https://www.nimhd.nih.gov/docs/2009-2013nih_health_disparities_strategic_plan_and_budget.pdf.

[10]. L. Hart, E. Larson, D. Lishner. Rural definitions for health policy and research. Am. J. Public Health 95.7, 1149-1155 (2005).

[11]. T. Thomas, R. DiClemente, S. Snell, Overcoming the triad of rural health disparities: How local culture, lack of economic opportunity, and geographic location instigate health disparities. Health Ed. J. 73.3, 285-294 (2013).

[12]. R. Rosenblatt, F. Chen, D. Lishner, M. Doescher, “The future of family medicine and implications for rural primary care physician supply.” Final report #125. (WWAMI Rural Health Research Center, 2010).

[13]. S. Letvak, The importance of social support for rural mental health. Issues Ment. Health Nurs. 23.3, 249-261 (2002).

[14]. K. Gonzalez, M. Shaughnessy, E. Kabigting, D. West, J. Robinson, Q. Chen, P. Fahs, A systematic review of the health of vulnerable populations within U.S. rural societies. Online J. Rural Nurs. Health Care 18.1, 112-147 (2018).

[15]. D. Morales, C. Barksdale, A. Beckel-Mitchener, A call to action to address rural mental health disparities. J. of Clin. Transl. Sci. 4.5, 1-20 (2020).

[16]. M. Meit et al., “The 2014 update of the rural-urban chartbook.” (Rural Health Reform Policy Research Center, 2014).

[17]. D. Siconolfi et al., Rural-urban disparities in access to home- and community-based services and supports: stakeholder perspectives from 14 states. J. Am. Med. Dir. Assoc. 20.4, 503-508 (2019).

[18]. D. Lichter, Immigration and the new racial diversity in rural America. Rural Sociol. 77.1, 3-35 (2012).

[19]. K. Kozhimannil, C. Henning-Smith, Racism and health in rural America. J. Health Care Poor Underserved 29.1, 35-43 (2018).

[20]. C. James, R. Moonesinghe, S. Wilson-Frederick, J. Hall, A. Penman-Aguilar, K. Bouye, Racial/ethnic health disparities among rural adults — United States, 2012–2015. Surveillance Summaries 66.23, 1-8 (2017).

[21]. Rural and Underserved Communities Health Task Force, “Left out: barriers to health equity for rural and underserved communities.” (U.S. House of Representatives Committee on Ways and Means, 2020).

[22]. Y. Apostolopoulos, M. Lemke, N. Hosseinichimeh, I. Harvey, K. Lich, J. Brown, Embracing causal complexity in health disparities: metabolic syndemics and structural prevention in rural minority communities. Prev. Sci. 19.8, 1019–1029 (2018).

[23]. T. Farrigan, T. Parker, The concentration of poverty is a growing rural problem. Amber Waves 4 (2012).

[24]. Web-Based Injury Statistics Query and Reporting System, Fatal injury reports. Centers for Disease Control and Prevention. Available at https://www.cdc.gov/injury/wisqars/fatal.html. Accessed 11/14/2021.

[25]. R. Thornton, C. Glover, C. Cené, D. Glik, J. Henderson, D. Williams, Evaluating strategies for reducing health disparities by addressing the social determinants of health. Health Aff. 35.8, 1416–1423 (2015).

[26]. S. Ogunwole, “We the people: American Indians and Alaska Natives in the United States.” (U.S. Census, 2006).

[27]. J. Waldram, A. Herring, T. Young, Aboriginal Health in Canada (University of Toronto Press, 2006).

[28]. D. Ely, A. Driscoll, Infant mortality in the United States, 2018: Data from the period linked birth/infant death file. National Vital Statistics Reports 69.7, 1-17 (2020).

[29]. D. Warne, L. Frizzell, American Indian health policy: Historical trends and contemporary issues. Am. J. Public Health 104.3, S263–S267 (2014).

[30]. M. Findling, R. Blendon, J. Benson, C. Miller, The unseen picture: issues with health care, discrimination, police and safety, and housing experienced by Native American populations in rural America. J. Rural Health 36, (2020).

[31]. M. King, A. Smith, M. Gracey, Indigenous health part 2: The underlying causes of the health gap. Lancet 374.9683, 76-85 (2009).

[32]. Council on Graduate Medical Education, “Physician distribution and health care challenges in rural and inner-city areas.” (Department of Health and Human Services, 1998).

[33]. L. Trout, C. Kramer, L. Fischer, Social medicine in practice: realizing the American Indian and Alaska Native right to health. Health Hum. 20.2, 19-30 (2018).

[34]. M. Cahn, S. Harvey, M. Town, American Indian and Alaska Native men's use of sexual health services, 2006-2010. Perspectives on Sexual and Reproductive Health 49.3, 181-189 (2017).

[35]. D. Nguyen, K. Ho, J. Williams, Social determinants and health service use among racial and ethnic minorities: findings from a community sample. Soc. Work Health Care 50.5, 390-405 (2011).

[36]. G. Zhao, C. Okoro, J. Hsia, W. Garvin, M. Town, Prevalence of disability and disability types by urban–rural county classification—U.S., 2016. Am. J. Prev. Med. 57.6. 749-756 (2019).

[37]. A. London, C. Heflin, J. Wilmoth, Work-related disability, veteran status, and poverty: implications for family well-being. J. Poverty 15.3, 330-349 (2011).

