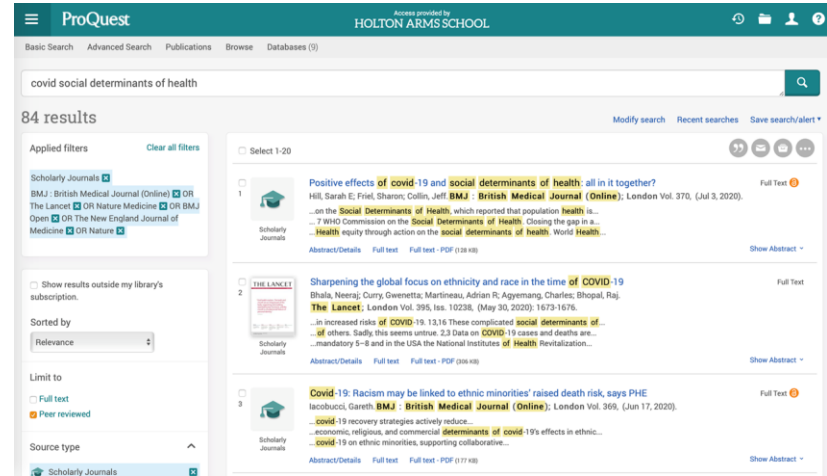# Studying the Social & Demographic Determinants & Disparities of Covid-19
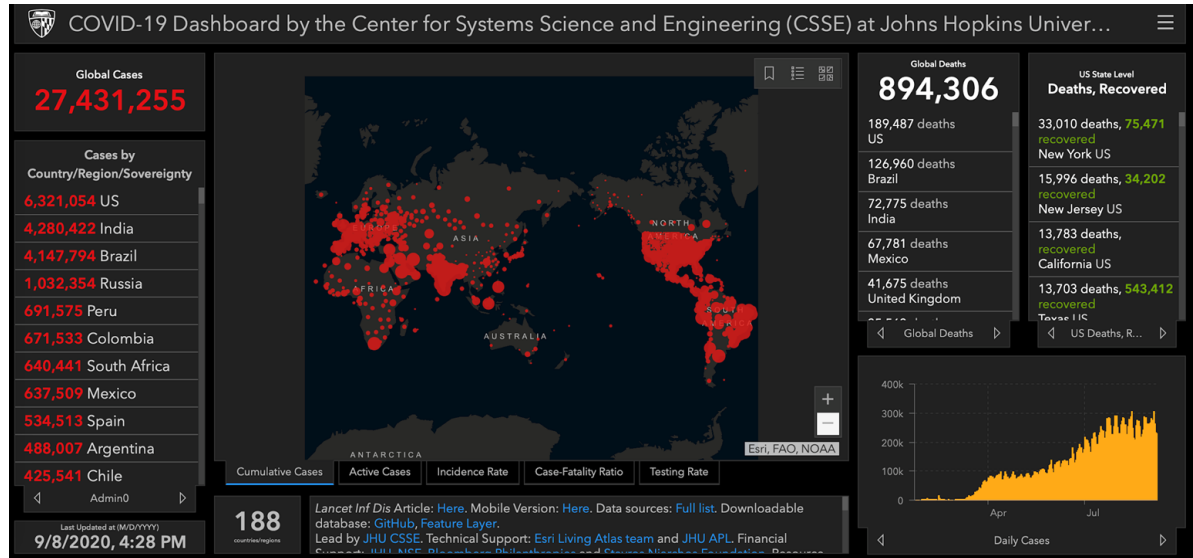
Ema Nakayama

Research Process

- Research Questions:
  - Why are the demographics not concrete with this disease?
  - Why are minorities so at risk for Covid-19 infections?
  - Which social determinants of health are associated with increased risk of Covid-19? How do they relate to the clinical risk factors?
  - What can we do to address socio-demographic disparities regarding Covid-19?

A screenshot of my computer screen during the research process
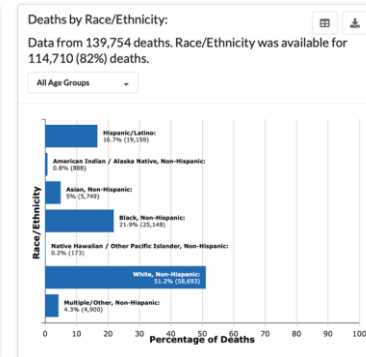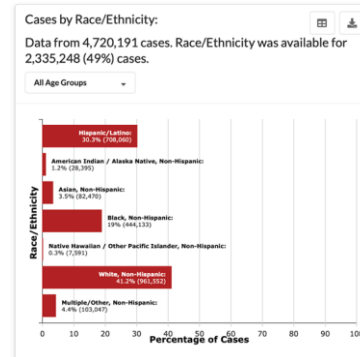
Information about Covid-19

- Virus: Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)
- Strategies: testing, lockdowns, mask mandates

Johns Hopkins Center for Systems Science and Engineering. "Covid-19 Global Cases Map." *Johns Hopkins University and Medicine*, coronavirus.jhu.edu/map.html. Map.

