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Dermatology in Rural Settings

Organizational, Clinical, and Socioeconomic
Perspectives

 Springer

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and Socioeconomic Perspectives

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This book is dedicated to dermatologists in the USA and around the world who are making a difference for the underserved by donating time and treasure to serve patients in need including: volunteer service in free clinics, university teaching service, the American Academy of Dermatology's AccessDerm™, faith-based dermatology health initiatives, performing hospital consultations, defending their patients through political action, engaging in carefully planned mission medicine on Indian reservations and around the world, and serving the many needs of their communities. Service to others is the rent you pay for your room here on Earth (Muhammad Ali).

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Foreword

The happiest, most satisfied physicians work in mission-driven environments – among colleagues or staff with shared values – where they can use their skills to serve the needs of patients and their communities by improving health. The days when physicians have the privilege to make a difference in the lives of our patients *connect us* to the aspirations that first brought us to this sacred profession. Other days – when barriers get in the way of care delivery – *deprive us* of the joy of work and foster burnout. I’ve observed the same predictors of professional satisfaction across every practice setting and in every medical specialty including dermatology.

Despite practicing medicine in a major urban area, I have witnessed my rural colleagues experience some of the greatest joys in medicine working in tight-knit communities serving particularly vulnerable patients. Of course, they can also experience some of the greatest frustrations in medicine as they navigate unique barriers to healthcare delivery. Those challenges, however, are driving small and large practices in rural settings to become innovation engines, rethinking and reinventing care delivery.

Rural populations live at the nexus of several forces underpinning health disparities in the USA. They suffer high burdens of underlying chronic disease, including diabetes, hypertension, and opioid-use disorder. These issues complicate the care of most other health problems. Their access to care is sometimes affected by gaps in wealth, employment, and insurance coverage. Shortages of physicians and longer travel distances in many rural areas exacerbate access challenges for even those with excellent insurance. The economic challenges of practice faced by rural physicians are particularly difficult for those with high educational debt burdens. Finally, the longstanding gaps in the diversity of the physician workforce leave our profession not fully resembling the patients we serve or benefitting from a wider breadth of viewpoints and life experiences of under-represented minorities.

I’m optimistic that a cadre of energetic physicians will harness innovative solutions to advance the work of rural healthcare and the health of rural populations. Coverage for telehealth services has expanded exponentially in the wake of the COVID-19 pandemic. The broadening of insurance coverage through ACA subsidies for commercial plans and Medicaid expansion in 39 states has improved access for many patients living in rural areas. Medical schools and residency programs are recruiting trainees with a diversity of life experiences and launching new curricula focused on rural and underserved

populations. National attention has highlighted the effects of racism in health, and this is driving change that is fundamental to reducing inequities.

Our profession's roots, shared values, and medical ethics will continue to drive practice improvements aimed at the betterment of the lives of our patients and public health. Health services research, iterative innovation, collaboration, and thoughtful policy debate are part of that process. I'm inspired by the efforts of many physician colleagues who are seeking opportunities for real change in rural healthcare delivery and finding joy in this meaningful work.

Conflict of Interest Disclosures: Dr Resneck serves as President-Elect of the American Medical Association, and he serves on the board of directors of the National Quality Forum. The views expressed here are those of the author and do not necessarily represent the views of the American Medical Association or the National Quality Forum.

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Preface

This book was born in the COVID-19 pandemic. Suddenly, the faculty of the Department of Dermatology at the University of Mississippi Medical Center found our in-person clinics shuttered. We struggled to use teledermatology to provide access to dermatologic care for our patients. It quickly became evident that there were more barriers than the federal regulations which had largely been relaxed. The technology was sluggish, images coming through on synchronous platforms were less than sharp, and “teeing up” patients took an inordinate amount of staff time. Still, we persevered and found ways to overcome each challenge. Then, something really strange happened. Locked down in our homes, there was more time to spend with our families and extra time to spend on a project! We’re Americans! Writing a book on access to care was a way to fight back, to make something good happen in a world of tragedy.

