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WHITE PAPER

Telehealth in Connecticut

An Analysis of Private Healthcare Claims Focusing on Areas with Greater Minority Populations

A FAIR Health White Paper, September 7, 2023

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Executive Summary

Telehealth became a major source of medical care during the COVID-19 shutdown in 2020 to reduce the risk of disease transmission. By providing benefits such as increased convenience and decreased travel time to appointments, telehealth has the potential to reduce traditional barriers to care that have been exacerbated by the pandemic for underserved populations, such as communities of color. However, previous research has left unclear the impact of telehealth on patient results such as number of visits, costs, emergency room (ER) visits and hospitalizations, and how these relate to the racial and ethnic diversity of an area.

With generous funding provided by the Connecticut Health Foundation, FAIR Health conducted an observational study, delving into its repository of private healthcare claim records—the largest in the nation—to examine the use of telehealth in Connecticut, with particular attention to differences in treatment in areas with greater minority populations. This study is intended for healthcare stakeholders in Connecticut and nationwide, including researchers, payors, providers, policy makers and patients. Stakeholders can use these insights to inform new research studies, influence the adoption of or reimbursement for telehealth for specific conditions, highlight areas of concern regarding healthcare access and address disparities in care. The analyses include the Connecticut population overall and also an in-depth analysis of seven of the most common and well-known health conditions treated via telehealth in the state. FAIR Health does not have data on the race or ethnicity of specific patients, so data are reported based on the racial and ethnic makeup of the geographic area referenced as a whole, not based on the race or ethnicity of the specific patients in the pool.

The study examined telehealth use for seven conditions: anxiety and other nonpsychotic mental disorders, mood (affective) disorders, COVID-19, acute upper respiratory infections, hypertensive diseases, diabetes mellitus and substance use disorders.

Among the key findings comparing patients who used telehealth to those who received only in-office medical care, using claim dates of service from March 1, 2020, to September 30, 2022:

- Females used telehealth more than males. Of all Connecticut residents receiving medical care included in the data, 52 percent were female and 48 percent were male. Among telehealth users, however, 59 percent were female and 41 percent were male.

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- In most of the eight geozips[1] in Connecticut, the share of patients using telehealth was fairly similar to that using all medical services. The two exceptions were geozip 061 (Hartford), which had a lower percentage of patients using telehealth, and geozip 068 (Stamford, Norwalk, Danbury), which had a higher percentage of patients using telehealth. Fifteen percent of all people in Connecticut who received medical services were from geozip 061, while 11 percent of those using telehealth were from that geozip; and 17 percent of all residents received medical care in geozip 068, while 21 percent of those using telehealth were from that geozip.

- Most patients used telehealth to see healthcare providers whom they also saw in person. Overall, 92.5 percent of Connecticut patients sought telehealth care from a provider whom they saw in person either before or after their telehealth visit. Only 7.5 percent of Connecticut patients used a telehealth provider they never saw in person.

- Overall, Connecticut telehealth patients were almost 15 times as likely as those who did not use telehealth to have more total visits[2] than average (odds ratio [OR][3]=14.90, 95 percent confidence interval [CI], 14.62-15.19, *P*<0.0001) and over 10 times as likely to have a higher allowed amount[4] sum than average (OR=10.61, 95 percent CI, 10.38-10.86, *P*<0.0001). In addition, telehealth patients were more likely to have ER visits and hospitalizations than patients who did not use telehealth, and that likelihood was higher for those who had more ER visits or hospitalizations. It is beyond the scope of this study to determine whether telehealth treatment or differences in the patients who select telehealth care led to the different results.

[1] A geozip is a geographic region typically corresponding to the first three digits of a zip code.

[2] Total visits include telehealth visits, in-person visits, ER visits and hospitalizations.

[3] In this white paper, the odds ratio (OR) is the likelihood that a result will occur in the presence of telehealth compared with the likelihood of it occurring without telehealth. An OR equal to 1 means that telehealth is not associated with the odds of the result; an OR of more than 1 means that telehealth is associated with higher odds of the result; and an OR of less than 1 means telehealth is associated with lower odds of the result.

[4] An allowed amount is the total negotiated, in-network fee paid to the provider under an insurance plan. It includes the amount that the health plan pays and the part the patient pays under the plan's in-network cost-sharing provisions (e.g., copay or coinsurance if the patient has met the deductible).

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- For two behavioral health conditions, a higher percentage of patients used telehealth rather than using only in-office care, but for the other five conditions studied, more patients were treated without telehealth than with it. The two conditions with higher telehealth use were anxiety and other nonpsychotic mental disorders (71 percent versus 29 percent), and mood (affective) disorders (74 percent versus 26 percent). The other five conditions—COVID-19, acute upper respiratory infections, hypertensive diseases, diabetes mellitus and substance use disorders—had higher percentages of patients associated with in-office care only than with telehealth.

- For all seven conditions analyzed in Connecticut, patients who used telehealth had higher average numbers of ER visits and hospitalizations than those who did not. The difference was particularly pronounced among patients with diabetes mellitus and hypertensive diseases; patients who used telehealth for these conditions had approximately double the average number of ER visits and hospitalizations as patients who did not use telehealth. For four of the conditions (acute upper respiratory infections, hypertensive diseases, diabetes mellitus and substance use disorders), this difference was significant in all geographic areas studied, regardless of the racial and ethnic makeup of the population.

- For all seven conditions, greater racial and ethnic diversity in an area (as measured by a smaller percentage of white people)[5] correlated with higher average numbers of ER visits and hospitalizations for both patients who used telehealth and those who did not use it. For six out of seven conditions, the differences among the three different population groupings (geozips that are 26 to 50 percent white, 51 to 75 percent white and 76 to 100 percent white) were statistically significant ($P<0.01$ to $P<0.0001$).

[5] The percentage of white residents in an area includes those identified by census data as white, as distinct from Black, Hispanic, Asian and other. The three geographic groupings included in this study are all geozips that are 26 to 50 percent white, 51 to 75 percent white and 76 to 100 percent white. Because no geozip in Connecticut is less than 26 percent white, the proportion 0 to 25 percent white is not included in this study.

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- For two behavioral health conditions, higher average overall costs for treatment were associated with patients who used telehealth, while lower average costs were associated with patients who used telehealth for two infectious conditions. For the behavioral health conditions (anxiety and other nonpsychotic mental disorders, and substance use disorders), average total allowed amount per person was higher for patients who used telehealth than those who used only in-office care across each of the eight geozips in Connecticut and across the state as a whole. For two of the other conditions (acute upper respiratory infections and COVID-19), average total allowed amount per person was lower for patients who used telehealth than those who used only in-office care in all eight geozips and statewide. Telehealth for the remaining three conditions varied by geozip and statewide.

- For treatments that included telehealth, substance use disorders were the condition with the highest likelihood of having more visits than the average number of visits, while acute upper respiratory infections were the condition least likely to be associated with more visits than average when treatment included telehealth. Of all seven conditions studied, substance use disorders had the highest odds ratio for more visits than average in Connecticut when patients used telehealth for the condition. Patients who used telehealth for substance use disorders were 4.09 times as likely as patients who did not use telehealth to have more visits related to their condition than average (95 percent CI, 3.77-4.45, $P<0.0001$). In contrast, patients who used telehealth for acute upper respiratory infections had the lowest odds ratio for more visits than average, though telehealth was still associated with a higher likelihood than no telehealth (OR=1.50, 95 percent CI, 1.44-1.55, $P<0.0001$).

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- Visits for patients who used telehealth for anxiety and other nonpsychotic mental disorders were the most likely to have higher-than-average costs, whereas visits for patients who used telehealth for COVID-19 were the least likely to have higher-than-average costs. Anxiety and other nonpsychotic mental disorders had the highest odds ratio for a higher allowed amount sum than average in Connecticut when patients used telehealth for this condition. Telehealth patients with anxiety and other nonpsychotic mental disorders were 3.22 times as likely as patients who did not use telehealth to have higher-than-average total allowed amounts for anxiety-related visits (95 percent CI, 3.11-3.34, *P*<0.0001). Conversely, COVID-19 telehealth patients had the lowest odds ratio: They were less likely than patients who did not use telehealth to have a higher COVID-19-related allowed amount sum than average (OR=0.38, 95 percent CI, 0.35-0.40, *P*<0.0001).

It is beyond the scope of this study to determine whether the increased visits, costs, ER visits and hospitalizations generally associated with telehealth in Connecticut in 2020-2022 were necessary or unnecessary, or whether there was a causal relationship between telehealth and the measured results. For example, with behavioral health conditions, a greater number of visits may indicate greater adherence to recommended treatment for those conditions. Similarly, increased visits noted for patients with diabetes and hypertension—both conditions that disproportionately affect people of color—may indicate increased remote monitoring.

Background

Telehealth, the remote provision of healthcare via telecommunications technology, became a major source of medical care during the COVID-19 shutdown in 2020[6] as providers and patients worked to follow the recommendations of national and international health organizations to reduce the risk of virus transmission.[7] A FAIR Health brief showed that claim lines indicating telehealth utilization in the United States increased 4,347 percent during the initial wave of COVID-19 in March 2020 when compared with the same month in 2019.[8]

Aside from reducing the opportunities for communicable disease transmission, telehealth has been shown to provide other benefits, including convenience and ease of scheduling.[9] Telehealth can be provided beyond office locations and be used in areas where doctors would not normally practice.[10] Telehealth may thus improve access to services[11] and may be particularly beneficial to rural, underserved communities.[12] In addition, patients may spend less time traveling and waiting; physicians may see more patients, including more diverse patients;[13] and healthcare costs may be reduced.[14,15] Telehealth, therefore, has the potential to ameliorate some of the barriers to traditional care.

[6] Shira H. Fischer et al., "The Transition to Telehealth during the First Months of the COVID-19 Pandemic: Evidence from a National Sample of Patients," *Journal of General Internal Medicine* 36 (January 6, 2021): 849-51, **https://doi.org/10.1007/s11606-020-06358-0**.

[7] Stephanie Joseph and Benjamin Philip Greene, "Telehealth and Telemedicine: Challenges and Prospects in Healthcare Delivery," in *Assessing the Need for a Comprehensive National Health System in the United States*, ed., Nikolaos Karagiannis, Sheilia R. Goodwin and David Stewart (Hershey, PA: IGI Global, December 2022), **https://www.igi-global.com/chapter/telehealth-and-telemedicine/315883**.

[8] FAIR Health, *The Evolution of Telehealth during the COVID-19 Pandemic: A Multiyear Retrospective of FAIR Health's Monthly Telehealth Regional Tracker*, A FAIR Health Brief, June 14, 2022, **https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/The%20Evolution%20of%20Telehealth%20during%20the%20COVID-19%20Pandemic-A%20FAIR%20Health%20Brief.pdf**.

[9] Jana Arbanas et al., *Mastering the New Digital Life: 2022 Connectivity and Mobile Trends*, 3rd edition, A Report from the Deloitte Center for Technology, Media & Telecommunications, 2022, **https://www2.deloitte.com/content/dam/insights/articles/us175371_tmt_connectivity-and-mobile-trends-interactive-landing-page/DI_Connectivity-mobile-trends-2022.pdf**.

[10] David A. Simon and Carmel Shachar, "Telehealth to Address Health Disparities: Potential, Pitfalls, and Paths Ahead," *Journal of Law, Medicine & Ethics* 49, no. 3 (2021): 415-17, **https://doi.org/10.1017/jme.2021.62**.

[11] N. M. Hjelm, "Benefits and Drawbacks of Telemedicine," Journal of Telemedicine and Telecare 11, no. 2 (March 2005): 60-70, **https://doi.org/10.1258/1357633053499886**.

[12] James P. Marcin et al., "Using Telemedicine to Provide Pediatric Subspecialty Care to Children with Special Health Care Needs in an Underserved Rural Community," *Pediatrics* 113, no. 1 (2004): 1-6, **https://doi.org/10.1542/peds.113.1.1**.

[13] Simon and Schachar, "Telehealth to Address Health Disparities."

[14] Hjelm, "Benefits and Drawbacks of Telemedicine."

[15] Simon and Schachar, "Telehealth to Address Health Disparities."

Background

Nevertheless, telehealth is not suitable for all medical issues, including some primary care visits[16] and laboratory tests. It has the potential to drive up utilization—and therefore costs—due to its greater convenience and potential duplication of services, although studies are mixed on whether it results in increased visits[17] or not.[18] Also unclear is telehealth's connection to avoidable or unnecessary ER visits and hospitalizations, which are an important focus for healthcare quality improvement.[19] Some research indicates that telehealth can result in increased ER visits and hospitalizations;[20] other research suggests that it reduces ER visits,[21] or that, used moderately, it makes no difference to ER visit and hospitalization rates.[22]

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[16] Yalda Jabbarpour et al., "Not Telehealth: Which Primary Care Visits Need In-Person Care?" *Journal of the American Board of Family Medicine* 34, supplement (February 2021): S162-69, https://doi.org/10.3122/jabfm.2021.S1.200247.

[17] J. Scott Ashwood et al., "Direct-to-Consumer Telehealth May Increase Access to Care but Does Not Decrease Spending," *Health Affairs* 36, no. 3 (March 2017): 485-91, https://doi.org/10.1377/hlthaff.2016.1130.

[18] Aliza S. Gordon, Wallace C. Adamson and Andrea R. DeVries, "Virtual Visits for Acute, Nonurgent Care: A Claims Analysis of Episode-Level Utilization," *Journal of Medical Internet Research* 19, no. 2 (2017): e35, https://doi.org/10.2196/jmir.6783.

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[20] Vivek V. Shah et al., "Association between In-Person vs Telehealth Follow-Up and Rates of Repeated Hospital Visits among Patients Seen in the Emergency Department," *JAMA Network Open* 5, no. 10 (October 3, 2022): e2237783, https://doi.org/10.1001/jamanetworkopen.2022.37783.

[21] Cigna, *Does Virtual Care Save Money?*, January 2022, https://newsroom.cigna.com/convenient-cost-effective-and-high-quality-virtual-care-is-here-to-stay.

[22] Kathleen Y. Li et al., *Telehealth Use in Michigan during COVID-19: Variation in Primary Care Telehealth Adoption and Its Impact on Emergency Department Use and Hospitalizations*, Institute for Healthcare Policy & Innovation brief, March 2021, https://ihpi.umich.edu/sites/default/files/2021-03/0216_Primary-Care-Telehealth-Adoption-Brief_FINALv2_0.pdf.

Background

Telehealth may be more apt to represent a transfer of an existing care relationship to a new modality, rather than the creation of a new relationship. Accordingly, people who already have difficulty accessing healthcare may still be disadvantaged.[23] Digital proficiency and access are important for telehealth participation, yet those who already experience health disparities, such as racial and ethnic minorities,[24,25] have been found to be the least likely to have either.[26,27,28] Moreover, the COVID-19 pandemic has exacerbated racial and ethnic health disparities in the United States; African Americans died at a disproportionately higher rate than the population overall during the early weeks of the pandemic.[29]

This national pattern was mirrored in Connecticut, where people of color had the worst COVID-19 outcomes and faced worse challenges when compared with their white peers during the first two years of the pandemic.[30] Previous research suggests that major causes of racial and ethnic disparities in the state include gaps in access to a regular healthcare provider, access to transportation and being able to afford food and housing.[31] Connecticut's Executive Order No. 7G[32] allows telehealth to be performed by out-of-state providers without Connecticut licensure, meaning patients can see healthcare professionals practicing telehealth anywhere in the country. Since telehealth has the potential to increase healthcare access without the need for transportation and at a potentially lower cost than traditional care, its increased uptake during the early pandemic in 2020 offers a unique opportunity to investigate the use of telehealth in Connecticut.

[23] Simon and Schachar, "Telehealth to Address Health Disparities."

[24] Renee Butkus et al., "Envisioning a Better US Health Care System for All: Reducing Barriers to Care and Addressing Social Determinants of Health," *Annals of Internal Medicine* 172 (2020): S50-S59, **https://doi.org/10.7326/M19-2410**.

[25] David R. Williams, "Race, Socioeconomic Status, and Health: The Added Effects of Racism and Discrimination," *Annals of the New York Academy of Sciences* 896, no. 1 (December 1999): 173-88, **https://doi.org/10.1111/j.1749-6632.1999.tb08114.x**.

[26] Nancy P. Gordon and Mark C. Hornbrook, "Older Adults' Readiness to Engage with eHealth Patient Education and Self-Care Resources: A Cross-Sectional Survey," *BMC Health Services Research* 18, no. 1 (March 27, 2018): 220, **https://doi.org/10.1186/s12913-018-2986-0**.

[27] "Internet/Broadband Fact Sheet," Pew Research Center, April 7, 2021, **https://www.pewresearch.org/internet/fact-sheet/internet-broadband/#panel-cf1ede57-7a4b-489e-8bcb-de1f4a6e643c**.

[28] Eric T. Roberts and Ateev Mehrotra, "Assessment of Disparities in Digital Access among Medicare Beneficiaries and Implications for Telemedicine," *JAMA Internal Medicine* 180, no. 10 (October 2020): 1386-89, **https://doi.org/10.1001/jamainternmed.2020.2666**.

[29] Aaron van Dorn, Rebecca E. Cooney and Miriam L. Sabin, "COVID-19 Exacerbating Inequalities in the US," *Lancet* 395 (April 18, 2020): 1243-44, **https://doi.org/10.1016/S0140-6736(20)30893-X**.

[30] Arielle Levin Becker, *Two Years In: Lessons from the COVID-19 Pandemic*, Connecticut Health Foundation, March 2022, **https://www.cthealth.org/publication/lessons-learned/**.

[31] Arielle Levin Becker, *Health Disparities in Connecticut: Causes, Effects, and What We Can Do*, Connecticut Health Foundation, January 2020, **https://www.cthealth.org/publication/health-disparities-in-connecticut-causes-effects-and-what-we-can-do/**.

[32] State of Connecticut, *Protection of Public Health and Safety during COVID-19 Pandemic and Response – Presidential Primary Postponement and Additional Public Health Measures*, State of Connecticut Executive Order, No. 7G, March 19, 2020, **https://jud.ct.gov/HomePDFs/Executive-Order-No-7G.pdf#:~:text=EXECUTIVE%20ORDER%20NO.%207G%20PROTECTION%20OF%20PUBLIC%20HEALTH,United%20States%20and%20confirmed%20spread%20in%20Connecticut;%20and**.

Background

Funded by a grant from the Connecticut Health Foundation, FAIR Health delved into its repository of private healthcare claim records—the nation's largest such database—to examine the use of telehealth in Connecticut, with particular attention to differences in treatment in areas with greater minority populations. The data span over two years, beginning at the start of the COVID-19 pandemic in March 2020 and continuing to September 2022, with a study population of more than one million patients. Analyses include demographic comparisons between patients who used telehealth and those who did not, by age, gender, race/ethnicity, income and location. The study also includes details on common procedures, conditions and average allowed (or in-network) costs associated with telehealth, as well as analyses of patient results per condition (e.g., total visits, allowed amounts, ER visits and hospitalizations), in relation to racial and ethnic diversity and telehealth use. Telehealth in this study includes synchronous modalities (video and phone visits used to supplement or replace in-person visits) and asynchronous modalities (where data are stored and forwarded to a provider, then used for remote monitoring, for example, electronic transfer of home blood pressure readings). The results presented herein could potentially inform use of telehealth and solutions for reducing barriers to care in Connecticut and elsewhere.

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Methodology

Methodology for Descriptive Analyses

Using its longitudinal dataset, FAIR Health identified all patients who received any medical services in Connecticut from January 1, 2019, to September 30, 2022. A residence geozip was then imputed for each of those individuals based on FAIR Health's imputation logic, and census information was used to assign each geozip to one of three groupings, based on the percentage of the population identified in the census as white (25 to 50 percent, 51 to 75 percent, and 76 to 100 percent white). For example, for geozip 060 (Bristol, Simsbury), census data were used to determine that the region was 51 to 75 percent white; subsequently, everyone who was deemed to be a resident of geozip 060 was placed into the 51 to 75 percent white grouping. Census-based information was applied for those geozips to all of the patients who were deemed to live in that geozip (average income, percentage white). The lowest percentage white group (26 to 50 percent) was expected to contain the highest percentage of people of color.

FAIR Health looked back to January 1, 2019, in order to identify the patient population for chronic conditions based on the Centers for Medicare & Medicaid Services Chronic Conditions Data Warehouse (CCW)[33] diagnosis categories and to measure the Department of Health & Human Services-Hierarchical Condition Category (HHS-HCC) risk scores of patients. The study period, however, for the results reported in this paper was from March 1, 2020, through September 30, 2022.

FAIR Health identified all patients in this patient population who had at least one telehealth service (as identified by having a telehealth procedure code, a telehealth place of service or a modifier indicating a telehealth service) and designated them as the "telehealth" cohort. (The same patients may also have received services from providers in person.) Patients who never had a telehealth service were designated as the "no-telehealth" cohort. The telehealth cohort comprised 429,634 patients and the no-telehealth cohort comprised 636,506 patients, for a total of 1,066,140 patients in the study (all commercially insured).

[33] "Chronic Conditions Data Warehouse," Centers for Medicare & Medicaid Services (CMS), accessed May 17, 2023, https://www2.ccwdata.org/web/guest/condition-categories.

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FAIR Health identified the most common diagnoses associated with telehealth visits in the telehealth cohort based on the volume of patients who received care for those conditions. The 15 most common primary diagnoses used in telehealth (with their ICD-10-CM diagnosis codes) were:

1. Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders (F40-F48);
2. Mood (affective) disorders (F30-F39);
3. COVID-19 (U07);
4. Acute upper respiratory infections (J00-J06);
5. Contact with and (suspected) exposure to communicable diseases (Z20);
6. Symptoms and signs – circulatory and respiratory systems (R00-R09);
7. Episodic and paroxysmal disorders (G40-G47);
8. Symptoms and signs – digestive system and abdomen (R10-R19);
9. General symptoms and signs (R50-R59);
10. Hypertensive diseases (I10-I16);
11. Other dorsopathies (M50-M54);
12. Diabetes mellitus (E10-E13);
13. Behavioral syndromes, associated with psychological disturbances and physical factors (F50-F59);
14. Mental and behavioral disorders due to psychoactive substance use (F10-F19); and
15. Pervasive and specific developmental disorders (F80-F89).

All individuals from the telehealth and no-telehealth cohorts who sought care for these diagnoses were identified, establishing a dataset of all patients who had services associated with these diagnoses.

FAIR Health focused initially on the top 10 of the 15 most common diagnoses. Initial descriptive analyses were performed on the top 10 to compare the telehealth utilization patterns of each condition overall; those that had patterns similar to the pattern of all people using telehealth were excluded from further analysis (numbers 6, 7, 8 and 9). In addition, number 5, Z20 (exposure to communicable diseases), was excluded because it had highly skewed patterns in the initial descriptive analyses, most likely due to COVID-19 and differences in how it was reported.

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Of numbers 11-15, two diagnoses were included in the condition-specific analyses. Number 12, diabetes mellitus, was included because it is a very common chronic condition that is reliant on patient monitoring for successful control. Number 14, substance use disorders, was included because it is a topic of great public health interest and one that FAIR Health has reported on in relation to the COVID-19 pandemic,[34] and because it would allow for comparison to results for other behavioral health conditions.

As a result, the following diagnostic conditions of interest were selected for condition-specific analyses:

1. Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders;
2. Mood (affective) disorders;
3. COVID-19;
4. Acute upper respiratory infections;
5. Hypertensive diseases;
6. Diabetes mellitus; and
7. Mental and behavioral disorders due to psychoactive substance use.

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[34] FAIR Health, *A Comparison of Substance Use Disorders before and during the COVID-19 Pandemic: A Study of Private Healthcare Claims*, A FAIR Health White Paper, September 27, 2022, https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/A%20Comparison%20of%20Substance%20Use%20Disorders%20before%20and%20during%20the%20COVID-19%20Pandemic%20-%20A%20FAIR%20Health%20White%20Paper.pdf.

Methodology

The following information was calculated for patients with the diagnostic conditions of interest:

1. The total number of services (i.e., visits) associated with each one of these patients for the time period.
2. The total allowed amount associated with each one of these patients for the time period.
3. The total number of services associated with the diagnostic condition of interest for the time period.
4. The total allowed amount associated with the diagnostic condition of interest for the time period.
5. The total number of unique ER visits (patient/date of service) as identified by CPT®[35] 99281-99285, place of service 23 or modifier ET (emergency services).
6. The total number of unique hospitalizations (using patient/admission date to determine uniqueness) as identified by any UB-04 claim with a bill type of 11* and a length of stay of 1 or more).

Using the information above, FAIR Health created averages, medians and other descriptive values for reporting and statistical analysis. A *P*-value of 0.05[36] or above was regarded as not statistically significant.

[35] CPT © 2022 American Medical Association (AMA). All rights reserved.

[36] A *P*-value measures the probability of obtaining the observed results of a statistical hypothesis test assuming that the null hypothesis (i.e., no relationship between two sets of data) is true. The lower the *P*-value, the more likely it is that the observed results did not occur due to chance. A *P*-value of <0.05 is the most commonly used threshold for statistical significance. This threshold will be used when describing the results of the statistical analyses in this paper.

Methodology

Statistical Methodology

Overall Population Analysis

T-tests and chi-square tests of independence[37] were performed to test the relationship between patient cohort (telehealth versus no telehealth) and the following variables: patient gender, patient age band, diagnosis category, geozip-based racial and ethnic composition and HCC risk score. The results showed that patient cohort was significantly related to all variables at a *P*-value of <0.0001.[38]

To adjust for the impact of these confounding variables when performing regression analyses, propensity score matching[39] was conducted to create an analysis cohort. FAIR Health created a 1:1 propensity score-matched dataset matched at baseline on:

- Patient gender;
- Patient age band;
- Geozip percentage white;
- Patient HCC risk score; and
- Diagnosis condition category.

For purposes of matching, diagnosis condition categories were defined as either chronic (diabetes; episodic and paroxysmal disorders; hypertensive diseases; and other dorsopathies), acute (acute upper respiratory infections; symptoms and signs involving the circulatory and respiratory systems; symptoms and signs involving the digestive system and abdomen; general symptoms and signs; COVID-19; and potential health hazards related to communicable diseases) or behavioral health (anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders; mood [affective] disorders; behavioral syndromes associated with physiological disturbances and physical factors; and substance use disorders).

[37] A t-test is a statistical test that compares the means (averages) of one or two groups, e.g., populations. A chi-square test of independence is a test that shows whether two variables in a population are related.

[38] See footnote 36.

[39] Propensity score matching is a statistical technique applied to observational data to estimate the effect of an exposure by accounting for the covariates that predict receiving the exposure (covariates are independent variables that can affect the result of a statistical test). In this case, a patient in the telehealth group was matched with a patient in the no-telehealth group who had similar propensity score values when telehealth cohort status was regressed on the covariates of interest. This method was used to control for the effect of these covariates on the likelihood that a patient would be in the telehealth versus no-telehealth cohort.

Methodology

Chi-square tests were performed on the resulting dataset to assure that the propensity match was successful for all matching variables. The successfully matched dataset consisted of 380,822 unique individuals.

Logistic regressions were performed on the propensity-matched dataset to calculate the odds ratios[40] of various results in the telehealth cohort compared to the cohort that did not receive telehealth. The results of interest included the following:

- Whether or not a patient had more total visits (including telehealth visits, in-person visits, ER visits and hospitalizations) than the average number of visits per patient (average of patients in both the telehealth and no-telehealth cohorts);
- Whether or not a patient had more total visits than the median number of visits per patient;
- Whether or not a patient had an ER visit;
- The number of ER visits a patient had (grouped into 0, 1, 2-3, 4-5, or 6 or more);
- Whether or not a patient had a hospital visit (i.e., a hospitalization with a minimum of one overnight stay);
- The number of hospital visits a patient had (grouped into 0, 1, 2-3, 4-5, or 6 or more);
- Whether or not a patient had a higher allowed amount sum than the average allowed amount sum per patient; and
- Whether or not a patient had a higher allowed amount sum than the median allowed amount sum per patient.

[40] See footnote 3.

