THE BORDERLESS HEALTHCARE REVOLUTION

THE DEFINITIVE GUIDE TO **BREAKING GEOGRAPHIC BARRIERS** THROUGH TECHNOLOGY

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CHAPTER

1

The Geography Problem

From the Front Lines

The summer heat in Texas hits you like a wall when you step outside. On this particular August morning in 2012, I was making my way up the cracked concrete path to Maria's mobile home, my medical bag feeling heavier with each step. The window-mounted air conditioning unit hummed desperately against the rising temperature. This was my third attempt to see Maria; we had previously been unable to find her trailer after two attempts to work through an interpreter, poor phone connections, and constantly changing locations of residence. So here I was, bringing the clinic to her. Maria's story would become one of countless examples I'd encounter of how geography shapes health in ways both obvious and subtle. But let me back up a bit. Let me tell you how I found myself making house calls in the Texas heat, and what it taught me about the deep divide in American healthcare.

When I first moved to Austin, TX, I was amazed at the availability of jalapeños. You could literally get them at any restaurant. What's better than jalapeños? Well, tacos for breakfast, lunch, and dinner of course! The city was bustling with music, people, and cutting-edge tech. It was a far cry from Upstate NY where I grew up. At the same time the stark contrast within the city nearly gave me whiplash. By night, I navigated the sleek corridors of the UT McCombs MBA program, surrounded by future tech executives

and management consultants. People of privilege, who were funding advanced degrees, with many of us already managing teams at big firms around town.

But by day, I wound through neighborhoods where the American Dream felt more like a distant mirage, and where few who did not live there would venture. I was providing medical care to patients who couldn't leave their homes. Patients who nobody wanted to see in their offices, because they were so complex, and whose situations were seemingly unfixable. The city's famous breakfast tacos and vibrant music scene had drawn me here, but it was these house calls that would reshape my understanding of American healthcare. Each doorway I stepped through told a different story of how geography, whether measured in miles or mere city blocks, could become an insurmountable barrier to care.

Fact Check:

1. **In 2022, 7.8% of U.S. counties did not have a primary care physician. The national ratio of primary care physicians was 83.8 per 100,000 population[1].**
2. **Over the course of the last 10 years, more than 120 rural hospitals have ceased operations, further limiting access to care for populations which are older, less healthy and less affluent than their urban counterparts[2].**
3. **An analysis of 2021 Medicare claims showed that beneficiaries in rural areas received less specialty care than those in urban areas[3].**

[1] Bureau of Health Workforce. *State of the Primary Care Workforce Report 2024*. Health Resources and Services Administration (HRSA). Published 2024. Accessed January 17, 2025. https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/state-of-the-primary-care-workforce-report-2024.pdf

[2] Chartis Center for Rural Health. *Rural Hospital Closure Crisis Deepens: New Research from Chartis Center for Rural Health Reveals*. Chartis Group. Published 2022. Accessed January 17, 2025. https://www.chartis.com/about/news/rural-hospital-closure-crisis-deepens-new-research-chartis-center-rural-health-reveals

[3] Association of American Medical Colleges. *Rethinking Rural Health: Issue Brief*. AAMC Research Institute. Published 2023. Accessed January 17, 2025. https://www.aamcresearchinstitute.org/our-work/issue-brief/rethinking-rural-health

The Reality of Home-Based Care

So, what does 'homebound' actually mean? According to Medicare guidelines, homebound patients have conditions that make leaving home difficult without considerable effort and assistance. When I started practicing in the early-2000s, this meant I could see patients monthly; a stark contrast to the typical once or twice-yearly primary care visits many Americans experience. This increased frequency of care should have meant better outcomes, but the reality was far more complex.

According to the Centers for Medicare & Medicaid Services (CMS), a patient is considered homebound if they meet the following criteria[1]:

1. **Criterion One**:
   - The patient must either:
     - Require the aid of supportive devices such as crutches, canes, wheelchairs, or walkers; the use of special transportation; or the assistance of another person to leave their place of residence due to illness or injury; or
     - Have a condition such that leaving home is medically contraindicated.
2. **Criterion Two**:
   - There must exist a normal inability to leave home; and
   - Leaving home must require a considerable and taxing effort.

Even if the patient leaves the home, they may still be considered homebound if the absences are infrequent, of short duration, or for the purpose of receiving healthcare treatment.[4]

Stories from the field- Barrier Spotlight Physical: The cards were still scattered across Fred's small table when we arrived, evidence of the game we'd interrupted. The air in his apartment was thick with the kind of stillness that comes from windows rarely opened. "¿Cómo está?" my medical assistant Art asked, his casual Spanish immediately putting Fred at ease. None of us could have known then, how the next few hours would unfold, or that this routine visit would become a race against time.

[4] Centers for Medicare & Medicaid Services. *Medicare Benefit Policy Manual*, Chapter 7, Section 30.1.1. Accessed January 17, 2025. `https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/bp102c07.pdf`

Fred (Frederico per his chart) was a 66-year-old Spanish speaking Latino man living alone in a 65+ low-income housing apartment on the southeast side of Austin. 2 million elderly, Medicare patients were completely or mostly homebound in 2011.[5] Fred was just one of this ever-increasing population.

He told me he had 'bad feet' for over a decade and scooched along the halls of his apartment complex in a wheelchair at a steady but snails' pace. He was jovial and when we got to his apartment, he had a friend over playing cards. After his wife died almost 5 years earlier, he had turned to smoking cigars, didn't go to the doctor and had very few ties with his family. But he had a few friends on his floor in the apartment building and generally seemed to be in a good mood. His social worker had referred him to us. She had helped him get on Medicare, receive food stamps and connected him with a free community service to bring him groceries to his apartment. His home was small and cluttered, not particularly well kept, but then again, he was a bachelor doing his best on his own. These stories from Austin aren't unique to Texas or even to the United States. Across the globe, healthcare systems struggle with similar challenges of access, quality and equity, though their solutions often differ dramatically.

Sometimes I would see new patients without much history to go on, and sometimes it was going to just be a surprise. Less than one-third of primary care physicians in the U.S. report making home visits, a rate significantly lower than in other high-income countries.[6] This time all we knew was that he had 'bad feet'. So, when we arrived, we were pretty much ready for anything. My medical assistant fortunately came with me everywhere I went. His Spanish was casual but was extremely helpful when seeing patients. While he had been scolded by more than one abuela for his casual grammar, it was certainly better than my own Spanish which was literally abysmal.

We went back and forth with Fred, asking him questions about his living situation, his health history and any medical problems he might have. He was worried about his feet; they had caused him pain for years and recently they had become even more numb in spots and

[5] Ornstein KA, Leff B, Covinsky KE, et al. *Epidemiology of the Homebound Population in the United States*. JAMA Intern Med. 2015;175(7):1180–1186. Accessed January 17, 2025. `https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2296016`

[6] Tikkanen R, Abrams MK. *Finger on the Pulse: Primary Care in the U.S. and Nine Other Countries*. The Commonwealth Fund. Published March 2024. Accessed January 17, 2025. `https://www.commonwealthfund.org/publications/issue-briefs/2024/mar/finger-on-pulse-primary-care-us-nine-countries`

were 'making his socks dirty'. But he said he had no other medical issues, was not on any medications, and had not seen a doctor for many years. So, we drew some blood, and I started my exam. He had a low fever to start, his blood pressure was elevated, and his heart rate was increased. But then again having a doctor in a white coat at your house often stresses folks out a bit. As I moved through my exam things continued to be rather insignificant.

