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Political death creep

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Abstract
In December 2019, an outbreak of a respiratory disease associated with a purported novel coronavirus (SARS-CoV-2) was reported in the city of Wuhan in the Hubei province of the People's Republic of China. On March 11, 2020, the World Health Organization declared Coronavirus Disease 2019 (COVID–19) a pandemic. COVID-19 case and death data is collected and reported by a much different criterion than all other infectious diseases and causes of death. These changes foster an environment for U.S. federal health officials and local governments to manipulate and confound the COVID-19 death rates. Is the motivation political? Governments and public health experts insist this liberal reporting provides a broad picture of how lethal the disease is, others contend that it gives license to those motivated to exaggerate death rates as part of a political effort to invoke fear in an election year. This paper frames the conflict and provides an analysis to test the notion of a political death creep. Results from two regression constructs show states that vote more democrat are assigning significantly more COVID-19 deaths, compared to the average state, controlling for population density and share of aged population.

Keywords: COVID-19, State Death Rates.

Introduction

In December 2019, an outbreak of a respiratory disease associated with a purported novel coronavirus (SARS-CoV-2) was reported in the city of Wuhan in the Hubei province of the People's Republic of China. On March 11, 2020, the World Health Organization declared Coronavirus Disease 2019 (COVID–19) a pandemic [1]. The first infection (case) of COVID–19 in the United States was reported in January 2020 and the first alleged death in February 2020, both in Washington State [2]. As of October 11, 2020, the number of known cases in the United States has increased to over 7.7 million and assigned deaths 214 thousand [3]. The case death rate has been observed to be the simple ratio: Assigned Deaths / Known Cases.

Projecting infectious disease cases and deaths appears paramount for epidemiologist modelers. U.S. COVID-19 case and death forecasts are based on mathematical models that capture the probability of moving between states from the susceptible to infected - then to recovery or death (SIR Models) [4]. State specific model projections have influenced individual behavior and government-mandated public health emergency orders. By mid-March 2020, most states closed schools, shuttered non-essential commerce and forced shelter in place orders. Initial case and death projections [5] stoked this reaction while media outlets tallied reported deaths with 'ticker' chyrons. The economic consequence of these model induced government mandates is nothing less than catastrophic. By mid-April 2020, roughly 26 million Americans filed for unemployment benefits [6]. Uncertainty and fear upended financial and commodity markets for months [7]. Small businesses are simply closing their doors, while Amazon and Walmart are growing more dominant [8].

Curiously, COVID-19 case and death data is collected and reported by a much different criterion than all other infectious diseases and causes of death. This unique standard for COVID-19 was developed despite the existence of guidelines that have been successfully used since 2003 [9]. COVID-19 data is collected and reported based on the March 24th National Vital Statistics Systems (NVSS) Guidelines (updated in April) [10] and the April 14th Centers for Disease Control (CDC) adoption of a position paper authored by the Council of State and Territorial Epidemiologists (CSTE) [11]. NVSS guidance introduced a new death certificate category code for COVID-19 and instructs on its liberal use.

The CSTE position paper describes the generous criteria acceptable to determine a COVID-19 case. Two strategic consequences of this data paradigm shift are:

- 'Presumed COVID-19' cause of death allowed on death certificates,
- Subordination of chronic comorbidities on COVID-19 assigned death certificates.

Governments and public health experts insist this liberal envelope provides a broad picture of how lethal the disease is, others contend that it gives license to those motivated to exaggerate death rates as part of a political effort to invoke fear in an election year [12]. For what ever reason, it appears federal health officials and local governments eagerly manipulate and confound COVID-19 death rates [13]. Is the motivation political? This paper frames the conflict and provides an analysis to test the notion of a politically motivated death creep.

