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Who votes for public health? U.S. senator characteristics associated with voting in concordance with public health policy recommendations (1998–2013)☆

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ABSTRACT

Background: The voting behaviors of elected officials shape the public's health. Little is known, however, about the characteristics of elected officials who vote in concordance with public health policy recommendations. This article presents the results of study conducted with the aims of: 1) testing the hypothesis that US Democrat Senators vote in concordance with American Public Health Association (APHA) policy recommendations more frequently than US Republican Senators, 2) identifying US Senator characteristics independently associated with voting in concordance with APHA, and 3) assessing trends in APHA voting concordance by political party.
Methods: We created a legislative dataset of 1434 votes cast on 111 legislative proposals by 184 US Senators during the years 1998 through 2013. Mixed effects linear regression models were used to estimate the independent contributions of political party, gender, geographic region, and year effects to annual APHA voting concordance. Votes were nested within Senators who were nested within States to account for non-independence and models considered potential for time and spatial patterns in the data.
Results: Adjusting for covariates and accounting for serial and spatial autocorrelation, Democrats averaged 59.1 percentage points higher in annual APHA voting concordance than Republicans (95% CI: 55.5, 62.7), females averaged 7.1 percentage points higher than males (95% CI: 1.9, 12.3), and Northeastern Senators averaged 16.1 percentage points higher than Southern Senators (95% CI: 9.1, 23.1).
Conclusions: Elected official's political party affiliation, gender, and geographic region are independently associated with public health voting decisions and should be considered when targeting and tailoring science-based policy dissemination strategies.

1. Introduction

Political systems shape the health of populations (Beckfield & Krieger, 2009; Borrell, Espelt, & Rodríguez-Sanz, Navarro, 2007; Navarro et al., 2006; Navarro, 2008; Bernier & Clavier 2011; Bambra, Fox, & Scott-Samuel, 2007; Kelleher, 2002). In the United States (US), federal legislation (i.e., policy enacted by US Congress) is a major component of the political system and one that exerts particular influence on population health. Through regulation of behavior and reallocation of tax revenues, legislation shapes the distribution of resources and opportunities for health within US society (Gostin & Gostin, 2000). The legislative process is complex and involves many sociopolitical factors (e.g., media, public opinion) and policy actors (e.g., constituents, advocacy organizations; Smith & Katikireddi, 2013). But at the end of this process, whether or not a legislative proposal is sent to the President's desk to become a law boils down to a relatively simple act: congresspersons' votes of "yay" or "nay" (Kingdon, 1989). As political scientist John Kingdon describes, "What transpires on the floor of a legislature defines the end product of the law-making apparatus" (Kingdon, 1989, p. 4).

Despite the influence of legislative voting on population-level determinants of health, and numerous calls for greater attention to political processes in public health research (Borrell et al., 2007; Bambra et al., 2007; Kelleher, 2002; Smith & Katikireddi, 2013; Fafard, 2015), relatively few studies have examined how elected officials vote on public health policy proposals—particularly at the federal-level in the US (Navarro, 2008; Tung, Vernick, Reiney, & Gielen, 2012). A systematic review identified eleven studies that

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assessed how elected officials voted on public health policy proposals in the US (Tung et al., 2012), but the vast majority were focused on specific issues (e.g., tobacco control) at the state-level. Only two studies, both conducted nearly 30 years ago, have systematically assessed how US congresspersons vote on public health policy proposals. In a 1986 study, Mueller analyzed US House of Representatives' voting between 1973 and 1980 on policies to expand access to health care and found that Democrats were substantially more likely to vote 'yay' on these proposals than Republicans (Mueller, 1986). In a 1987 study, Thomas and colleagues analyzed US Senate voting between 1973 and 1982 on a range of public health issues and found that political party was the strongest predictor of voting behavior (Thomas, Duncan, & Gold, 1987).

Since these studies were conducted, ideological differences between Democrat and Republican policymakers on health issues have been the topic of extensive scholarship (Gostin & Gostin, 2000; Goldberg, 2012; Malhotra & Heiman, 2012; Carpenter, 2012; Kindig, 2015; Gollust, 2016). Scholars have debated the 'politicization of public health policy (Gostin & Gostin, 2000; Goldberg, 2012; Malhotra & Heiman, 2012),' speculated about how partisan politics might be less extreme for health than social and economic issues (Carpenter, 2012), and argued that bipartisan support for public health policy is essential to improving population health (Kindig, 2015; Gollust, 2016). Empirical research, however, has not recently assessed if a partisan divide in public health voting exists among US policymakers. Furthermore, little is known about policymaker characteristics other than political party (e.g., gender, geographic region) that might be associated with public health voting decisions (Vega & Firestone, 1995; Norton 1999; Gerrity, Osborn, & Mendez, 2007; Gelman, 2009; Kau & Rubin 2013). These knowledge gaps deserve attention for at least two reasons.

