Data on Social and Environmental Determinants of Health and COVID-19: Public Use and Sharing

Background The inequitable burdens of COVID-19 cases, hospitalizations, and mortality as well as access to testing have been well-documented. The COVID-19 pandemic has affected

populations globally with numerous studies identifying increased impacts on individuals in lower socioeconomic status and from minority racial/ethnic populations. The observed inequalities in COVID-19 could be driven by social determinants of health (SDOH) that can explain differential exposure to the virus, vulnerability to infection, and access to testing and vaccines.

Understanding the structural relationship between COVID-19 and SDOH could benefit

communities in their response to COVID-19. These efforts are limited by the availability of fine spatial resolved data, high amounts of missing data on key demographic variables such as race-ethnicity and infrastructure to support dissemination of data in an interactive and easily interpretable manner. We present here lessons learned as part of the Center for Research on Social Stressors in Housing (CRESSH) on analyzing the relationship between SDOH and COVID-19 in collaboration with the Massachusetts Department of Public Health to address these limitations and make data available through public mapping dashboards.

Methods Using publicly available data on SDOH factors (i.e. percent Black, Latinx, age over 80 years, undergraduate students, as well as factors related to occupation, housing density, economic vulnerability, air pollution, and institutional facilities) compiled under the CRESSH study we linked to individual and publicly available town-level COVID-19 case data in Massachusetts. Using these data we (1) quantified the amount of missing race/ethnicity data over time and relationship to community SDOH; (2) developed regression models to assess associations between SDOH and COVID-19 case incidence at the neighborhood (Census tract) and town-level. (3) We built a publicly facing online dashboard of maps depicting changes in COVID-19 overlaid with a wide variety of SDOH and COVID-19 factors of vulnerability to disseminate results.

Results SDOH variables such as race/ethnicity, long-term care facilities, employment, essential workers and mobility were associated with COVID-19 cases with variations across time and stronger inequalities observed in analyses at the finer spatial scale of analysis (Census tract) than at the town-level. Additionally the proportion of COVID-19 cases in MA with missing data on race and Latinx ethnicity differed across time and space, despite state and federal mandates to collect these data. Missing data was also elevated along SDOH factors such as in areas with higher amounts of racially segregated and areas with lower economic stability.

Conclusions Linking Policies that could improve the accurate collection of essential demographic and reporting of COVID-19 data at finer resolutions are needed, but substantial challenges and discussions remain especially in regard to protection of privacy.