

# Relationship between Health Insurance and COVID-19 Rates and Deaths

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# Social Determinants of Health



Source: <https://www.cdc.gov/publichealthgateway/sdoh/index.html>

# Motivation and Goal

- ❖ We want to better understand how social determinants of health influence the spread and severity of disease outbreaks such as COVID-19.
- ❖ We will primarily focus on health insurance coverage because it reflects multiple social determinants at once (income, marriage, employment).

# Main Key Questions

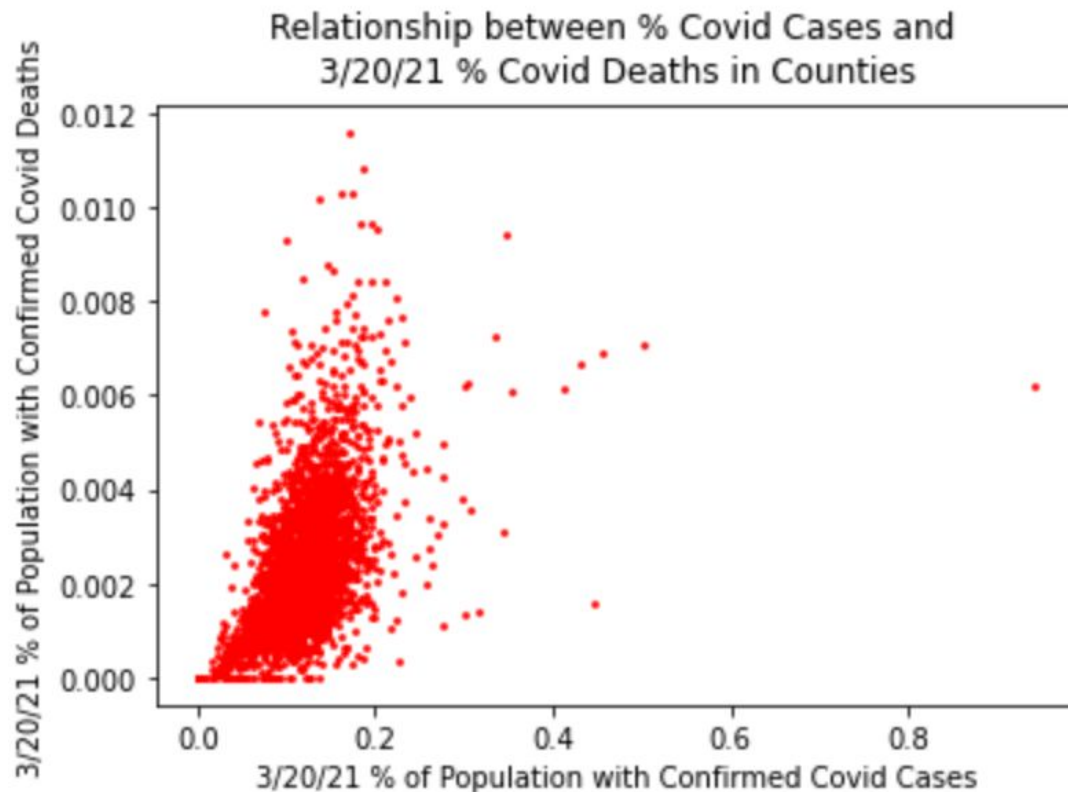
1. What is the relationship between coronavirus cases and access to health insurance? How does this relationship change across various states and counties in the United States?
2. What are other social determinants of health that affect coronavirus cases? How do these relationships compare with health insurance?