First, an understanding of policymaker characteristics associated with public health policy voting can contribute to a small, but growing body of knowledge about how advocates (e.g., citizens, community leaders, researchers, professional societies) might cultivate support for science-based public health policies through strategic communications (Niederdeppe, Roh, & Dreisbach, 2016; Brownson et al., 2011; Gollust, Lantz, & Ubel, 2009; Niederdeppe, Shapiro, Kim, Bartolo, & Porticella, 2014; Lee, Shapiro, & Niederdeppe, 2014; Niederdeppe, Roh, & Shapiro, 2015; Thibodeau, Perko, & Flusberg, 2015; Ortiz, Zimmerman, & Adler, 2016; Barry, Brescoll, Brownell, & Schlesinger, 2009; Farrer, Marinetti, Cavaco, & Costongs, 2015). The importance of targeting and tailoring communication strategies on the basis of demographic characteristics is well established (Woolf et al., 2015; Kreuter & Wray, 2003; Schmid, Rivers, Latimer, & Salovey, 2008), but little is known about policymaker characteristics that should be considered when crafting messages for this audience. For example, if Democrat and Republican policymakers are in fact polarized on public health voting, then communication strategies segmented on the basis of political party are warranted. Furthermore, if such polarization exists, then identification of demographic characteristics, such as gender and geographic region, associated with public health voting can inform the design of communication strategies that might foster bipartisan support for public health policy.

Second, an understanding of party differences in public health policy voting can cast light on the potential public health implications of political science research. Studies have shown that felon disenfranchisement policies (i.e., policies that restrict voting rights on the basis of a felony conviction) skew US Senate election outcomes in favor of Republicans (Purtle, 2013; Uggen & Manza, 2002; Manza & Uggen, 2008); and voter identification laws might have similar effects (US Government Accountability Office, 2014). Relatedly, excess premature mortality among African Americans (a population that predominantly votes for Democrat candidates) has been shown to shift US Senate elections' outcomes in favor of Republicans (Rodriguez, Geronimus, Bound, & Dorling, 2015). If Republican policymakers vote in concordance with public health policy recommendations less frequently than Democrat policymakers, then circumstances that skew election outcomes in favor Republicans could be considered potential barriers to legislation that would improve the public's health.

1.1. Study purpose

The primary purpose of our study was to advance knowledge about characteristics of policymakers that should be considered when designing communication strategies to cultivate support for science-based public health policies. The secondary purpose was to help bridge the gap between public health and political science research. The aims of the study were to: 1) test the hypothesis that US Democrat Senators vote in concordance with American Public Health Association (APHA) policy recommendations more frequently than US Republican Senators, 2) identify US Senator characteristics independently associated with voting in concordance with APHA, and 3) assess trends in APHA voting concordance by political party.

2. Materials and methods

2.1. Data

Founded in 1872, APHA is a non-partisan professional organization with over 25,000 members and the mission to "Improve the health of the public and achieve equity in health status (American Public Health Association, 2016)". Since 1998, APHA has published an Annual Congressional Record which identifies legislation introduced in US Congress with potentially major implications for public health (e.g., increases in public health care spending, toxic substance deregulation), indicates how APHA would vote (i.e., "yay" or "nay"), and whether each congressperson voted in concordance with APHA. The Annual Congressional Record is published in *The Nation's Health*, APHA's monthly newsletter. We obtained PDFs of issues of *The Nation's Health* that included the Annual Congressional Record and used text recognition software and manual data entry to create a longitudinal dataset containing each Senator's votes for the years 1998 through 2013. The study was classified as exempt by our Institutional Review Broad.

2.2. Variables

We used APHA policy recommendations as indicators of 'pro-public health' Congressional voting decisions. For each year, we created a measure of the proportion of the time that each Senator voted in concordance with APHA. This served as our dependent variable. Each Senator was classified by political party, gender, state, and the US geographic region of the state they represented (i.e., Midwest, Northeast, South, West; defined by the US Census Bureau). Political party was our primary independent variable and gender, state, geographic region, and voting year were covariates. Political party, as opposed to ideology score, was the primary independent variable for two reasons. For one, Thomas and colleagues found that political party affiliation was a stronger predictor of US Senators' public health voting decisions than political ideology score (Thomas et al., 1987). Second, information on political party affiliation is readily available and thus has practical utility for advocates seeking to target and tailor communication strategies.