Then I asked him to remove his socks and shoes for me so I could look at his legs and feet, where he was concerned. He said he couldn't do it by himself and admitted that he had been wearing this same set of shoes and socks continuously for over a week straight. We removed the shoes, and a terrible stench filled the room. The socks were stuck onto the feet in multiple places, and after removal revealed multiple wounds, ice cold toes, and no palpable pulses. But what sealed the deal was the redness spreading up his ankle, and a crackling feeling up his leg with discoloration consistent with necrotizing fasciitis. This is 'flesh eating bacteria' for the uninitiated. This is a medical emergency. He had not seen the color and crackling feeling a week earlier when he had gotten help to change his socks. In fact, he hadn't been concerned, because he couldn't feel it. Approximately 5% of U.S. adults report forgoing healthcare due to transportation barriers, with higher percentages among Black adults (8%), individuals with low family incomes (14%), and those with public health insurance (12%).[7] Fred couldn't remember the last time he'd been to the doctor, so it was unclear how long his feet had been going downhill.

Once you have seen necrotizing fasciitis you never forget it, and this was textbook. It reminded me of cases I had seen during my surgery training, I was convinced of my diagnosis, and this was an emergency. He needed to go to the ER for a surgical consult immediately. I wanted to call 911 and get him seen right away, but he was hesitant. He couldn't pay for an ambulance. He couldn't pay for medications or copay. He had no one to care for him. His feet had been 'bad' for years and he had never had an emergent problem. Plus, we just met. How could I help this man?

Fred was one of my most memorable patients, but this is what I saw day in and day out. Much of the time I did more social work

[7] Robert Wood Johnson Foundation. *More than One in Five Adults Forgo Healthcare Because of Transportation Barriers*. Published April 2023. Accessed January 17, 2025. https://www.rwjf.org/en/insights/our-research/2023/04/more-than-one-in-five-adults-with-limited-public-transit-access-forgo-healthcare-because-of-transportation-barriers.html

than medicine and did what I could to help those I served. But it was backbreaking, emotionally draining, and often straight up saddening when I felt that I didn't have a way to help. These were normal people that were parents, sisters, brothers and grandparents. All of them were suffering in one way or another, yet they just happened to be born on the east side of Austin, no advantages, no means, and no one who was advocating for them.

Between patients that struggled with mobility and Fred's hesitation to seek emergency care, a pattern emerged that went beyond simple transportation issues. The barriers to healthcare access form an intricate web of challenges. Consistent issues that presented themselves time and time again revolved around not only transportation, but financial ability, and education. Homebound patients, by definition, cannot leave their homes easily, but I was one of very few doctors willing to see them on their own turf in their homes. These patients were seemingly 'close' to healthcare but could not actually access it and were in their own personal 'healthcare deserts'. Transportation to a doctor's office is expensive, could be difficult to arrange, and often was next near impossible to find. Fred didn't have commercial insurance and couldn't pay for copays or anything supplemental for that matter. Lastly, like many in this situation, while Fred knew he had medical issues, he did not fully understand the extent and urgency of them. Trusting healthcare providers in the past had not worked in his favor.

A comprehensive definition of healthcare access incorporates the following interconnected pillars. These are the 5 Pillars of Healthcare Access.

1. **Physical – {Pillar}:** This encompasses geographic proximity to healthcare facilities but also includes infrastructure considerations such as transportation systems and the design of medical facilities to ensure accessibility for disabled individuals.
2. **Financial – {Pillar}:** Healthcare costs often extend beyond medical bills. These include transportation expenses, lost wages, and childcare needs. Out-of-pocket costs can act as significant deterrents for seeking timely care.
3. **Cultural – {Pillar}:** The compatibility of healthcare services with a patient's language, culture, and traditions is critical. Cultural competency builds trust and ensures that patients feel respected and understood.
4. **Digital – {Pillar}:** In the digital age, access to reliable internet, devices, and digital literacy has become an essential component

Diagram 1-1: Five Pillars of Access

of healthcare. Patient portals, telehealth visits, and online education tools depend on these resources.

5. **Trust and Knowledge – {Pillar}:** Historical mistrust due to systemic inequities or past mistreatment can prevent patients from engaging with the healthcare system. Concurrently, knowledge gaps about when and how to seek care can exacerbate health disparities.

As we move throughout this text you'll continue to see where the Pillars of access are improved or addressed, as well as where Barriers persist or are made worse. Here's an example of how that will look as we move forward:

- **Physical – {Pillar}:** this indicates the physical pillar is being improved or addressed
- **Physical – {Barrier}:** this indicates the physical pillar is a barrier or is being made worse.

Observations of Underserved Communities

The map on my office wall told a story, but not the one most people could see. The colorful pins marked hospital locations across central Texas creating a deceptive impression of comprehensive coverage. What the map didn't show were the stories behind each gap between those pins: the young mother calculating if she can afford the gas to drive three hours for her child's specialist appointment, the elderly farmer who had to move in with his daughter after the local hospital closed, the shift worker who couldn't take time off for medical appointments during regular business hours.

Underserved communities are everywhere, from the most rural, the most remote, to the middle of huge urban centers. Underserved can look very different or may even seem to be very much 'served' by the outside world. When we think of rural and remote locations, we often think of places far from the US such as sub-Saharan Africa,

the northern provinces of Canada, or isolated islands. But 'remote' doesn't necessarily mean thousands of miles away. Remote can mean there is no way to get healthcare within walking distance, within an hour, or more and produces a **Physical – {Barrier}** to care.

Stories from the field- Barrier Spotlight Physical: One of my kids has a friend at his school whose father I have never met. He's an orthopedic surgeon that works in a small town over an hour away. In speaking to his family, it seems he has a four-year contract and is being compensated quite well. But he is essentially on call 24/7, is the only orthopedic surgeon in an hour radius and is the only outpatient specialist as well. When the family moved to the beautiful small town in Upstate NY where he is working, they were excited. But they soon realized that the schools were not well funded, and their kids who were rather advanced, didn't fit in, and could not be supported. Now they have an apartment in a bigger city where the mom and 3 kids live all week and send the kids to a school that can support them. They go visit their actual home and their father on the weekends, which was certainly not their plan when they first moved to the area. The father doesn't make it to school events or concerts because he's always on call, and over an hour way. This is the double-edged sword of being a rural provider, especially a specialist.

