The Harvard Center for Population and Development Studies

Working Paper Series

Politicians, power, and the people's health: US elections and state health outcomes, 2012–2024

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September 12, 2024

HCPDS Working Paper Volume 24, Number 1

Title

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Submitted: September 12, 2024

ABSTRACT

Our descriptive study examined current associations (2022-2024) between four US state-level political metrics (political ideology based on voting records of US House and Senate members; US state political party control; state policies enacted; and voter political lean) and eight health state-level outcomes spanning the lifecourse: infant mortality; premature mortality; health insurance (adults aged 35-64); vaccination for children and persons aged ≥65 (flu; COVID-19 booster); maternity care deserts; and food insecurity; for the first three outcomes, we also examined trends in associations (2012-2024). For all political metrics, higher state-level political conservatism was associated with worse health outcomes. For example, comparing states with Republican vs. Democratic trifectas, current premature mortality rates (2022-2024) were worse (-25.5 deaths per 100,000 person-years, 95% confidence interval [CI] -46.2, -4.4) as was percent uninsured (-2.8, 95% CI -4.9, -0.6), with conservative states' worse health outcomes evident in every presidential election year. Additionally, the sharp rise of premature mortality rates in 2018-2021 started at higher levels and was greater in more conservative vs. more liberal states. These results can inform health professionals, policymakers, elected officials, civil society groups, and the broader electorate, especially in an election year.

Keywords: childhood vaccination; COVID-19 boosters; electoral politics; health insurance; infant mortality; flu vaccination; food insecurity; maternity care deserts; political polarization; political conservatism; political determinants of health; political liberalism; population health; poverty; premature mortality; state policies; state trifecta.

TEASER TEXT

To date, most US research on political determinants of health has focused on analyzing health impacts of proposed or enacted legislation or voter political lean (which neglects how voting is affected by both gerrymandering and voter suppression). We expand the focus by including two political metrics pertaining to elected officials' political ideology (based on voting records) and partisan concentrations of political governance. Our state-level analyses focus on eight current health outcomes (2022-2024) that span the lifecourse: infant mortality; premature mortality; health insurance (adults aged 35-64); vaccination for children and persons aged ≥65 (flu; COVID-19 booster); maternity care deserts; and food insecurity; for the first three outcomes, we also examined trends over time (2012-2024). Across all political metrics, higher state-level political conservatism was associated with: (1) worse health outcomes in the current period, and (2) higher the burdens of both premature mortality and percent of adults ages 35-64 lacking health insurance in every presidential election year. Additionally, the sharp post-2018 rise of premature mortality rates that extended through 2021 started at higher levels and was greater in the more conservative vs. more liberal states. This quantitative descriptive evidence offers important insights into how elections matter for population health.

LAY SUMMARY

Our descriptive study examined current associations (2022-2024) between four different types of state-level political measures and eight different state-level health outcomes. The political measures were: political ideology of elected representatives, based on US House and Senate members' voting records; US state political party control; state policies enacted; and voter political lean. The health outcomes were: infant mortality; premature mortality; health insurance (adults aged 35-64); vaccination for children and persons aged ≥65 (flu; COVID-19 booster); maternity care deserts; and food insecurity. For the first three outcomes, we also examined trends in associations (2012-2024). Overall, higher state-level political conservatism was associated with worse health outcomes. For example, comparing states with Republican vs. Democratic trifectas, current premature mortality rates (2022-2024) were worse (-25.5 deaths per 100,000 person-years, 95% confidence interval [CI] -46.2, -4.4) as was percent uninsured (-2.8, 95% CI -4.9, -0.6), with conservative states' worse health outcomes evident in every presidential election year. Additionally, the sharp rise of premature mortality rates in 2018-2021 started at higher levels and was greater in the more conservative vs. more liberal states. These descriptive results point to how politicians, political ideology, power, and elections can matter for people's health.

Introduction

Elections are crucial to democratic governance, with results shaping political priorities, policies, programs, resources, and population health.[1-6] At issue is who is elected, with what political agendas, both individually and part of political party affiliations and governing coalitions. Such statements might seem to be truisms, yet US research on the political determinants of health has focused primarily on policies proposed or enacted and voter political lean, not the elected officials and parties who enact the policies.[1,2,7-12]

Since 2020, a new wave of research has turned attention to the health impacts of political polarization and partisanship on government and individual responses to the COVID-19 pandemic.[2,13-19] In the US, this work chiefly has focused on voters' political lean and COVID-19 outcomes,[15,20-23] with a few such studies also examining overall mortality rates[23,24]; in these studies, more voter support for conservative or right-leaning politics typically was associated with worse health. A handful of studies have also analyzed the impact of the party affiliations of state governors on the timing and content of state's COVID-19 policies regarding population mobility, evictions, and masking,[25,26] people's response to these policies and to governor's recommendations,[13] and COVID-19 mortality[17]; as with voter lean, Governors' conservative opposition to public health regulations was associated with worse COVID-19 outcomes.[13,17,25,26]

To our knowledge, only one US study, focused on COVID-19 outcomes, jointly included exposure data on the political ideology of US Congressional representatives (House and Senate), based on their voting records, the presence of state trifectas (Governor, State House, and State Senate under the same political party control), and voter political lean.[27] This study found that, during a time period when vaccines were available (April 2021-March 2022), higher exposure to conservatism was associated with higher COVID-19 age-standardized mortality rates, even after taking into account the Congressional districts' social characteristics; similar patterns occurred for stress on hospital intensive care unit capacity for Republican trifectas and US Senator political ideology scores.[27] The only other population health

study to our knowledge including data on state trifectas found they were associated with the types of obesity-related health policies enacted between 2009-2015.[28]

Considering voting records of elected representatives and partisan concentrations of power adds several insights to studies on political determinants of health that are limited to voter political lean. First, only 66% and 46% of US eligible voters voted in, respectively, the 2020 presidential election and the 2022 mid-term elections[29]; persons least likely to vote typically are concentrated among politically, socially, and economically marginalized sectors of society, with such marginalization also associated with higher risk of poor health.[1,2,4,29-31] Second, factors such as voter suppression and gerrymandering (which occurs when legislators manipulate boundaries to give unfair advantage to population groups deemed likely to elect them, while diminishing the votes of others) [4,32-34] also affect the likelihood of voter views' translating to policies ultimately passed by governments. Considering relationships between population health profiles, politicians' political ideologies, and partisan concentrations of political power thus warrants attention.

In the US, one of 60 countries holding elections in 2024,[35-37] the outcomes of the November 5, 2024 elections will determine who is President, which party controls the US House and Senate, and the expansion, reversal, or continuation of state trifectas.[38] Focusing on the time period 2012-2024, our descriptive study examines relationships between diverse state-level political metrics and health outcomes, with the aim of generating information useful to the health professionals, policymakers, elected officials, civil society groups, and the broader electorate. Our *a priori* hypothesis is that more conservative politics – that is, politics that prioritize the private sector and cultural traditionalism over government programs, policies, and regulations that prioritize social equity and collective goods[1-10,33] – are associated both with poorer current public health outcomes and worse trends in population health improvements over time.

Data and Methods

Study design

Our repeated cross-sectional descriptive population-based study included US state-level data for all 50 US states plus the District of Columbia (DC); due to unavailable data for both health outcomes as well as most of the political metrics, we did not include US territories.[39,40] Current analyses (2022-2024) focused on eight public health outcomes that span the lifecourse and are quickly responsive to contemporaneous exposures (**Table 1**), of which three had data available for trend analyses for 2012-2024, a time period that spans the past three and current presidential election years (2012, 2016, 2020, and 2024). Attesting to their public health salience, all outcomes, except one (vaccination for the newly emergent disease COVID-19) were designated as either "leading health indicators" or "objectives" in one or both of the US Department of Health and Human Services agenda-setting initiatives *Healthy People 2020* and *Healthy People 2030*.[41,42]

Variables

Our study included three types of annual state-level variables: (a) political metrics; (b) health outcomes; and (c) socioeconomic covariates. Details on how to access these data and how to construct the variables employed respectively are in **Supplemental Table S1** and **Supplemental Textbox S1**.

State-level political metrics

The four state-level political metrics we use are complementary and measure: (1) political ideology based on Congressional representatives' roll-call votes; (2) political party concentrations of power in state government; (3) policies enacted by state legislators; and (4) states' voter political lean in national elections.

▪ Political ideology: DW-Nominate (2012-2024). We employed data on the first dimension of the DW-Nominate scale, which measures political ideology based on roll-call votes (especially regarding the economy and government regulation) of every member of the US Congress, using data spanning from the 112th through 118th Congress.[43] Given the variable number of US House representatives by US state (current median: 6; average: 8.7; range: 1-52) and also 2 US senators per state,[44] we generated annual state-level measures of DW-Nominate political polarization, based on tercile cut-points for the full study

period (2012-2024), using the Index of Concentration at the Extremes (ICE).[45-49] We scored the ICE to range from -1 (most conservative) to 1 (most liberal).

▪ Political party concentrations of power (2012-2024). For each time period under consideration (as demarcated in **Tables 1 and 2**), we assessed each state's annual trifecta status (i.e., state Governor and legislature controlled by the same political party)[50] and categorized states in relation to whether they were: (1) consistently a Republican trifecta; (2) consistently a Democratic trifecta; or (3) "mixed" (neither consistently a Republican or Democratic trifecta).

▪ State Liberalism Index (2012-2020). This metric, developed by Caughey and Warshaw, assigns scores derived from "a dynamic latent-variable model" based initially on "data on 148 [social and economic] policies collected over eight decades (1936–2014)" and extended to 2020.[51,52] We coded this metric as ranging from -1 (most conservative) to 1 (most liberal).

▪ Voter political lean (2022). The Cook Partisan Voting Index (PVI) uses people's votes to quantify "how partisan a district or state is compared to the nation as a whole."[53] This variable is available at the state level only for 2022, and its range was from R+25 to D+43,[54] which we coded as ranging from -25 (most Republican) to 43 (most Democratic).

State-level public health outcomes

▪ Infant mortality rates (2012-2024). We obtained the annual infant mortality rate data (deaths per 1000 live births), a critical public health outcome,[55-57] from CDC WONDER[58] for January 1, 2012-May 31, 2024.

▪ Premature mortality rates (2012-2024). We generated data on premature mortality (death before age 65, also a critical public health indicator[59-64]) using annual age-specific mortality data from CDC WONDER[58] for January 1, 2012-May 31, 2024, and age-standardized the rates (deaths per 100,000 person-years) via direct standardization using the Year 2000 Standard Million.[65]

▪ Health insurance (2012-2022). We accessed annual 1-year state-level estimates for the percentage of adults aged 35 to 64 lacking health insurance using US Census American Community

Survey data for January 1, 2012 through December 31, 2022.[66] This age group is ineligible for programs directed to children or adults aged ≥65,[61,69] and is the sole age bracket for working age adults consistently available for 2012-2022.[66]

▪ Childhood immunization (2022). We obtained state-level data on the percentage of children aged 24 months who had completed the series of seven recommended shots, critical for protecting against serious childhood and adult infectious diseases.[70-73] The data are from the CDC's ChildVaxView website,[71] for the time period January 1, 2022 through December 31, 2022.

▪ Older adult flu vaccination (2022). We obtained state-level data on the percentage of US adults aged ≥65 who reported receiving a seasonal flu vaccine, critical for protecting against serious flu complications,[74-76] during the past 12 months (January 1-December 31, 2022).[77]

▪ Older adult COVID-19 booster uptake (2023-2024). We obtained state-level data from CDC's CovidVaxView on the percentage of adults aged ≥65 who received a 2023-2024 COVID-19 vaccine dose, important for reducing high risk of hospitalization for COVID-19 in this age group,[78] between September 24, 2023-May 25, 2024, among those already vaccinated with ≥1 dose.[79]

▪ Food insecurity (2020-2022). We obtained US Department of Agriculture state-level data on food insecurity,[80] which can adversely affect health across the lifecourse,[81-84] for 2020-2022 (3-year estimate).[85]

▪ Maternity care deserts (2021-2022). We obtained data on the percent of women aged 15-44 in each state living in counties categorized as maternity care deserts[86-88] from America Health Rankings for 2021-2022 (2-year estimates).[89]

State-level socioeconomic covariates

We included data on poverty among children (<aged 18) and adults aged ≥65 (2012-2022), given poverty's well-documented contributions to health inequities,[90-92] its rapid responsiveness to fiscal policy changes,[93-96] and the numerous US safety programs using the federal poverty level to determine eligibility.[91,97-99] We employed state-level data, spanning January 1, 2012-December 31, 2022, using the 1-year American Community Survey estimates.[66]

Statistical Analysis

We first tabulated the distribution of each of the political, health, and poverty metrics (**Table 1**), across four time periods demarcated by the past three and current presidential election years (2012, 2016, 2020, and 2024), and mapped each state's value for the current period (2022-2024) (**Figure 1**). All analyses used the observed data, given no missing data for any variables; analyses using DW-Nominate and state trifecta data, however, excluded DC, since they are not applicable to DC's governance structure (**Table 1**). Correlations among the study variables are provided in **Supplemental Figure S1**.

We then used linear regression to quantify the current (2022-2024) cross-sectional standardized associations[101,102] between the state-level political exposures and health outcomes, overall and adjusted for the poverty variables (**Table 2; Supplemental Table S2**). Sensitivity analyses weighted for state population size[103,104] (**Supplemental Table S3**), and supplemental analyses stratified by racialized groups for infant mortality and premature mortality rates (**Supplemental Table S4**).

For the trend analyses (2012-2024), we first plotted the annual data for the selected health outcomes stratified by states grouped by level of political conservatism (**Figure 2**). Next, we conducted joinpoint analyses,[105-107] using these same state groupings, to identify key inflection points in the temporal trends (**Table 3**). We then fit spline regression models, using state-level random effects to account for possible unobserved heterogeneity between states, and adjusting for the poverty variables, to: (a) test for the significance of these joinpoints; (b) estimate the slope between the identified joinpoints; and (c) estimate the absolute difference in health outcomes, comparing the bottom and middle categories to the top category for each political metric, for each presidential election year.

We conducted all statistical analyses other than the joinpoint analyses[108] in R (version 4.3.3)[109]; information on how to access the analytic code is provided in **Supplemental Table S1**.

Ethics approval

No Institutional Review Board approval was required, because the study involved secondary analysis of publicly available de-identified data (Harvard Longwood Campus IRB decision tool, July 20, 2024).

Results

State political and health profiles

Table 1 provides data on the distribution of the state-level political metrics, health outcomes, and poverty metrics for the current period (2022-2024) and over time (2012-2024). Current values are mapped in **Figure 1**, which displays the geographic patterning of these measures. Similar patterns of state heterogeneity are evident for the political metrics, health outcomes, and poverty levels in each time period (**Table 1; Figure 1**).

Current cross-sectional analyses

Table 2 presents the standardized regression coefficients (for change in the health outcome associated with one standard deviation change in the political exposure variable) for the current period (2022-2024), adjusted for the poverty metrics; **Supplemental Table S2** presents the unadjusted and adjusted results. For all outcomes and all political metrics, higher exposure to state conservatism was associated with poorer health outcomes, even after adjusting for poverty, which attenuated estimates (**Table 2, Supplemental Table S2**). Sensitivity analyses weighted for state population size yielded similar results (**Supplemental Table S3**).

Overall, the largest gaps for worse outcomes were as follows, with negative estimates indicating lower values (i.e., better health outcomes) for states with lower political conservatism (**Table 2**): (a) *infant mortality*: Democratic vs. Republican trifecta (-0.94 infant deaths per 1000 live births, 95% CI -1.57, -0.30); (b) *premature mortality*: US House DW-Nominate ICE score (-8.87 deaths per 100,000 person-years, 95% CI -17.53, -0.20); (c) *percent uninsured*: Democratic vs. Republican trifecta (-2.76%, 95% CI -4.90, -0.61); (d) *maternity care desert*: Democratic vs. Republican trifecta (-6.21%, 95% CI -9.31, -3.11); and (e) *household food insecurity*: US Senate DW-Nominate ICE score (-0.56%, 95% CI -0.90, -0.21). In supplemental analyses for infant and premature mortality, the same patterns held for the white non-Hispanic population; however, among the Black non-Hispanic and Hispanic populations, the associations

were not significant (with wide 95% CI indicating low precision of estimates due to smaller population size; see **Supplemental Table S4**).

For health outcomes where a higher value is a better health outcome, the largest gaps were as follows (**Table 2**), with positive estimates indicating better outcomes in states with lower political conservatism: (a) *childhood vaccination*: US House DW-Nominate ICE Score (+2.78%, 95% 1.06, 4.49); (b) *flu vaccination among adults aged ≥65*: Democratic vs. Republican trifecta (+4.35%, 95% CI 1.36, 7.34); and (c) *COVID-19 booster among adults aged ≥65*: Democratic vs. Republican trifecta (+5.95%, 95% CI 2.77, 9.13).

Trend analyses

Figure 2 displays temporal trends, by year, in state-level health outcomes (and 95% CI) stratified by states grouped by their level of political conservatism; for virtually all outcomes, the extreme groups (e.g., comparing the top and bottom tercile, or Republican vs. Democratic trifecta) and their 95% CI do not overlap, with states in the most conservative stratum consistently having worse health than those in the most liberal stratum. **Supplemental Figure S2** shows these results by state within each tercile or trifecta grouping.