2.3. Analysis

First, we generated unadjusted univariate statistics and conducted bivariate analyses to describe annual APHA voting concordance by political party and covariates. Then, we used mixed effects linear regression models to estimate the independent contributions of political party, region, gender, and voting year effects to annual voting concordance. The mixed effects models employed a three level hierarchy: votes were nested within Senators who were nested within

states. The models used a random intercept for each Senator to account for the multiple votes over time and allow Senators to change political parties. To account for potential spatial autocorrelation and state-level voting patterns, another random intercept clustered Senators within states. Because voting decisions may be correlated over time—both within individual Senators and between different Senators from the same state—the models used an autoregressive correlation structure to account for serial correlation. To ensure our results were robust to modeling assumptions about the use of random intercepts, we also conducted a generalized estimating equation (GEE) sensitivity analysis and found that the GEE and mixed effects results were not meaningfully different.

A priori, we hypothesized that voting concordance by political party would change over time (Mueller, 1986; Thomas et al., 1987). Thus, our models included a year*political party interaction term. Year was treated as a continuous variable and mean-centered for the interaction. The point estimates from the regression model corresponds to the marginal mean change in percentage point APHA voting concordance, with 95% confidence intervals (CIs). All analyses were conducted using R 3.2.1 (R Foundation for Statistical Computing, Vienna, Austria).

3. Results

For the years1998 through 2013, 184 US Senators cast 1434 votes on 111 bills that APHA identified as important to public health (bill information in Supplemental File 1). Annual Senator APHA voting concordance averaged 55.0% (standard deviation: 39.5 percentage points). Seven Senators changed political parties during this period. Three Senators were Independents; we do not report results by this party because of the small number.

3.1. Political party effects

Before adjusting for covariates, a Democrat Senator voted in concordance with APHA an average of 88.3% of the time (standard deviation: 17.9 percentage points) and a Republican voted in concordance 21.3% of the time (standard deviation: 23.5 percentage points). The annual absolute difference between Democrats and Republicans in APHA voting concordance ranged from a low of 42.9 percentage points in 2008 (Democrats 89.8% concordance vs Republicans 46.9%) to a high of 91.4 percentage points in 2011 (Democrats 97.5% concordance vs Republicans 6.1%) (Fig. 1). After adjusting for gender, geographic region, voting year, and year*political party interaction and accounting for time and state correlations, Democrats averaged 59.1 percentage points higher in their annual APHA voting concordance (95% CI: 55.5, 62.7) than Republicans (Table 1).

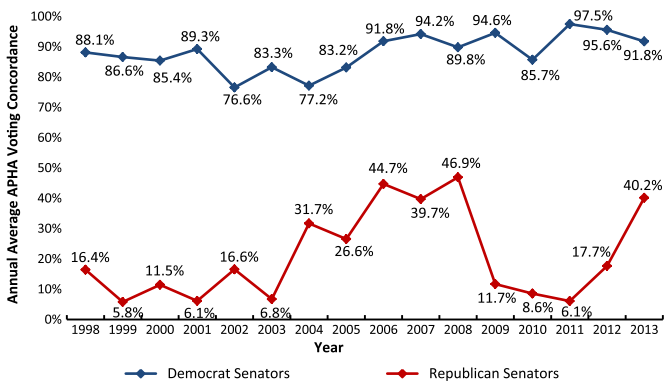

Fig. 1. Trend in US senators voting in concordance with APHA, by political party (1998–2013). *N*=1434 votes.

Table 1
US Senators characteristics associated with voting in concordance with APHA. Longitudinal mixed effects regression model estimates.

Senator characteristic	Between-year change in APHA voting concordance[a]	95% CI	p-value
Voting year	1.4	1.0, 1.8	< 0.01
Political party			
Republican	Ref	–	–
Democrat	59.1	55.5, 62.7	< 0.01
Gender			
Male	Ref	–	–
Female	7.1	1.9, 12.3	< 0.01
Region			
South	Ref	–	–
Midwest	5.7	-0.6, 12.0	0.08
West	6.3	0.04, 12.5	0.05
Northeast	16.1	9.1, 23.1	< 0.01
Voting year*political party interaction			
Republican	Ref	–	–
Democrat	−1.0	-−1.6, −0.5	< 0.01

[a] Estimates correspond to mean change in percentage point APHA voting concurrence. CI = confidence interval. APHA = American Public Health Association.

3.2. Gender, geographic region, and voting year effects

After adjusting for political party, geographic region, voting year, and year*political party interaction and accounting for time and state correlations, female Senators averaged 7.1 percentage points higher in annual APHA voting concordance than males (95% CI: 1.9, 12.3) (Table 1). Compared to Southern Senators, Northeast Senators averaged 16.1 percentage points higher in annual APHA voting concordance (95% CI: 9.1, 23.1), Western Senators averaged 6.3 percentage points higher (95% CI: 0.04 12.5), and Midwestern Senators averaged 5.7 percentage points higher (95% CI: −0.6, 12.0). Average annual APHA voting concordance among all Senators increased by an average of 1.4 percentage points each year (95% CI: 1.0, 1.8). The average between year increase, however, was higher among Republicans than Democrats, with Republican APHA voting concordance increasing an average of 1.0 percentage points more than Democrats each year (95% CI: 0.5, 1.6).

