Physicians' political preferences and the delivery of end of life care in the United States: retrospective observational study

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ABSTRACT

OBJECTIVES
To compare the delivery of end of life care given to US Medicare beneficiaries in hospital by internal medicine physicians with Republican versus Democrat political affiliations.

DESIGN
Retrospective observational study.

SETTING
US Medicare.

PARTICIPANTS
Random sample of Medicare beneficiaries, who were admitted to hospital in 2008-12 with a general medical condition, and died in hospital or shortly thereafter.

MAIN OUTCOME MEASURES
Total inpatient spending, intensive care unit use, and intensive end of life treatments (eg, mechanical ventilation and gastrostomy tube insertion) among patients dying in hospital, and hospice referral among patients discharged but at high predicted risk of 30 day mortality after discharge. Physicians were categorized as Democrat, Republican, or non-donors, using federal political contribution data.

RESULTS
Among 1 480 808 patients, 93 976 (6.3%) were treated by 1523 Democratic physicians, 58 876 (4.0%) by 768 Republican physicians, and 1 327 956 (89.6%) by 23 627 non-donor physicians. Patient demographics and clinical characteristics were similar between groups. Democrat physicians were younger, more likely to be female, and more likely to have graduated from a top 20 US medical school than Republican physicians. Mean end of life spending, after adjustment for patient covariates and hospital specific fixed effects, was US$17 938 (£12 872; €14 612) among Democrat physicians (95% confidence interval $17 176 to $18 700) and $18 409 among Republican physicians ($17 362 to $19 456; adjusted Republican v Democrat difference, $472 (−$803 to $1747), P=0.47). Intensive end of life treatments for patients who died in hospital did not vary by physician political affiliation. The proportion of patients discharged from hospital to hospice did not vary with physician political affiliation. Among patients in the top 5% of predicted risk of death 30 days after hospital discharge, adjusted proportions of patients discharged to hospice were 15.8%, 15.0%, and 15.2% among Democrat, Republican, and non-donor physicians, respectively (adjusted difference in proportion between Republicans v Democrats, −0.8% (−2.7% to 0.9%), P=0.43).

CONCLUSIONS
This study provided no evidence that physician political affiliation is associated with the intensity of end of life care received by patients in hospital. Other treatments for politically polarised healthcare issues should be investigated.

WHAT IS ALREADY KNOWN ON THIS TOPIC

In the United States, physician political affiliation is associated with differing views on national health policy

In one study, physician political affiliation was associated with treatment recommendations in hypothetical clinical scenarios that reflect polarized health issues

Whether physicians' political beliefs are associated with the end of life care they provide patients is unknown

WHAT THIS STUDY ADDS

Data on nearly 1.5m US Medicare beneficiaries in hospital were linked to data on political contributions of attending physicians, and analyzed to determine whether end of life spending and intensity of care varied by physician political affiliation (Republican v Democrat)

Physician political affiliation was not associated with the intensity of end of life hospital care received, including end of life spending, intensive end of life treatments (such as mechanical ventilation or gastrostomy tube insertion), and hospice referral

Further research is needed to understand whether physicians' political preferences influence the delivery of end of life care in outpatient settings or in other politically controversial areas of medicine

Introduction

The United States is in an era of historic political polarization, which is also true of physicians. Between 1991 and 2012, total physician contributions to political campaigns increased from US$20m (£14.4m; €16.3m) to $189m, and the proportion of individual physicians contributing to campaigns increased from 2.6% to 9.4%.[1] A generation ago, most US physicians identified as Republicans, but recent evidence suggests that doctors are now evenly split between Republicans and Democrats.[1] Significant ideological clustering exists along demographic and subspecialty lines: men, older physicians, and higher paid specialists favor Republican affiliations; whereas women, younger physicians, and lower paid specialists lean toward Democrat affiliations.[1]

Political affiliation of US physicians is associated with physicians' views on US healthcare policy—for example, liberal and independent doctors are more likely to endorse the Affordable Care Act, which among other things expanded access to insurance for Americans, and report that the medical profession is obligated to care for uninsured patients.[2] However, it is less clear whether political preferences affect how physicians deliver care. A recent study found that physicians' political affiliation was associated with

how seriously they judged particular health issues to be, and how they counselled patients in hypothetical clinical scenarios reflecting polarized health issues.[3] For instance, Democrat physicians were more likely to report that they would encourage patients to avoid keeping firearms at home, whereas Republican physicians were more likely to report that they would urge patients to stop smoking marijuana and would discourage future abortions. But whether the personal political beliefs of US physicians are associated with the actual care delivered to patients is unknown. Although data on physician politics and political polarization are limited globally, physicians across countries have historically been intensely political,[4] and there is limited understanding of whether the political beliefs of physicians could influence the type of care that they provide.

