Brexit and the NHS: voting behaviour and views on the impact of leaving the EU

Stephen Drinkwater¹ · Catherine Robinson²

Abstract

This paper examines three aspects of Brexit with regards to the NHS. First, we consider the influence of views regarding one of the most contentious issues in the referendum campaign: Vote Leave’s claim that the ‘savings’ from EU membership could alternatively be used to provide additional funding for the NHS. We find that views about NHS underfunding had a relatively small, but statistically significant, effect on leave voting even after controlling for a range of socio-demographic and economic variables. However, the magnitude of this effect is reduced and becomes insignificant when health-related and cultural controls are added. Second, we examine how NHS workers voted relative to others in employment, and find that a relatively high proportion was actually leave voters. Finally, we analyse whether individuals thought that Brexit would have a positive or negative impact on the NHS, as well as the reason or reasons for their view. We find that supporters of the Conservative party were by far the most likely to think that Brexit would be good for the NHS.

Keywords Brexit · National Health Service · Voting

Introduction

The decision that the UK made to leave the European Union (EU) following the June 2016 referendum was expected to impact on the National Health Service (NHS) in several ways. These include consequences from a reduction in the size of the economy, which would likely result in less money being spent on public services such as health care. Therefore, as Sir Simon Stevens—the then CEO of the

---

¹ Faculty of Business and Law, University of Roehampton, London SW15 5SL, UK
² Business School, University of Kent, Medway Campus, Kent ME4 4TB, UK
NHS—comments, “when the economy sneezes, the NHS catches a cold” (Simpkin and Mossialos 2017). More specifically in relation to GDP, Brexit had a short-term negative impact on UK output in the aftermath of the vote (Born et al. 2019) and is also predicted to bring about a fall in living standards by reducing GDP per capita by at least 2% (Hantzsche et al. 2019). Even though the eventual withdrawal agreement made with the EU at the end of December 2020 allowed for tariff free trade, thereby avoiding a ‘no-deal’ Brexit (Igwe 2022), leaving the EU is likely to have a detrimental effect on the overall UK economy. This is mainly because of disruptions to trade flows caused by an increase in regulations (De Lyon and Dhingra 2021). In terms of other Brexit outcomes, future EU migrants will need residence permits, although EU citizens already resident in the UK have the right to remain and retain existing rights (Igwe 2022).

The issue of funding for the NHS more generally also played a big role in the lead-up to the referendum. This was because possibly the most controversial claim related to the alternative uses for the expenditure required for EU membership. More specifically, the Leave Campaign argued that this could be redirected to fund the NHS. Our paper considers various issues relating to the NHS and Brexit including how NHS workers voted in the referendum and public views on the impact that Brexit will have on the NHS.

Simpkin and Mossialos (2017) examine the challenges and opportunities of Brexit for the NHS in four key areas: workforce, regulations, cross-border co-operation, and research & innovation. They conclude that international co-operation is vital for enhancing medical research and remaining at the cutting-edge of science but also is central to the UK Government’s Industrial Strategy for growth and prosperity. They argue that UK scientists should be allowed to access clinical trials networks and there should continue to be co-ordinated responses to cross-border health threats. In an article published just before the EU Referendum, McKee and Martin (2016) provide arguments for and against EU membership for the NHS, science and research. It is argued that membership of the EU made it far easier for the NHS to recruit highly skilled workers to fill vacancies that had emerged due to the UK’s under-investment in the training of health workers. Therefore, more restrictive immigration rules are likely to have a detrimental impact on staffing levels in the NHS. Cross-border mobility within the EU has also produced benefits in terms of the large number of life science researchers from Europe that are employed in UK universities, which has led to innovations in relation to drug discoveries and health services research. It is also noted that the European Medicines Agency, which used to be located in London, has enabled a single process for authorising medicines across the EU to be established, thereby reducing the costs of new products as well the time needed to bring them to market. In contrast, McKee and Martin (2016) note that Vote Leave had indicated that the NHS would see increased funding if the UK were to leave the EU, and that there would be more supportive immigration and regulation frameworks. It is also suggested that continued EU membership could harm the UK’s ability to recruit staff from outside of the EU and confer risks on the NHS with regards to being subjected to the whims of EU regulations and worsening institutions.
Brexit and the NHS: voting behaviour and views on the impact… 559

Fahy et al. (2019) argue that all forms of Brexit are bad for the UK’s health system, but that some are worse than others. In particular, they find that a ‘No Deal’ Brexit would be significantly worse than the ‘Withdrawal Agreement’. They also note, however, that all forms of Brexit would have negative implications for the UK’s leadership and governance of health, both at the European and global levels. They further suggest that Brexit would also have a detrimental impact on Parliament’s and other stakeholders’ ability to oversee and scrutinise government actions.

van Schalkwyk et al. (2020) identify several risks to the NHS in a post-Brexit era. These are: undermining the National Institute for Clinical Excellence, extending intellectual property protection, a weakening of regulatory protection, a reduction in scrutiny pertaining to trade, the increased possibility of decisions being made behind closed doors and increased hazards with regards to trade. Godlee et al. (2018) along with van Schalkwyk et al. (2019) argue that a ‘No Deal’ Brexit would disrupt complex supply chains and result in shortages of medicines and devices. Dayan et al. (2020) examine the impact on health in the UK more generally by considering uncertainties surrounding the short-term supply of medicines and medical devices to the UK after the end of the transitional period and the effects of government regulation of the causes of ill-health including poor air quality, tobacco and unhealthy and unsafe food. They also note that lower economic growth and limitations to government spending following Brexit could have a negative impact on the determinants of health, such as unemployment and access to health services. Burdett and Fenge (2018) explore the impact of Brexit on community and practice nurses specifically and conclude that the uncertainties surrounding Brexit are likely to have slowed down the move towards the integration of health and social care provision. Hervey et al. (2021) identify a number of areas in which Brexit can produce externalities for other countries. They categorise these into three types of health “Brexternalities”: those affecting part of the EU, those affecting all of the EU and those that have global effects. They suggest that all of these are negative and therefore identify them as costs of the UK exiting the EU.

Wildman et al. (2016) surveyed 100 senior health economists in October 2016 to elicit responses on a range of issues connected to Brexit including the positive and negative outcomes that could arise for health and health services in the UK. The responses highlighted the link between health spending and GDP, with a negative impact of Brexit on the economy resulting in NHS expenditure suffering. Alternatively, if Brexit benefitted the UK economy, then higher growth would lead to increased resources for the NHS. The labour market was identified as a major concern by respondents given the reliance of the NHS and the social care sector on workers who were born outside the UK. Restrictions on immigration would produce challenges for the health workforce, especially with regards to middle- and low-skilled workers. However, in response to these labour market problems, there may be an increase in the training of UK-born health professionals. Respondents also expressed concerns about the funding of medical research, health service research and socio-economic research following Brexit. They conclude by stating that Brexit is likely to bring about many challenges for health in the UK and that many respondents indicated that there were no positives.
Given the potential implications that Brexit had for the NHS, it is surprising that there appears to be little evidence on how the health care workforce voted in the EU Referendum. One exception is McCrae and Portes (2019), who report the results of a survey of 162 nursing and midwifery students at Kings College London on a range of issues connected to Brexit including on how they voted. They find that only 20% of the 123 respondents who answered the question about voting in the EU Referendum indicated that they had voted leave, which they compare with the overall leave vote of around 52%. However, this is virtually identical to the percentage of students who voted to leave the EU, according to data from the British Social Attitudes Survey (BSAS).