Table 3 presents data stratified by the political metrics and adjusted for the poverty variables, for: (1) the slope for the rate of change of the state-level health outcomes and the temporal inflection points, and (2) the rate differences across the political metrics in each presidential election year. Differences in baseline values and in trends, comparing states in the most conservative vs. liberal strata for each political metric, were most apparent for premature mortality and for percent of persons lacking health insurance; no consistent patterns were evident for infant mortality.

For premature mortality, the sharp rise in premature mortality in 2018-2021 was greatest in the states in the most conservative political strata for all four political metrics, with this steep rise compounding already higher baseline rates (**Table 3**). Contrasts in these slopes, comparing states in the most conservative vs. most liberal strata, were similar across political metrics for deaths per 100,000 person-years: (a) for *state liberalism index*: 29.0 (95% CI 25.6, 32.4) vs. 17.6 (95% CI 14.9, 20.3); (b) for

state trifecta: 27.0 (95% CI 24.4, 29.7) vs. 17.7 (95% CI 12.8, 22.7); (c) for *US House DW-Nominate Index*: 24.0 (95% CI 20.3, 27.6) vs. 15.6 (95% 12.7, 18.6); and (d) for *US Senate DW-Nominate Index*: 27.5 (95% CI 24.7, 30.3) vs. 14.8 (95% CI 11.4, 18.1). These slopes built on the 2016 absolute rate difference (per 100,000 person-years), between the more conservative vs. more liberal states, of: (a) for *state liberalism index*: 78.6 (95% 51.1, 106.2); (b) for *state trifecta*: 55.4 (95% CI 7.7, 103.1); (c) for *US House DW-Nominate Index*: 48.3 (95% CI 9.8, 86.7); and (d) for *US Senate DW-Nominate Index*: 60.7 (95% CI 24.3, 97.0). These absolute gaps persisted in 2024 for: (a) *state liberalism index*: 102.0 (95% CI 72.2, 131.8); (b) *state trifecta*: 52.8 (95% CI 3.7, 101.9); (c) *US House DW-Nominate Index*: 43.1 (95% CI 3.5, 82.7); and (d) *US Senate DW-Nominate Index*: 51.4 (95% CI 14.1, 88.8).

For percent of persons lacking health insurance (adults ages 35-64), for all political metrics, the point estimate for the slope for the rate of decline after 2015 was consistently lower in states in the more conservative vs. liberal strata (albeit with overlapping 95% CI). Moreover, the percentage of those without health insurance was consistently higher in the states in the more conservative vs. more liberal strata in every presidential election year; the lowest absolute difference equaled 4.4% (95% CI 1.2, 7.5), for the US House DW-Nominate Index in 2022 and the highest absolute difference equaled 7.2% (95% 2.5, 11.8), for state trifecta in 2020.

Discussion

The central finding of these descriptive analyses is that US states with more conservative political metrics had worse health profiles compared to those with more liberal political metrics. These relationships held across: (a) political metrics spanning the political process: political ideology based on US House and US Senate voting records; state-level concentrations of political power (trifecta); enacted state-level policies; and voter political lean, and (b) outcomes spanning the lifecourse from infancy to old age, with the selected outcomes chosen because they are quickly responsive to contemporaneous exposures (i.e., have short etiologic periods). Burdens of both premature mortality and percent of adults aged 35-64 lacking health insurance were consistently higher in more conservative vs. more liberal states in every presidential election year, and the sharp post-2018 rise of premature mortality rates extending

through 2021 started at higher levels and was greater in the more conservative vs. more liberal states. Together, these findings suggest that elections, political priorities, and concentrations of political power matter for population health.

Before interpreting study results, it is important to consider both study limitations and study strengths. First, as noted above, our state-level study is a correlational, not causal, analysis. The descriptive results do not represent causal estimates, since other state-level factors could be associated with the political metrics and confound the observed associations. Second, adjusting for poverty is likely overcontrol, since poverty arguably could be on the causal pathway between the political metrics and the health outcomes; supporting this view, adjusting for poverty attenuated estimates of the associations between the political metrics and health outcomes (**Supplemental Table S2**). Third, we were unable to analyze the health outcomes stratified by poverty, education or other socioeconomic metrics, due to lack of publicly accessible state-level health data for these metrics; similar data limitations precluded stratifying analyses by racialized groups, except for infant and premature mortality (**Supplemental Table S4**). Due to our focus on outcomes with short etiologic periods, we did not test for lagged associations, even as current and past political exposures might jointly affect state health profiles.

Among our study's strengths, we employed political metrics that capture the effects of both federal and state political power, via: (1) employing data on US Congressional representatives' political ideologies based on their voting records, including our innovative use of the ICE metric to quantify the extent of political polarization among representatives within states, and (2) data on state political concentrations of power (trifectas). We also used data on voter political lean (the metric most typically used in recent analyses of political polarization and health status[1,2,15-23]), without relying solely on this variable, since more than just voter views shape who is elected and the policies they enact; voter marginalization (e.g., by voter suppression and gerrymandering), results in some social groups having more voice than others. [1,2,4,32-34] We also employed an index of state policy liberalism,[51,52] one that captures domains of policy relevant to structural racism,[1,4,16,33,49] and did so without relying solely on this variable, recognizing that it is elected representatives who enact the policies at issue; we thus bring into

view those who pass the policies, in contrast to the conventional focus on the policies enacted.[1-3,5,8-12,110,111] Considered together, the consistency of findings across political metrics, health outcomes, and over time, lends support to the hypothesis that who is elected, the power they wield, and their incumbency matters for population health.

The observed relationship between greater state conservatism and poorer state health profiles could reflect causal pathways and also diverse biases, e.g., shared common causes,[112,113] selection bias[113(p. 396)] and conditioning on a shared effect.[112(p. 463)] For example, individuals could move to states that they view as having politics – and politicians – more compatible with their political views. Two lines of evidence suggest such moves would not lead to worse health in conservative states: (1) people who change their state of residence typically are more affluent than those who do not move[114,115] and thus likely to have better health[116,117]; and (2) if people move to states to obtain more social welfare benefits (e.g., because they have worse health or lack health insurance[116,117]), this would presumably imply moving to more liberal states.[2-4,7,8] Additionally, a shared common cause, such as states' past histories of structural racialized, economic, and political inequality (e.g., past histories of Jim Crow) – whereby such history leads to both contemporary greater conservatism and poorer health among states' residents – would bolster the hypothesis that conservatism adversely affects population health.[6,8,33,60] Future research could thus reasonably pursue investigating the causal basis of the descriptive associations we report.

Also supporting the hypothesis that political context shapes population health are results of the repeated cross-sectional trend analyses. For example, in the case of the percent of adults aged 35-64 who lack health insurance, the finding that the key inflection point in 2015 had tighter confidence intervals for the more liberal vs. more conservative states, along with the persistence of higher proportions of uninsurance in every presidential election year in the more conservative vs. more liberal states, is consistent with the 2013-2014 policy changes regarding Medicaid expansion and the subsequent state dynamics of adoption of Medicaid expansion.[118] The results for the higher and greater acceleration in premature mortality during the first years of the COVID-19 pandemic in more conservative vs. more liberal states is also consistent with prior US research on political conservatism and COVID-19 policies

and mortality and likely reflect the political as well as epidemiological dynamics of the onset of the COVID-19 pandemic.[2,3,8,13-18,20-27] Use of joinpoint analysis notably allowed for considering rates of change in relation to baseline rates, since both matter for appraising population health burdens and health inequities.[60,119] Relevant to short etiologic period, the bulk of premature deaths (before age 65) during the study time period were primarily due to external causes and, since 2020, COVID-19, not chronic diseases.[120,121]

Conclusion

In summary, our descriptive study provides timely and novel insights into consistent patterns of relationships between state-level conservatism – as measured by elected officials' political ideology (based on voting records), partisan concentrations of political governance, policies enacted, and voter political lean – and a wide range of US state-level population health outcomes for the time period 2012-2024. In our view, these results comprise the "bodily evidence that links the 'body natural' to the 'body politic'"[122(p. 10)] and can usefully inform health professionals, policymakers, elected officials, civil society groups, and the broader electorate, especially in election years,[35-37] about ways in which elections can matter for population health.[1-6,27,60,122] Our results suggest current levels and trajectories of health outcomes are shaped by political contexts, which are themselves changeable by elections, and point to opportunities for changing the magnitude of current gaps, by political metrics, in states' health status.[1,2,14,27,110,119,122] Our results additionally suggest that analyses concerned with political determinants of health are incomplete if they focus solely on voter political lean or state policies enacted, without also including data on the politicians, their votes, and partisan concentrations of power.

ACKNOWLEDGMENTS AND FUNDING

Funding: Soroush Moallef is supported by a Canadian Institutes of Health Research (CIHR) Doctoral Award (FRN # 193216). CIHR played no role in the writing of the manuscript or the decision to submit it for publication.

LIST OF TABLES AND FIGURES

SUPPLEMENTAL TABLES AND FIGURES

Table 1. Distribution of state-level variables: political exposures, health outcomes, and covariates, for 50 US states and the District of Columbia, current (2022-2024) for all variables, and by periods demarcated by US presidential election years for selected health outcomes (2012-2024)

Variable	Time Period												
	Current period[a]				Demarcated by US presidential election years								
					2012-2015			2016-2019			2020-2023		
	Year(s)	Mean (SD)	Median	Min Max IQR	Mean (SD)	Median	Min Max IQR	Mean (SD)	Median	Min Max IQR	Mean (SD)	Median	Min Max IQR
Political exposures[b]													
DW-nominate ICE score: US House of Representatives	2022-2024	-0.082 (0.54)	-0.214	-1 1 0.89	-0.058 (0.49)	-0.073	-1 1 0.63	-0.054 (0.50)	-0.093	-1 1 0.67	-0.064 (0.53)	-0.134	-1 1 0.90
DW-nominate ICE score: US Senate	2022-2024	-0.021 (0.80)	0	-1 1 2.00	0.046 (0.69)	0	-1 1 1.00	-0.036 (0.74)	0	-1 1 1.50	-0.030 (0.78)	0	-1 1 2.00
Cook PVI	2022	-2.65 (12.45)	-3.00	-25 43 17.5	--	--	--	--	--	--	--	--	--
State liberalism Index	2020	0.127 (1.79)	-0.119	-2.93 3.61 3.32	0.001 (1.43)	-0.099	-2.57 2.85 2.61	0.041 (1.67)	-0.166	-2.95 3.48 2.88	0.127 (1.79)	-0.119	-2.93 3.61 3.32
State trifecta	2022-2024												
% Democratic trifecta		32.0 (2.8)	34.0	28 34 6	21.5 (4.6)	23.0	14 26 7	17.5 (6.2)	15.0	12 28 9	30.5 (2.2)	30.0	28 34 3
% Republican trifecta		45.3 (0.9)	46.0	44 46 2	48.0 (1.4)	48.0	46 50 2	48.0 (3.2)	48.0	44 52 6	44.5 (1.6)	45.0	42 46 3
% “mixed”		22.7 (3.0)	22.0	20 26 6	30.5 (5.8)	29.0	26 38 9	34.5 (4.8)	35.0	28 40 9	25.0 (2.2)	25.0	22 28 4
Health outcomes[c]													
Infant mortality: deaths per 1000 live births	2022-2024	5.91 (1.37)	5.85	2.65 9.58 1.90	6.11 (1.22)	6.11	4.10 9.60 1.86	5.90 (1.20)	5.89	2.80 9.03 1.81	5.62 (1.26)	5.69	2.77 9.39 1.92
Premature mortality rate (age-adjusted death rate for persons under age 65 per 100,000 person-years)	2022-2024	247.86 (18.85)	245.7	230.2 267.7 18.8	222.00 (2.54)	221.35	219.8 225.5 2.7	230.63 (1.31)	230.60	229.4 231.9 2.1	272.15 (23.22)	270.4	245.70 302.10 18.2
% adults without health insurance (ages 35-64)	2022	9.04 (3.44)	8.44	2.74 19.67 5.17	13.72 (5.12)	13.54	3.09 25.84 7.04	9.97 (3.86)	9.65	3.03 21.61 5.87	9.58 (3.70)	8.97	2.74 21.54 5.21
Childhood immunization: % children 24 months who have completed the 7 series	2022	68.89 (6.8)	69.70	55.10 79.90 11.80	--	--	--	--	--	--	--	--	--
Flu vaccinations: % adults aged ≥65 vaccinated	2022	68.33 (4.81)	67.80	57.50 76.6 7.40	--	--	--	--	--	--	--	--	--

COVID-19 vaccination: % adults aged ≥65 who received a COVID-19 booster	2023-2024	34.01 (9.37)	33.16	14.13 62.64 12.73	--	--	--	--	--	--	--	--	--
Food insecurity: % of households	2020-2022	10.81 (2.23)	10.60	6.20 16.60 2.20	--	--	--	--	--	--	--	--	--
Maternity care deserts: % of female population aged 15-44 living in a county designated as being a maternity care desert	2021-2022	4.75 (5.51)	2.80	0 20.70 6.65	--	--	--	--	--	--	--	--	--
Covariates													
% of children below poverty (persons < age 18)[d]	2022	15.59 (4.21)	15	7 26 5	20.50 (5.11)	20	10 35 9	17.3 (4.85)	17	7 30 7	15.94 (4.34)	15	7 28 5.75
% of elderly adults below poverty (persons aged ≥65)	2022	10.58 (1.89)	10.20	7.50 15.90 2.55	8.93 (2.00)	8.50	4.30 17.50 2.52	8.91 (1.85)	8.60	4.20 16.70 2.33	9.95 (1.84)	9.60	6.55 15.90 2.30

Missing data: no variables had missing data; the political metrics for DW-Nominate and state trifecta, however, exclude DC because they are not applicable to its governance structure

Abbreviations: IQR = interquartile range; Min = minimum value; Max = maximum value; NA = not available

[a] "Current Period (2022-2024)" data includes the most recent data available, as follows: for DW-Nominate, 2022-2024; for Cook PVI, 2022; for State liberalism index, 2020; for State trifecta, 2022-2024; for infant mortality rates, 2022-2024; for premature mortality rates, 2022-2024; for % adults without health insurance, 2022; for childhood immunization, 2022; for flu vaccinations among adults ≥65, 2022; for COVID-19 vaccinations among adults ≥65, 2023-2024; for food insecurity, 2020-2022; for maternity care deserts, 2021-2022; for child and elderly poverty, 2022.

[b] For the political exposures on a continuous scale, lower values are more conservative, and higher values are more liberal. The values for the DW-Nominate metric for each time period employed the following data: 2012-2015 = Congress 112, 113, 114 scores; 2016-2019 = Congress 114, 115, 116 scores; 2020-2023 = Congress 116, 117 scores; and 2022-2024 = Congress 117, 118 scores. The DW-Nominate ICE metric ranges from -1 to 1, as does the state liberalism index, while the Cook PVI is the percentage points the state is more R or D compared to the national average.

[c] For the health outcomes, we obtained trend data (2012-2024) only for infant mortality, premature mortality, and percent without health insurance

[d] The source of the child poverty data provided only whole numbers (i.e., no digits after the decimal point)

Table 2. Cross-sectional standardized associations of the state-level current political exposures with the current health outcomes, adjusted for child and elderly poverty, for 50 US states and the District of Columbia, 2022-2024

Variable	Political exposure: standardized effect estimate (95% confidence interval) and p-value (for different from 0)											
Health outcomes	Cook PVI	P-value	State liberalism index	P-value	State trifecta				DW-nominate: US House	P-value	DW-nominate: US Senate	P-value
					D vs R	P-value	Mixed vs R	P-value				
Infant mortality: deaths per 1000 live births	-0.32 (-0.62, -0.02)	*	-0.56 (-0.84, -0.29)	***	-0.94 (-1.57, -0.30)	**	-0.24 (-0.83, 0.35)	‡	-0.43 (-0.68, -0.18)	***	-0.46 (-0.72, -0.21)	***
Premature mortality rate (age-adjusted death rate for persons under age 65 per 100,000 persons)	-10.53 (-20.21, -0.84)	*	-12.42 (-22.18, -2.65)	*	-25.49 (-46.62, -4.35)	*	-13.00 (-32.46, 6.47)	‡	-8.87 (-17.53, -0.20)	*	-10.83 (-19.65, -2.02)	*
% adults without health insurance (ages 35-64)	-1.54 (-2.51, -0.58)	**	-1.96 (-2.89, -1.02)	***	-2.76 (-4.90, -0.61)	*	-2.33 (-4.31, -0.36)	*	-1.05 (-1.94, -0.16)	*	-1.53 (-2.41, -0.66)	***
Childhood immunization: % children 24 months who have received full set of vaccines	2.35 (0.38, 4.32)	*	2.60 (0.60, 4.61)	*	3.06 (-1.56, 7.67)	‡	-0.07 (-4.32, 4.18)	‡	2.78 (1.06, 4.49)	**	2.70 (0.95, 4.46)	**
Flu vaccinations: % adults aged ≥65 vaccinated	2.85 (1.60, 4.09)	***	2.44 (1.08, 3.81)	***	4.35 (1.36, 7.34)	**	3.23 (0.47, 5.98)	*	1.71 (0.48, 2.95)	**	1.86 (0.59, 3.13)	**
COVID-19 vaccination: % adults aged ≥65 vaccinated who received booster	3.72 (2.39, 5.05)	***	3.73 (2.35, 5.12)	***	5.95 (2.77, 9.13)	***	4.03 (1.10, 6.96)	**	2.62 (1.35, 3.88)	***	3.26 (1.99, 4.52)	***
Food insecurity: % of households	-0.39 (-0.79, 0.01)	‡	-0.37 (-0.78, 0.05)	‡	-0.68 (-1.58, 0.23)	‡	-0.68 (-1.51, 0.15)	‡	-0.22 (-0.59, 0.15)	‡	-0.56 (-0.90, -0.21)	**
Maternity care deserts: % of female population aged 15-44 living in counties designated as a maternity care desert	-4.75 (-4.87, -2.43)	***	-2.93 (-4.36, -1.51)	***	-6.21 (-9.31, -3.11)	***	-3.43 (-6.29, -0.57)	*	-3.17 (-4.29, -2.05)	***	-2.24 (-3.58, -0.89)	**

p-value: * = 0.01 to <0.05 ** = 0.001 to <0.01; *** = <0.001 ; ‡ = >0.05

Note: for the current analyses, we include the most recent data available, as follows: for DW-Nominate, 2022-2024; for Cook PVI, 2022; for State liberalism index, 2020; for State trifecta, 2022-2024; for infant mortality rates, 2022-2024; for premature mortality rates, 2022-2024; for % adults without health insurance, 2022; for childhood immunization, 2022; for flu vaccinations among adults ≥65, 2022; for COVID-19 vaccinations among adults ≥65, 2023-2024; for food insecurity, 2020-2022; for maternity care deserts, 2021-2022; for child and elderly poverty, 2022.

