Client: University of Chicago - Internet Equity Initiative
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The 2022-23 Internet Equity Initiative research project aims to examine the urban digital divide in the United States and its impact on various socio-economic factors. This past quarter's primary emphasis was on healthcare. Specifically, the team incorporated the CDC PLACES dataset into last quarter's standard dataframe, facilitating an in-depth exploration of the relationship between broadband connectivity and individuals' engagement with health services, as well as their corresponding outcomes.

The culmination of this quarter's work contains the following three deliverables: (1) the merged and cleaned 2013-2017 ACS datasets, integrated with the CDC's PLACES dataset; (2) an exploratory analysis report that includes spatial visualizations and a constructed health index, and (3) a multivariate regression analysis of relationships between broadband connectivity and health-related variables from the PLACES dataset.

After the organizing and cleaning process, the team merged the CDC's PLACES dataset with the ACS dataset. The team performed exploratory data analysis on the merged dataset and developed a health index to provide concise representations of the 27 health-related variables. The index was divided into four sections: health outcomes, risk behaviors, prevention, and a composite index. Furthermore, the team generated univariate choropleths representing each health indicator (Figure 1) and bivariate choropleths examining the relationships between broadband connectivity and the health indicator (Figure 2) for each city on the census-tract level. These indexes, combined with the visualizations, highlight how health outcomes, behaviors, and services are associated with internet inequity in cities.

To explore individual factors contributing to the variations in health variables, the team conducted a multivariate regression analysis, examining the influence of broadband connectivity and socioeconomic index[1] (explanatory variables) on individual health indicators (outcome variable). While significant associations were found, multicollinearity limits the analysis. To overcome this limitation, the team recommended conducting a survey to concretely identify how individuals use the internet for health-related purposes.
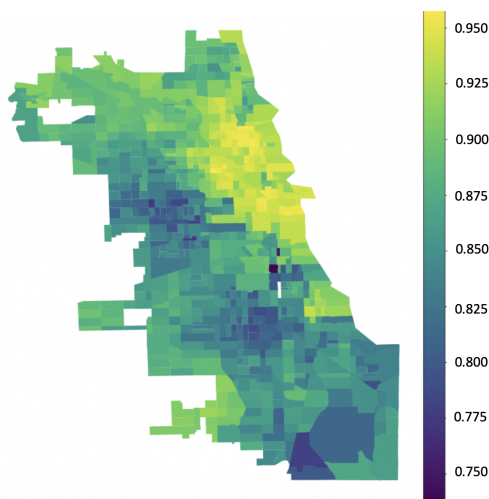

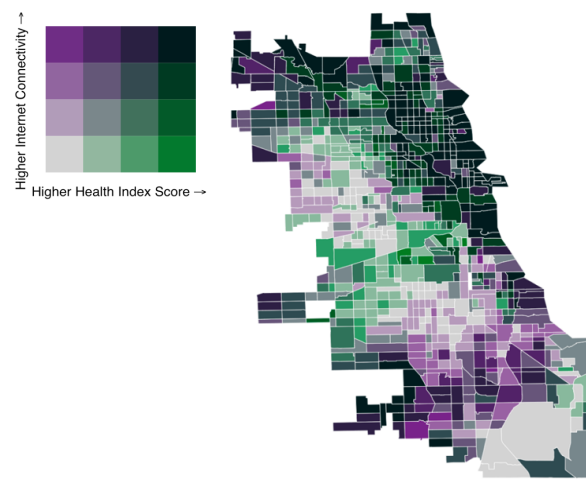***Figure 1.*** *Choropleth of Chicago, no reported physical health problem >= 14 days (2017)*

Figure 2. *Bivariate choropleth of Chicago, comparing health index variable with broadband connectivity*

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[1] The 2018 CDC Social Vulnerability Index (SVI) is used as a proxy for socioeconomic status on the census-tract level. The SVI uses ACS data to determine the relative social vulnerability and includes variables related to income, poverty, and household composition.