In the United States many counties lack basic services like OB/GYN and cardiology, let alone cancer treatments. In 2021, about 4.5 billion people, more than half of the global population, were not fully covered by essential health services[8]. Think about the sheer magnitude of that number. That's billions of people worldwide. As for the orthopedic in my story above, his practice was most likely much different than his peers in a larger city. In an area with many orthopedic specialists, you may have one for the hand, one for the spine, one for sports, and others for each subspecialty. However, when you're the only specialist in an area, you'll be taking care of most of those conditions. The concern here is that many local folks won't accept a referral to a specialist further away since they don't have the means or transportation to go. But from a safety and quality perspective,

[8] World Health Organization. *Billions left behind on the path to universal health coverage*. Published September 18, 2023. Accessed January 17, 2025. `https://www.who.int/news/item/18-09-2023-billions-left-behind-on-the-path-to-universal-health-coverage`

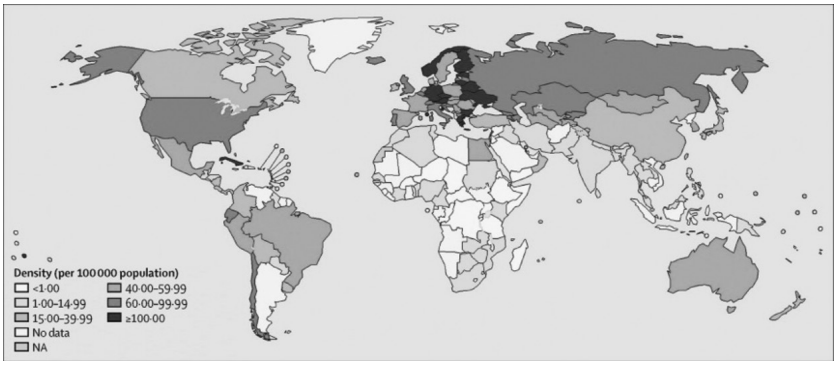

Diagram 1-2: Global distribution of surgeons, anesthesiologists and obstetricians per 100,000 population[9]. The color of the map represents the density/100,000 population

surgery is a volume practice. Does that surgeon have the volume to safely conduct various procedures with quality for their patients?

It has been shown that patients that do not have access to care have higher rates of chronic diseases like hypertension and diabetes[10]. Usually when they are finally treated, they have progressed to more advanced stages of disease creating worse outcomes and more costly care. Remember poor Fred and his gangrenous foot. If he had care and intervention much sooner, or better yet preventative care, he may have been in a better spot. Ultimately, I convinced Fred to go to the emergency room, and we called 911 for an ambulance. Working through my assistant for translation was difficult, but we were able to build a level of trust quickly. In his case he had a below knee amputation of his left leg. He recovered well, and received several new services to help him get the support and care he needed, as well as physical therapy, transportation and help in his home. Fred was in an urban environment but many of the problems remain the same. Rural populations have traditionally lacked effective and frequent preventative care and tend to have higher levels of untreated chronic conditions as well.

[9] Wurdeman, Taylor. n.d. "Map of Surgeon, Anesthesiologist, and Obstetrician Density." *Program in Global Surgery and Social Change* (blog). `https://www.pgssc.org/workforcemap`.

[10] Centers for Disease Control and Prevention. *Chronic Disease Prevalence in the US: Sociodemographic and Geographic Disparities*. Published March 2024. Accessed January 17, 2025. `https://www.cdc.gov/pcd/issues/2024/23_0267.htm?utm_source`

Fact Check: Physical – {Barrier}

- **Emergency Medical Services (EMS) Response Times in the US[11]:**
  - **Urban Areas:** Average response time is approximately 7 minutes.
  - **Rural Areas:** Median response time increases to more than 14 minutes, with nearly 10% of encounters experiencing waits of almost 30 minutes.
- **Specialist Availability per 100,000 Residents in the US[12]:**
  - **Urban Areas:** Approximately 263 specialists per 100,000 residents.
  - **Rural Areas:** Approximately 30 specialists per 100,000 residents.

Reflections on Emotional and Systemic Barriers

Story from the Field - Barrier Spotlight Physical: This past year Larry, one of the senior members of my volunteer fire department was diagnosed with a rare cancer. The specialists close-by were not equipped to treat him as well as those in a larger city. While his family was doing well and was able to drive him the almost three-hour drive to the large academic cancer center, it was beyond uncomfortable for him. One of our volunteer crews even brought Larry to an appointment via ambulance to see if it would help with his comfort. Nothing helped. Every bump on the drive, no matter how smooth the driver was at the wheel, was excruciating for him. For a man already facing the life and death situation of a cancer diagnosis, this almost put him over the edge of losing all hope and stopping treatment all together. Fortunately for Larry, a solution was found, and his care team was eventually able to get him his infusions locally. Today, he's in remission, and surrounded by friends and family, ready for if/when there is a next time. Discomfort, and the fear of discomfort almost stopped his care. He was an EMT and well versed in the hospital system, well

[11] Mell HK, Mumma SN, Hiestand B, Carr BG, Holland T, Stopyra J. Emergency Medical Services Response Times in Rural, Suburban, and Urban Areas. *JAMA Surg*. 2017;152(10):983–984. doi:10.1001/jamasurg.2017.2230

[12] Association of American Medical Colleges. Health Disparities Affect Millions in Rural U.S. Communities. Published October 31, 2017. Accessed January 17, 2025. https://www.aamc.org/news/health-disparities-affect-millions-rural-us-communities?utm_source

known in his community and well connected. But none of these things were able to help him with his issue with access.

While **Physical – {Barrier}** distance and **Financial – {Barrier}** constraints are well-known barriers to accessing healthcare, the emotional and systemic hurdles are equally significant and often overlooked. Imagine a member of an underserved population facing not just logistical challenges but also a deep-seated mistrust of the healthcare system. For many minority patients in particular, this distrust stems from historical events, such as the Tuskegee Syphilis Study, where African American men were deceived and denied proper treatment over decades, leading to a legacy of skepticism toward medical institutions[13]. This mistrust compounds psychological **Trust/Knowledge – {Barrier}**, such as fear of discrimination, stigmatization, or feeling unwelcome in healthcare settings. These barriers can deter individuals from seeking care or fully engaging with healthcare providers, even when services are accessible.

Acknowledging and addressing these psychological and historical obstacles is critical to truly improving healthcare access. These are just a few examples of how invisible barriers impact patient outcomes, and we will continue to explore them throughout this book. In Larry's case he was fortunate to have family members with reliable transportation that could drive him. Additionally, he had friends at the firehouse more than willing to drive an out-of-service ambulance at their personal expense. But this is certainly not the norm. There is a significant lack of coordinated transportation services throughout the United States, especially in rural environments. In these areas catching a bus, a train, or even grabbing a rental car or an Uber can be next near to impossible. Instead, a journey must be taken to a city center first to even catch a ride to the next place. When this means multiple hours of travel just to get to a doctor, it inevitably impacts employment and childcare.