Models, data and discussion

Should politics effect jurisdictional differences in a contagion's case death rate? A simple multivariate regression analysis is used to show if the perceived political ideology of a U.S. state impacts the COVID-19 death rate for that state. The model estimated is

$$Y_i = \alpha + \beta_k X_{ki} + \varepsilon_i$$

where Y_i is the COVID-19 case death rate for each i state and the District of Columbia, α is the overall constant term, β_k is the vector of k covariate parameter estimates, X_{ki} represents the k covariates for each i state, and ε_i is the error term. Simply, state COVID-19 case death rate's are regressed on population density, the percentage of a state's population age 65 and above, and the difference between main candidate total vote percentages for the 2016 Presidential election. Regarding the latter, in California for example, the percentage of the 2016 vote for Hillary Clinton was 61.5% while 31.5% voted for Donald Trump. The Clinton - Trump wedge becomes 61.5% - 31.5% = 30%. As this difference in voting share increases, it is presumed that a state is more Democrat in ideology. Population density is a control for how the disease behaves, congested jurisdictions appear to suffer infection and death the most. Moreover, the aged face the highest mortality risk with roughly 80% of the total COVID-19 assigned deaths occurring in the population of those 65 and above [14]. Table 1 includes variable definitions, sources, and descriptive statistics.

Table 1: Variable definitions, sources and descriptive statistics

Pop Density	Population of a state divided by the state's land area in square miles. Source, US Bureau of the Census 2019. Mean・425.46. STD・1,612.11.
65 Plus	Share (in percent) of a state's population age 65 and above. Source, US Bureau of the Census 2019. Mean・16.46. STD・1.40.
Clinton-Trump	State's 2016 voting difference in percent of total. Source, MIT Election Data and Science Lab 2017. Mean・-3.73. STD・23.79.
Death Rate	The number of assigned COVID-19 deaths over known cases by state (in percent). Source, John Hopkins University Centers for System Science and Engineering, CNN.com, 10/11/20. Mean・2.60. STD・1.74. Deaths Mean・4,187. Cases Mean・150,043

Descriptive statistics in Table 1 give rise to a fundamental problem with one of the covariates. The variable 65 Plus shows little variation across states (Mean 16.46, STD 1.40, STD/Mean 0.085). Minimal variation in a covariate encroaches the full rank (identification) assumption of the classic OLS model [15]. Any significant effect will likely be picked up by the model's constant term. Appendix Table A1 contains the results of the three covariate model and illustrates the effect on the overall constant term. Table 2 shows the results of the two covariate augmented model.

Table 2: Regression results

Dependent Variable: Death Rate				
R Square: 0.27	**F(2,48) Stat: 9.03**	**Significance F: < 0.01**		
Variable	**Coefficient**	**t Stat**	**P-Value**	**VIF**
Intercept	2.816	11.94	0.000	
Pop Density	-0.0001	-0.79	0.428	1.59
Clinton - Trump	0.043	3.80	0.000	1.59

White Test: 4.68

Observations: 51, includes the District of Columbia

The F test suggests the regression is significant at the < 0.01 level. The White test statistic [16], which follows a chi-square distribution with 2 degrees of freedom, fails to reject the null hypothesis of constant error variance with > 95% confidence (critical value 5.99). Moreover, low variance inflation factors (VIF) suggests the covariates are 0.59 from orthogonal. The population density control is statistically insignificant. Concentration of the susceptible at the state level appears to have no impact on COVID-19 case death rates.

Table 2 results for the Clinton - Trump wedge can be interpreted as follows. For every one standard deviation (23.79%) vote share increase in favor of Clinton (e.g., increasing the vote difference from say 10% to 33.79%), for the average state, the case death rate of the average state increases by 1.02 (23.79*0.043). Recall the mean for the dependent variable is 2.60 percent (1.02/2.60 = 39%). Evaluated at the mean for cases (150,043), this represents 1,546 assigned deaths. States that vote more democrat assign significantly more COVID-19 deaths to cases, on average (mean deaths 4,187), controlling for population density and share of aged population.