Table 3. Baseline rates, joinpoint regression analysis of trends in health outcomes stratified by state-level political metrics, and rate differences, adjusted for poverty, for 50 US states and the District of Columbia (2012-2024)*

Health outcome	Political metric		Baseline health outcome (2012)*: value (95% CI)		Inflection points (year, 95 % CI) and slope* (95% CI)				Comparison of absolute rate differences during presidential election years, adjusted for poverty*			
			Interval 1		Interval 2		Interval 3		2012	2016	2020	2024
			Estimate	Slope	Inflection point	Slope	Inflection point	Slope	Rate difference (95% CI)	Rate difference (95% CI)	Rate difference (95% CI)	Rate difference (95% CI)
Premature mortality rate (age-adjusted death rate for persons under age 65 per 100,000 persons)	State liberalism index	Most liberal: Consistently in top tercile	135.9 (107.4, 164.3)	**2.8 (1.3, 4.4)**	2018 (2015, 2018)	**17. 6 (14. 9, 20.3)**	2021 (2021, 2022)	**-19.4 (-22.6, -16.3)**	[referent]	[referent]	[referent]	[referent]
		Not consistently in either top or bottom tercile	172.3 (146.4, 198.2)	**2.9 (1. 6, 4.2)**	2018 (2015, 2018)	**21.8 (19.4, 24.2)**	2021 (2021, 2022)	**-26.2 (-28.8, -23.5)**	**36.4 (11.9, 61.0)**	**36.5 (12.6, 60.5)**	**104.0 (79.9, 128.1)**	29.1 (-15.7, 73.9)
		Most conservative: Consistently in bottom tercile	175.9 (142. 9, 208.8)	**12.5 (11.4, 13.6)**	2018 (2015, 2018)	**29.0 (25.6, 32.4)**	2021 (2021, 2022)	**-29.5 (-32.9, -26.2)**	**40.0 (12.0, 68.1)**	**78.6 (51.1, 106.2)**	**120.8 (91.9, 149.8)**	**102.0 (72.2, 131.8)**
	State trifecta	Consistently Democratic	173.7 (126.3, 221.1)	1.5 (-1.1, 4.1)	2018 (2016, 2018)	**17.7 (12.8, 22.7)**	2021 (2021, 2021)	**-19.8 (-25.6, -14.0)**	[referent]	[referent]	[referent]	[referent]
		Mixed	195.6 (168.3, 222.9)	**2.2 (1.1, 3.4)**	2018 (2015, 2018)	**21.9 (19.9, 23.9)**	2021 (2021, 2022)	**-22.7 (-24.9, -20.5)**	21.9 (-23.8, 67.7)	24.9 (-20.1, 69.8)	**99.5 (54.4, 144.7)**	30.1 (-53.3, 113.5)
		Consistently Republican	229.5 (196.0, 263.0)	1.4 (-0.1, 2.9)	2018 (2015, 2018)	**27.0 (24.4, 29.7)**	2021 (2021, 2022)	**-29.9 (-32.9, -26.9)**	**55.8 (7.7, 103.1)**	**55.4 (7.7, 103.1)**	**73.8 (26.0, 121.6)**	**52.8 (3.7, 101.9)**
	US House: DW-Nominate index	Most liberal: Consistently in top tercile	161.3 (128.8, 193.9)	1.5 (-0.5, 3.5)	2018 (2015, 2018)	**15.6 (12.7, 18.6)**	2021 (2021, 2022)	**-16.6 (-20.0, -13.1)**	[referent]	[referent]	[referent]	[referent]
		Not consistently in either top or bottom tercile	213.0 (185.2, 240.7)	**1.9 (0.8, 3.0)**	2018 (2015, 2018)	**26.0 (24.0, 28.0)**	2021 (2021, 2022)	**-28.6 (-30.8, -26.4)**	**51.6 (22.3, 80.9)**	**49.6 (20.8, 78.5)**	**122.2 (93.3, 161.2)**	43.5 (-7.3, 94.4)
		Most conservative: Consistently in bottom tercile	213.2 (174.5, 251.8)	**2.4 (0.8, 4.0)**	2018 (2015, 2018)	**24.0 (20.3, 27.6)**	2021 (2021, 2022)	**-26.0 (-30.2, -21.9)**	**51.8 (12.7, 91.0)**	**48.3 (9.8, 86.7)**	**63.1 (24.5, 101.7)**	**43.1 (3.5, 82.7)**
	US Senate: DW-Nominate Index	Most liberal: Consistently in top tercile	160.4 (125.6, 195.1)	**2.1 (0.3, 3.4)**	2018 (2015, 2018)	**14.8 (11.4, 18.1)**	2021 (2021, 2022)	**-15.3 (-19.2, -11.3)**	[referent]	[referent]	[referent]	[referent]
		Not consistently in	198.6 (171.2, 226.0)	**2.6 (1.5, 3.8)**	2018 (2015, 2018)	**24.0 (21.9, 26.0)**	2021 (2021, 2022)	**-25.9 (-28.2, -23.6)**	**38.3 (5.2, 71.4)**	**40.5 (8.0, 73.1)**	**110.8 (78.1, 143.5)**	37.2 (-20.5, 95.0)

		either top or bottom tercile										
		Most conservative: Consistently in bottom tercile	225.2 (191.7, 258.7)	1.0 (-0.5, 2.5)	2018 (2015, 2018)	**27.5 (24.7, 30.3)**	2021 (2021, 2022)	**-30.4 (-33.5, -27.2)**	**64.8 (27.9, 101.8)**	**60.7 (24.3, 97.0)**	**84.1 (47.6, 120.5)**	**51.4 (14.1, 88.8)**
Infant mortality: deaths per 1000 live births	State liberalism index	Most liberal: Consistently in top tercile	4.6 (3.9, 5.4)	**0.4 (0.2, 0.5)**	2022 (2014, 2022)	**0.3 (0.1, 0.4)**	-	-	[referent]	[referent]	[referent]	[referent]
		Not consistently in either top or bottom tercile	5.2 (4.4, 5.9)	-0.0 (-0.1, 0.0)	2022 (2015, 2022)	**0.4 (0.2, 0.5)**	-	-	0.5 (-0.0, 1.1)	**0.8 (0.2, 1.3)**	**1.0 (0.4, 1.5)**	**1.6 (0.9, 2.3)**
		Most conservative: Consistently in bottom tercile	6.1 (5.2, 7.0)	**-0.0 (-0.1, -0.0)**	2021 (2014, 2022)	**0.1 (0.0, 0.2)**	-	-	**1.5 (0.8, 2.1)**	**1.6 (1.0, 2.2)**	**1.7 (1.1, 2.3)**	1.6 (-0.5, 3.8)
	State trifecta	Consistently Democratic	5.1 (3.9, 6.3)	**-0.1 (-0.1, -0.0)**	2022 (2014, 2022)	0.2 (-0.2, 0.5)	-	-	[referent]	[referent]	[referent]	[referent]
		Mixed	5.2 (4.4, 6.0)	**-0.1 (-0.1, -0.0)**	2021 (2017, 2022)	0.2 (0.1, 0.3)	-	-	0.1 (-0.9, 1.2)	0.2 (-0.8, 1.2)	0.3 (-0.7, 1.3)	0.6 (-0.5, 1.7)
		Consistently Republican	5.9 (4.9, 7.0)	**0.0 (-0.1, 0.1)**	2016 (2014, 2017)	-0.1 (-0.2, -0.0)	2020 (2019, 2022)	**0.1 (0.0, 0.2)**	0.9 (-0.3, 2.0)	**1.3 (0.2, 2.3)**	**1.2 (0.1, 2.2)**	**1.4 (0.3, 2.6)**
	US House: DW-Nominate index	Most liberal: Consistently in top tercile	4.3 (3.5, 5.2)	**-0.1 (-0.1, -0.0)**	2022 (2014, 2022)	**0.3 (0.1, 0.5)**	-	-	[referent]	[referent]	[referent]	[referent]
		Not consistently in either top or bottom tercile	5.3 (4.5, 6.1)	**-0.1 (-0.1, -0.0)**	2021 (2014, 2022)	**0.1 (0.1, 0.2)**	-	-	**1.0 (0.4, 1.6)**	**1.1 (0.5, 1.7)**	1.2 (-0.7, 3.2)	**1.1 (0.4, 1.8)**
		Most conservative: Consistently in bottom tercile	4.9 (3.9, 5.9)	0.1 (0.0, 0.2)	2016 (2015, 2017)	-0.1 (-0.2, -0.0)	2021 (2019, 2022)	**0.3 (0.1, 0.4)**	0.6 (-0.3, 1.4)	**1.5 (0.7, 2.3)**	**1.4 (0.6, 2.2)**	**1.7 (0.8, 2.6)**
	US Senate: DW-Nominate Index	Most liberal: Consistently in top tercile	4.7 (3.8, 5.6)	**-0.1 (-0.1, -0.0)**	2022 (2014, 2022)	**0.3 (0.0, 0.5)**	-	-	[referent]	[referent]	[referent]	[referent]
		Not consistently in	5.5 (4.7, 6.4)	**-0.1 (-0.1, -0.0)**	2021 (2014, 2022)	**0.2 (0.1, 0.3)**	-	-	**0.8 (0.1, 1.5)**	**0.9 (0.2, 1.6)**	1.0 (-0.6, 2.6)	**1.1 (0.3, 1.9)**

		either top or bottom tercile										
		Most conservative: Consistently in bottom tercile	6.0 (5.0, 7.0)	-0.0 (-0.1, 0.1)	2016 (2014, 2017)	-0.1 (-0.2, 0.0)	2020 (2018, 2022)	0.1 (0.0, 0.2)	**1.2 (0.4, 2.1)**	**1.5 (0.7, 2.3)**	**1.5 (0.7, 2.3)**	**1.6 (0.8, 2.5)**
% lacking health insurance (adults aged 35-64)	State liberalism index	Most liberal: Consistently in top tercile	11.8 (9.4, 14.3)	**-2.0 (-2.2, -1.7)**	2015 (2014, 2016)	0.0 (-0.1, 0.2)	-	-	[referent]	[referent]	[referent]	[referent]
		Not consistently in either top or bottom tercile	14.6 (12.4, 16.9)	**-2.1 (-2.3, -1.9)**	2015 (2014, 2017)	0.0 (-0.1, 0.1)	-	-	**2.8 (0.7, 4.8)**	**2.2 (0.1, 4.2)**	1.6 (-1.2, 4.3)	2.0 (-0.5, 4.6)
		Most conservative: Consistently in bottom tercile	17.2 (14.3, 20.1)	**-1.9 (-2.2, -1.6)**	2015 (2014, 2020)	0.0 (-0.1, 0.1)	-	-	**5.4 (3.0, 7.7)**	**5.7 (3.3, 8.1)**	**6.0 (2.8, 9.1)**	**5.4 (3.0, 7.8)**
	State trifecta	Consistently Democratic	10.8 (7.3, 14.4)	**-2.0 (-2.4, -1.5)**	2015 (2014, 2016)	0.1 (-0.1, 0.3)	-	-	[referent]	[referent]	[referent]	[referent]
		Mixed	13.0 (10.7, 15.2)	**-2.1 (-2.3, -1.9)**	2015 (2014, 2017)	0.0 (-0.1, 0.1)	-	-	2.1 (-1.2, 5.4)	1.7 (-1.6, 5.1)	1.3 (-3.0, 5.7)	1.6 (-2.6, 5.7)
		Consistently Republican	15.6 (12.8, 18.3)	**-1.7 (-1.9, -1.4)**	2015 (2014, 2019)	0.0 (-0.1, 0.2)	-	-	**4.7 (1.2, 8.2)**	**5.9 (2.4, 9.5)**	**7.2 (2.5, 11.8)**	**5.7 (2.1, 9.4)**
	US House: DW-Nominate index	Most liberal: Consistently in top tercile	11.8 (9.1, 14.5)	**-1.7 (-2.1, -1.4)**	2015 (2014, 2016)	0.1 (-0.1, 0.2)	-	-	[referent]	[referent]	[referent]	[referent]
		Not consistently in either top or bottom tercile	14.5 (12.1, 16.9)	**-2.1 (-2.2, -1.9)**	2015 (2014, 2017)	0.0 (-0.0, 0.2)	-	-	**2.7 (0.4, 5.0)**	**2.4 (0.1, 4.7)**	2.2 (-0.8, 5.1)	2.3 (-0.5, 5.1)
		Most conservative: Consistently in bottom tercile	15.2 (12.0, 18.4)	**-2.0 (-2.3, -1.7)**	2015 (2014, 2019)	0.0 (-0.1, 0.2)	-	-	**4.7 (1.6, 7.8)**	**4.6 (1.5, 7.6)**	**5.7 (1.8, 9.7)**	**4.4 (1.2, 7.5)**
	US Senate: DW-Nominate Index	Most liberal: Consistently in top tercile	11.5 (8.8, 14.2)	**-2.0 (-2.3, -1.7)**	2015 (2014, 2016)	0.1 (-0.0, 0.2)	-	-	[referent]	[referent]	[referent]	[referent]
		Not consistently in	14.3 (12.0, 16.6)	**-2.1 (-2.3, -1.7)**	2015 (2014, 2018)	0.0 (-0.0, 0.2)	-	-	**2.7 (0.3, 5.1)**	2.3 (-0.1, 4.7)	1.8 (-1.4, 5.0)	2.0 (-0.9, 5.0)

		either top or bottom tercile										
		Most conservative: Consistently in bottom tercile	17.5 (14.7, 20.2)	**-1.7 (-2.1, -1.4)**	2015 (2014, 2020)	0.0 (-0.1, 0.2)	-	-	**5.9 (3.2, 8.6)**	**5.6 (2.9, 8.4)**	**5.4 (1.8, 8.9)**	**5.3 (2.5, 8.0)**

Abbreviation: CI = confidence interval

* Adjusted for both childhood poverty and poverty among persons aged ≥65; for the rate comparisons, the referent group for the rate difference is most liberal or Democratic trifecta, indicated by a value of [referent] for rate difference; DC is included solely for the state liberalism index analyses; and slopes and rate differences whose 95% CI exclude 0 are **in bold**

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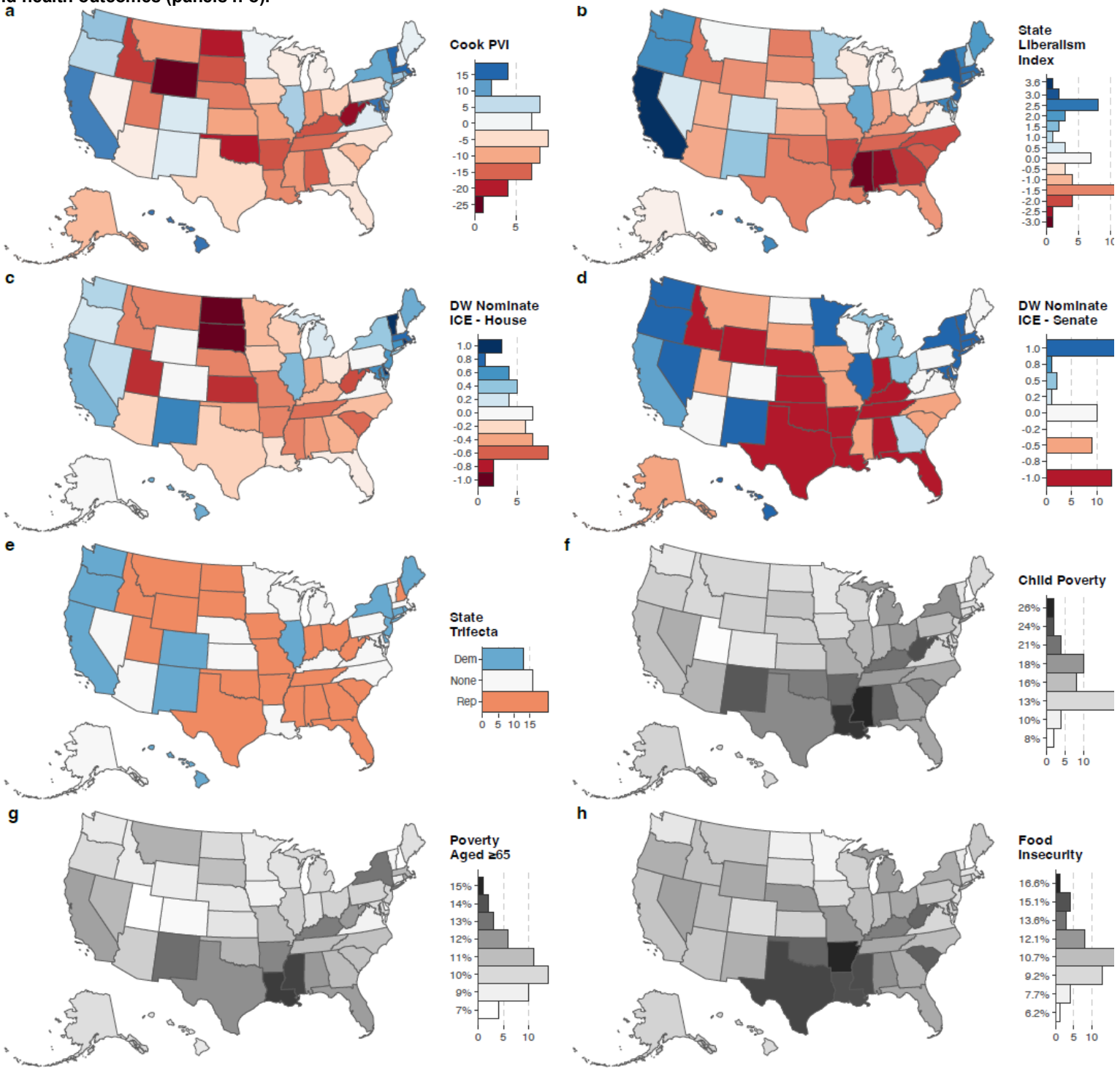
Figure 1. Maps of current state-level data for the political exposures, health outcomes, and covariates (2022-2024): political metrics (panels a-e), poverty (panels f-g), and health outcomes (panels h-o).



