

Insurance and Clinical Factors in a Mostly Hispanic Cohort of Patients Hospitalized for COVID-19

Nicolas Kaplan¹, Harry Feng, PhD¹, Peter Zimmerman, PhD¹

¹Case Western Reserve University School of Medicine, Department of Population and Quantitative Health Sciences

Abstract

Background:

- SARS-CoV-2 has had a worldwide impact, though to varying degrees amongst different communities and populations. A disparate incidence of COVID-19, as well as for severe illness resulting from COVID-19 infection, has been observed in minority populations in the U.S.^{1,4}
- Several medical conditions including obesity have been linked to more severe COVID-19 and worse outcomes.^{2,8}
- Additionally, insurance status has been associated with differential risk for obesity, diabetes, and other conditions that are potential risk factors for COVID-19.³

Methods:

- Patient data was retrospectively collected from the electronic medical record (EMR) at Doctor's Hospital at Renaissance from March – July 2020.
- R programming (4.0.2) & RStudio (1.3.1056) were used to clean the patient data and conduct a statistical analysis involving:
 - Bivariate logistic regressions
 - T-tests
 - Chi-square tests
 - Fisher's exact test

Results:

- Several comorbidities for obesity (type 2 diabetes, hypertension, and dyslipidemia) were significantly associated with greater odds for death.
- Patients with these comorbidities had significantly greater odds for having health insurance
- Patients with health insurance had significantly greater odds for death
- Patients with insurance were seen to be a median of 14 years older than uninsured patients.
- The combination of their more advanced age and their increased risk for death from several comorbidities contributed to the greater risk of death for insured patients in this cohort

Public Health Implications

- Comorbidities of obesity increase the risk for death in Hispanic COVID-19 patients

Population:

- The study cohort was recruited from patients admitted for in-patient, critical care services at Doctor's Hospital at Renaissance between March 1st and July 27th 2020.
 - Doctor's Hospital at Renaissance is the single largest hospital in Hidalgo County
- Hidalgo County's population is mostly (>92%) Hispanic.⁷
- Hidalgo County has elevated prevalence of risk factors for COVID-19:
 - 42.9% obesity prevalence (vs. 29.2% in Texas).⁵
- ~1/3 individuals under 65 years are uninsured.⁷
- Hidalgo County contains a major urban center and is a major point of entry from Mexico
 - ~100,000 Americans move South into the region as part of a yearly migration.⁶

Learning Objectives:

- Work with a team to prepare a protocol for submission to the hospital IRB
- Discuss how an electronic medical record can be applied towards data collection for population health
- Utilize software to clean and analyze patient data

Activities → Deliverables:

- Assisted in IRB proposal → IRB approval
- Studied electronic medical record & collected data → Preliminary data set
- Familiarized with R software & used R to clean and analyze patient data → Complete data set

Lessons Learned:

- Gained an understanding of R software
- Learned to apply statistics towards data analysis
- Familiarized myself with electronic medical record prior to matriculating to medical school
- Prepared to work with and direct clinical/research teams

Tables and Figures:

