## Title

Discrepancies in Estimating Excess Death by Political Party Affiliation During the COVID-19 Pandemic



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Lastly, trading low value use of antibiotics for low value use of oseltamivir (or any antiviral) ought not to be our goal. Instead, for the healthy patient, clinicians could opt for an adult viral prescription such as that provided by Choosing Wisely Canada[4]—advising rest, hand hygiene, hydration, and pyrexia control—given that most cases will self resolve.

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## Discrepancies in Estimating Excess Death by Political Party Affiliation During the COVID-19 Pandemic

**To the Editor** A study by Wallace et al, "Excess Death Rates for Republican and Democratic Registered Voters in Florida and Ohio During the COVID-19 Pandemic,"[1] makes important contributions at the intersection of the fields of political science, public health, and medicine. With the increase in the power of conservative ideologues within Republican party politics,[2] understanding the public health implications of political science variables is a worthy goal. However, conceptual conflation inherent in the authors' measurement of political party affiliation[1] may confound their state-level results.

Using pooled data from Florida and Ohio, the authors[1] found a 7.7-percentage point greater rate of excess deaths among Republicans than Democrats during the COVID-19 pandemic in the period after vaccinations became universally available. Yet, Florida had much smaller differences than Ohio.

This discrepancy in state-level excess death rates may exist because political party affiliation conflates 2 conceptually distinct variables: ideology and partisanship. Partisanship indicates which political party individuals support, while ideology represents the universe of philosophical constraints underpinning a person's political world view.[3] In the 20th century, these concepts were empirically distinct in US politics—although Democrats tended to be more liberal than Republicans, both parties had substantial numbers of liberal and conservative voters.

Ideologically conservative White voters who dominated Southern states coexisted uneasily alongside urban liberal and Black voters in the Democratic party's New Deal coalition. Passage of the 1960s Civil Rights legislation began sorting parties by ideology: conservative Democrats began voting for Republicans and liberal Republicans for Democrats.[4] The election of the first Black president, Barrack Obama, accelerated this trend.

However, party registration lags voting patterns. In Florida, Republicans have controlled all branches of state government since 1999, but Democrats retained an overall edge in partisan registration until 2021.[5]

The authors used distinct measures across states to operationalize political party affiliation,[1] which exacerbates the conflation of partisanship and ideology. For Ohio, they included individuals who voted in a party's primary election, suggesting ideological alignment with that party. In Florida, however, they selected individuals registered as a party member, including conservative Democrats who supported Republicans in general elections but had not switched their party membership.

This bias from using Florida registration data instead of voting data means the authors' analyses[1] would understate the true difference in Republican excess deaths. Researchers must be cognizant of variation in how states report political party affiliation when attempting to extend this study's important results.[1]

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**To the Editor** Wallace et al[1] claim excess mortality among Republican- vs Democratic-affiliated voters. We see 5 limitations.

First, a stated motivation for this study was avoidance of the "ecological fallacy,"[1] which plagues prior work. Yet, the authors' use of county-level vaccination rates—and not individual vaccination status—reintroduces this limitation.

Second, the authors' analysis is of approximately 500 000 of approximately 31 million combined residents of these states,[1] or approximately 2%. This introduces the problem that differences in excess mortality may represent network effects—or patterns of spread in specific communities—and not fundamental differences in modifiable health outcomes by political preference.

Third, the authors rely on a 57% probability of correctly matching names to these records (eMethods in the Supplement[1]). This is only marginally better than a coin flip.

Fourth, it is unclear whether age is adjusted for as a continuous variable or binned. It appears that voters aged 25 to 64 years were analyzed in a single bin (Figure 3[1]), as were voters aged 65 to 74 years. Yet the risks to a 25- vs a 64-year-old, or a 65- vs a 74-year-old, are substantively different. Can the authors reanalyze with age as a continuous variable?

Fifth, the authors select April 1, 2021, as the date when vaccination was offered to all; but Figure 2B[1] shows Democratic voters have greater excess mortality from the onset of the COVID-19 pandemic to October 2020—then, Republicans have excess mortality from that moment until the end of follow-up. The authors do not know the median date of vaccination. The use of their time point creates the illusion that excess mortality before vaccine availability is balanced, when in fact it is a mixed period with excess mortality in 1 group and then in the other.

Ultimately, the analysis has been widely used to claim that Republicans experienced greater excess mortality because they were more reluctant to receive the COVID-19 vaccine. The specific analysis does not further this claim due to the deficits we outlined. Prior work was limited by ecological fallacy, and this work is limited by the 5 errors noted.

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**Editorial Note:** The corresponding author of the original article was shown this letter and declined to reply on behalf of the authors.

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**In Reply** A letter from O'Mahen provides valuable context and commentary on our article, "Excess Death Rates for Republican and Democratic Registered Voters in Florida and Ohio During the COVID-19 Pandemic."[1]

Distinguishing ideology from partisanship is an important, yet challenging objective for researchers studying the effects of political alignment in public health. O'Mahen raises a critical point regarding the difference in measurement methods for political party affiliation across the 2 states we studied. Specifically, O'Mahen argues that our use of registration data to identify political party affiliation, which is measured using registered affiliation in Florida and participation in the primary election in Ohio, could result in an underestimation of the true difference in Republican excess deaths in Florida.

