



Published in final edited form as:

*Curr Pain Headache Rep.* ; 23(2): 9. doi:10.1007/s11916-019-0749-1.

## Unique Considerations for Special Populations in Episodic Migraine: the Underserved

Umer Najib<sup>1</sup>, Melissa Moore<sup>1</sup>, and David Watson<sup>1</sup>

<sup>1</sup>Department of Neurology, West Virginia University, Medical Center Drive, Suite 1310 HSS, Morgantown, WV 26506, USA

### Abstract

**Purpose of Review**—People with migraine disease face many challenges, and these challenges can be magnified when someone is part of an “underserved” population. We set out to examine various categories of “underserved” populations, consider the unique challenges faced by these groups, and discuss mechanisms to mitigate these challenges as much as possible.

**Recent Findings**—Very little research has been performed to specifically evaluate underserved populations related to people with migraine disease. Recent research has shown the overall limitations of limited numbers of physicians with specialty training in headache disorders, and the socioeconomic implications of migraine disease have long been reported.

**Summary**—Even the definition of “underserved” is not completely clear. We undertook to define this concept in the setting of migraine disease, breaking into different categories, including financial, geographic, and cultural/racial. Each underserved population has both shared and unique challenges, and in reality, given the paucity of medical expertise throughout the United States, one could make the argument that nearly all people with migraine disease are at risk for being underserved. In the future, epidemiologic as well as therapeutic research should incorporate analyses of these and any other underserved population to improve the application of study results across broad and varied populations whose commonality, in many cases, ends with sharing the same disease.

### Keywords

Migraine; Underserved; Barriers; Burden; Episodic migraine

### Introduction

Migraine, a neurobiologic disorder which often manifests itself through recurrent episodes of severe headache, environmental sensitivity, gastrointestinal distress, and physical disability, affects nearly 40 million people in the USA, with an estimated prevalence of 12–

---

David Watson [dwatson@hsc.wvu.edu](mailto:dwatson@hsc.wvu.edu).

**Conflict of Interest** Umer Najib, David Watson, and Melissa Moore declare that they have no conflict of interest.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

13% in adults and 6% in adolescents [1]. In young children, both genders are affected similarly, but postpubertal females are affected far more often than males, at a ratio of 3:1. The disabling nature of migraine has been recognized by the World Health Organization, which considers it one of the most disabling diseases worldwide [2]. It is the combination of immense prevalence and significant disability that demands a look into the underserved population affected by migraine, including the nature in which one is underserved, the effects of being underserved, and hopefully, the solutions.

In order to address the topic of the underserved population with episodic migraine (EM), it is necessary to attempt to define what it means to be underserved. According to the Health Resources and Services Administration (an agency of the United States Department of Health and Human Services), the medically underserved is divided into Areas and Populations. Medically Underserved Areas are defined as having a shortage of primary care health services within a geographic region such as a county, group of counties, group of urban census tracts, or group of county or civil divisions. Medically Underserved Populations are people groups which “may face economic, cultural, or linguistic barriers to health care,” and includes examples such as the homeless, Native American, or low-income groups [3].

While this more official federal designation is not entirely relevant when discussing people with episodic migraine, it does point to important financial and cultural barriers to care which do affect the EM population. However, the nature of being underserved in the EM population has a much broader scope, which we will attempt to develop more fully in the ensuing paragraphs.

Lack of access to medical expertise and quality care are the overriding challenges that create an underserved population. In EM, this can then be reasonably applied to almost everyone with the disease. In 2014, Mauser and Rosen found that, as of 2012, there were only 416 physicians who held a Headache Medicine certification from the United Council for Neurologic Subspecialties (UCNS). In addition, there were six states which had zero UCNS certified physicians, eight states with one, and five states with two [4•]. As of April 2018, the number of certified physicians has risen to 484 [5]. This means that there are roughly 80,000 people with migraine for every UCNS Headache Medicine certified physician. While we recognize that medical expertise and quality care are not limited to these 484 individuals, even a doubling or tripling of the number of physicians with expertise would not remediate the problem. Traditionally, neurologists have been considered the medical specialists responsible for providing care for people with migraine (other specialties, such as Internal Medicine, Family Medicine, and Pediatrics are represented as well, but to a lesser degree). According to the American Academy of Neurology, there were just over 16,000 neurologists in the USA in 2013, equaling to more than 2400 people with migraine per neurologist [6]. Clearly, simply by sheer volume, people with EM are underserved.

