Patient satisfaction and health system responsiveness in a decentralised health system

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Directora (Supervisor):

Dolores Jiménez Rubio

Tesis Doctoral en Ciencias Económicas y Empresariales

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Programa de Doctorado en Ciencias Económicas y Empresariales

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"Predicting rain doesn't count.
Building arks does."

Warren Buffett

"One of the great mistakes is to judge policies and programs by their intentions rather than their results"

Milton Friedman

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Abstract

Evaluating the effectiveness, equity, and efficiency, along with the patients' perspective, can help identify potential shortcomings and improve the performance of health services. This PhD thesis aims to evaluate the determinants of healthcare quality from the patients' perspective, while also examining potential sources of socioeconomic inequalities in a universal and decentralized healthcare system such as the Spanish National Health System (SNHS). The research questions are addressed in three chapters.

In the first chapter, the drivers of satisfaction with the Spanish Health System are explored. Using extensive longitudinal and cross-sectional data for Spain, we observe that policy measures such as public health spending and the patient-doctor ratio have a significant impact on the quality of healthcare systems, beyond individual-level differences. Our findings indicate that policymakers must exercise caution when reducing the level of health resources, particularly health personnel, as a response to economic downturns. Additionally, our research provides evidence that a growing reliance on private healthcare may be a reflection of inefficiencies in the public system, or the existence of important features of private insurance that are valued by patients.

The second chapter identifies the key determinants of prompt attention, one of the key health responsiveness domains and one of the most important determinants of health system satisfaction. Specifically, this study test whether waiting times for primary and specialist care depend on patients´ socioeconomic status (SES) in Spain. Additionally, we utilize the continuous nature of our data to investigate if the SES-related disparities in waiting times for specialist consultations vary across different parts of the waiting time distribution. Our analysis indicates the existence of a SES gradient in waiting times for

specialist services that can be attributed to factors such as education, employment status, and income. Additionally, we observe a less pronounced SES gradient for primary care, mostly associated with employment status. While the quantile estimates demonstrate the presence of a SES gradient throughout the distribution of waiting times for specialist visits, the SES differences are less pronounced in the context of longer waiting times in the public sector, although they still persist. Our findings suggest that the principle of equal treatment for equal need is not being implemented in practice.

The third chapter focuses on the role of political identity in influencing the demand for private health care ('political demand for health care'). We exploit evidence coming from the regional variation in the 2012 austerity cuts in the Spanish National Health System (NHS). Our findings suggest that individual support for congestion or right-wing narratives increased demand for private healthcare in areas where health services were more exposed to austerity spending cuts. These effects are stronger among relatively more affluent and healthier individuals, consistent with a 'congestion narrative' which prompts individuals to seek care beyond the National Health System.

The findings of this thesis may assist policy-makers and managers in monitoring the performance of health systems by offering evidence-based policy recommendations. This consideration is of particular interest in view of the fact that health systems in many countries must address a growing public-sector deficit, respond to increasing pressures due to COVID-19, and demographic shifts like an aging population and increasing polarization, which render the implementation of evidence-based health policies more demanding.

Resumen

Evaluar la efectividad, equidad y eficiencia, junto con la perspectiva de los pacientes, puede ayudar a identificar posibles deficiencias y mejorar el funcionamiento de los servicios sanitarios. Esta tesis doctoral pretende evaluar los determinantes de la calidad sanitaria desde la perspectiva de los pacientes, y, a la vez, examinar las posibles fuentes de desigualdades socioeconómicas dentro de un sistema sanitario universal y descentralizado como es el Sistema Nacional de Salud (SNS) español. Las preguntas de investigación se abordan en tres capítulos.