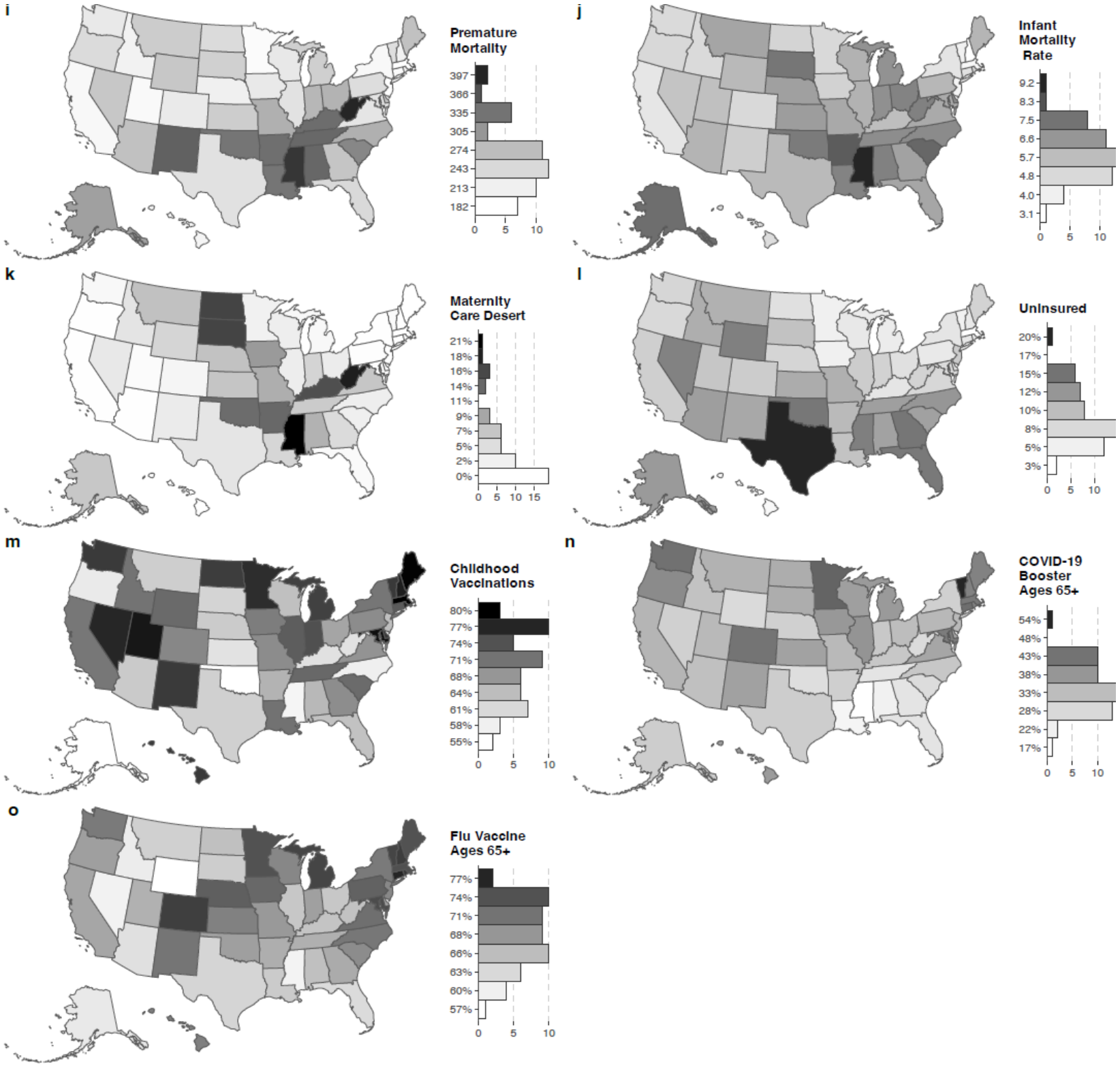
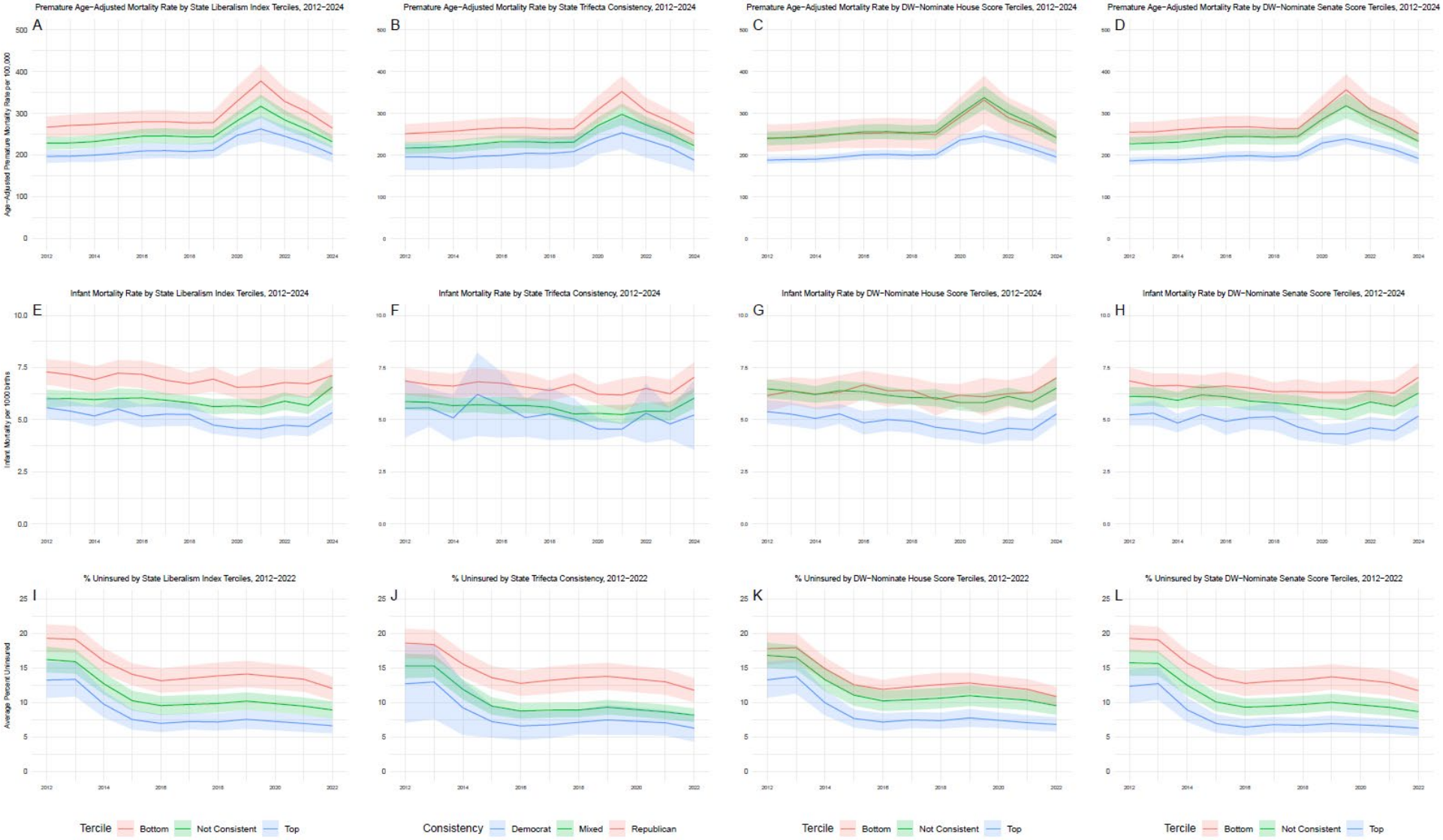

i
Premature Mortality
397
366
335
305
274
243
213
182
0 5 10
j
Infant Mortality Rate
9.2
8.3
7.5
6.6
5.7
4.8
4.0
3.1
0 5 10
k
Maternity Care Desert
21%
18%
16%
14%
11%
9%
7%
5%
2%
0%
0 5 10 15
l
Uninsured
20%
17%
15%
12%
10%
8%
5%
3%
0 5 10
m
Childhood Vaccinations
80%
77%
74%
71%
68%
64%
61%
58%
55%
0 5 10
n
COVID-19 Booster Ages 65+
54%
48%
43%
38%
33%
28%
22%
17%
0 5 10
o
Flu Vaccine Ages 65+
77%
74%
71%
68%
66%
63%
60%
57%
0 5 10

Figure 2. Trends in state-level health outcomes by stratified by state-level political metrics, for the 50 US states and the District of Columbia (2012-2024).



SUPPLEMENTAL TABLES AND FIGURES (September 12, 2024)

Prepared for:

Title: Politicians, power, and the people's health: US elections and state health outcomes, 2012-2024.

Authors: Nancy Krieger, Soroush Moallef, Jarvis T. Chen, Ruchita Balasubramanian, Tori L. Cowger, Rita Hamad, Alecia J. McGregor, William P. Hanage, Loni Philip Tabb, Mary T. Bassett

List of supplemental tables and figures

Textbox S1. Detailed information on generation, coding, and analysis of the study data.

State level political metrics

▪ Political ideology: DW-Nominate (2012-2024). The DW-Nominate metric provides a political ideology score based on the roll-call votes of every member of the US Congress, especially regarding votes on the economy and government regulation.[43] The score is produced by a "scaling procedure" that evaluates the closeness of the legislators' voting records.[43] We employed data on the first dimension of this scale, which we coded as ranging from -1 (most conservative) to 1 (most liberal), using data spanning from the 112th through 118th Congress.

Of note, US states currently range from having 1 to 52 members in the House of Representatives, with a median value of 6 and average value of 8.7, and every US state has 2 senators.[44] To guide our analysis of the DW-Nominate data, we determined that between 2012 and 2024, the DW-Nominate score nationally ranged, within the US House (435 voting representatives annually) from -0.941 to 0.784 (mean: -0.076; SD: 0.46); among Republicans the range was -0.139 to -0.941 (mean: -0.489; SD: 0.15), and among Democrats the range was 0.069 to 0.784 (mean: 0.384; SD: 0.11) (p-value for difference comparing Republican to Democratic score in a two-sample t-test: <0.001), while for the one independent, the score equaled -0.359. During this same time period, in the US Senate (100 voting representatives annually) the DW-Nominate score ranged from -0.968 to 0.751 (mean: -0.077; SD: 0.44); among Republicans, the range was -0.091 to -0.968 (mean: -0.492; SD: 0.17) and among Democrats the range was 0.030 to 0.751 (mean: 0.333; SD: 0.13) (p-value for difference comparing Republican to Democratic scores in a two-sample t-test: <0.001), and for the four independents the range was 0.163 to 0.543 (mean: 0.357; SD: 0.19).

To create an informative annual state level metric that considered the range of scores among the elected officials from each US state, we employed a novel approach, using the Index of Concentration at the Extremes (ICE). The ICE was initially developed by Douglas Massey to measure economic polarization within geographic areas[45]; it can, however, be used with any social groups in a defined population.[46-49] Our innovative use of the ICE enabled us to assess political polarization among state delegations to Congress.

To encompass changes in scores over time (reflecting temporal trends in US political polarization[1-4]), we identified three equal part tercile cut-points based on the overall distribution of the scores across the entire study period (2012-2024) for: (a) the US House (tercile 1: -0.941 to -0.436; tercile 2: -0.435 to 0.326; tercile 3: 0.325 to 0.784) and (b) the US Senate (tercile 1: -0.968 to -0.403; tercile 2: -0.402 to 0.272; tercile 3: 0.273 to 0.751). We then scored the terciles as "most conservative" (C; -1), "middle of the road" (M; 0), and "most liberal" (L; 1). In the US House, the percent of Republicans (R) and Democrats (D) respectively by tercile was: 100% R and 0% D in tercile 1 (C); 58.8% R and 41.2% D in tercile 2 (M); and 0% R and 100% D in tercile 3 (L). In the US Senate, the corresponding percentages were 100% R and 0% D in tercile 1 (C); 51.3% R and 48.7% D in tercile 2 (M); and 0% R and 100% D in tercile 3 (L).

We then calculated the ICE score (range: -1 to 1) for each state for each year, for both the US House and Senate, based on the values of their representatives' terciles. The ICE formula[45-47] is:

$$ICE_i = (A_i - P_i)/T_i$$

where A_i equals the number of representatives in one of the specified extremes within the designated state *i* (here, the top tercile for the DW-nominate score), P_i equals the number of representatives in the other specified extreme in state *i* (here, the bottom tercile for the DW-nominate score) and T_i equals the total number of representatives in state *i* (here, the total number of elected officials with a DW-nominate score). For example, considering the case of 2 US senators per state: if both are C, the score is -1; if one is C and one is M, the score is -0.5; if one is C and one is L, the score is 0; if both are M, the score is 0; if one is L and one is M, the score is 0.5; and if both are L, the score is 1. The 0 score thus equally captures the impact of the two different scenarios of: (a) only "middle" votes, and (b) "extremes" cancelling each other out.

▪ Political party concentrations of power (2012-2024). As defined by Ballotpedia, "trifecta" is "a term to describe single-party government, when one political party holds the governorship and majorities in both chambers of the state legislature in relation to control of the state legislator and Governor."[50] For each time period under consideration (as demarcated in **Tables 1 and 2**), we assessed each state's annual trifecta status[50] and categorized states in relation to

whether they were: (1) consistently a Republican trifecta; (2) consistently a Democratic trifecta; or (3) "mixed" (neither consistently a Republican or Democratic trifecta). This metric is not applicable to Washington, DC.

▪ State Liberalism Index (2012-2020). This metric, developed by Caughey and Warshaw, assigns scores derived from "a dynamic latent-variable model" based initially on "data on 148 policies collected over eight decades (1936–2014)" and extended to 2020.[51,52] Domains of policies included in the model pertain to: abortion, criminal justice, drugs and alcohol, education, the environment, civil rights, gun control, labor, social welfare, and taxation.[51(pp. 902-903)] The premise is that "in a context of American politics … [r]elative to conservatism, liberalism involves greater government regulation and welfare provision to promote equality and protect collective goods, and less government effort to uphold traditional morality and social order at the expense of personal autonomy," while "conservatism places greater emphasis on the values of economic freedom and cultural traditionalism."[51(p.901)] We coded this metric as ranging from -1 (most conservative) to 1 (most liberal).

▪ Voter political lean (2022). The Cook Partisan Voting Index (PVI) uses people's votes to quantify "how partisan a district or state is compared to the nation as a whole."[53] This variable is available at the state level only for 2022[54]; for all other years (back to 1997) it is available solely for US Congressional Districts.[53] For the 2022 data, "[a] Cook PVI score of D+2, for example, means that in the 2016 and 2020 presidential elections, the state or district performed about two points more Democratic in terms of two-party vote share than the nation did as a whole, while a score of R+4 means the state or district performed about four points more Republican."[54] In 2022, the range of the state-level score was from R+25 to D+43,[54] which we coded as ranging from -25 (most Republican) to 43 (most Democratic).

