

Using Travel Time and Distance to Quantify Access to Rural Dermatologic Specialty Care in Rural, Southeast and Northwest Missouri

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Abstract

Purpose. One- fifth of the United States population lives in rural communities, which can greatly limit residents' access to healthcare. This study examined how opening dermatology clinics in rural areas of Missouri impacted the distance and travel time required to see a dermatologist.

Methods. Over 500 participants completed a one-time questionnaire detailing dermatologic care prior to visiting the new rural dermatology clinics. Patients' home zip codes and prior healthcare provider's zip codes were collected and used to calculate travel time and distance to care.

Findings. In southeast Missouri, the average distance traveled for patients who had previously seen a dermatologist in another city was reduced by 29 miles on average (median=29 miles, mode=34 miles). In northwest Missouri, the travel reduction to receive care after new clinic opening was, on average, 45.6 miles.

Conclusions. Our data demonstrate that dermatology specialty care in rural communities decreased distance traveled for patients with skin conditions. Reducing the distance between rural patients and specialty providers can lead to improved care for rural Americans.

Introduction

One-fifth of the United States population lives in rural America which comes with unique challenges for the citizens that reside in these communities¹. Rural populations face decreased

access to healthcare and increased morbidity and mortality compared to their urban counterparts². One factor contributing to this health crisis is limited access to care and the isolation from metropolitan areas and specialty services.

Health disparities that accompany rural barriers to care encompass dermatologic diseases as well. While over one-third of primary care patients seek care for at least one skin problem, there is a maldistribution of specialty care available³. The distance traveled to obtain dermatologic care has a measurable effect on disease state. Stitzenberg et al highlights this disparity by looking at Breslow depth in melanoma patients and distance traveled to a dermatologist for diagnosis. They found that for every one mile traveled, there was a 0.6% increase in depth⁴.

In 2021, a new dermatology clinic opened in rural Southeast Missouri (SE MO). Before the opening of this clinic, the closest board-certified dermatologist was over a 30-minute drive for members of the community and even further for those living outside of it. While in 2022, U.S. Dermatology Partners (USDP) opened a clinic in a rural northwestern Missouri community. Prior to this, the nearest full-time dermatology clinic was greater than 60 miles away. Brustrom and Hunter showed that patients are unlikely to travel more than 20 miles for medical care, even when care is free⁵. Our aim is to quantify the effectiveness of this clinic opening in regard to access to dermatologic care by looking at drive time and first-time specialty care.

Methods

Over 500 participants completed a one-time questionnaire detailing past dermatologic care at each clinic. These questionnaires were completed within the first 18 months of the opening of Missouri Delta Medical Centers' (MDMC) Dermatology clinic and USDP-Chillicothe. Participants included adult patients receiving care from the MDMC Dermatology clinic who consented to participate. Utilizing self-reported home zip code and healthcare provider zip codes, drive time and miles traveled were calculated.

Ethics Approval

IRB approval was not required as this project was classified as quality improvement metrics for the clinics to utilize.

Drive Time Questionnaire

1. Home Zip Code: _____

2. Is Dr. Sindle the first dermatologist you've ever seen?

Yes ___ No ___

If yes,

3. What town was the closest dermatologist to you other than Dr. Sindle's office?
City Name/Zip Code: _____

4. Did you seek care for any skin concerns by a primary care provider (pediatrician, family medicine, etc.)?
-No
-Yes, City name/zip of clinic location: _____

5. Have you ever been seen for a skin concern by a provider who wasn't a dermatologist of primary care provider? (Ex: a surgeon)
-No
-Yes, provider specialty _____ and city name/zip code of clinic location: _____

If no,

3. Where were you seen in the past?
City Name/Zip Code: _____

Disclosure: this survey is completely voluntary and anonymous. Please do not disclose name or birthday on this survey. No personal data will be shared.

Results

In SE Missouri, 498 participants completed surveys. Sixty-three unique home zip codes were reported. Almost 54% of participants at the new Sikeston clinic saw a dermatologist for the first time. These participants who had not previously seen a dermatologist lived on average 35.6 miles to the closest dermatologist before the opening of MDMC's specialty clinic. The average distance traveled for patients who had previously seen a dermatologist in another city was reduced by 29 miles on average (median=29 miles, mode=34 miles). The average distance traveled for these

patients before seeking care in Sikeston was 40.6 miles to their previous dermatologist and after was 18.4 miles to the new dermatology office in Sikeston (Figure 1). The largest reduction in travel distance for patients who had seen a dermatologist before was 155 miles.

