Articles / Artículos

Perceptions of the state of health services and the Brexit vote

Las percepciones sobre el estado de los servicios de salud y el voto del Brexit

Susana Aguilar Fernández*
Universidad Complutense de Madrid, España
saguilar@ucm.es

Andrés Santana Leitner
Universidad Complutense de Madrid, España
andres.santana@uam.es

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ABSTRACT

The reasons behind the Brexit have been extensively analysed. Different studies have focused on factors as diverse as age, education, ethnicity, income, social class, unemployment, religion, immigration, and the support for parties and leaders, amongst others. No work has however studied the impact of perceptions of the quality of health services. This void is surprising because the Brexiteers repeatedly (and misleadingly) promised that 350 million pounds a week would be spent on the National Health Service (NHS) should the exit option triumph. As people who perceive health services to be bad might benefit from a better endowed NHS, we expect them to show a higher propensity to vote leave. Our results provide strong support for this, even when a wide array of controls is considered. This finding constitutes an original contribution to a crucial international political issue and stresses the importance of perceptions and fake news for voting behaviour.

Keywords: Brexit, perceptions, health services, fake news.

RESUMEN

Las razones del Brexit han sido extensamente analizadas. Distintos estudios se han centrado en factores como la edad, educación, etnia, ingresos, clase social, desempleo, religión, inmigración, y el apoyo a partidos y líderes. Ningún trabajo ha estudiado sin embargo el impacto de las percepciones sobre la calidad de los servicios de salud. Esta ausencia es sorprendente porque los partidarios del Brexit prometieron (engañosamente) que, de triunfar éste, el Servicio Nacional de Salud (SNS) recibiría semanalmente 350 millones de libras. Como los individuos que perciben que dichos servicios son malos se beneficiarán de un SNS mejor financiado, anticipamos que exhibirán una mayor propensión a votar a favor del Brexit. Nuestros resultados lo confirman, incluso cuando se introduce una amplia batería de controles. Este hallazgo constituye una contribución original a un tema crucial de la política internacional y enfatiza la importancia de las percepciones y las fake news en el comportamiento electoral.

Palabras clave: Brexit, percepciones, servicios de salud, *fake news*.

***Corresponding author / *Autor para correspondencia:* Susana Aguilar Fernández,** saguilar@ucm.es

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POLITICAL TURMOIL AND THE BREXIT

Few popular consultations have attracted as much media and scholarly attention as the one held on 23 June 2016 in the UK and Gibraltar on whether to stay in or leave the European Union (EU). Marking the first time in the country's history in which a referendum outcome had gone against the signalled preference of the government, the reasons for the leave vote or the so-called Brexit (52 per cent vs 48 per cent) have been analysed by numerous journals, reports and political webs. Although Euro-scepticism had been gradually growing in the UK, the outcome took many by surprise. The political turmoil unleashed and the ensuing resignation of the by then Prime Minister (PM), David Cameron, who had defended the remain option with the vow to strengthen the position of the UK within the EU, gave way to three years of political infighting. Important milestones in the process have been the resignation of PM Theresa May in March 2019 when she failed to get the Parliament to support the deal her team had struck with Europe; the controversial leadership of PM Boris Johnson, who committed to leave, with or without a deal, and later suspended the Parliament, a move found to be unlawful by the Supreme Court; and the 2019 December elections that gave a big parliamentary majority to Johnson's Conservatives, a result which was interpreted as a mandate to get the Brexit done and take the UK out of the EU in early 2020, something that happened on 31 January. However, an 11-month transition period started then in which the future relationship between the two entities is being vehemently discussed. So far, the UK is obliged by EU rules and remains in the customs union and single market, but it has withdrawn from EU's political institutions. The future is thus still uncertain as a second deal has still to be reached by the end of 2020.

The Brexit has been linked to many different factors: contextual, such as unemployment, income and education in deprived areas (Becker, Fetzer & Novy, 2017); political, such as the support for the UKIP (Goodwin & Heath, 2016) and the Conservatives (Curtice, 2017), and leader images (Clarke, Goodwin & Whiteley, 2017); policy-oriented, like the transfer of EU funds to UK regions (Fidrmuc, Hulényi & Tunali, 2016); and socio-demographic, such as age, education, and ethnicity (Goodwin & Heath, 2016), social class, place of residence, and religious belonging (Ashcroft, 2016), and income and employment (Becker et al., 2017). Scholars have also studied the effects of the possession of smart phones, the use of internet, and news consumption on Facebook (Del Vicario, Zollo, Caldarelli, Scala & Quattrociocchi, 2017) as well as newspaper readership (Swales, 2016). Many others have focused on perceptions: self-reported health (Townson, 2018), the mismatch between internationalized economies and parochial societies' values (Crescenzi, Cataldo & Faggian, 2018), economic insecurity (Halikiopoulou & Vlandas, 2017), anti-establishment feelings (Hobolt, 2016) and feelings towards immigration (Abrams & Travaglino, 2018; Hobolt, 2016; Palma, Sinclair & Esses, 2019; Rolfe, Ahlstrom-Vij Hudson-Sharp & Runge, 2018) are some examples. To our knowledge, no work has however studied the impact of perceptions of the quality of health services.