State level public health outcomes

▪ Infant mortality rates (2012-2024). Infant mortality is a critical marker of overall societal health[55] and constitutes a metric long used in US and global analyses of population health and for setting national health objectives.[56,57] We obtained the annual infant mortality rate data (deaths per 1000 live births) for the total population from CDC WONDER[58] for January 1, 2012-May 31, 2024, and conducted supplemental analyses stratified by racialized group for the current period.

▪ Premature mortality rates (2012-2024). Premature mortality is likewise a long-recognized indicator of inequities in both health status and access to health care.[59,60] We set age 65 as the cut-point because it determines eligibility to Medicare and Social Security[61] and because of heightened concerns about rising mortality in US working age adults.[62-64] We obtained the annual age-specific mortality data from CDC WONDER[58] for January 1, 2012-May 31, 2024, and age-adjusted the rates (deaths per 100,000 person-years) using the Year 2000 Standard Million.[65] As per the infant mortality data, we analyzed total population data for 2012-2024, with supplemental analyses stratified by racialized group likewise conducted for the current period.

▪ Health insurance (2012-2022). We accessed annual 1-year state-level estimates for the percent of adults ages 35 to 64 lacking health insurance, using US Census American Community Survey data for January 1, 2012 through December 31, 2022[66]; for 2020, however, we employed the average of the 2019 and 2021 data because, due to COVID-19, no data were released for 2020.[67,68] We focused on ages 35 to 64 because: (a) this age group is not eligible for US government insurance programs targeted to children and to seniors,[61,69] and (b) this was the sole age bracket for working age adults consistently available for 2012-2022.[66]

▪ Childhood immunization (2022). Vaccination of infants and young children is critical to protect against potentially serious childhood and adult infectious diseases.[70-73] We obtained state-level data on the proportion of children aged 24 months who had completed the 7 series of recommended shots listed in the CDC's ChildVaxView website,[71] for the time period January 1, 2022 through December 31, 2022; values can range from 0 to 100%. The combined seven-vaccine series includes: ≥4 doses of diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP); ≥3 doses of poliovirus vaccine; ≥1 dose of measles-containing vaccine; the full series of *Haemophilus influenzae* type b conjugate vaccine (Hib) (≥3 or ≥4 doses, depending on product type); ≥3 doses of hepatitis B vaccine(HepB); ≥1 dose of varicella vaccine (VAR); and ≥4 doses of pneumococcal conjugate vaccine (PCV).[73]

▪ Older adult flu vaccination (2022). Vaccination of adults aged ≥65 against influenza is important, because they are at higher risk of developing serious and potentially lethal flu complications, including respiratory complications, acute myocardial infarction, and ischemic strokes.[74-76] We obtained state-level data

on the percentage of US adults aged ≥65 who reported receiving a seasonal flu vaccine in the past 12 months in 2022 (January 1-December 31)[77]; values can range from 0 to 100%.

▪ Older adult COVID-19 booster uptake (2023-2024). On February 28, 2024, CDC's Advisory Committee on Immunization Practices recommended that all persons aged ≥65 receive 1 additional dose of any updated COVID-19 vaccine (including booster), given high risk of hospitalization for COVID-19 in this age group.[78] We obtained state-level data from CDC's CovidVaxView on the proportion of adults aged ≥65 who received a 2023-2024 COVID-19 vaccine dose between September 24, 2023-May 25, 2024 among those already vaccinated with ≥1 dose[79]; values can range from 0 to 100%.

▪ Food insecurity (2020-2022). The US Department of Agriculture defines "food secure" households as ones in which there is "access by all people at all times to enough food for an active, healthy life,"[80(p. 1)] whereas "food insecure" households are "at times, unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food."[80(p. 8)] Robust evidence indicate that food insecurity can adversely affect health across the lifecourse.[81-84] We obtained US Department of Agriculture state-level data on food insecurity for 2020-2022 (3-year estimate)[85]; values can range from 0 to 100%.

▪ Maternity care deserts (2021-2022). As defined by the US March of Dimes, maternity care deserts comprise counties "in which access to maternity health care services is limited or absent, either through lack of services or barriers to a woman's ability to access that care"[86(p. 1)]; residence in such counties can increases risk of morbidity and mortality among both pregnant persons and newborns.[86-88] We obtained maternity care desert data from America Health Rankings for 2021-2022 (2-year estimate), measuring the percent of "females ages 15-44" in a state that are "living in a county with no birth centers, certified nurse midwives, family practice physicians, obstetricians or hospitals that provide obstetric care"[89]; values can range from 0 to 100%.

State level socioeconomic covariates

We included data on poverty among children and adults aged ≥65 (2012-2022) as covariates for three reasons: (1) impoverishment contributes to excess morbidity and mortality across the lifecourse[90-92]; (2) poverty rates and income levels are temporally responsive to fiscal policy changes[93,94] (as notably illustrated by large rapid reductions in child poverty due to COVID-19 policies and their sharp rise after these policies lapsed[95,96]); and (3) numerous US safety net programs use the federal poverty level to determine eligibility, many with a focus on reducing poverty among children and seniors[91,97,98]; for these reasons, a *Healthy People 2030* objective is to "reduce the proportion of people living in poverty."[99] We employed state-level data, spanning January 1, 2012-December 31, 2022 on: (a) the percent of children <18 who live in families with income below the federal poverty level, derived from analyses of US Census data,[100] and (b) the percent of persons ≥65 living in poverty, using 1-year American Community Survey estimates,[66] noting that for 2020 we employed the average of the 2019 and 2021 values because, due to COVID-19, no data were released for 2020.[67,68] Additionally, because estimates for 2023-2024 are not yet available, we used the 2022 values for these years, which capture the rise in poverty rates following expiration of the COVID-19 pandemic relief programs.[95,96]

Statistical Analysis: additional notes

(1) We employed standardized parameter estimates (unit change in the outcome per 1 standard deviation of the exposure metric) to enable meaningful comparisons of estimate effect sizes across the exposures, given their different scales.[101,102] These analyses are not weighted for state population size, since the focus is on the state-level political metrics as the exposure and states as the unit of analysis.[103,104] Sensitivity analyses accordingly included models which weighted for state population size (**Supplemental Table S3**).

(2) Joinpoint regression utilizes a segmented regression function, which uses a grid search algorithm to identify the most likely inflection points and also employs a permutation test to test the significance of the inflection point (with Bonferroni adjustment).[105-108]

Supplemental Table S1. Resources for study replication: (a) data sources (all public access), and (b) analytic code		
(a) Data Sources		
State-level variable (annual)	**Years of data (used in study)**	**Website**
Political metrics		
-- Cook PVI	2022	https://www.cookpolitical.com/cook-pvi/2022-partisan-voting-index/state-map-and-list
-- State liberalism index	2012-2020	https://www.dropbox.com/t/MRDUHsLpFAzNBDhu
-- DW-nominate	2012-2024	https://voteview.com/about
-- State trifecta	2012-2024	https://ballotpedia.org/State_government_trifectas
Health outcomes		
-- Infant mortality rates	2012-2024	https://wonder.cdc.gov/
-- Premature mortality rates	2012-2024	https://wonder.cdc.gov/
-- % of adults without health insurance (ages 35-65)	2012-2022	https://data2.nhgis.org/main
-- % children 24 months who have completed the 7 vaccine series	2022	https://www.cdc.gov/vaccines/imz-managers/coverage/childvaxview/index.html
-- % adults aged ≥65 vaccinated for the flu	2022	https://www.americashealthrankings.org/explore/measures/flu_vaccine_sr
-- % adults aged ≥65 who received a COVID-19 booster	2023-2024	https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/index.html
-- % of households food insecure	2020-2022	https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/key-statistics-graphics/
-- % of women aged 15-44 living in a county designated as a maternity care desert	2021-2022	https://www.americashealthrankings.org/explore/measures/maternity_care_desert
Socioeconomic covariates		
-- % of children below poverty (persons < age 18)	2012-2022	https://datacenter.aecf.org/data/tables/43-children-in-poverty
-- % of adults aged ≥65 below poverty	2012-2022	https://data.census.gov/table/ACSST1Y2022.S1701?q=poverty&g=010XX00US$0400000
State population estimates (for weighting for sensitivity analyses)	2020-2023	https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-detail.html
(b) Analytic Code		
Analytic code to produce study results included in Tables 1-3 and Figures 1-2		https://github.com/smoallef/Elections-Matter

Supplemental Table S2. Cross-sectional standardized associations of the state-level current political exposures with the current health outcomes, crude and adjusted for poverty, for 50 US states and the District of Columbia, 2022-2024

Variable	Model	Political exposure											
Health outcomes		**Cook PVI**	**P-value**	**State liberalism index**	**P-value**	**State trifecta**				**DW-nominate: US House**	**P-value**	**DW-nominate: US Senate**	**P-value**
						D vs R	**P-value**	**Mixed vs R**	**P-value**				
Infant mortality: deaths per 1000 live births													
Total population	Crude	-0.56 (-0.88, -0.25)	<0.001	-0.82 (-1.08, -0.56)	<0.001	-1.40 (-2.20, -0.60)	<0.001	-0.50 (-1.26, 0.247)	0.183	-0.63 (-0.94, -0.32)	<0.001	-0.69 (-0.98, -0.39)	<0.001
	Adjusted*	-0.32 (-0.62, -0.02)	0.038	-0.56 (-0.84, -0.29)	<0.001	-0.94 (-1.57, -0.30)	0.005	-0.24 (-0.83, 0.35)	0.412	-0.43 (-0.68, -0.18)	<0.001	-0.46 (-0.72, -0.21)	<0.001
Premature mortality rate (age-adjusted death rate for persons under age 65 per 100,000 persons)													
Total population	Crude	-24.68 (-38.6, -10.7)	<0.001	-31.66 (-44.39, -18.93)	<0.001	-52.22 (-88.85, -15.58)	0.006	-28.57 (-63.02, 5.87)	0.101	-20.63 (-35.4, -5.85)	0.007	-24.74 (-38.68, -10.80)	<0.001
	Adjusted*	-10.53 (-20.21, -0.84)	0.033	-12.42 (-22.18, -2.65)	0.014	-25.49 (-46.62, -4.35)	0.019	-13.00 (-32.46, 6.47)	0.186	-8.87 (-17.53, -0.20)	0.045	-10.83 (-19.65, -2.02)	0.017
% adults without health insurance (ages 35-64)	Crude	-1.71 (-2.56, -0.85)	<0.001	-2.12 (-2.89, -1.34)	<0.001	-3.38 (-5.58, -1.17)	0.003	-2.73 (-4.80, -0.66)	0.010	-1.32 (-2.23, -0.42)	0.005	-1.83 (-2.67, -0.99)	<0.001
	Adjusted*	-1.54 (-2.51, -0.58)	0.002	-1.96 (-2.89, -1.02)	<0.001	-2.76 (-4.90, -0.61)	0.013	-2.33 (-4.31, -0.36)	0.022	-1.05 (-1.94, -0.16)	0.022	-1.53 (-2.41, -0.66)	<0.001
Childhood immunization: % children 24 months who have received full set of vaccines	Crude	2.72 (0.92, 4.51)	0.004	3.25 (1.53, 4.97)	<0.001	4.63 (-0.16, 9.42)	0.058	0.91 (-3.59, 5.40)	0.687	3.33 (1.59, 5.08)	<0.001	3.29 (1.58, 5.01)	<0.001
	Adjusted*	2.35 (0.38, 4.32)	0.021	2.60 (0.60, 4.61)	0.011	3.06 (-1.56, 7.67)	0.189	-0.07 (-4.32, 4.18)	0.973	2.78 (1.06, 4.49)	0.002	2.70 (0.95, 4.46)	0.003
Flu vaccinations: % adults aged ≥65 vaccinated	Crude	2.81 (1.69, 3.93)	<0.001	2.68 (1.54, 3.83)	<0.001	5.12 (2.07, 8.18)	0.001	3.74 (0.88, 6.62)	0.011	2.05 (0.80, 3.30)	0.002	2.26 (1.05, 3.48)	<0.001
	Adjusted*	2.85 (1.60, 4.09)	<0.001	2.44 (1.08, 3.81)	<0.001	4.35 (1.36, 7.34)	0.005	3.23 (0.47, 5.98)	0.023	1.71 (0.48, 2.95)	0.007	1.86 (0.59, 3.13)	0.005
COVID-19 vaccination: % adults aged ≥65 vaccinated who received booster	Crude	4.46 (2.92, 6.01)	<0.001	5.06 (3.61, 6.40)	<0.001	8.28 (3.97, 12.59)	<0.001	5.52 (1.46, 9.57)	0.009	3.61 (1.90, 5.32)	<0.001	4.42 (2.86, 5.97)	<0.001
	Adjusted*	3.72 (2.39, 5.05)	<0.001	3.73 (2.35, 5.12)	<0.001	5.95 (2.77, 9.13)	<0.001	4.03 (1.10, 6.96)	0.008	2.62 (1.35, 3.88)	<0.001	3.26 (1.99, 4.52)	<0.001
Food insecurity: % of households	Crude	-0.96 (-1.54, -0.39)	0.002	-1.18 (-1.73, -0.64)	<0.001	-1.74 (-3.28, -0.21)	0.027	-1.32 (-2.76, 0.117)	0.071	-0.69 (-1.31, -0.07)	0.030	-1.10 (-1.66, -0.54)	<0.001
	Adjusted*	-0.39 (-0.79, 0.01)	0.054	-0.37 (-0.78, 0.05)	0.081	-0.68 (-1.58, 0.23)	0.139	-0.68 (-1.51, 0.15)	0.106	-0.22 (-0.59, 0.15)	0.241	-0.56 (-0.90, -0.21)	0.002
Maternity care deserts: % of female population aged 15-44 living in a	Crude	-3.74 (-4.91, -2.58)	<0.001	-3.48 (-4.70, -2.25)	<0.001	-7.44 (-10.76, -4.12)	<0.001	-4.20 (-7.33, -1.07)	0.009	-3.65 (-4.85, -2.44)	<0.001	-2.89 (-4.23, -1.54)	<0.001

county designated as being a maternity care desert													
	Adjusted*	-4.75 (-4.87, -2.43)	<0.001	-2.93 (-4.36, -1.51)	<0.001	-6.21 (-9.31, -3.11)	<0.001	-3.43 (-6.29, -0.57)	0.019	-3.17 (-4.29, -2.05)	<0.001	-2.24 (-3.58, -0.89)	0.002

*** Adjusted for covariates:** % of children below poverty (persons < age 18) in 2022; % of elderly adults below poverty (persons aged ≥65) in 2022

Note: for the current analyses, we include the most recent data available, as follows: for DW-Nominate, 2022-2024; for Cook PVI, 2022; for State liberalism index, 2020; for State trifecta, 2022-2024; for infant mortality rates, 2022-2024; for premature mortality rates, 2022-2024; for % adults without health insurance, 2022; for childhood immunization, 2022; for flu vaccinations among adults ≥65, 2022; for COVID-19 vaccinations among adults ≥65, 2023-2024; for food insecurity, 2020-2022; for maternity care deserts, 2021-2022; for child and elderly poverty, 2022.