En el primer capítulo se exploran los determinantes de la satisfacción con el Sistema Nacional de Salud español. Utilizando datos longitudinales y transversales para España, demostramos que medidas políticas como el gasto sanitario público y la ratio paciente-médico tienen un impacto significativo en la calidad de los sistemas sanitarios, más allá de las diferencias a nivel individual. Nuestros resultados indican que los responsables políticos deben actuar con cautela a la hora de reducir el nivel de recursos sanitarios, en particular el personal sanitario, como respuesta a las recesiones económicas. Además, nuestra investigación aporta evidencias sobre la relación entre la creciente demanda por la sanidad privada y la existencia de ineficiencias dentro del sistema público, así como, existencia de características importantes de la sanidad privada que son valoradas por los pacientes.

El segundo capítulo identifica los principales determinantes de la rapidez en la atención, uno de los ámbitos clave de la capacidad de respuesta del sistema sanitario y uno de los determinantes más importantes de la satisfacción con el Sistema Nacional de Salud. En concreto, este estudio analiza si los tiempos de espera para la atención primaria

y especializada, ante una misma necesidad clínica, dependen del nivel socioeconómico (NSE) de los pacientes en España. Además, utilizamos la naturaleza continua de nuestros datos para investigar si las disparidades relacionadas con el NSE en los tiempos de espera para las consultas de especialistas varían en las distintas partes de la distribución del tiempo de espera. Nuestro análisis indica la existencia de un gradiente de nivel socioeconómico en los tiempos de espera para los servicios de especialista que puede atribuirse a factores como la educación, la situación laboral y los ingresos familiares. Por otro lado, observamos un gradiente de nivel socioeconómico menos pronunciado para la atención primaria, asociado sobre todo a la situación laboral. Mientras que las estimaciones de regresión por cuantiles demuestran la presencia de un gradiente de nivel socioeconómico en toda la distribución de los tiempos de espera para las visitas especializadas, las diferencias de nivel socioeconómico son menos pronunciadas en el contexto de los tiempos de espera más largos en el sector público, aunque siguen persistiendo. Nuestros resultados sugieren que el principio de igualdad de trato para la misma necesidad, un principio fundamental de los sistemas sanitarios nacionales como el español, no se está aplicando en la realidad.

El tercer capítulo se centra en el papel de la identidad política a la hora de influir en la demanda de asistencia sanitaria pública, ya sea inhibiendo o facilitando la demanda de asistencia sanitaria privada ("demanda política de asistencia sanitaria"). Comprobamos si las narrativas políticas que subrayan la saturación de la sanidad financiada con fondos públicos, definidas como "narrativas de congestión ", aumentan la propensión individual a utilizar la sanidad privada tras los recortes del gasto en sanidad, después de controlar por situación socioeconómica. Explotamos evidencia procedente de la variación regional en los recortes de austeridad de 2012 en los programas de asistencia sanitaria pública en el Sistema Nacional de Salud (SNS) español, y nos apoyamos en la estabilidad de la

ideología política de los individuos. Nuestros resultados sugieren que las narrativas de congestión aumentó la demanda de sanidad privada en las zonas en las que los servicios sanitarios estaban más expuestos a los recortes del gasto sanitario. Estos efectos son más acusados entre los individuos con mayor renta y con mejor estado de salud, lo que concuerda con una "narrativa de la congestión" que incita a los individuos a buscar asistencia más allá del Sistema Sanitario de Salud.

Las conclusiones de esta tesis pueden ayudar a los responsables políticos y a los gestores a supervisar el rendimiento de los sistemas sanitarios, ofreciendo recomendaciones políticas basadas en evidencias. Esta consideración reviste especial interés en vista de la creciente presión que sufren los sistemas sanitarios de muchos países, los cuales deben hacer frente a un creciente déficit del sector público, responder a las consecuencias de la COVID-19 y a cambios demográficos como el envejecimiento de la población y la creciente polarización, que hacen más desafiante la aplicación de políticas sanitarias.