Our team had previously been assembled through a series of lectures at annual meetings of the American Academy of Dermatology. Adam Byrd, MD, was the center of the University of Mississippi Medical Center’s (UMMC) efforts to provide academic dermatologic care in rural Mississippi, far from our urban medical center. Vinny Nahar, MD, PhD, lead physician in charge of research at UMMC was entrenched in writing manuscripts about efforts to utilize teledermatology and Project ECHO to address the dermatologic needs of rural patients. Cindy Firkins Smith, MD, chief executive officer and professor of dermatology at Carris Health, University of Minnesota, had spent her life working to recruit dermatologists and primary care physicians to rural areas of Minnesota. Finally, as chair of the Department of Dermatology at UMMC, Bob Brodell was ready to steer the textbook writing ship.

This book is dedicated to rural patients throughout America who struggle to find physicians for their primary and specialty care. Chapter 1 highlights the severity of this problem. The rest of the chapters consider components of the rural dermatology access to care problem and each provides potential solutions. We may not be able to solve this problem overnight, but the chap-

ters of this book demonstrate that there is something each of us can do to help! Some of you may have additional ideas.... write to us! No idea is too small, as we work together to make big changes.

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Acknowledgments

This book was inspired by the creative ideas of dermatologists who have been motivated to improve access to dermatologic care for rural citizens around the world.

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Rural Dermatology: Statistical Measures and Epidemiology

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Epidemiology: The Current State of the Dermatology Workforce

The Rural-Urban Divide

At first glance, defining rural versus urban may seem to be an easy enough task: farm vs. city; agriculture vs. service industry; small vs. large populations; or maybe sparse housing vs. lively neighborhoods. When defining these taxonomies, stereotypical distinctions like those listed above

The major factors that brought health to mankind were epidemiology, sanitation, vaccination, refrigeration, and screen windows.

-Former Colorado governor, Richard Lamm, 1986.

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believe important considerations related to the cultural, socioeconomic, and demographic aspects of societies risking oversimplification [1]. Each method of defining rural and urban has consequences that impact the application of policy and the collection and analysis of data [1, 2]. Depending on the taxonomy used, the percentage of Americans living in rural areas ranges from 10–28% of the total population (approximately 30–90 million) [1, 3].

Significant disparities exist in health care outcomes between rural and urban residents [4, 5]. As compared to urban counterparts, rural residents are more likely to die of preventable conditions including heart disease, stroke, lower respiratory tract disease and cancer [4, 5]. Additionally, rural residents have a lower average life expectancy than their urban peers (76.7 years and 79.1 years respectively) [6]. In rural areas, there are shortages of both general practitioners and specialty physicians, including dermatologists [6] (see Table 1.1).

Dermatology

Utilizing the Area Health Resources file and American Academy of Dermatology data, there are 3.4 to 3.65 dermatologists per 100,000 people

Table 1.1 Dermatologist Density Distribution in the United States

All dermatologists	
All of US	3.4–3.65 per 100,000 individuals
Metro	4.11 per 100,000 individuals
Non-metro	1.05 per 100,000 individuals
Rural	0.085 per 100,000 individuals
Pediatric dermatologists	
All of US	1 per 385,000 children
Mohs surgeons	
All of US	0.70 per 100,000 individuals
Metro	0.78 per 100,000 individuals
Nonmetro	0.27 per 100,000 individuals
Rural	0.23 per 100,000 individuals

Nonphysician Clinicians in Dermatology: Physician Assistants and Nurse Practitioners

in the United States [7, 8]. The concentration of dermatologists is significantly lower in rural areas as compared to urban ones. In 2013, the average density of dermatologists was estimated to be 4.11 per 100,000 population in metropolitan areas as compared to 1.05 per 100,000 population in non-metropolitan areas and 0.085 per 100,000 population in rural areas [8]. Additionally, 40% of dermatologists work in the 100 densest population centers in the US [9]. Areas with the highest concentrations of dermatologists in the US include the Upper East Side of Manhattan, New York (41.8 per 100,000), Palo Alto, California (36.6 per 100,000) and Santa Monica, California (35.9 per 100,000) [9].