Methodology

Condition-Specific Analysis

Logistic regressions were also run on seven additional datasets containing patients with diagnoses in the seven condition categories of particular interest (i.e., diagnostic conditions of interest). These condition-specific datasets were developed by creating propensity score-matched analysis cohorts using patient gender, patient age band, geozip percentage white, patient HCC risk score and the presence or absence of the diagnosis of interest as matching variables. For each cohort, regressions were run on members diagnosed with the condition to predict the number of visits associated with the condition, sum of the allowed amounts associated with the condition and the presence and number of ER and hospital visits. Visits and allowed amounts were considered to be associated with a condition if the diagnosis of interest was present on the associated claim.

This segmented analysis showed the associations between telehealth use among patients with specific diagnoses of interest and utilization and allowed costs for those conditions.

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Limitations

The data used in this report comprise claims data for privately insured patients who are covered by insurers and third-party administrators who voluntarily participate in FAIR Health's data contribution program. Medicare Advantage (Medicare Part C) enrollees from contributing insurers are included, but not participants in Medicare Parts A, B and D.[41] In addition, data from Medicaid, CHIP and other state and local government insurance programs are not included, nor are data collected regarding uninsured patients.

The patient's place of residence is not provided in the data FAIR Health receives and is instead imputed based on the locations where a patient receives services.

Geozips may contain a mix of neighborhoods with different racial, ethnic and income compositions, and more granular cuts of the data might identify differences that are not evident at a geozip level.

Data are reported based on the racial and ethnic makeup of an area as a whole, not based on the race or ethnicity of the specific patients in the pool.

This is an observational report based on the data FAIR Health receives from private payors regarding care rendered to covered patients. The report was not subject to peer review.

[41] FAIR Health also receives the entire collection of claims for traditional Medicare Parts A, B and D under the CMS Qualified Entity Program, but those data are not a source for this report.

Results

Overall Findings

Year-over-Year Changes

During 2020, the first year of the COVID-19 pandemic, 44 percent of Connecticut residents who received medical care used telehealth (figure 1) for at least a portion of the care they received. The percentage decreased each subsequent year, to 35 percent in 2021 and 30 percent in 2022.

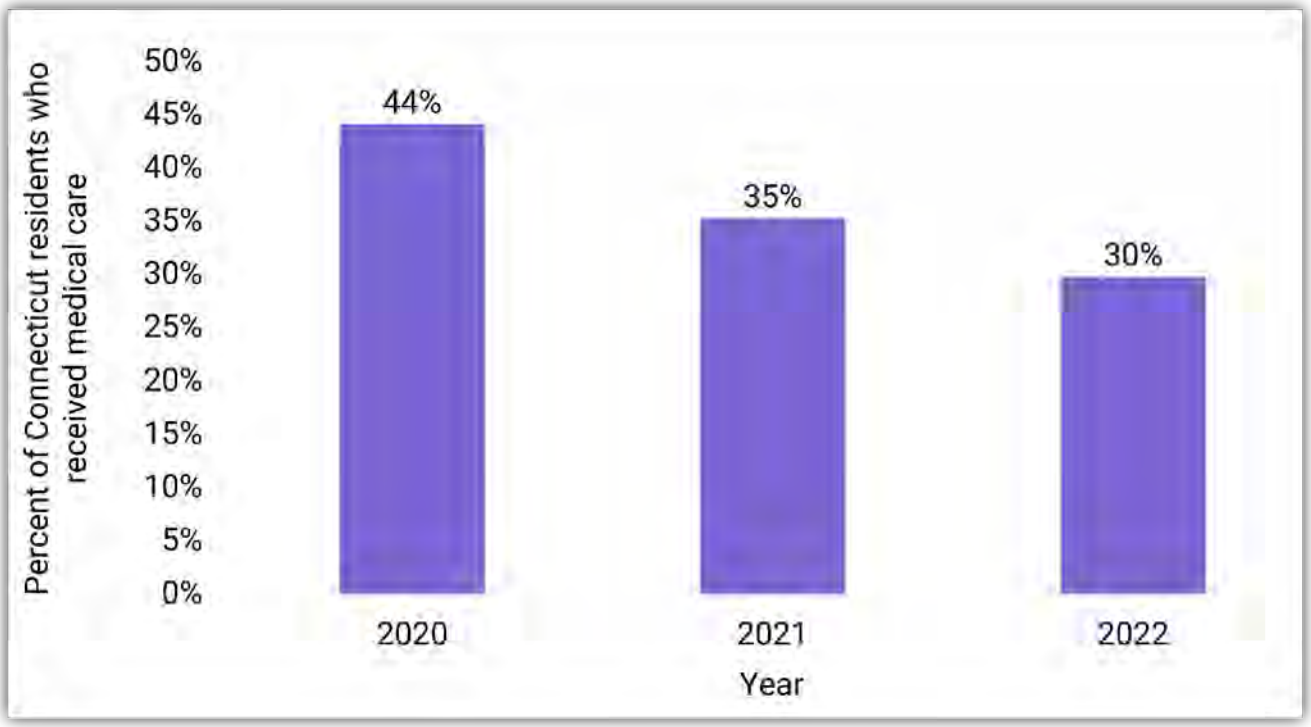


Figure 1. Percent of Connecticut residents receiving medical care who used telehealth, 2020-2022[42]

[42] In this paper, the date range 2020-2022 represents data from March 1, 2020, to September 30, 2022.

Results

Age and Gender

In the period 2020-2022, Connecticut residents aged 19-64 accounted for approximately 77 percent of patients who received telehealth, but only 70 percent of patients receiving any medical care (figure 2). By contrast, individuals aged 65 and older constituted approximately 8 percent of both telehealth patients and all patients receiving medical care.[43] Previous research has shown that patients 65 years or younger are more likely to use telehealth (specifically videoconferencing) than those over age 65,[44] which could explain the greater percentage of patients aged 19-64 receiving telehealth services. Conversely, residents aged 0-18 years were less represented among those who used telehealth (15 percent) compared to all services (21 percent). This result is in line with evidence that pediatric telehealth use in the United States had a sharper decline than telehealth in other primary care specialties from 2021 to 2022.[45]

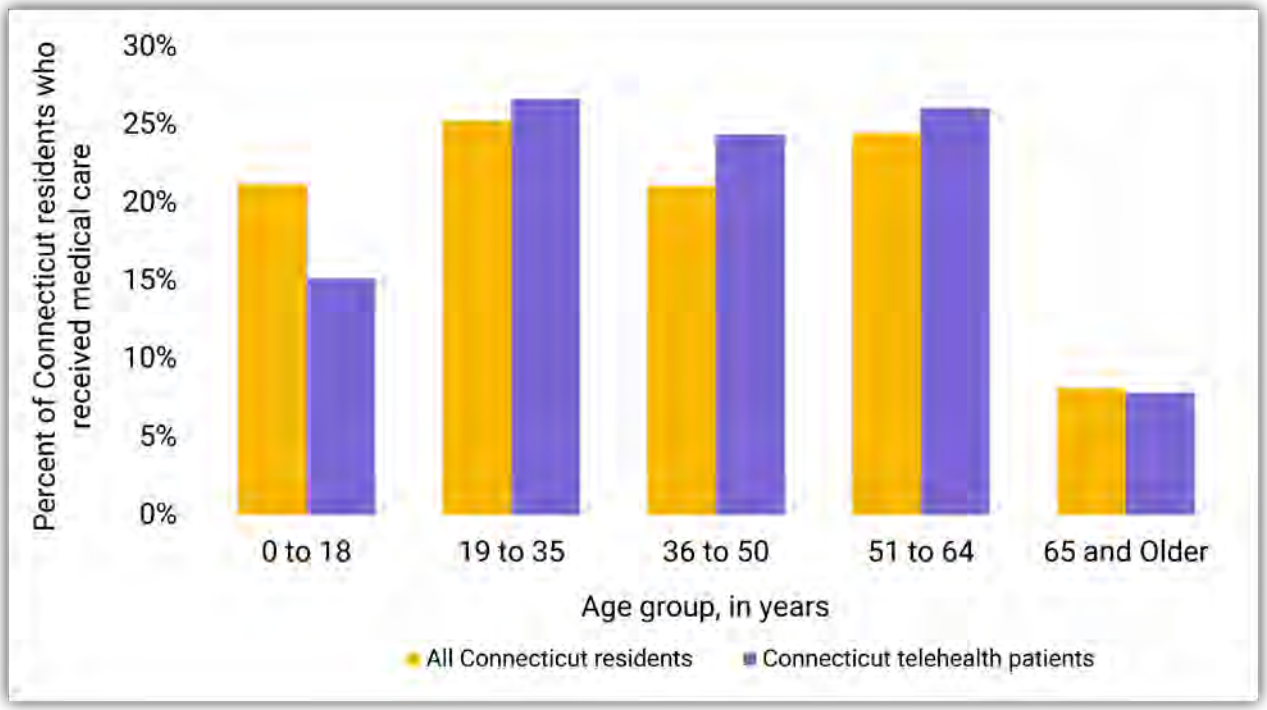


Figure 2. Age group distribution of all Connecticut residents who received medical care and those who received telehealth, 2020-2022

[43] FAIR Health data include Medicare Advantage (Medicare Part C) enrollees from contributing insurers, but not participants in Medicare Parts A, B and D, which may explain the low percentage of patients aged 65 and over receiving medical care in this report.

[44] Shira H. Fischer et al., "Prevalence and Characteristics of Telehealth Utilization in the United States," *JAMA Network Open* 3, no. 10 (October 2020): e2022302, https://doi.org/10.1001/jamanetworkopen.2020.22302.

[45] FAIR Health, *A Window into Primary Care: An Analysis of Private Healthcare Claims*, A FAIR Health White Paper, March 15, 2023, https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/A%20Window%20into%20Primary%20Care%20-%20A%20FAIR%20Health%20White%20Paper.pdf.

Results

In the period 2020-2022, females made up a larger share of Connecticut residents receiving medical care than did males (figure 3). Of those receiving all medical services, 52 percent were female and 48 percent were male. Among telehealth users, the difference was more pronounced, with females accounting for 59 percent and males 41 percent. This corresponds to previous research showing that women are more likely than men to use telehealth as a form of medical care.[46]

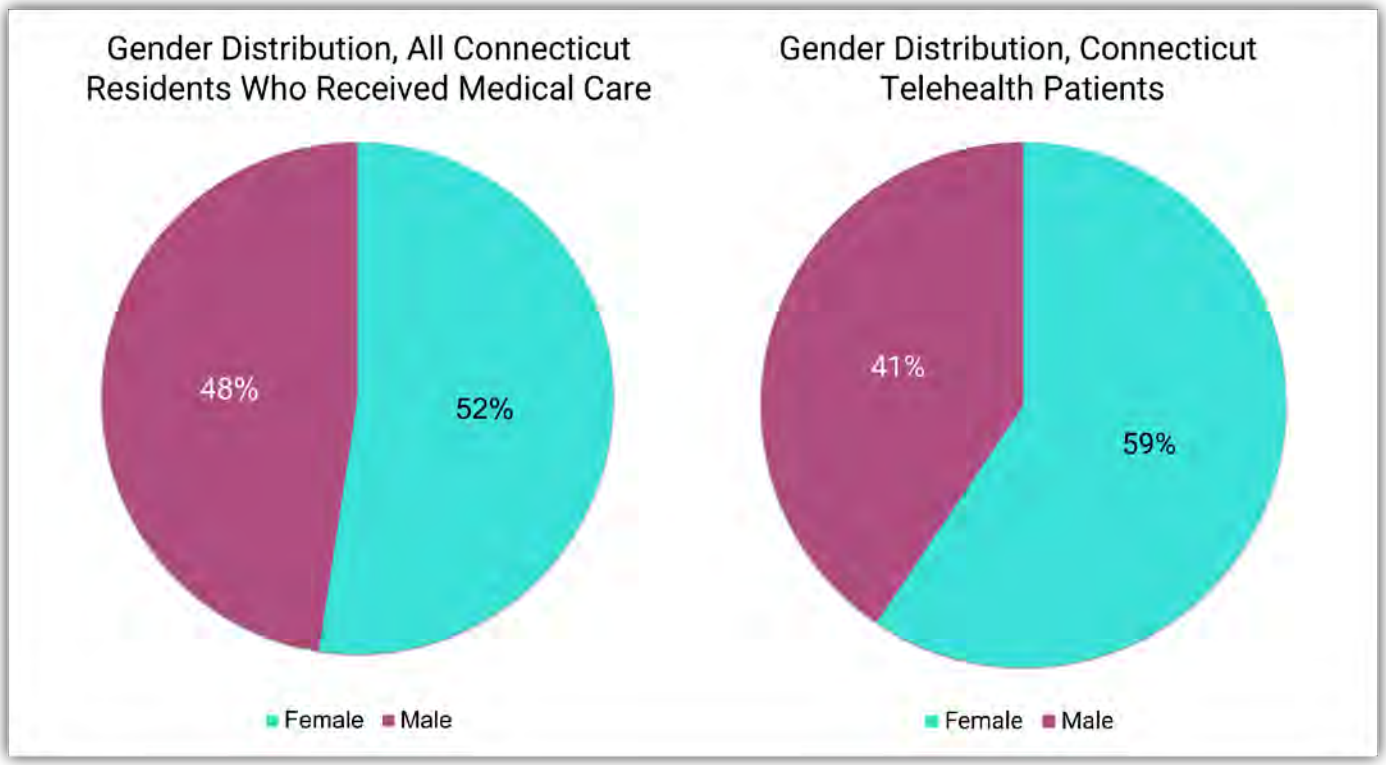


Figure 3. Gender distribution of all Connecticut residents receiving medical care (left panel) and Connecticut telehealth patients (right panel), 2020-2022

[46] Jennifer M. Polinski et al., "Patients' Satisfaction with and Preference for Telehealth Visits," *Journal of General Internal Medicine* 31, no. 3 (March 2016): 269-75, https://doi.org/10.1007/s11606-015-3489-x.

Results

Geography and Race/Ethnicity

The distribution of Connecticut residents using medical services and using telehealth in each of the eight geozips in the state in the period 2020-2022 is presented in figure 4. While the percentage using telehealth is fairly similar to that using all medical services in most geozips, there are two exceptions. While 15 percent of all Connecticut residents who received medical services were from geozip 061 (Hartford), only 11 percent of those using telehealth were from that geozip. Conversely, 17 percent of all residents received medical care in geozip 068 (Stamford, Norwalk, Danbury), but 21 percent of those using telehealth were from that geozip.

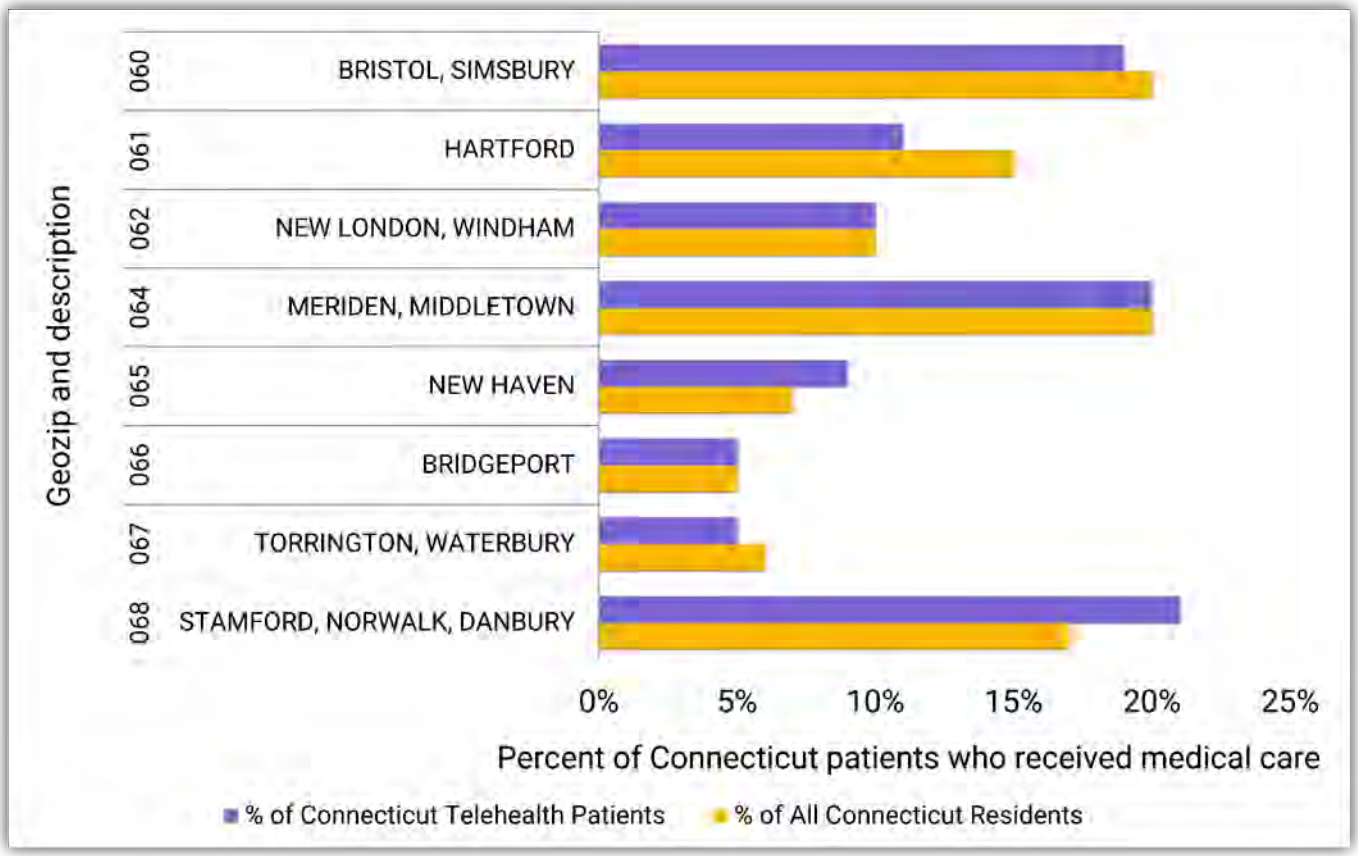


Figure 4. Distribution of all Connecticut residents who received medical care and Connecticut telehealth patients by geozip, 2020-2022

Results

In the period 2020-2022, the percentage of residents identified by census data as white, a measure of racial and ethnic diversity, varied across each of Connecticut's eight geozips (table 1). The most diverse geozips were 061 (Hartford), 065 (New Haven) and 066 (Bridgeport), each with between 26 and 50 percent of the population identified as white. The least diverse geozips were 062 (New London, Windham) and 064 (Meriden, Middletown), both with a population that was between 76 and 100 percent white. The other three geozips—060 (Bristol, Simsbury), 067 (Torrington, Waterbury) and 068 (Stamford, Norwalk, Danbury)—were between 51 and 75 percent white.

Table 1. Percent of Connecticut geozip residents identified by census data as white, 2020-2022

Geozip	Description	Geozip Percent White
060	BRISTOL, SIMSBURY	51-75%
061	HARTFORD	26-50%
062	NEW LONDON, WINDHAM	76-100%
064	MERIDEN, MIDDLETOWN	76-100%
065	NEW HAVEN	26-50%
066	BRIDGEPORT	26-50%
067	TORRINGTON, WATERBURY	51-75%
068	STAMFORD, NORWALK, DANBURY	51-75%

Results

The geozips with the lowest and the highest average incomes had, respectively, the highest and second highest percentage of Connecticut residents using telehealth as a percentage of all residents receiving care in the period 2020-2022 (figure 5). The lowest average income was found in geozip 065 (New Haven), where 35 percent of residents receiving medical care did so via telehealth. In geozip 068 (Stamford, Norwalk, Danbury), where residents had the highest average income, 33 percent of patients receiving medical services used telehealth. Patients from geozips with moderate average incomes in the other geozips ranged from 21 to 28 percent telehealth usage. Geozip 061 (Hartford) had the lowest percentage of residents using telehealth, at 21 percent of all residents receiving medical care. Geozip 061 also had the second lowest average income and was among the geozips with the lowest measured white population (26-50 percent white; table 1).

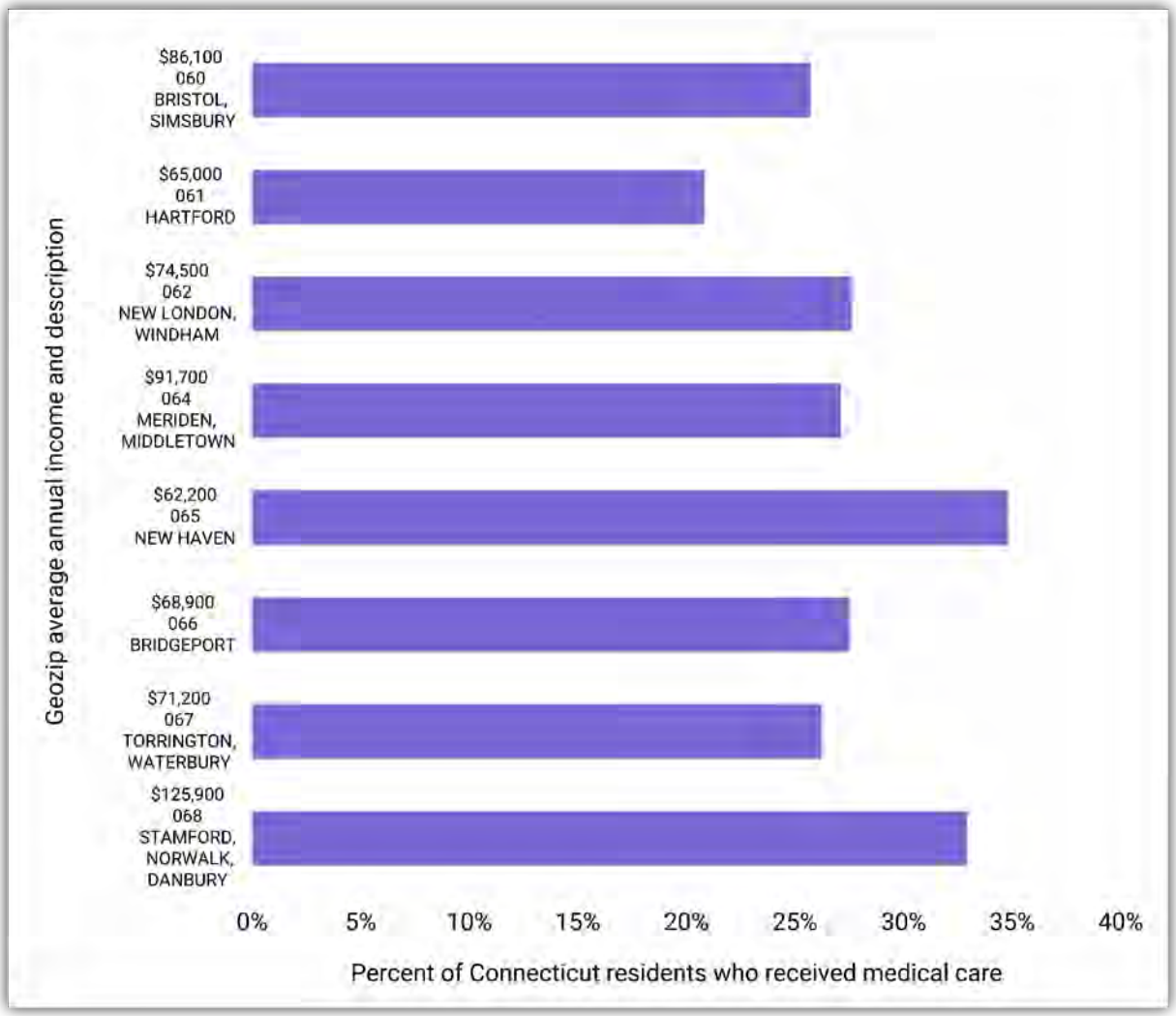


Figure 5. Percent of Connecticut residents using telehealth services by average annual income of resident geozip, 2020-2022

Results

Of Connecticut patients who used telehealth, 86 percent received those services from providers with practice zip codes in Connecticut. The next most common sources for telehealth services to patients in Connecticut were New York State (eight percent), Massachusetts (three percent), Texas (three percent) and California (two percent).

According to FAIR Health data, within Connecticut itself, patients received telehealth services most frequently from providers in New Haven County (25.4 percent), Fairfield County (25.0 percent) and Hartford County (24.5 percent). Other FAIR Health analyses showed that these three counties have the highest concentration of providers in general in the state: Hartford County has 30.2 percent, New Haven County 29.7 percent and Fairfield County 22.9 percent.

Overall, 92.5 percent of Connecticut patients sought telehealth care from a provider whom they saw in person either before or after their telehealth visit. Only 7.5 percent of Connecticut patients used a telehealth provider they never saw in person.

“Overall, **92.5 percent** of Connecticut patients sought telehealth care from a provider whom they saw in person either before or after their telehealth visit.”

Results

Telehealth Types and Procedures

The majority—85 percent—of Connecticut telehealth users in the period 2020-2022 used online digital telehealth only, which includes both video and asynchronous[47] monitoring (figure 6). Audio-only telehealth was used by seven percent of patients and both online digital and audio telehealth by eight percent.

