

Identifying the Status of Telehealth for Cancer Patients in the Rural Northeastern United States

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KEYWORDS. Telehealth, Cancer, Rural, Access

BRIEF. Surveyed oncologists in the rural northeastern United States allow for the prediction of future improvements for cancer care-related telehealth.

ABSTRACT. Cancer is a disease that affects all populations. While research suggests that incidence rates for cancers in the United States are declining in both rural and urban populations, studies also show that rural populations have higher mortality rates than their urban counterparts. Frequently highlighted limitations, like travel distance and costs, have prohibited better care for these patients. A current trend to combat such limitations has been the implementation of telehealth in various methods (patient-provider visits, monitoring, interpretation of testing results, consultations, clinical trials, etc.). However, certain rural regions, especially those in the northeastern United States, fail to attain the data that affirms this popular application's success. In fact, little is known about the status of cancer care for patients in the rural northeastern United States. Therefore, there is a crucial need for more information on how telehealth affects cancer care patients living in this location. We crafted a survey for oncologists throughout this region to gather the most genuine data regarding this topic possible. After analyzing the results, we suggest the best improvements to increase the effectiveness and quality of cancer care in the rural northeastern United States. The findings indicate changes that would be most beneficial for oncologists in this region to advance their overall service and treatment.

INTRODUCTION.

Recent statistical research has shown that current lifestyle habits, along with an aging population, are responsible for a global increase in the occurrence of cancer [1]. While the United States has seen overall incidence and mortality rates decline, this decline has not been seen in its rural populations [2]. The 2010 United States Census Bureau counted nearly 1 in 5 Americans living in a rural area, making this disparity an urgent concern [3]. Significant ethnic, geographic, and socioeconomic disparities exist in modern cancer treatment and screening [4, 5]. Living in a rural area has been shown to present obstacles to cancer care access, specifically due to increased poverty, transportation barriers, limited access to certain resources for comprehensive, high-quality care, and insufficient health care personnel and/or specialists [6]. In fact, data from the American Society of Clinical Oncology's workforce analysis shows that only 3% of medical oncologists practice in rural areas, and over 70% of counties in the United States do not have medical oncologists [7]. These limitations contribute to the higher cancer mortality and incidence rates in rural areas compared to urban locations [8]. This has led to a public understanding of the growing need for improvement in cancer medicine and oncology. However, despite overall gains toward better quality treatment and access to care in the United States, certain regions continue to lag in attaining the same level of improvement [9].

One consequence of COVID-19 was the rapid adoption of telehealth to deliver medical care [10]. Research comparing telehealth intervention with standard face-to-face intervention has shown telehealth to have the potential to be just as effective as traditional in-person interventions [11]. As with any new modality of delivering

care, there are many hurdles to overcome such as equipment, training, and licensing, which are all magnified in a rural setting [12, 13]. Utilizing telehealth to improve the cancer care of rural dwellers is a recent area of focus [8]. Unfortunately, areas such as the rural northeastern United States lack not only the data to support or disprove this trend but also to suggest future implementations that would improve the quality of care, specifically oncology care [14].

The purpose of this study was to examine the prevalence of telehealth in rural northeast cancer care and determine ways to make it more assessable in this setting. We hypothesized that rural oncologists would have the best insight into how telehealth could improve the treatment of their patients. This will provide guidance for improving access to quality cancer care in rural areas, specifically the Eastern Shore of Delaware, Maryland, and Virginia, and whether investing in telehealth as a potential treatment method is worthwhile.

MATERIALS AND METHODS.

A survey, shown in Table 1, was distributed to oncologists and their nurse practitioners at seven hospitals serving the rural residents of Delaware, Maryland, and Virginia. Hospitals surveyed were in counties defined as rural based on geographic isolation and lack of access to public transportation as well as health care. The hospitals surveyed were in Sussex County, Delaware: Dorchester, Somerset, Wicomico, and Worcester counties in Maryland: and Accomack County, Virginia. All counties met the definition of rural based on U.S. Census criteria and were deemed USDA Business and Industry Ineligible locations [15].

Google forms were employed to deliver the survey. Immediate delivery, low cost, and the ability to reach a large array of oncologists in a widespread area were deciding factors in this method of data collection. The online survey consisted of seven multiple choice and three freehand response questions, entitled "Telehealth Poll." The survey was designed to take no more than ten minutes of the provider's time to complete. Direct (yes/no) questions established a baseline on current telehealth use by the provider, its benefit during COVID-19, and whether there was a place for this mode of care in the future. A few questions were intended to gather specific ways that oncologists had implemented telecare in their practices, their level of success, and in what ways would they continue to apply telecare in future deliveries of care. Difficulties encountered with this modality of care were also investigated. Lastly, three open-ended questions allowed providers to address why telehealth should have a place in rural oncology care, how it could be improved, and how great a benefit it will ultimately make for their patients.