Stories from the Field – Barrier Spotlight Physical: New mothers are experiencing pretty much the hardest job in the world. They have been building a small human, and while they need to heal their own bodies, they also need to care for a helpless infant 24/7. For those without an involved partner, being a single parent makes this 1000% more difficult. Gabby was a 22-year-old African American female seen at a colleague's mother/baby family medicine practice. She had

[13] Centers for Disease Control and Prevention. U.S. Public Health Service Syphilis Study at Tuskegee. Updated April 22, 2021. Accessed January 18, 2025. `https://www.cdc.gov/tuskegee/index.html`

called very concerned that morning about her baby's breathing. He had a bad cough and lots of 'snot'. She did not have any family members to support her and was raising the child on her own. She had a 3-year-old little boy as well, which kept her very busy. When the office got the call, they were happy to make time for them and said she could come right in. She was grateful, and said she would get there as soon as she could.

As the day went on, the staff continued to wait for her in the office, but lunchtime came and went, and she had still not arrived. As the clock hit 4pm, the bell rang on the front door, and mother, baby and big brother all finally arrived. They looked tired, the big brother was complaining about being hungry and they all looked like they had been in the cold for far too long. When the team finally got them into the room, and of course made sure a lollipop was available for her oldest, she broke down in tears. It turns out she had to walk over a mile with her children to get onto a bus, then transfer at the central bus station. Her son had to use the bathroom which caused them to miss their transfer, and they finally caught the next bus and had to walk another mile to get to the office. She was exhausted and the kids were cranky. Fortunately, after an exam, it turned out her baby was just fighting off a little cold. She was taught how to use the nose suction to help the baby breathe better and given some tips for getting him to sleep. She was relieved but was not looking forward to the long trip home.

Gabby was a stay-at-home mom, and was receiving benefits until she could get back to work. If she had been working, think of the time off she would have had to take. Travelling all the way to the office via multiple buses was not just a quick lunch hour appointment, instead she spent the whole day getting to the office. Transportation **Physical – {Barrier}s** can exist in both urban and rural environments. Transportation is considered a systemic barrier to healthcare and while it impacts urban populations, it disproportionately impacts rural populations, creating a cascade of negative consequences for health outcomes and healthcare equity. Rural residents often face significant travel distances to access care due to a shortage of local providers and facilities, with many regions entirely lacking specialists or emergency services. Public transportation options are scarce or nonexistent in these areas, leaving patients to rely on costly or unreliable means of travel, such as personal vehicles or community rideshares, if available at all. This structural challenge exacerbates existing healthcare disparities, as rural individuals are more likely to delay or forgo necessary care altogether, leading to worsening of chronic conditions, preventable complications, and emergency

interventions that could have been avoided with routine care. The inability to address transportation inequities not only undermines efforts to improve rural healthcare access but also drives up overall healthcare costs by shifting care to emergency and acute settings[14]. Systemic solutions that include investments in transportation infrastructure, mobile health services, and telehealth expansion are critical to addressing this pervasive barrier and ensuring equitable access for rural populations.

We've discussed a multitude of barriers to care that extend from our backyards to the other side of the world. But how can we truly define healthcare access in our modern world? Healthcare access has several components (See Diagram 1.1) and as you can imagine this definition continues to evolve. Think of the differences in communication means and technology just a few decades ago, compared to today. Digital 'readiness' may not have even been considered a component of this definition at that time, but today more than ever, it is becoming essential. Access to healthcare is more than simply a matter of physical proximity.

The Economics of Rural Healthcare

When examining the **Financial – {Barrier}** aspects of healthcare accessibility, the disparities are striking. Globally, rural communities consistently face a shortage of available medical care. Specialists, such as our friend the orthopedic surgeon, are particularly scarce in these areas. Those who do practice in rural settings often manage extensive workloads, encompassing a broad scope of practice, which may limit their ability to provide optimal care for each patient. So why are there so few rural healthcare services? This shortage is attributed to several factors, including the maldistribution of the healthcare workforce, **Financial – {Barrier}** constraints, and the challenges associated with recruiting and retaining healthcare professionals in rural settings[15].

Healthcare at its core is a business just like any other industry. A car dealership would not sell cars that were not profitable. A railroad would not keep running train lines where no passengers wanted to ride. Unfortunately, healthcare is in a similar situation. Rural healthcare

[14] Rural Health Information Hub. Transportation to Support Rural Healthcare. Updated May 2023. Accessed January 18, 2025. `https://www.ruralhealthinfo.org/topics/transportation`

[15] Rural Health Information Hub. Transportation to Support Rural Healthcare. Updated May 2023. Accessed January 18, 2025. `https://www.ruralhealthinfo.org/topics/transportation`

systems operate in a precarious financial ecosystem where lower patient volumes and higher operational costs often lead to deficits. In the US, rural hospitals frequently rely on Medicare and Medicaid reimbursements, which tend to be lower than those from private insurers. Moreover, rural populations often experience higher rates of chronic illness, resulting in increased demand for healthcare services that are costly to provide.

When rural hospitals close, the economic implications are severe. Between 2010 and 2021, over 136 rural hospitals shut their doors, with 19 closures in 2020 alone, the most in one year for the previous decade[16]. A typical rural hospital supports a significant portion of local employment and contributes substantially to the community's economic stability. The closure of rural hospitals isn't just a medical crisis, it's an economic one. When a rural hospital closes, the impact ripples through the entire community. Beyond the immediate loss of healthcare access, communities lose well-paying jobs, struggle to attract new businesses, and often see property values decline. Rural healthcare systems often serve as the nucleus for ancillary services, including pharmacies, home health agencies, and specialty practices. The loss of these services exacerbates healthcare deserts, forcing patients to travel farther and incur higher out-of-pocket expenses.

Policy changes and innovative models can mitigate these challenges. Expanding telehealth reimbursement policies, fostering public-private partnerships to sustain rural hospitals, and incentivizing healthcare professionals to work in underserved areas are crucial steps forward. Addressing the economics of rural healthcare requires a multifaceted approach. Investments in broadband infrastructure, workforce development, and value-based care models can create more

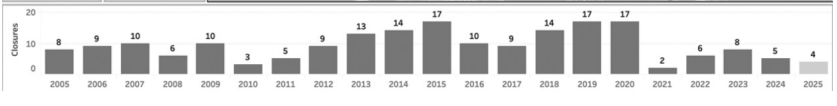

Diagram 1-3: US Rural Hospital Closures 2005-Present[17]

[16] American Hospital Association. *Rural Hospital Closures Threaten Access*. Published September 2022. Accessed January 18, 2025. http:// https://www.aha.org/system/files/media/file/2022/09/rural-hospital-closures-threaten-access-report.pdf?utm_source

[17] Cecil G. Sheps Center for Health Services Research. *Rural Hospital Closures*. University of North Carolina at Chapel Hill. Available at: https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/. Accessed January 22, 2025.

resilient systems. Furthermore, integrating advanced technologies like AI-driven diagnostics and wearable health devices can reduce the burden on overstretched healthcare workers while improving patient outcomes.

Digital Divide

The role of public libraries in bridging the digital healthcare gap deserves special attention. In many rural communities, libraries serve as de facto telehealth centers, providing both internet access and private spaces for virtual medical consultations. The American Library Association reports that 98% of public libraries provide free Wi-fi to patrons who otherwise lack access to such resources[18].