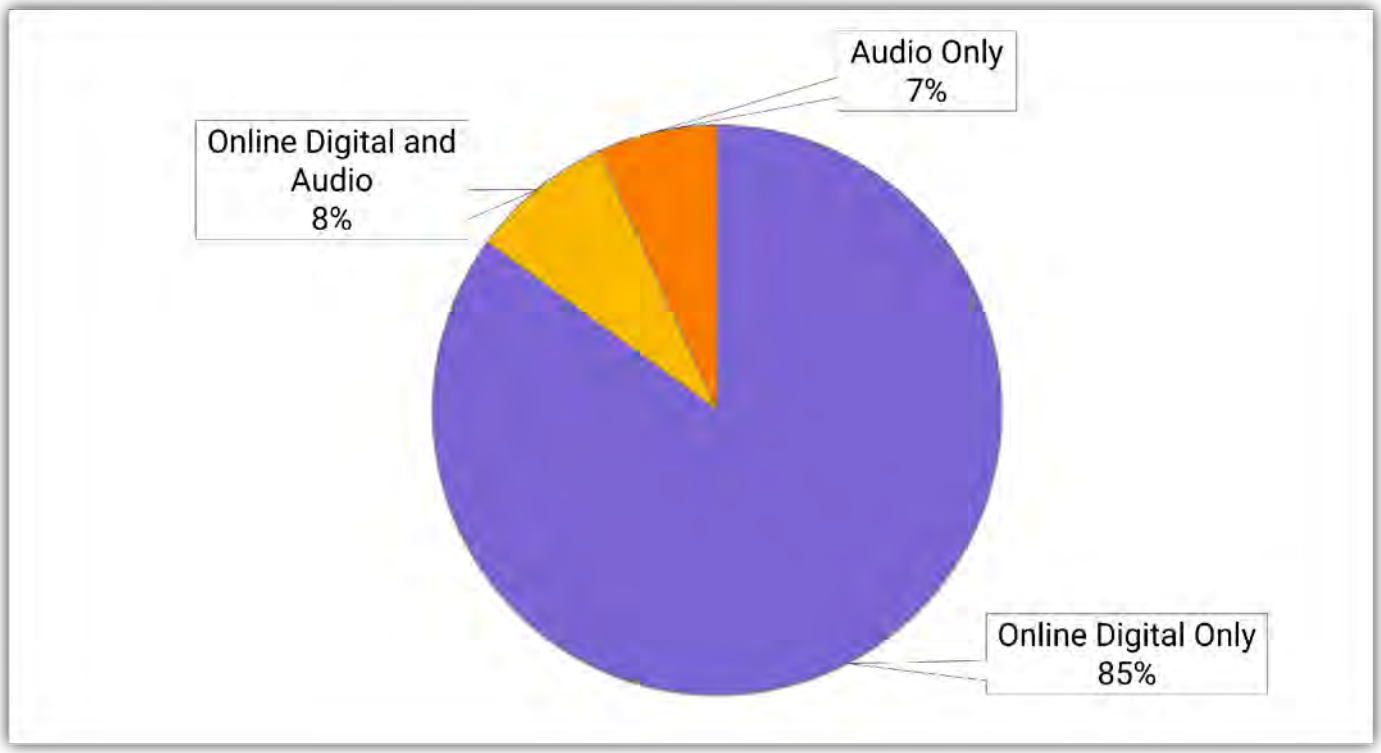
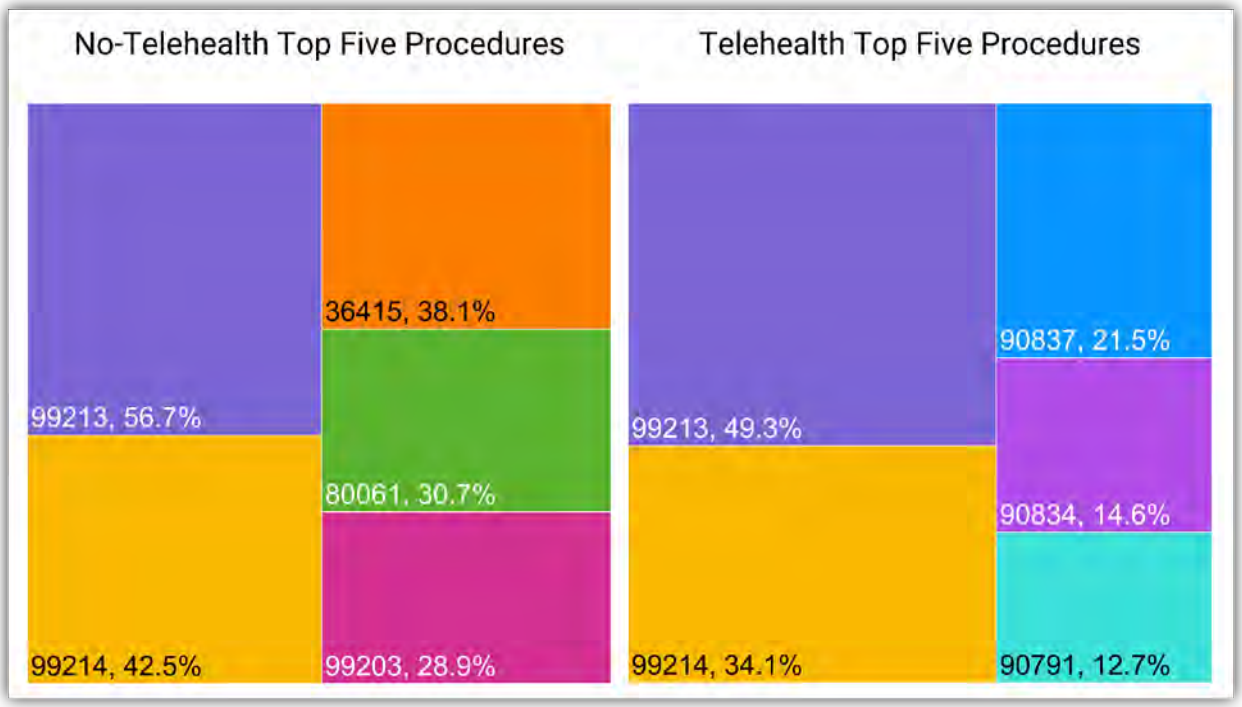


Figure 6. Percent of Connecticut telehealth patients using each telehealth modality, 2020-2022

[47] Asynchronous telehealth is telehealth in which data are stored and forwarded (e.g., blood pressure or other cardiac-related readings transmitted electronically; A1c levels transmitted electronically).

Results

The five most common procedures performed via telehealth versus those performed without telehealth in the period 2020-2022 are shown in figure 7. The top two procedures for both were CPT 99213 (established patient office or other outpatient visit, 20-29 minutes) and CPT 99214 (established patient office or other outpatient visit, 30-39 minutes).



Procedure Code	Description
99213	Established patient office or other outpatient visit, 20-29 minutes
99214	Established patient office or other outpatient visit, 30-39 minutes
36415	Insertion of needle into vein for collection of blood sample
80061	Blood test, lipids (cholesterol and triglycerides)
99203	New patient office or other outpatient visit, 30-44 minutes
90837	Psychotherapy, 1 hour
90834	Psychotherapy, 45 minutes
90791	Psychiatric diagnostic evaluation

Figure 7. Top five procedures in Connecticut telehealth and no-telehealth patients, 2020-2022

Results

Among patients who did not use telehealth, CPT 99213 made up 56.7 percent of all codes, whereas among those who used telehealth, this procedure made up 49.3 percent of all codes.

The procedures in third, fourth and fifth place among telehealth users were related to mental health: CPT 90837 (psychotherapy, 1 hour), CPT 90834 (psychotherapy, 45 minutes) and CPT 90791 (psychiatric diagnostic evaluation). This conforms to research showing that telehealth has been commonly used for mental health conditions since the start of the COVID-19 pandemic.[48] By contrast, the procedures in third, fourth and fifth place among patients who did not use telehealth were two laboratory codes—CPT 36415 (insertion of needle into vein for collection of blood sample) and CPT 80061 (blood test, lipids [cholesterol and triglycerides])—and CPT 99203 (new patient office or other outpatient visit, 30-44 minutes). This may be the case because laboratory tests typically need to be performed on-site by a medical professional, and in-person care may be preferable for initial appointments.[49]

Patient Results and Conditions

Among patients who used telehealth compared to those who did not in the period 2020-2022, the odds of all measured patient results (e.g., total visits, ER visits, hospitalizations, allowed amount sum) were significantly higher (P<0.0001; table 2). Total visits and allowed amount sums showed the highest odds ratios;[50] compared to those who did not use telehealth, telehealth patients were almost 15 times as likely to have more total visits than the average. Similarly, telehealth patients were over 10 times as likely to have a higher allowed amount sum than the average when compared to patients who did not use telehealth. Telehealth can drive up healthcare utilization due to its convenience,[51] which could in part explain why patients using telehealth had higher odds of more visits than average and higher allowed amount sums than average.

[48] FAIR Health, *The Evolution of Telehealth during the COVID-19 Pandemic*.

[49] Michelle Andrews, "Virtual or in Person: Which Kind of Doctor's Visit Is Better, and When It Matters," KFF Health News, March 6, 2023, https://kffhealthnews.org/news/article/patient-guide-teleheath-or-in-person-doctor-visit/.

[50] See footnote 3.

[51] Ashwood et al., "Direct-to-Consumer Telehealth May Increase Access to Care but Does Not Decrease Spending."

Results

For ER visits and hospitalizations, the effects of patient cohort increased with the number of visits. For example, patients who used telehealth had 1.17 times the odds of having any hospitalization, but 3.94 times the odds of having six or more hospitalizations.

Table 2. Odds ratios for all results of patients in the telehealth cohort compared to the no-telehealth cohort, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Total Visits Than Average	14.90	(14.62, 15.19)	<0.0001
More Total Visits Than Median	13.02	(12.82, 13.23)	<0.0001
Any ER Visit	1.68	(1.66, 1.71)	<0.0001
2-3 ER Visits	2.04	(1.99, 2.09)	<0.0001
4-5 ER Visits	3.17	(2.97, 3.38)	<0.0001
6 or More ER Visits	4.86	(4.42, 5.34)	<0.0001
Any Hospitalization	1.17	(1.14, 1.20)	<0.0001
2-3 Hospitalizations	1.70	(1.60, 1.80)	<0.0001
4-5 Hospitalizations	2.97	(2.48, 3.55)	<0.0001
6 or More Hospitalizations	3.94	(3.06, 5.07)	<0.0001
Higher Allowed Amount Sum Than Average	10.61	(10.38, 10.86)	<0.0001
Higher Allowed Amount Sum Than Median	9.24	(9.09, 9.38)	<0.0001

Results

In the period 2020-2022, the percentage of patients with the 15 most common diagnostic conditions in Connecticut varied depending on whether they were treated with or without telehealth (figure 8).

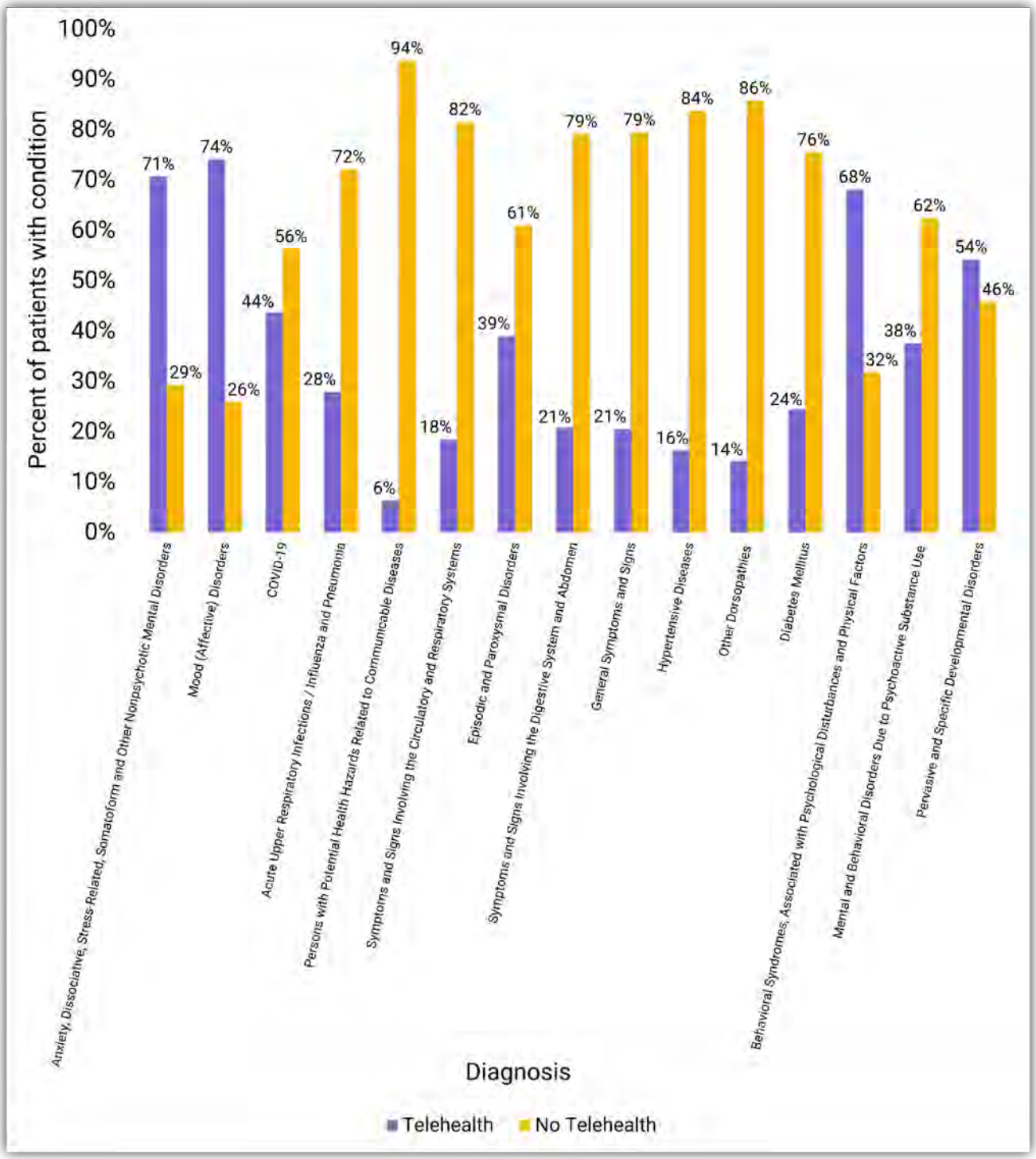


Figure 8. Percent of patients with the top 15 diagnoses associated with telehealth or no-telehealth services in Connecticut, 2020-2022

Results

Three behavioral health diagnoses and a developmental disorder diagnosis had higher percentages of patients associated with telehealth than without. Pervasive and specific developmental disorders were treated with telehealth in 54 percent of patients. The three behavioral health diagnoses were anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders (anxiety and other nonpsychotic disorders), mood (affective) disorders and behavioral syndromes associated with psychological disturbances and physical factors. For these conditions, 71, 74 and 68 percent of patients used telehealth respectively. As previously stated, telehealth has been widely used for behavioral health conditions, such as mental health conditions,[52,53] potentially explaining its increased use in these cases.

Nevertheless, patients with mental and behavioral disorders due to psychoactive substance use (substance use disorders) showed higher use of care without telehealth (62 percent) than with telehealth (38 percent). Despite wide implementation of telehealth counseling during the 2020 shutdown among Connecticut patients with opioid use disorder, patients still needed to pick up their medication and get routine drug testing (albeit less frequently) from opioid treatment programs,[54] which could explain the higher percentage of patients using services without telehealth for this condition.

[52] FAIR Health, *The Evolution of Telehealth during the COVID-19 Pandemic*.

[53] Donald M. Hilty et al., "The Effectiveness of Telemental Health: A 2013 Review," *Telemedicine Journal and E-Health* 19, no. 6 (June 2013): 444-54, https://doi.org/10.1089/tmj.2013.0075.

[54] Sarah Brothers, Adam Viera and Robert Heimer, "Changes in Methadone Program Practices and Fatal Methadone Overdose Rates in Connecticut during COVID-19," *Journal of Substance Abuse Treatment* 131 (2021): 108449, https://doi.org/10.1016/j.jsat.2021.108449.

Results

The diagnosis with the lowest percentage of patients using telehealth was persons with potential health hazards related to communicable diseases, at six percent. Patients may prefer in-person visits for some nonemergency medical care.[55] In addition, racial and ethnic minorities that are disproportionately affected by certain conditions, like diabetes mellitus[56] and hypertensive diseases,[57] may be less likely to use telehealth due to preexisting barriers.[58,59]

The remainder of this study concerns results related to seven specific conditions:

1. Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders;
2. Mood (affective) disorders;
3. COVID-19;
4. Acute upper respiratory infections;
5. Hypertensive diseases;
6. Diabetes mellitus; and
7. Mental and behavioral disorders due to psychoactive substance use.

[55] Zachary S. Predmore et al., "Assessment of Patient Preferences for Telehealth in Post–COVID-19 Pandemic Health Care," *JAMA Network Open* 4, no. 12 (December 1, 2021): e2136405, **https://doi.org/10.1001/jamanetworkopen.2021.36405**.

[56] Centers for Disease Control and Prevention, *2020 National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States*, 2020, **https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf**.

[57] Paul K. Whelton et al., "2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, *Hypertension* 71, no. 6 (2018): e13-e115, **https://www.ahajournals.org/doi/full/10.1161/HYP.0000000000000065?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed**.

[58] Williams, "Race, Socioeconomic Status, and Health."

[59] Roberts and Mehrotra, "Assessment of Disparities in Digital Access."

Results

Condition-Specific Findings

Anxiety, Dissociative, Stress-Related, Somatoform and Other Nonpsychotic Mental Disorders

Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders (anxiety and other nonpsychotic mental disorders) is a broad category that includes such common mental health conditions as generalized anxiety disorder, obsessive-compulsive disorder, post-traumatic stress disorder and adjustment disorders. This was the most common diagnosis category associated with telehealth in Connecticut in the period 2020-2022. Of Connecticut patients with this condition, 71 percent used telehealth to receive care for it; 29 percent did not.

The proportion of patients who used telehealth for anxiety and other nonpsychotic mental disorders did not differ greatly from that of patients who did not use telehealth when compared within areas with similar percentages of white people (figure 9). The greatest difference was in the areas that were 51 to 75 percent white, where the share of the no-telehealth distribution was 58.9 percent and the share of the telehealth distribution was 55.6 percent.

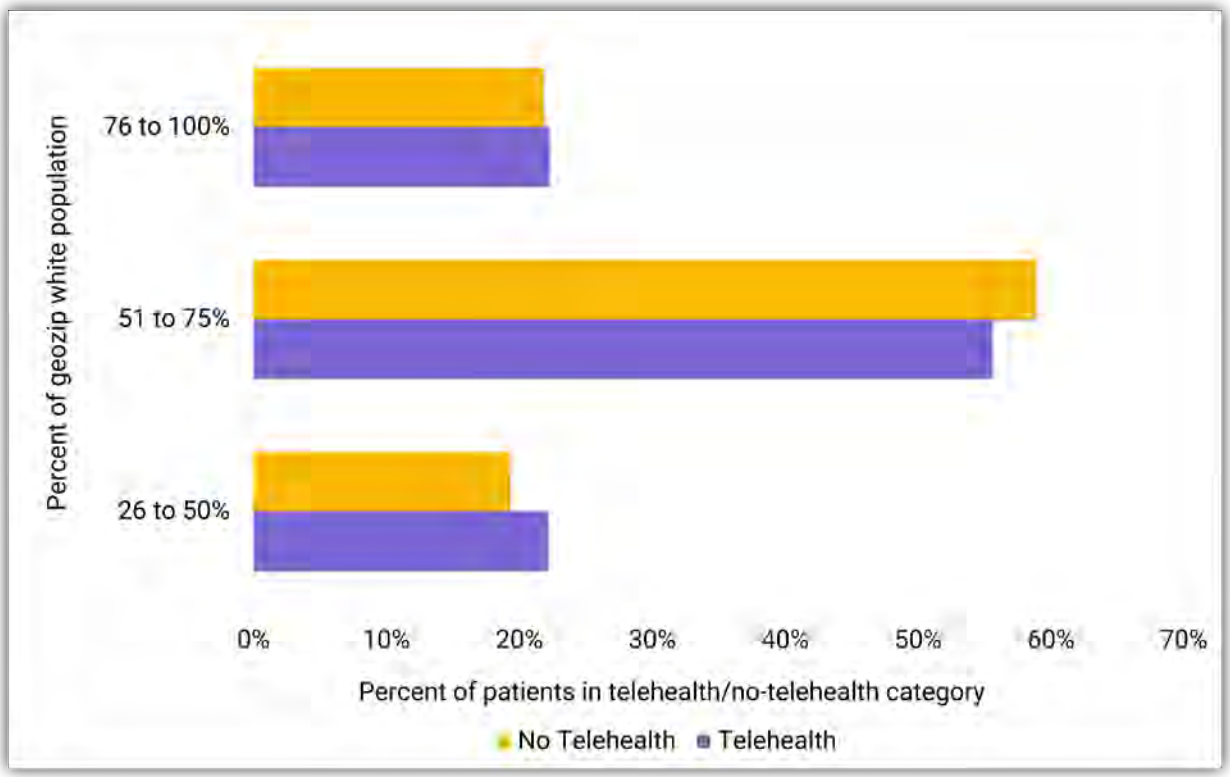


Figure 9. Distribution of Connecticut patients with anxiety and other nonpsychotic mental disorders who used or did not use telehealth across geozip white populations, 2020-2022

Results

The average number of ER visits by patients who received telehealth versus patients who did not receive telehealth for anxiety and other nonpsychotic mental disorders was compared across the percentages of the population that were white (figure 10). In the areas that were 26 to 50 percent white, the difference between telehealth and no telehealth was not statistically significant (*P*=0.1975). But in the two geographies with higher percentages of white people, the differences were statistically significant (*P*<0.0001), with telehealth accounting for higher average ER visit rates than no telehealth. Where the percentage of the population that was white was 51 to 75 percent, telehealth was associated with 0.470 average ER visits for this condition compared to 0.345 for no telehealth (the largest difference). Where the population was 76 to 100 percent white, telehealth was associated with 0.383 average ER visits for this condition compared to 0.298 for no telehealth.

Across both telehealth and no-telehealth categories, the average number of ER visits was significantly higher (*P*<0.0001) when the population was less white. For example, in the areas that were 26 to 50 percent white, the average ER visit rate across both telehealth and no telehealth was 0.579, while in the geographic areas that were 76 to 100 percent white, it was 0.355.

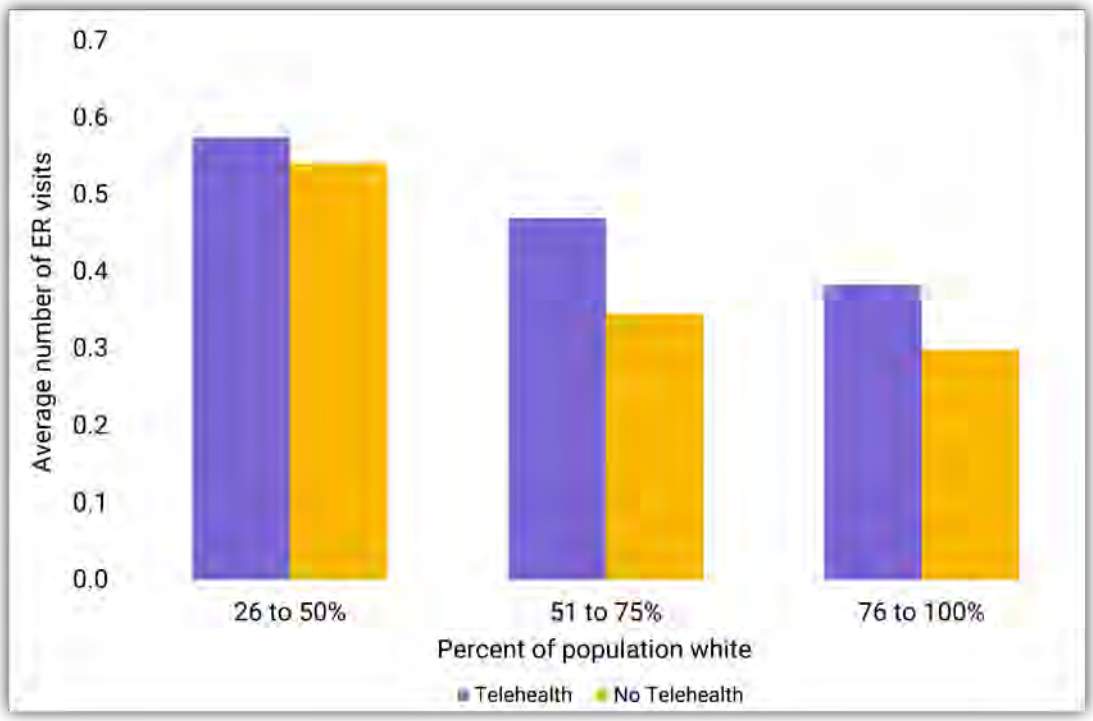


Figure 10. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for anxiety and other nonpsychotic mental disorders by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations of patients who received telehealth versus patients who received no telehealth for anxiety and other nonpsychotic mental disorders was compared across the percentages of the population that were white (figure 11). In all three geographic groupings, the differences were statistically significant (*P*<0.0001), with telehealth accounting for higher average hospitalization rates than no telehealth. For example, where the percentage of the population that was white was 26 to 50 percent, telehealth was associated with 0.162 average hospitalizations for this condition compared to 0.128 for no telehealth. The largest difference was in the geographic areas that were 51 to 75 percent white, where an average of 0.102 hospitalizations were associated with telehealth whereas 0.059 were associated with no telehealth.

Across both telehealth and no-telehealth categories, the average number of hospitalizations was significantly higher (*P*<0.0001) when the population was less white. For example, in the geographic areas that were 26 to 50 percent white, the average hospitalization rate across both telehealth and no telehealth was 0.152, while in the geographic areas that were 76 to 100 percent white, it was 0.062.

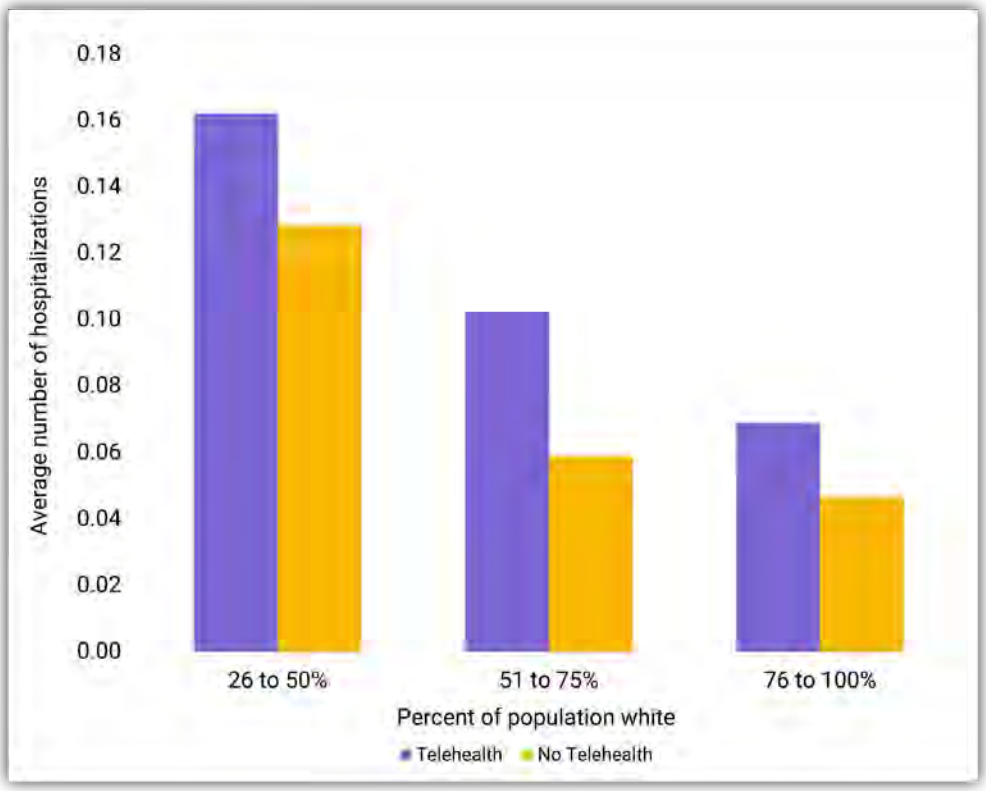


Figure 11. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for anxiety and other nonpsychotic mental disorders by the percentage of the population that was white, 2020-2022

Results

In every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for anxiety and other nonpsychotic mental disorders was higher for patients who used telehealth than those who did not (figure 12). The differences were statistically significant ($P<0.0001$) everywhere except geozip 067 (Torrington, Waterbury; $P=0.2807$). The greatest difference was in geozip 060 (Bristol, Simsbury), where the average total allowed amount per patient for telehealth was more than twice that for no telehealth ($1,313 compared to $568). Across Connecticut as a whole, the average total allowed amount per patient for all services they received was $1,394 for telehealth users, compared to $758 for no telehealth. In part, this is because telehealth patients were more likely to have more visits (see figure 13).

