

Authority L and Metra commuter rail stations because transit hubs provide access to drug markets for nonresidents.³

We assessed neighborhood disadvantage using the formula $\{[(c/10 + d/10) - (a/10 + b/10)]/4\}$ with 5-year US Census percentages, where *a* represents adults 25 years or older with a college degree, *b* represents owner-occupied housing, *c* represents households with incomes below the federal poverty threshold, and *d* represents female-headed households with children. Neighborhood disadvantage scores ranged from -5 (very low or little disadvantage) to +5 (very severe disadvantage).⁴ We assessed segregation using the Index of Concentration at the Extremes⁵ by subtracting the number of non-Latino Black residents from the number of non-Latino White residents in a zip code and dividing by the zip code population (segregation ranges, -1 indicates 100% Black population; 0 indicates 50% Black, 50% White; and 1 indicates 100% White).

We calculated the euclidean distance from the home zip code centroid to GPS coordinates of the overdose location (eFigure in the [Supplement](#)). Because urban zip codes are compact and divided along lines that do not necessarily correspond with residents' versions of their neighborhood,⁶ we designated overdoses that occurred in the same or contiguous zip codes as home zip code nontraveling and overdoses that occurred 2 or more zip codes away as "far" traveling (eFigure in the [Supplement](#)). We used logistic regression to assess individual- and neighborhood-level correlates of travel. Two-sided *P* < .05 was considered statistically significant. R software, version 3.4.1 (R Foundational for Statistical Computing) was used for statistical analysis.

Results | Of 3927 fatal overdoses, the mean (SD) age across all overdoses was 44.1 (12.6) years, 2972 (75.7%) were men, 1832 (46.7%) were non-Latino White, and 1596 (40.6%) were non-Latino Black. A total of 1171 individuals (30%) had traveled 2 or more zip codes beyond their home zip code (mean [SD] distance, 49.4 [262.4] km). Men (923 of 1171 individuals [78.8%]; *P* = .003) and younger individuals (mean [SD] age, 41.9 [12.2] vs 44.8 [12.6] years; *P* < .001) were significantly more likely to travel, and there were no differences by racial/ethnic subcategories. Decedents were more likely to travel far from zip codes with low to high neighborhood deprivation (adjusted odds ratio [AOR], 1.43; 95% CI, 1.27-1.60) and from zip codes that were predominantly non-Latino White to predominantly non-Latino Black (AOR, 2.13; 95% CI, 1.61-2.83) (**Table 1**). Travel was significantly associated with fentanyl-involved overdoses (AOR, 1.40; 95% CI, 1.20-1.63), but not with heroin-involved overdoses (AOR, 1.12; 95% CI, 0.96-1.29) after controlling for race/ethnicity, sex, neighborhood deprivation score, and transit hub in home zip code (**Table 2**).

Discussion | Thirty percent of decedents traveled far from their home to the location of the fatal overdose. Decedents tended to travel to more resource-deprived and segregated neighborhoods compared with their home neighborhood. Those who traveled were more likely to have fentanyl in their system at the time of death. This cross-sectional study was limited to fatal overdoses in 1 US mixed urban-suburban county. We did not

have access to narratives for how or why people traveled to their overdose location. Additional narrative information is needed to provide context into how place and travel contribute to overdose.

People who use drugs to fatal ends may reside far distances from where they consume drugs. Nonresidents of overdose hot spots should be a focus of treatment screening and delivery.

Elizabeth D. Nesoff, PhD, MPH

Charles C. Branas, PhD

Silvia S. Martins, MD, PhD

Author Affiliations: Department of Epidemiology, Columbia University Mailman School of Public Health, New York, New York.

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Corresponding Author: Elizabeth D. Nesoff, PhD, MPH, Department of Epidemiology, Columbia University Mailman School of Public Health, 722 W 168th St, Fifth Floor, New York, NY 10032 (en2408@columbia.edu).

Author Contributions: Dr Nesoff had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: All authors.

Acquisition, analysis, or interpretation of data: Nesoff.

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1. Hedegaard H, Miniño AM, Warner M. Urban-rural differences in drug overdose death rates, by sex, age, and type of drugs involved, 2017. *NCHS Data Brief* 345. 2019;345(345):1-8.