If you're reading this book, and more importantly, if you spent your own money to buy it, then you probably have internet access at your work or home. Your biggest day-to-day connectivity issue is likely focused on obtaining the highest speed possible to stream your favorite reality show while your kids do their homework simultaneously (or complain that Fortnight is lagging!). However, many people worldwide do not have internet access as readily as many of us do in the U.S. In fact, access to broadband internet, as opposed to dial-up services, is very limited in many rural areas, even those not far from large urban centers. Patients in these areas may also lack reliable cell phone coverage, access to broadband or fiber-optic internet, or may not have internet access at all. To obtain access, they might need to visit their local library or school during business hours. Globally, the numbers are even more staggering. As of 2023, approximately 2.6 billion people, or 33% of the global population, remained offline[19].

While cell phone coverage and broadband internet may not seem like a necessity for quality healthcare, let's think about the patient journey. To make an appointment how do you contact a doctor's office? To ask a medication or treatment question do you have to utilize a patient portal or other solution? If you have the benefit of being able to access telemedicine services, do you have the bandwidth

[18] American Library Association. *Quotable Facts About America's Libraries*. Published 2019. Accessed January 18, 2025. `https://www.ala.org/sites/default/files/advocacy/content/ALAquotable%20facts.2019%20web.pdf?utm_source`

[19] International Telecommunication Union. *Facts and Figures 2023 - Internet use*. Published October 10, 2023. Accessed January 18, 2025. [`https://www.itu.int/itu-d/reports/statistics/2023/10/10/ff23-internet-use/`]

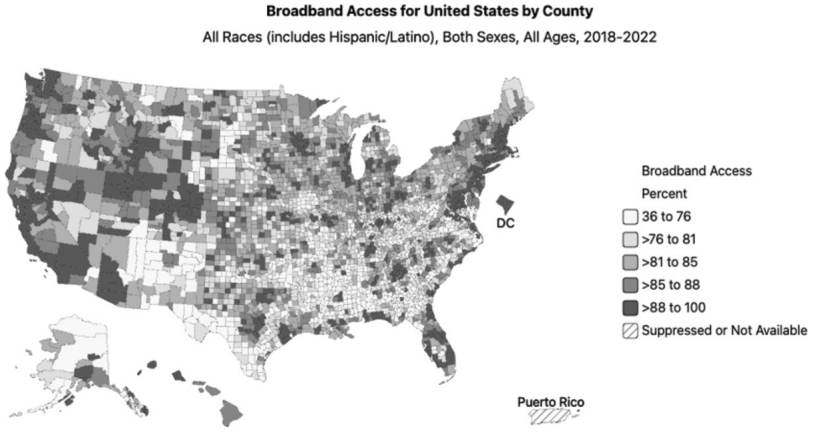

Diagram 1-4: Broadband Access for United States by County (2018-2022 all races, both sexes)[20]

to have a clear picture and conversation with your provider? Lacking these means of communication can greatly diminish the ability of a patient (this is even harder for kids) to use these services creating a **Physical – {Barrier}**. If you're utilizing public resources, having a tele-med visit in the middle of the library is certainly not an ideal situation. I have personally taken a tele-med visit (as the patient) from the floor of a conference, and I would certainly not recommend this. First, I could barely hear the provider and secondly, I didn't want everyone around me to hear about my personal health issues and history. This was a situation where I had great service and connectivity. If the picture or voice had been choppy, I can't imagine how negative an experience it would have been

Health Literacy: The Hidden Barrier to Care

Access to broadband and the ability to use it effectively are integral to health literacy. Today, most health information, public health announcements, and patient resources are provided through apps or online links, making printed educational materials increasingly obsolete. Tasks such as reading prescription labels, understanding

[20] HD*Pulse*: An Ecosystem of Minority Health and Health Disparities Resources. National Institute on Minority Health and Health Disparities. Created 2/22/2025. Available from `https://hdpulse.nimhd.nih.gov`

medical instructions, or navigating patient portals may seem straightforward to healthcare providers, but they present significant challenges for millions worldwide. Health literacy, the capacity to access, comprehend, and utilize health information to make informed decisions, is a critical yet often overlooked barrier to healthcare access. The World Health Organization emphasizes that health literacy involves the personal knowledge and competencies that accumulate through daily activities, social interactions, and across generations[21]. These competencies are mediated by organizational structures and the availability of resources that enable individuals to access, understand, appraise, and use information and services to maintain and promote health.

Stories from the Field – Pillar Spotlight Digital: When I was a kid in the age of dial up, my mother had a thick blue book she kept stored in the cabinet right above the family telephone. It contained 'all the medical information you could ever need'. No matter what illness we had, heard on the news or could dream up she always had an entry in there to reference. Even as I entered medical school, I couldn't convince her to stop referring to that outdated text. Now many years later she is certainly guilty of occasionally referencing 'Dr. Google'. Fortunately, she's moved on to more reputable sources from trusted sites and those of academic medical centers. But if the parent of a physician can potentially have outdated healthcare information presented to them in their day-to-day life, imagine a patient without digital literacy and a pronounced **Digital –** {Barrier}. ……I better see if that book is still there!

The challenges of health literacy manifest in countless daily scenarios. Consider a patient with diabetes trying to manage their condition. They must understand blood glucose numbers, calculate insulin doses, interpret nutrition labels, and recognize early warning signs of complications. For someone with limited health literacy, this complex self-management can become overwhelming, leading to poor outcomes despite having physical access to care. The digital transformation of healthcare has inadvertently created new literacy challenges. As healthcare systems increasingly rely on patient portals, mobile apps, and telehealth platforms, a new form of literacy, digital health literacy, has become essential. When we think of all the components

[21] World Health Organization. Health literacy. Published 2023. Accessed January 18, 2025. `https://www.who.int/news-room/fact-sheets/detail/health-literacy?utm_source`

of health literacy, we can break it down into ten key components that enable individuals to effectively engage with healthcare information and healthcare services:

1. **Accessing Health Information**: The ability to locate or obtain relevant health data from various sources.
2. **Understanding Health Information**: Comprehending medical terms, instructions, and concepts necessary for informed health decisions.
3. **Evaluating Information**: Assessing the credibility and relevance of health information to one's personal health context.
4. **Communicating Health Information**: Effectively discussing health concerns and information with healthcare providers and support networks.
5. **Navigating Healthcare Systems**: Understanding how to utilize healthcare services, including appointment scheduling and understanding insurance processes.
6. **Decision-Making**: Applying health information to make appropriate health-related choices.
7. **Numeracy Skills**: The everyday skill of making sense of numbers and using basic math. Interpreting and working with numerical health data, such as dosage instructions and medical statistics.
8. **Digital Literacy**: Using digital tools and platforms to access and manage health information.
9. **Cultural Competence**: Recognizing cultural differences that influence health beliefs and practices.
10. **Self-Efficacy**: Having confidence in one's ability to act and make decisions regarding personal health.