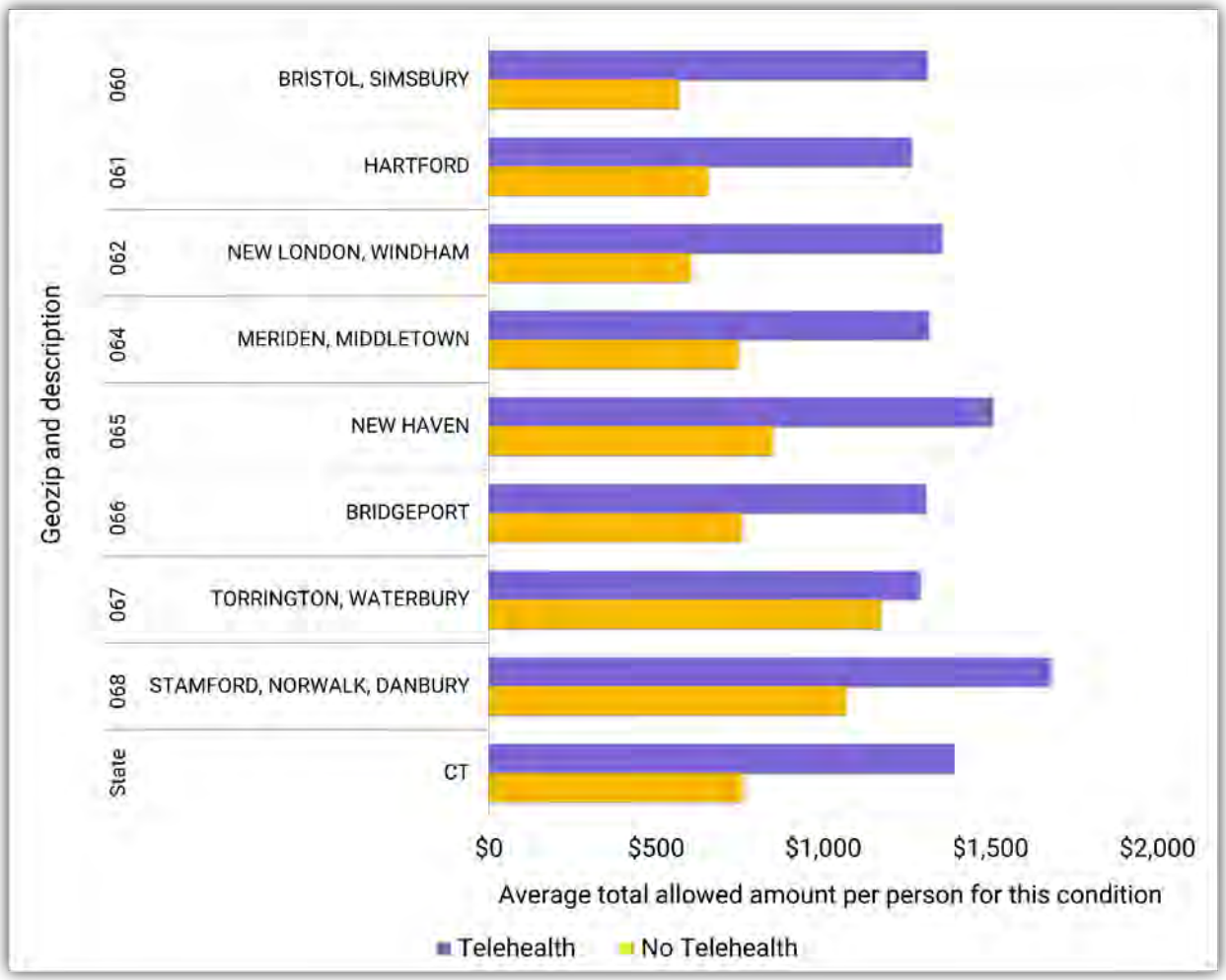


Figure 12. Average total allowed amount per patient for all services for anxiety and other nonpsychotic mental disorders for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

The average total allowed amount per patient for services for anxiety and other nonpsychotic mental disorders and the average number of visits per patient for this condition were significantly higher (*P*<0.0001) for patients who used telehealth than those who did not in all three geographic groups (figure 13). For example, in the geographic areas that were 51 to 75 percent white, the average allowed amount for telehealth users was $1,439, compared to $773 for no telehealth, and the average number of visits was 12.69 for telehealth compared to 5.26 for no telehealth. These areas had the largest average allowed amount and number of visits for both telehealth and no telehealth.

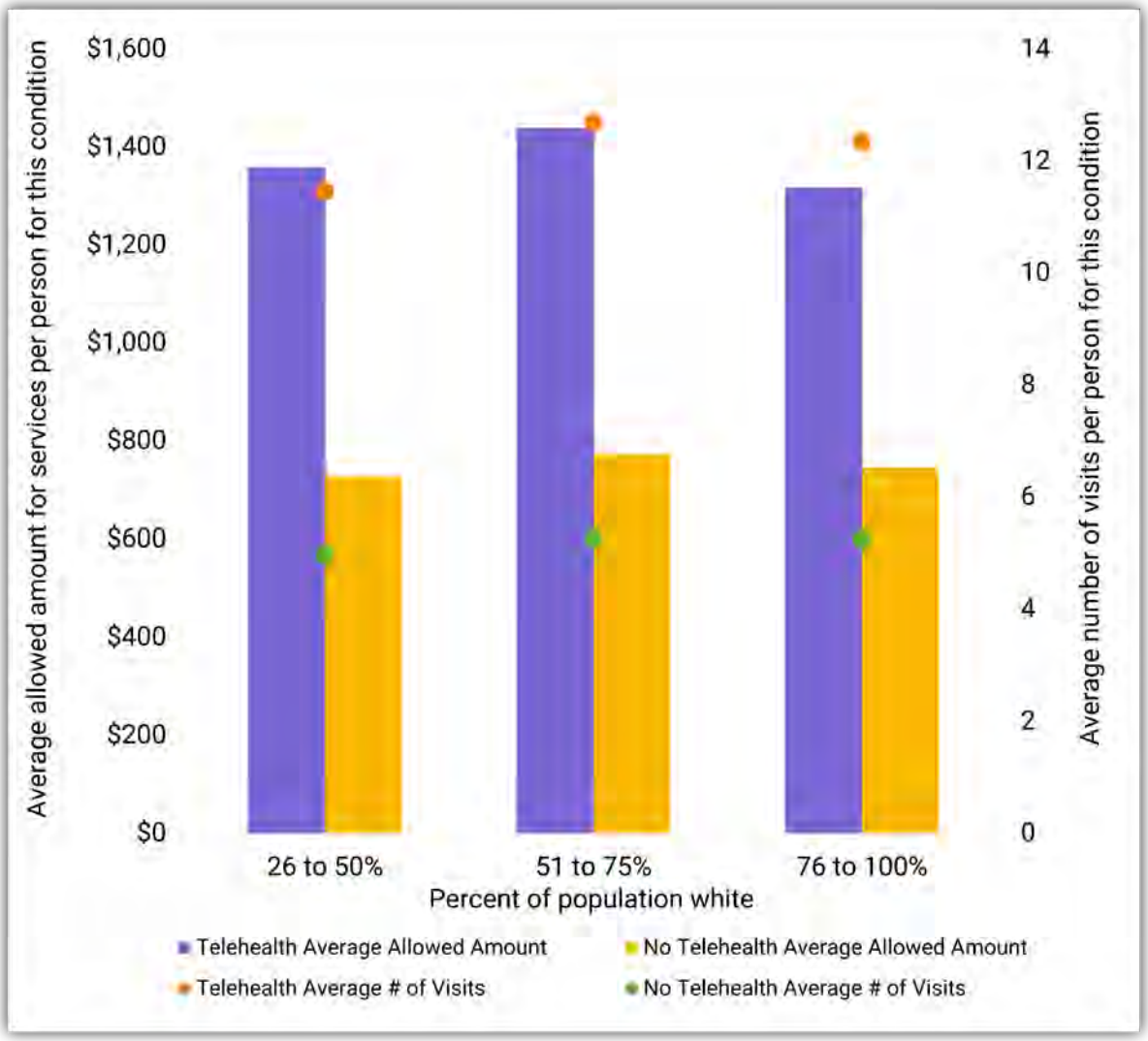


Figure 13. Average total allowed amount per patient for services for anxiety and other nonpsychotic mental disorders and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

Table 3 shows the results of logistic regressions run on the propensity score-matched[60] cohort of patients who had a diagnosis of anxiety and other nonpsychotic mental disorders (anxiety). Telehealth patients with anxiety had significantly increased odds (*P*<0.0001) of having the following:

- More anxiety-related visits than the average;
- More anxiety-related visits than the median;
- Any ER visit;
- Any hospitalization;
- Higher allowed amount sums for anxiety-related visits than the average; and
- Higher allowed amount sums for anxiety-related visits than the median.

The odds ratios[61] are higher for the anxiety visit results than for the anxiety allowed amount sums, both of which are higher than for ER visit and hospitalization results. For example, telehealth patients with anxiety were about four times as likely as patients who did not use telehealth to have more anxiety-related visits than average, but only about three times as likely as patients who did not use telehealth to have a higher anxiety-related allowed amount sum than average.

Iacheev © 123RF.com

[60] See footnote 39.

[61] See footnote 3.

Results

The increased odds ratios for anxiety visit results could indicate that telehealth patients adhered to treatment more consistently due to the convenience of telehealth. A randomized controlled trial found that telehealth improved adherence to medication among patients with severe mental illness.[62]

Table 3. Odds ratios for Connecticut patients who used telehealth for anxiety and other nonpsychotic mental disorders (anxiety) compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Anxiety-Related Visits Than Average	4.06	(3.92, 4.20)	<0.0001
More Anxiety-Related Visits Than Median	3.76	(3.65, 3.86)	<0.0001
Any ER Visit	1.34	(1.30, 1.39)	<0.0001
Any Hospitalization	1.32	(1.24, 1.40)	<0.0001
Higher Anxiety-Related Allowed Amount Sum Than Average	3.22	(3.11, 3.34)	<0.0001
Higher Anxiety-Related Allowed Amount Sum Than Median	3.13	(3.04, 3.22)	<0.0001

[62] Lara N. Schulze et al., "Improving Medication Adherence with Telemedicine for Adults with Severe Mental Illness," Psychiatric Services 70, no. 3 (March 1, 2019): 225-28, https://doi.org/10.1176/appi.ps.201800286.

Results

Mood (Affective) Disorders

Mood disorders—often also referred to as affective disorders—are a set of psychiatric conditions that mainly include bipolar disorder and depression. This category was the second most common diagnosis associated with telehealth in the period 2020-2022 in Connecticut, with 74 percent of these patients using telehealth. The remaining 26 percent did not use telehealth for this condition.

The proportion of patients who used telehealth for mood (affective) disorders and those who did not were very similar in all three geographic groupings (figure 14). The greatest difference was found in the geographic areas that were 51 to 75 percent white, where the share of patients using telehealth was 57.1 percent, while the share of no-telehealth patients was 55.7 percent.

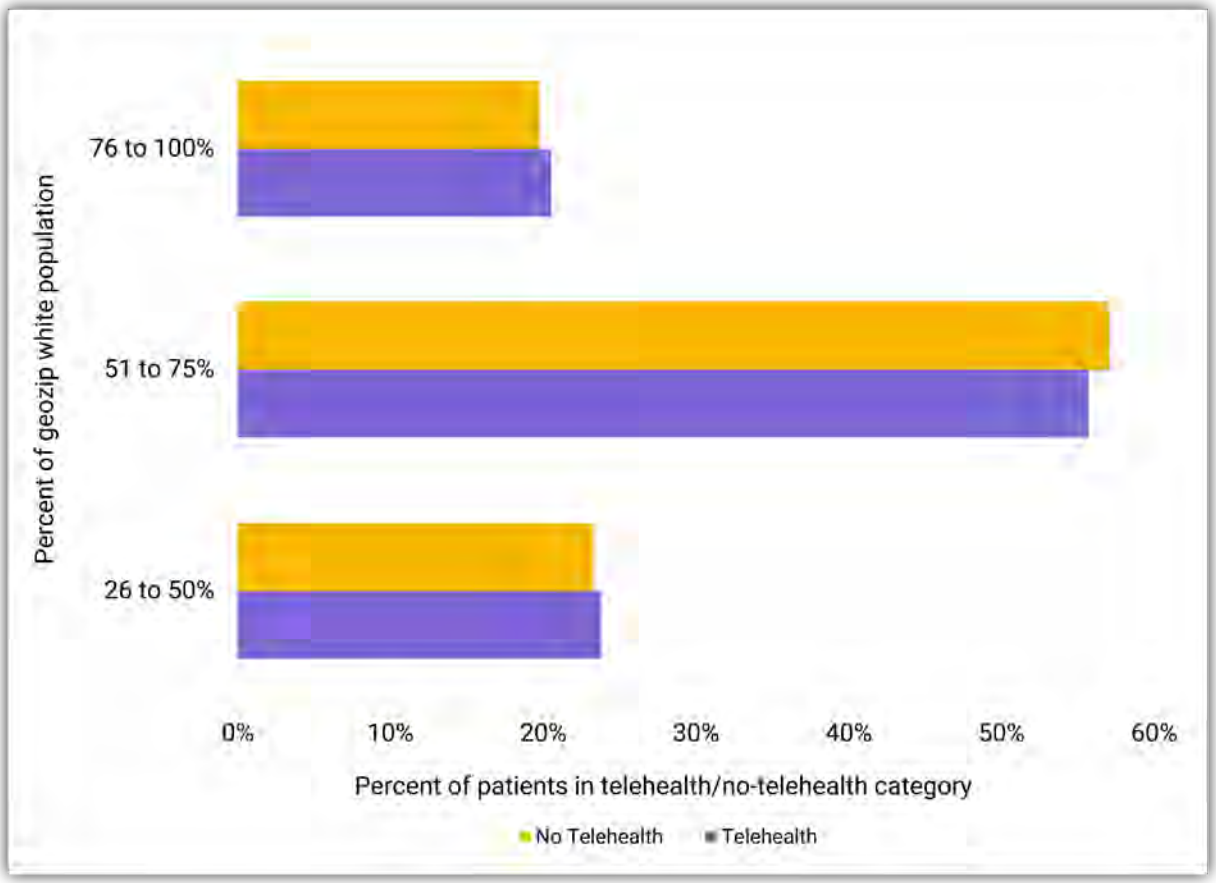


Figure 14. Distribution of Connecticut patients with mood (affective) disorders who used or did not use telehealth across geozip white populations, 2020-2022

Results

The average number of ER visits by patients who received telehealth versus patients who did not receive telehealth for mood (affective) disorders was compared across the geozips based on the percentage of the population that was white (figure 15). The difference between telehealth and no telehealth in the geographic areas that were 26 to 50 percent white was not statistically significant (*P*=0.6503). In the other two categories, the differences were statistically significant (*P*<0.0001) and telehealth accounted for higher average numbers of ER visits than no telehealth. In the geographic areas that were 51 to 75 percent white, telehealth was associated with 0.620 average ER visits for this condition compared to 0.476 for no telehealth. Where the percentage of the population that was white was 76 to 100 percent, telehealth was associated with 0.484 average ER visits for this condition compared to 0.381 for no telehealth.

The average number of ER visits for telehealth and no-telehealth patients with mood (affective) disorders was significantly higher (*P*<0.0001) when the population was less white. For example, in the geographic areas that were 26 to 50 percent white, the average ER visit rate across both telehealth and no telehealth was 0.829, while in the 76 to 100 percent category, it was 0.456.

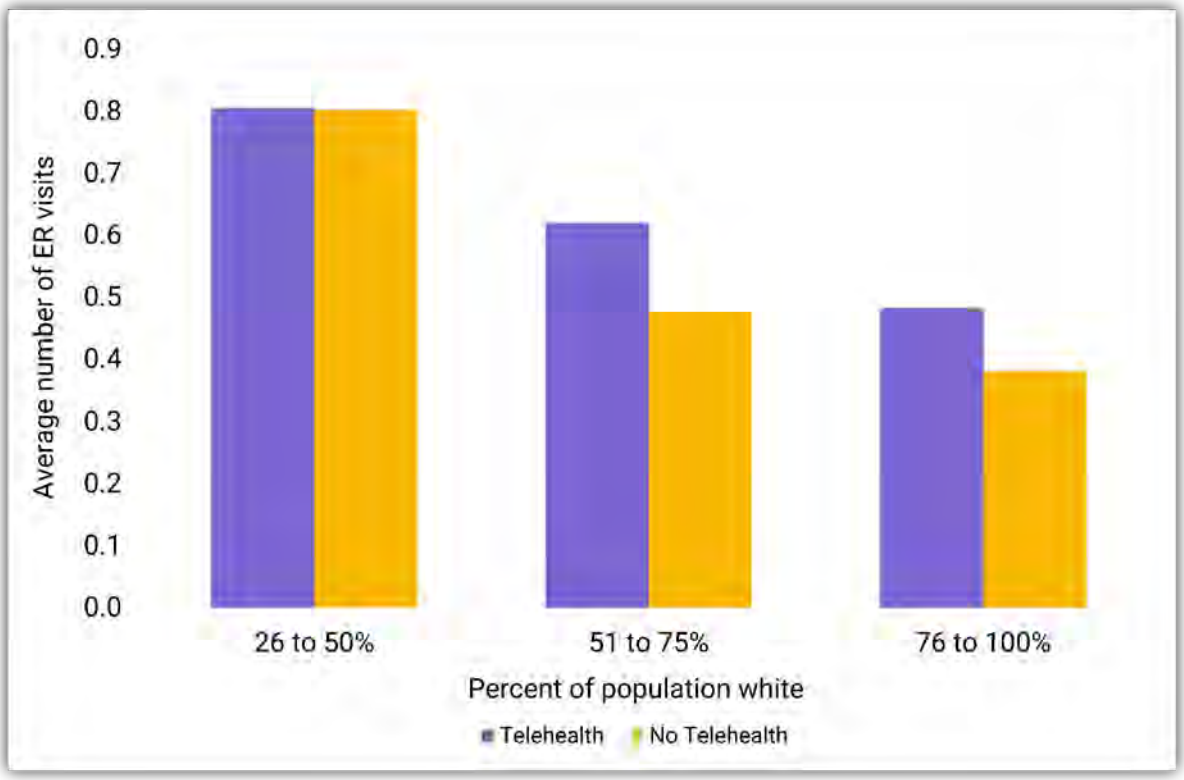


Figure 15. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for mood (affective) disorders by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations of patients who received telehealth versus patients who received no telehealth for mood (affective) disorders was compared across the percentages of the population that were white (figure 16). In all three categories, patients who used telehealth had a higher average number of hospitalizations than those who did not. The difference, however, was only statistically significant in the 51-75 percent white category (*P*=0.0066), where the average number of hospitalizations was 0.155 among telehealth users and 0.136 among those who did not use telehealth.

Across both telehealth and no-telehealth categories, the average number of hospitalizations was significantly higher (*P*<0.0001) when the population was less white. For example, in the geographic areas that are 26 to 50 percent white, the average hospitalization rate across both telehealth and no telehealth was 0.249, while in the geographic areas that were 76 to 100 percent white, it was 0.109.

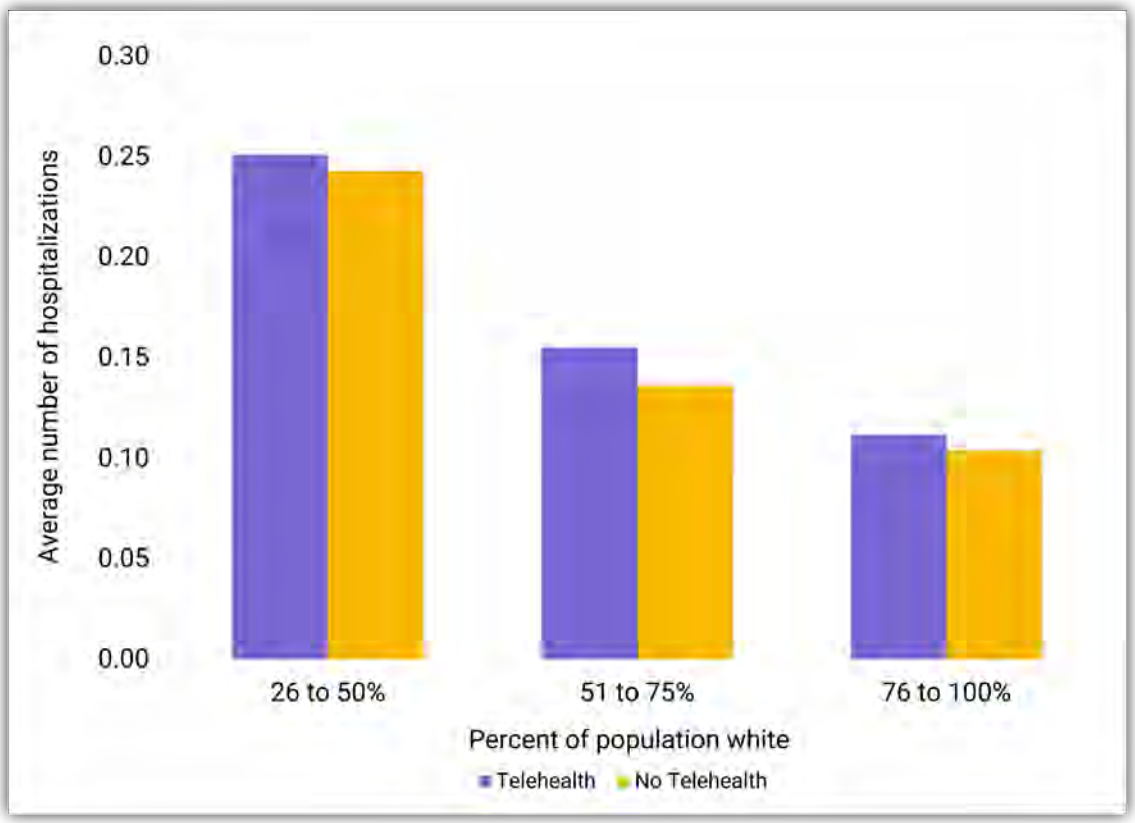


Figure 16. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for mood (affective) disorders by the percentage of the population that was white, 2020-2022

Results

In every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for mood (affective) disorders varied between telehealth and no telehealth (figure 17). The differences were statistically significant in six out of the eight geozips (*P*<0.05) but not always in the same direction. The geozips that did not differ significantly were geozip 068 (Stamford, Norwalk, Danbury; *P*=0.2038) and geozip 066 (Bridgeport; *P*=0.9635). Connecticut as a whole also showed no statistically significant difference between telehealth and no telehealth (*P*=0.8839). The greatest difference was found in geozip 067 (Torrington, Waterbury), where the average total allowed amount for all services per patient using telehealth was significantly lower ($2,627) than for patients not using telehealth ($8,050; *P*<0.0001). Conversely, in geozip 061 (Hartford), the average allowed amount for all services per patient using telehealth was significantly higher ($3,267) than for patients who did not use telehealth ($2,430; *P*=0.0006).

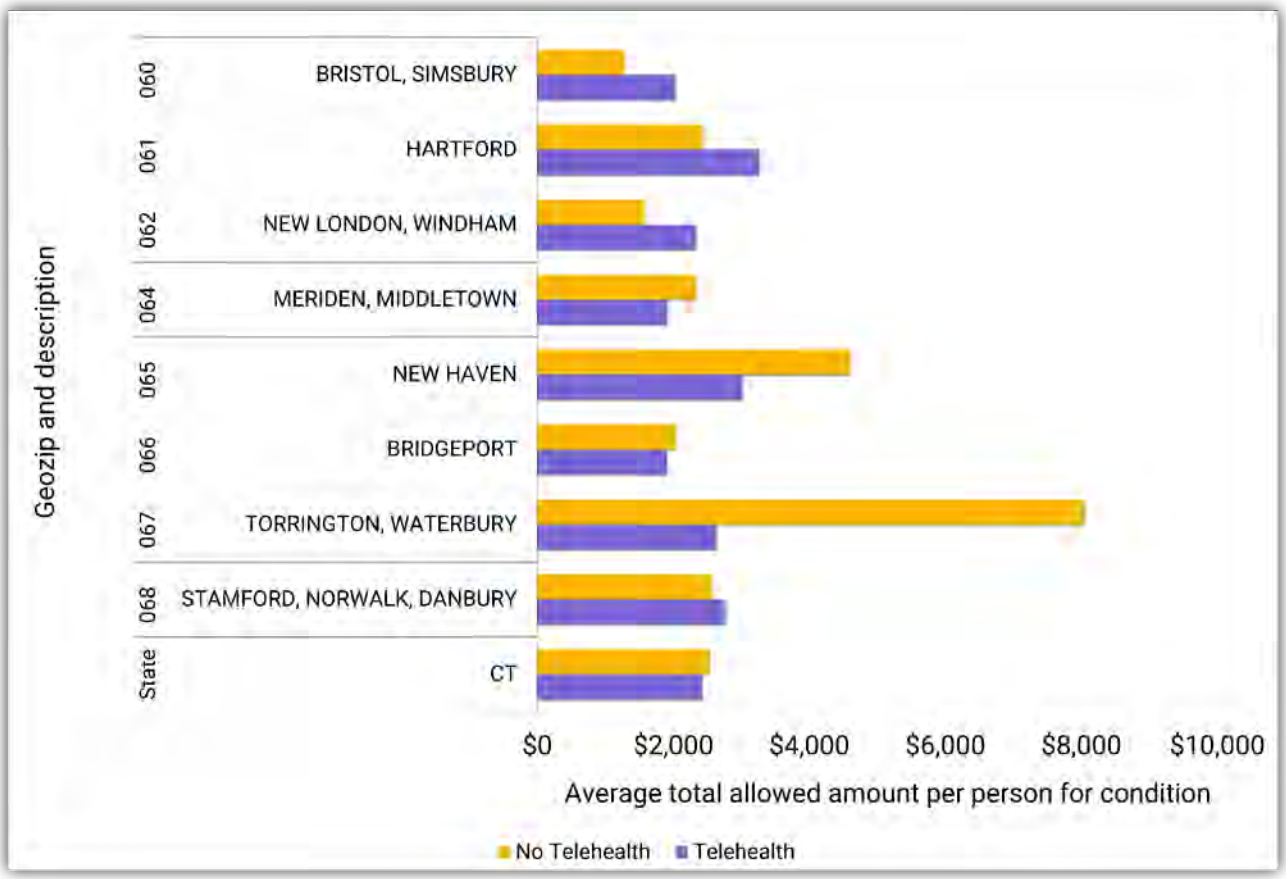


Figure 17. Average total allowed amount per patient for all services for mood (affective) disorders for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

For this condition, in each of the three geographic groupings, the average total allowed amount per patient for services for mood (affective) disorders and the average number of visits per patient are shown in figure 18. The only statistically significant difference between telehealth and no-telehealth average allowed amounts occurred in the geographic areas that were 76 to 100 percent white, where the telehealth average allowed amount per person was lower than that for no telehealth ($1,912 compared to $2,334; *P*=0.0278). The average number of telehealth visits per person was significantly higher than the average number of per person visits without telehealth for all three categories (*P*<0.0001). Within a cohort (either telehealth or no telehealth), these numbers showed little variation across areas with different percentages of white populations. For example, the average number of telehealth visits per person ranged from 11.56 to 12.31, whereas the average number of visits without telehealth ranged from 5.51 to 5.80.