Introduction

1. Background and context

Evaluating health systems and policies is crucial from an economic perspective to analyse the effectiveness of public health policies on population health and detect potential barriers in healthcare access. This is particularly critical considering the volume of public funding invested in this sector. According to the latest data from the OECD in 2022, the average health expenditure across OECD countries was around 9.6% of their GDP, up from 8.8% in 2019, mainly due to the COVID-19 pandemic (OECD, 2022). However, there are large variations in the amount and sources of healthcare resources invested across countries. The United States has the largest healthcare spending at 17.8% of its GDP, while in Germany and Spain health spending is considerably lower (12.8% and 10.7% of GDP, respectively). Government resources play a significant role in healthcare funding, with Germany and Spain allocating 11% and 7.8% of their GDP, respectively, to public health expenditure.

Decentralized health systems In parallel with a rapidly growing role of public funding devoted to healthcare over the last decades, the adoption of decentralised governance of health systems has been widely introduced worldwide. For instance, as Figure 1.1 illustrates, the decentralization of the Spanish healthcare system to regions was implemented gradually over a 20-year period from 1981 to 2001 and was largely politically motivated (Costa-Font & Ferrer-i-Carbonell, 2019). In essence, decentralisation involves the transfer of decision-making power and authority for public planning and management from a higher level of government, typically the national government, to lower geographical or administrative units.

Figure 0.1 Transfer date of healthcare competences among Spanish regions.

Source: author´s elaboration based on Ministerio de Sanidad, Servicios Sociales e Igualdad (2016).

The rationale behind decentralisation is that local decision makers are better placed to respond promptly and effectively to local needs, and are more accountable to local citizens' demands (Oates, 1999). However, intergovernmental fiscal transfers may be necessary to compensate for different revenue capacities at the local level. Moreover, decentralization may also exacerbate health inequalities if local regions rely on user fees or reduce coverage of the universal health package, and may lead to inefficiencies in resource allocation if there is a high dependency on grants from lower tiers of government (Jiménez-Rubio, 2023). Additionally, diseconomies of scale and heterogeneity of preferences among subnational governments and stakeholders can further pose challenges to the implementation of decentralized health policies (Khaleghian, 2004). In health care, decentralization may generate inefficient location of facilities, more inefficient pricing of inputs, and higher levels of administrative paperwork than a centralized health system, and may even result in increased inequalities in health and health care services (Jiménez-Rubio & García-Gómez, 2017).

Austerity policies In accordance with the European Commission's response to prolonged economic crisis in Spain, the newly appointed government in 2011 implemented a variety of cost-cutting measures[1], such as redefining healthcare system beneficiaries, implementing changes in the universality of healthcare access, and cost-sharing measures for specific services (Gallo & Gené-Badia, 2013). In particular, these measures included the introduction of pharmaceutical co-payments for pensioners, restrictions on undocumented immigrants' access to healthcare, and the introduction of prescription co-payments in some regions.

In view of the development of healthcare services worldwide, evaluating the effectiveness of decentralization in achieving the intrinsic goals of health systems is of paramount importance. Such evaluations are critical to guiding policymakers and healthcare managers by promoting evidence-based reforms to strengthen health systems and achieve better health outcomes for the population as a whole. Along with other traditional health system outcomes (such as effectiveness, equity and efficiency), quality measures from the patients' perspective can enhance the monitoring of health service performance and help decision-making, as pointed by Barbazza et al. (2019).

Quality of health systems Self-reported measures have become increasingly recognized as a valuable means of assessing policy outcomes beyond the health system following Stiglitz-Sen-Fittoussi recommendations (Pak, 2020). By focusing on the patient's viewpoint, policymakers and managers can gain insights into their needs, perceptions, and concerns, which can help identify potential shortcomings and improve the

[1] Royal Decree Law 16/2012 titled "*Urgent measures to ensure the sustainability of the National Health System and improve service quality and safety*"

performance of health services (Pascoe, 1983; Doyle et al., 2013; Park, Park, Kwon, Kang, & Noh, 2016). Patient satisfaction plays a crucial role in treatment compliance, whereas inadequate satisfaction can lead to lower utilization of public services and potentially a worsening in public health (Price et al., 2014). Several studies indicate that patients who express dissatisfaction with the public health system are more likely to opt-out of public health insurance, while privately insured individuals are less inclined to support increased spending on the NHS or view public healthcare spending as a priority (Costa-Font & Jofre-Bonet, 2008).