2. Cooper HL, Tempalski B. Integrating place into research on drug use, drug users' health, and drug policy. *Int J Drug Policy*. 2014;25(3):503-507. doi:10.1016/j.drugpo.2014.03.004

3. McCord ES, Ratcliffe JH. A micro-spatial analysis of the demographic and criminogenic environment of drug markets in Philadelphia. *Aust NZ J Criminol*. 2007;40(1):43-63. doi:10.1375/acri.40.1.43

4. Ross CE, Mirowsky J. Neighborhood disadvantage, disorder, and health. *J Health Soc Behav*. 2001;42(3):258-276. doi:10.2307/3090214

5. Krieger N, Waterman PD, Spasojevic J, Li W, Maduro G, Van Wye G. Public health monitoring of privilege and deprivation with the index of concentration at the extremes. *Am J Public Health*. 2016;106(2):256-263. doi:10.2105/AJPH.2015.302955

6. Coulton CJ, Korbin J, Chan T, Su M. Mapping residents' perceptions of neighborhood boundaries: a methodological note. *Am J Community Psychol*. 2001;29(2):371-383. doi:10.1023/A:1010303419034

Assessment of COVID-19 Hospitalizations by Race/Ethnicity in 12 States

Given the reported health disparities in coronavirus disease 2019 (COVID-19) infection and mortality by race/ethnicity,^{1,2} there is an immediate need for increased assessment of the prevalence of COVID-19 across racial/ethnic subgroups of the population in the US. We examined the racial/ethnic prevalence

Table. Racial and Ethnic Composition of Cumulative COVID-19 Hospitalizations in 12 States

State (study observation period)	Cumulative No. of hosp on first d vs last d of study period ^a	Ethnicity, % ^b		Race, % ^b		White		Black		AIAN		Asian	
		Hispanic		Hosp		Diff		Hosp		Diff		Hosp	
		Hosp	State ^c	Hosp	State ^c	Hosp	State ^c	Hosp	State ^c	Hosp	State ^c	Hosp	State ^c
Arizona (April 30–June 24, 2020)	1169 vs 4313	31.3	31.6	42.6	54.4	–0.3	54.4	5.8	4.4	1.4	15.7	2.1	3.4
Indiana (April 27–June 24, 2020)	2844 vs 6883	NA	NA	61.6	85.1	NA	85.1	28.1	9.8	18.3	0.5	1.4	2.5
Kansas (May 7–June 24, 2020)	587 vs 1082	26.1	12.1	71.6	86.4	14.0	86.4	22.0	6.1	15.8	0.7	4.1	3.1
Massachusetts (April 20–June 24, 2020) ^d	3790 vs 11 219	17.8	12.3	55.5	71.4	5.5	71.4	14.3	7.2	7.0	NA	4.0	7.0
Minnesota (May 14–June 18, 2020) ^e	1915 vs 3718	15.5	5.5	52.9	84.1	10.0	84.1	24.9	6.8	18.1	2.7	9.8	5.1
New Hampshire (April 27–June 24, 2020)	246–558	10.4	3.9	78.9	90.0	6.1	90.0	5.3	1.4	3.9	NA	2.9	2.9
Ohio (April 21–June 24, 2020)	2779 vs 7447	4.4	3.9	58.4	81.9	2.2	81.9	31.8	13.0	18.8	0.1	2.0	2.5
Oregon (May 27–June 24, 2020)	759 vs 1006	5.1	25.8	61.9	86.8	12.5	86.8	4.0	2.2	1.8	1.6	4.8	4.8
Rhode Island (April 22–June 24)	585 vs 1677	0.0	33.0	48.8	72.0	17.1	72.0	12.5	6.0	6.5	NA	NA	NA
Utah (May 7–June 24, 2020)	476 vs 1256	2.9	35.3	42.5	78.0	21.1	78.0	3.1	1.1	1.9	5.0	1.9	2.6
Virginia (April 19–June 14, 2020) ^f	1422 vs 5536	9.0	36.2	44.1	69.5	26.5	69.5	27.7	19.9	7.8	NA	NA	NA
Washington (May 6–June 24, 2020)	2632 vs 4093	26.0	25.1	53.9	68.0	12.2	68.0	–14.1	3.9	2.1	1.3	8.7	9.1

Abbreviations: AIAN, American Indian/Alaskan Native; COVID-19, coronavirus disease 2019; diff, difference; hosp, hospitalization; NA, not available; State, state population.