Using data from various years of the BSAS, the specific research questions that we focus on in this paper are as follows: How did workers in Health and Social Care vote in the EU Referendum relative to those employed in other industries and sectors—given that we would expect those who work in the NHS to be best placed to understand the potential consequences of Brexit on health services? What impact do British people think that Brexit will have on the NHS? What influence did views towards the degree to which the NHS was underfunded (or not) have on the leave vote?

We combine data from the 2016–2019 BSAS surveys—each of which asked questions (to at least part of the sample) on whether the respondent voted and how they voted in the EU Referendum—pooling across all years to provide as large a sample of public sector workers in Health and Social Care as possible to address the first research question. Only single years of data are analysed to answer the other two questions, as the relevant questions were only asked in specific years. In particular, the question on views about the funding of the NHS and whether the individual voted in the EU Referendum were only asked to same individuals in 2016, whilst questions about how the NHS will be affected by Brexit were only asked of a subset of the respondents included in the 2018 survey. With regards to the latter questions, respondents were also asked about the reasons why they thought Brexit would be good or bad for the NHS. As a result, an individual’s opinion on the issue could be based on several factors—in keeping with the arguments for and against presented in McKee and Martin (2016) and giving further depth to our understanding of motivations.

The impact of views on the (under) funding of the NHS on the leave vote

The ‘Boris Bus’ may well be the most abiding image of the Vote Leave’s EU Referendum campaign, where the prominent leave campaigner Boris Johnson—subsequently the UK Prime Minister—travelled around the country in a bus emblazoned
with the slogan: “We send the EU £350 m a week, let’s fund our NHS instead”\(^1\) It was highlighted that this sum was equivalent to being able to build a brand new and fully staffed hospital every week. The claim was refuted by senior statisticians at the time and a crowdfunding campaign was subsequently launched to prosecute Boris Johnson 2 years after the vote took place.\(^2\)

More generally, from a political perspective, the Leave Campaign adopted a strategy of focusing on simple messages, especially in relation to immigration and EU threats to national sovereignty.\(^3\) This contrasted with the approach taken by the government backed and official pro-Remain Campaign who emphasized the economic consequences of leaving the EU, dubbed by leave campaigners as “Project Fear”. The economic costs included the Treasury’s estimate that households would be £4,400 worse off by 2030 if the UK voted to leave the EU. Business leaders also drew attention to the economic damage that Brexit could do, especially in terms of job losses.

Our analysis on this aspect can be related to the literature on uniformed voting. Benz and Stutzer (2004) argue that voters’ political awareness is dependent on the political system under consideration. In particular, they find that voters in countries that have referenda are better informed. Whilst, in relation to the characteristics of voters, Wegenast (2011) argues that educated individuals face less transaction and information costs. We use the BSAS from 2016 to provide a representative sample of individuals who voted in the EU referendum.\(^4\) The percentage of all respondents voting to leave the EU was 50.5%, which is close to the official leave vote for Britain (52.1%). Moreover, given the unexpected nature of the result, this percentage is closer to the official leave vote than that recorded in surveys such as Understanding Society, used by other studies including Liberini et al. (2019), where only 42% of respondents thought that the UK should leave the EU. Given that the key question on NHS funding was only asked to a third of respondents and that around three-quarters of eligible voters turned out at the referendum, this leaves around 750 usable observations.\(^5\)

---

\(^1\) Digby (1998) argues that the NHS is a much-loved British institution and was unique when established in 1948 by being funded through general taxation rather than through private or public insurance. Whilst Smith (2018) refers to the NHS as the ‘sacred cow in British politics’.

\(^2\) This included a rebuttal by the UK Statistical Authority in that the figure being quoted related to the gross rather than net cost of membership. The legal case against Johnson was unsuccessful after being thrown out by two high court judges in June 2019. The claim about NHS funding was also watered down after the referendum (Wildman et al. 2017).

\(^3\) The focus on immigration was most notably exemplified by a poster showing an influx of refugees, indicating that the UK was at breaking point. Another well-known example was the suggestion made by another leading leave campaigner, Michael Gove, that ‘people in this country have had enough of experts’.

\(^4\) See Blackaby et al. (2020) for further details of the 2016 survey, especially in terms of its comparability to other sources.

\(^5\) The proportion voting leave in this smaller sample is slightly lower than in the full sample as just under a half of the individuals answering the question on NHS funding (49.3%) indicated that they had voted leave.
The following question was used to construct the explanatory variable of interest: “Is the NHS facing a funding problem?”. Respondents were asked to indicate whether they thought there was (1) No, (2) A minor, (3) A major, or (4) A severe funding problem. Table 1 reports the responses alongside how respondents voted in the referendum. Only a small percentage (under 1%) of respondents indicated that they did not know if the NHS was underfunded. This view was slightly higher amongst leave voters and we exclude these cases from the subsequent analysis. In contrast, the vast majority of respondents (over 85%) thought that the NHS either had a major or severe funding problem. This percentage was higher amongst leave voters, with a differential of just under 10 percentage points compared to remain voters. The difference is statistically significant at the 10% level and it is this dummy variable that we focus upon. We estimate a series of probit regression models to examine whether indicating that the NHS had a major or severe funding problem affected the probability of voting leave. This involves including additional variables in each specification to establish the robustness of the estimates (in relation to the raw differences).

The initial probit model (1) contains a dummy variable indicating whether respondents thought the NHS had either a major or severe funding problem and a set of educational controls based on highest qualification obtained. A second model (2) adds controls for the respondent’s interest in politics, using four dummy variables which measure the extent of views relative to the reference category of very interested in politics. A final set of models (3, 4, 5, 6) add explanatory variables cumulatively. The set of covariates initially consists of demographic and socio-economic characteristics such as those included in Liberini et al. (2019). These models are then augmented by a wider set of controls—including national identity and attitudes towards immigration—which have found to be important in

| Funding Problem in NHS | % of Remain voters | % of Leave voters | Proportion voting leave | Difference in mean | P value |
|------------------------|--------------------|------------------|------------------------|-------------------|---------|
| No funding problem in NHS | 2.3 | 2.1 | 0.471 | − 0.054 | 0.669 |
| A minor funding problem in NHS | 13.0 | 8.7 | 0.398 | − 0.127** | 0.042 |
| A major funding problem in NHS | 48.5 | 47.6 | 0.490 | − 0.034 | 0.392 |
| A severe funding problem in NHS | 35.8 | 40.2 | 0.524 | − | − |
| Don’t know | 0.5 | 1.3 | − | − | − |
| Number of observations | 386 | 378 | 757 | − | − |
| No/minor funding problem in NHS | 15.4 | 11.0 | 0.410 | − 0.095* | 0.076 |
| Major/Severe funding problem in NHS | 84.6 | 89.0 | 0.505 | − | − |

** and * indicate significance at the 5% and 10% levels, respectively, using two-tailed tests. Respondents providing a “Don’t Know” have been excluded from the major/severe dummy variable.
explaining the leave vote (Clarke et al. 2017; Goodwin and Milazzo 2017; Fox 2021).6

Table 2 contains the results from estimating the probit models.7 In the first model, which controls for differences in educational attainment, the variable of interest (the NHS has a major or severe funding problem) becomes more important in comparison to the raw data. In particular, the difference in the probability of voting leave between individuals who believed that the NHS had a major or severe funding problem and those who did not was 13 percentage points, with this effect being significant at the 5% level. In common with other empirical studies on Brexit, including Clarke et al. (2017), we find that education is a very important predictor of how an individual voted in the referendum, with graduates far more likely to be remain voters.