From the components above we can see that the diabetic patient we just discussed must touch every single one of these areas to properly utilize their insulin and manage their diabetes at home. Any breakdown in even one of these components could lead to a wrong dose, failure to recognize an emergency, or further complications of disease.

Literacy Levers How-To

Low health literacy drains US $106 billion to $238 billion from the nation's care budget every year; it also drives higher hospital use and mortality in heart-failure patients. [22] **So what can be done to improve this Digital – {Barrier}?**
Three system fixes you can deploy this quarter:

1. **Adopt universal teach back: Require every clinician to close each visit with a patient "teach back" confirmation; embed a smart phrase in the EHR for rapid documentation; audit charts monthly and target 90% completion in six months.**
2. **Launch multi-lingual, plain-language portals: Add an immediate language-toggle plus eighth grade-reading-level summaries for medications and follow-up tasks. Track portal logins from limited-English-proficiency patients and aim for a 20% rise by year end.**
3. **Swap dense text for numeracy friendly visuals: Replace discharge packets and insulin handouts with icon-based dose grids and pictograms. Monitor medication-error reports and seek a 25% reduction within twelve months.**

Implement these levers together: they attack comprehension, language, and numeracy in one coordinated push, turning the cost burden of low literacy into measurable patient-safety and financial gains.

Rural and underserved communities face compound challenges. In these areas, limited health literacy often intersects with:

- Limited English proficiency
- Lower educational attainment
- Reduced access to technology
- Fewer opportunities for health education

As you can imagine cultural context plays a crucial role in health literacy and can become a **Cultural – {Barrier}**. Medical instructions that make perfect sense in one cultural context might be confusing or even offensive in another. For example, dietary recommendations

[22] Vernon JA, Trujillo A, Rosenbaum S, DeBuono B. *Low Health Literacy: Implications for National Health Policy*. Washington, DC: Department of Health Policy, School of Public Health and Health Services, The George Washington University; 2007. Accessed January 18, 2025. `https://pmc.ncbi.nlm.nih.gov/articles/PMC7956806/`

that don't account for cultural food practices or religious restrictions often go unheeded not because of willful non-compliance, but because they conflict with deeply held cultural values.

The pandemic brought many of these **Cultural – {Barrier}** and **Digital – {Barrier}s** into sharp focus. Public health messaging about COVID-19 needed to be understood by diverse populations with varying literacy levels, primary languages and access. Countries that succeeded in their public health response often employed multi-modal communication strategies: simple visual aids, clear verbal instructions, and culturally appropriate messaging. Those that relied solely on written communication or complex scientific explanations often struggled to achieve public compliance with health measures[23].

Healthcare providers often overestimate their patients' health literacy. Studies show that even highly educated individuals can struggle with medical terminology and complex healthcare decisions. This "literacy gap" between provider assumptions and patient understanding leads to missed appointments, medication errors, and poor adherence to treatment plans. A study published in the Journal of Health Communication found that nurses overestimated patients' health literacy, with overestimates outnumbering underestimates six to one[24].

The financial implications of poor health literacy extend beyond direct healthcare costs. Lost productivity, increased disability claims, and preventable emergency room visits all stem from inadequate health literacy. For example, heart failure patients with low health literacy are at an increased risk of hospitalization and death[25]. For employers, communities, and healthcare systems, investing in health literacy programs offers a significant return on investment. As healthcare continues to evolve and become more complex, addressing health literacy becomes increasingly critical. The solution isn't simply about

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[23] Krieger JL, Neil JM, Duke K, et al. What did the pandemic teach us about effective health communication strategies? *BMC Public Health*. 2022;22:2339. doi:10.1186/s12889-022-14707-3.https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-14707-3?utm_source

[24] Dickens C, Piano MR, Morrow DG, et al. Nurse Overestimation of Patients' Health Literacy. *J Health Commun*. 2013;18(Suppl 1):62-69. doi:10.1080/10810730.2013.825670. https://www.tandfonline.com/doi/pdf/10.1080/10810730.2013.825670?utm_source

[25] Peterson PN, Shetterly SM, Clarke CL, et al. Health Literacy and Outcomes Among Patients With Heart Failure. *JACC Heart Fail*. 2015;3(6):448-456. doi:10.1016/j.jchf.2015.01.014. https://www.acc.org/latest-in-cardiology/articles/2020/05/25/12/42/low-health-literacy-associated-with-more-hospitalizations-mortality-in-hf?utm_source

making information available; it's about making it accessible, understandable, and actionable for all populations.

Solutions require a multi-faceted approach:

1. Universal precautions in health communication: assuming all patients may have difficulty understanding health information
2. Integration of health literacy education into school curricula
3. Cultural competency training for healthcare providers
4. Development of user-friendly health technologies

Healthcare's Geographic Divide: A Global Context

Stories from the Field – Barrier Spotlight Physical: Back in my youth I learned how to SCUBA dive with a team of other students for a research expedition off a remote Fijian island. A bunch of healthy young people living in a research station amongst a small, isolated tribe…what could go wrong?

My problems were superficial when you think about it. I got terrible bed bugs and was a walking and talking example of why bed bugs are seriously the absolute worst. I also got double ear infections from diving for data collection multiple times a day. Now an ear infection doesn't seem like a big deal sitting here at my computer all cozy at my home in New York. But it was a much bigger deal on that remote island. We had a limited amount of acetaminophen and medication with us, and it was for the whole group. I couldn't just go get more at the pharmacy down the street. Secondly, we had to depend on whatever medications had been brought with our provisions weeks before. To this day I still have no idea what I was treated with. The writing on the bottle of ear drops was not in any language I knew, but when you feel that bad, you take the options you've got.

Weeks later when I flew back to the U.S., still with a double ear infection, the changes of altitude on the plane were absolutely excruciating. Fortunately for me, I was able to be treated when I returned home. For those that remained on the island, or for those that grew up there and that was their lifelong home, the ability to get medications or other services was a two-hour plus boat ride away. Now looking back, I wonder what we would have done if someone had broken a leg, or had a real diving accident that needed urgent evaluation and care? The outcomes would have certainly been different.

Fact Check:

- **In 2021, about 4.5 billion people, more than half of the global population, were not fully covered by essential health services[26].**
- **In low-income countries, 50% to 60% of the population lives more than eight kilometers from healthcare facilities, often without access to reliable transportation[27].**
- **In Sub-Saharan Africa, more than 170 million people live over two hours away from a hospital, with 40% residing more than four hours away[28].**

Healthcare challenges vary significantly across different regions, often influenced by unique geographical, infrastructural, and socio-economic factors. Below is a high-level overview of just some of these challenges:

Sub-Saharan Africa[29]*: Physical* – **{Barrier}**, *Financial*– **{Barrier}**

- **Chronic Shortage of Healthcare Workers:** Many countries in Sub-Saharan Africa face a significant deficit in healthcare professionals. For instance, the density of specialist physicians in Zimbabwe is considerably lower than the global average, with reporting fewer than 1 physician per 10,000 individuals.
- **Lack of Basic Infrastructure:** Healthcare facilities often struggle with inadequate infrastructure, including limited access to essential services like electricity and clean water. This hampers the delivery of quality healthcare services.