[38]. J. Kennedy, E. Wood, L. Frieden, Disparities in insurance coverage, health services use, and access following implementation of the affordable care act: a comparison of disabled and nondisabled working-age adults.” Inq. 54, 1-10 (2017).

[39]. E. Lopez, T. Neuman, L. Levitt, G. Jacobson, How much more than medicare do private insurers pay? A review of the literature. (KFF, 2012). Available at https://www.kff.org/medicare/issue-brief/how-much-more-than-medicare-do-private-insurers-pay-a-review-of-the-literature/.

[40]. C. Griffin Jr., M. Stein, Self-perception of

disability and prospects for employment among U.S. veterans. Work 50.1, 49-58 (2014).

[41]. Veterans Affairs Office of Rural Health, Rural veteran healthcare challenges. (Veterans Affairs, 2012). Available at https://www.ruralhealth.va.gov/aboutus/ruralvets.asp

[42]. A. Wallace, R. Lee, T. MacKenzie, A. West, S. Wright, B. Booth, K. Hawthorne, W. Weeks, A longitudinal analysis of rural and urban veterans' health-related quality of life. J. Rural Health 26.2, 153-163 (2010).

[43]. R. Tessler, R. Rosenheck, G. Gamache, Declining access to alcohol and drug abuse services among veterans in the general population. Military Medicine 170, 234-238 (2005). U.S. Census Bureau, 2020 Census ACS 1-year data. (U.S. Census Bureau, 2020).

[44]. K. Seal, D. Bertenthal, C. Miner, S. Sen, C. Marmar, Bringing the war back home: Mental health disorders among 103,788 US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. Arch. Intern. Med. 167.5, 476-482 (2007).

[45]. J. McCarten, C. Hoffmire, R. Bossarte, Changes in overall and firearm veteran suicide rates by gender, 2001–2010. Am. J. Prev. Med. 48.3, 360–364 (2015).

[46]. A. Skoufalos, J. Clarke, E. Ellis, V. Shepard, E. Rula, Rural aging in America: proceedings of the 2017 connectivity summit. Popul. Health Manag. 20.S2, S1-S10 (2018).

[47]. Institute of Medicine. Retooling for an aging America: building the health care workforce (National Academies Press, 2008).

[48]. C. Dyer, C. Murdock, J. Hiner, J. Halphen, J. Burnett, Elder mistreatment intervention: strategies for connecting with diverse and rural populations. Generations 44.1, 91-97 (2020).

[49]. A. Hintenach, O. Raphael, W. Hung, Training programs on geriatrics in rural areas: a review. Curr. Geriatr. Rep. 8.2, 117-122 (2019).

[50]. A. Golden, M. Silverman, M. Mintzer, Is geriatric medicine terminally ill? Ann. Intern. Med. 156, 654–656 (2012).

[51]. National Resident Matching Program, "Results and data: Specialties Matching Service, 2015 appointment year." (National Resident Matching Program, 2015). Available from http://www.nrmp.org/wp-content/uploads/2015/02/Results-and-Data-SMS-2015.pdf.

[52]. M. Kaplan, N. Huguet, B. McFarland, J. Mandle, Factors associated with suicide by firearm among U.S. older adult men. Psychol. Men Masc. 13.1, 65-74 (2012).

[53]. R. Hudson, Lack of social connectedness and its consequences. Public Policy & Aging Report 27.4, 121–123 (2017).

[54]. A. Coburn, E. Bolda, Rural elders and long-term care. West. J. Med. 174.3, 209-213 (2001).

[55]. B. Collins, T. Borders, K. Tebrink, K. Xu, Utilization of prescription medications and ancillary pharmacy services among rural elders in west Texas: distance barriers and implications for telepharmacy. Journal of Health and Human Services Administration 30.1, 75-97 (2007).

[56]. Department of Veterans Affairs, "FY2020

Funding and FY2021 Advance Appropriations, Volume II Medical Programs and Information Technology Programs." (Department of Veterans Affairs, 2019).

[57]. A. Scharlach, E. Fuller-Thomson, B. Kramer, "Curriculum model on aging and ethnicity." (University of California Berkeley School of Social Welfare, 2002).

[58]. L. Baldwin, D. Grossman, S. Casey, W. Hollow, J. Sugarman, W. Freeman, L. Hart, Perinatal and infant health among rural and urban American Indians/Alaska Natives. Am. J. Public Health 92.9, 1491–1497 (2002).

[59]. E. Jensen, E. Wieling, T. Mendenhall, A phenomenological study of clinicians' perspectives on barriers to rural mental health care. J. Rural Ment. Health 44.1, 51-61 (2020).

[60]. B. Kaufman, S. Thomas, R. Randolph, J. Perry, K. Thompson, G. Holmes, G. Pink, The rising rate of rural hospital closures. The Journal of Rural Health 32.1, 35-43 (2016).

[61]. Healthy People 2020. Healthy People 2020. (Office of Disease Prevention and Health Promotion, 2014). Available at https://www.healthypeople.gov/2020.

[62]. M. Cyr, A. Etchin, B. Guthrie et al., Access to specialty healthcare in urban versus rural US populations: a systematic literature review. BMC Health Serv Res 19, 974 (2019).

[63]. V. Blue Bird Jernigan, E. J. D'Amico, B. Duran, D. Buchwald, Multilevel and Community-Level Interventions with Native Americans: Challenges and Opportunities. Prevention Science 21, 65–73 (2018).