Pediatric Dermatology

Pediatric dermatology was recognized as a subspecialty of the American Board of Dermatology in 2000 [10]. Nationwide, there is a perceived shortage of pediatric dermatologists with wait times being the longest for any pediatric subspecialty. In the US, there is approximately 1 pediatric dermatologist for every 385,000 children; 1 pediatrician for every 1500 children; and, 1 dermatologist for every 30,000 people [10]. In surveys of pediatricians, pediatric dermatology is identified as one of the three most difficult pediatric specialties to rake referrals [10]. Wait times

average between 6 and 13 weeks nationally [10, 11].

Like general dermatologists, pediatric dermatologists are concentrated in and around large metropolitan centers, with very few practitioners in rural locales [11]. In rural areas, geographic maldistribution compounds the national shortage of pediatric dermatologists and makes accessing adequate care especially difficult.

Dermatopathology

The geographic distribution of the dermatopathology workforce has not been well-characterized. However, a recent survey of fellows of the American Society of Dermatopathology found that nearly 65% were practicing in or affiliated with an academic center [12]. Additionally, while the Northeast, Midwest and West each have approximately 20% of practicing dermatopathologists, about 30% practice in the Southern United States [12]. Given the unique characteristic that pathology samples are sent and dermatopathologists can provide professional services anywhere in the country, the geographic distribution of dermatopathologists may not impact access to care in the same manner as general and subspecialty dermatologists.

Mohs Micrographic Surgery and Procedural Dermatology

Mohs micrographic surgery (MMS) is a technique utilized to manage skin cancer located in cosmetically and functionally sensitive body areas in the United States. Compared to other skin cancer treatment methods, such as excision, MMS is associated with higher cure rates, smaller defect sizes and better aesthetic outcomes.

The MMS workforce has expanded significantly over the past few decades. From 1995 to 2016, the annual number of American College of Mohs Surgery-accredited fellowship positions increased from 25 to 84 [13]. Approximately 20% of dermatology graduates pursue training in

MMS and there are approximately 2240 practicing Mohs surgeons in the United States [13, 14]. Compared to the general dermatology workforce, the MMS workforce is more likely to be concentrated in urban areas. 94.6% of all Mohs surgeons practice in metropolitan locales while 5% practice in nonmetropolitan areas and less than 1% practice in rural areas [14]. Additionally, 98.6% of rural counties do not have a practicing Mohs surgeon [14].

Nonphysician clinicians, including nurse practitioners and physician assistants, have been employed to expand access to medical care, especially in underserved areas. Nurse practitioners are able to practice independently in 22 US states and the District of Columbia [15]. Physician assistants, in contrast, must be directly supervised by a physician [15]. The use of these physician extenders has increased significantly over time across specialties. In dermatology, membership of the Society of Dermatology Physician Assistants grew from 49 to over 2700 between 1994 and 2014 [16].

Nonphysician clinicians are used widely in dermatology, with nearly 50% of practices employing them to perform medical visits and procedures [15]. Like dermatologists, nonphysician clinicians are more likely to practice in urban areas than rural ones [15]. More than 70% of nonphysician clinicians practice in counties with a dermatologist density over 4 per 100,000 population [15]. Only 3% practice in counties without dermatologists [15].

Trends over Time

A Historical Perspective

From the late 1950s to early 1980s, the number of training positions for dermatologists increased significantly. This was largely attributable to government programs that increased the sizes of medical school classes and funding for dermatology residencies [13]. Subsequently, concerns about oversaturation of dermatologists led to a significant decrease in the expansion of new

training programs in the 1980s and 1990s [13]. In the past two decades, the number of dermatologists trained annually has grown modestly, keeping pace with US population growth [13]. Similarly, the density of dermatologists in the US has increased. From 1995 to 2013, the density of dermatologists in the US increased by 21% from 3.02 per 100,000 residents to 3.65 per 100,000 residents [8]. Growth in the dermatology workforce has been disproportionately higher in urban areas than rural ones. Between 1995 and 2013, the difference between dermatologist density in rural and urban areas increased by 18% from 3.41 per 100,000 people to 4.03 per 100,000 people (rural: 0.065 in 1995 and 0.085 in 2013; urban: 3.47 in 1995 and 4.11 in 2013) [8]. Despite the increases in dermatologist density in recent years, there exists a shortage of medical dermatologists, especially in rural areas. With 20% of dermatologists training in Mohs surgery and many others performing cosmetic procedures, the availability of medical dermatologists may be constrained.