We sought to examine whether physicians' political affiliations are associated with how they care for patients at the end of life, an issue that has become highly politicized in recent years, particularly with controversy surrounding Medicare's decision not to reimburse physicians for advance care planning.[5] The intensity of end of life care received by patients has been shown to be highly sensitive to physician preferences.[6-8] The proportion of a physician's patients enrolled in hospices strongly predicts whether that physician's other patients enroll in hospices.[6] Physicians' reported beliefs about treatment are an important determinant of end of life spending.[8] Differences in patient preferences for end of life care also explain only a small share of regional variation in end of life spending.[7]

Using data on US Medicare beneficiaries in hospital near the end of life, we examined whether US physicians' political preferences influenced the intensity of care given to patients at the end of life, including total costs of care, intensive care unit use, discharge of patients from hospital to hospice, and the administration of life saving treatments.

Methods

Overview
We sought to analyze whether physician political preferences influence the type of care that they provide patients. We focused on patterns in end of life practice, rather than other practice patterns that have been associated with physician political preferences (eg, counseling on abortion or contraception, firearm safety, and alcohol or tobacco use),[3] for two reasons. Firstly, end of life care is often politicized and is sensitive to physician care preferences more generally.[5-8] Secondly, analyzing the relation between physicians' political preferences and practice patterns requires data on patient level healthcare use plus information on physicians that would enable linkage to data on physician political affiliation. We analyzed Medicare data (described below), which includes physician identifying information and a large group of Americans whose end of life care is financed through the Medicare program.

We focused on care that occurs when patients are in hospital and die either during their time in hospital or shortly thereafter. For many patients, decisions on end of life care made by providers could occur in stages in the outpatient setting; however, outpatients may prefer to go to physicians with similar care preferences. Recommendations on end of life care made by primary care providers or outpatient specialists (eg, oncologists) might therefore reflect patient preferences rather than physician preferences.

To minimize this selection bias, we analyzed patterns in end of life care among general medicine inpatients treated by hospital physicians, relying on the assumption that because these doctors typically work scheduled shifts or blocks, patients do not choose their hospital physician and vice versa. Patients in the same hospital might therefore be considered quasirandomized to hospital physicians of varying political affiliation; this strategy has been used to analyze the association between various physician characteristics and patient costs of care and outcomes.[9-12]

To assess differences in end of life care among physicians of different political affiliation, we analyzed spending and other measures of resource use among patients who died in hospital, including use of intensive care units and intensive end of life treatments, according to physician political affiliation. In addition, among patients in hospital who were discharged but were at high predicted risk of short term mortality, we analyzed whether rates of discharge to hospice varied by physician political affiliation.

Data sources and study sample
We identified hospitalizations for patients with a general medical condition using the 2008-12 Medicare provider analysis and review (MedPAR) files; a random 20% of these files were linked by beneficiary ID to the 20% Medicare carrier files. We supplemented these data with annual beneficiary summary files, which include patient demographics and chronic illness diagnoses, and hospital characteristics from the American Hospital Association annual survey. To focus on physician decisions on end of life care, we restricted our analysis to instances when a patient died in the hospital or within a prespecified time after discharge.

We identified hospital stays involving a hospitalist physician, based on evaluation and management claims. Hospitalists were defined as physicians with a specialty of internal medicine who filed at least 90% of their total evaluation and management billings in an inpatient setting, which is a validated approach.[13] Based on previous work, we defined the attending hospitalist as the physician who accounted for the plurality of Medicare Part B charges during a hospital stay.[9-12] In sensitivity analyses, we defined the attending hospitalist on the basis of the plurality of inpatient evaluation and management claims.[9-12]

For each physician, we defined political affiliation using data on political contributions from the Database on Ideology, Money in Politics and Elections

(DIME).[1][14] The database includes all donations (US$) given to both Democratic and Republican candidates and committees in each federal election from 1992 to 2014, using publicly available information from the Federal Election Commission.[15] The database, which includes all political donors in the USA and detailed information on each donor including full name, occupation, and address, has previously been linked to the National Plan and Provider Enumeration System National Provider Identifier registry to identify political contributions by US physicians.[1]

We linked physicians in our Medicare data to political contributions in the DIME database by National Provider Identifier number. We categorized physicians as either Democrats or Republicans according to which party received more total contributions from the physician over the study period, or non-donors if no contributions could be found for that National Provider Identifier entry. In previous work, more than 95% of donations by physicians were made to one of these two major political parties.[1]