Adding controls for an interest in politics, socio-demographic and economic influences does not affect the marginal effect on the variable of interest greatly, since it remains around 0.13 in each specification and is significant at the 5% level. The only significant effect with regards to the interest in politics variable relates to those with no interest in politics being far more likely to be leave voters compared to individuals expressing a great deal of interest in politics. As further variables are added in specifications (5) and (6), the magnitude of the estimated value of the coefficient is reduced, with the marginal effect falling to 0.115 and significance at only the 10% level after the inclusion of health-related variables. The impact of the variable is further reduced after cultural controls have been added as the marginal effect falls to 0.103 and is not significantly different from zero.

Brexit voting by public sector workers in health and social care

It was unclear how NHS workers would vote ahead of the referendum. On the one hand, a high proportion of staff working in the NHS are highly educated professionals—with degree level qualifications, who have been found to have been far more likely to vote remain (Liberini et al. 2019), but this may be set against the extra funding for the health service that was ‘promised’ by Leave Campaign. Table 3 shows the proportion of leave voters amongst public sector workers in Health and Social Care compared to employees in other industries and sectors.8 It is noticeable from the table that there is a higher percentage of leave voters amongst Health and Social Care workers relative to the other two main public sector employers: Education and Public Administration & Defence. This is despite there being a lower proportion of graduates amongst the latter group of employees in comparison to those employed in health and social care.

6 The notes below Table 2 provide details of the variables included in each of the specifications.
7 Table 9 in the Appendix contains the full results from the fourth and sixth specifications.
8 We use this group to approximate those who work in the NHS. The NHS workforce accounts for around 80% of the number of public sector workers in Health and Social Care, based on estimates from the Annual Population Survey.
Table 2  Marginal effects for the probability of voting leave in the EU referendum

|                              | (1)       | (2)       | (3)       | (4)       | (5)       | (6)       |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Major/severe funding problem in NHS | 0.130**   | 0.123**   | 0.132**   | 0.130**   | 0.115*    | 0.103     |
|                              | (0.055)   | (0.057)   | (0.060)   | (0.064)   | (0.065)   | (0.068)   |
| First degree                 | 0.111     | 0.094     | 0.055     | 0.016     | 0.033     | 0.059     |
|                              | 0.090     | 0.091     | 0.094     | 0.095     | 0.098     | 0.103     |
| Higher education below degree | 0.388***  | 0.377***  | 0.343***  | 0.315***  | 0.327***  | 0.324***  |
|                              | (0.066)   | (0.068)   | (0.075)   | (0.083)   | (0.085)   | (0.087)   |
| A level or equivalent        | 0.373***  | 0.363***  | 0.355***  | 0.344***  | 0.356***  | 0.324***  |
|                              | (0.069)   | (0.071)   | (0.072)   | (0.079)   | (0.081)   | (0.087)   |
| O level or equivalent        | 0.507***  | 0.499***  | 0.467***  | 0.435***  | 0.449***  | 0.389***  |
|                              | (0.053)   | (0.054)   | (0.060)   | (0.071)   | (0.071)   | (0.083)   |
| CSE or equivalent            | 0.513***  | 0.505***  | 0.479***  | 0.452***  | 0.463***  | 0.435***  |
|                              | (0.039)   | (0.041)   | (0.050)   | (0.061)   | (0.060)   | (0.070)   |
| Foreign or other qualification| 0.275**   | 0.252*    | 0.195     | 0.148     | 0.171     | 0.149     |
|                              | (0.123)   | (0.132)   | (0.140)   | (0.157)   | (0.159)   | (0.166)   |
| No qualifications            | 0.530***  | 0.504***  | 0.451***  | 0.358***  | 0.360***  | 0.334***  |
|                              | (0.048)   | (0.048)   | (0.065)   | (0.083)   | (0.090)   | (0.098)   |
| Quite a lot of interest in politics | −         | − 0.041   | − 0.036   | − 0.064   | − 0.065   | − 0.041   |
|                              | (0.060)   | (0.064)   | (0.064)   | (0.065)   | (0.060)   |            |
| Some interest in politics    | −         | 0.029     | 0.060     | 0.037     | 0.029     | 0.004     |
|                              | (0.572)   | (0.066)   | (0.068)   | (0.068)   | (0.068)   | (0.072)   |
| Not very much interest in politics | −         | 0.046     | 0.052     | − 0.019   | − 0.023   | − 0.005   |
|                              | (0.471)   | (0.079)   | (0.082)   | (0.083)   | (0.083)   | (0.088)   |
| No interest in politics      | −         | 0.300***  | 0.372***  | 0.387***  | 0.390***  | 0.385***  |
|                              | (0.087)   | (0.077)   | (0.083)   | (0.082)   | (0.082)   | (0.088)   |
| Demographic controls         | −         | −         | X         | X         | X         |            |
| Economic controls            | −         | −         | X         | X         | X         |            |
| Health-related controls      | −         | −         | −         | X         | X         |            |
| Cultural controls            | −         | −         | −         | −         | X         |            |
| N                            | 756       | 756       | 746       | 729       | 727       | 727       |
| Pseudo R-squared             | 0.138     | 0.150     | 0.199     | 0.249     | 0.253     | 0.315     |

Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests. Reference categories are Post-Graduate degree for education and a great deal of interest in politics. Demographic controls are gender, age, region, ethnicity, whether born in the UK, marital status, children in household and religion. Economic controls are economic activity, housing tenure, Index of Multiple Deprivation quintile and view of current financial position. Health-related controls are view of own health status and satisfaction with the NHS. Cultural controls are national identity and whether concerned about immigration.
High proportions of remain voters are also to be found in (industrial) sectors with workforces with a high concentration of graduates—such as Information & Communications, Financial & Insurance Services and Professional, Scientific and Technical Services, as well as private sector workers employed in Education and those employed in the Charitable sector. More than a half of the workers in each of these sectors were graduates and less than 30% voted to leave. Well over a half of private sector workers in Health and Social Care (57%) voted leave in the EU Referendum. However, less than 17% of this group of workers were graduates. A similar proportion of people employed in Agriculture, Forestry and Mining were graduates and an even higher percentage (65%) voted to leave the EU. This was slightly below the percentage of leave voters amongst Construction workers (67%).

Table 4 reports the marginal effects from probit models in other industries and sectors relative to public sector workers in Health and Social Care. Despite controlling for education and other factors (including gender, age and region—as noted

| Sector                                      | Prop. leave voters | N   | Proportion graduates |
|---------------------------------------------|--------------------|-----|----------------------|
| Health & social work: public sector         | 0.405              | 257 | 0.479                |
| Education: public sector                    | 0.238              | 298 | 0.664                |
| Public administration & defence             | 0.368              | 136 | 0.390                |
| Other public sector                         | 0.457              | 92  | 0.380                |
| Agriculture/forestry/mining                 | 0.652              | 23  | 0.174                |
| Manufacturing                               | 0.515              | 237 | 0.283                |
| Public Utilities                            | 0.529              | 34  | 0.471                |
| Construction                                | 0.671              | 85  | 0.235                |
| Distribution                                | 0.504              | 278 | 0.147                |
| Transport & storage                         | 0.578              | 102 | 0.157                |
| Accommodation & food services               | 0.471              | 68  | 0.132                |
| Information & communications               | 0.260              | 96  | 0.531                |
| Financial & insurance services              | 0.250              | 112 | 0.500                |
| Prof., scientific & technical activities    | 0.266              | 158 | 0.557                |
| Admin. & support services                   | 0.506              | 87  | 0.241                |
| Education: private                          | 0.232              | 56  | 0.625                |
| Health & social work: private               | 0.573              | 96  | 0.167                |
| Other private sector                        | 0.538              | 52  | 0.173                |
| Nationalised industry                       | 0.472              | 36  | 0.250                |
| Charity                                     | 0.279              | 111 | 0.486                |
| Other sector                                | 0.450              | 20  | 0.350                |
| Total                                       | 0.412              | 2434| 0.381                |