We concur with this observation and the suggestion that this methodologic limitation—a feature of how party affiliation is recorded by states themselves and reflected in the voter registration data that we used—may lead our results to underestimate the true difference in excess deaths during the study period. Voter party registration choice, which may not capture current ideological leanings as accurately as primary voting behavior does, may dilute estimates of the association of political ideology with health in our context. Considering the implications of state-by-state heterogeneity in voter records is an issue common to research in political science and other disciplines that study party identification.[2]

O'Mahen also underscores the need for future research in this area. With the increased polarization of public health and medicine within the US[3-5] and elsewhere, it is critical to understand how partisanship and ideology interact with health. Within the US, for example, O'Mahen points to the value of a national study of the association between political party affiliation and excess death rates during the COVID-19 pandemic to assess the generalizability of our findings and to better understand the role of state-specific differences in how party affiliation is recorded in analyses, such as those we reported in our article.[1]

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## Electrocardiogram Recording in the Prone Position

**To the Editor** When patients are prone, it is common to perform an electrocardiogram (ECG) by placing the precordial electrodes on the patient's back, which transposes the usual location of the precordial electrodes to the dorsum (anatomical mirror). The case reported by Zhang et al[1] shows that a substantial anterior ST elevation can go unnoticed in the ECG recorded this way. In another article, based on a case series of 100 patients, Chieng et al[2] demonstrated the limited diagnostic capacity of the ECG obtained in this way, and specifically, showed this method is "unreliable for the detection of anterior myocardial injury."

Based on the concept of the mirror image electrocardiogram,[3] we have proposed an alternative system for recording ECG in patients in the prone position.[4] According to the dipole theory, for each precordial point, there exists a corresponding point on the back (antipodal point). At this antipodal point, it is possible to obtain an identical ECG, albeit with opposite polarity and lower voltage. These antipodal points are located along an approximately straight path, extending from the left scapular line at the fifth intercostal level (corresponding to mirror $V_1$) to the right anterior axillary fold at the second intercostal level (equivalent to mirror $V_6$).

Zhang et al[1] recommend reviewing the diagnostic criteria for acute ST-segment elevation myocardial infarction in the ECGs obtained from these patients. We propose the recording of precordial leads by positioning electrodes not on anatomical mirrors, but on electrical mirrors, and suggest recording with a calibration of 20 mm per mV.[4] Each precordial lead obtained in this manner closely resembles its corresponding lead, albeit inverted, and may hold important diagnostic value.

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**In Reply** We would like to express our gratitude to Cobos Gil et al for their thought-provoking and insightful comments on our case report,[1] which discussed how anterior leads ST-segment elevation might be missed on the findings of an electrocardiogram (ECG) recorded in the commonly used prone position. Their comments addressed a new prone ECG acquisition method based on the concept of the mirror image electrocardiogram reported by Kors and van Herpen.[2] The ECG acquired by this method shows morphologic findings similar to those of the standard ECG, which makes the diagnosis of arrhythmias (eg, bundle-branch block) more convenient. The comments also mention that this prone ECG acquisition method may have important diagnostic value in anterior ST-segment elevated myocardial infarction (STEMI).

However, this method of acquiring an ECG recording in the prone position is associated with higher impedance due to the distance between the electrodes and the heart; therefore, the ECG amplitudes are lower. Taking the example of the ECG used in the study by Cobos Gil et al,[3] we measured the amplitude of precordial leads and calculated the proportion by which it is decreased due to increased impedance. After conversion, the amplitudes of QRS complexes of $V_1$ through $V_6$ account for 59%, 27%, 21%, 23%, 26%, and 40% of the supine ECG results. However, the commonly used method of prone ECG acquisition also leads to a decrease in the amplitude of ECG waveforms. According to the findings of our case report[1] and those of Chieng et al,[4] the amplitudes in the precordial leads of prone ECG are approximately 70% to 75% of the supine counterparts, which may be better than the new method.

Therefore, even if there is a substantial ST-segment deviation in precordial leads, the amplitude of the new prone ECG deviation is relatively smaller, particularly in leads $V_2$ through $V_4$. Besides, during the process of ECG acquisition, issues such as power frequency interference and baseline wander can produce low-amplitude interference waves.[5] In addition, the uncomfortable prone position may induce postural tremor, which may introduce additional artifacts in the ECG recording.[6] Consequently, these ST-segment deviations may be mistaken for interferences and artifacts because of their naturally low amplitudes. These could go unnoticed by physicians, potentially compromising the diagnostic precision of this acquisition method for myocardial ischemia and STEMI. Therefore, the new method may have a higher probability of overlooking the possibilities of diagnosing acute myocardial infarction or ischemia.

Moreover, another challenge in the clinical application of this new method is the placement of electrodes. Due to the absence of appropriate surface markers, there is a risk of electrode misplacement during clinical use, which may affect the interpretation of the ECG findings.

We strongly agree that the commonly used prone ECG acquisition method has several limitations, such as low amplitude, substantial differences between its morphologic findings and those of the standard supine position, difficulties in