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BRIEF ARTICLE

Five Years Later: Continuing Disparity in the Geographic Density and Distribution of U.S. Dermatologists

Christopher N. Nguyen, MD[1], Quoc-Bao Nguyen, MD, MBA[2,3], Kyle Lauck, MD[4], Adelaide Hebert, MD[2,3]

[1]Department of Internal Medicine, Northside Hospital Gwinnett, Lawrenceville, GA
[2]Department of Dermatology, The University of Texas MD Anderson Cancer Center, Houston, TX
[3]Department of Dermatology, UTHealth McGovern Medical School, Houston, TX
[4]Department of Internal Medicine, UTHealth McGovern Medical School, Houston, TX

ABSTRACT

Objectives: A discrepancy exists in the geographical distribution of dermatologists across the United States (US). The aim of this study was to reexamine the current geographical density of dermatologists to describe any changes compared to date from 5 and 12 years ago.
Methods: Membership data from the 2021 American Academy of Dermatology (AAD) database were retrieved to characterize the distribution of dermatologists in 3-digit zip code areas.
Results: Out of 712 populated zip codes with dermatologists, 510 (71.6%) had less than 4 dermatologists per 100,000, as compared to 515 (72.3%) in 2016 (– 0.19% CAGR). The dermatologist density of the 100 most populated areas (M = 4.5 dermatologists per 100,000, SD = 3.3) and 100 least populated areas (M = 1.6 dermatologists per 100,000, SD = 6.2) were significantly different ($P < 0.0001$).
Conclusion: This analysis provides continued trends to compare to previous studies performed in 2016 and 2009. The highest and lowest density areas were similar to results from previous studies. The results indicate an enduring and significant maldistribution of dermatologists in the US.

INTRODUCTION

Despite expansion of the dermatologic workforce, a discrepancy remains in the geographical distribution of dermatologists across the United States (US). From a 2014 American Academy of Dermatology (AAD) survey, dermatologists in rural areas were more likely to report an undersupply of dermatologists, while dermatologists in urban areas were more likely to report an oversupply.[1] The Glazer et al. studies analyzing the geographic distribution of practicing dermatologists in the US in 2009 and 2016 confirmed this maldistribution.[2,3] This study presents a continuation of those studies and aims to reexamine the current geographical density of dermatologists to describe any changes that may have occurred over the past 5 and 12 years, respectively.

METHODS

Like the previous studies, de-identified data for AAD members were retrieved from the most current AAD membership database, the 2021 AAD membership database for this analysis. Demographic information included the member's category, state, and zip code. Fellows were included as practicing dermatologists. US territories were excluded from this analysis. US population data was obtained from the American Community Survey. Information associated with 5-digit zip codes were consolidated to their corresponding larger 3-digit zip codes. Compound annual growth rates (CAGR) were calculated to assess annual percentage growth. And descriptive statistics and unpaired two-sample t-tests were used. Institutional review board approval was not necessary as no human subjects were used for this study.

RESULTS

The 2021 database contained 11,525 dermatologists compared with 10,845 in 2016 (1.22% CAGR) and 9,598 in 2009 (1.54% CAGR). With the U.S. population approaching 328 million, there are 3.5 dermatologists per 100,000 people, an increase from 3.4 in 2016 (0.58% CAGR) and 3.2 in 2009 (0.75% CAGR). There were 712 zip codes that were populated and had at least 1 dermatologist; 510 (71.6%) of them had less than 4 dermatologists per 100,000, as compared to 515 (72.3%) in 2016 (– 0.19% CAGR). There were 174 areas that were populated (average population of 99,000) but had no dermatologists at all. The dermatologist density of the 100 most populated areas (M = 4.5 dermatologists per 100,000, SD = 3.3) and 100 least populated areas (M = 1.6 dermatologists per 100,000, SD = 6.2) were significantly different ($P < 0.0001$).

The 10 highest and lowest dermatologist density locations from the current analysis and the 2016 analysis are listed (**Figure 1** and **Figure 2)**. This listing is based on locations that have at least 1 dermatologist. The average density for the 10 densest locations was 24.6 dermatologists per 100,000, an increase from 23.3 in 2016 (1.1% CAGR), but a decrease from 25 in 2009 (– 0.13% CAGR). And 83.5% of the dermatologists in the top 10 areas practice in the northeast. Specifically, 93% can be found in either Manhattan or Boston. Currently, 36.5% of dermatologists practice in the 100 densest areas, a downtrend from 38.6% in 2016 (– 1.11% CAGR) and 40% in 2009 (– 0.76% CAGR). Conversely, only 1.6% of dermatologists practice in the 100 least dense areas as compared to 1.8% in 2016 (– 2.33% CAGR).