Data relate to respondents answering questions on whether and how voted in the EU Referendum that were included in the BSA surveys carried out between 2016 and 2019. Self-employed workers have been excluded. The correlation coefficient between the proportions of leave voters and graduates in the 21 industrial sectors in the table is −0.85
below Table 1), significant differences remain. Construction was the only industry which had a significantly higher proportion of leave voters after controlling for other influences. In contrast, in the first specification (which excludes occupational controls), the probability of voting leave was significantly lower at the 5% level in four industries/sectors. Controlling for occupation in the second specification has some impact on these findings, with a reduced level of significance observed in Financial & Insurance Services and Professional, Scientific & Technical Activities. The probability of voting leave also becomes significant in Private Education at the 10% level in the second specification. The relatively high level of public sector workers

| Table 4 Marginal effects for industry and sectoral dummies (relative to public sector workers in health and social care) for the probability of voting leave |
|---------------------------------|-----------------|-----------------|
|                                 | (1)             | (2)             |
|                                 | M.E  S.E        | M.E  S.E        |
| Education: public              | −0.145*** 0.040 | −0.174*** 0.040 |
| Pub admin: public              | −0.069 0.051    | −0.060 0.053    |
| Other public sector            | 0.027 0.065     | 0.018 0.066     |
| Agriculture/forestry/mining    | 0.190 0.118     | 0.197 0.118     |
| Manufacturing                  | 0.019 0.048     | 0.021 0.050     |
| Public Utilities               | 0.105 0.097     | 0.121 0.101     |
| Construction                   | 0.202*** 0.069  | 0.205*** 0.071  |
| Retail/distribution            | −0.022 0.045    | 0.005 0.048     |
| Transport & storage            | 0.035 0.064     | 0.005 0.065     |
| Accommodation & food services  | −0.023 0.068    | −0.048 0.069    |
| Information & communications   | −0.101 0.061    | −0.088 0.062    |
| Financial & insurance services | −0.139** 0.053  | −0.109* 0.056   |
| Prof., scientific & technical activities | −0.145*** 0.047 | −0.111*** 0.051 |
| Admin & support services       | 0.039 0.066     | 0.022 0.069     |
| Education: private             | −0.108 0.071    | −0.139* 0.069   |
| Health & soc. work: private    | 0.098 0.063     | 0.055 0.065     |
| Other private sector           | 0.005 0.077     | 0.009 0.076     |
| Nationalised industry          | −0.018 0.089    | −0.012 0.092    |
| Charity                        | −0.142** 0.051  | −0.143** 0.052  |
| Other sector                   | −0.004 0.115    | −0.018 0.117    |
| Pseudo R-squared               | 0.154           | 0.170           |
| N                              | 2464            | 2434            |

Marginal effects are calculated at sample means. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using robust standard errors and two-tailed tests. Specification 1 controls for gender, age, highest educational qualifications, region, ethnicity, marital status, children in household, religion, and year of interview. Specification 2 also includes 1-digit occupational controls.

Two specifications of the model have been estimated because of the potential impact of occupation over and above education and other variables, given that there are occupational differences between NHS workers.
Brexit and the NHS: voting behaviour and views on the impact…

...dissatisfaction in the NHS due to staff shortages (Iliffe and Manthorpe 2019).

Table 5 presents estimates for public sector workers employed in Health and Social Care, as well as those employed in Education, for the probability of voting leave. For both groups of workers, lower levels of education have a positive and significant effect on the probability of being a leave voter. This is particularly noticeable for public sector workers employed in Health and Social Work, where individuals possessing a post-graduate degree are significantly less likely to vote leave in...

| Table 5 | Marginal effects for the probability of voting leave in selected public sector industries |
|---------|--------------------------------------------------------------------------------------------------|
|         | Health and social care                                                                            | Education                                                                                   |
|         | M.E | S.E | Mean | M.E | S.E | Mean |
| Female  |     |     |      |     |     |      |
| Aged 30–39 |     |     |      |     |     |      |
| Aged 40–49 |     |     |      |     |     |      |
| Aged 50–59 |     |     |      |     |     |      |
| Aged 60 and over |     |     |      |     |     |      |
| Under-graduate degree |     |     |      |     |     |      |
| Higher Ed. below degree |     |     |      |     |     |      |
| A level or equivalent |     |     |      |     |     |      |
| O level or equivalent |     |     |      |     |     |      |
| Other or no qualification |     |     |      |     |     |      |
| Wales |     |     |      |     |     |      |
| London |     |     |      |     |     |      |
| Rest of England |     |     |      |     |     |      |
| Interviewed in 2017 |     |     |      |     |     |      |
| Interviewed in 2018 |     |     |      |     |     |      |
| Interviewed in 2019 |     |     |      |     |     |      |
| Married |     |     |      |     |     |      |
| Children in household |     |     |      |     |     |      |
| Ethnic minority |     |     |      |     |     |      |
| Roman Catholic |     |     |      |     |     |      |
| Church of England/Anglican |     |     |      |     |     |      |
| Other Christian |     |     |      |     |     |      |
| Non-Christian religion |     |     |      |     |     |      |
| Intermediate non-manual |     |     |      |     |     |      |
| Junior non-manual |     |     |      |     |     |      |
| Other occupation |     |     |      |     |     |      |
| Pseudo R-Squared |     |     |      |     |     |      |
| N |     |     |      |     |     |      |

Marginal effects are calculated at sample means. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively, using robust standard errors and two-tailed tests. Reference categories are aged 18–29, post-graduate degree, Scotland, interviewed in 2016, no religion and professional/manager.
comparison to all other educational categories. In contrast, only two of the positive effects associated with the educational categories are significant at the 5% level relative to employees with post-graduate degrees in (public sector) Education. The majority of the other explanatory variables are not significant for each group of workers. The exceptions being public sector workers in Health and Social Care living in London (relative to those living in Scotland) and Other Christians employed in Education (relative to those with no religion), who are significantly more likely to vote leave at the 10% and 5% levels, respectively. The lack of significance of the other variables may be partly due to the relatively small sample sizes. However, given the strong influence of education, especially for those employed in Health and Social Care, the more muted impact of other factors such as gender, age, marital status and ethnicity is interesting and points to a relatively homogeneous impact of these characteristics on voting leave, once educational differences have been accounted for. It is also interesting that there are no significant occupational effects after controlling for other influences, including educational qualifications.¹⁰

Therefore, our results indicate that controlling for socio-demographic characteristics does little to account for the differences in leave voting for public sector workers in Health and Social Care compared to other industries, particularly Education, which we believe provides a suitable comparison group. There may, however, be other variables that could explain these differences, including national identity and attitudes towards immigration (Goodwin and Milazzo 2017). Adding measures of national identity in the above regressions only has a small effect on the estimates reported in Tables 4 and 5. This is because the distribution of responses to the national identity questions for those employed in Health and Social Care is very similar to other public sector workers, especially in Education. No consistent questions on attitudes towards immigration were asked between 2017 and 2019, but the responses to a question regarding concerns about immigration provide a possible explanation for the observed differences in voting patterns in the EU Referendum. In particular, amongst public sector workers who voted, 32% of those employed in Health and Social Care expressed a concern about immigration. This was slightly higher than the percentage indicated by Public Administration and Defence but almost double that of public sector workers in Education (17%). Our findings with regards to this group of workers may also be related to the arguments made by Curtis (2018) that voters are now less likely to identify with a political party and are more inclined to be influenced by particular policies.