The rationale for choosing health services stems from Townson (2018), who focuses on a key promise made by the leave campaign: to give the National Health Service (NHS) the £350m that the EU (allegedly) took every week from the UK. It was first made by the Labour MP, Gisela Stuart, and quickly subscribed to by Boris Johnson and Michael Gove, who repeatedly stood on platforms in which the promise appeared prominently. Indeed, it was painted on the side of their campaign bus touring all over Britain, and it was run in targeted internet adverts aimed at floating voters. The £350m figure was soon to become the subject of dispute and shortly before the vote Andrew Dilnot, the chair of the UK Statistics Authority, criticised it strongly. Once the result in favour of Brexit was announced, leading figures of the leave campaign started to step back from the "NHS promise": Iain Duncan Smith claimed he had never said the NHS would get £350m a week and Nigel Farage admitted that it had been a mistake to have made such a pledge. Days after the referendum, a crowdfunding campaign

based on alleged abuse of public trust was initiated, its purpose being to have Boris Johnson prosecuted over the NHS claim.

Even though most pro-leave public figures soon backtracked on the NHS pledge, the "damage" had already been done: a poll published a week before the referendum found that nearly half the British public had believed this claim and, most importantly maybe, 78 per cent of all voters had heard that Britain was sending £350m a week to the EU (Ipsos MORI, 2016). A study by King's College London showed that 42 per cent of people who had heard of the claim still believed it to be true while 22 per cent were unsure. Conservative voters (54 per cent) and Leave voters (61 per cent) were particularly susceptible to this fake news item (https://www.independent.co.uk/news/uk/politics/vote-leave-brexit-lies-eu-pay-money-remain-poll-boris-johnson-a8603646.html, consulted on January 21st, 2020).

Not only had the NHS pledge a great impact on the British public but the leave campaign was described, overall, as more consistent because it confined itself to a small set of topics and core values (Shaw, Smith & Scully, 2017). Its success might have translated in two facts: the pro Brexit percentage increased as the deadline vote day became closer (Liberini, Oswald, Proto & Redoano, 2019), and the only type of voter profile, which was also the most numerous (30.3 per cent), recording a significant increase in support for leave from 2016 to 2017 was the highly politically engaged, which was also the more susceptible to the leave campaign (Janmaat, Melis, Green & Pensiero, 2018).

The main goal of this article is to explicitly test whether perceptions of health services are significantly related to the leave vote, and whether those perceptions retain a statistically significant effect even after controlling for a variety of factors previously identified by the scholarly literature as relevant for the Brexit decision. As people with perceptions of bad health services may benefit from more money being allocated to the NHS, we expect that the worse the perceptions of those health services, the higher the likelihood of voting leave, all the rest equal. To test if individuals with more critical perceptions of the NHS were more likely to vote for the leave option, we use European Social Survey (ESS) data, and more specifically, the UK citizens' responses of the eighth round of the European Social Survey (ESS, 2018a) and the ESS round eight's specific module for the UK (ESS, 2018c).

THE SUPPLY-SIDE OF POLITICS: POLITICIANS, (FAKE) NEWS, AND REFERENDUMS

The ability of political leaders to activate dormant divides and to even invent non-existing ones has been amply recognized in the literature. As early as 1969, Sartori anticipated that, in an increasingly politicized world, "the power of power (was) growing at a tremendous pace... with reference to the manipulative and coercive capacity of state power" (1969, p. 214). This capacity has grown in our days on account of the usage of digital information and on-line social networks. These new technologies can be astutely used by spin doctors and electoral experts in party campaigns and consultation processes to propagate fake news. Once the information is detected to be false, the propagator can backtrack and offer excuses for her misjudgement or inaccurate statement in order to escape "punishment". The damage can be however irreversible as certain segments of society might continue to believe that the information in question was right.

Manipulative powers can misrepresent reality and hide factual evidence, thereby distorting public perceptions on a large scale. In this article we assume that this process is basically top-down or elite-led. However, we do not overlook the fact that many people carry their own biases, as shown for instance by party affiliates being more tolerant toward the

corruption practices of their own party (Anduiza, Gallego & Muñoz, 2013). Nor do we ignore that people are often resistant to change and may choose to expose themselves to those information channels that, by being in tune with their stereotypes and preconceived ideas, reinforce their perceptions (Cantarella, Fraccaroli & Volpe, 2019; Jermias, 2001; Jonas, Schulz-Hardt, Frey & Thelen, 2001). Regardless of whether it is one way or another, perceptions of the world may matter as much as the real world itself: whether people decide to join or not a protest movement can be partially attributed to political entrepreneurs who construct and channel certain emotions such as fear and joy (Jasper, 2011), and how people perceive the consequences of globalization help us explain the vote for populist parties in Europe.