4. Discussion

US Democrat Senators voted in concordance with APHA policy recommendations much more frequently than Republicans during the period between 1998 and 2013. This finding confirms that a partisan divide in public health policy voting still exists in US Congress and is consistent with public opinion research indicating that Democrats are more supportive of government intervention to address health than Republicans (Gollust et al., 2009; Robert & Booske 2011; Gollust 2016). The finding also suggests that circumstances which reduce the likelihood of Democrat Senators being elected (e.g., felon disenfranchisement; Purtle, 2013; Uggen & Manza, 2002; Manza & Uggen, 2008) and voter ID policies (US Government Accountability Office, 2014), disproportionately high premature mortality among Democrat voters (Rodriguez et al., 2015) could be considered potential barriers to passing legislation that would promote public health. There is a continued need to integrate political science and public health research to improve understanding of the processes through which politics impact population health.

In 2015, David Kindig wrote that “One of the most critical issues facing us today is finding a political and ideological common ground for improving population health” (Kindig, 2015, p. 24). Although we

observed a modest trend toward greater APHA voting concordance among Republicans during the study period, our analysis paints a dismal picture of bi-partisanship (or lack thereof) for public health policy in the US Senate. Our findings provide empirical support for targeting and tailoring separate advocacy messages for Democrat and Republican policymaker audiences; or using messages which emphasize values that resonate with both parties (e.g., care, liberty, fairness) or especially resonate with Republicans (e.g., loyalty, authority) (Haidt, 2012; Matthews, Burris, Ledford, & Baker, 2016). Our study also highlights the potential of targeting and tailoring messages on the basis of policymaker gender and geographic region.

We found that female gender was independently associated with a Senator voting in concordance with APHA recommendations more frequently than males. This is consistent with research demonstrating that female congresspersons typically vote more liberally than males, regardless of political party affiliation (Vega & Firestone, 1995; Norton, 1999; Gerrity et al., 2007; Gelman, 2009). Research also suggests that female congresspersons are more effective at advancing their policy agendas than males (Anzia & Berry, 2011; Volden, Wiseman, & Wittmer, 2013). Targeting female congresspersons with tailored advocacy messages might be an effective strategy to promote public health policy.

The finding that Southern Senators voted in concordance with APHA policy recommendations least frequently, even after adjusting for political party and other covariates, is consistent with the historically conservative voting patterns of Southern congresspersons (Gelman, 2009). Although this finding is not surprising, from a public health perceptive, it is troubling because the populations of Southern states generally have worse health status than those of other regions (Kaiser Family Foundation, 2016) and would likely disproportionately benefit from APHA's policy recommendations.

Our study highlights a number of areas for future research. Qualitative studies should explore factors that influence the public health voting decisions of US Senators, such as those of Southern Senators who consistently vote counter to public health policy recommendations. Our study focused on Senator characteristics that are largely non-modifiable and future research should investigate associations between modifiable factors, such Senators' knowledge about determinants of population health, and public health voting decisions. Although our study contributes to knowledge about how communication strategies might be targeted and tailored to cultivate policymaker support for public health policies Niederdeppe et al. (2016); Brownson et al. (2011); Haidt (2012); Matthews et al. (2016) have not evaluated whether such strategies have actual impacts on voting decisions. Such outcome evaluations are a priority area for future research. Finally, most public health authority exists at the state-level (Gostin & Gostin, 2000) and future research should examine public health voting decisions at this level of government.

4.1. Limitations

Our study has five main limitations. First, APHA is only one, albeit the largest, of many public health professional organizations in the US and other 'pro-public health' organizations might have different policy agendas. APHA policy recommendations were used as indicators of legislative decisions that would presumably promote public health, but are by no means an exhaustive list of legislative decisions that have public health implications. Second, our study was limited to the US Senate and did not examine public health voting patterns in the US House of Representatives. Third, the scope of our study was broadly focused on public health policy and we did not categorize legislative proposals according to the specific health topics that they addressed (e.g., environment, gun safety). Fourth, temporal variations in annual APHA voting concordance should be interpreted with caution because they could be an artifact of changes in APHA's policy priorities, not changes in Senator support for public health policies. Fifth, the notion that APHA policy recommendations would promote public health is founded on the untested assumption that APHA recommendations are more likely to produce salutatory benefits than the alternative voting decision.

4.2. Conclusions

Federal legislation is a tool which can structure society so that all its members have ample resources and opportunities for health. Our study empirically demonstrates that Senators' support for legislative proposals that are likely to help achieve this varies dramatically according to their individual characteristics, particularly political party affiliation. Advocates seeking to cultivate bi-partisan support for public health policy should consider using targeted and tailored communication strategies that account for Senators' characteristics.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ssmph.2016.12.011.

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