Finally, we linked these data by National Provider Identifier number to a comprehensive physician database assembled by Doximity, an online networking service for US physicians. The database, which has been used in previous studies,[9-12][16][17] includes information on physician age, sex, specialty, and training history (medical school, residency, fellowship) for all US physicians. These data have been obtained from multiple sources and data partnerships including the National Plan and Provider Enumeration System, American Board of Medical Specialties, state medical boards, and collaborating hospitals and medical schools. Details of the database and its validation have been published.[14]

Study outcomes and covariates

The primary outcome was total inpatient spending under Medicare Parts A and B for patients who either died in hospital or died within 30, 60, or 90 days of hospital discharge. For the second group of patients, spending was calculated for the index hospital stay, and not for outpatient spending following discharge. These outcomes were chosen to determine whether the overall intensity of end of life care, as defined by total inpatient spending, varied by physician political affiliation. We also considered inpatient spending among patients who died shortly after discharge to allow for varying definitions of the "end of life."

Secondary outcomes included intensive care unit use and use of intensive end of life treatments (intubation and mechanical ventilation, tracheostomy, gastrostomy tube insertion, hemodialysis, enteral nutrition, and cardiopulmonary resuscitation)[18] for patients who died in hospital (eTable 1 lists procedure codes). We also analyzed rates of discharge from hospital to hospice for patients who were predicted to be at high risk of death within 30 days of hospital discharge (top 5%, 10%, or 25% of predicted 30 day mortality risk, based on multivariable logistic regression of 30 day mortality after hospital discharge as a function of covariates listed below).

Patient covariates included age, sex, race or ethnicity, and chronic conditions (indicator variables for each of 11 conditions, obtained from the Chronic Condition Data Warehouse[19]). We used the reported diagnosis related group to categorize each hospitalization into 25 indicators for mutually exclusive major diagnostic categories. Physician covariates included age, sex, and whether the physician attended a top 20 medical school according to *US News and World Report*. These factors can be correlated with both physician political affiliation and patterns in end of life care. Finally, physicians of varying political affiliation might work differently in regions or hospitals where unobserved patient preferences are similar to physician preferences or where unobserved illness severity systematically differs. We included hospital fixed effects to account for unmeasured differences in patient populations, effectively comparing differences in end of life care given to patients treated by physicians of different political affiliations within the same hospital.[8-11] There were no missing data in our analysis; specifically, no missing data on outcomes for the intensity of end of life care, patient covariates (age, sex, race or ethnicity, and chronic conditions), and political contributions of physicians.

Statistical analysis

Selection bias arises if physicians with varying political preferences treat patients with systematically different disease characteristics or treatment preferences. To reduce this bias, we relied on the assumption that within the same hospital, patients do not choose specific hospitalist physicians. Therefore, patients might be similar in both observable and unobservable characteristics across physicians of varying political affiliation. Following previous work,[9-12][19][20] we assessed this approach by:

- Comparing patients' characteristics (demographics and chronic conditions) between Democrat, Republican, and non-donor physicians; and
- Assessing the case mix balance by plotting the cumulative distribution of diagnosis related groups between Democrat, Republican, and non-donor physicians (differences between group distributions were assessed by the Kolmogorov-Smirnov test).

Our primary statistical approach was a multivariable linear regression, modeling each outcome of end of life care as a function of whether the patient was treated by a Democrat, Republican, or non-donor physician (indicator variables), with adjustment for covariates described above and robust standard errors clustered at the physician level.[9-12][21] We calculated adjusted outcomes for physicians by estimating predicted probabilities of outcomes for each patient fixing physician political affiliation at each categorical level, and averaging over our national sample (known as the marginal standardization form of predictive margins[22]). Specifically, we reported the following by physician political affiliation: adjusted spending for patients who died in hospital or within 30, 60, or 90 days of hospital discharge, adjusted use of intensive

care units or intensive end of life treatments among patients who died in hospital, and adjusted proportion of patients discharged from hospital to hospice among patients who were at high predicted risk of mortality within 30 days following hospital discharge.

Additional analyses

One concern with focusing on total spending among deceased inpatients is that spending by physicians could affect a patient's survival in hospital. Restricting analysis to only those patients who died in hospital could miss patients whose lives were saved by any differences in spending between physicians of varying political affiliation. We therefore analyzed differences in adjusted 30 day mortality from date of hospital admission, by physician political affiliation. Specifically, we estimated analogous logistic models to those described above in which the outcome variable was mortality within 30 days of hospital admission and the main exposure of interest was physician political affiliation. We also replicated the primary spending analysis and stratified expected mortality by quarters, rather than observed mortality.