Supplemental Table S3. Cross-sectional standardized associations of the state-level current political exposures with the current health outcomes, crude and adjusted for poverty,* weighted by state population size, for 50 US states and the District of Columbia, 2022-2024**

Variable	Model	Political exposure											
Health outcomes		**Cook PVI**	**P-value**	**State liberalism index**	**P-value**	**State trifecta**				**DW-nominate: US House**	**P-value**	**DW-nominate: US Senate**	**P-value**
						D vs R	**P-value**	**Mixed vs R**	**P-value**				
Infant mortality: deaths per 1000 live births													
Total population	Crude	-1.05 (-1.34, -0.76)	<0.001	-0.78 (-0.94, -0.61)	<0.001	-1.76 (-2.32, -1.20)	<0.001	-0.46 (-1.04, 0.12)	0.118	-0.98 (-1.28, -0.68)	<0.001	-0.64 (-0.89, -0.39)	<0.001
	Adjusted*	-0.54 (-0.88, -0.20)	0.003	-0.51 (-0.69, -0.32)	<0.001	-1.04 (-1.49, -0.60)	<0.001	-0.19 (-0.62, 0.25)	0.388	-0.54 (-0.81, -0.27)	<0.001	-0.37 (-0.57, -0.16)	<0.001
Premature mortality rate (age-adjusted death rate for persons under age 65 per 100,000 persons)													
Total population	Crude	-45.86 (-58.10, -33.62)	<0.001	-29.38 (-37.8 8, -20.88)	<0.001	-61.67 (-89.05, -34.30)	<0.001	-21.20 (-49.80, 7.40)	0.143	-37.59 (-51.56, -23.61)	<0.001	-25.01 (-36.31, -13.70)	<0.001
	Adjusted*	-25.22 (-38.86, -11.59)	<0.001	-15.00 (-23.76, -6.24)	0.001	-26.10 (-47.45, -4.72)	0.018	-3.41 (-24.13, 17.30)	0.742	-17.78 (-29.63, -5.93)	0.004	-10.87 (-19.77, -1.98)	0.012
% adults without health insurance (ages 35-64)	Crude	-2.29 (-3.74, -0.84)	0.003	-2.19 (-3.05, -1.33)	<0.001	-5.37 (-7.63, -3.10)	<0.001	-5.49 (-7.85, -3.12)	<0.001	-2.41 (-3.82, -1.01)	<0.001	-2.68 (-3.59, -1.78)	<0.001
	Adjusted*	-2.68 (-4.54, -0.82)	0.006	-2.71 (-3.71, -1.71)	<0.001	-5.27 (-7.73, -2.81)	<0.001	-4.78 (-7.17, -2.30)	<0.001	-2.60 (-4.14, -1.06)	0.001	-2.52 (-3.51, -1.54)	<0.001
Childhood immunization: % children 24 months who have received full set of vaccines	Crude	3.31 (1.40, 5.21)	0.001	2.45 (1.21, 3.68)	<0.001	4.39 (0.72, 8.06)	0.020	2.83 (-1.01, 6.67)	0.144	3.41 (1.55, 5.26)	<0.001	3.07 (1.75, 4.39)	<0.001
	Adjusted*	3.21 (0.72, 5.71)	0.013	2.36 (0.82, 3.90)	0.003	2.83 (-1.12, 6.77)	0.156	1.32 (-2.50, 5.15)	0.490	3.17 (1.09, 5.25)	0.004	2.54 (1.09, 3.99)	<0.001
Flu vaccinations: % adults aged ≥65 vaccinated	Crude	2.07 (0.66, 3.48)	0.005	1.41 (0.48, 2.35)	0.004	3.91 (1.60, 6.21)	0.001	5.26 (2.85, 7.67)	<0.001	1.73 (0.31, 3.15)	0.018	1.86 (0.85, 2.87)	0.001
	Adjusted*	2.44 (0.72, 4.15)	0.006	1.48 (0.39, 2.57)	0.009	3.50 (1.10, 5.90)	0.005	4.27 (1.94, 6.60)	<0.001	1.76 (0.27, 3.24)	0.022	1.47 (0.42, 2.51)	0.007
COVID-19 vaccination: % adults aged ≥65 vaccinated who received booster	Crude	4.04 (2.17, 5.91)	<0.001	2.84 (1.62, 4.06)	<0.001	6.96 (3.68, 10.25)	<0.001	6.57 (3.13, 10.00)	<0.001	3.54 (1.63, 5.44)	<0.001	3.42 (2.11, 4.73)	<0.001
	Adjusted*	3.55 (1.79, 5.32)	<0.001	2.33 (1.23, 3.43)	<0.001	5.00 (2.41, 7.58)	<0.001	3.94 (1.43, 6.45)	0.003	2.95 (1.46, 4.43)	<0.001	2.22 (1.16, 3.29)	<0.001

Food insecurity: % of households	Crude	-1.40 (-2.08, -0.72)	<0.001	-0.98 (-1.43, -0.54)	<0.001	-2.47 (-3.68, -1.27)	<0.001	-2.27 (-3.53, -1.01)	<0.001	-1.15 (-1.85, -0.44)	0.002	-1.23 (-1.70, -0.75)	<0.001
	Adjusted*	-0.71 (-1.34, -0.09)	0.026	-0.52 (-0.90, -0.13)	0.010	-1.35 (-2.23, -0.47)	0.003	-1.23 (-2.08, -0.37)	0.006	-0.58 (-1.11, -0.04)	0.034	-0.68 (-1.02, -0.33)	<0.001
Maternity care deserts: % of female population aged 15-44 living in a county designated as being a maternity care desert	Crude	-3.68 (-4.76, -2.59)	<0.001	-1.98 (-2.81, -1.15)	<0.001	-4.62 (-7.03, -2.23)	<0.001	-2.19 (-4.71, 0.33)	0.087	-3.20 (-4.36, -2.03)	<0.001	-1.94 (-2.92, -0.96)	<0.001
	Adjusted*	-3.34 (-4.81, -1.87)	<0.001	-1.31 (-2.36, -0.26)	0.015	-2.84 (-5.37, -0.32)	0.028	-1.25 (-3.70, 1.20)	0.311	-2.49 (-3.80, -1.17)	<0.001	-1.22 (-2.23, -0.20)	0.020

*** Adjusted for covariates:** % of children below poverty (persons < age 18) in 2022; % of elderly adults below poverty (persons aged ≥65) in 2022

**** Population weights.** Weights were scaled by total population (i.e., normalized each state's population as a proportion of the total US population), and the weights employed were as follows: (1) infant mortality: 2023 population estimates; (2) premature mortality: 2023 population estimates; (3) childhood immunization: 2022 population estimates; (4) flu vaccines: 2022 population estimates; (5) COVID-19 vaccination: 2023 population estimates; (6) food insecurity: average of 2020-2022 population estimates; and (7) maternity care deserts: average of 2021-2022 population estimates. Source of population estimates: US Census Bureau Population and Housing Estimates (https://www.census.gov/programs-surveys/popest.html)

Table S4. Supplemental analyses for infant mortality and premature mortality rates stratified by racialized groups: cross-section standardized associations of the state-level current exposures with the current health outcomes, for the 50 US States and the District of Columbia, 2022-2024.

Variable	Model	Political exposure											
Health outcomes		Cook PVI	P-value	State liberalism index	P-value	State trifecta				DW-nominate: US House	P-value	DW-nominate: US Senate	P-value
						D vs R	P-value	Mixed vs R	P-value				
Infant mortality: deaths per 1000 live births													
Black non-Hispanic	Crude	-1.07 (-2.55, 0.40)	0.150	-1.50 (-2.93, -0.06)	0.041	-2.41 (-6.26, 1.44)	0.231	-1.33 (-4.87, 2.22)	0.456	-2.17 (-3.72, -0.62)	0.007	-1.13 (-2.57, 0.32)	0.123
	Adjusted*	-0.13 (-1.91, 1.65)	0.885	-0.76 (-2.52, 1.00)	0.387	-1.27 (-5.16, 2.62)	0.514	-0.38 (-3.92, 3.16)	0.829	-1.79 (-3.37, -0.20)	0.028	-0.60 (-2.12, 0.91)	0.428
Hispanic	Crude	0.20 (-0.58, 0.99)	0.602	-0.25 (-1.02, 0.52)	0.521	0.33 (-1.62, 2.27)	0.736	1.19 (-0.65, 3.03)	0.198	-0.30 (-1.12, 0.53)	0.474	-0.12 (-0.88, 0.64)	0.750
	Adjusted*	0.42 (-0.56, 1.40)	0.390	-0.30 (-1.28, 0.68)	0.545	0.59 (-1.51, 2.68)	0.575	1.34 (-0.59, 3.26)	0.168	-0.25 (-1.16, 0.65)	0.573	-0.10 (-0.95, 0.75)	0.813
White non-Hispanic	Crude	-0.97 (-1.26, -0.68)	<0.001	-0.79 (-1.05, -0.52)	<0.001	-1.66 (-2.37, 0.95)	<0.001	-0.70 (-1.36, -0.02)	0.041	-0.65 (-0.94, -0.36)	<0.001	-0.77 (-1.03, -0.51)	<0.001
	Adjusted*	-0.86 (-1.17, -0.54)	<0.001	-0.69 (-1.00, -0.38)	<0.001	-1.41 (-2.10, -0.72)	<0.001	-0.55 (-1.19, 0.08)	0.087	-0.54 (-0.83, -0.26)	<0.001	-0.66 (-0.93, -0.39)	<0.001
Premature mortality rate (age-adjusted death rate for persons under age 65 per 100,000 persons)													
Black non-Hispanic	Crude	-21.36 (-45.70, 2.98)	0.084	-27.55 (-51.37, -3.73)	0.024	-47.20 (-108.04, 13.63)	0.125	-5.64 (-62.85, 51.55)	0.843	-21.69 (-45.92, 2.54)	0.078	-24.29 (-48.40, - 0.17)	0.048
	Adjusted	-4.00 (-28.86, 20.86)	0.747	-4.12 (-29.60, 21.39)	0.747	-15.47 (-63.79, 38.16)	0.553	11.82 (-32.97, 60.83)	0.622	-8.05 (-29.14, 13.05)	0.446	-9.00 (-31.80, 13.80)	0.498
Hispanic	Crude	-3.31 (-13.80, 7.18)	0.529	-0.831 (-11.36, 9.70)	0.875	13.81 (-12.24, 39.85)	0.292	3.89 (-20.60, 28.38)	0.751	3.01 (-7.51, 13.53)	0.568	2.58 (-7.92, 13.09)	0.623
	Adjusted*	-0.30 (-12.66, 12.06)	0.961	3.90 (-8.73, 16.52)	0.538	18.12 (-8.76, 45.12)	0.181	6.59 (-18.23, 31.40)	0.596	4.76 (-6.21, 15.74)	0.387	5.74 (-5.53, 17.01)	0.311
White non-Hispanic	Crude	-36.16 (-49.00, - 23.32)	<0.001	-34.73 (-47.90, -21.57)	<0.001	-53.63 (-88.53, -18.74)	0.003	-33.55 (-66.36, -0.73)	0.045	-17.35 (-31.94, -2.77)	0.021	-28.27 (-42.66, -13.88)	<0.001
	Adjusted*	-19.62 (-29.85, -9.40)	<0.001	-13.50 (-24.28, -1.61)	<0.001	-28.98 (-50.85, -7.12)	0.010	-19.31 (-39.44, 0.83)	0.060	-6.17 (-15.53, 3.19)	0.191	-13.09 (-23.20, -2.97)	0.012

* **Adjusted for covariates:** % of children below poverty (persons < age 18); % of elderly adults below poverty (persons aged ≥65)

Note: we focused these sensitivity analyses on the 3 largest racialized groups (white non-Hispanic, Black non-Hispanic, Hispanic), and we restricted these analyses to the current period only (2022-2024) given major changes in 2020 in the categorization of racialized groups for the mortality data (with data available solely for "single race," but no longer for "bridged race," groups).[58] For these analyses, we excluded data from states whose county-level counts were suppressed or unreliable, due to small population size (<10 and 10-20 deaths, respectively), for the Black non-Hispanic population (affecting 9 states for infant mortality in 2022, 11 states in 2023, and 14 states in 2024; and 4 states for premature mortality in 2024), the Hispanic population (affecting 10 states and D.C. for infant mortality in 2022, 6 states for infant mortality in 2023, and 10 states and D.C. for infant mortality in 2024; and 1 state for premature mortality in 2024), and for the white non-Hispanic population (affecting 2 states and D.C for infant mortality in 2022, 1 state and D.C. in 2023, and 4 states and D.C. in 2024).

During the 2022-2024 time period, the overall infant mortality rates (deaths per 1000 live births; mean (SD)) by racialized groups was as follows: Black non-Hispanic: 11.06 (4.22); Hispanic: 5.72 (2.06); and white non-Hispanic: 4.62 (1.28). The corresponding premature mortality rates (deaths aged ≥65 per 100,000 person-years, age-standardized using the Year 2000 standard million; mean (SD)) were: Black non-Hispanic: 386.0 (92.97); Hispanic: 187.52 (39.50); and white non-Hispanic: 243.60 (61.40).

Figure S1. Correlations among the political metrics, health outcomes, and poverty variables, 50 US States and the District of Columbia, 2012-2024.

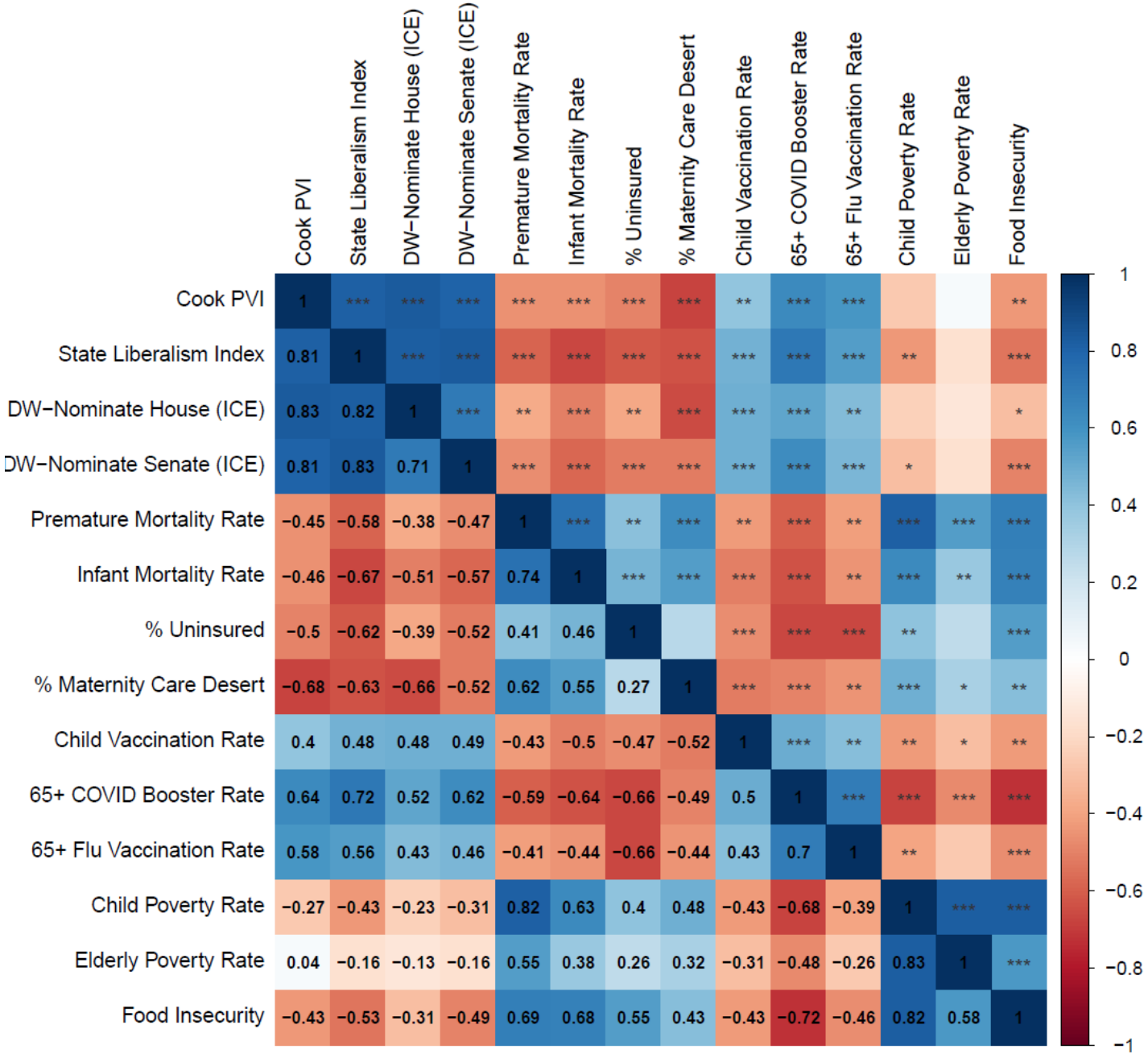
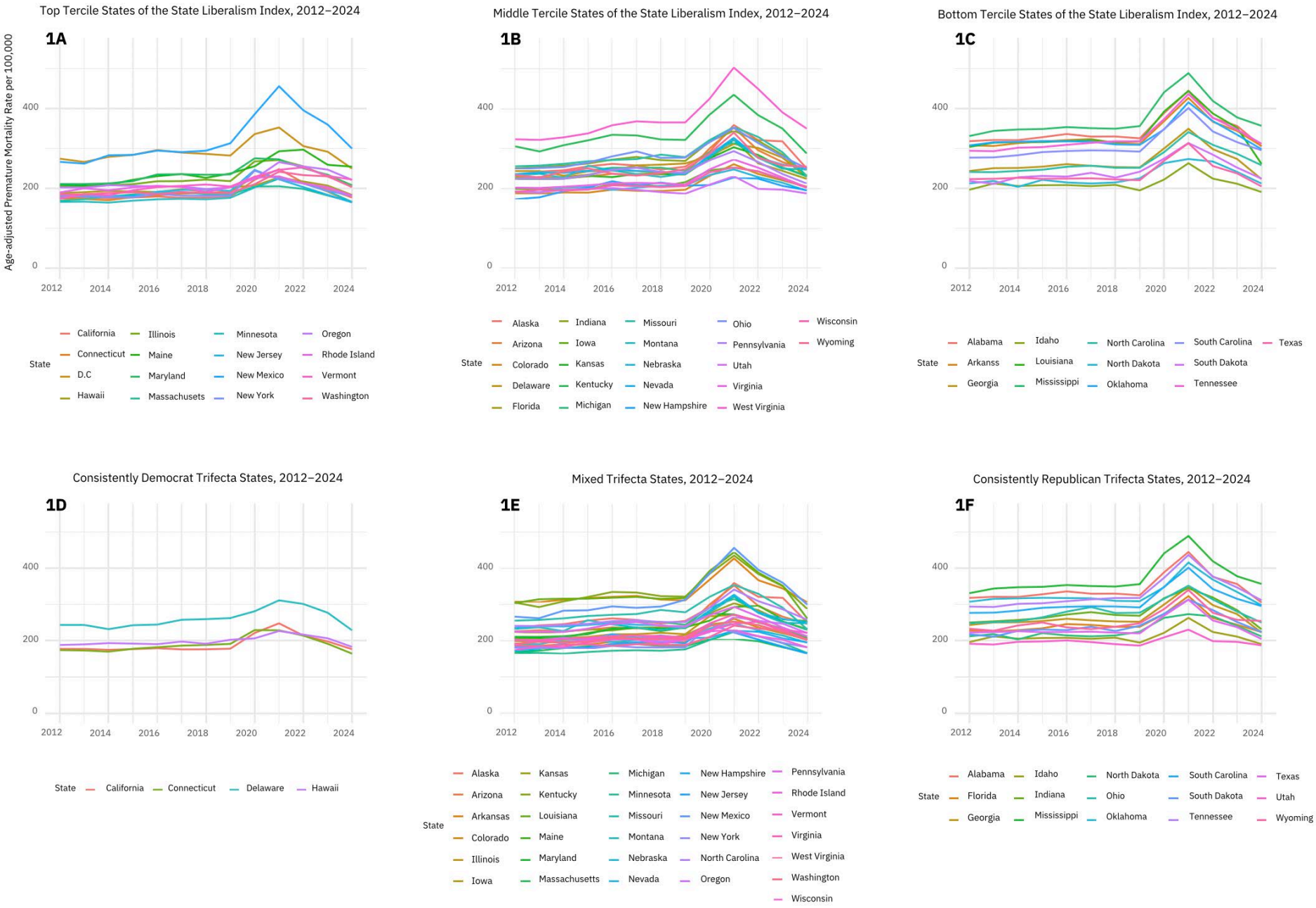


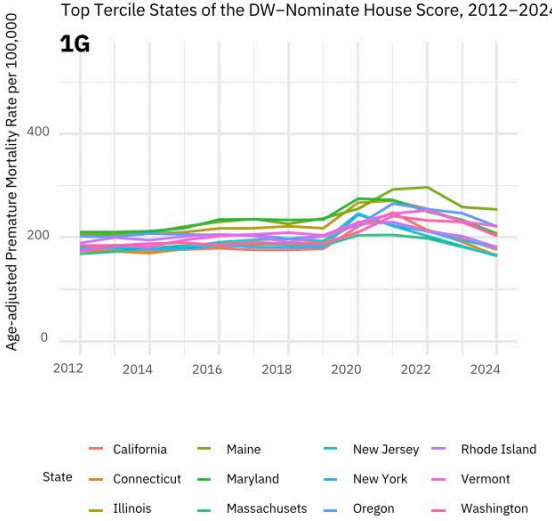
Figure S2. Trends in state-level health outcomes, by state, by stratified by state-level political metrics, for the 50 US states and the District of Columbia (2012-2024): premature mortality (1A-1L); infant mortality (2A-2L); and percent uninsured (3A-3L).