RESULTS.

Of the oncologists and their staff surveyed, we were only able to obtain a 5% response rate, precluding the use of statistics to analyze our collected data. Despite this, all respondents answered to having engaged in telehealth. During COVID-19, all respondents found telehealth to be beneficial for patients' cancer care and treatment.

Table 1. Telehealth survey content

Survey Question	Answer Choice
Have you engaged in telehealth in any way?	yes/no
In what ways did you participate in telehealth?	virtual patient provider visits/online monitoring/remote interpretation of tests/virtual consultations/at home clinical trials for patients/none/other
Do you think that telehealth during covid-19 benefitted your patients?	yes/no/no notable effect
Would you be interested in further implementing telehealth into the future of healthcare? Explain.	yes/no/indifferent (open ended)
What hindrances have you found with telehealth and patients?	poor internet connection/difficulty operating technology/limited access to technology/credentialing and licensing/reimbursement/interoperability/patient mistrust/malpractice concerns/other/none
How do you feel telehealth has affected cancer-care in this region? Explain.	positively/negatively/no significant change (open ended)
What parts of telehealth do you feel would best benefit your patients?	virtual patient provider visits/online monitoring/remote interpretation of tests/virtual consultation/at home clinical trials for patients/other/none
What would change about telehealth practices in this region to make it more beneficial to you and your patients?	(open ended)

Healthcare providers had previously participated in telehealth through virtual-patient provider visits and virtual consultations. Figure S1 demonstrates that the most frequently identified and emphasized setbacks encountered by telehealth and patients were poor internet connectivity, user difficulty operating technology, and limited access to technology.

As evident in Figure S2, half of the respondents from the current study felt that telehealth benefitted cancer care in this region and half felt that there was no significant change. Additionally, this data demonstrated that telehealth had no perceived adverse or negative effects on cancer care in the rural northeastern United States. Despite this, all healthcare providers were interested in further implementing telehealth into the future of cancer care in their region. Reasons for doing so included homebound patients having access to aggressive treatment and telehealth providing convenience to patients in ways like eliminating travel times and cost. In support of continuing the adoption of telehealth in rural areas, providers pointed out that patients are not always well enough for office visits and commonly lack a reliable means of transportation. On the other hand, it is worth noting that while telehealth has provided convenience for follow-up and some consultation appointments, it does not impact whether treatment is needed as patients are still required to come into the clinic for certain types of care.

In the future, virtual-patient provider visits, online monitoring, remote interpretation of tests, and virtual consultations (the most widely suggested) were recommended for future beneficial telehealth improvements in the rural northeastern United States. For potential changes, eliminating video telehealth in times when it is not necessary, being able to see patients from the provider’s practice who are out of state, and being available to Medicaid patients were the most mentioned improvements.

DISCUSSION.

Despite limited data, this study affirms that telehealth has a promising future in optimizing cancer care for patients in the rural northeast. Our research identified ways that telehealth has already upgraded the cancer care experience through the ease of virtual consultations and follow-ups. Changes in legislation would allow interstate telehealth, and the inclusion of Medicaid patients would place telehealth in the hands of those persons who could benefit from this option the most. Notably, providers felt telehealth would remain part of the overall

cancer care delivery. Additionally, they deemed that telehealth had no adverse effects on treatment.

Despite attempts to obtain at least a 50% survey response rate from oncologists and their nurse practitioners, we were unable to do so. The main reason given during follow up was a lack of time to respond to our survey. Collecting healthcare information via online survey proved challenging, suggesting that other methods or incentives should be enlisted for future efforts to collect such data. Due to a low response rate of 5%, answers could not be statistically analyzed for all northeastern rural locations despite continuous attempts to contact healthcare professionals either virtually or in person. However, responses do provide preliminary findings for future work. Results obtained showed agreement that telehealth use in oncology care has been helpful, particularly during the COVID-19 pandemic. Furthermore, all respondents felt there is a role for telehealth in future applications in rural cancer care, citing convenience and the ability to research more treatment options. The inherent limitations of patient access to the internet and the unreliability of a strong network in rural settings were primary concerns for oncologists. These issues led to division as to how oncologists ultimately felt about telehealth’s impact on rural Northeast cancer care to date. Opinions also differed on the best ways to currently utilize this modality of care in the rural setting. On the other hand, the various possibilities cited by oncologists; virtual patient/provider visits, online monitoring, remote interpretation of tests, and virtual consultations, show many potential areas for future focus that could facilitate rural cancer care. Respondents also acknowledged that cancer care involves treatments such as radiation, chemotherapy, and surgery that telehealth simply cannot impact.

CONCLUSION.