Although our main analysis classified physicians as Democrats, Republicans, or non-donors depending on which party received more contributions during the study, physicians' preferences on end of life care could be non-linearly related to political contributions—for example, perhaps only the most extreme physician donors differ in their recommendations on end of life care. We therefore also separated physicians' political contributions into seven categories: three categories of political contributions for each party (low, medium, or high donors to a given party, based on how much was contributed within the party) and a set of non-donor physicians.

Sensitivity analyses

In addition to these analyses, we estimated models without hospital fixed effects, which compared patients treated by Republican versus Democrat physicians across, rather than within, hospitals. This model allowed for the possibility that one way in which Republican and Democrat physicians could differ in their care is in choosing to practice in hospitals with different practice styles (eg, religion affiliated hospitals). We conducted this as a sensitivity analysis, rather than the main analysis, because the study design within hospitals accounted for the possibility that patient preferences towards care could vary across hospitals, and the quasirandomization of patients to hospitalist physicians within the same hospital could plausibly deal with this concern.

We also estimated a propensity score model of end of life spending among patients treated by Republican versus Democrat physicians (as in our baseline analysis, this sample was comprised of patients who died in hospital). The propensity score for treating physician's political affiliation was based on patient age, sex, indicator variables for the 10 chronic conditions used in our baseline model, indicator variables for the diagnosis related group, and indicator variables for hospital. The propensity score model was estimated by nearest neighbor matching (Stata command "teffects psmatch"). Furthermore, we estimated the association between hospital spending on end of life care and physician political affiliation using a generalized linear model with a γ distribution with a log-link, to address the right-skewness of spending.[23] Finally, we conducted subgroup analyses according to US Census region to assess for heterogeneity in the association between end of life spending and physician political affiliation across hospitals. Analyses were performed in Stata (version 14). The 95% confidence intervals around reported estimates reflected 0.025 in each tail or $P \leq 0.05$.

Patient involvement

No patients were involved in setting the research question or the outcome measures, nor were they involved in developing plans for design or implementation of the study. No patients were asked to advise on interpretation or writing up of results. There are no plans to disseminate the results of the research to study participants or the relevant patient community.

Results

Physician characteristics

Our sample included 25 918 physicians (1523 Democratic, 768 Republican, and 23 627 non-donors). Relative to Republican physicians, Democrat physicians were younger, more likely to be female, and more likely to have attended a top 20 medical school (table 1). Non-donor physicians were, on average, younger than both Democrat and Republican physicians, and less likely to be female or to have attended a top medical school.

Patient characteristics

Our sample included 1 480 808 patients, of whom 51 621 (3.5%) died in hospital; 148 457 (10.0%), 211 604 (14.3%), and 254 856 (17.2%) patients died within 30, 60, and 90 days of hospital discharge, respectively. Overall, 1 327 956 (89.6%) patients admitted to hospital in our study were treated by non-donor physicians, 93 976 (6.3%) by Democratic physicians, and 58 876 (4.0%) by Republican physicians. Patient demographics, comorbidities, and admission diagnoses were similar across groups (table 2; eFigure 1). Statistically significant differences were small in magnitude, and not in any systematic direction (that is, for comorbidities that were significantly different between patients treated by Republican v Democrat physicians, some were slightly more common among patients treated by Republican physicians or by Democrat physicians). Therefore, these differences were unlikely to be important confounders. Patients treated by Republican physicians were more likely to be admitted to small, southern, for profit, and rural hospitals than patients treated by non-donor or Democrat physicians. Patient characteristics were

Table 1 | Physician characteristics according to political affiliation

Characteristic	Non-donor	Democrat	Republican	Joint*	Republican v Democrat*
No of physicians	23 627	1523	768	—	—
Age (years)					
<40	9936 (42.1)	285 (18.7)	109 (14.2)		
40-44	5331 (22.6)	313 (20.6)	111 (14.5)		
45-49	3371 (14.3)	264 (17.3)	153 (19.9)		
50-54	2085 (8.8)	220 (14.4)	104 (13.5)	<0.001	<0.001
55-59	1492 (6.3)	203 (13.3)	126 (16.4)		
60-64	876 (3.7)	135 (8.9)	89 (11.6)		
65+	536 (2.3)	103 (6.8)	76 (9.9)		
Age (years; mean)	43.0	48.8	51.0	<0.001	<0.001
Time since residency (years, mean)	10.2	16.1	18.8	<0.001	<0.001
Female	8695 (36.8)	375 (24.6)	113 (14.7)	<0.001	<0.001
Top 20 medical school attendance	1347 (5.7)	225 (14.8)	49 (6.4)	<0.001	<0.001