DISCUSSION

Our analysis reveals an enduring maldistribution of dermatologists between urban and rural areas (**Figure 3**). Almost 20% of populated zip codes did not have a single dermatologist. Like in 2009, the 10 densest zip codes had an average density 7 times the national average. Also, 9 of the 10 densest zip codes in 2016 remained among the top 10 in 2021. None of the least dense areas in 2016 improved to more than 1 dermatologist per 100,000. Some suggest that 4 dermatologists per 100,000 people is the ratio needed to sufficiently care for a population.[3] Consistent with 2016, over 70% of areas do not meet that target density and nearly 60% have less than 3 per 100,000. In the past 5 years, only 5 more zip codes reached this threshold. These results may indicate that initiatives aimed at redistribution of dermatologists have not made a major difference.

	2021			2016		
Rank	**3-Digit Zip Code (Section Code)**	**Location**	**Dermatologists per 100,000**	**3-Digit Zip Code (Section Code)**	**Location**	**Dermatologists per 100,000**
1	022	Boston, Massachusetts	57.6	101	Manhattan, New York (upper east side)	41.8
2	904	Santa Monica, California	31.9	943	Palo Alto, California	36.6
3	943	Palo Alto, California	28.4	904	Santa Monica, California	35.9
4	100	Manhattan, New York (central and lower)	25.9	022	Boston, Massachusetts	31.9
5	037	Hanover, New Hampshire	20.4	024	Middlesex County, Massachusetts	27.9
6	041	Portland, Maine	20.0	100	Manhattan, New York (central and lower)	24.0
7	905	Torrance, California	16.0	037	Hanover, New Hampshire	19.4
8	024	Middlesex County, Massachusetts	15.7	208	Bethesda and Rockville, Maryland	16.2
9	214	Annapolis, Maryland	15.5	214	Annapolis, Maryland	15.2
10	101	Manhattan New York (upper east side)	15.0	041	Portland, Maine	15.1

Figure 1. Comparison of the 10 most dermatologist-dense areas, for locations with at least 1 dermatologist, in the United States in 2021 vs 2016.

	2021			2016		
Rank	**3-Digit Zip Code (Section Code)**	**Location**	**Dermatologists per 100,000**	**3-Digit Zip Code (Section Code)**	**Location**	**Dermatologists per 100,000**
712	932	Bakersfield, California[a]	0.13	114	Jamaica, New York	0.27
711	114	Jamaica, New York	0.13	403	Lexington, Kentucky	0.30
710	936	Fresno, California	0.16	989	Yakima, Washington	0.35
709	851	Phoenix, Arizona[a]	0.22	776	Beaumont, Texas	0.37
708	403	Lexington, Kentucky	0.29	935	Mojave, California	0.38
707	610	Rockford, Illinois[a]	0.33	453	Dayton, Ohio	0.41
706	469	Kokomo, Indiana	0.33	465	South Bend, Indiana	0.42
705	989	Yakima, Washington	0.34	484	Flint, Michigan	0.44
704	935	Mojave, California	0.37	790	Amarillo, Texas	0.44
703	453	Dayton, Ohio[a]	0.40	304	Swainsboro, Georgia	0.45

[a]Suburban area

Figure 2. Comparison of the 10 least dermatologist-dense areas, for locations with at least 1 dermatologist, in the United States in 2021 vs 2016.