^a Total cumulative hospitalizations on the first and last days of the study period: 19 204 and 48 788.

^b The % Hispanic, White, Black, AIAN, and Asian individuals were calculated based on the number of hospitalizations with known race/ethnicity. Race categories White, Black, AIAN, and Asian represent the “Non-Hispanic” category with known race/ethnicity in the following states: Arizona, New Hampshire, Massachusetts, Rhode Island, Utah, Washington. In other states, the race categories include “Hispanic.” Therefore, the sum across Hispanic ethnicity and race categories may be more than 100%. The % race/ethnicity among hospitalized represents the average over the study period for each state.

^c Data for race/ethnicity distribution in states were obtained from the US Census Bureau.⁴

^d Massachusetts reports combined confirmed and suspected COVID-19 hospitalizations; Utah and Virginia separately report confirmed (included in this analysis) and suspected hospitalizations. Other states do not specify confirmed vs suspected hospitalizations.

^e Minnesota provides data weekly.

^f Virginia provides data only for White and Black races, and aggregates all other races in the “Other” category. Hispanic ethnicity data are provided starting May 20, 2019. Reporting format changed again on June 15, 2020; therefore, the analyses include data up to June 14, 2020.

of cumulative COVID-19 hospitalizations in the 12 states that report such data and compared how this prevalence differs from the racial/ethnic composition of each state's population.

Methods | Using data extracted from the University of Minnesota COVID-19 Hospitalization Tracking Project,³ we identified the 12 states that reported the race/ethnicity of individuals hospitalized with COVID-19 between April 30 and June 24, 2020. We calculated the percentage of cumulative hospitalizations by racial/ethnic categories averaged over the study period and then calculated the difference between the percentage of cumulative hospitalizations for each subgroup and the corresponding percentage of the state's population for each racial/ethnic subgroup as reported in the US Census.⁴ The race/ethnicity categories included were White, Black, American Indian and/or Alaskan Native, Asian, and Hispanic. Descriptive statistical analyses were conducted using Stata/MP, version 14 (Stata Corp). The University of Minnesota Institutional Review Board reviewed the study data and deemed it exempt from review and informed consent requirements because the study was not human subjects research.