Data are number (%) of physicians unless stated otherwise.
*P values reflect comparison using *t* tests or *z* tests of proportions, where appropriate. Joint P value reflects comparison across all three groups of physician political affiliation (Republican, Democrat, and non-donor); P value for Republican *v* Democrat comparison only compares those two groups.

similar across physician groups after adjustment for hospital fixed effects, effectively comparing patient characteristics between physicians of varying political affiliation within the same hospital (eTable 2).

Spending on end of life care
Mean unadjusted inpatient spending on end of life care among 51 621 patients who died in hospital

was $18 353 for Democrat physicians, $17 091 for Republican physicians, and $17 271 for non-donor physicians (P=0.04 for joint test). After adjustment for patient and physician covariates and hospital fixed effects, physician political affiliation was not associated with mean adjusted spending on end of life care for patients who died in hospital or within 30, 60, or 90 days of discharge (fig 1; eTable 3). For example,

Table 2 | Patient characteristics according to physician political affiliation

Characteristic	Non-donors	Democrats	Republicans	Joint*	Republican v Democrat*
No of patients	1 327 956	93 976	58 876	—	—
Age (years; mean)	74.9	74.4	75.3	0.007	0.002
Female	790 134 (59.5)	55 258 (58.8)	35 443 (60.2)	0.009	0.002
White	1 087 596 (81.9)	75 275 (80.1)	49 044 (83.3)	0.006	0.002
Chronic conditions					
Acute myocardial infarction or ischemia	908 322 (68.4)	63 904 (68)	40 860 (69.4)	0.06	0.03
Alzheimer's dementia	409 010 (30.8)	29 414 (31.3)	18 781 (31.9)	0.072	0.41
Atrial fibrillation	367 844 (27.7)	25 186 (26.8)	16 132 (27.4)	0.009	0.17
Chronic kidney disease	616 172 (46.4)	43 323 (46.1)	26 553 (45.1)	0.005	0.07
Chronic obstructive pulmonary disease	646 715 (48.7)	46 518 (49.5)	29 909 (50.8)	<0.001	0.05
Diabetes	666 634 (50.2)	47 552 (50.6)	29 615 (50.3)	0.70	0.67
Congestive heart failure	758 263 (57.1)	53 942 (57.4)	34 384 (58.4)	0.01	0.11
Hyperlipidemia	1 001 279 (75.4)	69 636 (74.1)	44 098 (74.9)	0.002	0.18
Hypertension	1 191 177 (89.7)	83 827 (89.2)	53 106 (90.2)	0.008	0.002
Stroke or transient ischemic attack	383 779 (28.9)	26 971 (28.7)	17 310 (29.4)	0.19	0.10
History of cancer	247 000 (18.6)	17 010 (18.1)	10 715 (18.2)	0.009	0.85
US Census region					
Northeast	270 655 (20.4)	17 237 (18.3)	5842 (9.9)		
Midwest	295 445 (22.2)	18 479 (19.7)	12 995 (22.1)	<0.001	<0.001
South	535 179 (40.3)	38 039 (40.5)	31 829 (54.1)		
West	226 677 (17.1)	20 221 (21.5)	8210 (13.9)		
Hospital size					
Small (<100 beds)	128 917 (9.7)	10 249 (10.9)	9100 (15.5)		
Medium (100-399 beds)	741 239 (55.8)	51 320 (54.6)	32 118 (54.6)	<0.001	<0.001
Large (≥400 beds)	457 800 (34.5)	32 407 (34.5)	17 658 (30.0)		
Hospital type					
Public	159 400 (12.0)	12 514 (13.3)	8599 (14.6)		
For-profit	187 471 (14.1)	13 938 (14.8)	10 144 (17.2)	<0.001	<0.001
Non-profit	981 085 (73.9)	67 524 (71.9)	40 133 (68.2)		
Hospital geography					
Urban	1 139 518 (86.1)	79 686 (84.8)	45 502 (77.3)		
Suburban	132 763 (10.0)	10 591 (11.3)	9344 (15.9)	<0.001	<0.001
Rural	51 843 (3.9)	3678 (3.9)	3984 (6.8)		