Future Projections

The demand for dermatologists in the US is projected to increase significantly over time [7]. This is partially due to a growing and aging US population. The US Census Bureau estimates that by 2060, the US population will grow by 80 million and the number of citizens over the age of 65 will double from 45 million to 95 million [17]. As a result, the prevalence and burden of skin cancer and dermatologic disease is projected to grow [7]. Additionally, the scope of dermatologists has grown in recent decades, with increased care of medically complicated and hospitalized patients further contributing to increased demand for trained dermatologists [13].

Changes in the dermatology workforce over time may have a disproportionate impact on rural residents. The dermatology workforce is aging. From 1995 to 2013, the ratio of dermatologists older than 55 to those younger than 55 increased from 0.32 to 0.57 [8]. Dermatologists in rural

areas are more likely to be over the age of 55, and closer to retirement, than their urban peers [8]. Similarly, dermatologists entering the workforce are more likely to practice in urban areas [13]. As a result, disparities in access to dermatology care between rural and urban locales are expected to increase over time.

Impacts on Patients

Access to Care

Disparities in the dermatology workforce between rural and urban areas has impacted rural residents' access to dermatologic care. On a national level, rural patients experience longer wait times as compared to those in suburban and urban areas [18], although this is not shown consistently [19]. In 2007, the average wait time for new patients in rural settings was 45.6 days as compared to 31.5 days in suburban areas and 32.7 days in urban ones [18]. In addition, rural residents travel further, on average, to seek dermatologic care as compared to their urban peers [20].

Rural residents also have less access to specialized dermatological care. One study demonstrated a lower concentration of dermatology providers who prescribed injectable biologic medications, which are increasingly used to treat systemic dermatologic conditions, in rural areas as compared to urban ones [21]. As mentioned previously, access to dermatologic specialists, such as Mohs micrographic surgeons and pediatric dermatologists, is also limited in rural areas. Pediatric dermatologists are concentrated in metropolitan locales and less than 1% of all Mohs surgeons practice in rural counties.

Patient Outcomes

Impaired access to adequate dermatologic care has been demonstrated to impact patient outcomes. Dermatologist density is associated with well-defined disease-specific outcomes for

patients with melanoma and Merkel cell carcinoma.

Every year, over 75,000 Americans are diagnosed with melanoma and 9000 die from the disease [22]. An increased density of dermatologists is correlated with better outcomes for melanoma. Dermatologists are more likely to diagnose melanoma at an early stage than non-dermatologist providers which leads to better patient outcomes [23]. Higher dermatologist density is associated with early melanoma detection. One study demonstrated a 39% increase in odds of early melanoma diagnosis for each additional dermatologist per 10,000 population [24]. Similarly, proximity to the nearest dermatologist is associated with decreased melanoma thickness at the time of diagnosis [25]. Another study demonstrated that increased dermatologist density, to a point, is correlated with lower melanoma mortality [26]. However, additional dermatologists over 2 per 100,000 population do not appear to impact melanoma mortality rates [26].

Merkel cell carcinoma is an aggressive neuroendocrine cancer that impacts 1600 Americans annually [27]. Dermatologist density has been associated with improved outcomes for Merkel cell carcinoma. Patients with Merkel cell carcinoma who lived in areas of higher dermatologist density had improved survival rates as compared to those living in areas with low dermatologist density [28].

Epidemiologic Perspective and Considerations

Defined epidemiologic data on dermatologist density can be used to compare rural vs urban areas, and trends over time. However, rural areas over time become developed to an extent that farms and forests merge into suburbia and the suburbs become relatively urban. We strongly advocate for developing data that provide opportunities to monitor for differences between rural and urban areas and specifically address deficiencies, when possible, to improve medical