Increasing role of private health insurance More recently, there is there is a growing reliance on the private sector and market-oriented reforms in many established national health systems. For instance, in recent years there has been a significant increase in the utilization of private health insurance (PHI) in Spain. PHI offers increased choice of providers and expedited access to healthcare services (OECD, 2020). As a result, private healthcare spending constitutes 29.4% of the total healthcare spending in Spain (OECD, 2022). Additionally, 11.5 million individuals in Spain currently take up a private healthcare insurance plan and there is a discernible trend of individuals opting for complementary private health insurance. In particular, during the period 2001-2020 the proportion of private insurance holders has more than doubled ranging from 7,6% in 2001 to 15.3% in 2020 (OECD, 2022).

The increasing presence of private healthcare within publicly-funded healthcare systems, such as in Spain (see Jiménez-Martín et al. (2016) or Cantarero-Prieto et al. (2017)) can reveal weaknesses within the public healthcare system as well as quality gaps from public provision such as excessive wait times (Besley et al, 1999). In fact, prompt attention seems to be one of the key perceived or non-clinical quality factors (or "responsiveness

domains") of a health system (Valentine et al., 2008), and appears to be one of the main reasons behind the increasing PHI uptake (Besley, 1999, Jofre-Bonet, 2000, Biró and Hellowell, 2016). Moreover, recent studies suggest that waiting times may vary according to patients' socioeconomic status rather than clinical need (Siciliani, 2014), and that healthier individuals may resort to private healthcare in the event of a high expected wait (Johar, 2016). Longer waiting times in the NHS are becoming a serious barrier of access to the universality of health services (World Health Organization, 2019). This issue is posssibly intensified with the onset of the COVID-19 pandemic, as non-emergency medical procedures and treatments have been postponed (Findling, Blendon & Benson, 2020).

Ideology and partisan bias The COVID-19 pandemic has also further highlighted the problem of partisan bias, particularly with regard to vaccination and social distancing measures. According to recent research conducted by Clinton et al. (2021), Cornelson and Miloucheva (2022), and Serrano-Alarcón et al. (2023), individuals holding conservative views exhibited a low propensity to comply with recommended health behaviours such as wearing facial masks and support for participating in Covid-19 vaccination campaigns. Consequently, political and partisan bias appear to be another relevant factor in influencing uptake of private health insurance and healthcare decisions in general and ultimately public policy effectiveness. Moreover, the studies conducted by Propper (2000) and Costa-Font and Jofre-Bonet (2008) have shown that political allegiance significantly affects their evaluation of the National Health Service (NHS) performance, and consequently, the reliance on private healthcare. In short, as polarization and distrust of institutions continue to increase, the effectiveness of public policy may additionally be increasingly compromised by political attitudes and narratives (Milosh et al., 2021). This is particularly relevant in contexts where individual participation in public programs

generates externalities, such as vaccination campaigns or public education and healthcare services.

2. Aims & research questions

The primary objective of this thesis is to analyse, quantify, and evaluate the level of satisfaction and responsiveness of the Spanish National Health System. In particular, the main aim of this study is to identify some of the key determinants of healthcare quality and analyse potential socioeconomic disparities within a universal and decentralized healthcare system.

The thesis seeks to answer the following **research questions**:

In **chapter 1**, we explore the **key drivers of the performance of a National Health System** (NHS) in terms of patient reported quality of care, a less traditionally studied dimension of healthcare performance which is increasingly studied in public policy evaluation. Given that many of the factors analysed (most notably public health expenditure and health resources) are directly subject to the influence of policy makers, our study enables a better understanding of the key drivers of quality of care with the aim of informing policymaking and in turn improving population health. Additionally, we analyse the growing importance of the private health sector within a universal NHS and its potential implications for the public health system's inefficiencies or patients' preferences.