Data are number (%) of patients unless stated otherwise.
*P values reflect comparison using *t* tests or *z* tests of proportions, where appropriate. Joint P value reflects comparison across all three groups of physician political affiliation (Republican, Democrat, and non-donor); P value for Republican *v* Democrat comparison only compares those two groups.
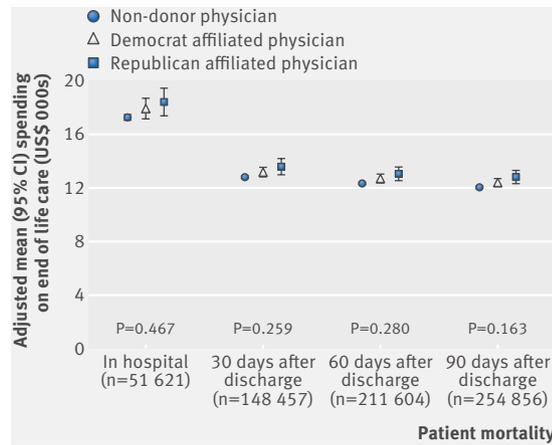
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Fig 1 | Adjusted mean spending (95% confidence interval) on end of life care, by patient mortality and physician political affiliation. Mean adjusted estimates were calculated by the marginal standardization form of predictive margins, a standard approach that computes adjusted estimates by averaging over the entire covariate distribution in the data. P values indicate comparison between Democratic and Republican physicians. Web appendix shows mean differences (95% confidence interval) in adjusted end of life spending between Republican and Democrat physicians

for inpatient deaths, mean adjusted spending was $17 938 (95% confidence interval $17 176 to $18 700) among Democrat physicians and $18 409 ($17 362 to $19 456) among Republican physicians (adjusted Republican v Democrat difference $472 (−$803 to $1747), P=0.47).

Intensive end of life treatments

We found no statistically significant differences in the end of life care for patients who died in hospital across political affiliation categories of treating physicians (table 3). The adjusted proportion of patients treated in intensive care units was similar between Democrat (52.5%), Republican (54.6%), and non-donor physicians (53.5%; adjusted difference in proportion between Republicans v Democrats 2.1% (95% confidence interval −1.2% to 5.4%), P=0.22). Conditional on receiving any care in intensive care units, the mean number of days spent and mean adjusted costs in intensive care units were also similar across groups (table 3).

There were no significant differences in the adjusted proportion of patients receiving intensive end of life treatments between Democrat (38.0%), Republican (40.6%), and non-donor physicians (40.3%; adjusted difference in proportion between Republicans v Democrats 2.6% (95% confidence interval −0.7% to 5.9%), P=0.13; table 3).

Hospice use

The adjusted proportion of patients discharged from hospital to hospice did not vary with physician political affiliation (table 4). For example, among 74 048 patients in the top 5% of predicted 30 day mortality after discharge, the adjusted proportions of patients discharged to hospice were 15.8%, 15.0%, and 15.2% among Democrat, Republican, and non-donor physicians, respectively (adjusted difference between Republicans v Democrats −0.8% (95% confidence interval −2.7% to 0.9%), P=0.43).

Additional analyses

We found no differences in adjusted 30 day mortality according to physician political affiliation, nor any between group differences in adjusted spending for patients in the top 25% of predicted 30 day mortality (eFigure 2), in analyses allowing for the possibility that physician spending could affect patient mortality. Among patients who died in hospital, we also found no differences in adjusted spending on end of life care across finer categories of political contributions (eTable 4). Our findings were also robust to attributing physicians based on the plurality of evaluation and