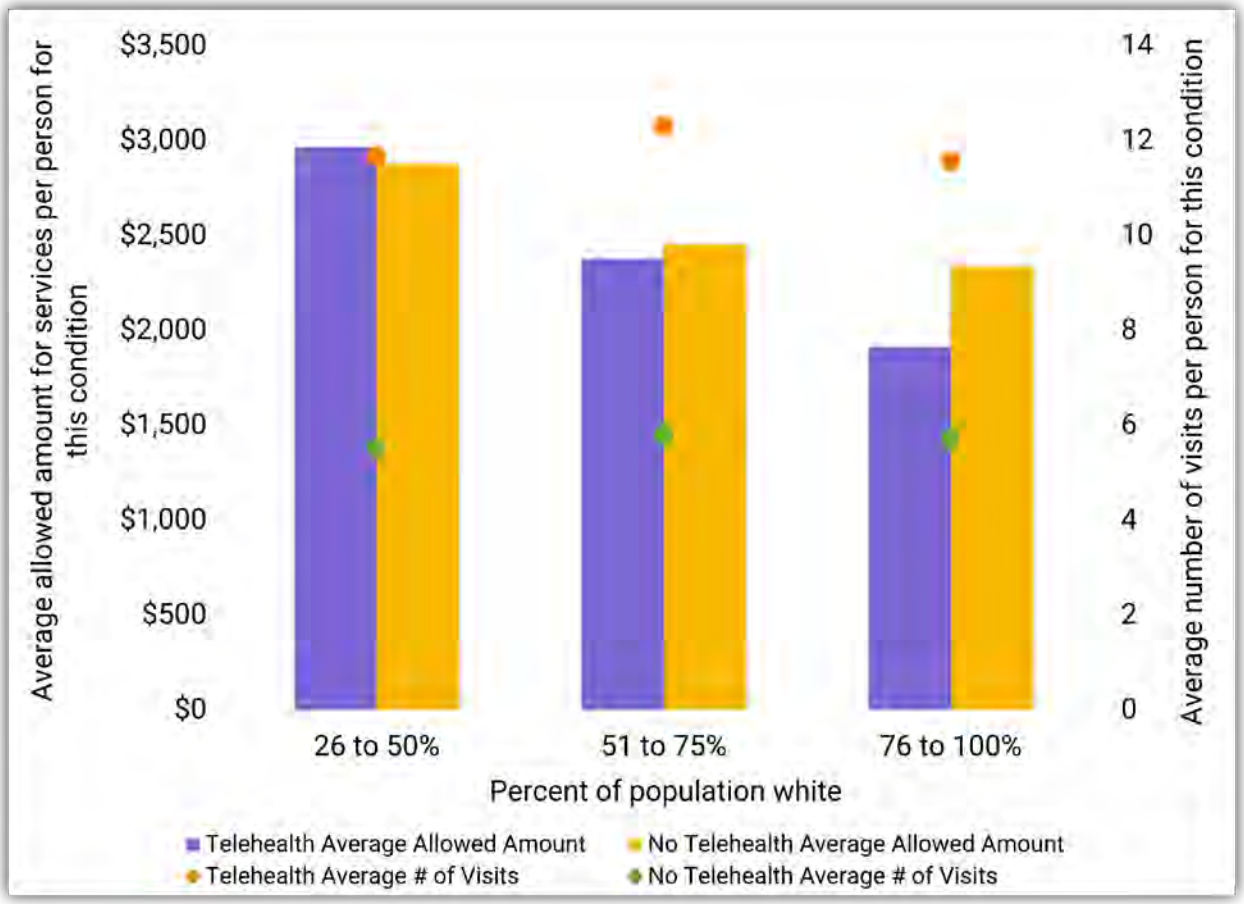


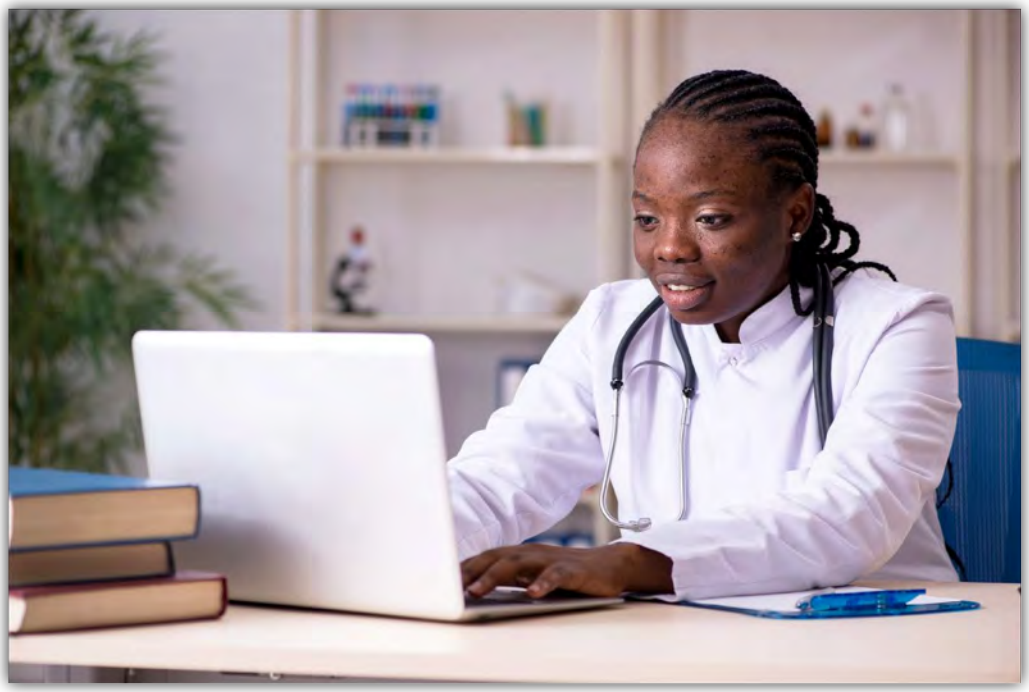
Figure 18. Average total allowed amount per patient for services for mood (affective) disorders and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

Table 4 shows the results of logistic regressions run on the propensity score-matched cohort of patients who had a diagnosis of mood (affective) disorder (mood disorder). Telehealth patients with mood disorders had significantly increased odds ($P<0.0001$) of having the following:

- More mood disorder-related visits than the average;
- More mood disorder-related visits than the median;
- Any ER visit;
- Higher allowed amount sums for mood disorder-related visits than the average; and
- Higher allowed amount sums for mood disorder-related visits than the median.

Telehealth patients with mood disorders also had significantly increased odds ($P=0.0090$) of any hospitalization.



Elnur © 123RF.com

Results

The odds ratios were higher for the mood disorder visit results than for the allowed amount sums, both of which were higher than for the ER and hospitalization results. For example, telehealth patients with mood disorders were about three-and-a-half times as likely as patients who did not use telehealth to have more mood disorder-related visits than average, but less than one-and-three-quarter times as likely as patients who did not use telehealth to have a higher mood disorder-related allowed amount sum than average.

The finding that patients using telehealth were more likely to have higher numbers of mood disorder-related visits than those not using telehealth suggests that telehealth may have the potential to promote adherence to treatment via increased provider interaction. A systematic review found that telehealth interventions were effective in improving adherence to medication among patients with affective disorders.[63]

Table 4. Odds ratios for Connecticut patients who used telehealth for mood (affective) disorders (mood disorders) compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Mood Disorder-Related Visits Than Average	3.41	(3.23, 3.60)	<0.0001
More Mood Disorder-Related Visits Than Median	3.48	(3.33, 3.65)	<0.0001
Any ER Visit	1.34	(1.28, 1.40)	<0.0001
Any Hospitalization	1.10	(1.02, 1.17)	0.0090
Higher Mood Disorder-Related Allowed Amount Sum Than Average	1.70	(1.59, 1.81)	<0.0001
Higher Mood Disorder-Related Allowed Amount Sum Than Median	2.64	(2.52, 2.77)	<0.0001

[63] Marian Leiz et al., "Telemedicine as a Tool to Improve Medicine Adherence in Patients with Affective Disorders – A Systematic Literature Review," Patient Preference and Adherence 16 (December 30, 2022): 3441-63, https://doi.org/10.2147/PPA.S388106.

Results

COVID-19

The COVID-19 pandemic has fueled the growth and adoption of telehealth practices across the nation. Within this acute diagnosis category in the period 2020-2022, 44 percent of Connecticut patients received care via telehealth, while the other 56 percent did not.

The proportion of patients who used telehealth for COVID-19 and those who did not were very similar when compared within each of the three population groupings (figure 19). The greatest difference was found in the geographic areas that were 26 to 50 percent white, where the share of telehealth patients was 25.1 percent, while the share of no-telehealth patients was 27.4 percent.

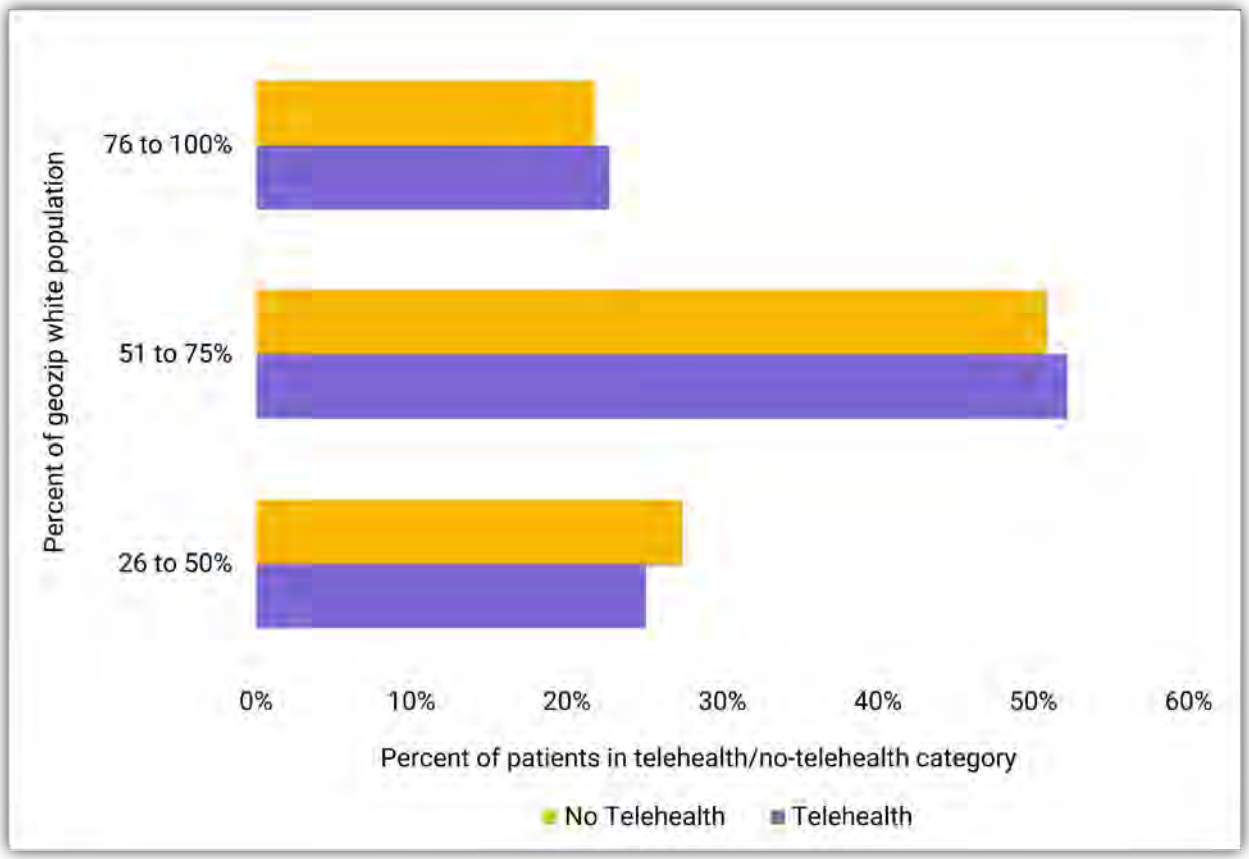


Figure 19. Distribution of Connecticut patients with COVID-19 who used or did not use telehealth across geozip white populations, 2020-2022

Results

Figure 20 shows the average number of ER visits by patients with COVID-19 who received telehealth, versus patients who did not receive telehealth, in each of the three groupings of the population. The difference between telehealth and no telehealth in the geographic areas that were 26 to 50 percent white was not statistically significant (*P*=0.7635). The differences were statistically significant in the other two categories (*P*<0.05), in which telehealth was associated with higher average numbers of ER visits than no telehealth. In the areas that were 51 to 75 percent white, telehealth was associated with 0.503 average ER visits for patients with this condition compared to 0.475 for no telehealth (*P*=0.00221). In the areas that were 76 to 100 percent white, telehealth was associated with 0.428 average ER visits for patients with this condition compared to 0.397 for no telehealth (*P*=0.010568).

Statistically significant differences were found among all three categories (*P*<0.0001). The average number of ER visits for both telehealth and no-telehealth patients with COVID-19 was higher when the population was less white. For example, in the geographic areas that were 76 to 100 percent white, the average ER visit rate across both telehealth and no telehealth was 0.4115, while in the areas that were 26 to 50 percent white, it was 0.6136.

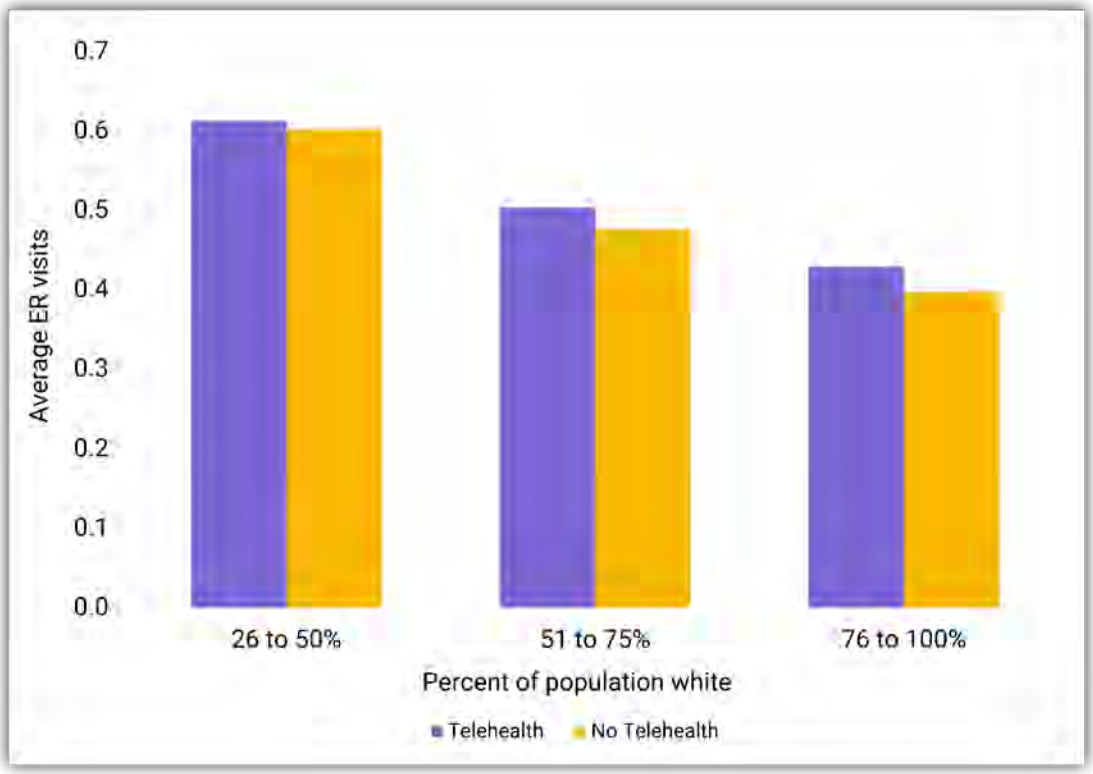


Figure 20. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for COVID-19 by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations of patients who received telehealth versus patients who received no telehealth for COVID-19 was compared across the white population categories (figure 21). In all three categories, patients who used telehealth had a higher average number of hospitalizations than those who did not. The difference was not statistically significant in the areas that were 26-50 percent white (*P*=0.2409). In the two other categories, however, the difference was statistically significant (*P*<0.05). For example, in the areas that were 51-75 percent white, the average number of hospitalizations was 0.098 among the telehealth users and 0.085 among those who did not use telehealth (*P*=0.0001). Similarly in the 76 to 100 percent white category, the average number of hospitalizations was 0.068 for telehealth patients and 0.060 for no-telehealth patients (*P*=0.0438).

Once again, across telehealth and no-telehealth categories, the average number of hospitalizations was significantly higher (*P*<0.0001) when the population was less white. For example, in the geographic areas that were 26 to 50 percent white, the average hospitalization rate across both telehealth and no telehealth was 0.1465, while in the areas that were 76 to 100 percent white, it was 0.0635.

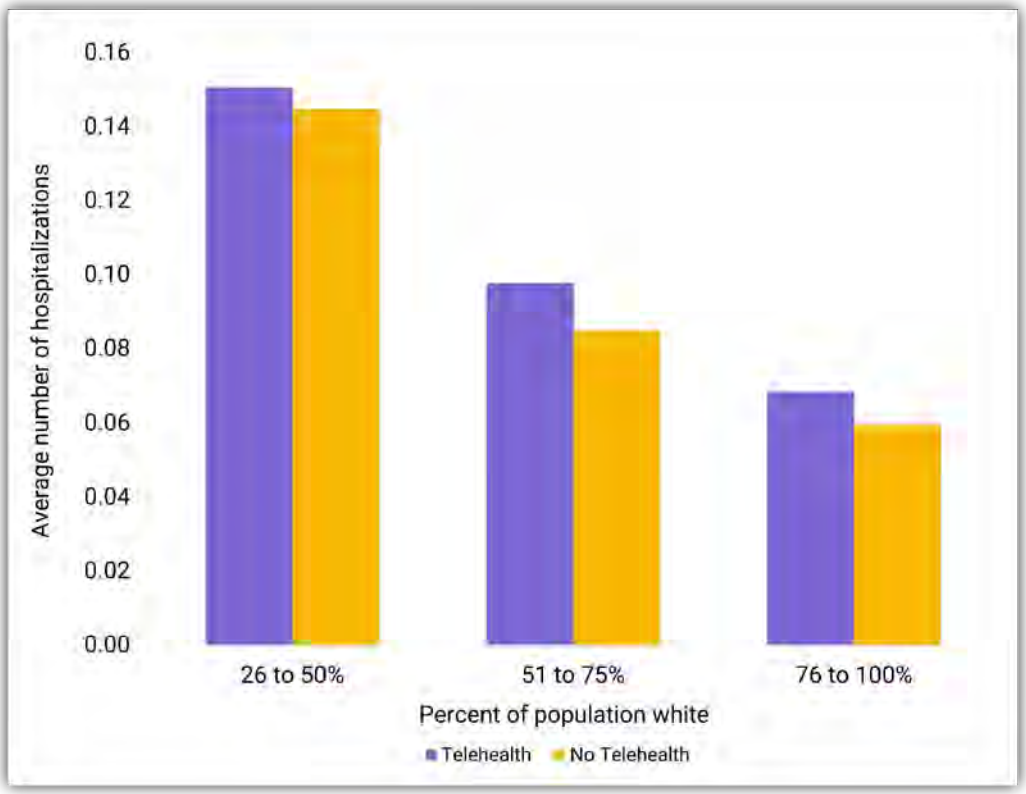


Figure 21. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for COVID-19 by the percentage of the population that was white, 2020-2022

Results

In every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for COVID-19 was lower for telehealth users than nonusers (figure 22). The differences were statistically significant in five out of the eight geozips, plus Connecticut as a whole (*P*<0.05). The geozips that did not differ significantly were geozip 060 (Bristol, Simsbury; *P*=0.8458), geozip 065 (New Haven; *P*=0.2642) and geozip 066 (Bridgeport; *P*=0.9398). The greatest statistically significant dollar amount difference was found in geozip 061 (Hartford), where the average total allowed amount for all services per patient using telehealth was $1,036 compared to $1,843 for all services for patients not using telehealth (*P*=0.0329). For Connecticut as a whole, the average total allowed amount for all services for patients using telehealth was $782, while for patients not using telehealth it was $1,178 (*P*<0.0001).

Figure 22. Average total allowed amount per patient for all services for COVID-19 for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

The average allowed amount per patient for services for COVID-19 and the average number of visits per patient for this condition, split based on the percentage of the population in each geozip that were white, are shown in figure 23. Statistically, average allowed amounts for telehealth were significantly lower than for no telehealth in two of the three categories. In the 76 to 100 percent white category, the telehealth average allowed amount was $574, whereas the no-telehealth amount was $850 (*P*=0.0455). In the 51 to 75 percent white category, the average allowed amounts were $682 for telehealth and $1,014 for no telehealth (*P*=0.0003). The average number of telehealth visits per person was significantly higher than the average number of per person visits without telehealth for all three categories (*P*<0.0001). For example, the average number of visits in the areas that were 26-50 percent white was 2.08 for telehealth and 1.57 for no telehealth. Both the average allowed amounts per person and the average number of visits per person for this condition increased as the percentage of the population that was white decreased. This pattern was evident for both patients who used telehealth and those who did not.

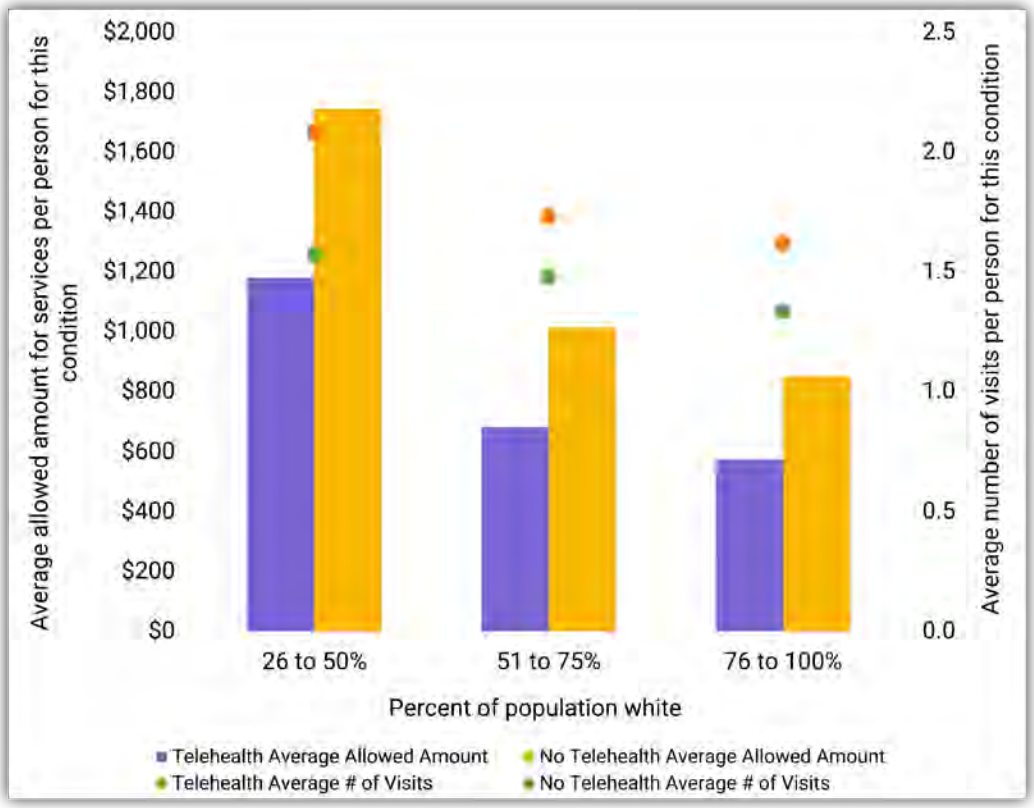


Figure 23. Average total allowed amount per patient for services for COVID-19 and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

The results of logistic regressions run on patients who had a diagnosis of COVID-19 are shown in table 5. Telehealth patients with COVID-19 had significantly increased odds (*P*<0.0001) of having more COVID-19-related visits than the average and more COVID-19-related visits than the median. For example, telehealth patients were about twice as likely as no-telehealth patients to have more COVID-19-related visits than average.

Conversely, the odds ratios for the other results showed that COVID-19 patients who used telehealth were significantly less likely to have any ER visit or any hospitalization and they were also significantly less likely to have higher allowed amount sums than the average when compared to COVID-19 patients who did not use telehealth (*P*<0.0001).

These results suggest that while COVID-19 patients using telehealth were more likely to have more visits than the average, they were also less likely to visit the ER or be hospitalized. This finding involves only the propensity score-matched dataset used when performing regression analysis; it differs from the findings reported in relation to figures 20 and 21, which used the larger dataset.

Table 5. Odds ratios for Connecticut patients who used telehealth for COVID-19 compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More COVID-19-Related Visits Than Average	2.18	(2.10, 2.25)	<0.0001
More COVID-19-Related Visits Than Median	2.18	(2.10, 2.25)	<0.0001
Any ER Visit	0.81	(0.78, 0.84)	<0.0001
Any Hospitalization	0.73	(0.69, 0.77)	<0.0001
Higher COVID-19-Related Allowed Amount Sum Than Average	0.38	(0.35, 0.40)	<0.0001
Higher COVID-19-Related Allowed Amount Sum Than Median	0.28	(0.27, 0.29)	<0.0001

Results

Acute Upper Respiratory Infections

Acute upper respiratory infections can involve the nose, throat, larynx and bronchi. Well-known examples include laryngitis, rhinitis, tonsillitis and pharyngitis. Across Connecticut in the period 2020-2022, 28 percent of patients with acute upper respiratory infections received care via telehealth and the remaining 72 percent did not.

The proportion of patients who used telehealth for acute upper respiratory infections did not differ greatly from that of patients who did not use telehealth when compared within geographic areas with similar white percentages of the population (figure 24). In the geographic areas that were 51 to 75 percent white, telehealth was used less than no telehealth. The share of the no-telehealth distribution was 56.4 percent and the share of the telehealth distribution was 53.0 percent. Conversely, in the geographic areas with both the highest and lowest proportion of whites, telehealth was used more than no telehealth. For example, in the areas that were 26 to 50 percent white, 22.2 percent of patients with acute upper respiratory infections did not use telehealth, whereas 24.2 percent did.

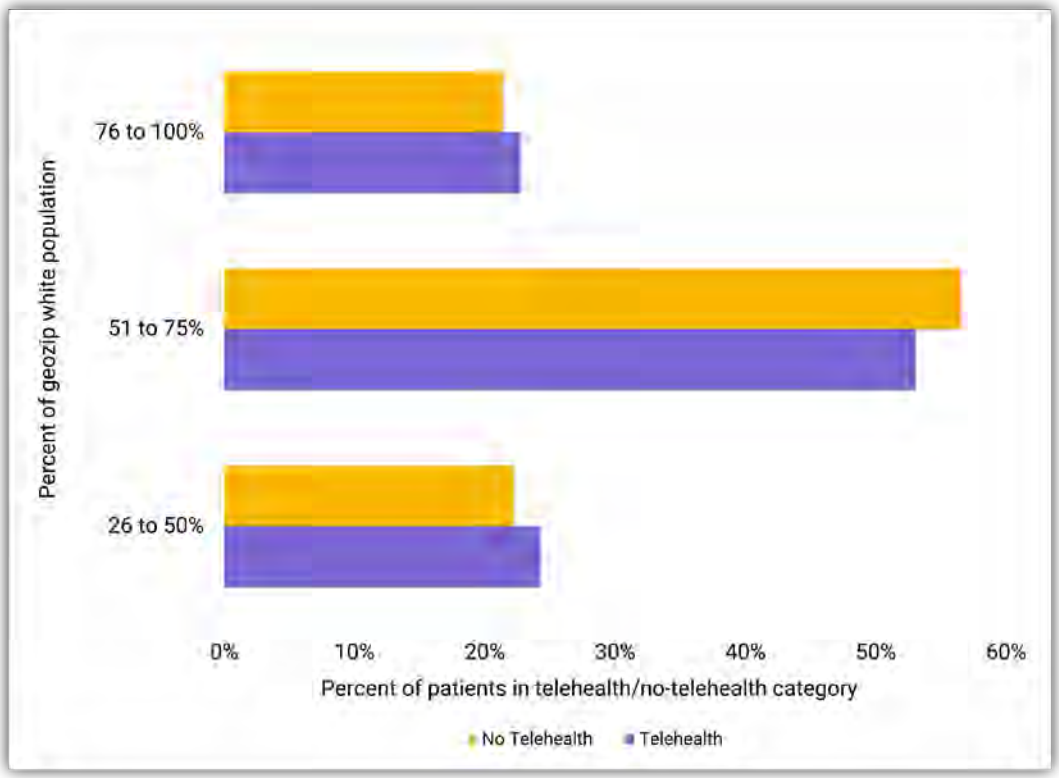


Figure 24. Distribution of Connecticut patients with acute upper respiratory infections who used or did not use telehealth across geozip white populations, 2020-2022

Results

The average number of ER visits by patients who received telehealth was higher than for patients who did not receive telehealth for acute upper respiratory infections across all three geographic groupings (figure 25). In the geographic areas that were 26 to 50 percent white, there was the least pronounced difference between telehealth (0.654 average ER visits) and no telehealth (0.598 average ER visits), though the difference was still statistically significant (*P*=0.02149). There was a larger difference in means within the other two groupings. For example, the largest difference occurred where the percentage of the population that was white was 51 to 75 percent; telehealth was associated with 0.568 average ER visits in these areas, compared to 0.349 for no telehealth (*P*<0.0001). In addition, where the percentage of the population that was white was 76 to 100 percent, telehealth was associated with 0.437 average ER visits for this condition compared to 0.326 for no telehealth (*P*<0.0001).

When telehealth and no-telehealth patients were combined, the average number of ER visits was significantly higher (*P*<0.0001) when the population was less white. For example, in the geographic areas that were 26 to 50 percent white, the average ER visit rate across both telehealth and no telehealth was 0.640, while in the areas that were 76 to 100 percent white, it was 0.360.