In **chapter 2**, we study in more detail the determinants of prompt attention, which is one of the key dimensions of healthcare quality of patients' perceived quality. Specifically, we analyse whether **waiting times for primary and specialist care depend on patients' socioeconomic status (SES) within the Spanish NHS**. Despite the fact that

in many universal health systems, waiting times act as a non-monetary rationing mechanism which should be based on clinical need rather than the ability to pay, there is growing evidence that among patients with similar levels of need, waiting times often differ according to socioeconomic status.

In **chapter 3**, we shed light on the interactions between public and private healthcare, and analyse whether the uniformity of provision and barriers to access of the public healthcare system may result in an increasing "partial opting out" of individuals We restrict attention to the role of **ideological motivations for health care use after austerity in the context** of a universal health system. In particular, we investigate whether support for right and far right-wing political narratives emphasizing the shortcomings and overcrowding of health-care services following the 2012 austerity measures incentivizes the use of private health care.

3. Data and institutional settings

To answer the above research questions, this thesis makes primarily use of the Spanish Health Barometer for the span 2010-2019. The SHB survey (Ministerio de Sanidad, 2022) is conducted annually, with a representative sample of the Spanish population, aged 18 and above, totalling more than 7,800 people per year, and collects information on opinions, attitudes, utilisation and perceptions of health services. Public health care resources and health spending were obtained from the Spanish Health Ministry Database (Ministerio de Sanidad, Consumo y Bienestar Social, 2018b). Data for GDP and other regional covariates were obtained from the Instituto Nacional de Estadística (2018). To identify the political views of parties supported by individuals, the study employs data from the Chapel Hill Survey of Experts (Jolly et al., 2022), which estimates the ideological and policy positions of political parties (Bakker et al., 2021). The dataset includes evaluations of 337 experts who examined 268 political parties from across the European Union. The study concentrates on the positions of Spanish parties on overall ideological stances, such as the importance of public services vs reducing taxes, redistribution of wealth, and state intervention.

Spain provides a suitable setting to investigate health related outcomes such as satisfaction and responsiveness of a National Health System due to the strong decentralization of the Spanish healthcare system and the resulting geographical differences in health-related outcomes and policies (Jiménez-Rubio, 2023). Spanish healthcare system is characterized by universal coverage, with healthcare services being publicly provided, except for pharmaceuticals that may require co-payment. The autonomous communities can provide complementary healthcare packages, in addition to the comprehensive common package.

This PhD thesis contributes to the field of health economics in several ways. Firstly, this study identifies the key drivers of several measures of patient perceived quality of care. Secondly, it sheds light on the interaction between public and private healthcare, including potential opting-out scenarios. Finally, the thesis provides insights and recommendations for addressing disparities in healthcare performance and ensuring the sustainability of health systems.

The final section of this dissertation includes a conclusion where the findings are summarized and their limitations are discussed. Additionally, the potential implications and avenues for future research are identified.

Chapter 1 ***How do policy levers shape the quality of a National Health System?***

- A preliminary version of this chapter was disseminated as a working paper for the EvaluAES workshop. The key final results have been published in the paper titled How do policy levers shape the quality of a national health system? *Journal of Policy Modeling*, *44*(1), 203–221. https://doi.org/10.1016/j.jpolmod.2021.09.003 (See García-Corchero & Jiménez-Rubio, 2022).

1. Introduction

Quality of care is widely recognised as a fundamental objective of a health system and is a major concern for many national and supranational organisations. Poor quality of care may have a detrimental effect on access and take-up and can become a serious barrier to the universality of health services (World Health Organization, 2019). While most initiatives to improve health care quality focus on clinical aspects of health services, the adoption of a more patient-centred approach is becoming a universally accepted core dimension of healthcare quality (Hanefeld et al., 2017). The use of care-quality measures, from the patients' perspective, in addition to the consideration of other, more traditional health system outcomes (effectiveness, equity, efficiency, etc.), enriches the monitoring of health service performance and strengthens decision-making (Barbazza et al., 2019). Indeed, the use of self-reported measures to evaluate policy outcomes is not exclusive to the health system, but is increasingly accepted as a valuable contribution to the evaluation of many other public policies, in line with the recommendations of Stiglitz-Sen-Fittoussi (Pak, 2020).

