American Politics and the Spread of SARS-CoV-2

Jason H. Wasfy, M.D., M.Phil.

[1]Cardiology Division, Department of Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA

[2]Massachusetts General Physicians Organization, Boston, MA

Address for correspondence:

Jason H. Wasfy, M.D., M.Phil., Cardiology Division, GRB 8-843, Massachusetts General Hospital, 55 Fruit Street, Boston, MA 02114; Tel: (617) 643-7257; Fax: (617) 726-7437
Email: jwasfy@mgh.harvard.edu

Even long before the Covid-19 pandemic, the politics of communities have long been associated with the public health of those communities. In the United States, healthier voters have been more likely to identify with the Republican party.[1] However, any association may have shifted in the past few years. In the 2016 presidential election, counties with poorer public health shifted voting toward the Republican party.[2] Consistent with this observation, multiple analyses have now shown that reduction in life expectancy over decades was associated with a shift toward Republican presidential voting in 2016.[3–5] This trend appears to extend to Congressional elections in 2018.[6] In recent years at least, communities with worse public health are shifting toward the Republican party.

Any causal interpretation of this shifting association, however, remains tricky to pinpoint. First, by the very nature of this type of ecological research, ecological inference bias limits the ability to understand causal relationships.[7] When we assess voting trends among populations, such as voters within a county, we still know essentially nothing about the votes of specific individuals. Counties with poor public health shifting votes to the Republican party could mean that individuals with poor health are shifting votes to the Republican party. But the finding is also compatible with other explanations. Perhaps counties with more disparities between a few healthy and many more unhealthy people are shifting toward the Republican party – although the healthy people are shifting strongly Republican and the unhealthy people are shifting mildly Democratic. These ecologic analyses tell us about public health and aggregate voting counts. But they tell us very little about the correlation between individual health and individual votes.

This is not just a theoretical research methods issue. It is known to confound ecological analyses of voting. For example, poor states are more likely to vote for Republicans. But in both rich and poor states, poor people within those states are more likely to vote for Democrats.[8] So examining the correlation between voting and income at the state level can lead to inaccurate conclusions – a reversal of the true association. Both data on individuals as well as statistical techniques that account for these clustered data, including multilevel modeling, are required to reveal the correct direction of the association.[9] Similar issues may complicate any type of assessment of health and voting at the county level.

In this context, this interesting and important analysis by Mourad et al.[10] in this issue of *Clinical Infectious Diseases* should be viewed as an attempt to understand the independent association of characteristics of communities rather than individuals. The characteristics examined are the late worsening of the SARS-CoV-2 pandemic and overall voting patterns in the 2016 presidential election. The authors focus on changes in case counts in June 2020. During this time after the initial surge, the American economy was reopening despite widespread ongoing community spread of SARS-CoV-2. The authors' basic hypothesis that political preferences may affect disease spread is compelling, because local political preferences could affect public health mitigation measures.

This question is particularly important because of the deep polarization and politicization around measures to contain SARS-CoV-2. Just as during the 1918 H1N1 influenza pandemic[11], mask-wearing has become politicized. In June 2016, Democrats and Democratic-leaning independents were more than twice as likely to advocate for consistent masking in public places than Republicans and Republican-leaning independents.[12]

Partisan affiliation was associated with larger differences in comfort with daily activities such as eating in a restaurant than race, geography, gender, and age.[12]

As such, it is entirely possible that public attitudes (one measure of which is voting history) may be correlated with local policies, norms, and behavior, which in turn could influence the spread of SARS-CoV-2. From an analytical perspective, testing this important hypothesis is ambitious although very challenging.

In this work, the authors define political affiliation by a binary variable (whether or not the Republican candidate won the presidential election of 2016 by more than 10 points) and define worsening SARS-CoV-2 spread as a binary variable (rising or falling case counts during June 2020). They performed logistic regression on the primary binary outcome variable (worsening SARS-CoV-2 spread) with political affiliation as the primary predictor of interest. Other sociodemographic variables used in the model included Black race, Hispanic ethnicity, SDI, and metropolitan designation (population 1 million or more, 250,000-1 million, less than 250,000, or non-metropolitan). Counties with 50 or fewer cases of SARS-CoV-2 were excluded from the analysis. Given these criteria, about two-thirds of counties were excluded.

The authors find that after multivariable adjustment, Republican voting was associated with greater odds of rising SARS-CoV-2 case counts in June 2020 (OR 1.80, [1.33-2.42]). These results are interesting and they raise the possibility that political orientation is associated with local disease spread in the early summer of 2020. Presumably such an association, if it exists, might be mediated through acceptance of mask-wearing, social distancing, and other measures recommended by the Centers for Disease Control and Prevention.

As is common with complex analyses with observational data, there are important limitations that should temper our confidence that such an association exists. First, the initial wave of the pandemic in the United States in March and April 2020 most affected large cities on the coasts, where Democratic voting is more common. Although those areas are likely far from herd immunity, it is not surprising that other areas of the country would have rising case counts later in the pandemic. Case counts in some "blue states" hard-hit in the early pandemic were still elevated in early June, and as such would be labeled as "case counts decreasing" because of the way the variable is defined here.

Also, dichotomization of the voting and case count variables also might lose some information. Presumably, the political orientations of counties that voted Republican +9% are very different than those that voted Democratic +40% in the 2016 presidential election. Additional analyses considering these as continuous variables or considering different categorizations would be interesting. As the authors discuss, unmeasured confounding is always a potential source of bias in this type of analysis. As such, reviewing literature on voting patterns and including other types of sociodemographic characteristics in regression models known to be associated with voting would be illustrative. As they stand now, these results should be viewed as important but only hypothesis-generating with much more to learn about political culture of communities and the spread of SARS-CoV-2.

Despite these residual uncertainties, one thing seems clear. We need understand better why this pandemic has clobbered the United States. The United States has had the

highest number of cases and deaths, and the seventh-highest per capita death rate from Covid-19 in the world[13], despite massive resources and a large, expensive health care system. Social mistrust, deep political polarization, inadequate public health infrastructure, health care disparities, misinformation from senior officials, and different federal and local approaches to disease control all may have contributed. We need to better understand why so many American lives have been lost. As this work from Mourad et al. reminds us, because this pandemic has been so cataclysmic and politized, political and social factors may play a role in disease spread. In a politicized pandemic and a polarized country, we must look at political and social factors alongside biological ones.

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