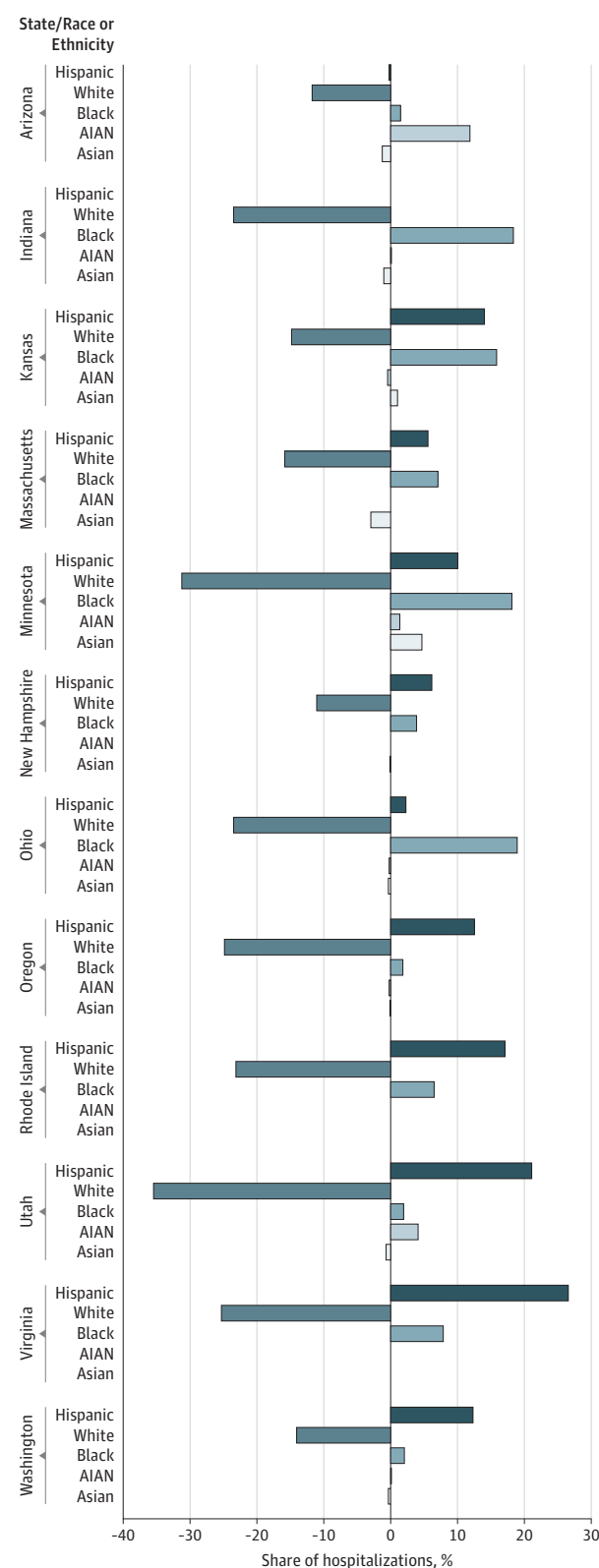
Results | This analysis of COVID-19 hospitalizations in 12 US states during nearly a 2-month period represented a total of 48 788 cumulative hospitalizations among a total population of 66 796 666 individuals in 12 US states by the end of the study period on June 24, 2020. The share of the hospitalizations of White patients was substantially smaller vs their share of state population in all 12 states (**Table and Figure**). For example, in Minnesota, the share of hospitalizations of White patients was 52.9%, whereas their share of the state population was 84.1%. Conversely, the percentage of hospitalizations among Black patients exceeded the percentage of their representative proportion of the state population in all 12 states. Differences between the cumulative percentage of hospitalizations and the state population of Black individuals were greatest in Ohio (31.8% vs 13.0%), Minnesota (24.9% vs 6.8%), Indiana (28.1% vs 9.8%), and Kansas (22.0% vs 6.1%).

Eleven states reported the number of COVID-19 hospitalizations for Hispanic individuals, and in 10 states, the percentage of hospitalizations for Hispanic individuals was higher than their representative proportion of the state population. The disparity among Hispanic individuals was most pronounced in Virginia (36.2% of hospitalizations vs 9.6% of population), Utah (35.3% of hospitalizations vs 14.2% of population), and Rhode Island (33.0% of hospitalizations vs 15.9% of population).

The pattern was largely reversed for the Asian population. In 6 of 10 states that reported data for this subgroup, the proportion of hospitalizations was lower compared with their population representation. In Massachusetts, for example, the Asian population comprised 7.0% of the population but only 4.0% of the COVID-19 hospitalizations.

Hospitalization data for American Indian and Alaskan Native populations were only reported by 8 states. However, the disparity was substantial in select states. In Arizona, the American Indian and Alaskan Native population accounted for 15.7% of the hospitalizations but only 4.0% of the state's

Figure. Hospitalizations vs Population of Racial/Ethnic Subgroups in 12 States



The bars represent the difference between the cumulative percentage of hospitalizations and the proportion of state population by each racial/ethnic subgroup. AIAN indicates American Indian/Alaskan Native.

population. Similarly, in Utah, this subgroup accounted for 5.0% of the hospitalizations in contrast with 0.9% representation of the state population.

Discussion | This analysis identified considerable disparities in the prevalence of COVID-19 across racial/ethnic subgroups of the population in 12 US states. These findings are consistent with an earlier Centers for Disease Control and Prevention analysis of 580 hospitalizations between March 1 and March 30, 2020, that found disproportionately high COVID-19 hospitalizations for the Black population.⁵ Similarly, a study of 1052 confirmed COVID-19 cases between January 1 and April 8, 2020, at a California health system reported higher odds of hospitalization in non-Hispanic Black individuals compared with non-Hispanic White individuals.⁶ In addition, we observed high hospitalization rates for Hispanic individuals in most of the states analyzed and high hospitalization rates for American Indian and Alaskan Native populations in select states.