In NW Missouri, 113 patients were included from 28 unique zip codes. Forty-two patients (37%) had never seen a dermatologist, and 71 (63%) had seen a dermatologist prior to their first visit to MDMC Dermatology. Fifty percent of new dermatology patients sought care for skin-related concerns from their primary care provider. For prior dermatology patients, the travel reduction to receive care after clinic opening was, on average, 45.6 miles and 46.1 minutes. New dermatology patients cited the nearest dermatologic specialty care prior to clinic opening to be an average of 62.3 miles and 65.5 minutes away. The average travel time to care after the clinic opened in this population was 19.1 miles and 23.7 minutes.

Discussion

This study aimed to assess the impact of new rural dermatology clinics on access to specialty care by analyzing the reduction in travel distance and time for patients seeking dermatologic services in Southeast Missouri (SEMO) and Northwest Missouri (NWMO). The findings highlight the crucial role that localized specialty care plays in improving access, particularly in underserved rural regions.

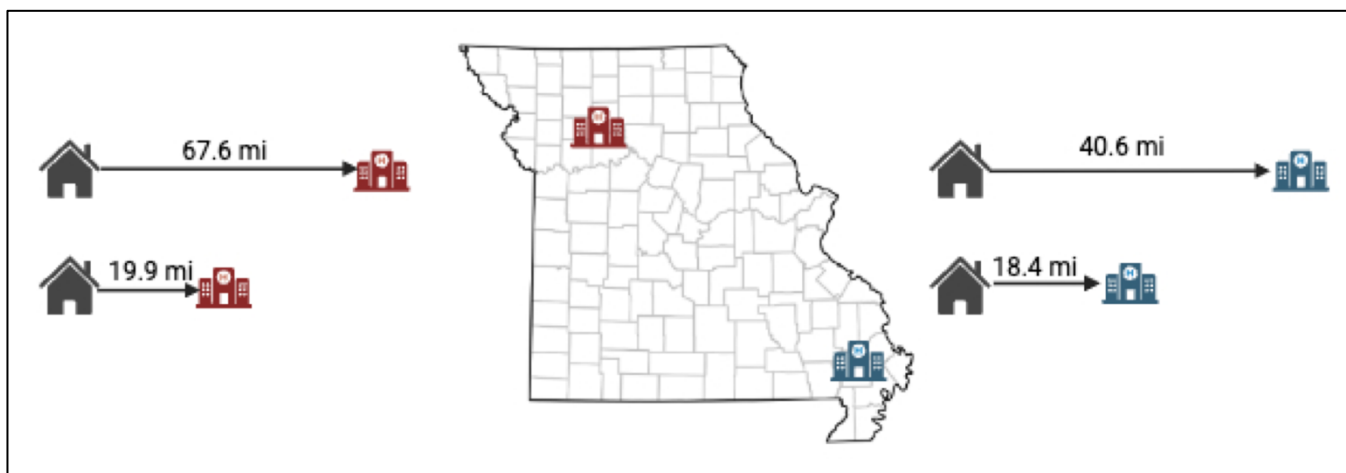


Figure 1: Distance traveled by patients who had previously seen a dermatologist before and after the opening of new clinics in NW MO and SE MO. Patients in NW MO were an average of 67.6 miles from their dermatologist before the new clinic opened, and they were an average of 19.9 miles from the new Chillicothe clinic. Patients in SW MO were an average of 40.6 miles from their dermatologist before the new clinic opened, and they were an average of 18.4 miles from the new Sikeston clinic

Improved Access to Dermatologic Care in Rural Missouri

Both clinics showed a significant reduction in the distance patients traveled to receive dermatologic care. In SEMO, the opening of the Missouri Delta Medical Center (MDMC) clinic reduced travel distance by 29 miles on average for those previously receiving care in other locations. Similarly, the opening of the U.S. Dermatology Partners (USDP) clinic in NWMO resulted in an average reduction of 45.6 miles for returning dermatology patients. This reduction emphasizes the geographic barriers that rural patients face and how local access can alleviate these challenges.