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[26] World Bank. Billions left behind on the path to Universal Health Coverage. Published September 18, 2023. Accessed January 18, 2025. https://www.worldbank.org/en/news/press-release/2023/09/18/billions-left-behind-on-the-path-to-universal-health-coverage

[27] Stanford Social Innovation Review. *The Invisible Rural Access Barrier*. Published June 2022. Accessed January 18, 2025. https://ssir.org/articles/entry/the_invisible_rural_access_barrier

[28] Ballard Brief. *Lack of Access to Maternal Healthcare in Sub-Saharan Africa*. Published December 2021. Accessed January 18, 2025. https://ballardbrief.byu.edu/issue-briefs/lack-of-access-to-maternal-healthcare-in-sub-saharan-africa

[29] World Health Organization. Atlas of African Health Statistics 2022: Health Situation Analysis of the WHO African Region. Published 2022. Accessed January 18, 2025. https://www.afro.who.int/publications/atlas-african-health-statistics-2022-health-situation-analysis-who-african-region-0

- **Limited Access to Essential Medicines**: The availability of necessary medications is often restricted due to supply chain issues and financial constraints affecting patient care.

South Asia: Physical – {**Barrier**}, *Financial*– {**Barrier**}, *Cultural* – {**Barrier**}

- **Overwhelming Population Density Straining Limited Resources:** High population densities in countries like India and Bangladesh place immense pressure on existing healthcare systems, leading to resource constraints.
- **Geographic Barriers:** Regions with challenging terrains, such as the Himalayas, impede access to healthcare services, making it difficult for populations to receive timely medical attention.
- **Cultural and Gender-Based Barriers to Care:** Societal norms and gender roles can limit access to healthcare for certain groups, particularly women, affecting overall health outcomes.

Remote Island Nations: Physical – {**Barrier**}, *Financial* – {**Barrier**}

- **Extreme Isolation from Specialized Care:** Isolated locations result in limited access to specialized medical services, necessitating travel to distant facilities for advanced treatments.
- **Vulnerability to Natural Disasters Disrupting Medical Supply Chains:** Natural calamities like cyclones and tsunamis can sever supply lines, leading to shortages of essential medical supplies.
- **Limited Capacity for Emergency Medical Transport:** Geographical isolation and limited infrastructure hinder the ability to provide prompt emergency medical services.

Disparity in Emergency Response Capabilities:

- **Urban Singapore:** Boasts an average emergency response time of approximately 8 minutes, reflecting a well-developed infrastructure[30].

[30] Ministry of Home Affairs, Singapore. Oral Reply to Parliamentary Question on Average Response Times for Emergency Vehicles to Reach Their Destinations in the Past Three Years. Published March 21, 2023. Accessed January 20, 2025. https://www.mha.gov.sg/mediaroom/parliamentary/oral-reply-to-pq-on-average-response-times-for-emergency-vehicles-to-reach-their-destinations-in-the-past-three-years/

- **Urban India**: Mean response times vary from 14 minutes to 47 minutes on average, highlighting significant gaps in emergency services[31].
- **Remote African villages:** Often lack formal emergency response systems, leaving communities without timely medical assistance.

These disparities underscore the critical need for tailored healthcare strategies that address the unique challenges of each region, focusing on infrastructure development, workforce enhancement, and equitable resource distribution. But the **Physical – {Barrier}**s in global healthcare doesn't exist in isolation, it's intensified by an interconnected web of modern challenges. Climate change has emerged as a particularly insidious force in healthcare delivery. As extreme weather events increase in frequency and severity, they don't just disrupt existing healthcare services; they fundamentally reshape the landscape of healthcare access. In Bangladesh, for example, rising sea levels and increasingly severe monsoons regularly cut off coastal communities from medical care for weeks at a time. These communities face a cruel double burden: their healthcare needs increase due to climate-related illnesses while their ability to access care diminishes.

Political instability can also significantly complicate healthcare delivery. In conflict zones, challenges extend beyond **Physical– {Barrier}** to include navigating dangerous areas where healthcare infrastructure has been deliberately or inadvertently destroyed. Healthcare workers in these regions often flee, leading to a devastating 'brain drain' that can take generations to recover from. For example, in Syria, the emigration factor of physicians to the United States is around 13%, indicating a substantial loss of medical professionals[32]. The ripple effects extend beyond the conflict zones themselves, as neighboring countries struggle to absorb and care for refugee populations, often in makeshift facilities with limited resources. There are over a billion people currently living in settings of conflict, displacement, and natural disasters, which severely hampers the delivery of basic health services.

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[31] Factly. What is the state of emergency ambulance services in India? Published January 2023. Accessed January 20, 2025. `https://factly.in/what-is-the-state-of-emergency-ambulance-services-in-india/`

[32] Thieme Connect. Migration of Physicians and Health Care Workers: Syria as an Example. Published 2012. Accessed January 20, 2025. `https://www.thieme-connect.com/products/ejournals/pdf/10.4103/2231-0770.94802.pdf`

Economic disparities perhaps create the most persistent **Financial – {Barrier}** to improving global healthcare access. While wealthy nations debate the latest advances in telemedicine and robotic surgery, many developing countries struggle to maintain basic medical supplies and infrastructure. The cruel irony is that the region's most in need of innovative healthcare solutions are often the least able to afford them. A single medical helicopter for rural emergency response, a common sight in developed nations, could consume the entire annual healthcare budget of a small developing country. This economic reality forces difficult choices: does a nation invest in basic primary care centers that might help many, or emergency transport systems that could save fewer but critically ill patients? This complex interplay of challenges requires solutions that go beyond simply building more clinics or training more doctors. Any effective approach to global healthcare access must consider these compounding factors and their long-term implications for healthcare delivery.

The COVID-19 Effect

One of the areas that increased at rapid pace during the pandemic was telemedicine. If you recall in the United States all elective surgeries were on hold, and unless you had an emergent situation you did not want to be in a doctor's office or a hospital emergency room. If we went, you were almost guaranteed to get infected. My family's first telemedicine appointment was in the summer of 2020. My son needed a medication refill, and his doctor, who would normally require an in-person visit, had to adapt. It was nothing fancy: just a phone call. But it was effective. She gathered the information she needed and called in the refill. This simple interaction exemplified how quickly medicine had to transform.

As the pandemic continued there was also a shift in the expectations of providers and patients, and this has continued even today:

1. Patients became more engaged in their care decisions
2. Healthcare consumers became more discerning, especially in high income countries
3. Technology adoption accelerated across age groups
4. Traditional care models were questioned and reimagined in all settings

Fact Check:

- **US telehealth visits surged by 154% in late March 2020 compared to the same period in 2019[33].**
- **84% of physicians were offering virtual visits by April 2021, and 57% preferred to continue those services in the US[34].**
- **Medicare telehealth visits increased from approximately 840,000 in 2019 to 52.7 million in 2020[35].**

The rapid adoption of telehealth during COVID-19 catalyzed a broader revolution in healthcare delivery. What began as stopgap measures eventually evolved into a fundamental restructuring of how we think about care access. Early in the pandemic, I witnessed my son's pediatrician transform her practice overnight from waiting rooms and in-person visits, to a hybrid model of care delivery. By the end of 2020, her practice had not only mastered telehealth but had implemented remote monitoring for their young asthma patients. This transformation occurred across multiple fronts, including different disease processes, settings of care, and in populations not previously served.