## Economic Burden of Migraine: Especially the Uninsured and Underinsured Population

Migraine has a high economic burden in terms of both direct and indirect healthcare costs. The annual direct and indirect cost associated with migraine was estimated to be \$36 billion in 2016 [7].

The direct costs associated with migraine include costs of the treatment of migraine (medication cost, primary care visits, diagnostic testing, neurologist visits, emergency department visits, and hospitalizations) and the treatment of associated comorbid conditions (such as mood disorders). A recent study by Bonafede and colleagues showed that in commercially insured adults in the USA, individuals with migraine have substantially higher total annual healthcare costs (direct and indirect combined) compared with demographically matched individuals without migraine. The data from this study showed \$8924 higher combined cost in individuals with migraine compared to individuals without migraine [8].

The indirect costs on the other hand are generally estimated by reduced productivity (hours or days) which is then monetized using wage rates. Employer specific indirect costs have been estimated by some studies by using workplace data on days missed from work, short-term disability, and long-term disability [9]. Both US and European data shows that indirect costs greatly exceed direct costs associated with migraine, with one European study showing up to 93% of total annual cost attributed to indirect costs [10]. In addition to hours/days missed from work, there is indirect economic burden associated with working while ill (presenteeism) [11]. In a study looking at the economic burden of ten health conditions affecting US employers, proportion of presenteeism related costs was highest in migraine compared with all other conditions studied (89% of the total cost compared with 61% across all the conditions) [12].

The economic impact of migraine is compounded in low-income states, which are generally medically underserved as well. Data from 2015 National Health Interview Survey (NHIS) showed that the prevalence of migraine was highest in the population with an annual family income less than \$35,000 (19.9%) [13]. Furthermore, the NHIS data showed that in people under the age of 65 the prevalence was highest in the group insured by Medicaid (26%), with uninsured having a higher prevalence (17.1%) as well compared with people with private insurance (15.1%). In people over the age of 65, the prevalence was highest in the group with Medicare and Medicaid (16.4%). In the USA, low socioeconomic status is also associated with higher emergency department (ED) visits for the treatment of headache disorders [14], which not only results in higher direct treatment costs but also in inadequate therapy. Wilper and colleagues analyzed data (1997–2007) from National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey and showed that those who are uninsured and those with Medicaid receive substandard therapy for migraine. They hypothesized that this was at least in part because these patients received more care in the ED and less care in the physicians' offices [15]. Furthermore, requirements for step therapy by noncommercial insurers pose another barrier to care that affects people with migraine. Such interference in medical decision making can sometimes result in

incomplete disease control and puts EM patients at risk of transformation into chronic migraine.

Therefore, not only does episodic migraine increase an individual's overall direct and indirect healthcare cost, but also those who are economically underserved to begin with are more severely affected due to the reasons outlined above.

## Geographically Underserved

Commonly overlooked populations with episodic migraine are those who live in rural settings. In WV, where we practice, as in much of the nonurban parts of the USA, our patients commonly face not only many of the previously described barriers to care but also a geographic barrier. The regions most affected by the paucity of headache specialists are largely more rural areas as well, including the Southern and Western regions as defined by Mauser and Rosen [4•].

A review of all patients seen in the WVU Medicine Headache Center over a one-month time period revealed that the average distance traveled was 70.1 miles, one way. 72.9% of these patients traveled over 25 miles, 53.6% over 50 miles, and 27.5% over 100 miles, with the longest distance traveled 235 miles, one way, with an estimated travel time of 4 h and 15 min according to an online map website. Of note, none of these patients are “VIPs” who are flying in from other regions by choice. Only 17.4% actually reside in the same town as the Headache Center, and approximately one third of these patients rely on Medicaid for insurance coverage. These geographic issues create barriers to care in multiple ways. People with migraine often have difficulty with long distance driving due to motion, light, and smell sensitivity. The time commitment of the travel plus the visit can often lead to the loss of an entire day. Additionally, many of these patients are poor and cannot afford to spend the money required in fuel costs. These challenges are certainly not unique to WV, but rather affect almost any patient not living in an urban center within close proximity to specialty headache care or with reliable public transportation.