It has been suggested that the known case death rate is the wrong metric to statistically explain. The death rate is a ratio of two variables, both suffering from interconnected measurement issues. It appears the definition of the denominator is more problematic than the assignment of a COVID-19 death [17]. Convention focuses on deaths per 100,000 population of a jurisdiction of interest. Table 3 and the regression in Table A2 of the Appendix provides the results of regressing COVID-19 assigned deaths per 100,000 population of a state on the k vector depicted in Table 1.

Table 3: Regression results

Dependent Variable: Deaths per 100,000 population		Mean 54.35 · STD 39.78 Mean State Population 6,435,305		
R Square: 0.13	F(2,48) Stat: 3.74	Significance F: < 0.05		
Variable	**Coefficient**	**t Stat**	**P-Value**	**VIF**
Intercept	56.108	9.55	0.000	
Pop Density	0.0009	0.22	0.829	1.59
Clinton - Trump	0.574	2.03	0.048	1.59

White Test: 5.87
Observations: 51, includes the District of Columbia

The F test suggests the regression is significant at the < 0.05 level. The White test statistic again fails to reject the null hypothesis of constant error variance with > 95% confidence (critical value 5.99). The population density covariate is again statistically insignificant. Table 3 results for the Clinton - Trump wedge can be interpreted as follows. For every one standard deviation (23.79%) vote share increase in favor of Clinton (e.g., moving the vote difference from say 10% to 33.79%), for the average state, deaths per 100,000 population of the average state increases by 13.66. Table 3 shows the mean for the dependent variable as 54.35 (13.66/54.35 = 25.1%). Evaluated at the mean for state population, this represents 879 assigned deaths. The two constructs presented here suggest that the CDC directed liberal death reporting guidance for COVID-19 fosters an environment for a blue state political death creep.

Arguably, this analysis is limited by the small sample size, aggregate data and possible heterogeneity problems (state specific) inherent in cross-section regressions [18]. However, the results here are compelling and spur interest to expand the analysis. In a perfectly transparent world, an examination of all death certificates would be invaluable. In the real world, this data gathered for states may also be available in full at the county level. A more broad landscape could provide expanded analysis and more robust inference.

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Appendix

Table A1: Regression Results

Dependent Variable: Death Rate			
R Square: 0.29	**F(2,48) Stat: 6.58**	**Significance F: < 0.01**	
Variable	**Coefficient**	**t Stat**	**P-Value**
Intercept	0.498	0.26	0.796
Pop Density	-0.0001	-0.63	0.529
65 Plus	0.140	1.21	0.229
Clinton - Trump	0.042	3.68	0.001

Observations: 51, includes the District of Columbia

Note from text Table 1 that the mean of the 65 Plus covariate is 16.46%. Evaluating the 65 Plus parameter estimate at the mean, yields 16.46 * 0.14 = 2.30, then adding this result to the intercept term above (Table A1) yields 2.80 which is roughly the constant term in the text Table 2. Estimates for Pop Density and Clinton - Trump are essentially the same of those found in text Table 2.

Table A2: Regression Results

Dependent Variable: Deaths per 100,000 of population			
R Square: 0.14	**F(2,48) Statistic: 2.47**	**Significance F: 0.074**	
Variable	**Coefficient**	**t Stat**	**P-Value**
Intercept	68.448	1.41	0.165
Pop Density	0.0008	0.18	0.859
65 Plus	-0.744	-0.26	0.799
Clinton - Trump	0.582	2.02	0.048

Observations: 51, includes the District of Columbia

Note from text Table 1 that the mean of the 65 Plus covariate is 16.46%. Evaluating the 65 Plus parameter estimate (Table A2) at the mean, yields 16.46 * -0.744 = -12.25, then adding this result to the intercept term above (68.448 - 12.25) yields 56.198 which is roughly the constant term in text Table 3. Estimates for Pop Density and Clinton - Trump are essentially the same of those found in text Table 3.