Covid-19 Demographic Data

- Under-reporting of demographic data
- Under-representation of research on socio-demographic factors
- Looking at CDC statistics vs. looking at cohort studies
- Racial & socioeconomic disparities

Cases by Race/Ethnicity:
Data from 4,720,191 cases. Race/Ethnicity was available for 2,335,248 (49%) cases.

All Age Groups

Deaths by Race/Ethnicity:
Data from 139,754 deaths. Race/Ethnicity was available for 114,710 (82%) deaths.

All Age Groups

Centers for Disease Control and Prevention, editor. "Coronavirus Disease 2019 (COVID-19)." *Centers for Disease Control and Prevention*, U.S. Department of Health & Human Services

Burton, Jeffrey, et al. "Hospitalization and Mortality among Black Patients and White Patients with Covid-19." *The New England Journal of Medicine*, vol. 382, no. 26, 2020 Jun 25, pp. 2534-43.

Table 3. Odds Ratios for Hospitalization among 3481 Covid-19–Positive Patients.*

Variable	Model 1	Model 2	Model 3
		odds ratio (95% CI)	
Race: black vs. white	1.71 (1.46–1.99)	2.35 (1.97–2.80)	1.96 (1.62–2.37)
Age, in 5-yr units	—	1.34 (1.30–1.37)	1.29 (1.25–1.33)
Sex: female vs. male	—	0.57 (0.49–0.66)	0.56 (0.48–0.65)
Charlson Comorbidity Index score	—	—	1.05 (1.00–1.10)
Residence in low-income area: yes vs. no	—	—	1.22 (1.04–1.43)
Insurance			
Medicare vs. commercial	—	—	1.73 (1.39–2.14)
Medicaid vs. commercial	—	—	1.65 (1.29–2.12)
Other vs. commercial	—	—	0.91 (0.70–1.20)
Obesity: yes vs. no	—	—	1.43 (1.20–1.71)

* Model 1 is the unadjusted race-only model; model 2 includes race with the additional covariates of age and sex; and model 3 includes race with the additional covariates of age, sex, Charlson Comorbidity Index score, residence in a low-income area, insurance plan, and obesity.

Factors Contributing to Disparities

- Intersection of race & socioeconomic status (SES)
- Disproportionately high prevalence of underlying comorbidities
  - "Weathering"
- Inability to social distance, work from home, and take other preventative measures
- Inequity & bias in healthcare
- Lack of access to resources
  - Territorial stigmatization & environmental racism
  - Health insurance

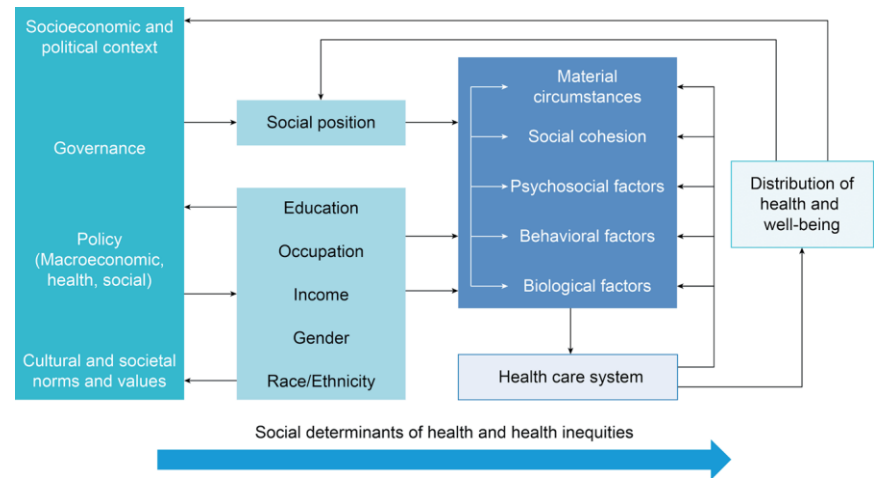- Rooted in systems of oppression & inequality

Social determinants of health and health inequities

Chart detailing how different factors and determinants interact with each other
From: Pan American Health Organization

Research Conclusions & Takeaways

- Need for more research on socio-demographic determinants of health
  - Representation in Covid-19 clinical tests
  - Health effects of racial discrimination & social prejudice
- Dangers of presenting data without adequate context & explanation
- How to connect scientific findings with policies and changes

More Takeaways: Mistakes Made & Lessons Learned

- Procedures learned:
  - How to search for and read journal articles
    - Going through citations & references
  - How to look at dynamic data
- Time management
  - Creating & self-enforcing a schedule
- Organizational skills
  - Keeping track of downloaded PDFs, notes documents, & sources

A selfie (at home) taken while working on this project

Acknowledgements

- Thank you to Dr. Krug and the Holton Science Department!

Questions?