In SE Missouri, over half of the patients had never seen a dermatologist prior to their first visit, underscoring the unmet demand for dermatologic care in the region. NWMO showed a similar trend, with 37% of patients seeking dermatologic care for the first time after the clinic's opening. These findings indicate that the proximity of dermatologic services can encourage patients to seek care for previously untreated or unmonitored conditions.

Impact on Disease Outcomes and Public Health

The importance of timely dermatologic care cannot be overstated, particularly in rural areas where barriers to specialty services often lead to delayed diagnoses and worsening disease severity. As previously demonstrated, increased travel distance can correlate with adverse disease outcomes, as seen with deeper Breslow depths for melanoma diagnoses in patients who must travel further to see a dermatologist. The reduced travel time and distance observed in this study may not only improve the likelihood of early diagnosis but may also prevent the progression of skin diseases to more severe stages, thus potentially reducing morbidity and mortality associated with conditions like melanoma, psoriasis, and other skin cancers.

A review of nearly ten thousand patients in Nebraska with melanoma demonstrated that rural melanoma patients had a significantly greater likelihood of dying from melanoma compared to their urban counterparts.⁶ This finding illustrates a major disparity in health outcomes for rural citizens. If more rural dermatology clinics were available, these patients may have been seen earlier and may have had better outcomes. In a review of the National Cancer Database from 2011 to 2020, Akers et al found that urban patients were significantly more likely to present with a stage zero, one, or two melanoma compared to rural patients who were

more likely to present with a stage three or four melanoma.⁷ In that study, rural patients traveled an average of 68 miles to receive dermatology care while urban patients drove an average of 20 miles. Overall, multiple studies reinforce the concept that rural patients tend to have later stage melanomas and worse mortality from melanoma compared to urban Americans.

Barriers to Care and Patient Behavior

While reducing travel distance is a critical factor in improving access to care, other barriers remain, including transportation issues, socioeconomic factors, and the availability of timely appointments. Previous studies have indicated that many patients are unwilling to travel more than 20 miles for care, even when services are provided at no cost. In this study, patients in NWMO and SEMO traveled significant distances even after the opening of nearby clinics, with average distances still exceeding 13 miles in SEMO and 19 miles in NWMO. Although these reductions are substantial, further efforts may be needed to address the remaining access barriers.

Additionally, the high percentage of patients in both clinics who had never seen a dermatologist prior to the study indicates the importance of patient education and outreach. Increased awareness of the availability and importance of dermatologic care in these regions could potentially encourage more patients to seek preventive care earlier, reducing the overall burden of skin disease.

Limitations

Multiple limitations exist in this study. Participation was entirely voluntary, and there were no incentives to complete the survey. This study is also subject to recall bias, as patients may not remember visiting a dermatologist or where exactly that dermatologist was located. These findings are important for the regions served but may be difficult to generalize to regions with different infrastructures or healthcare systems. Finally, geography is only one barrier to seeking care. The survey did not capture health insurance status, socioeconomic status, access to transportation, or other variables that impact a person's ability to travel to a physician's office.

Future Directions

This study provides valuable insight into the positive impact that localized specialty clinics can have on rural populations. Future research could expand upon this by assessing clinical outcomes, such as changes in disease severity and treatment

delays before and after the clinic openings. Furthermore, studies exploring the socioeconomic and demographic factors influencing access to dermatologic care in these rural regions may help identify additional strategies to bridge the care gap.

Lastly, efforts to extend teledermatology services to even more remote areas could further alleviate the access disparities highlighted in this study. Telemedicine can reduce the need for long-distance travel for initial consultations, follow-up visits, or monitoring of chronic conditions, particularly for patients in geographically-isolated areas.

Conclusion

The opening of dermatology clinics in rural SE and NW Missouri substantially reduced travel distances and improved access to specialty care for previously underserved populations. The increased access to dermatologic care for patients who had never been seen by a dermatologist before the clinic's establishment reflects the critical need for localized services in rural communities. As healthcare disparities in rural America continue to persist, the implementation of similar specialty clinics and other innovative solutions, like telemedicine, will be key to addressing the gaps in care for dermatologic and other specialty services.

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