Premature mortality rates (age-standardized per 100,000): panels 1A-1L



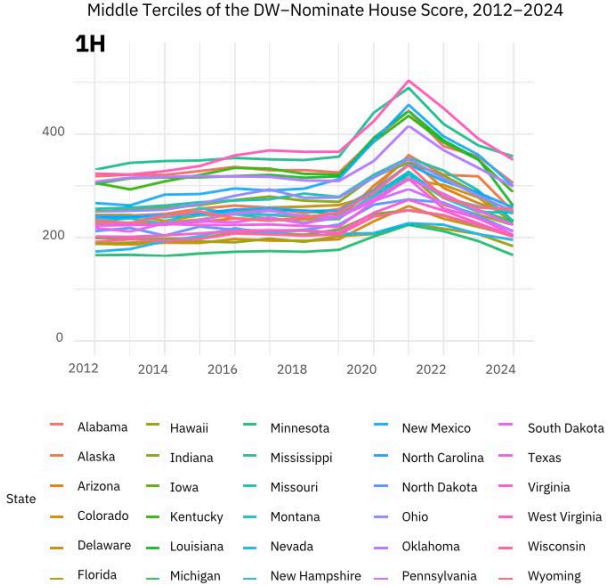
Top Tercile States of the DW–Nominate House Score, 2012–2024

1G



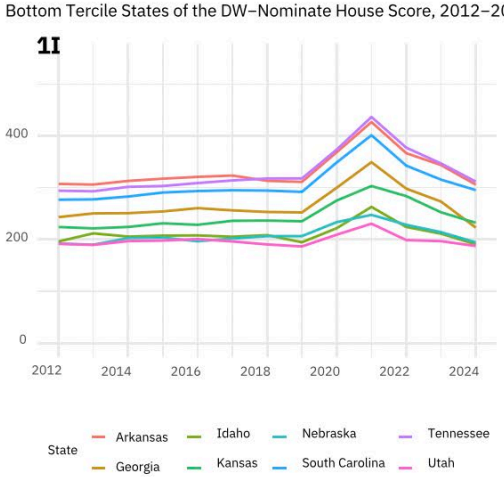
Middle Terciles of the DW–Nominate House Score, 2012–2024

1H



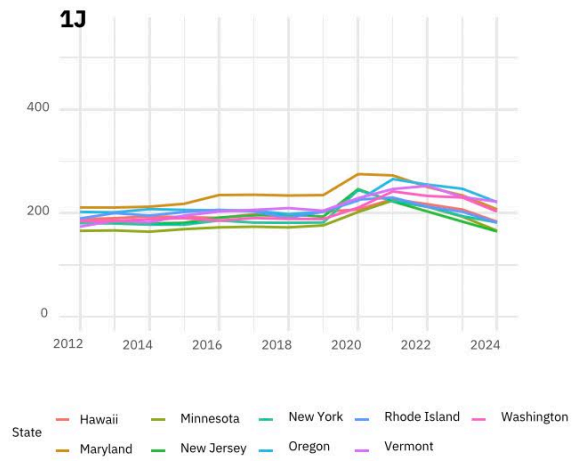
Bottom Tercile States of the DW–Nominate House Score, 2012–2024

1I



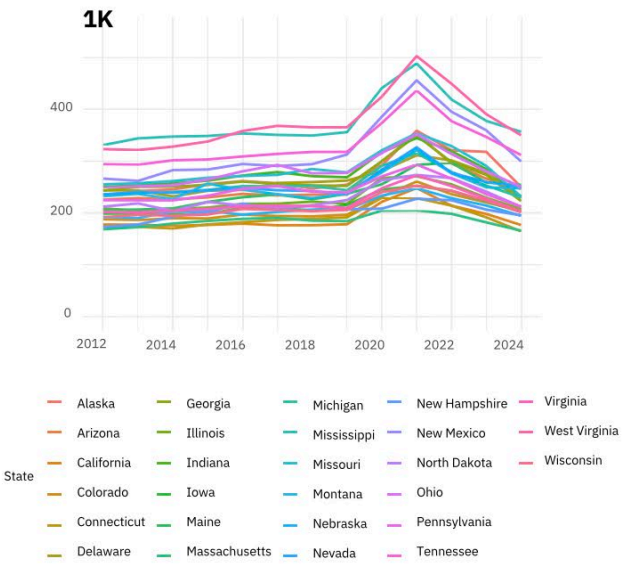
Top Tercile States of the DW–Nominate Senate Score, 2012–2024

1J



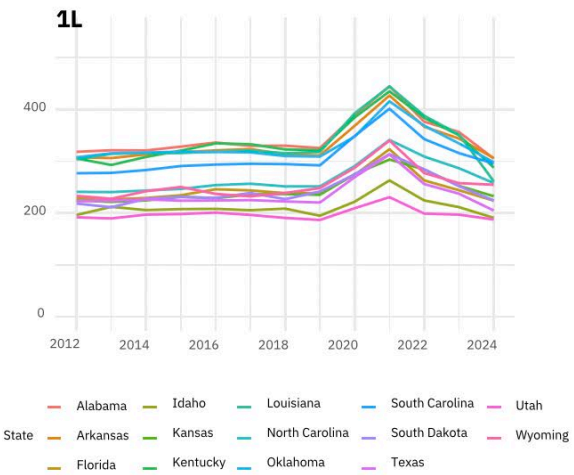
Middle Tercile States of the DW–Nominate Senate Score, 2012–2024

1K

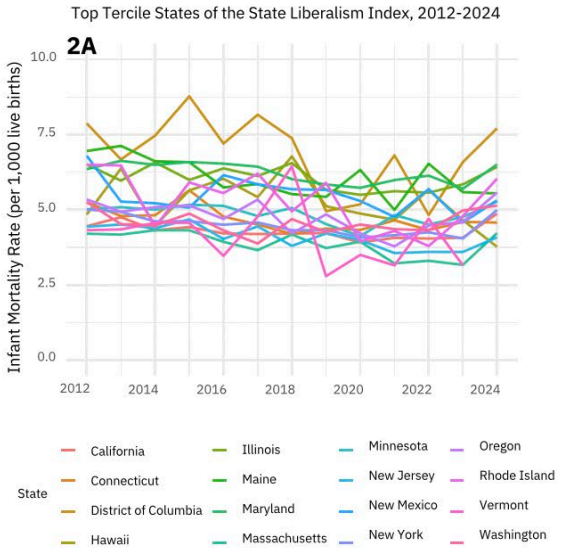


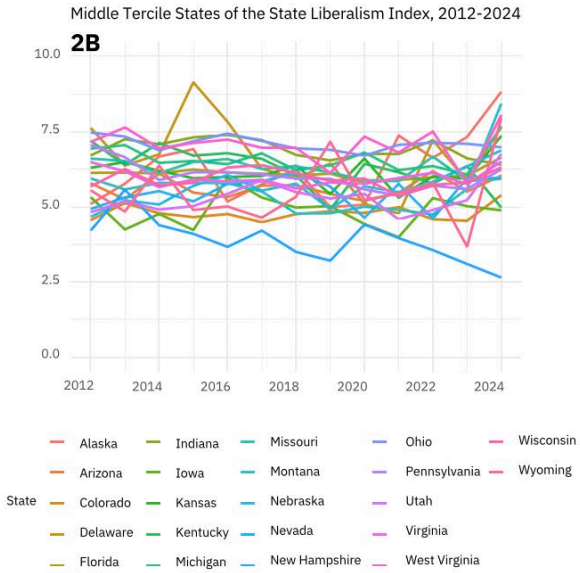
Bottom Tercile States of the DW–Nominate Senate Score, 2012–2024

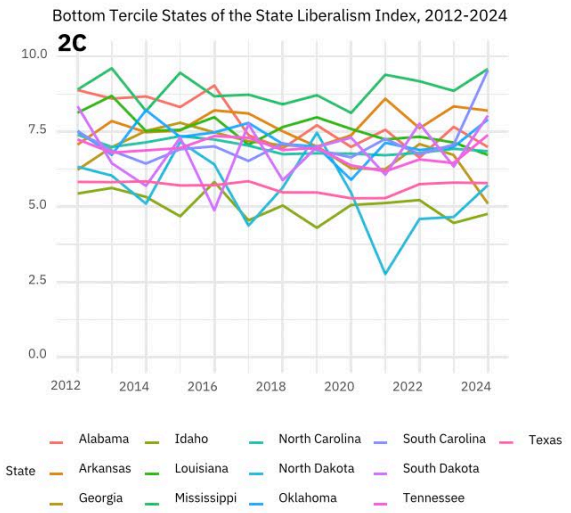
1L

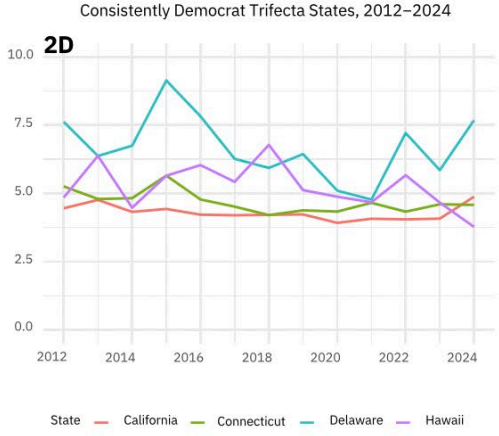


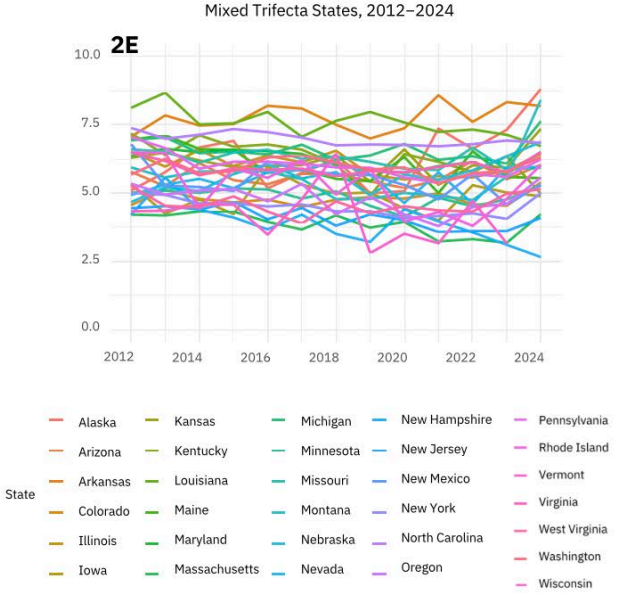
Infant mortality rates (deaths per 1000 live births): panels 2A-2L

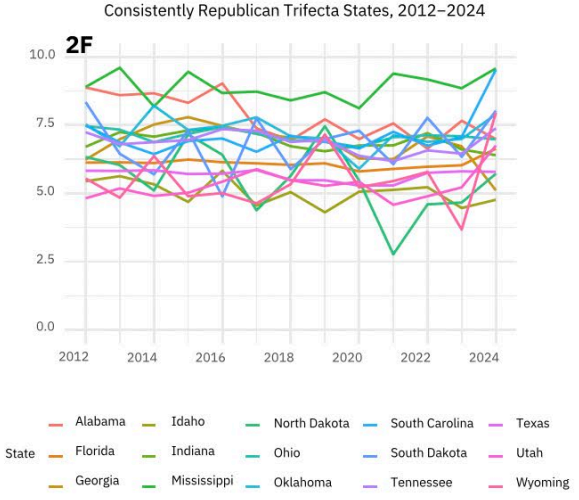




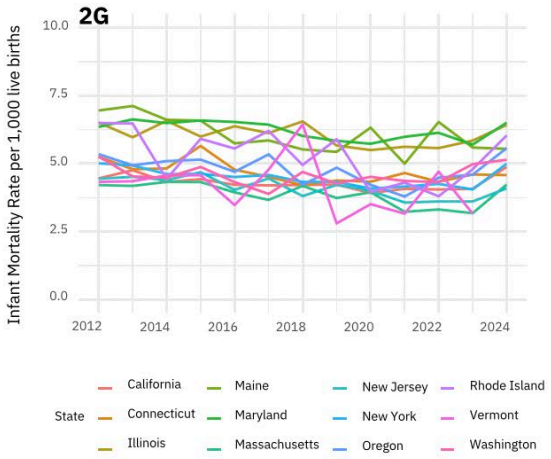




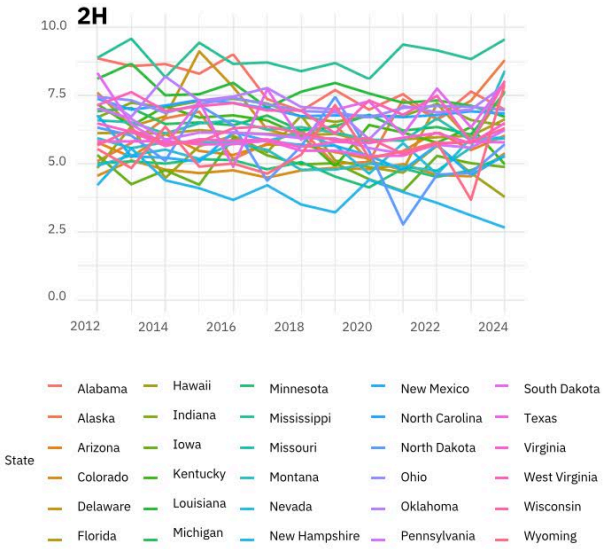




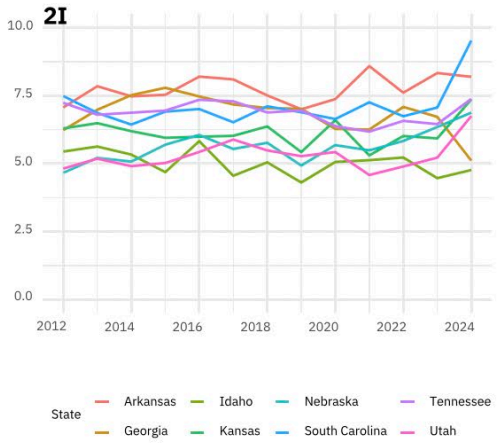
Top Tercile States of the DW–Nominate House Score



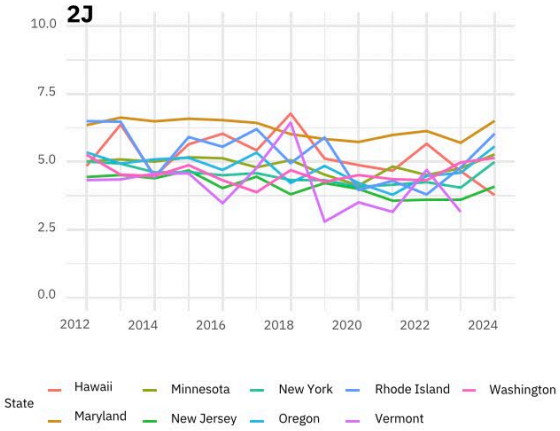
Middle Tercile States of the DW–Nominate House Score