## Cultural, Racial and Language Barriers

Available data from national survey studies have shown some discrepancies in prevalence and treatment of migraine in different racial groups [16•]. These variations in estimates among different studies are likely secondary to the differences in their methods of data collection. National Health Interview Survey 2005 to 2012 data shows that the average prevalence of severe headache or migraine is the highest in Native Americans (17.7%), followed by Whites (15.5%), Hispanics (14.5%), Blacks (14.45%), and finally Asians (9.2%). These results show the highest prevalence in Native Americans which is one of the most underserved segments of the US population. Furthermore, there are differences in treatment patterns among the US racial and ethnic minorities. For instance, Hispanics and African Americans with migraine have a disproportionately lower number of outpatient medical visits than Whites [16•]. This suggests that some underserved populations with migraine are less likely to seek care or less likely to receive the same quality of care compared with some groups.

Language barriers have not been well studied in migraine patients; however, the importance of effective communication between patients and healthcare providers remains vital especially in underserved populations. A recent study looking at non-English preferring stroke patients showed that patients who received professional medical interpreters received better quality of acute stroke care compared with patients who did not receive interpreter services [17]. Some of the potential reasons for not using such resources include a perceived lack of available interpreters, preference to communicate through ad hoc interpretation by patients' family member, or time constraints during outpatient visits [18, 19].

It is only reasonable to postulate that using professional medical interpreters will likely improve migraine diagnosis and management as well in non-English preferring patients.

## Suggestions to Mitigate these Challenges

As we have stated, virtually every person with migraine can be considered underserved. Many, however, were underserved in even greater ways, as we have described. Additionally, there are likely numerous other special populations for whom an argument could be made that it is underserved. As we consider the unique challenges faced by our underserved patients, we offer the following suggestions for how we might mitigate these challenges:

### Uninsured/Underinsured

1. While we have at our disposal a broad array of treatment options, including pharmaceutical, psychological, behavioral, and interventional (i.e., neuromodulation), it is important to remember that many of these options have significant costs and often are not covered by insurers or affordable to our patients. As the field advances, do not forget to consider older, generic, or more affordable options. For example, using estimated costs obtained from [GoodRx.com](https://www.goodrx.com), the cash price for nine 12.5 mg doses of almotriptan is \$303, whereas nine 10 mg doses of rizatriptan is \$45. On the preventative side, due to a paucity of newly developed medications (calcitonin gene-related peptide antibodies notwithstanding), the differences among pharmaceutical options are much smaller, but can still range from \$70 per month for divalproex sodium 250 mg twice per day to \$4 per month for metoprolol 100 mg twice per day or amitriptyline 50 mg daily.
2. Advise patients to use online coupon options, such as those found at [GoodRx.com](https://www.goodrx.com). According to the GoodRx website, six 40-mg doses of eletriptan can be purchased with cash for \$257, but the available online coupon can bring this down to \$75.
3. Advise patients to call multiple pharmacies, as individual drug prices can vary greatly from pharmacy to pharmacy related to complicated contractual agreements between pharmacies, manufacturers, and insurers.
4. Be clear with patients that not all migraine treatments come in a bottle. Behavioral modification, such as dietary changes, sleep hygiene, and exercise,

are free. Cognitive behavioral therapy may be a covered benefit for those with insurance.

### Geographically Underserved

1. Allow patients traveling greater distances to be scheduled nearer the middle of the day to avoid the need for an overnight stay, an extremely early waking time (potentially triggering), or the need to travel late into the evening going home.
2. Work with patients who need to see multiple physicians/providers to coordinate these visits into one trip. This is often challenging, as nearly every physician in every specialty has a busy schedule, but often saving even just one trip can be very helpful. This can reduce driving time, fuel expenses and work loss, as well as other benefits.
3. Headache medicine is a field, which lends itself well to the option of telemedicine. While some places have already started doing this, there remain significant logistical barriers, including reimbursement, safety concerns, and legal ramifications. Additionally, in WV, there remain significant portions of the population who do not have access to high-speed Internet. Despite these limitations, telemedicine for patients with episodic migraine remains an interesting option.
4. Consider efforts to educate the primary care providers in the areas most affected. Improving the ability of local providers to care for patients with episodic migraine, including the avoidance of opioids, the relative safety of triptans, and the art of using preventive medications can be impactful in limiting the need of patients to travel for expert headache care, or at least provide an improved framework for comanaging patients, thus limiting the frequency of their need to travel for headache care.