Referendums and popular consultations, which usually demand from the voter a "Manichean" decision on complex matters, offer a perfect scenario for the use of these manipulative powers. Some of these matters have a moral character, are elusive consensus and prone to be simplified by the elites and interest groups: abortion (the 2018 consultation in Ireland) and same-sex marriage (the 2015 consultation in Slovenia and the 2008 popular initiative in California) are some examples. In other cases, the call for the people to decide relates to high-profile constitutional matters: the Brexit is a perfect example but so were the consultations in Scotland (2014) and Quebec (1995) about the possibility to break away from Great Britain and Canada, respectively. Popular consultations in countries such as Switzerland and the United States show a low turnout of around 30 per cent (Mendelsohn & Cutler, 2000) and usually mobilize less citizens than elections (LeDuc, 2003). Referendums may at times promote intolerance and undermine minority rights (Gamble, 1997). In the 70s, many US state chambers adopted pieces of legislation against racial discrimination whereas certain referendums voided them (Vanderleeuw & Engstrom, 1987) and went against minority rights in five areas: aids tests, language, school desegregation, housing desegregation and desegregation in public spaces, and gay rights (Donovan & Bowler, 1998; Gamble, 1997). In a comparative analysis of the 49 US states that have some form of popular consultation (the only exception is Delaware), the propensity to prohibit same-sex marriage was higher in all those cases in which the participation of the legislative was not contemplated (Lupia, Krupnikov, Levine, Piston & Von Hagen-Jamar, 2010). By not allowing its intervention, Lewis (2011) concluded that minority rights could be jeopardized. In Switzerland, religious minority rights have been equally unprotected by referendums (Christmann & Danaci, 2012). Not surprisingly, Smith (2005) has claimed that political institutions such as the courts or the government can make more headway with the protection of rights than popular initiatives.

Although there is no unequivocal consensus about the outcomes of popular initiatives (Frey & Goette, 1998; Uleri, 1996) and Donovan and Bowler (1998) have qualified their negative conclusions, there are reasons for caution over them. Yet they are on the rise (Mendelsohn & Cutler, 2000) and right and left populist parties have used them or argued in favour of them. Only in Europe can the following recent examples be singled out: the proposal by the Law and Justice party in Poland to hold a referendum in order to tackle the country's relationship with the EU, Podemos' support for a referendum in Catalonia to address the separatist challenge, the 2016 referendum over immigration quotas promoted by Orbán in Hungary, and the 2015 referendum on the EU economic rescue to Greece organized by the Syriza government of Tsipras.

The referendum on the EU membership of the UK was not called by a populist party nor can its result be labelled as illiberal or anti-minority rights. It is however a clear example of how popular consultations can help political leaders fabricate divisive issues: the pro-leave campaigners singled out the financial crisis of the NHS and claimed that exiting the EU would alleviate its monetary deficit. They knew exactly why they were hitting on the NHS: ever since the 1942 Beveridge Report set out to fight against the five evils of want, disease, ignorance, squalor and idleness, and established the foundations for the welfare state in the UK, the citizens have shown unwavering support for the NHS and have systematically made it their

priority to get extra government funding for the health services. Furthermore, survey data show that the NHS is cherished as a public institution and has become a key element of the national identity.

The NHS, which pioneered worldwide the idea that free healthcare was to be associated to citizenship, has undergone numerous and profound changes since its kick-off in 1948. As the staff working for the NHS has skyrocketed and the pressure for services is ever growing, the budget assigned to it has always fallen short of demand and expectations. The first budget cuts were introduced in the 50s, but it was the Conservative Party under Thatcher that started a process of privatisation of the NHS in the 80s. Since then cabinets of different political leanings have not deviated from this policy, even though they may have publicly denied it. While support for the NHS has changed little over time, citizens' satisfaction with it is not constant and changes in response to issues like funding, waiting times, patient experience, and the political context.

The last survey conducted in 2019 shows that overall satisfaction with the NHS is 60 per cent. Those who are very or quite dissatisfied reached their highest around 1995 (nearly 50 per cent) and amount now to less than 25 per cent. The main reasons for dissatisfaction are staff shortages (62 per cent) and long waiting times for general practitioners and hospital appointments (57 per cent). Most importantly for our argument, the idea that the government doesn't spend enough money on the NHS is the third reason (49 per cent). Despite a high level of overall satisfaction, the prospects for the NHS seem gloomy as 42 per cent think that the general standard of care will get worse rather than better (29 per cent) over the next five years. Again, the funding problem resurfaces in this item when 80 per cent express that the NHS is facing a major or severe funding problem, a perception that was also found in the previous years (https://www.kingsfund.org.uk/publications/public-satisfaction-nhs-social-care-2019#reasons, consulted on 7 October 2020).

DATA AND METHODS

We combine the UK citizens' responses of the eighth round of the European Social Survey (ESS, 2018a) with the specific module for the UK (ESS, 2018c), which collects country-specific information on the Brexit. Starting in 2002, the European Social Survey (ESS) is an academically-driven multi-country survey administered on a biennial basis. To date (October 2020), nine rounds have been completed, with 22 countries participating in the first round, 31 countries in the last (ninth) round, 14 countries in all the rounds (Belgium, Finland, Germany, Hungary, Ireland, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom), and 38 countries in at least one round.