¹⁰ Some of the occupational dummies become significant if the educational controls are excluded. Specifically, the positive effects for Junior Non-Manual and Other occupations are significant at the 10% and 1% levels for NHS workers and at the 5% level for public sector workers employed in education. The significance levels attached to the other explanatory variables are not greatly affected if the educational dummies are excluded.
Brexit and the NHS: voting behaviour and views on the impact…

Public opinion on the impact of Brexit on the NHS

Given the virtually unanimous view amongst health economists that Brexit will adversely affect the NHS (Wildman et al., 2016), then it is interesting to see the extent to which this view is held amongst the public. Table 6 reports how respondents thought Brexit would impact on the NHS. It shows that around 6% of respondents answering the question posed in 2018 thought that Brexit would be a very good thing for the NHS and around 22% that it would be a good thing. Slightly higher percentages of the sample answering this question thought that Brexit would be very bad (11%) or bad (24%). Quite a high percentage (around 7%) said that they did not know and the remaining 31% thought that Brexit would neither have a positive or negative effect on the NHS. The distribution of responses to this question was somewhat different to that found in the British Election Survey Internet Panel Wave 8, as reported in Curtice (2017). He analysed responses to a question on the consequences of leaving the EU that was asked in May/June 2016 and reported that 33% thought that Brexit would result in a better NHS, 21% that the NHS would be worse following Brexit and 36% that the NHS would be about the same. Reasons for this discrepancy could be that (or at least partly due to) the BSAS responses relate to 2018 when the claims of the Leave vote had been discredited (and disowned) by their supporters (Simpkins and Mossialos, 2017). The table also reveals differences by political party supported, with a far higher percentage of supporters of the Conservative party reporting that they thought that Brexit would be good or very good for the NHS in comparison to supporters of other parties, as well as in comparison to those individuals without any political affiliation, but to a lesser extent.

Table 7 explores the connection between individual characteristics and perceptions on the impact of Brexit on the NHS. The first set (1) is ordered probit estimates for the respondent’s view of the implications of Brexit for the NHS. The dependent variable has been constructed, such that a higher value corresponds with a more positive view of Brexit on the NHS. The table also includes marginal effects from three (binary) probit models: the probability of indicating that leaving the EU would either be good (including very good) or bad (including very bad) for the NHS (2)
| Variable                                | Coef    | S.E    | M.E    | S.E    | Coef    | S.E    | M.E    | S.E    |
|-----------------------------------------|---------|--------|--------|--------|---------|--------|--------|--------|
| Female                                  | 0.014   | 0.077  | −0.018 | 0.037  | −0.008  | 0.033  | −0.093**| 0.044  |
| Married                                 | −0.092  | 0.079  | 0.070* | 0.038  | 0.017   | 0.034  | −0.065 | 0.046  |
| Children in household                   | −0.133  | 0.096  | 0.066  | 0.044  | −0.061  | 0.044  | 0.023  | 0.057  |
| Ethnic minority                         | 0.148   | 0.162  | −0.118*| 0.066  | 0.067   | 0.075  | −0.088 | 0.095  |
| Roman Catholic                          | −0.123  | 0.147  | 0.059  | 0.065  | −0.022  | 0.056  | −0.017 | 0.092  |
| Church of England/Anglican             | 0.070   | 0.110  | −0.008 | 0.054  | 0.044   | 0.048  | −0.045 | 0.058  |
| Other Christian                         | 0.182*  | 0.099  | −0.078 | 0.047  | 0.039   | 0.045  | 0.047  | 0.062  |
| Non-Christian Religion                  | 0.089   | 0.183  | −0.068 | 0.083  | −0.137* | 0.061  | 0.047  | 0.117  |
| North East                              | 0.406*  | 0.212  | −0.157*| 0.079  | 0.214** | 0.111  | 0.172  | 0.112  |
| North West                              | 0.258   | 0.166  | −0.106 | 0.071  | 0.139*  | 0.086  | 0.265***| 0.088  |
| Yorkshire & the Humber                  | 0.401** | 0.161  | −0.113 | 0.069  | 0.204** | 0.085  | 0.278***| 0.089  |
| East Midlands                            | 0.318*  | 0.169  | −0.074 | 0.074  | 0.178** | 0.088  | 0.313***| 0.082  |
| West Midlands                            | 0.329*  | 0.183  | −0.105 | 0.074  | 0.243***| 0.093  | 0.199* | 0.101  |
| South West                              | 0.213   | 0.174  | −0.050 | 0.080  | 0.080   | 0.089  | 0.182* | 0.098  |
| East of England                          | 0.130   | 0.158  | −0.025 | 0.074  | 0.054   | 0.077  | 0.171* | 0.096  |
| London                                  | 0.238   | 0.161  | −0.131*| 0.068  | 0.129   | 0.088  | −0.024 | 0.109  |
| South East                              | 0.200   | 0.155  | −0.114 | 0.067  | 0.146** | 0.082  | 0.254***| 0.085  |
| Wales                                   | 0.083   | 0.245  | −0.075 | 0.093  | 0.115   | 0.115  | 0.310***| 0.093  |
| Aged 30–39                              | 0.003   | 0.148  | −0.054 | 0.070  | −0.026  | 0.071  | 0.056  | 0.106  |
| Aged 40–49                              | 0.122   | 0.154  | −0.058 | 0.070  | 0.080   | 0.079  | 0.180* | 0.099  |
| Aged 50–59                              | 0.254   | 0.157  | −0.109 | 0.067  | 0.102   | 0.080  | 0.143  | 0.100  |
| Aged 60–69                              | 0.118   | 0.183  | −0.142*| 0.074  | 0.036   | 0.087  | 0.169  | 0.107  |
| Aged 70 and over                         | 0.147   | 0.205  | −0.128 | 0.091  | 0.087   | 0.099  | 0.179  | 0.119  |
| Higher Ed. below degree                  | 0.443***| 0.126  | −0.171***| 0.048 | 0.062   | 0.063  | 0.180**| 0.069  |
| A level or equivalent                    | 0.470***| 0.129  | −0.184***| 0.045 | 0.147** | 0.063  | 0.155**| 0.068  |
| O level or equivalent                    | 0.562***| 0.117  | −0.204***| 0.043 | 0.159***| 0.058  | 0.282***| 0.058  |
| CSE or Equivalent                       | 0.817***| 0.160  | −0.243***| 0.049 | 0.149** | 0.080  | 0.372***| 0.065  |
| Foreign or other qualification           | 0.353   | 0.279  | −0.214 | 0.121  | −0.083  | 0.156  | 0.198  | 0.123  |
| No qualification                        | 0.862***| 0.117  | −0.301***| 0.039 | 0.269***| 0.058  | 0.292***| 0.064  |
| Unemployed                              | 0.275   | 0.200  | −0.020 | 0.086  | 0.163** | 0.089  | 0.246** | 0.096  |
| Student                                 | −0.245  | 0.206  | 0.220* | 0.120  | −0.113  | 0.098  | 0.135  | 0.170  |
| Permanently sick                         | 0.251   | 0.201  | −0.076 | 0.086  | 0.242***| 0.090  | −0.029 | 0.160  |
| Retired                                 | 0.332** | 0.147  | −0.110 | 0.066  | 0.115*  | 0.067  | 0.009  | 0.079  |
Table 7 (continued)

| Effect of Brexit on NHS | Brexit bad for NHS | Brexit good for NHS | Leave Voter |
|-------------------------|--------------------|---------------------|-------------|
| Coef S.E | M.E S.E | M.E S.E | M.E S.E | M.E S.E |
| Looking after home | 0.030 0.210 | 0.076 0.094 | 0.048 0.090 | 0.006 0.111 |
| Other activity | 0.201 0.347 | -0.051 0.122 | 0.010 0.131 | 0.361 0.176 |
| Labour supporter | -0.638*** 0.101 | 0.285*** 0.047 | -0.180*** 0.036 | -0.328*** 0.048 |
| Liberal democrat supporter | -0.963*** 0.170 | 0.339*** 0.072 | -0.252*** 0.027 | -0.292*** 0.067 |
| Other party supporter | -0.396*** 0.135 | 0.188*** 0.064 | -0.092* 0.044 | -0.130** 0.064 |
| Supports no party | -0.066 0.119 | -0.058 0.062 | -0.099** 0.043 | -0.129 0.076 |
| Pseudo R-Squared | 0.089 | 0.171 | 0.148 | 0.172 |
| N | 897 | 897 | 897 | 689 |