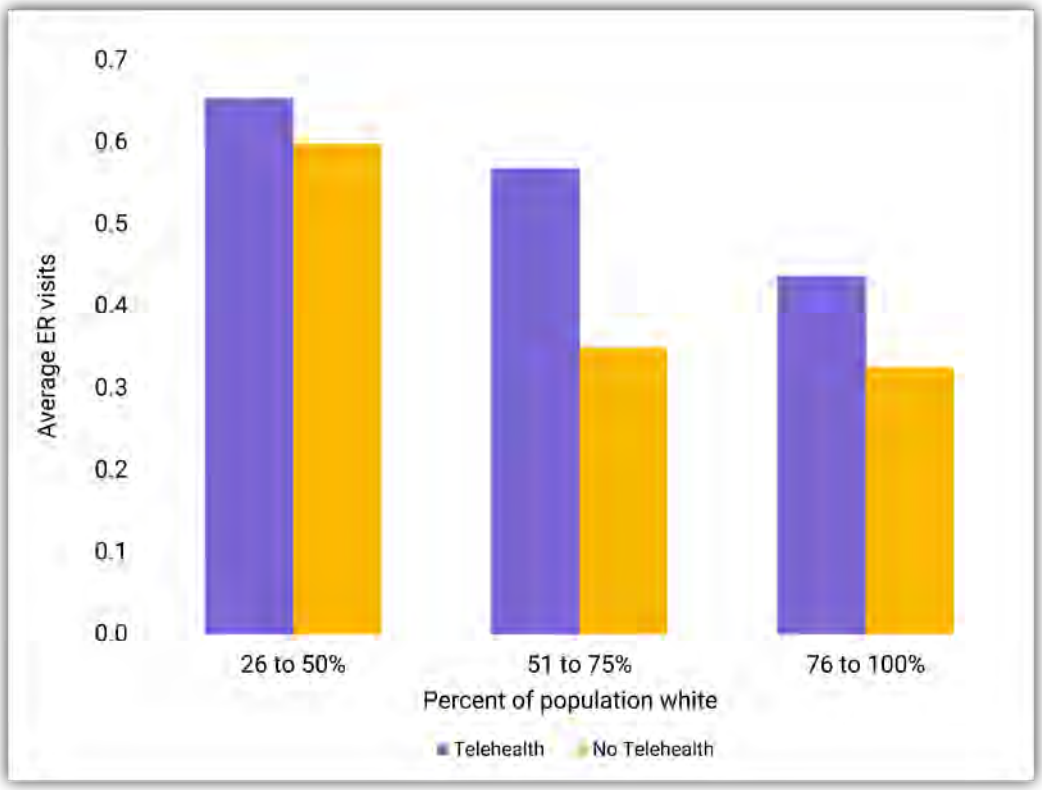


Figure 25. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for acute upper respiratory infections by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations for patients who received telehealth versus patients who received no telehealth for acute upper respiratory infections was compared across the percentages of the population that were white (figure 26). In all three geographic groupings, the differences were statistically significant (*P*<0.0001), with telehealth accounting for higher average hospitalization rates than no telehealth. For example, where the percentage of the population that was white was 26 to 50 percent, telehealth was associated with 0.165 average hospitalizations for this condition compared to 0.103 for no telehealth. The largest difference occurred in the areas that were 26 to 50 percent white, where telehealth was associated with an average of 0.165 hospitalizations and no telehealth was associated with an average of 0.103 hospitalizations.

When telehealth and no-telehealth categories were combined, the average number of hospitalizations was significantly higher (*P*<0.0001) in the regions with a lower percentage of whites. For example, in the geographic areas that were 26 to 50 percent white, the average number of hospitalizations was 0.120, while in the areas that were 76 to 100 percent white, it was 0.052.

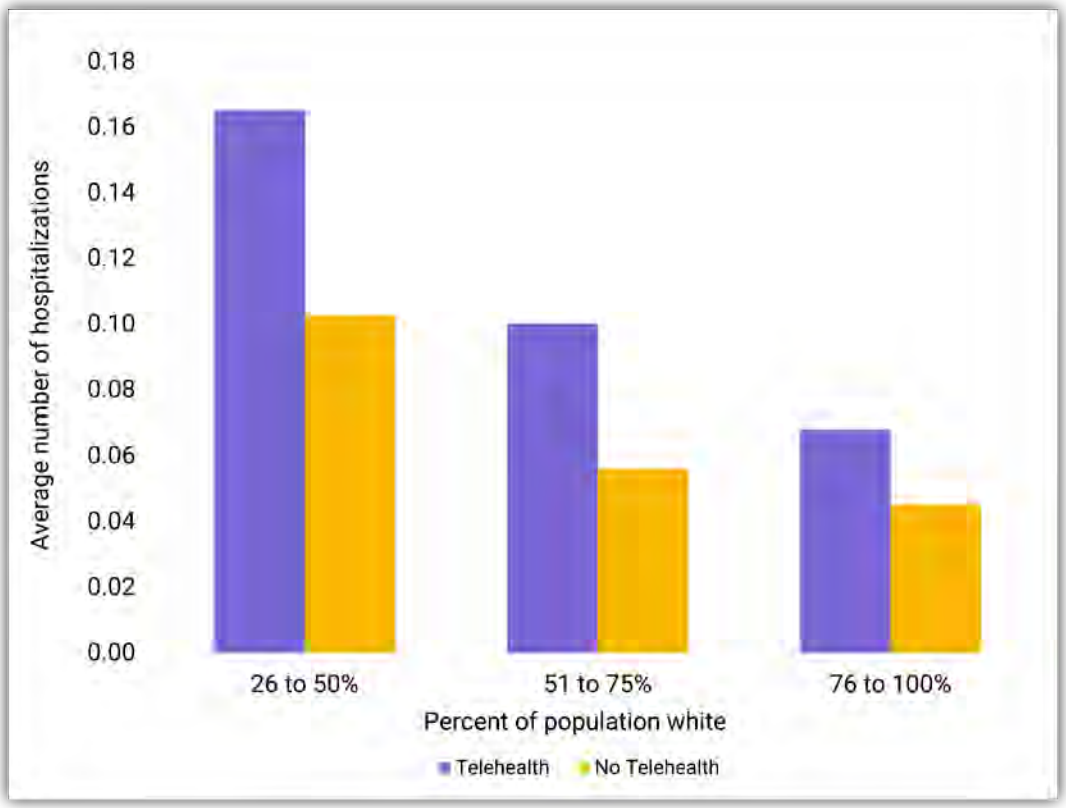


Figure 26. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for acute upper respiratory infections by the percentage of the population that was white, 2020-2022

Results

Similar to the results seen for COVID-19, in every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for acute upper respiratory infections was lower for patients who used telehealth than those who did not (figure 27). All the differences were statistically significant (*P*<0.0001), with the greatest difference seen in geozip 065 (New Haven), where the average total allowed amount for all services per patient for telehealth was less than half that for patients with no telehealth ($179 compared to $388). Across Connecticut as a whole, the average total allowed amount per patient for all services was $173 for patients using telehealth, compared to $300 for patients with no telehealth services.

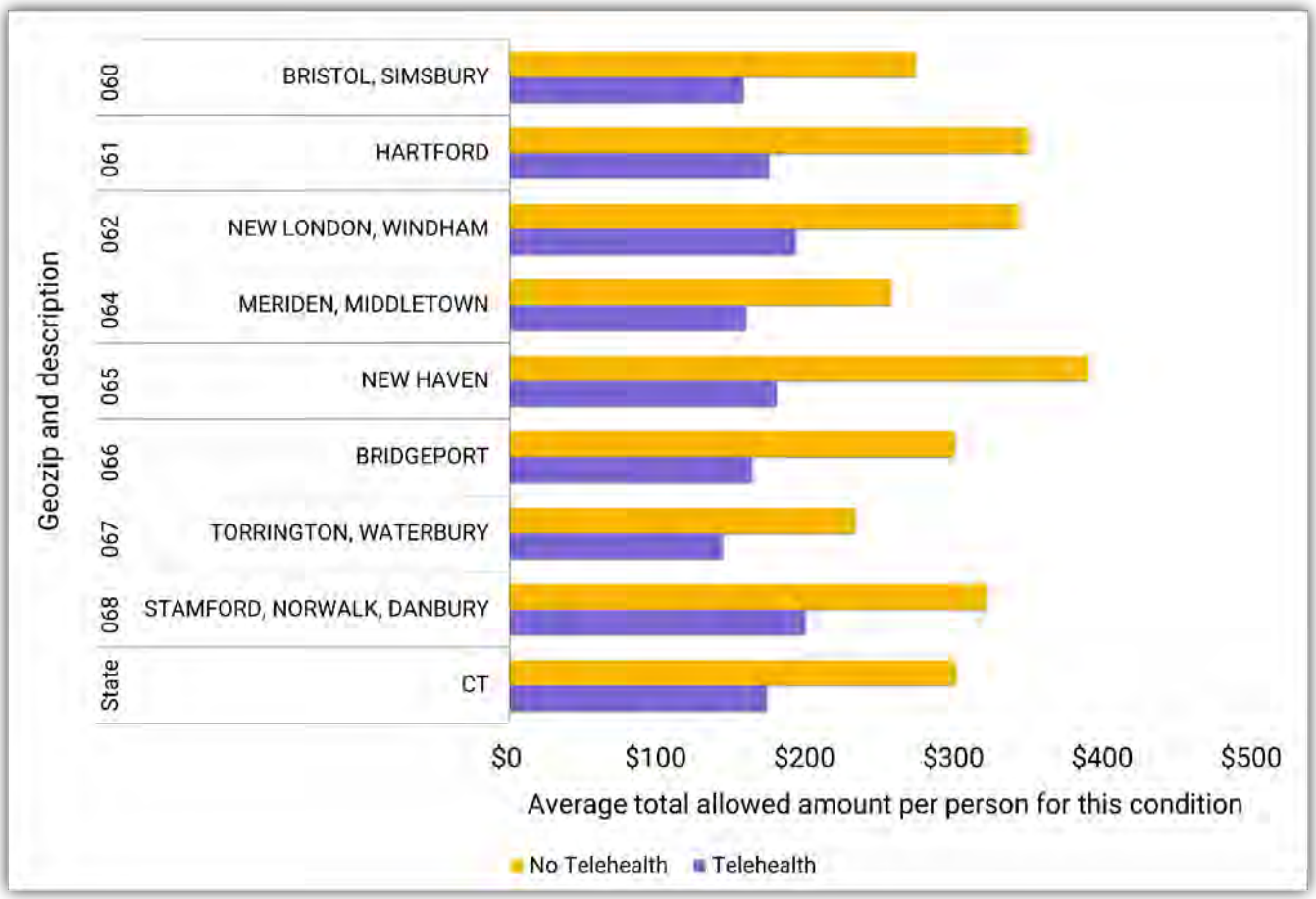


Figure 27. Average total allowed amount per patient for all services for acute upper respiratory infections for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

The average total allowed amount per patient for services for acute upper respiratory infections and the average number of visits per patient for this condition across three geographic groupings are shown in figure 28. Average total allowed amounts were significantly lower (*P*<0.0001) for patients who used telehealth than those who did not in all three categories. The largest difference was in the geographic areas that were 26 to 50 percent white, where the average allowed amount for telehealth was $173 compared to $343 for no telehealth. The average number of visits showed less variation, but the differences were statistically significant in both the 51-75 percent white (*P*<0.0001) and the 76-100 percent white (*P*=0.0363) categories. In the geographic areas that were 26 to 50 percent white, the average number of visits were the same in both telehealth and no-telehealth patients (1.51; *P*=0.4590).

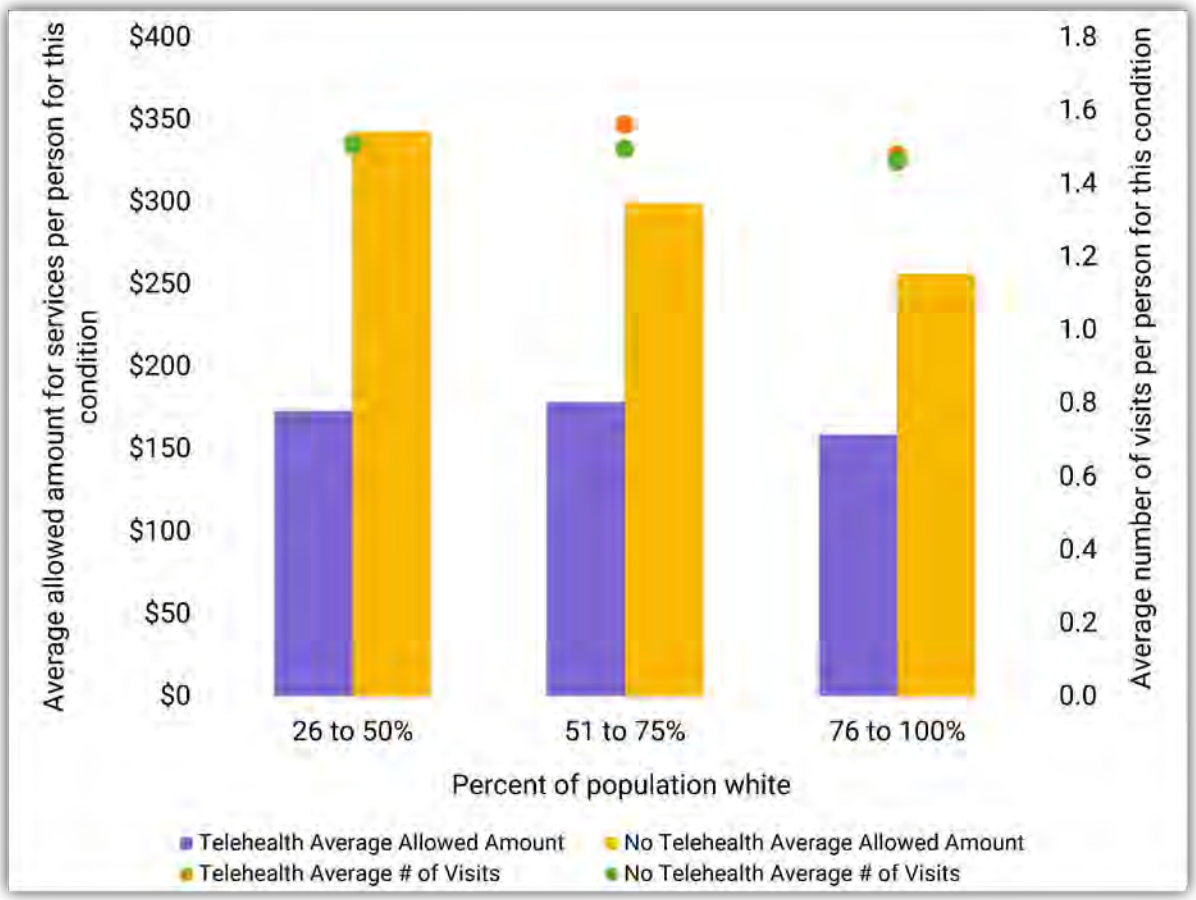


Figure 28. Average total allowed amount per patient for services for acute upper respiratory infections and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

The results of logistic regressions run on the propensity score-matched cohort of patients who had a diagnosis of acute upper respiratory infections are presented in table 6. Telehealth patients with acute upper respiratory infections had significantly increased odds ($P \leq 0.0001$) of having the following:

- More acute upper respiratory infection-related visits than the average;
- More acute upper respiratory infection-related visits than the median;
- Any ER visit; and
- Any hospitalization.

Telehealth patients were one-and-a-half times as likely as patients who did not use telehealth to have more acute upper respiratory infection-related visits than the average and the median. Telehealth patients were also more likely than no-telehealth patients to have any ER visit (1.08) and any hospitalization (1.18). The odds ratios for the allowed amount sums, however, were less than one, meaning that telehealth patients were less likely than no-telehealth patients to have higher allowed amount sums than the average or median for this condition (0.40 and 0.44, respectively); both allowed amount sum odds ratios were statistically significant ($P<0.0001$).

Table 6. Odds ratios for Connecticut patients who used telehealth for acute upper respiratory infections compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Acute Upper Respiratory Infection-Related Visits Than Average	1.50	(1.44, 1.55)	<0.0001
More Acute Upper Respiratory Infection-Related Visits Than Median	1.50	(1.44, 1.55)	<0.0001
Any ER Visit	1.08	(1.04, 1.12)	0.0001
Any Hospitalization	1.18	(1.11, 1.27)	<0.0001
Higher Acute Upper Respiratory Infection-Related Allowed Amount Sum Than Average	0.40	(0.38, 0.41)	<0.0001
Higher Acute Upper Respiratory Infection-Related Allowed Amount Sum Than Median	0.44	(0.43, 0.46)	<0.0001

Results

Hypertensive Diseases

Hypertensive diseases include essential (primary) hypertension (also known as high blood pressure), hypertensive heart disease, hypertensive chronic kidney disease, hypertensive heart and chronic kidney disease, secondary hypertension and hypertensive crisis. During the study period of 2020-2022, 16 percent of Connecticut patients with hypertensive diseases used telehealth for this condition, while 84 percent did not.

The proportion of patients who used telehealth for hypertensive diseases varied from that of patients who did not use telehealth when compared within geographic areas that had similar percentages of white populations (figure 29). In both the areas that were 76 to 100 percent white and 51 to 75 percent white, a lower percentage of patients used telehealth compared to those who did not. In the areas that were 26 to 50 percent white, the pattern was reversed, and a higher percentage of patients used telehealth (29.4 percent) than no telehealth (23.3 percent).

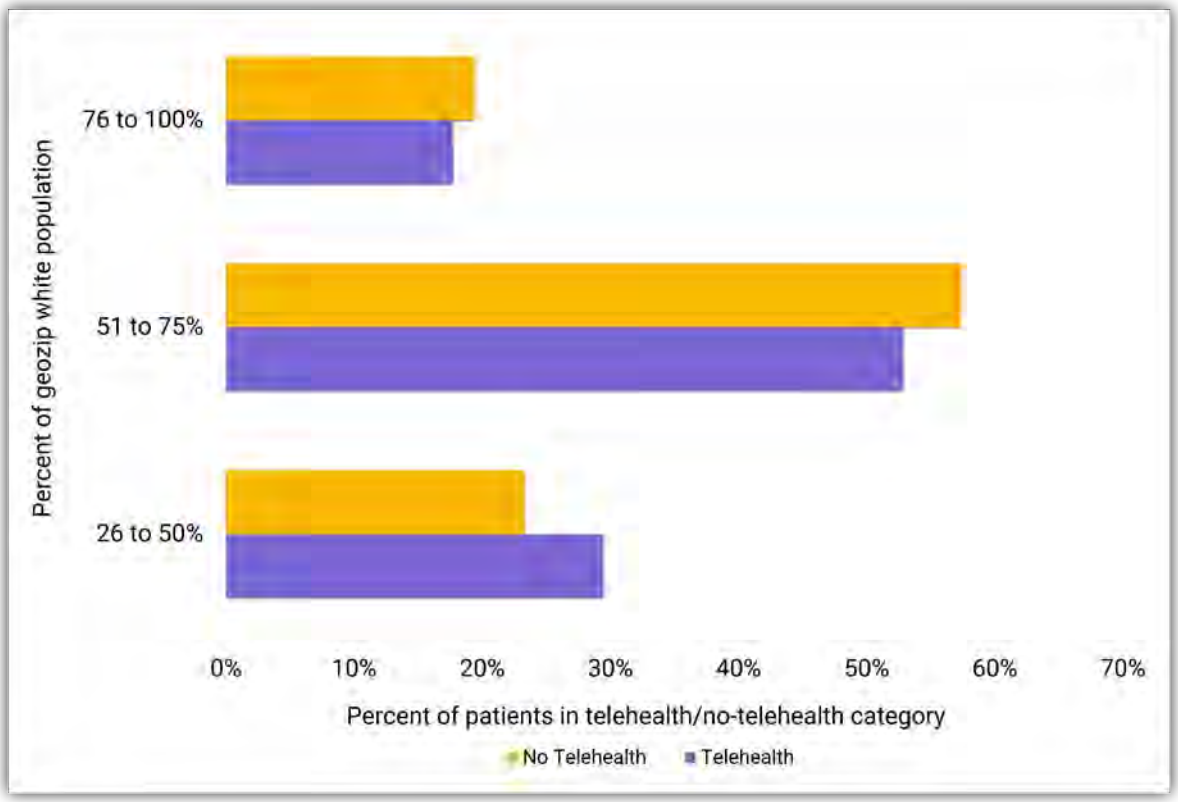


Figure 29. Distribution of Connecticut patients with hypertensive diseases who used or did not use telehealth across geozip white populations, 2020-2022

Results

The average number of ER visits by patients who received telehealth versus patients who did not receive telehealth for hypertensive diseases was compared across the percentages of the population that were white (figure 30). In all three groups, the differences were statistically significant (*P*<0.0001), with telehealth accounting for more than twice the average numbers of ER visits than no telehealth. Where the percentage of the population that was white was 26 to 50 percent, telehealth was associated with 0.919 average ER visits, versus 0.423 average ER visits for no telehealth. In the areas that were 51 to 75 percent white, telehealth was associated with 0.785 average ER visits, whereas no telehealth was associated with 0.338 average ER visits. The areas that were 76 to 100 percent white had 0.621 average ER visits associated with telehealth and 0.290 average ER visits associated with no telehealth.

Across both telehealth and no-telehealth categories, the average number of ER visits was significantly higher (*P*<0.0001) when the population was less white. For example, in the areas that were 26 to 50 percent white, the average ER visit rate across both telehealth and no telehealth was 0.538, while in the areas that were 76 to 100 percent white, it was 0.338.

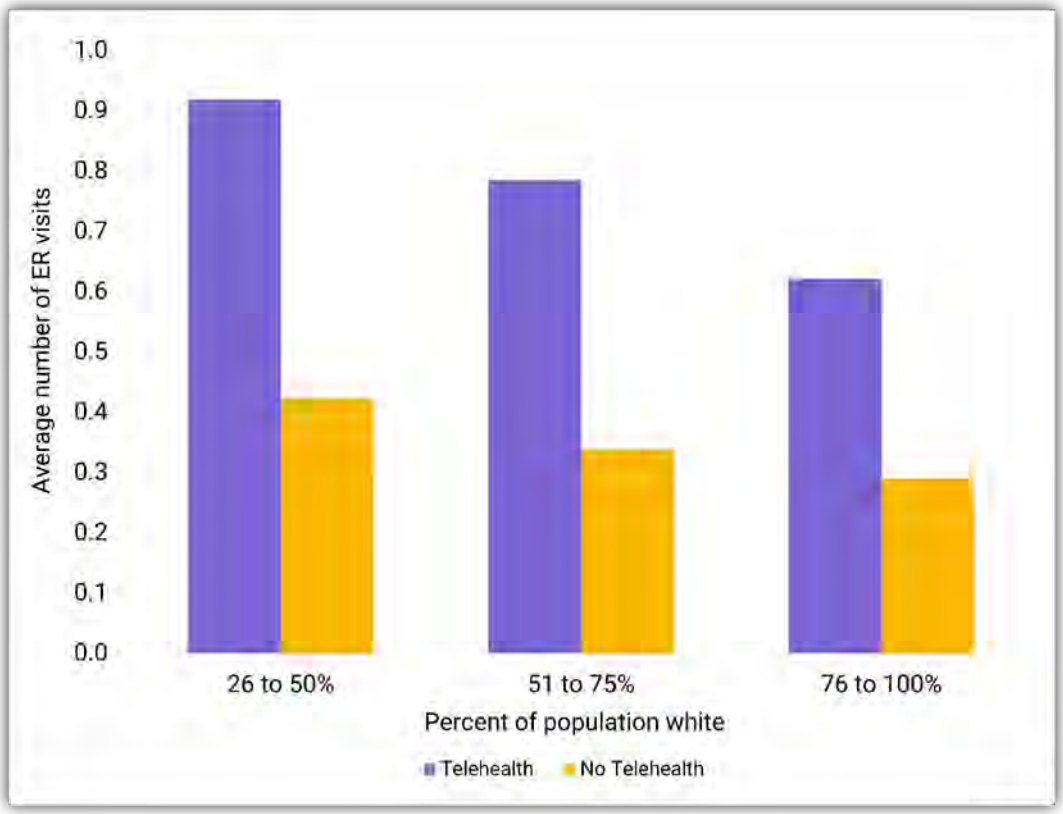


Figure 30. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for hypertensive diseases by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations of patients who received telehealth versus patients who received no telehealth for hypertensive diseases was compared across the percentages of the population that were white (figure 31). In all three geographic groups, the differences were statistically significant (*P*<0.0001), with telehealth accounting for about twice the average hospitalization rates compared to no telehealth. For example, where the percentage of the population that was white was 26 to 50 percent, telehealth was associated with 0.273 average hospitalizations for this condition compared to 0.143 for no telehealth.

When both telehealth and no-telehealth categories were combined, the average number of hospitalizations was significantly different among the three categories (*P*<0.0001), with the areas with the highest percentage of the population that was white associated with the lowest average number of hospitalizations. For example, in the areas that were 76 to 100 percent white, the average hospitalization rate across both telehealth and no telehealth was 0.075, while in the 26 to 50 percent white areas, it was more than twice as much at 0.169.

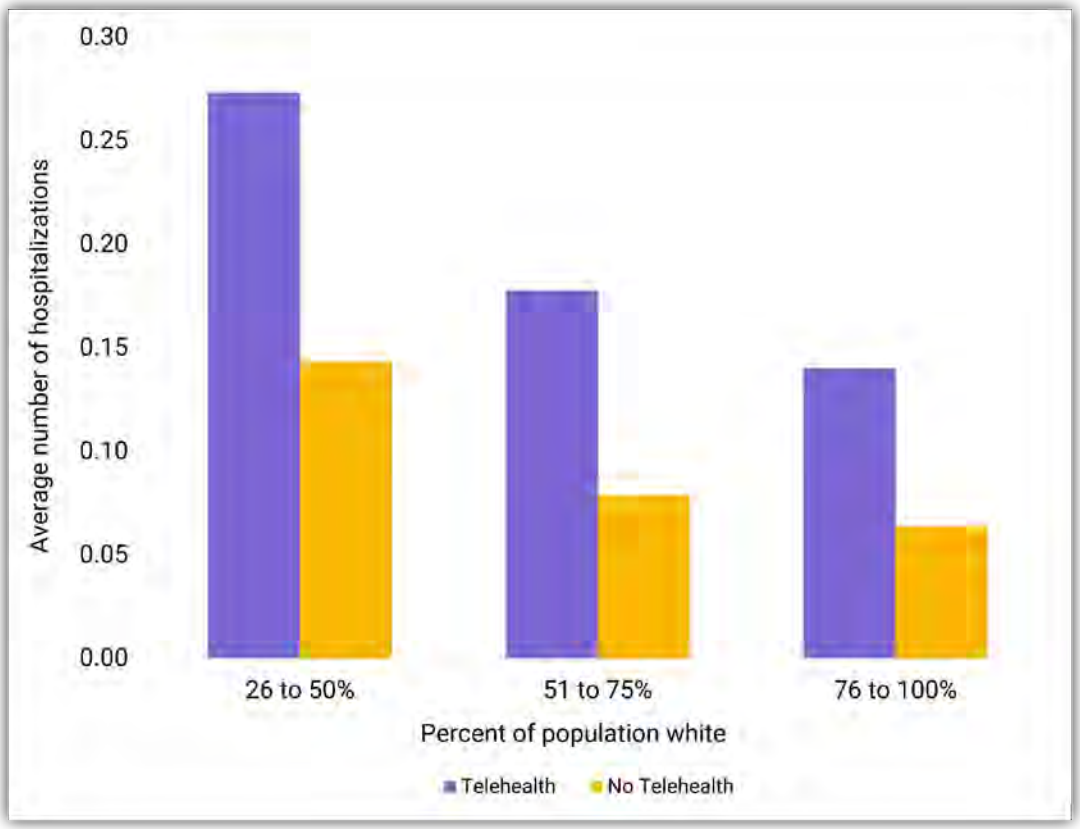


Figure 31. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for hypertensive diseases by the percentage of the population that was white, 2020-2022

Results

In every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for hypertensive diseases in patients who used telehealth and those who did not is shown in figure 32. The differences were not statistically significant (*P*>0.05) except in geozip 068 (Stamford, Norwalk, Danbury; *P*=0.0062) where the average total allowed amount per telehealth patient for all services was less than that for patients not using telehealth ($357 compared to $551). A similar trend was seen in five other geozips, plus Connecticut as a whole, but in the remaining two geozips—geozip 060 (Bristol, Simsbury) and geozip 064 (Meriden, Middletown)—telehealth was associated with a higher average total allowed amount per person for all services received than no telehealth.