The ESS employs the most rigorous methodologies: the surveys involve strict random probability sampling, a minimum target response rate of 70 per-cent and rigorous translation protocols. The unit of analysis are individuals, and the universe is made up of all persons aged 15 and over who dwell in private households in the participating countries regardless of their nationality, citizenship, language or legal status. The time method consists of partly repetitive cross sections, whereby questions on a variety of core topics are repeated from previous rounds of the survey. The hour-long interviews also include specific modules of questions developed for each round and, in some instances, country-specific data are also collected to open the possibility of asking questions that are of interest for a particular country.

The relevant round for this study is the eighth one, which asks a set of questions about the Brexit in the module for the UK. Since this round, all countries are required to administer the entire questionnaire face-to-face. In Round 8, the survey covered 23 countries, including 18 EU member states (all but Bulgaria, Croatia, Cyprus, Denmark, Greece, Latvia, Luxembourg,

Malta, Romania, and Slovakia) plus five non-EU countries (Iceland, Israel, Norway, the Russian Federation, and Switzerland) with an overall case count of 44,387 and 536 variables. The specific modules developed for Round 8 covered Public Attitudes to Climate Change, Energy Security, and Energy Preferences and Welfare Attitudes in a Changing Europe. In this article, we used the ESS Round 8 version 2.1, published on December 1 2018. Further technical details regarding the ESS Round 8 may be consulted in the ESS8 Documentation Report (ESS, 2018b, pp. 6-18).

In the UK, the data collector was the National Centre for Social Research and the funding agency, the Economic and Social Research Council. The mode of data collection of the main interview was computed assisted personal interview (CAPI) and the mode of data collection of the contact form interview was paper and pencil interview (PAPI). The questionnaire was structured exclusively in English and the fieldwork period started on September 1st 2016 and ended on March 20th 2017. The sample design stipulated a representative sample of those aged 15 or above living in the UK, with varying sample sizes across regions given the regions' likewise varying population sizes; north of the Caledonian Canal, the Isle of Man and the Channel Islands were excluded. The sample frame consisted of two stages, postal sectors and postal delivery points. The sample design included five stages, which, on top of postal sectors and delivery points, comprised dwellings, households and persons. The fieldwork was carried out by 214 free-lance interviewers who were exclusively paid per completed interview. All of them were trained in refusal conversion and most of them received ESS specific personal briefing. Advance information provided to interviewees consisted in a letter and a brochure, and unconditional non-monetary incentives were provided before the interview. Out of a total of 5,000 issued sample units for the main questionnaire, 1,959 valid interviews were obtained with a response rate of 42.82 per cent. Further technical details of the UK survey may be consulted in the ESS8 Documentation Report (ESS, 2018b, pp. 181-190).

The eighth round of the ESS was accompanied by an auxiliary file with specific data for the UK, which includes information on seven variables for the same 1,959 individuals: the individual and country identifiers and five questions on the Brexit, three of them related to the EU referendum held in June 2016 (whether the interviewee had voted or not; whether the interviewee voted stay, leave, or blank; and how would a non-voting interviewee have voted if given again the chance), and the other two on the hypothetical scenario than an EU referendum were held the day after the interview (how would she vote and how likely was she to vote).

As the main survey and the UK module include information on the same 1,959 individuals, we sorted both datasets by the individual identifier and performed a 1:1 merge of the two databases to add the variables of the UK module to those of the main survey. The resulting database had 1,959 individuals and 541 variables (534 of the main survey, five of the UK module, and two shared by both). After removing from our database those without UK citizenship (115) and under voting age (32), we are left with 1,812 cases. As its unit of analysis are also individuals, the merged dataset can be analysed without the need to employ hierarchical analytical techniques like multilevel analyses.

As we want to test whether perceptions of bad health services are related to the leave vote (first model), our dependent variable is binary, and takes on the value 1 if the answer is "leave" ("in the EU referendum in June 2016, did you vote for the UK to remain a member of the EU or to leave the EU?"), and 0 if the answer is "remain". Cases for which the EU referendum question was not applicable (395) or without valid responses to it have been coded as missing and are not included in our analyses[1].

Our key independent variable ("what you think overall about the state of health services in the UK nowadays?"), which is included in all our models, has 11 values, from extremely bad (0) to extremely good (10). Its inclusion in the models only produces one additional missing case.

1 Cases for which the EU question was not applicable include those who did not vote in the EU referendum (366 of the total voting-age UK citizens in the merged database), were not eligible to vote or not registered (23), refused to report whether they had voted or not (5), or did not know if they had voted (1). Cases without valid responses to the EU question include those who voted blank (4), refused to tell the interviewer how they voted (25) or did not know how they voted (5).

In our second model, we control for socio-demographic variables: age (in years), gender (0 = men, 1 = women), education (recoded as 1 = primary, 2 = secondary, 3 = tertiary, 4 = MA and PhD),first ancestry (recoded as 1 = British/English, 2 = Welsh, 3 = Scottish, 4 = Northern Irish, 5 = European, 6 = non-European), dwelling (recoded as 1 = big city or suburb, 2 = town or small city, 3 = village or farm), and church attendance (recoded as 1 = never, 2 = occasionally, i.e., less than weekly, 3 = frequent, i.e., weekly or more). The inclusion of all these variables is responsible for the loss of 112 additional cases.