# Data used

ID	Name	Demographic Group	Demographic Group	Uninsured: Number	Uninsured: MOE
1000	Alabama	3,955,117	0	470,052	13,365
1001	Autauga County, AL	46,709	0	4,693	553
1003	Baldwin County, AL	172,071	0	22,660	1,982
1005	Barbour County, AL	17,106	0	2,310	269
1007	Bibb County, AL	16,643	0	1,764	229
1009	Blount County, AL	47,053	0	6,642	656
1011	Bullock County, AL	6,864	0	815	109
1013	Butler County, AL	15,443	0	1,838	232
1015	Calhoun County, AL	91,554	0	10,166	1,054
1017	Chambers County, AL	26,631	0	3,092	381
1019	Cherokee County, AL	19,892	0	2,682	301
1021	Chilton County, AL	36,290	0	5,930	604
1023	Choctaw County, AL	9,778	0	1,319	147
1025	Clarke County, AL	18,882	0	2,371	282
1027	Clay County, AL	10,358	0	1,651	189
1029	Cleburne County, AL	11,936	0	1,623	186
1031	Coffee County, AL	42,793	0	5,359	537
1033	Colbert County, AL	43,574	0	4,936	570
1035	Conecuh County, AL	9,342	0	1,166	148
1037	Coosa County, AL	7,977	0	1,003	128
1039	Covington County, AL	28,860	0	3,524	389
1041	Crenshaw County, AL	11,088	0	1,418	163
1043	Cullman County, AL	67,318	0	9,309	902
1045	Dale County, AL	39,754	0	4,378	521
1047	Dallas County, AL	30,554	0	3,478	435
1049	DeKalb County, AL	58,333	0	10,995	950
1051	Elmore County, AL	64,834	0	6,409	730
1053	Escambia County, AL	27,401	0	4,094	449
1055	Etowah County, AL	81,286	0	10,125	986

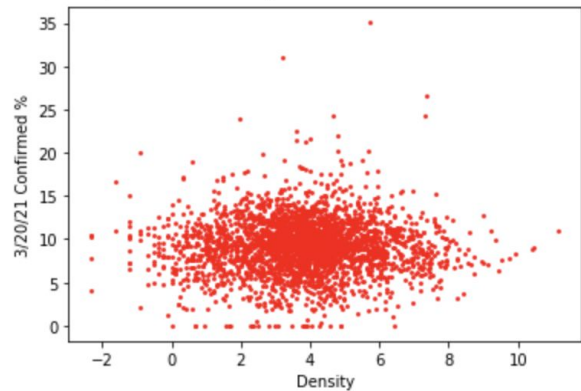
- US States/Counties
- Confirmed cases from 1/22/20 to 3/20/21
- Confirmed deaths from 1/22/20 to 3/20/21
- Number/percentage of insured/not insured
- Population density
- Latitudes and Longitudes

# Confirmed % and Death %

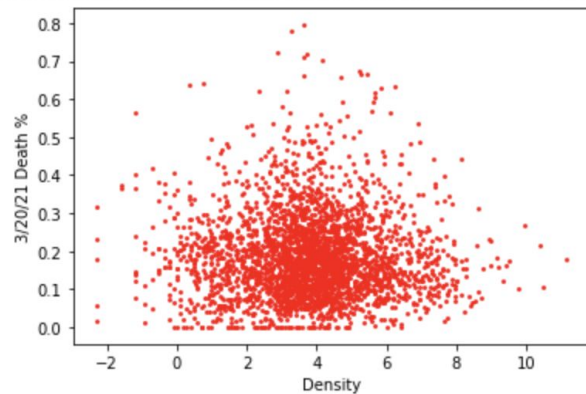


# Population Density

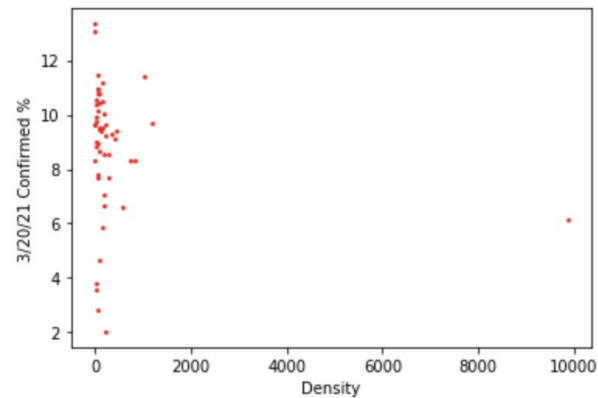
Relationship between Density and Percent of Covid Cases in Counties