### Cultural, Racial, and Language Barriers

1. Patient education is important in countering any cultural beliefs that create barriers in diagnosis and treatment adherence. Primary care providers should be encouraged to use specialist referrals in cases where cultural barriers appear to interfere with patients' management.
2. Recognize the importance of effective communication and have a low threshold of using professional medical interpreters. This can not only help in the correct diagnosis but also help understand patients' needs and perspectives.

### References

Papers of particular interest, published recently, have been highlighted as:

- Of importance

1. Bigal ME, Lipton RB, Winner P, Reed ML, Diamond S, Stewart WF. Migraine in adolescents – association with socioeconomic status and family history. *Neurology*. 2007;69:16–25. [PubMed: 17606878]

2. Headache disorders. <http://www.who.int/news-room/fact-sheets/detail/headache-disorders>. Accessed 20 June 2018.
3. Medically Underserved Areas and Populations (MUA/Ps). <https://bhwh.hrsa.gov/shortage-designation/muap>. Accessed 20 June 2018.
4. Mauser ED, Rosen NL. So many migraines, so few subspecialists: analysis of the geographic location of United Council for Neurologic Subspecialties (UCNS) certified headache subspecialists compared to United States headache demographics. *Headache*. 2014;54:1347–57 [PubMed: 24942840] An excellent evaluation of the distribution of headache medicine certified specialists and the overall inadequacy in number.
5. UCNS Diplomates Certified in Headache Medicine. <http://www.ucns.org/globals/axon/assets/12644.pdf>. Accessed 20 June 2018.
6. AAN Press release. The doctor won't see you now? Study: US facing a neurologist shortage. <https://www.aan.com/PressRoom/Home/PressRelease/1178>. Accessed 20 June 2018.
7. Migraine Research Foundation. Migraine fact sheet. New York: MRF; 2016.
8. Bonafede M, Sapra S, Shah N, Tepper S, Cappell K, Desai P. Direct and indirect healthcare resource utilization and costs among migraine patients in the United States. *Headache*. 2018;58(5):700–14. [PubMed: 29446063]
9. Hawkins K, Wang S, Rupnow MF. Indirect cost burden of migraine in the United States. *J Occup Environ Med*. 2007;49:368–74. [PubMed: 17426520]
10. Bloudek LM, Stokes M, Buse DC, Wilcox TK, Lipton RB, Goadsby PJ, et al. Cost of healthcare for patients with migraine in five European countries: results from the International Burden of Migraine Study (IBMS). *J Headache Pain*. 2012;13:361–78. [PubMed: 22644214]
11. Schultz AB, Chen CY, Edington DW. The cost and impact of health conditions on presenteeism to employers: a review of the literature. *PharmacoEconomics*. 2009;27:365–78. [PubMed: 19586075]
12. Goetzel RZ, Long SR, Ozminkowski RJ, Hawkins K, Wang S, Lynch W. Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. employers. *J Occup Environ Med*. 2004;46(4):398–412. [PubMed: 15076658]
13. Burch R, Rizzoli P, Loder E. The prevalence and impact of migraine and severe headache in the United States: figures and trends from government health studies. *Headache*. 2018;58(4):496–505. [PubMed: 29527677]
14. Friedman BW, Serrano D, Reed M, Diamond M, Lipton RB. Use of the emergency department for severe headache. A population-based study. *Headache*. 2009;49:21–30. [PubMed: 19040677]
15. Wilper A, Woolhandler S, Himmelstein D, Nardin R. Impact of insurance status on migraine care in the United States: a population-based study. *Neurology*. 2010;74:1178–83. [PubMed: 20385889]
16. Loder S, Sheikh HU, Loder E. The prevalence, burden, and treatment of severe, frequent, and migraine headaches in US minority populations: statistics from national survey studies. *Headache*. 2015;55:214–28 [PubMed: 25644596] A good evaluation of migraine disease prevalence in minorities in the US.
17. Luan Erfe BM, Siddiqui KA, Schwamm LH, Kirwan C, Nunes A, Mejia NI. Professional medical interpreters influence the quality of acute ischemic stroke care for patients who speak languages other than English. *J Am Heart Assoc*. 2017;6(9):e006175. [PubMed: 28935679]
18. Tschurtz BA, Koss RG, Kupka NJ, Williams SC. Language services in hospitals: discordance in availability and staff use. *J Healthc Manag*. 2011;56:403–17. [PubMed: 22201202]
19. Hsieh E. Not just “getting by”: factors influencing providers’ choice of interpreters. *J Gen Intern Med*. 2015;30:75–82. [PubMed: 25338731]