Table 3	Intensity of end of life care among study patients who died in hospital, by physician political affiliation					
Outcome	Non-donors	Democrats	Republicans	Difference, Republican v Democrat	Joint*	Republican v Democrat*
No of physicians	1378	974	527	—	—	—
Intensive unit care use						
Any use	53.5 (53.0 to 53.9)	52.5 (50.6 to 54.5)	54.6 (52.0 to 57.2)	2.1 (−1.2 to 5.4)	0.50	0.22
Total No of days spent, conditional on use of intensive care unit (mean; 95% CI)	5.5 (5.4 to 5.7)	5.6 (5.3 to 5.9)	5.5 (5.0 to 6.0)	−0.1 (−0.7 to 0.5)	0.93	0.72
Total costs, conditional on use of intensive care unit (mean $; 95% CI)	18 948 (18 341 to 19 555)	18 899 (17 427 to 20 371)	18 907 (16 540 to 21 273)	7.4 (−2708 to 2723)	0.99	0.99
Intensive end of life treatment						
Any intensive end of life treatment	40.3 (39.8 to 40.8)	38.0 (36.2 to 39.9)	40.6 (37.9 to 43.3)	2.6 (−0.7 to 5.9)	0.07	0.14
Intubation and mechanical ventilation	32.5 (32.1 to 33.0)	30.5 (28.6 to 32.3)	33.1 (30.5 to 35.8)	2.7 (−0.6 to 6.0)	0.10	0.11
Tracheostomy	1.3 (1.2 to 1.3)	1.4 (1.1 to 1.6)	1.2 (1.0 to 1.4)	−0.2 (−0.5 to 0.2)	0.60	0.31
Gastrostomy tube insertion	1.9 (1.8 to 2.0)	2.0 (1.5 to 2.5)	1.5 (0.8 to 2.2)	−0.5 (−1.3 to 0.4)	0.47	0.28
Hemodialysis	6.3 (6.1 to 6.5)	6.3 (5.5 to 7.2)	6.4 (5.4 to 7.5)	0.1 (−1.3 to 1.5)	0.95	0.85
Enteral nutrition	6.4 (6.2 to 6.6)	6.5 (5.6 to 7.5)	5.5 (4.5 to 6.5)	−1.1 (−2.5 to 0.3)	0.19	0.14
Cardiopulmonary resuscitation	7.6 (7.4 to 7.9)	7.8 (6.9 to 8.8)	8.2 (6.8 to 9.6)	0.3 (−1.4 to 2.0)	0.73	0.71

Data are adjusted proportion of patients treated in intensive care units or receiving specific intensive end of life treatments (% (95% confidence interval)) unless stated otherwise. Estimates based on 51 621 patients who died in hospital. Mean adjusted estimates were calculated by the marginal standardization form of predictive margins, a standard approach which computes adjusted estimates by averaging over the entire covariate distribution in the data.
*Joint P value reflects comparison across all three groups of physician political affiliation (Republican, Democrat, and non-donor); P value for Republican v Democrat comparison only compares those two groups.

Table 4 | Adjusted proportion of patients discharged to hospice, according to 30 day mortality risk of patients after discharge and physician political affiliation

Predicted mortality risk of patients, 30 days after discharge	No of patients	Adjusted proportion of patients discharged to hospice (% (95% CI))*					
		Non-donors	Democrats	Republicans	Difference, Republican v Democrat	Joint†	Republican v Democrat†
Top 25%	370 702	9.4 (9.3 to 9.5)	9.6 (9.2 to 10.0)	9.4 (8.8 to 10.0)	−0.2 (−1.0 to 0.5)	0.71	0.62
Top 10%	148 082	12.5 (12.3 to 12.7)	12.7 (12.0 to 13.4)	12.6 (11.7 to 13.6)	−0.1 (−1.4 to 1.0)	0.83	0.88
Top 5%	74 048	15.2 (14.9 to 15.4)	15.8 (14.7 to 16.8)	15.0 (13.7 to 16.4)	−0.8 (−2.7 to 0.9)	0.55	0.43

*Mean adjusted estimates were calculated by the marginal standardization form of predictive margins, a standard approach which computes adjusted estimates by averaging over the entire covariate distribution in the data.
†Joint P value reflects comparison across all three groups of physician political affiliation (Republican, Democrat, and non-donor); P value for Republican v Democrat comparison only compares those two groups.

management claims (eFigure 3). Similar findings were obtained in models that excluded hospital fixed effects, in propensity score analysis of spending on end of life care, when estimating spending with generalized linear models (eTable 5) and in subgroup analyses conducted among hospitals in the four US Census regions (eTable 6).

Discussion
Principal findings
In the present study, we examined whether end of life spending and care among Medicare beneficiaries in hospital differed by US physicians' political affiliations. We found no evidence between political affiliation and end of life care, which included overall healthcare spending, intensive end of life treatments, use of intensive care units, or referral to hospice. Similarly, the magnitude of political contributions made by physicians—to either Republican or Democratic parties—was not associated with differences in end of life care. From a clinical perspective, these findings suggest that, at least for inpatients' end of life care, physician political preferences bear no relation with the type of care that patients receive.

Implications
With historic divisiveness in the USA surrounding issues of death and dying, political polarization within American medicine,[12] variation in treatment preferences across US physicians,[7] and recent evidence suggesting that US physicians' political beliefs could influence their provision of care,[3] differences in the delivery of end of life care among physicians of different political persuasions might be expected. We found no evidence that physicians' personal political views affected the character or intensity of end of life care given to patients. Although limited data on physician politics and political polarization exists outside the USA, physicians worldwide have historically been intensely political.[4] Our findings, if generalizable to physicians of other countries and other treatment contexts, suggest that the political beliefs of physicians have limited influence on the type of care that they provide.