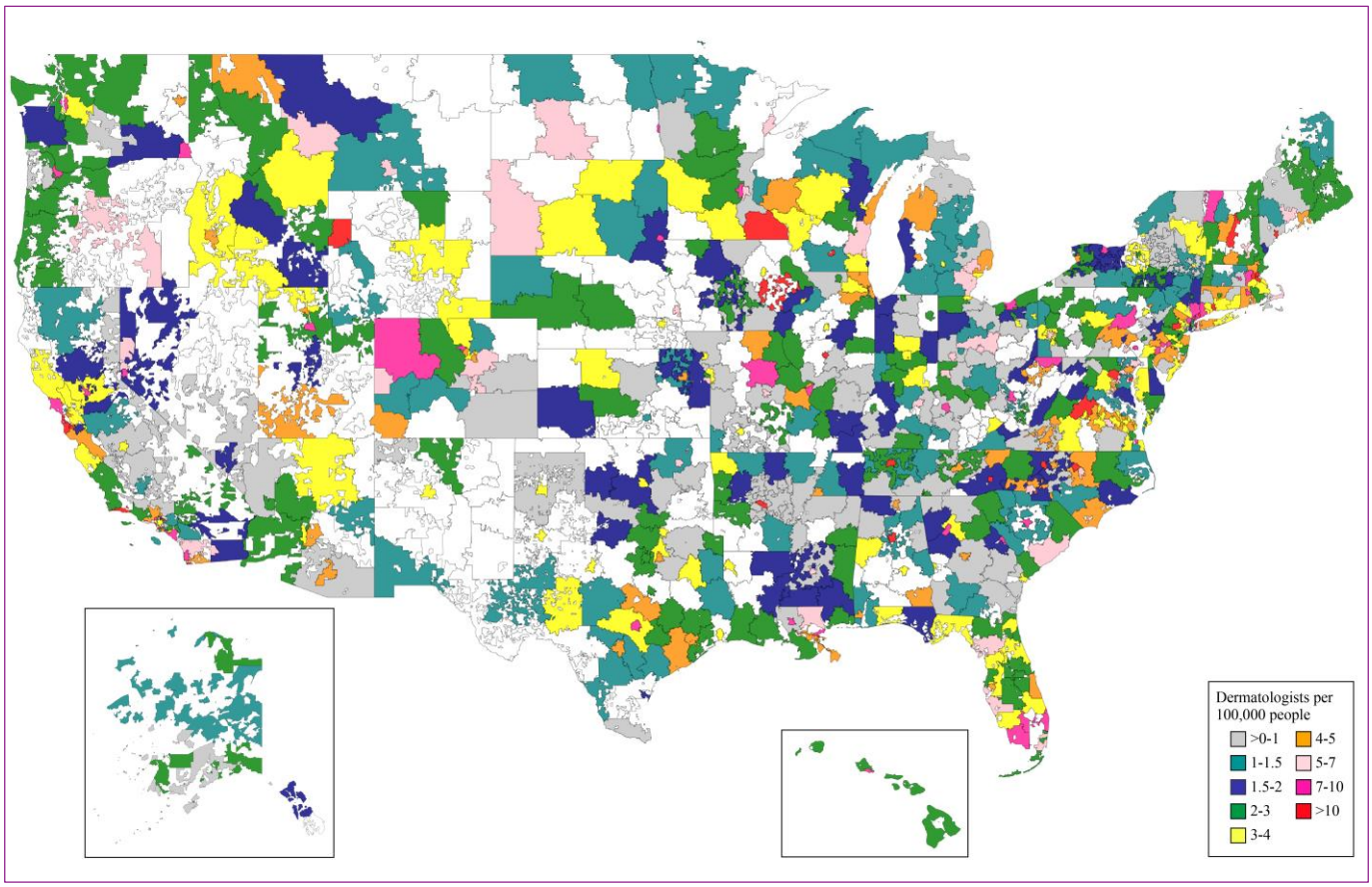

Figure 3. US Dermatologist Density by 3-Digit Zip Code. The number of dermatologists practicing per 100,000 people in each 3-digit zip code is indicated by the colors on the map. Zip codes without any dermatologists are included in white.

Addressing underserved areas remains paramount as dermatologist density is associated with patient outcomes, particularly in melanoma and Merkel cell carcinoma.[4,5] Multiple solutions have been considered. One of the strongest barriers in rural physician retention is lack of geographical connection, partly due to the limited residency positions available. Partnerships between residency programs and rural hospitals may expand residency spots, while also supporting underserved areas.[6] Advanced practice practitioners may alleviate rural areas, however, they tend to favor urban areas as well.[7] And teledermatology has proven to be effective in rural communities, with reimbursement constraints as the greatest barrier.[8] Other strategies to consider include financial incentives, increasing physician spouse job opportunities, and recruiting students of rural backgrounds.

This study is limited by the AAD membership database, as AAD membership distribution may not represent the true distribution of all US dermatologists. However, this analysis may still add to the overall discussion and provide insight into the subject, since we used a consistent methodology as previous studies and present trends over a 5- and 12-year span. Another limitation is our analysis assumes each area requires similar a dermatologist density (4 dermatologists per

100,000 people) and we cannot account for specific differences in demand within each area. The data presented constitutes one metric and should be interpreted alongside other measures of adequacy (such as appointment wait-times) for a holistic viewpoint of this nuanced issue.

CONCLUSION

Based on the AAD membership database, an enduring maldistribution of dermatologists exists. This complex issue likely needs a multifaceted solution with continual effort and thought from leaders in the field. Recurrent assessment of the database in the future can continue to help identify areas that may be underserved. This knowledge may provide insight into the effectiveness and implementation of countermeasures and, ultimately, improve patient care and outcomes.

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Corresponding Author:
Christopher N. Nguyen, MD
1 Baylor Plaza
Houston, TX 77030
Email: christopher.nguyen42@gmail.com

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