In the third, we control for economic and work-related variables: income (eleven levels), unemployment (1 = yes, 0 = no), employment sector (1 = public, 2 = private, 3 = self-employed), union membership (1 = yes, 0 = no), perceptions of risk of financial insecurity ("during the next 12 months how likely is it that there will be some periods when you don't have enough money to cover your household necessities?", from 1 = not at all likely, to 4 = very likely), and perceptions of facing household income difficulties (from 1 = living comfortably on present income, to 4 = finding it very difficult on present income). As the latter two correlate too highly (0.59), we have run a factor analysis (FA) to create a latent variable of economic insecurity (see details in Table A1 in the appendix). We have also run a principal component analysis (PCA) and a parallel analysis (PA) to confirm that the two items can be meaningfully combined in a single dimension. Both the PCA (Table A2 in the appendix) and the PA (Table A3 in the appendix) corroborate that the two economic insecurity items load into a single dimension. The inclusion of the economic and work-related set of variables provokes the loss of 226 additional cases.

To exclude the possibility that the results found for the degree of satisfaction (or lack thereof) with the quality of the health services may owe to other sources of satisfaction, we introduce a further control in our fourth model, "general satisfaction", which captures the respondents' satisfaction with the state of education, the way democracy works, the government, and life in general. As we did with the economic insecurity latent variable, we have run a FA (details also available in Table A1) to create a latent variable of general satisfaction. Satisfaction with the government and with democracy are the indicators with the highest loads. Before running the FA, we have conducted the standard battery of techniques to determine the dimensionality of the four items, including a PCA, a PA, and a scree plot (SP). The three coincide in pointing to a single dimension: the PCA shows that only one eigenvalue is higher than unity (Table A2 in the appendix), the PA reveals that only one component has a larger PCA eigenvalue than PA eigenvalue (Table A3), and the SP reveals that the drop in the magnitude of eigenvalues becomes much flatter after the first plotted point (Figure A1 in the appendix). Therefore, controlling for the single general satisfaction variable created with the FA seems appropriate. This variable engenders 49 additional missing values.

Table A4 (in the appendix) shows the descriptive statistics and also the variance inflation factors (VIFs) of the independent variables. All the VIFs lie well below the values that would call for concern regarding potential problems of multicollinearity, implying that the variables can be simultaneously introduced into the models. Table A5 (in the appendix) displays the matrix of correlations of the variables employed in the analyses. Note that the propensity of voting leave has a statistically significant (at the conventional five per cent level) negative correlation not only with the satisfaction with health services, but also with education level, income level, first (non-British or non-English) ancestry, sex (woman), and union member, as well as substantial positive correlations with age, employment sector (not public) and economic insecurity. Our key independent variable, satisfaction with health services, has statistically significant correlations with age, religious attendance, and general satisfaction, as well as a negative one with economic insecurity.

Altogether, the main independent variable and all the control variables added in models 2, 3 and 4 are responsible for the loss of 388 cases, leading to a total of 995 cases used in our regression models. Table A6 (in the appendix) displays the details of the total number of cases in the survey and the different sources of missing data. Following standard practice, all the models are computed using the same number of cases (the 995 for which there is information on all the variables of the full model): by doing so, we can be sure that the

differences among the models are due to the relationships among the variables, and not to the differences among the samples (Santana & Rama, 2017, pp. 149-150).

RESULTS

Our four models in Table 1 consistently show that perceptions of bad health services are related to the Brexit vote. In consonance with our hypothesis, worse perceptions of health services significantly enhance the likelihood of voting leave, both in the uncontrolled model and in the three models with controls. In our second model, the only controls that matter are female, tertiary and MA/PhD education, and Scottish and European ancestry, all of them reducing the propensity to vote leave, whereas age increases it. Attesting to the robustness of our results, all these controls retain their significance and the direction of their effects in the third and fourth models, and none of the non-significant controls in the second model attains significance in the third and fourth models. None of the socioeconomic controls added in our third model is statistically significant and, again, this result is robust, as none acquires significance in the fourth model. Finally, the fourth model reveals that our latent control variable, general satisfaction, is positively related to the leave decision.

Notice that the four tested models are sequentially nested, so all the variables of a given model, whether significant or not, are included in the next model. By testing nested models for the same number of cases (for the same sample), we ensure the comparability of models and the adequacy of the usage of several measures to compare the goodness of fit of the different models, such as the likelihood ratio test (LRT) or Akaike's Information Criterion (AIC). Both the LRTs and the Wald tests for the variables added in each model suggest that model 1 significantly improves the fit of a null model without any explanatory variables, model 2 significantly improves the fit of model 1, model 3 fails to improve significantly the fit of model 2, and model 4 significantly improves the fit of model 3[2]. The figures for the AIC imply that the best fitting model is the full model (model 4), followed by model 2, which also receives substantial support. Model 3 has considerable less support, and the uncontrolled first model has almost no support[3].