Our finding could have several potential explanations. Firstly, political preferences of US physicians might not substantially affect physicians' beliefs, much less actions, regarding end of life care. Polling from the Pew Research Center suggests that members of both major US political parties believe that patients should drive decisions on their end of life care, even if it means discontinuation of life sustaining treatment.[24] Even if political preferences might affect physicians' views on appropriate end of life treatments, physicians may not consciously or subconsciously impose those views on how they care for patients. More generally, demonstrated differences in stated beliefs of Republican and Democrat physicians in surveys might not translate into actual differences in patient care.[23] Political affiliations of physicians can also only serve as noisy signals of other preferences (eg, religious beliefs) that might be more closely aligned with treatment preferences of physicians.

Secondly, our study examined the relation between the end of life care of patients in hospital and political contributions of individual hospital based physicians. Although most patients in hospital for general medical conditions in the USA are cared for by hospitalist physicians,[8-11] medical care—especially complex end of life care—is delivered in teams. Any potential effect of a physician's political preferences on end of life care could be diluted because patients are cared for in multidisciplinary medical teams. Preferences of a patient's primary outpatient provider towards end of life care might also be more relevant than the preferences of inpatient physicians. More generally, factors such as patient preferences, clinical condition, non-political physician characteristics, and health system characteristics could have a greater role in explaining any differences in end of life treatment and spending than physician political ideologies. Nonetheless, because individual attending physicians leading teams have discretion in terms of what clinical services to consult (eg, palliative care services), it is not a priori clear that physician political preferences would not be related to treatment patterns in end of life care.

Study strengths and limitations
Our study had several limitations. Firstly, this study was observational and cannot be interpreted as causal.

Secondly, although previous work demonstrated differences in how Democrat and Republican physicians respond to hypothetical scenarios related to politically polarized healthcare issues,[3] these issues did not include end of life care. We focused on end of life care because of its political polarization and the ability to analyze differences in end of life care across physicians using Medicare data. Future research could analyze whether physician political affiliation is associated with differences in care in other politicized issues, such as female reproductive care, firearm counseling, and human papilloma virus vaccination, all of which are not applicable to the Medicare population.

Thirdly, we studied end of life care among patients treated by hospitalist physicians, assuming that these physicians would have had a substantive role in decisions on end of life care for patients who died in hospital or shortly thereafter, and would be plausibly quasirandomized to patients within the same hospital. We chose this setting to mitigate risk of observed differences in end of life care across physicians being driven by patient preferences, therefore prioritizing the internal validity of our findings. These results might not generalize to primary or specialty care in outpatient settings. In addition, the relative importance of physician preferences in influencing treatment could be larger in emergency or hospital settings where physicians often do not have pre-existing, longitudinal relationships with patients.

Fourthly, differences in political preferences across physicians could correlate with other physician characteristics (such as age and sex) that correlate with patterns of end of life care, but our analysis adjusted for physician age and sex. More generally, a physician's political affiliation is at best a proxy for overall preferences towards how healthcare should be provided. Nonetheless, a recent analysis showed substantial differences between Democrat and Republican physicians in how they would provide care for politically polarized health issues.[3] Fifthly, we identified exposure of patients to Democrat versus Republican physicians on the basis of physician political donations to either party. Many physicians who do not donate to political parties could still have strong political preferences. Although those non-donating physicians could not be categorized as either Republicans or Democrats in our analysis, their exclusion from either party should not necessarily bias our comparison of end of life care intensity.

Another potential limitation was that we attributed decisions on end of life treatment to a specific hospitalist physician on the basis of the plurality of Medicare Part B charges. This approach has been used in recent studies showing similar findings with other physician attribution methods.[8-11] Our findings were also robust to attributing physicians on the basis of the plurality of evaluation and management claims. Furthermore, our findings relate to a specific, albeit substantive, component of care provided by US physicians—general inpatient medical care—and might not generalize to other treatment settings and, importantly, to physicians of other countries.

Finally, our study was based on the notion that physician preferences could influence the intensity of end of life care that patients receive, partly because of previous survey studies suggesting the importance of physician preferences in guiding care related to politically polarized healthcare issues.[3] However, physicians could have a small role in influencing end of life treatments compared with patients and their families, which might also explain the lack of association between physician political affiliation and the intensity of end of life care.

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Web appendix: Supplemental appendix