Figure 32. Average total allowed amount per patient for all services for hypertensive diseases for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

The average total allowed amount per patient for services for hypertensive diseases showed no statistically significant differences (*P*>0.05) between patients who used telehealth and those who did not in all three geographic categories (figure 33). The average number of visits per patient for this condition, however, was significantly higher in the telehealth patients than the no-telehealth patients in all categories (*P*<0.0001). For example, in the areas that were 26 to 50 percent white, the average number of visits was 2.99 for telehealth and 2.09 for no telehealth. These areas had the largest average allowed amount and number of visits for both telehealth and no telehealth.

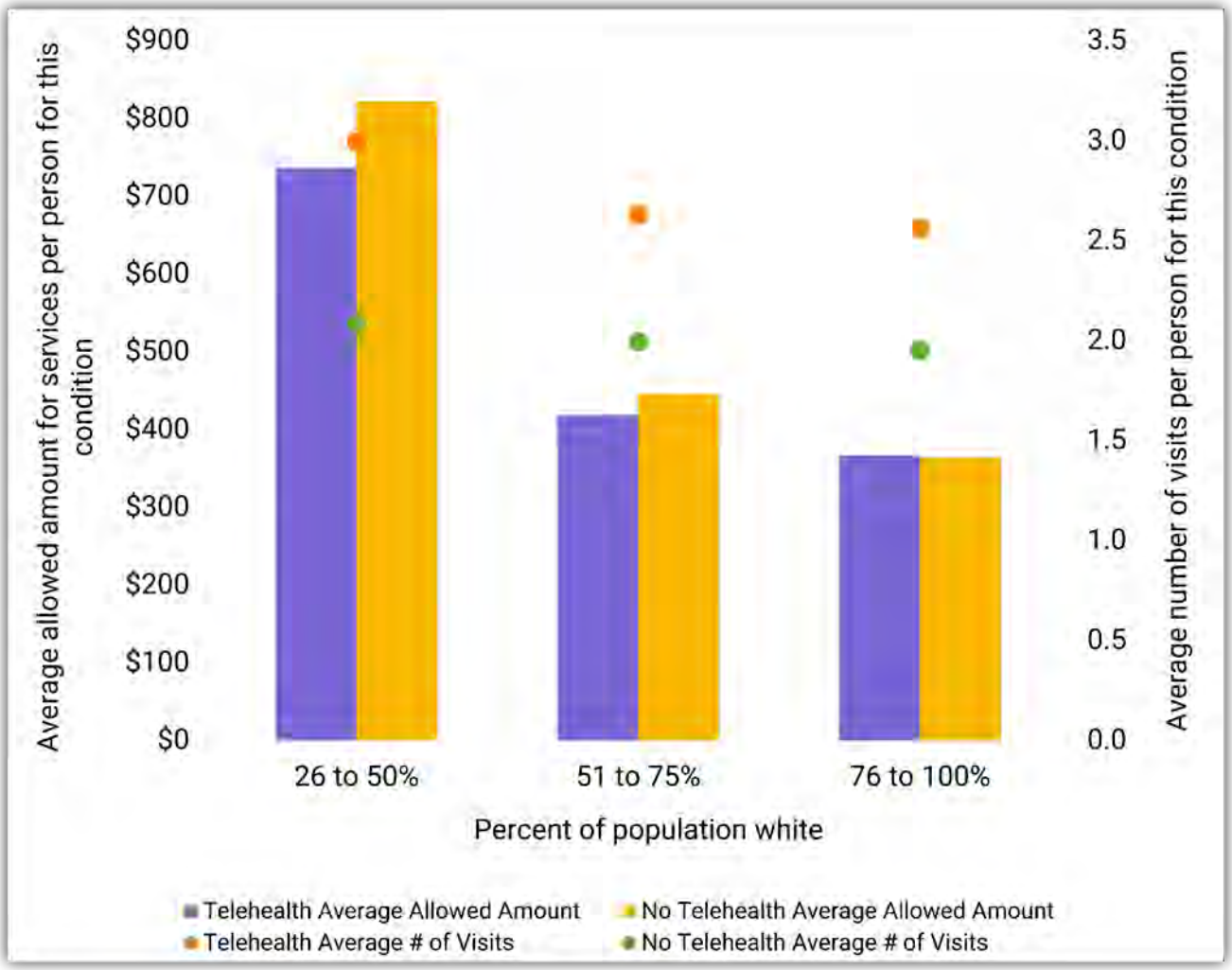


Figure 33. Average total allowed amount per patient for services for hypertensive diseases and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

Table 7 shows the results of logistic regressions run on the propensity score-matched cohort of patients who had a diagnosis of hypertensive diseases (hypertension). Telehealth patients with hypertensive diseases had significantly increased odds (*P*<0.0001) of having the following:

- More hypertension-related visits than the average;
- More hypertension-related visits than the median;
- Any ER visit;
- Any hospitalization;
- Higher allowed amount sums for hypertension-related visits than the average; and
- Higher allowed amount sums for hypertension-related visits than the median.

Telehealth patients with hypertensive diseases were about twice as likely as patients who did not use telehealth to have more hypertension-related visits than the average and the median, and to have any ER visit. They were about one-and-a-half times as likely as patients who did not use telehealth to have a higher hypertension-related allowed amount sum than average, and to have a hospitalization.

The increased likelihood of patients with hypertensive diseases who use telehealth to have more visits than average could indicate an increase in remote monitoring of their condition. Prior research has shown that home blood pressure monitoring in conjunction with electronic communications from health professionals may help patients to use antihypertensive treatment and reduce blood pressure.[64]

Table 7. Odds ratios for Connecticut patients who used telehealth for hypertensive diseases (hypertension) compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Hypertension-Related Visits Than Average	2.31	(2.19, 2.44)	<0.0001
More Hypertension-Related Visits Than Median	2.11	(2.01, 2.22)	<0.0001
Any ER Visit	2.05	(1.94, 2.16)	<0.0001
Any Hospitalization	1.58	(1.46, 1.71)	<0.0001
Higher Hypertension-Related Allowed Amount Sum Than Average	1.52	(1.41, 1.65)	<0.0001
Higher Hypertension-Related Allowed Amount Sum Than Median	1.24	(1.18, 1.30)	<0.0001

[64] Ji-Guang Wang et al., "Telemedicine in the Management of Hypertension: Evolving Technological Platforms for Blood Pressure Telemonitoring," *Journal of Clinical Hypertension* 23, no. 3 (March 2021): 435-39, https://doi.org/10.1111/jch.14194.

Results

Diabetes Mellitus

In this study, the diabetes mellitus condition included type 1 diabetes mellitus, type 2 diabetes mellitus, and other specified diabetes mellitus. Among Connecticut patients in the period 2020-2022, the majority were treated for type 2 (84 percent), followed by type 1 (15 percent) and other specified diabetes (1 percent). Across the state, 24 percent of patients receiving care for diabetes mellitus did so via telehealth and 76 percent of patients with this condition did not use telehealth.

The proportion of patients who used telehealth for diabetes mellitus and those who did not were compared within areas with similar percentages of white people (figure 34). In the 51 to 75 percent white and the 76 to 100 percent white categories, a higher percentage of patients did not use telehealth for diabetes mellitus care than those who did use telehealth. In the 26 to 50 percent white category, however, a higher percentage of patients used telehealth compared to those who did not. This lowest percentage white category also showed the largest difference between telehealth and no-telehealth patients (31.7 percent compared to 26.1 percent respectively).

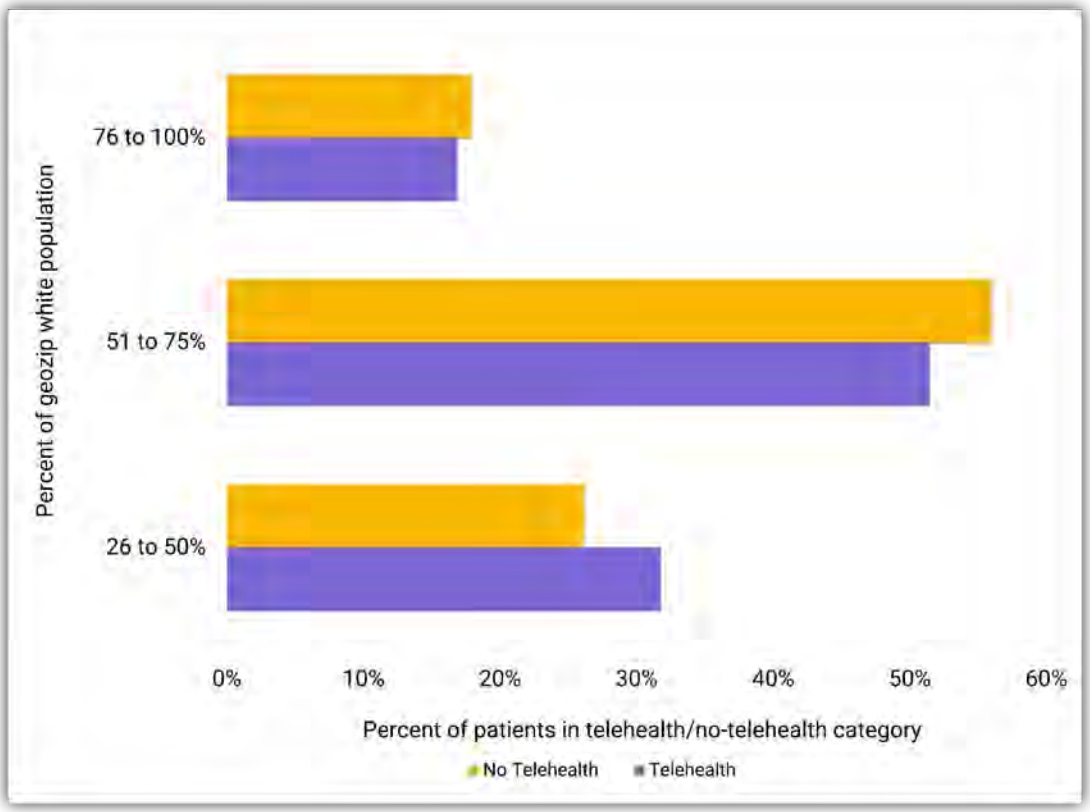


Figure 34. Distribution of Connecticut patients with diabetes mellitus who used or did not use telehealth across geozip white populations, 2020-2022

Results

The average number of ER visits by patients who received telehealth was significantly higher (*P*<0.0001) than for patients who did not receive telehealth for diabetes mellitus across the three percentage white categories (figure 35). The number of ER visits for patients using telehealth was more than twice the number of ER visits for patients not using telehealth in each category. For example, in the areas that were 76 to 100 percent white, the average number of ER visits (in the period 2020-2022) was 0.67 for telehealth and 0.31 for no telehealth, and in the areas that were 26 to 50 percent white, the average number of ER visits was 0.96 for telehealth and 0.44 for no telehealth. In the areas that were 51 to 75 percent white, the average number of ER visits was 0.90 for telehealth and 0.34 for no telehealth.

When examined across telehealth and no-telehealth categories, the average number of ER visits was significantly different (*P*<0.0001) between the groupings, with number of ER visits decreasing as the percentage of the population that was white increased. For example, in the 26 to 50 percent white group, the average ER visit rate across both telehealth and no telehealth was 0.604, while in the areas that were 76 to 100 percent white, it was 0.383.

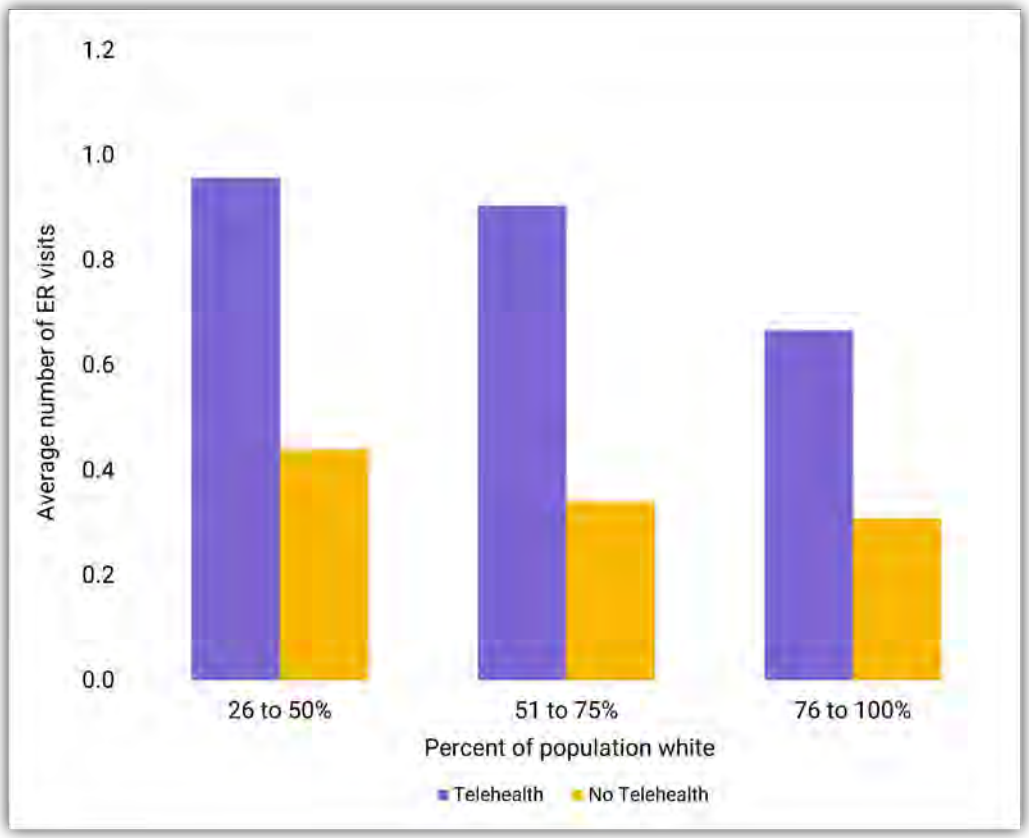


Figure 35. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for diabetes mellitus by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations was significantly higher for patients who received telehealth (*P*<0.0001) than for patients who received no telehealth for diabetes mellitus across all population groupings (figure 36). The numbers of hospitalizations for telehealth were more than double those without telehealth. For example, where the white population was between 26 and 50 percent, telehealth was associated with 0.33 average hospitalizations for this condition compared to 0.16 for no telehealth. In the group of geozips that were 51 to 75 percent white, the average number of hospitalizations was 0.22, while for no telehealth it was 0.09. In addition, in the areas that were 76 to 100 percent white, the average number of hospitalizations was almost three times as many for telehealth patients (0.20) than for no-telehealth patients (0.07).

Across both telehealth and no-telehealth categories, the average number of hospitalizations was significantly higher (*P*<0.01) when the population was less white. For example, in the areas that were 26 to 50 percent white, the average hospitalization rate across both telehealth and no telehealth was 0.211, while in the 76 to 100 percent white category, it was 0.100 (*P*<0.0001).

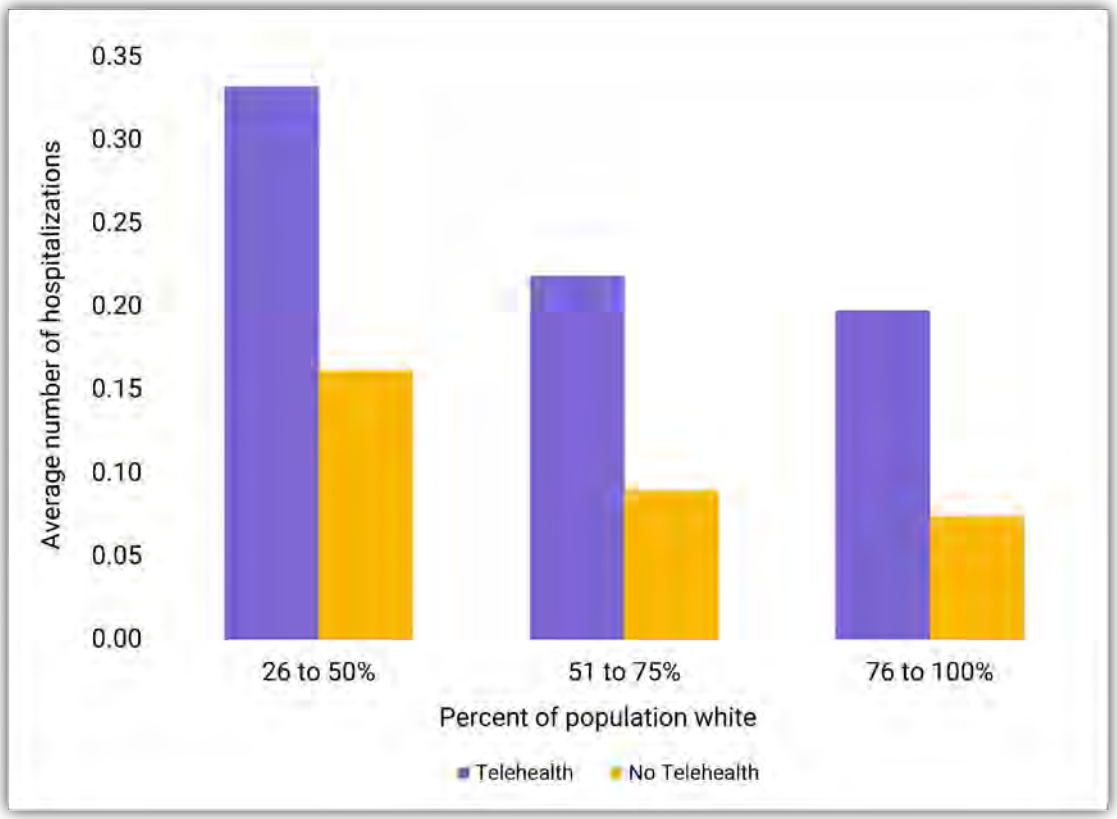


Figure 36. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for diabetes mellitus by the percentage of the population that was white, 2020-2022

Results

In almost every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for diabetes mellitus was higher for patients who used telehealth than those who did not (figure 37). The exception was geozip 061 (Hartford), where the telehealth average total allowed amount ($1,369) was slightly lower than that for no telehealth ($1,377). The differences were statistically significant in six geozips and in Connecticut as a whole (*P*<0.05). The differences were not statistically significant in geozip 067 (Torrington, Waterbury; *P*=0.4217) or geozip 061 (*P*=0.7993). The greatest average dollar amount difference was in geozip 065 (New Haven), where the average total allowed amount per patient for telehealth was $2,414 and for no telehealth it was $1,543 (*P*=0.0050). Across Connecticut as a whole, the average total allowed amount per patient for all services they received was $1,730 for telehealth, compared to $1,076 for no telehealth (*P*<0.0001).

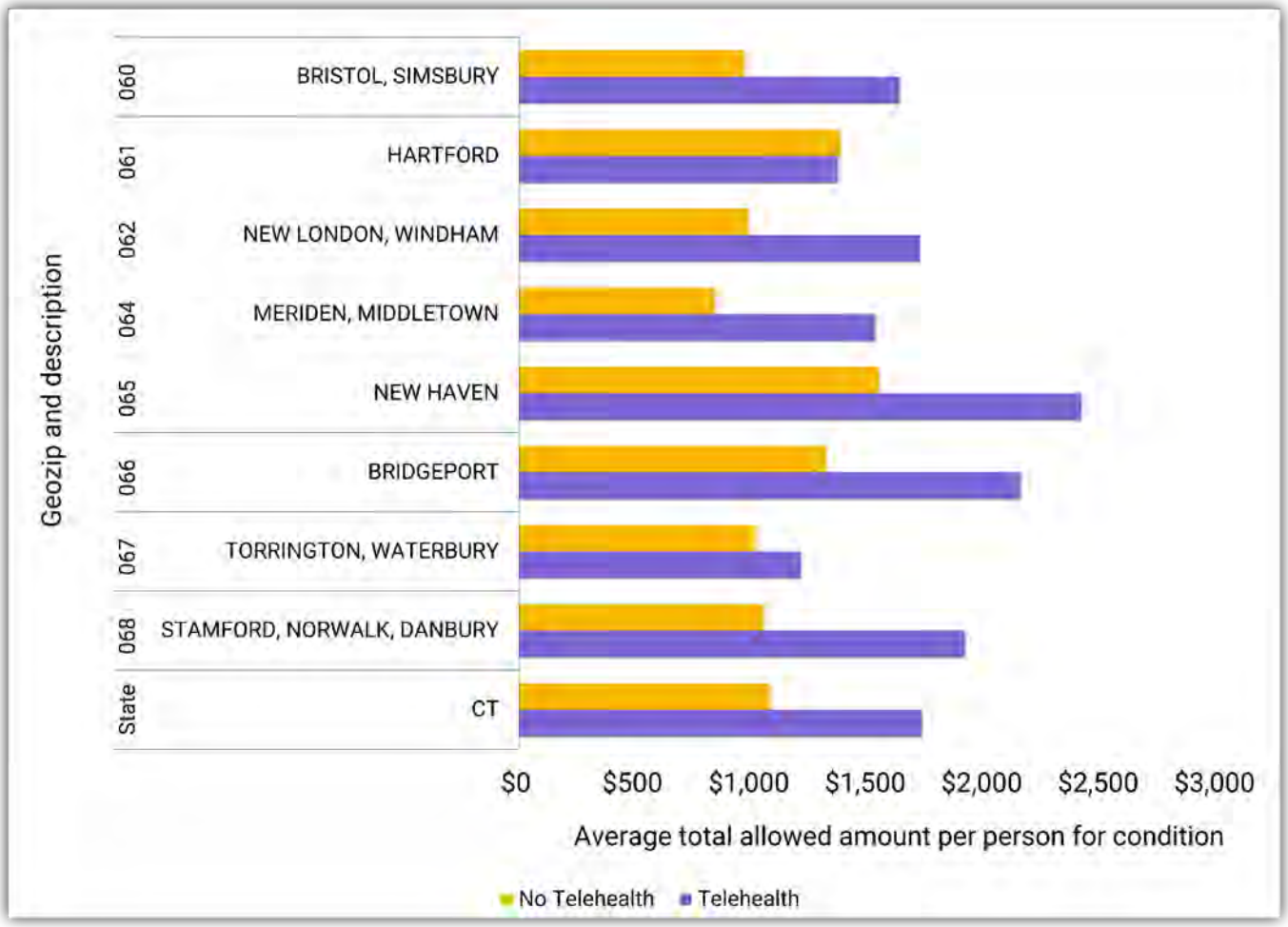


Figure 37. Average total allowed amount per patient for all services for diabetes mellitus for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

The average total allowed amount per patient for services for diabetes mellitus and the average number of visits per patient for this condition were significantly higher (*P*<0.001) for patients who used telehealth than those who did not in all three geographic groupings (figure 38). For example, in the areas that were 51 to 75 percent white, the average allowed amount for telehealth was $1,692 compared to $996 for no telehealth (*P*<0.0001), and the average number of visits was 5.82 for telehealth compared to 3.43 for no telehealth (*P*<0.0001). The areas that were 26 to 50 percent white had the highest average allowed amount for telehealth ($1,897) and for no telehealth ($1,408); the difference between telehealth and no telehealth was statistically significant at *P*=0.0009.

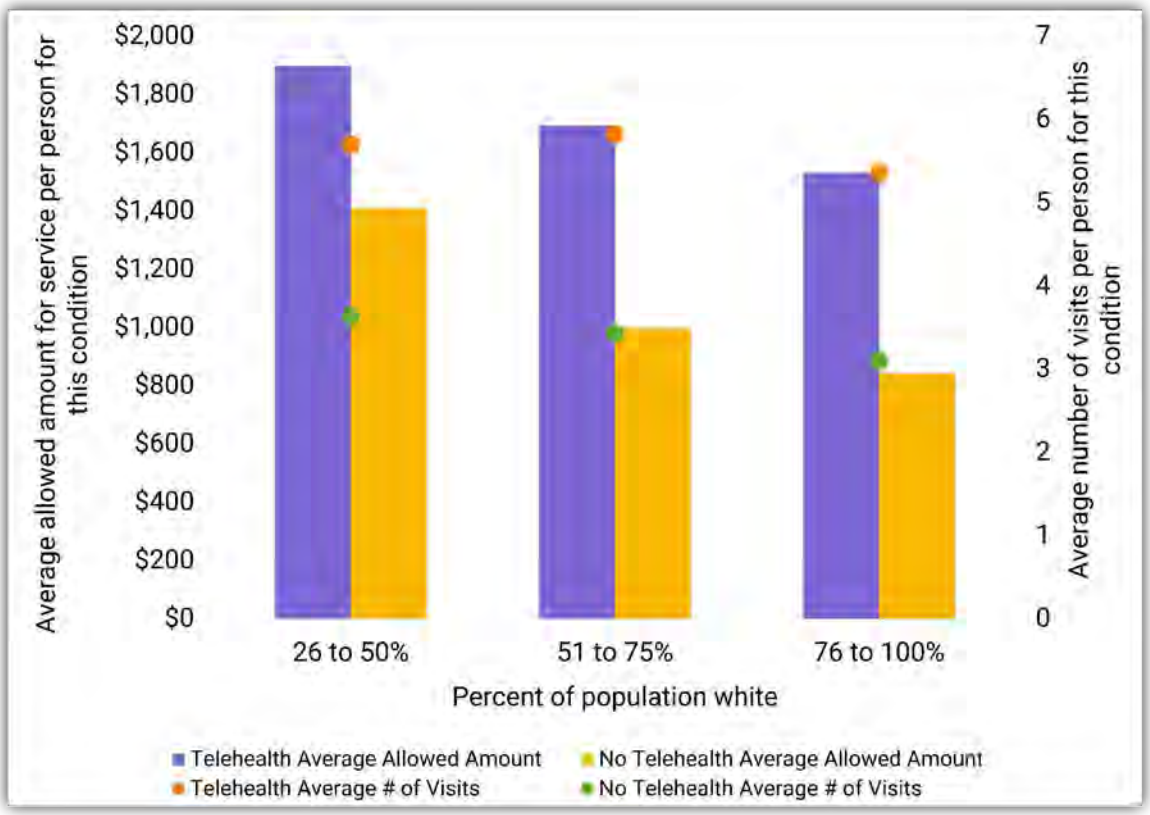


Figure 38. Average total allowed amount per patient for services for diabetes mellitus and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

Table 8 shows the results of logistic regressions run on the propensity score-matched cohort of patients who had a diagnosis of diabetes mellitus (diabetes). Telehealth patients with diabetes had significantly increased odds (P<0.0001) of having the following:

- More diabetes-related visits than the average;
- More diabetes-related visits than the median;
- Any ER visit;
- Any hospitalization;
- Higher allowed amount sums for diabetes-related visits than the average; and
- Higher allowed amount sums for diabetes-related visits than the median.

The odds ratios are higher for the diabetes visit results than for the diabetes allowed amount sums. For example, telehealth patients with diabetes were about three times as likely as patients who did not use telehealth to have more diabetes-related visits than average, but only about twice as likely as patients who did not use telehealth to have a higher diabetes-related allowed amount sum than average. The odds ratio for any ER visit (1.80) was higher than for any hospitalization (1.43).

Results

The increased odds ratios for diabetes visit results is supported by research showing that telehealth patients with diabetes mellitus, regardless of racial or ethnic group, returned for in-person eye examinations at a higher rate than patients who did not receive any telehealth services.[65]

Table 8. Odds ratios for Connecticut patients who used telehealth for diabetes mellitus (diabetes) compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Diabetes-Related Visits Than Average	2.85	(2.69, 3.01)	<0.0001
More Diabetes-Related Visits Than Median	2.85	(2.70, 3.01)	<0.0001
Any ER Visit	1.80	(1.69, 1.90)	<0.0001
Any Hospitalization	1.43	(1.32, 1.55)	<0.0001
Higher Diabetes-Related Allowed Amount Sum Than Average	1.75	(1.61, 1.89)	<0.0001
Higher Diabetes-Related Allowed Amount Sum Than Median	1.98	(1.88, 2.10)	<0.0001

[65] David J. Ramsay et al., "Telehealth Encourages Patients with Diabetes in Racial and Ethnic Minority Groups to Return for In-Person Ophthalmic Care during the COVID-19 Pandemic," *Clinical Ophthalmology* 16 (July 2022): 2157-66, https://doi.org/10.2147/OPTH.S368972.