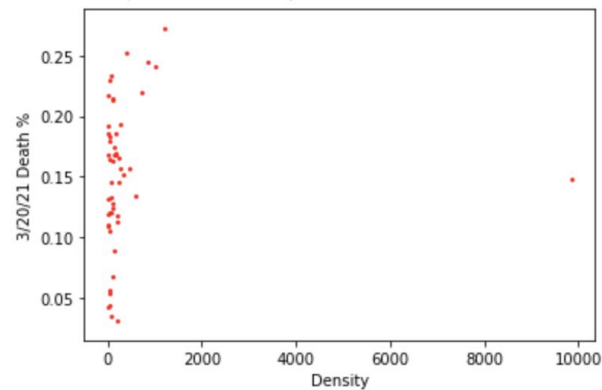
Relationship between Density and Percent of Covid Deaths in Counties



Relationship between Density and Percent of Covid Cases in States

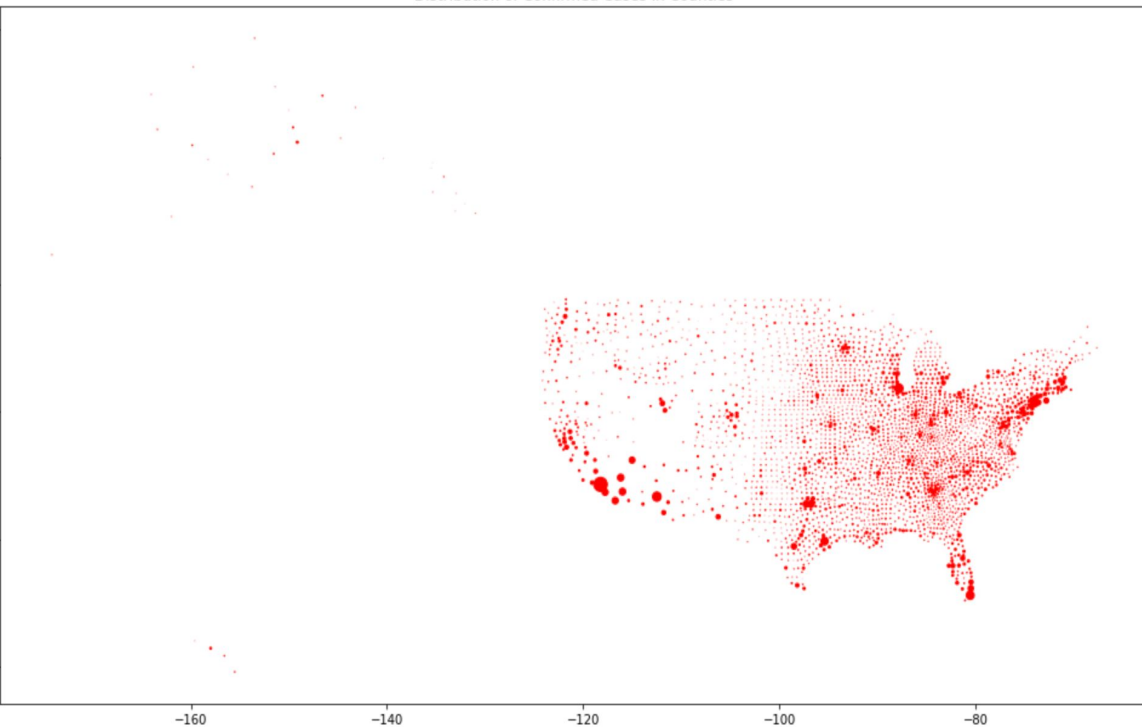


Relationship between Density and Percent of Covid Deaths in States

