

# SPATIAL ANALYSIS OF TELEHEALTH UTILIZATION IN A PEDIATRIC PAIN CLINIC

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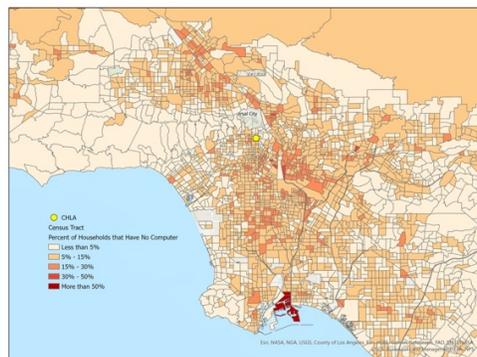
**Introduction:** Social determinants of health (SDOH) have a significant impact on access to health. Low socioeconomic status (SES) has been associated with delayed care and missed appointments. Telehealth services provides an opportunity to deliver health care by reducing physical barriers. During the COVID-19 pandemic, telehealth services were expanded by many health systems to continue providing socially distant care. While telehealth has the potential to bridge physical gaps in care, technology can be an additional barrier to accessing care and exacerbate existing health disparities. Understanding the impact of telehealth in the context of SDOH risk factors may be an important component toward studying and achieving health equity. Unfortunately, there is a limited amount of SES factors available to study in the electronic health record (EHR). The goal of our study was to use an innovative method to better understand the SES and location risk factors that are associated with the utilization of telehealth services in a pediatric pain clinic at an academic children's hospital.

**Methods:** Following IRB approval, we conducted a retrospective study of all pediatric pain clinic patients seen by telehealth at a free-standing academic children's hospital from 4/2020 to 5/2021. Patient demographic details and telehealth utilization data were abstracted from the EHR and the enterprise data lake. Administrative outcomes of interest were telehealth appointment no-show or cancellations within 24 hours. Patient EHR addresses were geocoded and geospatial analytic techniques, including spatial linkage of EHR data with US Census-American Community Survey 2019 Data (5-Year) was conducted. Analysis was at the patient-level and neighborhood block-group level for SDOH measures. Specific neighborhood level measures used included the percent of households that have no computer. Analysis was conducted utilizing SAS, R, and ArcGIS Pro.

**Results:** Our study included 550 pediatric pain patients, and all were successfully geocoded at the street level address. There were 309 patients (56.2%) who had their initial follow-up appointment using telehealth and 241 (43.8%) who were seen as a new patient visit. Most patients had government insurance (61.6%) as compared to commercial (38.4%). Overall, 14.9% of appointments were cancelled <24 hours or did not show up for their telehealth appointment. New appointments were more likely to be cancelled <24 hours or not show up (21.2%) as compared to follow-up appointments where 10% were cancelled/no show. A large percentage of patients self-reported their race as "Other" (51.8%) or were unknown (14.2%). Patient residential addresses came from a variety of locations in the state of California with a small number of patients from Nevada and Arizona. Patients who cancelled <24 hours or did not show up were more likely to come from neighborhoods (defined as Census Block Groups) of lower socioeconomic status. In addition, census block groups that had more "households with no computers" were more likely to cancel/no show for their telehealth appointment. Digital maps demonstrating geographic variation and disparities in access to telehealth utilization were created for exploration and descriptive purposes.

**Discussion:** We successfully identified patient level and neighborhood level socioeconomic risk factors that are associated with cancelling (<24 hours) or not showing up for their telehealth appointment. Leveraging EHR data with geospatial analytics can augment our understanding of the SDOH that may impact the delivery of telehealth services in a pediatric population. Future steps include using these spatial risk factors to risk stratify and improve care delivery pathways to reduce disparities in telehealth utilization.

**Figure 1.** Percent of households that have no computer by Census Block Group in the Greater Los Angeles Region



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