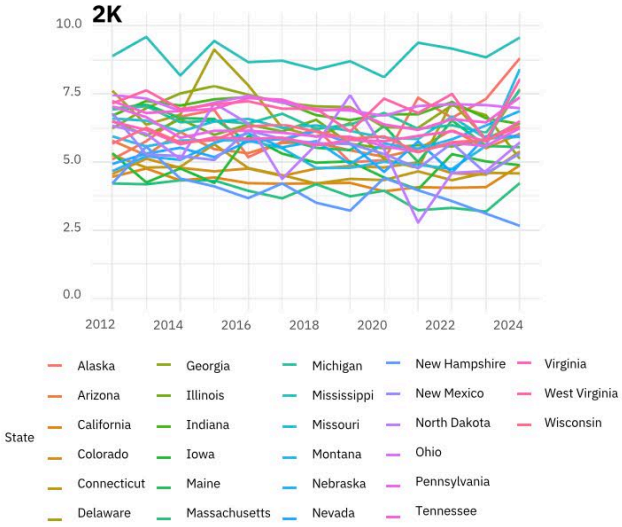
Bottom Tercile States of the DW–Nominate House Score



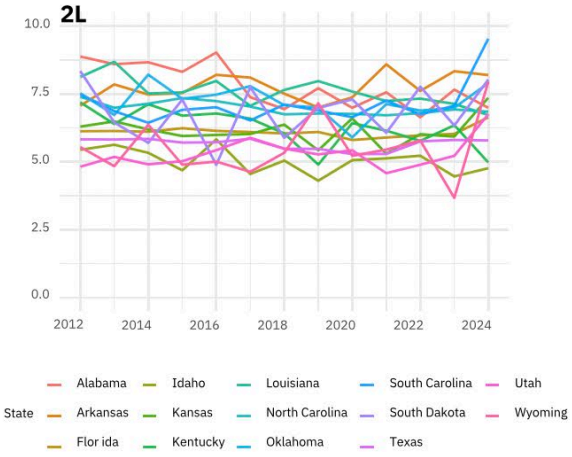
Top Tercile States of the DW–Nominate Senate Score



Middle Tercile States of the DW–Nominate Senate Score

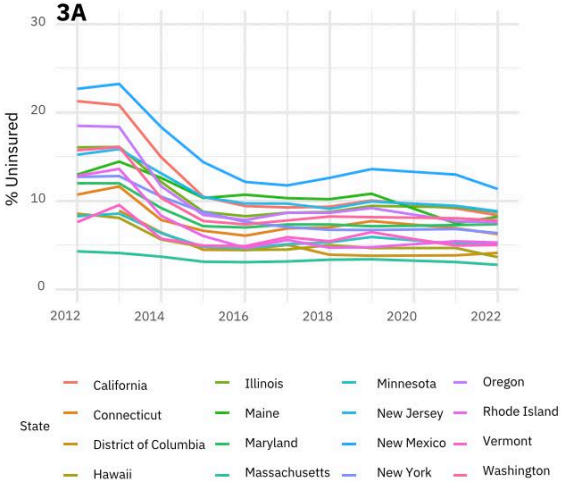


Bottom Tercile States of the DW–Nominate Senate Score

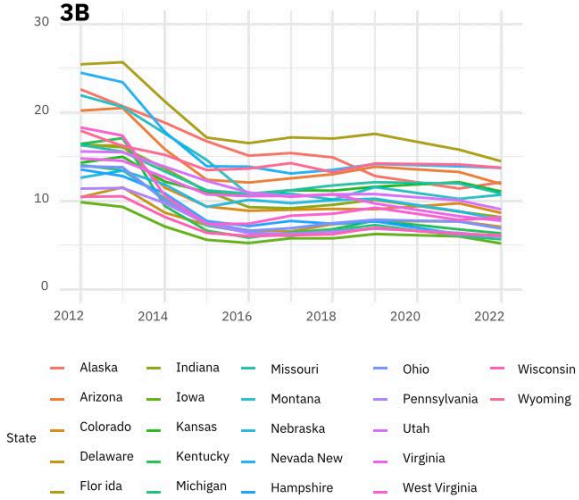


Percent uninsured (adults age 35-64 years): panel 3A-3L

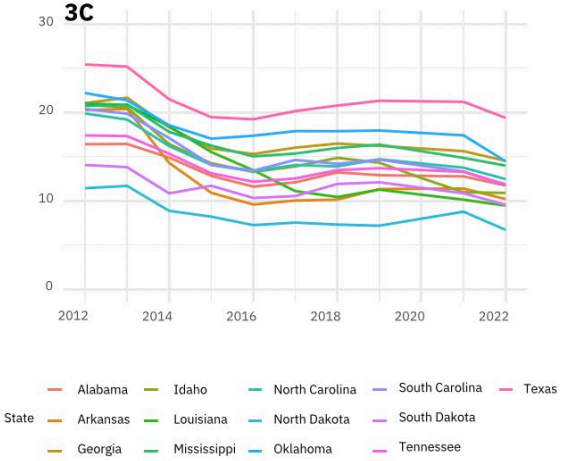
Top Tercile States of the State Liberalism Index, 2012–2022



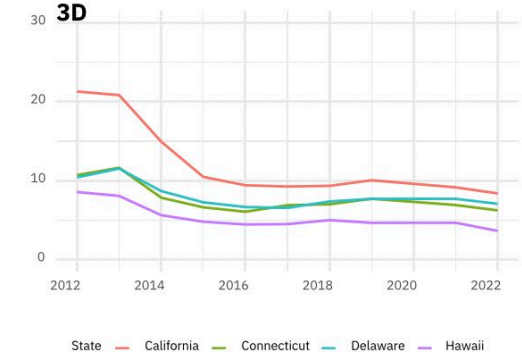
Middle Tercile States of the State Liberalism Index, 2012–2022



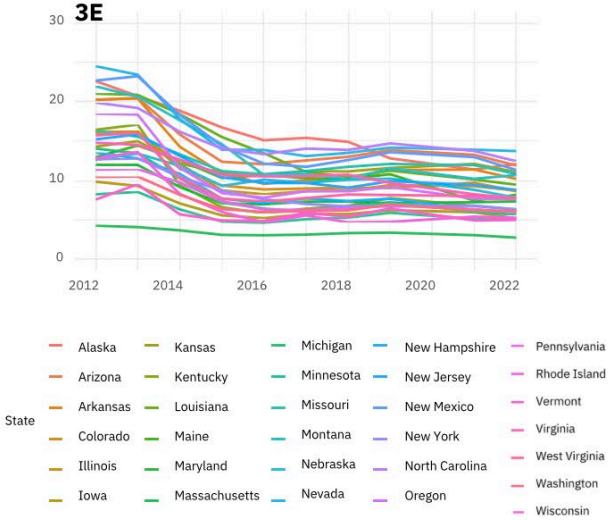
Bottom Tercile States of the State Liberalism Index, 2012–2022



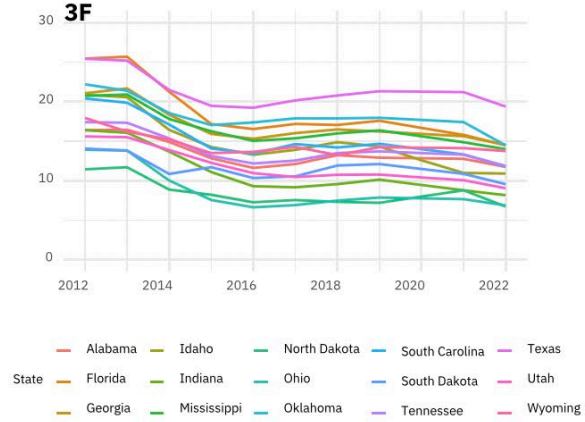
Consistently Democratic Trifecta States, 2012–2022



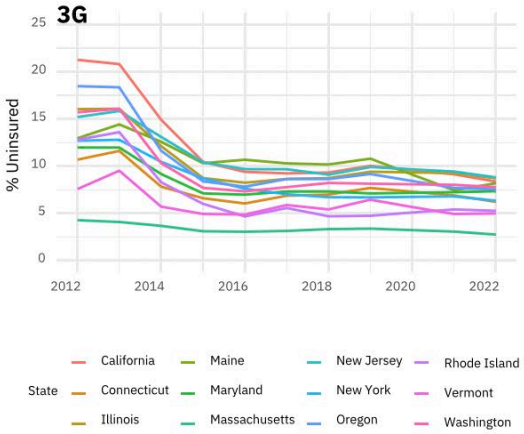
Mixed Trifecta States, 2012–2022



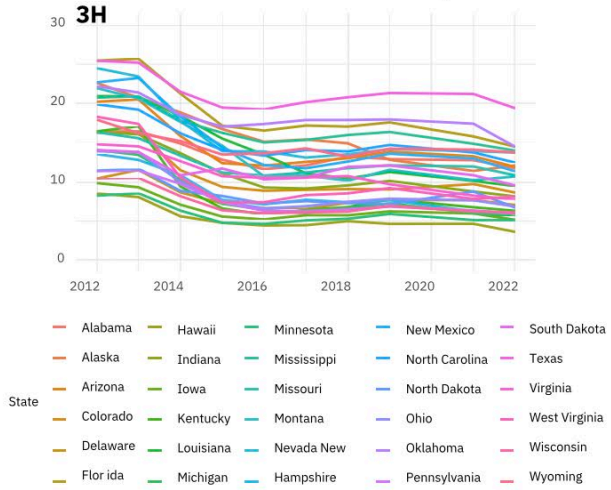
Consistently Republican Trifecta States, 2012–2022



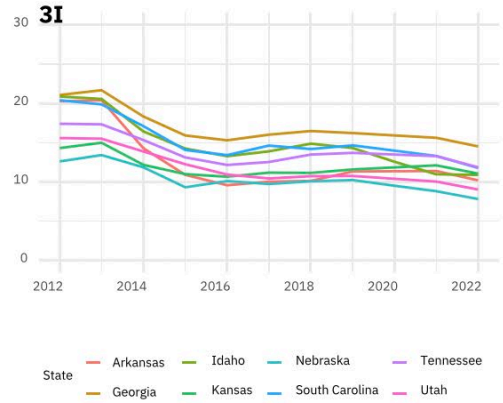
Top Tercile States of the DW–Nominate House Score, 2012–2022



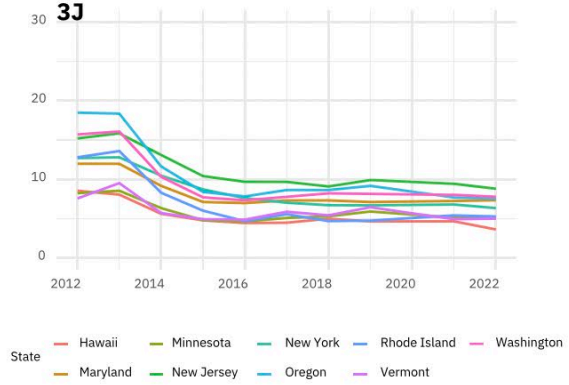
Middle Tercile States of the DW–Nominate House Score, 2012–2022



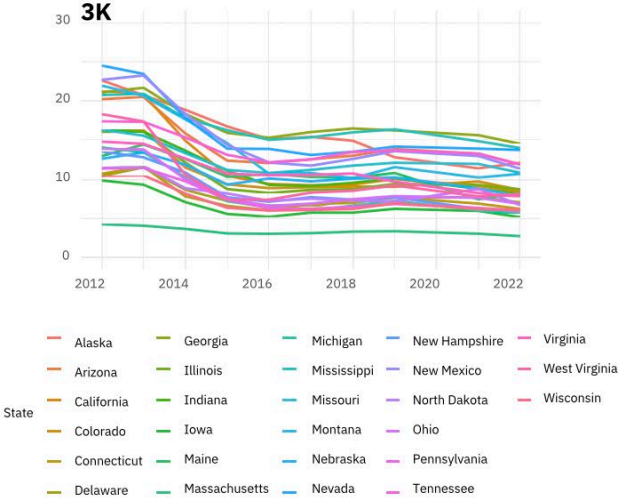
Bottom Tercile States of the DW–Nominate House Score, 2012–2022



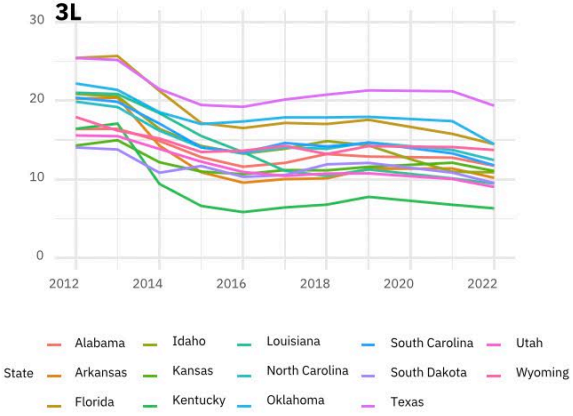
Top Tercile States of the DW–Nominate Senate Score, 2012–2022



Middle Tercile States of the DW–Nominate Senate Score, 2012–2022



Bottom Tercile States of the DW–Nominate Senate Score, 2012–2022



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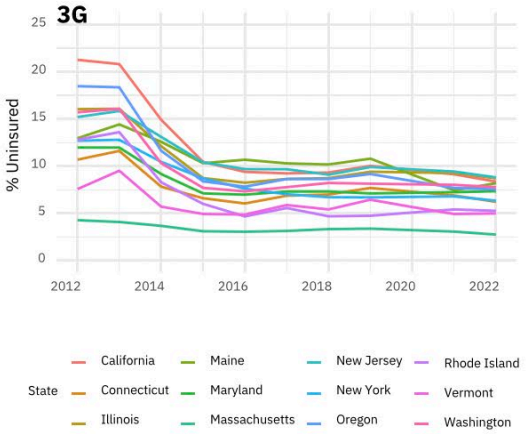
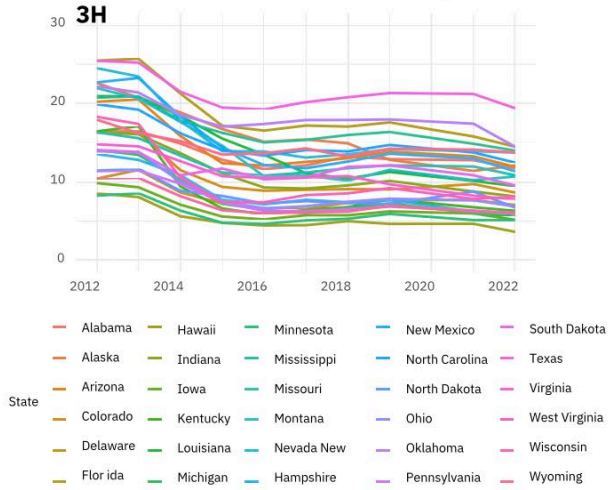
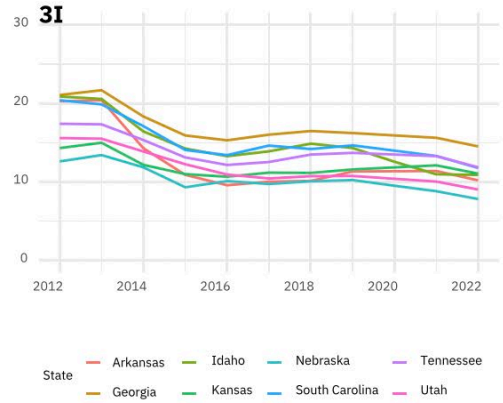
Top Tercile States of the DW–Nominate House Score, 2012–2022



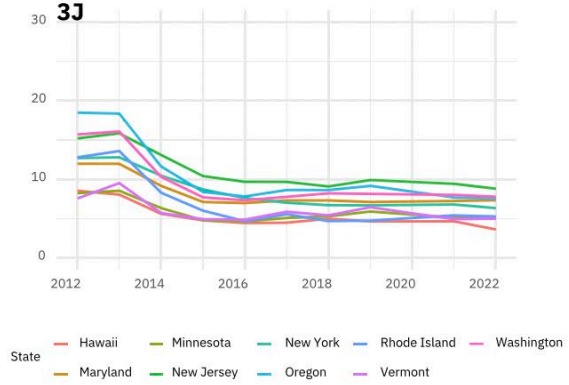
Middle Tercile States of the DW–Nominate House Score, 2012–2022



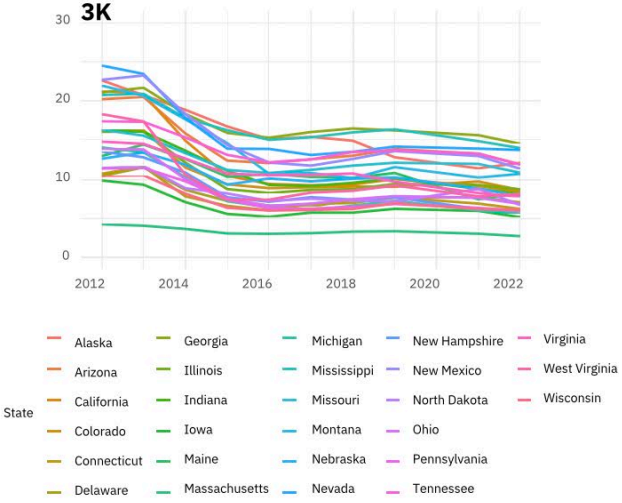
Bottom Tercile States of the DW–Nominate House Score, 2012–2022



Top Tercile States of the DW–Nominate Senate Score, 2012–2022



Middle Tercile States of the DW–Nominate Senate Score, 2012–2022



Bottom Tercile States of the DW–Nominate Senate Score, 2012–2022