These findings highlight the need for increased data reporting and consistency within and across all states. Only 12 of 50 US states have consistently reported hospitalizations by race/ethnicity during our study period. New Jersey and Florida recently started reporting data on COVID-19 hospitalizations by race/ethnicity. The present study is limited in that there was no adjustment for age, sex, comorbidities, and socioeconomic factors within each racial/ethnic group that are likely to be associated with COVID-19 hospitalizations.

A large body of research has identified racial/ethnic health disparities in the risk of infection associated with a higher prevalence of comorbidities, less access to health care, adverse economic conditions, and service-related occupations.² The unique clinical, financial, and social implications of COVID-19 for racial/ethnic populations that are often systematically marginalized in society must be well understood to design and establish effective and equitable infrastructure solutions.

Pinar Karaca-Mandic, PhD
Archelle Georgiou, MD
Soumya Sen, PhD

Author Affiliations: Carlson School of Management, Department of Finance, University of Minnesota, Minneapolis (Karaca-Mandic); Starkey Hearing Technologies, Eden Prairie, Minneapolis, Minnesota (Georgiou); Carlson School of Management, Department of Information & Decision Sciences, University of Minnesota, Minneapolis (Sen).

Corresponding Author: Pinar Karaca-Mandic, PhD, Carlson School of Management, Department of Finance, University of Minnesota, 321 19th Ave S, Minneapolis, MN 55455 (pkmandic@umn.edu).

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Author Contributions: Dr Karaca-Mandic had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: All authors.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Karaca-Mandic, Georgiou.

Critical revision of the manuscript for important intellectual content:

All authors.

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1. Artiga S, Orgera K, Pham O, Corallo B. Growing data underscore that communities of color are being harder hit by COVID-19. Kaiser Family Foundation website. April 21, 2020. Accessed July 7, 2020. <https://www.kff.org/coronavirus-policy-watch/growing-data-underscore-communities-color-harder-hit-covid-19/>
2. Mahajan UV, Larkins-Pettigrew M. Racial demographics and COVID-19 confirmed cases and deaths: a correlational analysis of 2886 US counties. *J Public Health (Oxf)*. 2020;fdaa070. doi:10.1093/pubmed/fdaa070
3. University of Minnesota, Carlson School of Management. COVID-19 hospitalization tracking project. <https://carlsonschoool.umn.edu/mili-misrc-covid19-tracking-project>
4. U.S. Census Bureau. Population estimates, 2018. Accessed March 29, 2020. <https://www2.census.gov/programs-surveys/popest/datasets/2010-2018/counties/asrh/>
5. Centers for Disease Control and Prevention. Hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed Coronavirus disease 2019—COVID-NET, 14 States, March 1-30, 2020. Published April 17, 2020. Accessed May 29, 2020. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm>
6. Azar KMJ, Shen Z, Romanelli RJ, et al. Disparities in outcomes among COVID-19 patients in a large health care system in California. *Health Aff (Millwood)*. Published online May 21, 2020;f202000598. doi:10.1377/hlthaff.2020.00598

Disparities in Secondhand Smoke Exposure in the United States: National Health and Nutrition Examination Survey 2011-2018

Secondhand smoke exposure (SHSe) is one of the causes of sudden infant death syndrome, respiratory tract infections, ear infections, and asthma attacks in infants and children; coronary heart disease, stroke, and lung cancer in adult non-smokers; and low birth weight, premature deliveries, and congenital defects in pregnancies.¹ It results in nearly 42 000 deaths (more than 41 000 adults and 900 infants) among non-smokers every year in the US, with Black individuals accounting for 24% to 36% of the infant deaths.² The US Surgeon General determined that there is no risk-free level of SHSe.³ With the outbreak of coronavirus disease 2019, which affects lung function, improving smoke-free policies to enhance air quality should be a growing priority.