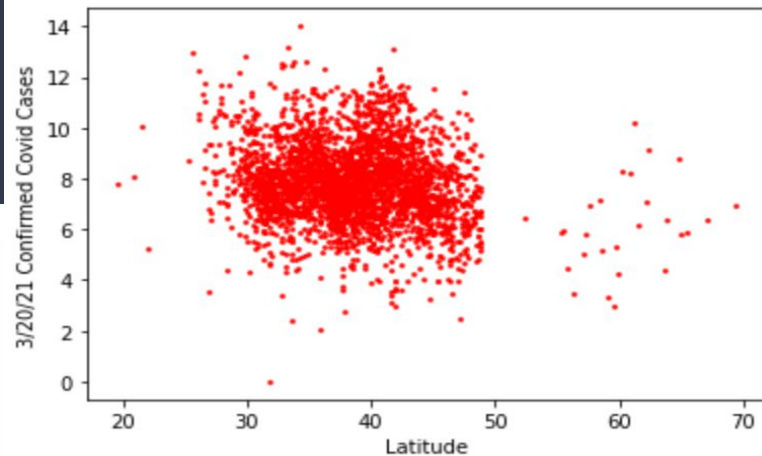


# Geographic Analysis

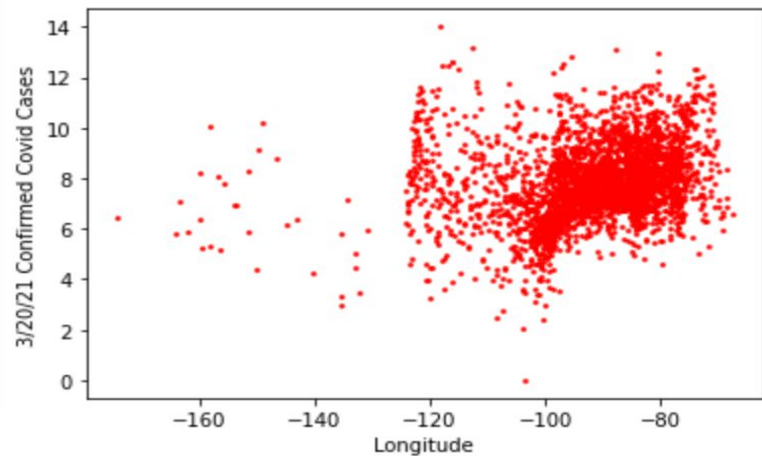
Distribution of Confirmed Cases in Counties



Relationship between Latitude and  
3/20/21 Covid Cases in States



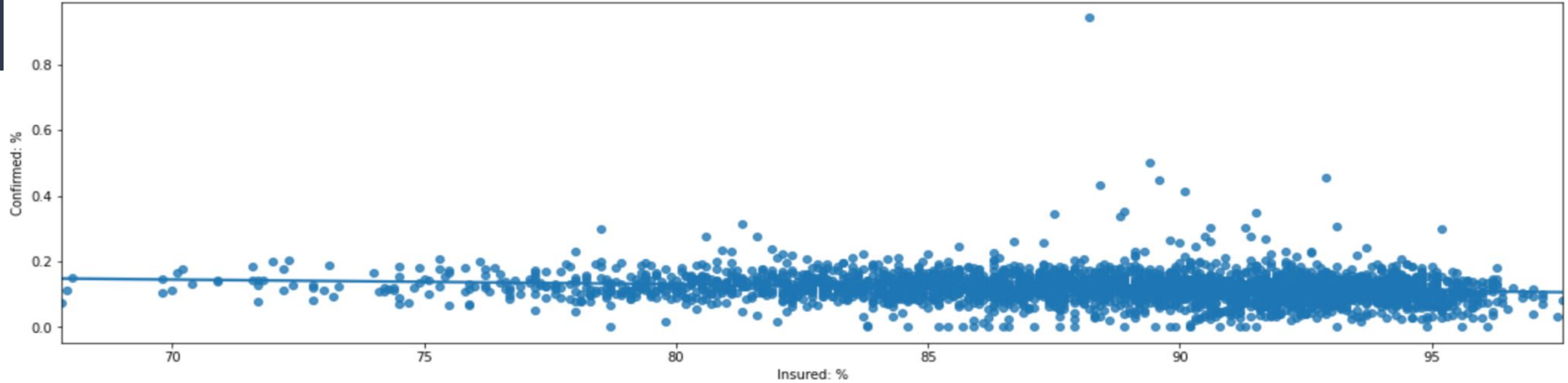
Relationship between Longitude and  
3/20/21 Covid Cases in States