Perhaps one of the most significant innovations was the rapid development of virtual specialty networks. Rural hospitals that previously struggled to access specialist consultations could suddenly connect with urban medical centers for real-time consultation. However, this wave of innovation, while impressive, exposed critical gaps in our healthcare infrastructure. The digital divide, long a concern in healthcare delivery, became a chasm that threatened to leave vulnerable populations even further behind.

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[33] Centers for Disease Control and Prevention. Trends in the Use of Telehealth During the Emergence of the COVID-19 Pandemic — United States, January–March 2020. Published October 30, 2020. Accessed January 20, 2025. https://stacks.cdc.gov/view/cdc/97233

[34] American Hospital Association. A Fresh Perspective: Where Telehealth Growth Will Go From Here. Published July 20, 2021. Accessed January 20, 2025. https://www.aha.org/aha-center-health-innovation-market-scan/2021-07-20-fresh-perspective-where-telehealth-growth-will

[35] U.S. Department of Health and Human Services. Medicare Beneficiaries' Use of Telehealth Services: A Closer Look. Published December 2021. Accessed January 20, 2025. https://aspe.hhs.gov/sites/default/files/documents/a1d5d810fe3433e18b192be42dbf2351/medicare-telehealth-report.pdf

The financial landscape of healthcare underwent its own revolution during this period. Payment models that had remained relatively static for decades suddenly required rapid evolution to accommodate new care delivery methods. Insurance companies and Medicare scrambled to develop telehealth reimbursement structures that made sense for both providers and patients. Remote patient monitoring, previously a niche service, needed new payment codes to reflect its growing importance. States rushed to implement virtual care parity laws, ensuring that providers would be compensated fairly for virtual visits.

As we look to the future, the innovations sparked by COVID-19 continue to evolve in exciting ways. Healthcare delivery is increasingly moving toward a hybrid model that combines the best aspects of traditional and virtual care. Home-based care, supported by remote monitoring technologies, is becoming more sophisticated and widely available. Platform-based healthcare solutions are making it easier to coordinate care across multiple providers and settings. The key lesson from this period of rapid innovation isn't just about technology adoption, it's about adaptability and equity. As one of my colleagues noted, "The technology was always there. What changed was our willingness to use it, and our understanding of who might be left behind." This understanding must guide our path forward as we continue to innovate in healthcare delivery.

A New Map

When I first arrived at Fred's apartment, I didn't know we'd be calling 911. I didn't know he would lose his leg or that he'd later tell me it saved his life. What I did know, from the moment I stepped through his door, was that we needed a better map.

Not a map of hospitals or clinics, those already existed. We needed a map that reflected the actual terrain of healthcare access; one that accounted for distance and dollars, culture and trust, digital reach and systemic red tape. A map that understood how someone like Fred could live just minutes from world-class healthcare and still be medically stranded.

This book is that map.

Over the next chapters, we'll walk through the **Five Pillars of Access; Physical, Financial, Cultural, Digital,** and **Trust/Knowledge,** and examine how these barriers appear in cities, towns, and villages across the globe. We'll explore how emerging technologies like telehealth, artificial intelligence, and remote robotic surgery are expanding care in places that were once unreachable. But we'll also

ask hard questions: When does technology widen the divide instead of closing it? What does it take to build systems that actually work for the people left behind?

Fred's story is not just a cautionary tale. It's a call for revolution. Because access isn't a single doorway; it's a network. A living, shifting, interdependent web of people, policies, platforms, and pain points. If we want to create a future where everyone gets the care they need, we have to learn to see that web, and start pulling the right threads.

Let's begin.

Startup Builder's Box (or more nicely designed option). Add generous spacing between this box and the text above it as well as the checklist below

You're not building for "rural" or "urban." You're building for real people who miss care because the clinic is one transfer too far, the sidewalks aren't plowed, or the co-pay isn't worth the risk. Want to design for access? Start here:

1. **Don't assume infrastructure exists:** Most care plans assume patients have reliable transport, a working phone, or broadband. They often don't. Consider if your segment needs you to build for low-bandwidth, no-car, no-wifi, walk-only environments. If your solution needs GPS, cellular signal, or real-time video, ask what happens when none are available.
2. **Go to them:** Your target user may live 3 miles from a major hospital and still be medically unreachable. Bring care to the bus stop, the food pantry, and the church basement. Think about mobile units, microclinics, or asynchronous care that fits inside a pharmacy kiosk.
3. **Solve for friction, not distance:** Fred's story wasn't about miles; it was about socks, silence, and no one showing up. Treat care deserts like logistics problems. Where does care fail to arrive? What can you hand off to community partners, volunteers, or automation? Where does your design quietly assume privilege?

If your product doesn't close the gap between *nearby* and *reachable*, you're not solving for access. You're just mapping hospitals.

Leaders' End-of-Chapter Action Checklist: Chapter 1 "The Geography Problem"

LEADER	HIGH-IMPACT ACTION TO STRENGTHEN *PHYSICAL ACCESS*
❑ Board Director	Approve a mobile-clinic capital line and mandate a quarterly *Travel-Time Index* aiming for < 30 minutes to primary care for 90% of residents
❑ Chief Executive Officer	Charter a *Road-to-Care Task Force* and cut average patient mileage reimbursement claims by 25% within twelve months
❑ Chief Information Officer	Publish a county broadband gap map on the intranet and broker ISP partnerships that raise household telehealth capability to 95%
❑ Chief Health Information Officer	Standardize low-bandwidth tele-triage protocols and reduce avoidable rural transfers to tertiary centers by 15% over the next year
❑ VP Clinical Operations	Rotate "pop-up" specialty clinics through every critical-access site each Friday and track visit volume plus no-show rates
❑ VP Nursing & Patient Education	Launch rideshare or fuel-card vouchers for high-risk patients; target a 20% drop in missed appointments after six months
❑ VP Data & Analytics	Build a geospatial dashboard overlaying service lines with the Social Vulnerability Index to select two priority ZIP codes each quarter
❑ Telehealth Program Manager	Field-test 10 low-bandwidth telehealth kits monthly in homebound households and report latency plus clinical completion rates
❑ Patient Experience Manager	Add a one-click transit-burden question to every post-visit survey and include results in the weekly *Voice of the Patient* digest
❑ Community Health Worker Supervisor	Host "Bus-Stop Clinics" for blood-pressure checks and schedule twice weekly; enroll one hundred new patients by year-end
❑ Director of Snacks & Morale	Procure GPS-enabled donuts so nobody gets lost on the way to care; distribute at the next quality huddle with extra sprinkles for punctuality