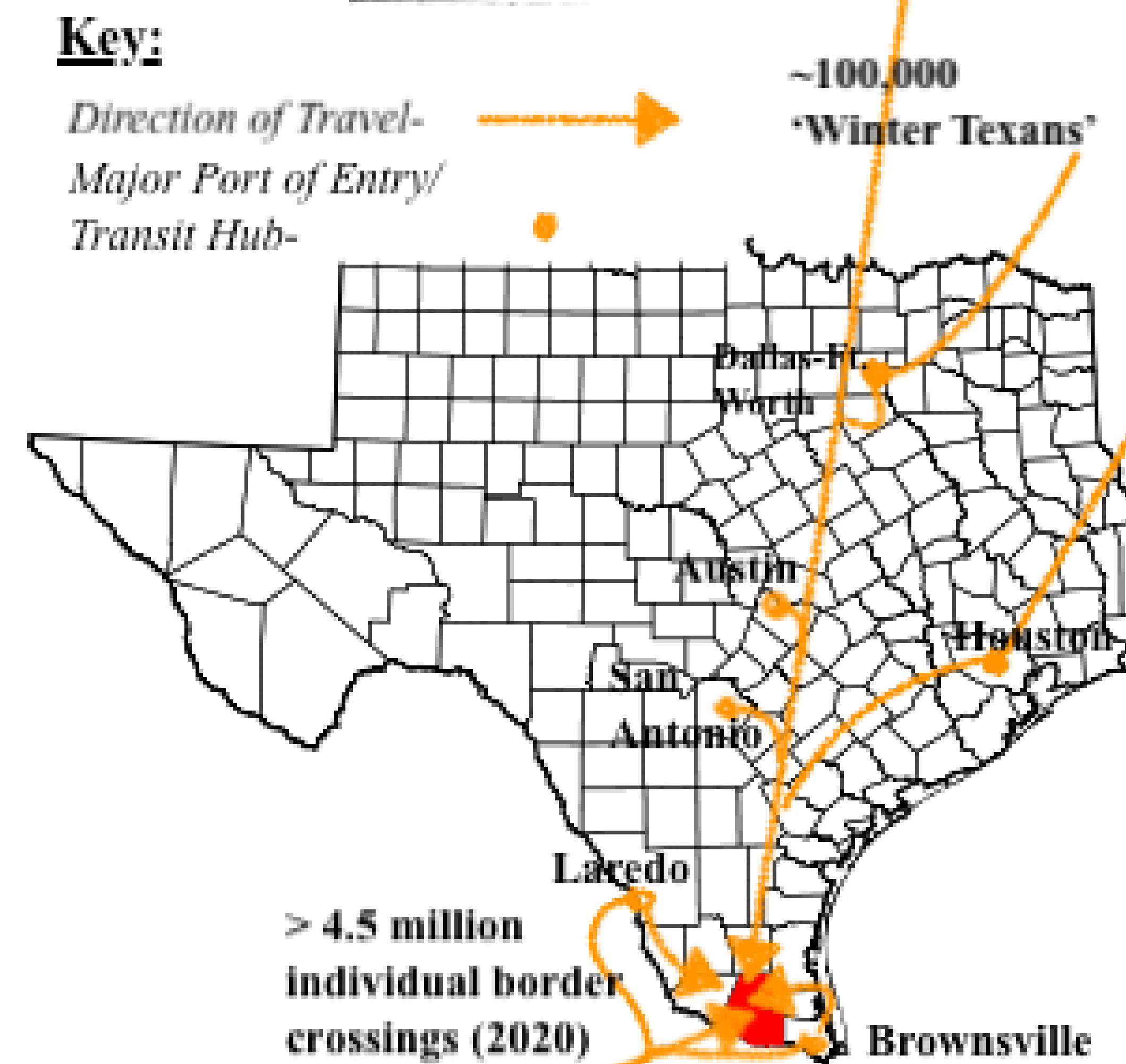


Figure 1: Speculative Population Movement into Hidalgo County, Texas

Variable	Median	Mean	St. Dev
Age	64	62.14347	16.82703
BMI	30.8	32.10416	8.706785
Length of Stay	7	10.48661	9.272805
Proportional Breakdown			
Variable	Proportion	#	
Sex			
Male	0.543	378	
Female	0.457	318	
Race			
Hispanic, Latino, or of Hispanic origin	0.963	659	
American Indian or Alaskan Native	0.001	1	
Black or African American	0.000	0	
Asian	0.004	3	
Native Hawaiian or Pacific Islander	0.000	0	
Caucasian	0.031	21	
Insurance Status			
No	0.203	128	
Yes	0.797	503	
Insurance Breakdown			
Medicare	0.106	67	
Medicaid	0.046	29	
Private	0.464	293	
Medicare & Medicaid	0.141	89	
Medicare & Private	0.054	34	
Uninsured	0.190	120	
Outcomes (Dichotomized)			
Alive	0.673	444	
Dead	0.323	213	

Table 1: Descriptive Statistics

References:

- Covid-19 racial and ethnic disparities. (n.d.). Retrieved April 21, 2021, from <https://www.cdc.gov/coronavirus/2019-nCoV/community-health/equity/racial-ethnic-disparities/facts.html>
- Dietz, W., & Santos-Burgoa, C. (2020). Obesity and its implications for covid-19 mortality. *Obesity*, 28(6), 1005-1005. doi:10.1002/oby.22818
- Mylona, E. K., Benitez, G., Shehadeh, F., Fleury, E., Mylonakis, S. C., Kalligeros, M., & Mylonakis, E. (2020). The association of obesity with health insurance coverage and demographic characteristics: A statewide cross-sectional study. *Medicine*, 99(27). doi:10.1097/md.00000000000021016
- Podewils, L. J., Burket, T. L., Mettenbrink, C., Steiner, A., Seidel, A., Scott, K., . . . Hasnain-Wynia, R. (2020). Disproportionate incidence of Covid-19 INFECTION, hospitalizations, and deaths among persons identifying as Hispanic or Latino — Denver, colorado MARCH–OCTOBER 2020. *MMWR. Morbidity and Mortality Weekly Report*, 69(48), 1812-1816. doi:10.15585/mmwr.mm6948a3
- Programs to Reduce Obesity in High Obesity Areas* [Pamphlet]. (2016). Centers for Disease Control and Prevention.
- Simpson, P. M. (2018, May). 2017 - 2018 Survey Report. *The Winter Texan*.
- U.S. Census Bureau Quickfacts: Hidalgo County, Texas. (n.d.). Retrieved from <https://www.census.gov/quickfacts/hidalgo-county-texas>
- Zhang, F., Xiong, Y., Wei, Y., Hu, Y., Wang, F., Li, G., . . . Zhu, W. (2020). Obesity predisposes to the risk of higher mortality in young Covid-19 patients. *Journal of Medical Virology*, 92(11), 2536-2542. doi:10.1002/jmv.26039



<https://youtu.be/l0f7rH1Vnpc>