One patient-centred outcome which is attracting growing attention in many countries is the level of satisfaction with the care received. In universal health systems in which patients are allowed to select the provider, such as the Netherlands and the UK, the information obtained from patient experience surveys is used not only to monitor health care delivery but also to promote patient choice. Although health care satisfaction is a self-reported quality outcome, several studies have recorded a strong association between subjective and objective measures of this parameter, which suggests that self-reported measures of satisfaction can be considered valid predictors of more objective mechanisms and can legitimately be used to evaluate the performance of health systems (Fiorentini, Robone and Verzulli, 2018).

In this field, too, recent systematic literature reviews (Doyle et al., 2013; Price et al., 2014) provide suggestive evidence of a positive association between patient experience and clinical quality. Thus, focusing on the patient's perspective might make managers and policy makers more alert to the user's needs, perceptions and concerns and help anticipate areas of failure, thus enhancing health service performance (Pascoe, 1983; Doyle et al., 2013; Park et al., 2016). Satisfied patients are more likely to comply with treatment recommendations, whereas lower levels of patient satisfaction might lead to an underutilisation of public services and negatively impact on public health (Price et al., 2014). Previous studies have also reported that individuals who express dissatisfaction with the public health system are more likely to opt out of public health insurance, and that the privately insured are less likely to favour increased spending on the NHS, or to view public healthcare spending as a priority (Costa-Font & Jofre-Bonet, 2008).

In the present study we explore the key drivers of the performance of a National Health System (NHS) -in terms of patient reported quality of care- by drawing on the monitoring framework proposed by Barbazza et al., (2019), which establishes direct links between the capacity, performance and impact of health care in terms of population health status and well-being. Given that many of the factors analysed (most notably public health expenditure and health resources) are directly subject to the influence of policy makers, our study enables a better understanding of the key drivers of quality of care with the aim of informing policymaking and in turn improving population health.

We contribute to the existing literature along several lines. First, in contrast to much previous work (see section 2.1) our study focuses on variations in health system performance (both users and non-users of the NHS) over a long time series. Second, we use data at the regional rather than the national level, thus increasing the homogeneity in

the measurement of the variables considered, and the reliability of the comparisons made (Fiorentini et al., 2018). In addition, unlike some previous studies (e.g. Kotzian, 2009; Robone et al., 2011; Xesfingi & Vozikis, 2016) we disentangle the resources of health care funding, since there is evidence that reliance on private care might reveal certain drawbacks of a NHS (Costa-Font & García, 2003; Epstein & Jiménez-Rubio, 2019). Finally, we scrutinise and compare the different areas within a NHS (primary, specialised, hospital and emergency services) in terms of service quality, enabling us to target policy recommendations more precisely. Our focus on the situation in Spain provides a unique opportunity to study the drivers of health care quality, given the highly decentralised nature of health services in this country and the long-time span covered by our data (2002-2016), including the onset of the Great Depression in 2008. In addition, since Spain was one the European countries hardest hit by the economic recession, the extended time span of our analysis provides the opportunity to consider the major financial cutbacks in the health care sector that followed the 2008 recession[2] (Grigorakis et al., 2018) and which were asymmetrically implemented across the regions (Gené-Badia et al., 2012; Gallo & Gené-Badia, 2013).

While we focus our analysis on multilevel modeling, our results are robust to a battery of robustness tests, including first differences estimations, which are less likely to produce spurious results, and lagged estimations of our key policy levers, to account for a non-contemporary effect of our variables of interest.

[2] In line with many other European countries such as the UK, Greece or Portugal, Spain implemented a pro-cyclical economic policy on public health budgets to address fiscal pressure in the aftermath of the 2008 economic recession (Grigorakis et al., 2018).

The study results suggest that regional characteristics such as public health expenditure or the doctor-patient ratio exert a considerable influence on health service quality. Another significant finding is that there seems to be a considerable interaction between private and public health sectors, as for some of the NHS services analysed, the proxy for private healthcare is negatively associated with patient satisfaction.