Moreover, we do not test so-called refined or more-parsimonious models that exclude variables that fail to reach conventional significance thresholds (or, for that matter, the sets of variables that fail to improve the goodness of fit of previous models) because, despite their popularity among many scholars, these refined models suffer from serious statistical problems, such as unpredictable biases in the regression coefficients, the P-values and the confidence intervals (Heinze & Dunkler, 2017). Note also that non-significant is not the same as zero, so omitting a variable because it is non-significant could lead to a mis-specified model.

Hence, regardless of the controls we introduce, perceptions of the quality of health services are significantly related to the Brexit vote: the worse the former are, the higher the propensity to vote leave. As Figure 1 shows, these perceptions explain 24 percentage points in the probability of voting leave, spanning from 65 per cent among those who believe that the quality of health services is extremely bad (0) to 41 per cent among those who believe it to be extremely good (10).

2 Following standard practice, we consider that a model significantly improves the fit of another one when the p-value of the chi square for the relevant degrees of freedom is below 0.05. Being an approximation of the LRTs, the Wald tests provide qualitatively the same answer as the LRTs.

3 The lower the figure for Akaike's Information Criterion (Akaike, 1973), the better the fit of the model; moreover, according to the rules-of-thumb offered by Burnham and Anderson (2002), models within 0–2 points on the AIC also have substantial support, models in the 4–7 point range have considerably less support, and models greater than 10 points apart have almost no support.

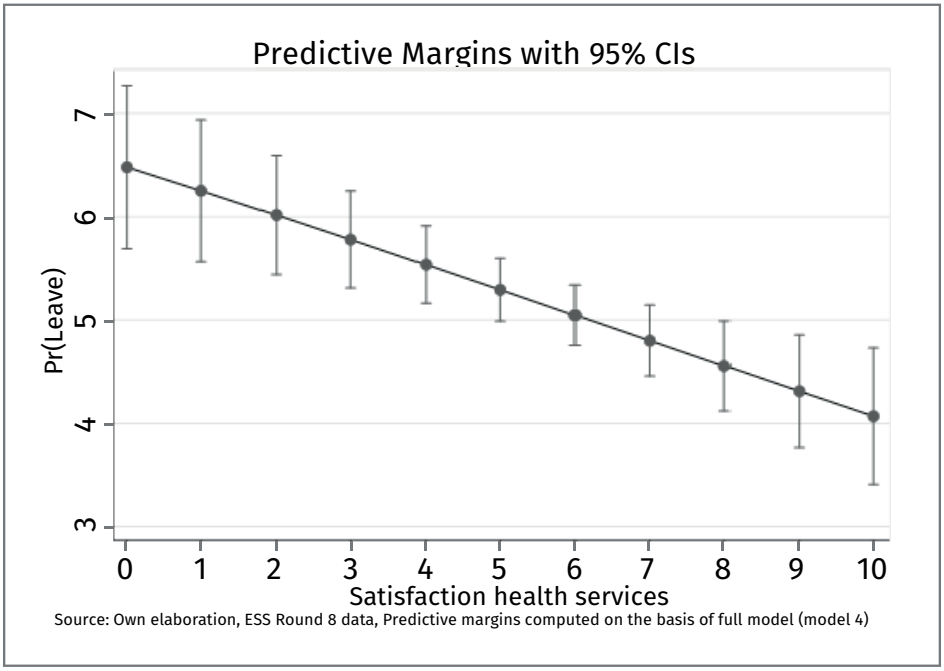
Table 1. Perceptions of health services and the Brexit vote

	Model 1	Model 2	Model 3	Model 4
Satisfaction health services	**-0.0683***	**-0.0808****	**-0.0793***	**-0.114*****
	(0.0285)	(0.0311)	(0.0316)	(0.0340)
Age (years)		**0.0105***	**0.0139****	**0.0130****
		(0.0045)	(0.0050)	(0.0050)
Sex (female)		**-0.288***	**-0.351***	**-0.337***
		(0.1380)	(0.1444)	(0.1452)
Education (base: primary)				
- Secondary		-0.264	-0.205	-0.279
		(0.2221)	(0.2248)	(0.2268)
- Tertiary		**-1.108*****	**-1.001*****	**-1.043*****
		(0.2183)	(0.2313)	(0.2328)
- MA, PhD		**-1.797*****	**-1.676*****	**-1.696*****
		(0.2639)	(0.2843)	(0.2852)
First ancestry (base: English)				
- Welsh		-0.295	-0.245	-0.191
		(0.2668)	(0.2697)	(0.2729)
- Scottish		**-0.786*****	**-0.754****	**-0.702****
		(0.2306)	(0.2323)	(0.2339)
- Northern Irish		0.0722	0.133	0.155
		(0.4003)	(0.4049)	(0.4065)
- European		**-0.520***	**-0.522***	**-0.489***
		(0.2241)	(0.2257)	(0.2280)
- Non-European		-0.602	-0.633	-0.669
		(0.3747)	(0.3767)	(0.3778)
Dwelling (base: big city)				
- Town or small city		0.149	0.133	0.126
		(0.1715)	(0.1725)	(0.1733)
- Village or farm		0.0212	0.00850	-0.0209
		(0.1868)	(0.1898)	(0.1907)
Church attendance (base: never)				
- Occasional		0.0760	0.0701	0.0342
		(0.1508)	(0.1522)	(0.1534)

