Social and Physical Environmental Barriers of Long-Acting ARV Adherence

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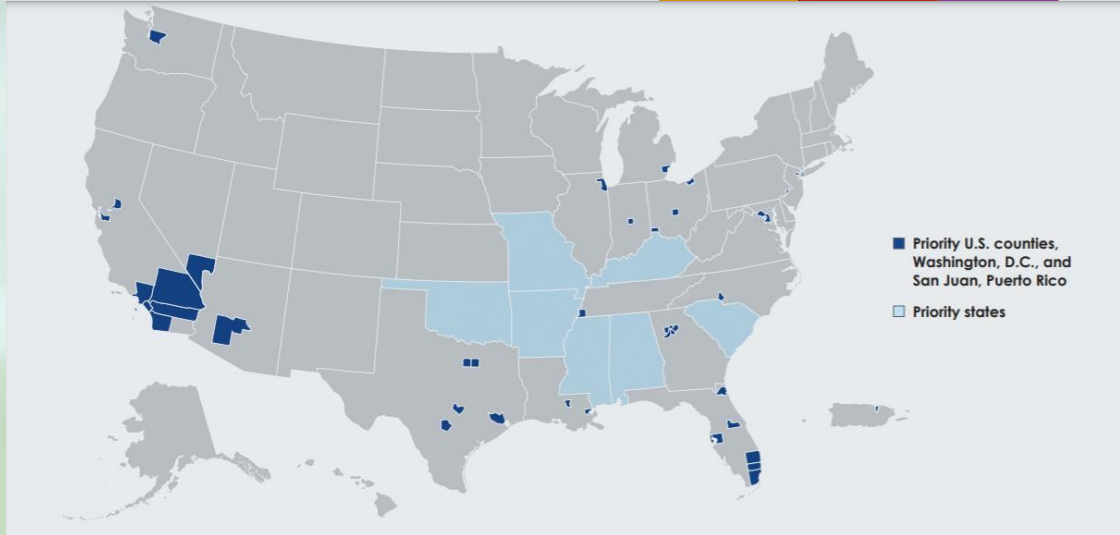
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COI Disclosure

- The authors have no conflicts to disclose.

GEOSPATIAL SCIENCE AND APPLICATION FOR HIV PREVENTION AND MANAGEMENT

Geospatial Network Analyses

- Spatial network analyses

- Distance and transportation types home to clinics

Lifespace Measurement

- Geomobility
  - How individuals move throughout their community to impact how they live, work and play

  - Anonymized smartphone data
  - App-based real-time data collection

Identifying Risk Inequity Among Same-Sex Households During COVID-19 Mitigation

Background

- ## Early in COVID-19 pandemic

- Vulnerable populations experienced widespread inequities

- Sexual minorities, such as members of the lesbian, gay and bisexual (LGB) communities, experience significant disparities related to health outcomes and social determinants of health that may translate into an increased risk of COVID-19 outcomes.

- The purpose of this study was to examine adherence to CoVID-19 non-pharmaceutical interventions within the context of same-sex households.

Methods: Data

- Data on same-sex couples were collected from the U.S. Census Bureau's 2018 5-year American Community Survey (ACS)(United States Census Bureau, 2019). The ACS contains aggregated five-year census tract estimates of households with unmarried same-sex partners as well as unmarried opposite-sex partners. Proportion of unmarried same-sex partner households (USSPHs) as a function of total unmarried partner households were calculated and mapped at the census-tract level throughout the counties of Saint Louis City and St. Louis County in Missouri (n=305).

    population density (per square mile),   median annual household income,   proportion of residents by race/ethnicity (White; African-American/Black; Hispanic/Latinx; Asian; Other/Multiple),   proportion of residents working in healthcare support industry per census-tract

- Geomobility metrics related to stay-at-home policy adherence were adopted from a national U.S. marketing company that enrolls and collects panel participant GPS mobility data along with visits to business and point-of-interest data. Policy intervention metrics included in this study were defined as: (1) average daily proportion of tract residents that did not leave home, defined as the number of people whose smartphone did not leave a strict perimeter around their residence over the total number within geographic sample; (2) average daily time spent at home, defined as the average of minutes were the smart electronic device stayed within resident perimeter among those in the sample; (3) average daily distance traveled, defined as the grand average of miles traveled from and to

Data Analyses

- The average proportion of USSHs in a census tract within the City of St. Louis and St. Louis County was calculated, and a stratification value roughly one standard deviation above the average was set to be 25%, (mean=7.7%, sd=14.7).

- Census tracts were subsequently categorized into one of two groups based on the proportion of USSHs: 1) census tracts with a proportion of USSPHs equal to or greater than 25%; and 2) census tracts with a proportion of USSPHs less than 25%. Independent t-tests were used to identify significant differences in socio-demographic characteristics and stay at home policy metrics by census-tract percent unmarried same-sex partnered households.

- Four linear multivariate regression models were constructed to identify both the directional relationship and the magnitude between census-tracts with $\geq$25% unmarried same-sex partnered households and each policy metric; (1) daily proportion of tract that did not leave home, (2) average daily time spent at home, (3) average daily distance traveled, and (4) daily proportion of tract that left for work. Models also included sociodemographic variables of interest to adjust for important context factors an understand relationships of these variables to policy metrics.