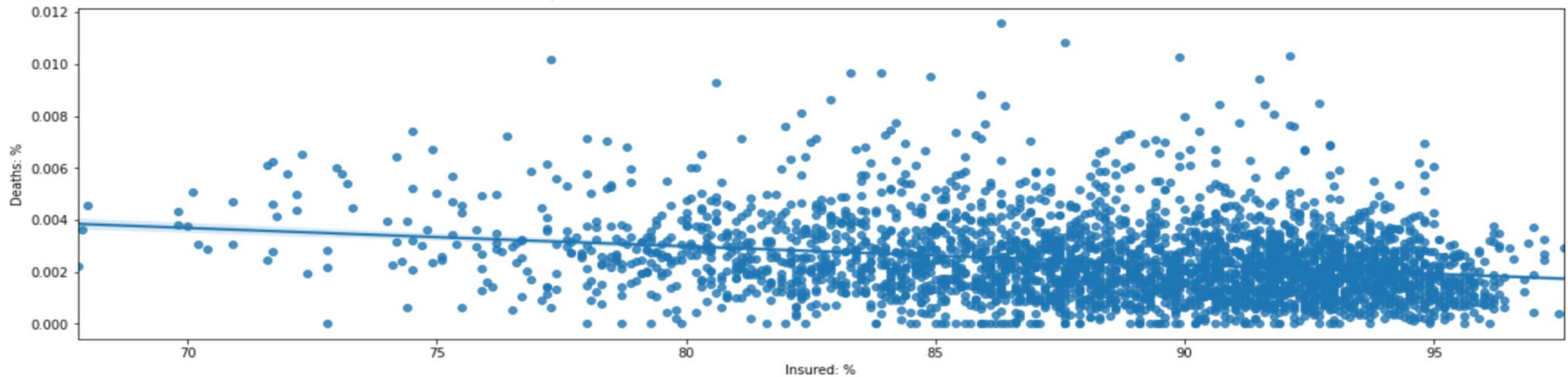


# Analysis – Insured %, Confirmed %, Deaths %

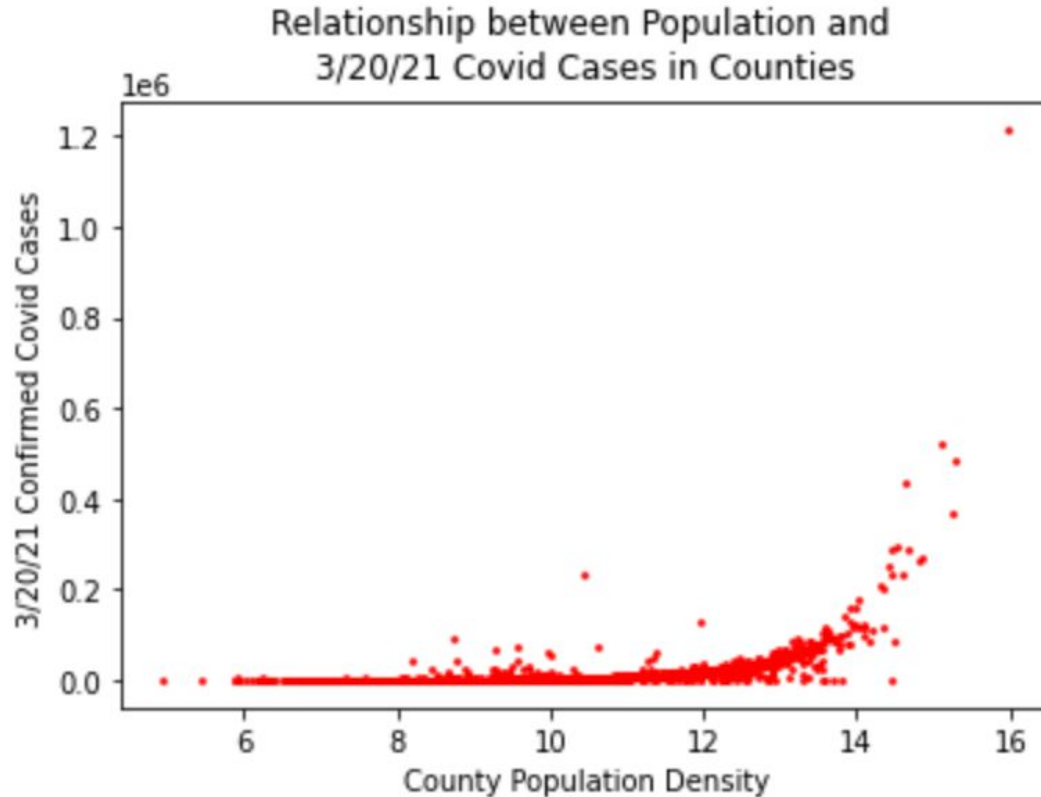
Relationship between Percent of Insured and Percent of 3/20/21 Covid Cases in Counties