Marginal effects are calculated at sample means. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using robust standard errors and two-tailed tests. Reference categories are aged 18–29, graduate, Scotland, no religion and supports the Conservative party. Results in model (4) just relate to individuals interviewed in 2018.
Table 8  Reasons for views on the impact of Brexit for the NHS (2018)

| View of Brexit on the NHS | Good/very good | Bad/very bad |
|---------------------------|----------------|-------------|
| More/less money available for the government to spend on the NHS (%) | 59.9 (42.1) | 42.6 (20.7) |
| More NHS jobs for British people (%) | 22.5 (5.6) | – |
| Medicines and equipment will cost less/more (%) | 15.4 (1.9) | 55.4 (12.0) |
| Fewer EU rules and regulations (%) | 38.2 (8.4) | 15.5 (2.2) |
| Fewer migrants using the NHS (%) | 49.1 (35.6) | – |
| More/less funding for medical research (%) | 19.5 (2.8) | 48.4 (4.3) |
| Restrictions on non-British using the NHS (%) | – | 21.0 (7.6) |
| More difficult to recruit staff from the EU (%) | – | 75.8 (46.7) |
| Other reason (%) | 4.5 (3.8) | 4.1 (6.5) |
| % giving 1 reason | 40.1 | 26.8 |
| % giving 2 reasons | 27.0 | 23.6 |
| % giving 3 reasons | 23.2 | 26.5 |
| % giving 4 reasons | 6.0 | 11.7 |
| % giving 5 reasons | 1.1 | 6.1 |
| % giving 6 reasons | 2.6 | 5.0 |
| % giving 7 reasons | 0.0 | 0.3 |
| Mean number of reasons | 2.09 | 2.63 |
| N (unweighted) | 267 | 343 |

The numbers in parentheses are the percentages of the total who stated only one reason for why they thought that leaving the EU would be good or bad for the UK.

effects (at the 5%) levels for females who are significantly more likely to be leave voters and Other Christians who thought that Brexit would be good for the NHS.\textsuperscript{11}

Table 8 contains the reasons that respondents gave for their views. A higher proportion of those individuals who thought that Brexit would be good or very good for the NHS only gave one reason (40%) compared to those who thought that Brexit would have a bad or very bad effect on the NHS (27%). The mean number of reasons given for their choice was 2.63 for individuals who thought Brexit would be bad or very bad for the NHS and 2.09 for those who thought it would be good or very good. 42% of the 107 respondents who gave only one reason why Brexit would be a good or very good thing for the NHS indicated that this was because more money would be available to spend on it, which might provide some tentative evidence in favour of impact of Leave’s campaign’s focus on spending (additional) money on the NHS. 36% of those giving a single reason why Brexit would be good/very good for the

\textsuperscript{11} The marginal effect for this latter variable is negative and significant at the 10% level in relation to Brexit being bad for the NHS. The marginal effect is positive but insignificant when the dependent variable is Brexit is good for the NHS.
NHS indicated that it would be as a result of fewer migrants using the NHS. The most common reasons given for why Brexit would be bad or very bad for the NHS were that it would be more difficult to recruit staff from the EU, cited by 76% of all respondents holding such a view and 47% giving a single reason, medicines and equipment would cost more (indicated by 55% with this view and 12% giving one reason), less funding for medical research (48%; 4%) and less money available for the government to spend on the NHS (43%; 21%).

Conclusions

Despite research that indicates that Brexit will have “overwhelmingly negative consequences for health care and health within the UK” (Hervey et al. 2021, p. 177), a relatively high proportion—over 40%—of public sector workers employed in Health and Social Care voted leave in the EU Referendum. This was around the same percentage as all those in employment and considerably higher than workers in several other sectors and industries, most notably Education, even after controlling for a range of personal characteristics. We also find that a relatively high percentage of the British electorate thought that Brexit would be beneficial for the NHS, with 6% of the sample of respondents interviewed in 2018, indicating that Brexit would be a very good thing for the NHS and 22% that it would be a good thing. Interestingly, we also find that individuals who held these positive views were far more likely to give only one or two reasons for their choice in comparison to those who thought that Brexit would be bad or very bad for the NHS. Almost 80% of those giving one reason why Brexit would be a good/very good thing for the NHS indicated they thought it would be, because more money would be available or there would be fewer migrants using the service. Whilst almost a half of those giving one reason why Brexit would be bad or very bad for the NHS indicated that it was, because it would be more difficult to recruit staff from the EU (Table 8).

We also investigate the potential impact of Vote Leave’s campaign message in relation to extra funding for the NHS. The significant finding regarding views about the degree to which the NHS was underfunded had on the leave vote—which persists even after controls for education, interest in politics, socio-demographic and economic influences have been included—is reduced and becomes insignificant as a wider range of influences, especially national identity and attitudes towards immigration, are added. This suggests that the probability that an individual voted leave was not greatly affected by them being uninformed on this issue. Rather, other covariates such as those related to health and culture reduced the influence of voters’ views on whether the NHS was underfunded. Therefore, although this campaign message appears to have had a positive impact on the

---

12 Fitzgerald et al. (2020) provide examples of how the right-wing Brexit supporting press regularly published articles before the referendum on the demands that immigrants made on health resources.

--

DATE: 19. July 2022.

WORD COUNT: 8600 (Excluding First Page).
leave vote, other issues such as those that preyed on voters’ fears—especially in relation to attitudes towards immigration for individuals with an English national identity—had a far larger influence on the final outcome. Thus, in common with other economic factors, this slogan undoubtedly influenced perceptions surrounding the costs and benefits surrounding the decision to remain or leave the EU, but was not the key driver of the leave vote. As such, the “Boris Bus” slogan appears to have embodied a bundle of attitudes and beliefs rather than represent a cast iron pledge that was ever believed by the British electorate.

Our findings suggest a number of possible avenues for future research. These include establishing the extent to which different groups of voters were influenced by Vote Leave’s pledge to increase funding in the NHS. In particular, it would be interesting to ascertain exactly what impact such claims had on the way in which public sector workers in Health and Social Care voted, given that a relatively high proportion of this group appeared to be in favour of the UK leaving the EU at the time of the Brexit referendum. It should, therefore, be possible for qualitative researchers to obtain further insights on why sections of the electorate voted in this way. Furthermore, the COVID-19 pandemic has seen increased public support for the NHS and its workers, as well as putting increased pressure on its operations. Therefore, it will be fascinating to see whether the pandemic has brought about a change in public opinion with regards to the impact of Brexit on the NHS.