This research further supported that rural patients face unique challenges involving healthcare access. Higher cancer mortality rates observed in rural populations highlight the urgency to employ new methods of care for affected individuals. Findings from this study suggest promise in telehealth to bring part of this care directly to patients in a timely manner. Future data collection from oncologists and staff in other northeastern rural locations is needed. Determining ways to provide rural patients with Wi-Fi network access and associated devices to use while receiving care is also needed for telehealth to be a reliable modality. Overall, the mission to close the

gap in cancer survival rates and basic access to care existing between rural and urban populations is worthy of future studies.

ACKNOWLEDGMENTS.

I want to express my gratitude toward Ms. Crystal Harrell of Yale University's School of Public Health for the incredible mentorship that she provided throughout the conducting of this research. I also want to thank Mr. Ishaan Chawdhary and Mr. Tyler Moulton for their support and advice on this research study.

SUPPORTING INFORMATION.

The supporting information includes figures serving as visual representations of the data regarding the hindrances of telehealth and the perceived benefit of telehealth usage for cancer care patients in the Northeastern United States.

REFERENCES

1. L.A. Torre, F. Bray, R.L. Siegel, J. Ferlay, J. Lortet-Tieulent, A. Jemal, Global cancer statistics. *CA Cancer J Clin.* **65**(2), 87-108 (2012).
2. W.E. Zahnd, A.S. James, L. Brard, Rural-Urban Differences in Cancer Incidence and Trends in the United States. *Cancer Epidemiol Biomarkers Prev.* **27**(11), 1265-1274 (2018).
3. Census Urban and Rural Classification and Urban Area Criteria. *United States Census Bureau*, (2010).
4. Y. Collins, K. Holcomb, E. Chapman-Davis, D. Khabele, J.H. Farley, Gynecologic cancer disparities: a report from the Health Disparities Taskforce of the Society of Gynecologic Oncology. *Gynecol Oncol.* **133**(2), 353-61 (2014).
5. L.S. Downs, J.S. Smith, I. Scarinci, L. Flowers, G. Parham, The disparity of cervical cancer in diverse populations. *Gynecol Oncol.* **109**(2 Suppl), 1275-82 (2008).
6. J.A. McDougall, M.P. Banegas, C.L. Wiggins, V.K. Chiu, A. Rajput, A.Y. Kinney, Rural disparities in treatment-related financial hardship and adherence to surveillance colonoscopy in diverse colorectal Cancer survivors. *Cancer Epidemiol Biomark Prev.* **27**(11), 1275-82 (2018).
7. M. Charlton, J. Schlichting, C. Chioreso, M. Ward, P. Vikas, Challenges of rural Cancer Care in the United States. *Oncology (Williston Park).* **29**(9), 63340 (2015).
8. T. Pal, P.C. Hull, T. Koyama, P. Lammers, D. Martinez, J. McCarthy, E. Schremp, A. Tezak, A. Washburn, J.G. Whisenant, D.L. Friedman,

Enhancing Cancer care of rural dwellers through telehealth and engagement (ENCORE): protocol to evaluate effectiveness of a multi-level telehealth-based intervention to improve rural cancer care delivery. *BMC Cancer.* 126 (2021).

9. N. Wentzensen, M.A. Clarke, R.B. Perkins, Impact of COVID-19 on cervical cancer screening: Challenges and opportunities to improving resilience and reduce disparities. *Preventative Medicine.* (151), 1-7 (2021).
10. M.A. Bowman, D.A. Seehusen, C.J. Ledford, The 'Telehealth Divide' - Who Are the Underserved, and What Care Is Improved. *J Am Board Fam Med.* **35**(3), 451-453 (2022).
11. R. Speyer, D. Denman, S. Wilkes-Gillan, Y.W. Chen, H. Bogaardt, J.H. Kim, D.E. Heckathorn, R. Cordier, Effects of telehealth by allied health professionals and nurses in rural and remote areas: A systematic review and meta-analysis. *J Rehabil Med.* **50**(3), 225-235 (2018).
12. R. Nelson, Telemedicine and Telehealth: The Potential to Improve Rural Access to Care. *AJN Reports.* **117**(6), 17-18 (2017).
13. K. Cortelyou-Ward, D.N. Atkins, A. Noblin, T. Rotarius, P. White, C. Carey, Navigating the Digital Divide: Barriers to Telehealth in Rural Areas. *J Health Care Poor Underserved.* **31**(4), 1546-1556 (2020).
14. K.E. Knudsen, C. Willman, R. Winn. Optimizing the Use of Telemedicine in Oncology Care: Postpandemic Opportunities. *Clin Cancer Res.* **27**(4), 933-936 (2021).
15. Rural Maryland Council, The Rural Maryland Council. *Rural Maryland Council.* (2020)



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