Relationship between Percent of Insured and Percent of 3/20/21 Covid Deaths in Counties

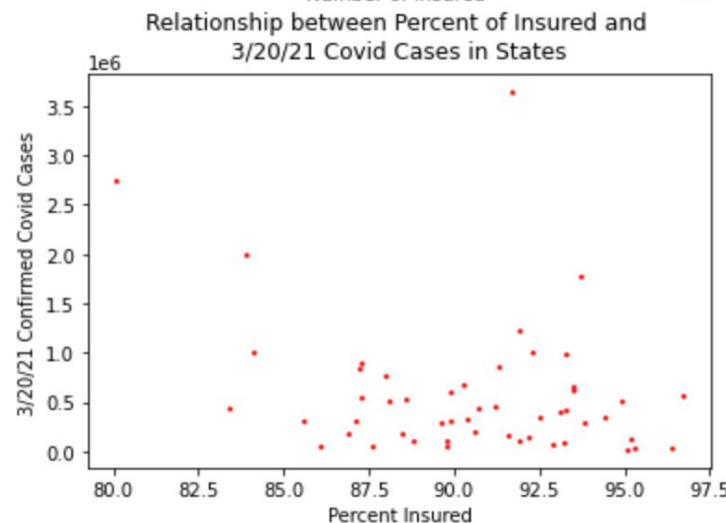
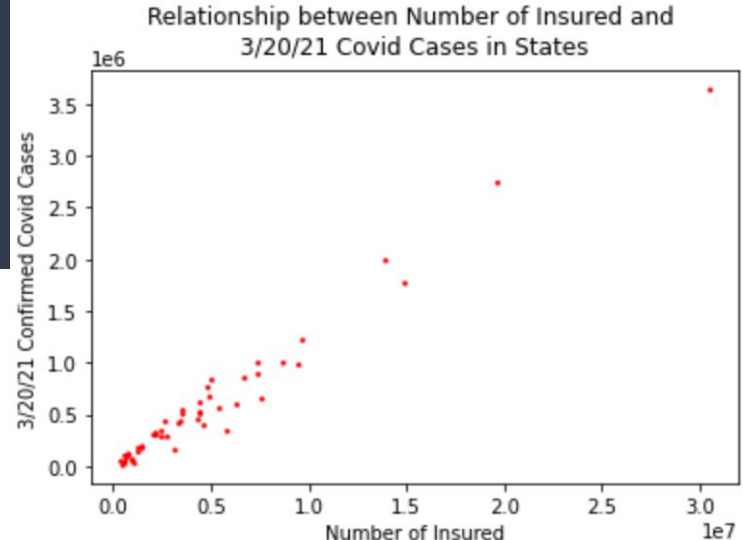


# Analysis – County Population Density



# Challenges along the way

- ❖ Clean up/aligning process
  - Manually parsed (pandas)
- ❖ Finding the best method to interpret the data
- ❖ Population, cause of relationships
- ❖ Testing frequency
- ❖ Asymptomatic



# Limitations / Next Steps

- ❖ Relevant vaccine data was difficult to find at this stage
- ❖ There could have been other interesting factors
  - Demographics, lock down periods, climate differences, etc

Thank you!