Appendix

See Table 9.
### Table 9
Means of explanatory variables and estimates from specifications (4) and (6) for the probability of voting leave

|                                | Specification 4 | Specification 6 |
|--------------------------------|-----------------|-----------------|
|                                | Marginal effect | St. Err          | Mean          | Marginal effect | St. Err          |
| Major/severe funding problem in NHS | 0.130***        | 0.064           | 0.869         | 0.103           | 0.068           |
| First degree                   | 0.016           | 0.095           | 0.182         | 0.059           | 0.103           |
| Higher education below degree  | 0.315***        | 0.083           | 0.102         | 0.324***        | 0.087           |
| A level or equivalent          | 0.344***        | 0.079           | 0.173         | 0.324***        | 0.087           |
| O level or equivalent          | 0.435***        | 0.071           | 0.197         | 0.389***        | 0.083           |
| CSE or equivalent              | 0.452***        | 0.061           | 0.080         | 0.435***        | 0.070           |
| Foreign or other qualification | 0.148           | 0.157           | 0.019         | 0.149           | 0.166           |
| No qualifications              | 0.358***        | 0.088           | 0.165         | 0.334***        | 0.098           |
| Quite a lot of interest in politics | −0.064       | 0.064           | 0.315         | −0.053          | 0.069           |
| Some interest in politics      | 0.037           | 0.068           | 0.318         | 0.004           | 0.072           |
| Not very interested in politics | −0.019         | 0.082           | 0.154         | −0.005          | 0.088           |
| No interest at all in politics | 0.387***        | 0.083           | 0.044         | 0.385***        | 0.088           |
| Age 25–34                      | 0.196           | 0.159           | 0.120         | 0.294**         | 0.131           |
| Age 35–44                      | 0.116           | 0.169           | 0.169         | 0.138           | 0.155           |
| Age 45–54                      | 0.214           | 0.155           | 0.175         | 0.246*          | 0.139           |
| Age 55–64                      | 0.276*          | 0.153           | 0.179         | 0.285*          | 0.140           |
| Age 65–74                      | 0.275           | 0.166           | 0.197         | 0.255           | 0.162           |
| Age 75 and over                | 0.347*          | 0.151           | 0.117         | 0.330*          | 0.150           |
| Female                         | 0.065           | 0.046           | 0.567         | 0.084*          | 0.049           |
| North East                     | 0.263**         | 0.098           | 0.052         | 0.264           | 0.169           |
| North West                     | 0.169*          | 0.088           | 0.132         | 0.112           | 0.177           |
| Yorkshire & the Humber         | 0.251**         | 0.093           | 0.085         | 0.155           | 0.184           |
| East Midlands                  | 0.062           | 0.112           | 0.065         | −0.041          | 0.190           |
| West Midlands                  | 0.287**         | 0.089           | 0.077         | 0.238           | 0.167           |
| East of England                | 0.234***        | 0.085           | 0.120         | 0.148           | 0.178           |
| London                         | 0.140           | 0.110           | 0.067         | 0.105           | 0.187           |
| South East                     | 0.221**         | 0.086           | 0.132         | 0.152           | 0.175           |
| South West                     | 0.207**         | 0.088           | 0.116         | 0.098           | 0.181           |
| Wales                          | 0.161           | 0.108           | 0.052         | 0.164           | 0.118           |
| Rural                          | 0.076           | 0.053           | 0.231         | 0.092           | 0.057           |
| Ethnic Minority                | 0.035           | 0.099           | 0.072         | 0.058           | 0.100           |
| Born in the UK                 | 0.139           | 0.104           | 0.935         | 0.071           | 0.120           |
| Co-habitating                  | −0.137*         | 0.074           | 0.095         | −0.186**        | 0.074           |
| Divorced or separated          | 0.000           | 0.070           | 0.129         | 0.032           | 0.077           |
| Widowed                        | −0.215***       | 0.074           | 0.077         | −0.077          | 0.092           |
| Single                         | −0.149**        | 0.071           | 0.171         | −0.126*         | 0.074           |
| 1 Child in household           | 0.148*          | 0.083           | 0.083         | 0.175*          | 0.087           |
| 2 Children in household        | 0.001           | 0.087           | 0.100         | −0.003          | 0.089           |
| 3 Children in household        | 0.091           | 0.111           | 0.045         | 0.133           | 0.108           |
Table 9 (continued)

| Specification 4 | Specification 6 |
|-----------------|-----------------|
| Marginal effect | St. Err          | Mean | Marginal effect | St. Err |
| 4 Or more children in household | $-0.111$ | $0.114$ | $0.039$ | $-0.089$ | $0.119$ |
| Unemployed      | $0.165$ | $0.113$ | $0.034$ | $0.225^*$ | $0.106$ |
| Student         | $-0.277^*$ | $0.120$ | $0.029$ | $-0.274^*$ | $0.127$ |
| Permanently sick| $0.296^{**}$ | $0.122$ | $0.028$ | $0.327^{**}$ | $0.116$ |
| Retired         | $0.098$ | $0.085$ | $0.320$ | $0.115$ | $0.092$ |
| Looking after home | $-0.039$ | $0.095$ | $0.062$ | $0.017$ | $0.097$ |
| Other economic activity | $0.316$ | $0.162$ | $0.007$ | $0.328$ | $0.188$ |
| Comfortable on present income | $0.017$ | $0.068$ | $0.435$ | $0.006$ | $0.071$ |
| Neither comfortable or uncomfortable | $0.050$ | $0.075$ | $0.320$ | $0.046$ | $0.078$ |
| Struggling on present income | $0.191^*$ | $0.097$ | $0.099$ | $0.189^*$ | $0.099$ |
| Really struggling on present income | $-0.068$ | $0.151$ | $0.023$ | $-0.128$ | $0.156$ |
| Lives in IMD Quartile 2 Area | $0.046$ | $0.076$ | $0.168$ | $0.086$ | $0.082$ |
| Lives in IMD Quartile 3 Area | $-0.046$ | $0.081$ | $0.215$ | $-0.017$ | $0.084$ |
| Lives in IMD Quartile 4 Area | $-0.059$ | $0.079$ | $0.234$ | $-0.053$ | $0.083$ |
| Lives in IMD Quartile 5 Area | $-0.054$ | $0.083$ | $0.238$ | $-0.038$ | $0.086$ |
| Owner occupied: buying | $-0.016$ | $0.063$ | $0.292$ | $0.005$ | $0.068$ |
| Social: local authority | $0.003$ | $0.095$ | $0.080$ | $-0.029$ | $0.100$ |
| Social: housing association | $0.056$ | $0.100$ | $0.070$ | $0.013$ | $0.106$ |
| Private renter | $-0.003$ | $0.082$ | $0.136$ | $0.003$ | $0.085$ |
| Other renter | $0.240$ | $0.257$ | $0.008$ | $0.317$ | $0.223$ |
| Lower professional & managers | $0.118^*$ | $0.068$ | $0.283$ | $0.079$ | $0.070$ |
| Intermediate occupations | $-0.025$ | $0.084$ | $0.129$ | $-0.051$ | $0.088$ |
| Small employers/own account | $0.188^{**}$ | $0.088$ | $0.091$ | $0.184^*$ | $0.092$ |
| Lower supervisory/technical | $0.188^*$ | $0.093$ | $0.078$ | $0.150$ | $0.100$ |
| Semi routine occupation | $0.171^{**}$ | $0.083$ | $0.147$ | $0.109$ | $0.089$ |
| Routine occupation | $0.220^{**}$ | $0.095$ | $0.103$ | $0.187^*$ | $0.105$ |
| Non-limiting health problem | $-0.162$ | $0.038$ | $0.144$ | $0.077$ | $0.080$ |
| Limiting health problem | $-0.161$ | $0.068$ | $0.455$ | $0.067$ | $0.062$ |
| Quite satisfied with NHS | $-0.765$ | $0.067$ | $0.036$ | $-0.316^*$ | $0.139$ |
| Neither satisfied/Dissatisfied with NHS | $0.089$ | $-0.140$ | $0.039$ | $-0.117$ | $0.190$ |
| Quite dissatisfied with NHS | $0.037$ | $0.071$ | $0.334$ | $0.305^{***}$ | $0.046$ |
| Very dissatisfied with NHS | $0.054$ | $0.178$ | $0.377$ | $-0.165^{**}$ | $0.073$ |
| Concerns with immigration | $0.073$ | $0.209^{**}$ | $0.046$ | $-0.029$ | $0.088$ |
| Scottish/Welsh not British | $0.004$ | $0.082$ | $0.047$ | $0.105$ | $0.272$ |
Brexit and the NHS: voting behaviour and views on the impact…