Table 1. Characteristics of Census-tracts within City of St. Louis and St. Louis County according to Proportion of Same-Sex Unmarried Households (n=305)			
	Tracts with ≥25% Same-sex Unmarried Households (n=35, 11.5%)	Tracts with <25% Same-sex Unmarried Households (n=270, 88.5%)	p-value
Population density (mi^2) - (mean, Standard deviation)	4,629.36 (3,159.10)	4,276.92 (2,715.62)	0.479
Median annual household income ($1,000's) (mean, SD)	80.89 (42.78)	59.38 (32.03)	0.007
Race/ethnicity (%) (mean, SD)			
White	69.89 (26.95)	54.03 (33.83)	0.005
African-American/Black	22.19 (28.84)	36.71 (36.03)	0.009
Hispanic/Latinx	2.49 (1.94)	3.08 (3.23)	0.129
Asian	3.89 (3.78)	3.52 (4.59)	0.647
Other/Multiple	2.54 (2.12)	2.66 (2.06)	0.744
Proportion working in healthcare support industry (mean, Std)	2.34 (2.26)	4.52 (4.82)	<0.001
Daily average % not leaving home during stay-at-home orders[1] (mean, Std)	91.71 (11.75)	90.37 (14.36)	0.599
Daily average time spent at home during stay-at-home orders[1] (minuets) (mean, SD)	898.65 (267.63)	817.69 (264.58)	0.090
Daily average distance traveled from home during stay-at-home orders[1] (miles) (mean, SD)	3.61 (3.03)	5.15 (14.25)	0.526

Table 2. Linear Regression Models to Determine Social Distancing Metrics across Census-tracts (n=305)[1]								
	1. Daily average % not leaving home during stay-at-home orders		2. Daily average time spent at home during stay-at-home orders (minutes)		3. Daily average distance traveled from home during stay-at-home orders (miles)		4. Daily average % leaving home for work during stay-at-home orders	
	B (Std e)	p-value	B (Std e)	p-value	B (Std e)	p-value	B (Std e)	p-value
Tracts with ≥25% Same-sex Unmarried Households	0.86 (1.33)	0.517	-11.04 (17.25)	0.523	-0.83 (0.57)	0.146	0.63 (0.29)	0.028
Race/ethnicity- White (%)	0.04 (0.02)	0.017	0.23 (0.25)	0.360	<0.01 (0.01)	0.751	-0.01 (<0.01)	0.001
Medan annual household income ($1,000's)	<0.01 (<0.01)	0.009	<0.01 (<0.01)	<0.001	<-0.01 (<0.01)	<0.001	-0.01 (<0.01)	<0.001
Proportion working in healthcare support industry	0.03 (0.12)	0.831	0.71 (1.62)	0.660	-0.02 (0.05)	0.758	0.06 (0.03)	0.028
1. Based on data collected from March 23, 2020 to April 20, 2020								

Discussion

- Data suggest, sexual minorities may be at greater risk for acquiring COVID-19 as a result of increased likelihood of traveling and engaging in employment away from home. These populations should be engaged for increased messaging surrounding testing locations, obtaining personal protective

Results summary

- Data suggest that a greater proportion of unmarried same-sex partners within a census tract is associated with increases in the proportion of individuals who left for work amidst stay-at-home orders implemented in a public health effort to curb the spread of CoVID-19. While the proportion of USSPHs was not predictive of other social metrics surrounding stay-at-home orders, the association with employment suggests that USSPHs may be at greater risk for contracting or spreading COVID-19 as a result of having jobs that requires physical attendance at a place of employment, rather than an option for telecommuting or working from home. Given that USSPHs may be indicative of greater sexual minority populations not captured by census tract data

Discussion

It is also notable that increased proportions of USSPHs and healthcare workers was associated with greater proportions of individuals leaving home for work during a stay-at-home order, while a higher income and greater likelihood of being white decreased the likelihood of leaving home for employment. Those with a 'professional' or higher-wage type of employment are more likely to be able to stay and work from during a pandemic. It is well established that sexual minorities experience significant workplace discrimination, which can prevent an individual from being hired or promoted, receiving equal pay(Fric, 2017). This is of particular importance since the state where the analysis occurred does not afford workplace protections for sexual or gender minorities. As a result, there is an increased likelihood that USSPHs do not work in industries or professions that can readily adopt telecommuting positions. Additionally, research indicates that same sex couples are more likely to have both partners working rather than just one, increasing the likelihood that someone in the household may have to leave home to work during a pandemic

limitations

- these data are in aggregate based on census tracts, and does not provide for an individual or household level analysis. In addition, it is possible that unmarried same-sex partner households do not reflect the entirety of the sexual minority population, both in general and within those census tracts, and these results may not generalize to married same-sex couples or single sexual minority individuals. However, these data do suggest that there is a significant association between the proportion of same-sex couples in a geographic area, and the proportion of people within that area who left home for employment amidst stay-at-home orders during the CoVID-19 pandemic.

App-based HIV-related Data Collection

- Health care promotion in community
    - PrEP clinics
    - HIV clinics and testing sites
    - Grocery stores/pharmacies

Extension to provide E-Health

- Smart technology
  – Phones, watches, biotechnology, pill date/time stamps

Social media and dating apps

- Heavy study of dating apps and HIV risk
  - Disclosure, testing, social media prevention promotion

Satellite imagery and Analysis

- Climate change and HIV infection risk

Thank you

Questions, comments

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