- Frequent		-0.235	-0.205	-0.303
		(0.2360)	(0.2388)	(0.2420)
Income (decile)			-0.00677	-0.0152
			(0.0297)	(0.0300)
Unemployed (yes)			-0.0511	-0.0554
			(0.4169)	(0.4219)
Employment sector (base: public)				
- Private			-0.0339	-0.0575
			(0.1649)	(0.1659)
- Self-employed			-0.225	-0.223
			(0.2548)	(0.2565)
Unionised (yes)			-0.289	-0.244
			(0.1521)	(0.1534)
Economic insecurity			0.126	0.181
			(0.1171)	(0.1194)
General satisfaction				0.288**
				(0.0980)
Observations (N)	995	995	995	995
Akaike Information Criterion (AIC)	1376.9	1276.6	1282.4	1275.9
Likelihood ratio test: pvalue	0.0160	0.0000	0.3915	0.0036
Wald test: p-value	0.0164	0.0000	0.3965	0.0038

Note: binary logistic regression models. Standard errors reported in parentheses. The reference for dwelling is big city or outskirts. The reference for first ancestry is English or British. Effects that are statistically significant at the 0.05 or more stringent levels are highlighted in bold. Key: * p<0.05, ** p<0.01, *** p<0.001.
Source: elaboration of the authors based on ESS Round 8 data.

Figure 1. Effect of the satisfaction with health services on the Brexit vote (predictive margins)



Note: Circles represent the best estimation of the probability of voting leave for each level of satisfaction with health services, holding all the other variables at their means. Vertical bars represent the 95 per cent confidence intervals around each point-estimation. Predictive margins computed on the basis of the full model (model 4).

Source: elaboration of the authors based on ESS Round 8 data.

CONCLUSIONS

Perceptions carry weight, no matter how different they might be from the real world. And perceptions can be manufactured or altered by political elites with the aid of experts and digital technologies. Not all citizens are equally permeable to this strategy: high levels of political sophistication and individual biases, which make people more inclined to expose themselves to information that is in tune with their Weltanschauung, might lead elite-led manipulative attempts to fail. In other cases, however, these attempts succeed and even when recognition of error and misjudgement ensues, this does not undo the damage done. This happened during the Brexit vote when key figures of the leave campaign pledged falsely that the NHS would economically profit from the UK leaving the EU: the NHS pledge came to be known by nearly four fifths of the public and was believed by half of it. This is a most relevant example of misinformation or bluntly fake news, which was chosen by the Brexiteers because they were aware that the NHS is a treasured national institution in the UK and is perceived to be severely underfunded. Besides this great impact, the pro Brexit campaign, by confining itself narrowly to a few topics, was perceived as more consistent, which might explain why the percentage of

leave voters increased as the referendum became closer. More precisely, the only voter profile that showed a significant increase in support for leave over 2016 was the highly politically engaged, which was also the more permeable to the Brexit campaign.

Departing from the relevant position that the NHS "fake news" item had in the leave campaign, we have drawn on perceptions of bad health services in the country as a new individual determinant of Brexit and found that they are robustly associated with the leave vote, event after controlling for an ample battery of potentially confounding variables. Our results for the socio-demographic controls (the propensity to vote leave is lower for women, those with university degrees and of Scottish or European ancestry) are in line with the profile of the Brexit voter: old white man, English, and low educated (Ashcroft, 2016; Goodwin & Heath, 2016; Swales, 2016). The lack of significance of the socio-economic controls is interesting, given that the austerity policies after the 2008 financial crisis have been blamed for the leave outcome (Dorling, 2016) and Brexiteers have been depicted as financially concerned (Liberini et al., 2019), economically deprived (Swales, 2016), and losers of globalisation (Hobolt, 2016). Finally, the positive relationship between general satisfaction and the leave vote goes in line with Janmaat et al. (2018), for whom the only group showing a significant increase in support for the Brexit was "the highly engaged and satisfied", which expressed satisfaction with democracy and high levels of trust in public officials; and with Liberini et al. (2019), who found that the completely satisfied people were fractionally more likely to vote leave than the mostly dissatisfied ones.

What is novel in this work , then, is the robustness of the finding whereby perceiving that the health services in the country are bad is unequivocally associated with the Brexit vote, regardless of the controls we introduce. The results of the fourth model are especially revealing, as they show that the perceptions of the quality of health services, which is closely linked to the fake news of the pro-leave campaign, retain and even strengthen their effect on the EU referendum vote even after controlling for general satisfaction. That the outcome of a referendum with crucial international repercussions can be partially linked to misinformation and ensuing wrong perceptions is ultimately worrying for democracy.