Acknowledgements This research forms part of the WISERD Civil Society: Civic Stratification and Civil Repair research programme (Work Package 2.2), which has been funded by the Economic and Social Research Council (Project Reference No.: ES/S012345/1). The British Social Attitudes Survey has been made available by the UK Data Service. We would like to thank two reviewers for providing helpful comments and to David Blackaby, Alan Collins and Colin Jennings for useful discussions.

References

Benz, M., and A. Stutzer. 2004. Are voters better informed when they have a larger say in politics? Evidence for the European Union and Switzerland. *Public Choice* 119 (1): 31–59.

Blackaby, D., Drinkwater, S., and Robinson, C. 2020. Regional variations in the Brexit Vote: Causes and potential consequences. IZA Discussion Paper No. 13579. http://ftp.iza.org/dp13579.pdf

Born, B., G. Müller, M. Schularick, and P. Sedláček. 2019. The costs of economic nationalism: Evidence from the Brexit experiment. *Economic Journal* 129 (623): 2722–2744.

Burdett, T., and L.-A. Fenge. 2018. What implications will Brexit have for integrated care provision? *Journal of Community Nursing* 32 (6): 57–61.

Curtice, J. 2017. Why leave won the UK’s EU Referendum. *Journal of Common Market Studies* 55: 19–37.

Curtice, J. 2018. The emotional legacy of Brexit: How Britain has become a country of ‘remainers’ and ‘leavers.’ London: National Centre for Social Research.

Clarke, H., M. Goodwin, and P. Whiteley. 2017. *Brexit: Why Britain Voted to Leave the European Union*. Cambridge: Cambridge University Press.

Dayan, M., Fahy, N., Hervey, T., McCarey, M., Jarman, H., and Greer, S. 2020. *Understanding the Impact of Brexit on Health in the UK*. Research Report, Nuffield Trust.

De Lyon, J., and Dhingra, S. 2021. The impacts of Covid-19 and Brexit on the UK economy: Early evidence in 2021. Covid-19 Analysis Series No. 021, Centre for Economic Performance, London School of Economics and Political Science.

Digby, A. 1998. Continuity or change in 1948? The significance of the NHS. In K. Bloor (ed.) *Radicalism and Reality in the National Health Service: Fifty Years and More*. York: York University.

Donoghue, M., and M. Kuisma. 2022. Taking back control of the welfare state: Brexit, rational-imaginar-ies and welfare chauvinism. *West European Politics* 45 (1): 177–199.

Fahy, N., T. Hervey, S. Greer, H. Jarman, D. Stuckler, M. Galsworthy, and M. McKee. 2019. How will Brexit affect health services in the UK? An updated evaluation. *The Lancet* 393 (10174): 949–958.

Fitzgerald, D., A. Hinterberger, J. Narayan, and R. Williams. 2020. Brexit as heredity redux: Imperialism, biomedicine and the NHS in Britain. *The Sociological Review* 68 (6): 1161–1178.

Fox, S. 2021. Political alienation and referendums: How political alienation was related to support for Brexit. *British Politics* 16 (1): 16–35.

Table 9 (continued)

| Specification 4 | Specification 6 |
|-----------------|-----------------|
| Marginal effect | St. Err | Mean | Marginal effect | St. Err |
| British         | – –     | 0.128 | – 0.335*** | 0.068 |
| Other           | – –     | 0.050 | – 0.233*    | 0.109 |
| None of these identities | – –     | 0.012 | – 0.359*    | 0.128 |

***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively, using two-tailed tests and robust standard errors. Reference categories are Post-Graduate Qualification, very interested in politics, Aged 18–24, Scotland, Married, No children in household, Employed, Owner Occupied—bought, lives in Index of Multiple Deprivation (IMD) Quantile 1 Area, Higher Professional and Managerial Occupation, Living really comfortably on present income, No health problem, Very satisfied with the NHS and English not British.
Godlee, F., D. Kinnair, and C. Nagpaul. 2018. Brexit will damage health. *British Medical Journal* 363: 1.

Goodwin, M., and C. Milazzo. 2017. Taking back control? Investigating the role of immigration in the 2016 vote for Brexit. *British Journal of Politics and International Relations* 19 (3): 450–464.

Hantzsche, A., A. Kara, and G. Young. 2019. The economic effects of the UK government’s proposed Brexit deal. *The World Economy* 42 (1): 5–20.

Hervey, T., I. Antova, M. Flear, J. McNale, E. Speakman, and M. Wood. 2021. Health “Brexternalities”: The Brexit effect on health and health care outside the United Kingdom. *Journal of Health Politics, Policy and Law* 46 (1): 177–203.

Igwe, P.A. 2022. The paradox of Brexit and the consequences of taking back control. *Societies* 12: 69. https://doi.org/10.3390/soc12020069.

Iliffe, S., and J. Manthorpe. 2019. Job dissatisfaction, ‘burnout’ and alienation of labour: Undercurrents in England’s NHS. *Journal of the Royal Society of Medicine* 112 (9): 370–377.

Liberini, F., A. Oswald, E. Proto, and M. Redoano. 2019. Was Brexit triggered by the old and unhappy? Or by financial feelings? *Journal of Economic Behavior & Organization* 161: 287–302.

McCrae, N., and J. Portes. 2019. Attitudes to Brexit: A survey of nursing and midwifery students. *Journal of Advanced Nursing* 75: 1–9.

McKee, M., and J. Martin. 2016. How the exit of the UK from the European Union could affect healthcare, science and research. *The Pharmaceutical Journal* 296: 7889. https://doi.org/10.1211/PJ.2016.20201011.

van Schalkwyk, M., P. Barlow, D. Stuckler, M. Rae, T. Lang, T. Hervey, and M. McKee. 2019. Assessing the health effects of a ‘no deal’ Brexit. *British Medical Journal* 366: I5300. https://doi.org/10.1136/bmj.i5300.

van Schalkwyk, M., H. Jarman, T. Hervey, O. Wouters, P. Barlow, and M. McKee. 2020. Risks to health and the NHS in the post-Brexit era. *British Medical Journal* 369: m2307. https://doi.org/10.1136/bmj.m2307.

Simpkin, V., and E. Mossialos. 2017. Brexit and the NHS: Challenges, uncertainties and opportunities. *Health Policy* 121 (5): 477–480.

Smith, J. 2018. Gambling on Europe: David Cameron and the 2016 referendum. *British Politics* 13 (1): 1–16.

Wegenast, T. 2010. Uninformed voters for sale: Electoral competition, information and interest groups in the US. *Kyklos* 63 (2): 271–300.

Wildman, J., R. Baker, and Donaldson, C., 2017. Health and Brexit. *Health Economics* 26 (8): 959–961.

Publisher’s Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.