Results

Mental and Behavioral Disorders Due to Psychoactive Substance Use

Mental and behavioral disorders due to psychoactive substance use (substance use disorders) are related to a broad range of psychoactive substances, including alcohol, opioids, cannabinoids, sedative hypnotics, cocaine, hallucinogens, tobacco, volatile solvents and other stimulants. Common mental and behavioral disorders associated with psychoactive substance use include acute intoxication, harmful use, dependence syndrome, withdrawal state, psychotic disorder, amnesic syndrome and others. Among Connecticut patients in the period 2020-2022 with substance use disorders, 38 percent of patients used telehealth to receive care, whereas 62 percent of patients did not use telehealth.

The proportion of patients who used telehealth for substance use disorders did not differ greatly from that of patients who did not use telehealth when compared within geozips with similar percentages of white people (figure 39). The greatest difference was in the areas that were 51 to 75 percent white, where the share of the no-telehealth distribution was 53.2 percent, and the share of the telehealth distribution was 50.8 percent. In the other two categories, however, the percentage of telehealth users was higher than those who did not use telehealth.

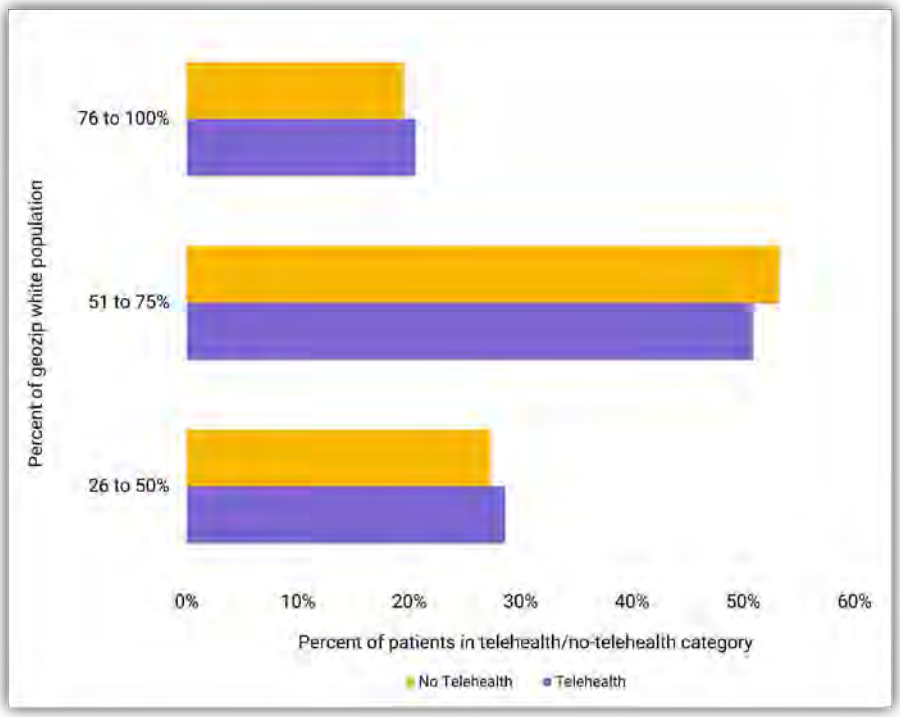


Figure 39. Distribution of Connecticut patients with substance use disorders who used or did not use telehealth across geozip white populations, 2020-2022

Results

The average number of ER visits by patients who received telehealth versus patients who did not receive telehealth for substance use disorders was compared across the white population categories (figure 40). There was a significantly higher average number of ER visits among telehealth patients than no-telehealth patients in each of the three categories ($P<0.01$). In the areas that were 76 to 100 percent white, the average number of ER visits was 0.76 for telehealth patients and 0.59 for patients who did not use telehealth ($P=0.0011$). The average number of ER visits was higher in the 51 to 75 percent white category, with 1.09 visits for telehealth and 0.76 for no telehealth ($P<0.0001$) and even higher in the 26 to 50 percent white category, with 1.23 visits for telehealth and 1.04 for no telehealth ($P=0.0004$).

Across both telehealth and no-telehealth categories, the average number of ER visits was significantly higher ($P<0.0001$) when the population was less white. For example, in the areas that were 26 to 50 percent white, the average ER visit rate across both telehealth and no telehealth was 1.124, while in the areas that were 76 to 100 percent white, it was 0.637.

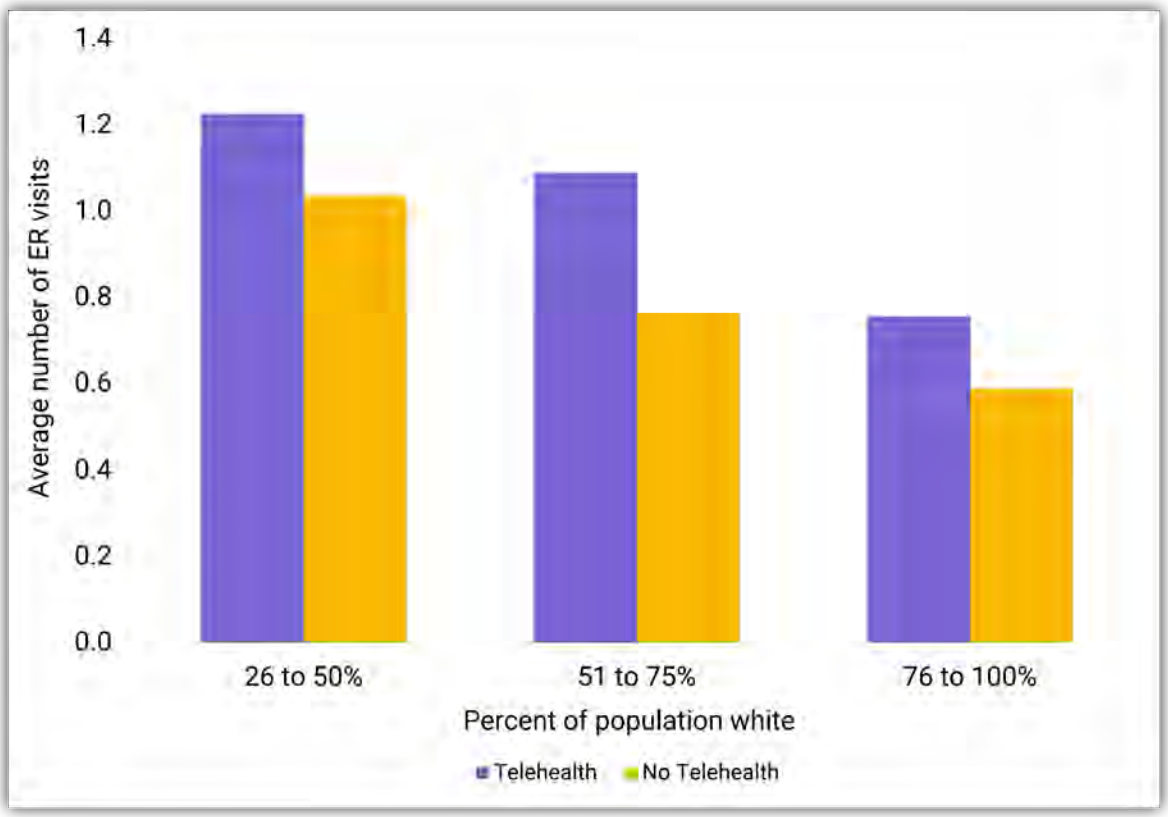


Figure 40. Average number of ER visits by Connecticut patients who received telehealth versus no telehealth for substance use disorders by the percentage of the population that was white, 2020-2022

Results

The average number of hospitalizations of patients who received telehealth versus patients who received no telehealth for substance use disorders was compared across the white population categories (figure 41). In all three geographic groupings, the differences were statistically significant (*P*<0.0001), with telehealth associated with higher average hospitalization rates than no telehealth. For example, where the population was 26 to 50 percent white, telehealth was associated with 0.63 average hospitalizations for this condition compared to 0.37 for no telehealth. When the percentage of the population that was white was highest (76 to 100 percent), the difference was most pronounced, and the average number of hospitalizations was two-and-a-half times greater among telehealth patients than no-telehealth patients (0.50 compared to 0.20).

When combining both telehealth and no-telehealth categories, the average number of hospitalizations was significantly higher (*P*<0.0001) in the areas that were 26 to 50 percent white compared to the areas that were 76 to 100 percent white (0.450 versus 0.300). The difference was also significant between the geographic areas that were 51 to 75 percent white (0.407 average hospitalizations) and the geographic areas that were 76 to 100 percent white (0.300; *P*=0.0005). Between the geographic areas that were 26 to 50 percent white and the areas that were 51 to 75 percent white, however, the difference was not statistically significant (*P*=0.0914).

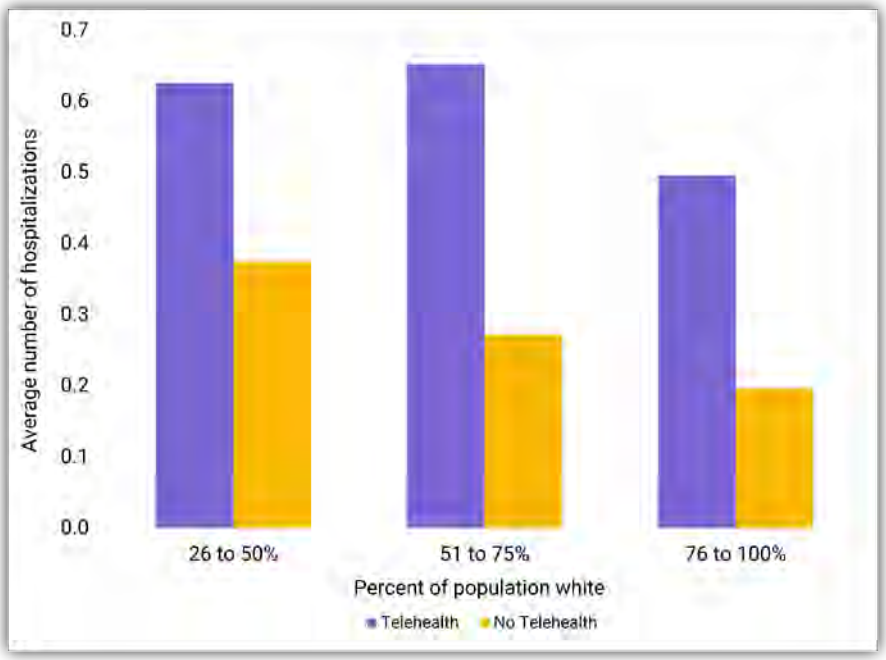


Figure 41. Average number of hospitalizations of Connecticut patients who received telehealth versus no telehealth for substance use disorders by the percentage of the population that was white, 2020-2022

Results

In every geozip and across Connecticut as a whole, the average total allowed amount per patient for all services for substance use disorders was significantly higher for patients who used telehealth than those who did not (*P*<0.05; figure 42). The greatest difference was in geozip 060 (Bristol, Simsbury), where the average total allowed amount per patient for telehealth was more than three times that for no telehealth ($9,333 compared to $3,030; *P*<0.0001). Across Connecticut as a whole, the average total allowed amount per patient was $6,973 for telehealth, compared to $3,248 for no telehealth (*P*<0.0001).

Figure 42. Average total allowed amount per patient for all services for substance use disorders for patients who used telehealth versus those who did not, by geozip and across Connecticut, 2020-2022

Results

The average total allowed amount per patient for services for substance use disorders and the average number of visits per patient for this condition were significantly higher (*P*<0.0001) for patients who used telehealth than those who did not in all three geographic categories (figure 43). For example, in the geographic areas that were between 51 and 75 percent white, the average allowed amount for telehealth was $7,894 compared to $3,504 for no telehealth, and the average number of visits was 18.60 for telehealth compared to 6.68 for no telehealth. These areas had the largest average allowed amount and number of visits for telehealth. The areas that were 26 to 50 percent white, however, had the highest average number of visits for no telehealth (8.32).

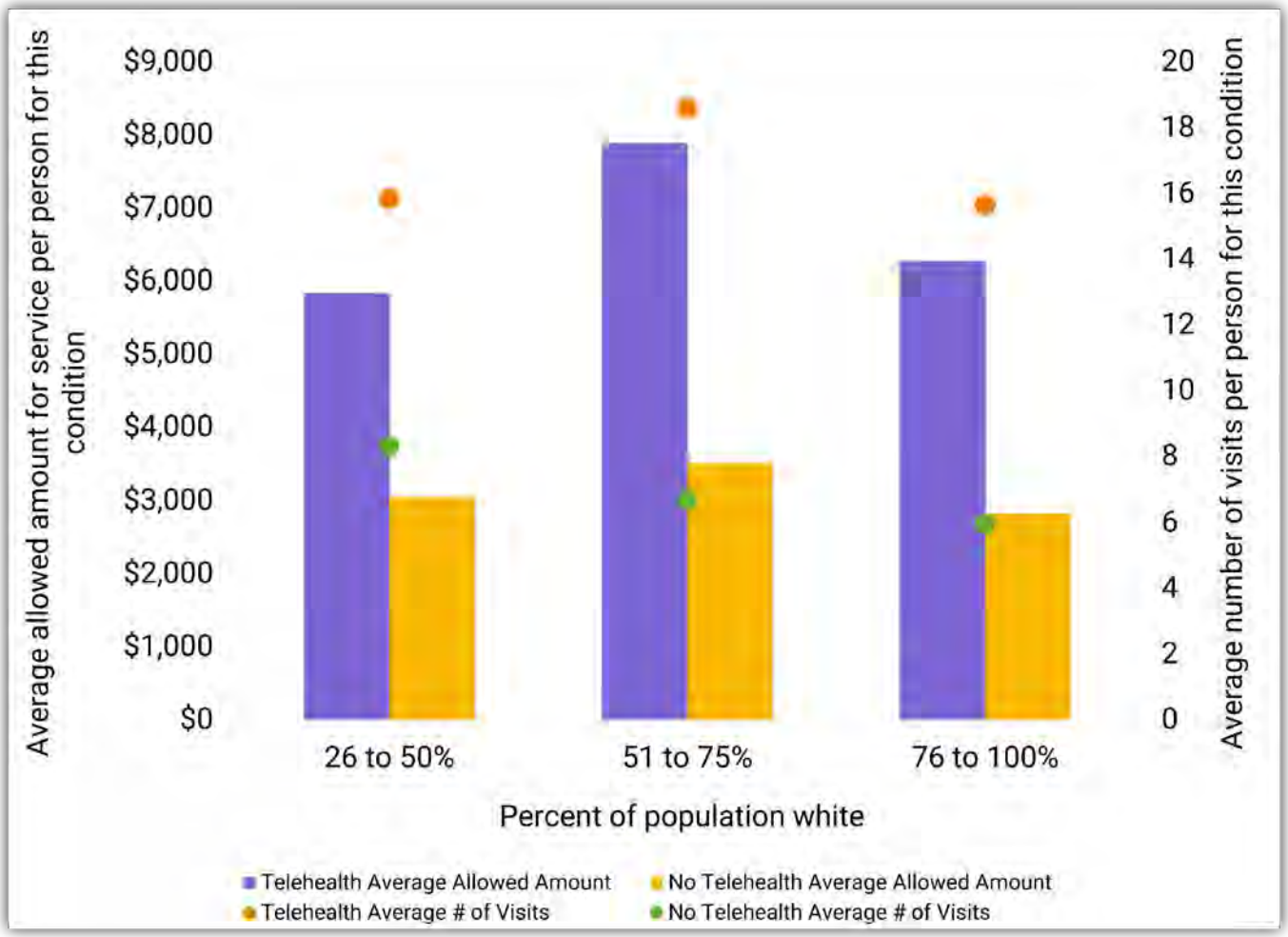


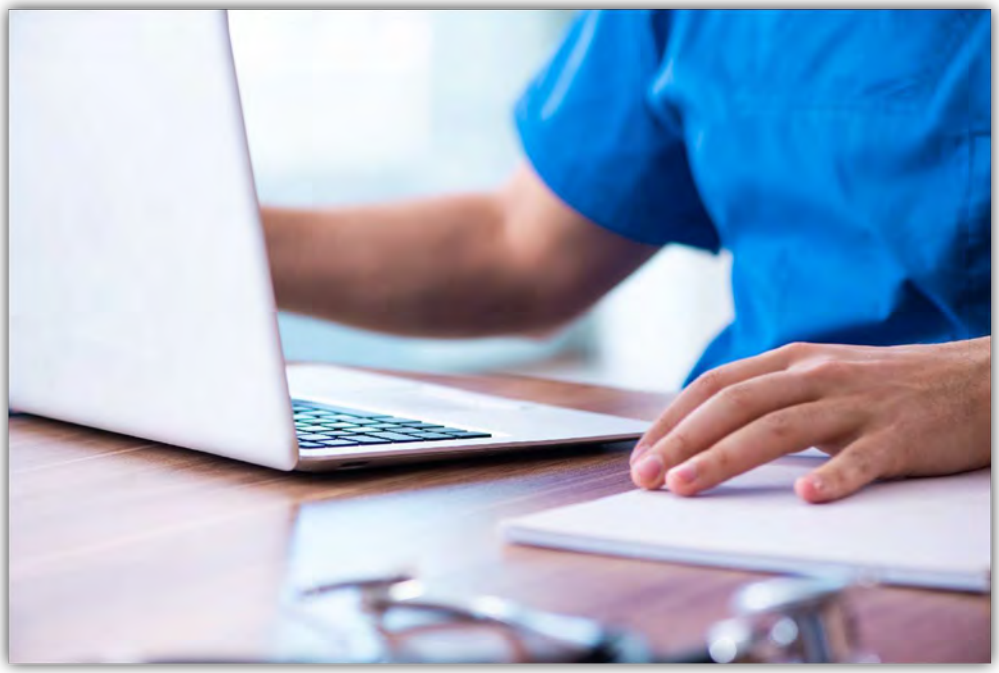
Figure 43. Average total allowed amount per patient for services for substance use disorders and the average number of visits per patient for this condition, by the percentage of the population that was white in Connecticut, 2020-2022

Results

Table 9 shows the results of logistic regressions run on the propensity score-matched cohort of patients who had a diagnosis of substance use disorders. Patients with substance use disorders who used telehealth had significantly increased odds (P<0.0001) of having the following:

- More substance use disorder-related visits than the average;
- More substance use disorder-related visits than the median;
- Any hospitalization;
- Higher allowed amount sums for substance use disorder-related visits than the average; and
- Higher allowed amount sums for substance use disorder-related visits than the median.

Telehealth patients with substance use disorders had lower odds (0.93) of having any ER visit than patients who did not use telehealth for that condition, but that difference was not statistically significant (P=0.0512).



Elnur © 123RF.com

Results

The odds ratios are higher for the substance use disorder visit results than for the substance use disorder allowed amount sums. For example, telehealth patients with substance use disorder were about four to four-and-a-half times as likely as patients who did not use telehealth to have more substance use disorder-related visits than the average or median, but only about one to two times as likely as patients who did not use telehealth to have a higher substance use disorder-related allowed amount sum than the average or median.

The increased odds ratio for more substance use disorder-related visits than average may indicate that telehealth patients adhered to treatment more than those who did not use telehealth. A study of veterans with substance use disorders found that telehealth increased the likelihood of initiating and attending treatment sessions when compared to in-person care.[66]

Table 9. Odds ratios for Connecticut patients who used telehealth for substance use disorders compared to patients who did not use telehealth for this condition, 2020-2022

	Odds Ratio	95% Confidence Interval	*P*-value
More Substance Use Disorder-Related Visits Than Average	4.09	(3.77, 4.45)	<0.0001
More Substance Use Disorder-Related Visits Than Median	4.45	(4.14, 4.78)	<0.0001
Any ER Visit	0.93	(0.87, 1.00)	0.0512
Any Hospitalization	1.18	(1.08, 1.28)	<0.0001
Higher Substance Use Disorder-Related Allowed Amount Sum Than Average	1.35	(1.23, 1.48)	<0.0001
Higher Substance Use Disorder-Related Allowed Amount Sum Than Median	1.94	(1.80, 2.08)	<0.0001

[66] Rebecca E. Sistad et al., "Comparing Substance Use Treatment Initiation and Retention between Telehealth Delivered during COVID-19 and In-Person Treatment Pre-COVID-19," *American Journal on Addictions* 32, no. 3 (May 2023): 301-8, https://doi.org/10.1111/ajad.13385.

Conclusion

FAIR Health undertook a study to examine the use of telehealth in Connecticut during the period 2020-2022, with particular attention to differences in treatment in areas with greater minority populations. This study made several notable findings. There was a gender difference between Connecticut residents receiving telehealth and those receiving all medical services. Among telehealth users, 59 percent were female while, among all Connecticut residents receiving medical care, 52 percent were female. There were also some geographic differences. In most of the eight geozips in Connecticut, the share of patients using telehealth was fairly similar to that using all medical services, except in geozip 061 (Hartford), where a smaller share used telehealth; and geozip 068 (Stamford, Norwalk, Danbury), where a larger share used telehealth. Geozip 061 has a population of between 26 and 50 percent white residents, whereas geozip 068 has a population of between 51 and 75 percent white residents.

Of patients who used telehealth, 92.5 percent sought it from a provider they had also seen in person, whereas only 7.5 percent of patients had a telehealth visit with a provider they never saw in person.

In general, telehealth utilization in Connecticut, as compared to no telehealth utilization, was associated with more total visits, higher allowed amount sums, more ER visits and more hospitalizations. For example, in the overall analyses, telehealth patients were almost five times as likely to have six or more ER visits and almost four times as likely to have six or more hospitalizations than patients who did not use telehealth. Overall, Connecticut telehealth patients were almost 15 times as likely as those who did not use telehealth to have more total visits than average and over 10 times as likely to have a higher allowed amount sum than average.

In all seven conditions examined in detail in Connecticut, telehealth was associated with higher average numbers of ER visits and hospitalizations than no telehealth. For four of the conditions, this difference was statistically significant in all geographic areas studied. In all seven conditions, greater racial and ethnic diversity in an area correlated with higher average numbers of ER visits and hospitalizations across both patients who used telehealth and did not use it.

Conclusion

Of the seven conditions, two had higher percentages of patients utilizing telehealth for treatment of that condition than not using it: anxiety and other nonpsychotic mental disorders and mood (affective) disorders. The other five conditions—COVID-19, acute upper respiratory infections, hypertensive diseases, diabetes mellitus and substance use disorders—had higher percentages of patients who did not use telehealth than who did.

For two of the seven conditions (acute upper respiratory infections and COVID-19), telehealth was associated with a lower average total allowed amount than no telehealth in all eight geozips and statewide. COVID-19 telehealth patients had lower odds than patients who did not use telehealth of having a higher COVID-19-related allowed amount sum than average.

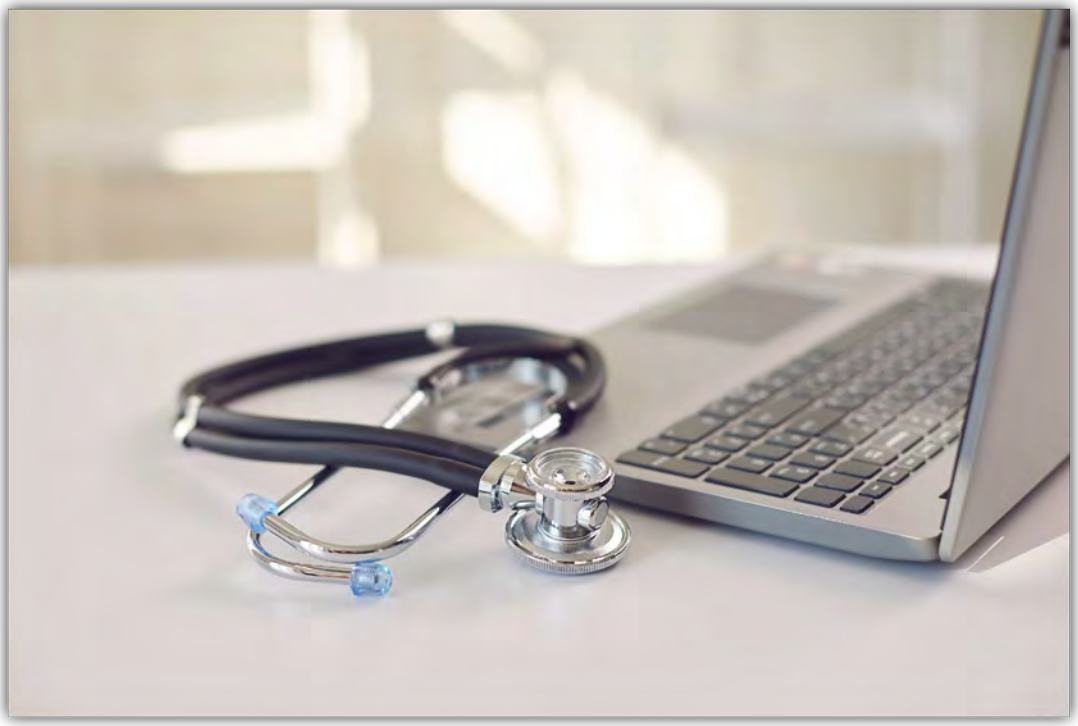
Of all seven conditions studied, substance use disorders had the highest odds ratio for more visits than average in Connecticut when patients used telehealth for the condition. In contrast, patients who used telehealth for acute upper respiratory infections had the lowest odds ratio for more visits than average, though they were still more likely to have more visits than average compared to those who did not use telehealth.

“COVID-19 telehealth patients had lower odds than patients who did not use telehealth of having a higher COVID-19-related allowed amount sum than average.”

Conclusion

It is beyond the scope of this study to determine whether the increased visits, costs, ER visits and hospitalizations generally associated with telehealth in Connecticut in 2020-2022 were necessary or unnecessary, or whether there was a causal relationship between telehealth and the measured results. For example, as noted in the discussion of the behavioral health conditions, a greater number of visits may indicate greater adherence to recommended treatment for those conditions. Similarly, increased visits noted for patients with diabetes and hypertension—both conditions that disproportionately affect people of color—may indicate increased remote monitoring. FAIR Health hopes that other researchers will build on the findings reported in this study to learn more about the effects of telehealth, particularly on reducing barriers to care. FAIR Health also hopes that this study will be of value to other healthcare stakeholders in Connecticut and nationwide, including payors, providers, policy makers and patients.

FAIR Health thanks the Connecticut Health Foundation for generously funding this study. FAIR Health also thanks Dr. Chima Ndumele of Yale University for his guidance on the study's design and execution and for his review of an earlier version of this white paper.



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About FAIR Health

FAIR Health is a national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information through data products, consumer resources and health systems research support. FAIR Health qualifies as a public charity under section 501(c)(3) of the federal tax code. FAIR Health possesses the nation's largest collection of private healthcare claims data, which includes over 42 billion claim records and is growing at a rate of over 2 billion claim records a year. FAIR Health licenses its privately billed data and data products—including benchmark modules, data visualizations, custom analytics and market indices—to commercial insurers and self-insurers, employers, providers, hospitals and healthcare systems, government agencies, researchers and others. Certified by the Centers for Medicare & Medicaid Services (CMS) as a national Qualified Entity, FAIR Health also receives data representing the experience of all individuals enrolled in traditional Medicare Parts A, B and D; FAIR Health includes among the private claims data in its database, data on Medicare Advantage enrollees. FAIR Health can produce insightful analytic reports and data products based on combined Medicare and commercial claims data for government, providers, payors and other authorized users. FAIR Health's free, award-winning, national consumer websites are **fairhealthconsumer.org** and **fairhealthconsumidor.org**. For more information on FAIR Health, visit **fairhealth.org**.

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