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APENDIX

Table A1. Factor analysis of the four dimensions of economic insecurity

Variable	Loadings	Uniqueness	Scorings
Risk of financial insecurity	0.6807	0.5367	0.42952
Household income difficulties	0.6807	0.5367	0.42952

Source: Own elaboration, ESS Round 8 data. N = 1,685; method: principal factors; rotation: orthogonal varimax; retained factors: 1; method for the computation of the scoring coefficients: regression.

Table A2. Principal component analysis of the four dimensions of satisfaction

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.10605	1.30478	0.5265	0.5265
Comp2	0.801274	0.0563591	0.2003	0.7268
Comp3	0.744915	0.397154	0.1862	0.9131
Comp4	0.347761	n.a.	0.0869	1

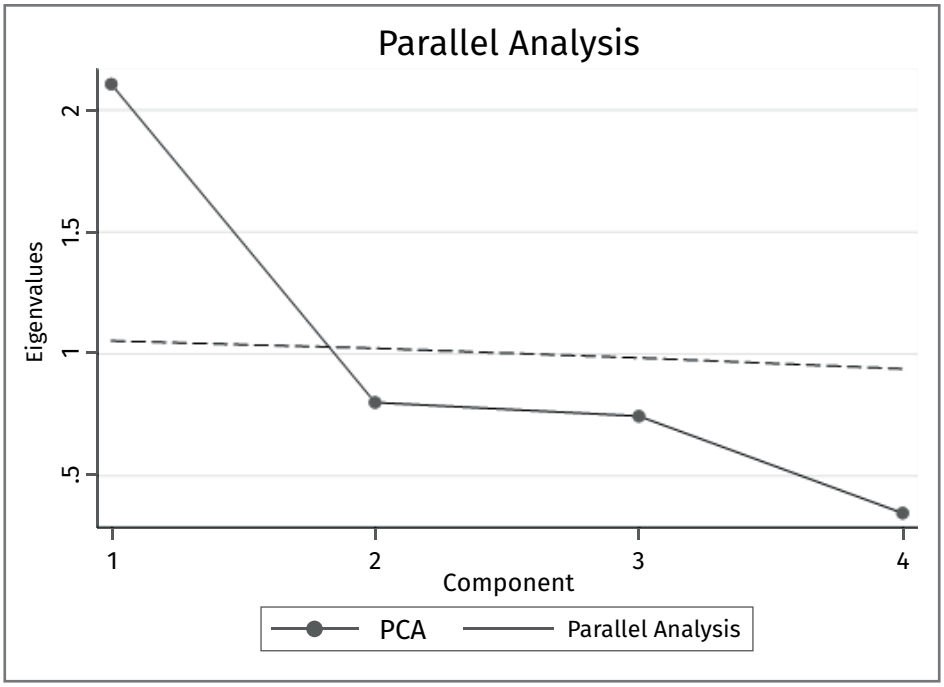
Source: Own elaboration, ESS Round 8 data. N = 1,685; n.a.: not applicable.

Table A3. Parallel analysis of the four dimensions of satisfaction

Component	PCA	PA	Difference
1	2.10605	1.053761	1.052289
2	0.8012741	1.023092	-0.2218174
3	0.744915	0.9839485	-0.2390335
4	0.3477615	0.9391994	-0.591438

Source: Own elaboration, ESS Round 8 data. N = 1,685; PCA = principal component analysis; PA = parallel analysis for principal components. PA Eigenvalues Averaged Over 10 Replications.

Figure A1. Parallel analysis of the four dimensions of satisfaction



Source: Own elaboration, ESS Round 8 data. N = 1,685; PCA = principal component analysis.

Table A4. Factor analysis of the four dimensions of satisfaction

Variable	Loadings	Uniqueness	Scorings
Satisfaction with government	0.7407	0.4514	0.39382
Satisfaction with democracy	0.7385	0.4546	0.38977
Satisfaction with the state of education	0.4461	0.801	0.15494
Satisfaction with life	0.4111	0.831	0.14037

Source and notes: see Table A1.

Table A5. Descriptive statistics

	Mean	Sd	Min	Max	VIF
Leave the EU	0.51	0.5	0	1	n.a.
Satisfaction with health services	5.66	2.25	0	10	1.18
Age (years)	53.83	16.97	18	93	1.43
Sex (female)	0.55	0.5	0	1	1.10
Education level	2.49	0.95	1	4	1.36
First ancestry	2.03	1.59	1	6	1.06
Dwelling	2.05	0.75	1	3	1.06
Church attendance	1.61	0.69	1	3	1.13
Income (decile)	5.51	2.91	1	10	1.61
Unemployed	0.03	0.17	0	1	1.06
Employment sector	1.75	0.62	1	3	1.18
Union member	0.49	0.5	0	1	1.19
Financial insecurity	-0.11	0.7	-0.82	2.37	1.46
General satisfaction	0.03	0.81	-2.38	1.87	1.27

Source: Own elaboration, ESS Round 8 data. N = 995; VIF: Variance inflation factor. Mean VIF = 1.24.