The remainder of this paper is organised as follows: in the following section, we conduct a review of the main existing literature in the area and describe the main characteristics of the Spanish National Health System, after which we show the empirical strategy employed. The study findings are detailed in section 4 and section 5 presents the main conclusions drawn and identifies relevant policy implications.

2. Literature review and the Spanish case

2.1 Literature review

Several recent studies have evaluated health system reforms on the basis of self-reported health system satisfaction and other non-clinical factors (Hekkert et al., 2009; N. Valentine et al., 2010; Barbazza et al., 2019), in contrast to previous literature in this area, which has mainly focused on the effect of demand-side characteristics ("patient expectations") usually in terms of individual covariates such as gender, education, age or income (Pascoe, 1983; Costa-Font & Jofre-Bonet, 2008; Kotzian, 2009; Price et al., 2014; Park et al., 2016; Pak, 2020). However, in recent years, there has been growing interest in analysing the influence on service quality of the patient's socioeconomic environment and of health system supply factors. Hekkert et al. (2009) argued that although an important part of the patient satisfaction- explained variance depends on the patient's own

characteristics (such as socioeconomic status), hospital-specific attributes like hospital type and size and catchment-area population density also play an important role. In this line, Robone et al. (2011) examined how the characteristics of health systems, the structure of the population and the economic, cultural and institutional characteristics of the health system context may influence patient-perceived quality and health system responsiveness in different countries[3]. This study concluded that a country's education level and overall health expenditure have a significant impact on responsiveness. On the other hand, the percentage of public health care expenditure in total expenditure is inversely related to this responsiveness, which suggests that market incentives may play an important role in promoting patient responsiveness. In this context, Malhotra and Do (2017) explored disparities in health service quality in a large set of richer and poorer countries and found that public health expenditure appears to be closely related to patient-perceived quality, especially in the case of less well-off individuals. The authors concluded that increasing the capacity of the public health service, by improving healthcare coverage and reducing out-of-pocket expenditure, could significantly reduce socio-economic disparities in terms of health system responsiveness. Several empirical studies of the role played by publicly-financed health services have measured the capacity of the health system, for example in terms of the health care resources allocated to the health system. In this regard, Xesfingi and Vozikis (2016) reported that patient satisfaction was mostly influenced by healthcare-related indicators proxied by the

[3] Health system responsiveness is a measure of how well a health system responds to non-clinical aspects of health care and meets the population's legitimate expectations in their interaction with the health system. The notion of patient satisfaction does not fully coincide with the concept of responsiveness because it "may not capture what actually happens when people come in contact with the health system, and the responses are strongly influenced by prior expectations of what will or should happen" (Darby et al., 2000).

proportion of clinical staff (positively) and of hospital beds (negatively). In Spain, Pérez-Romero et al. (2017) looked into the influence of socioeconomic and health factors on satisfaction with the health system. These authors highlighted the existence of considerable differences among Spanish regions in terms of supply-side factors such as total health expenditure. On the other hand, Gené-Badia et al. (2012) argued that the substantial increase in public spending that took place in Spain immediately before the 2008 recession did not seem to have directly increased the health-care satisfaction of the population. Indeed, patient-reported satisfaction with health care was reported to have increased during the subsequent economic recession in Spain (2009-2011).

Overall, most previous studies have observed a positive impact of public health-related resources on quality, proxied by satisfaction with the health services, although the results are somewhat inconclusive. In addition, owing to the cross-sectional nature of the data employed, most previous research in this respect (e.g. Gené-Badia et al., 2012; Pérez-Romero et al., 2017; Xesfingi & Vozikis, 2016) does not reflect the long-term evolution of the main variables of interest, thus ignoring the lagged effect of macroeconomic policies.

2.2 Spanish Health Care System

Spain has a universal health care system that is free at the point of delivery with the exception of pharmaceuticals, which may require co-payment (Bernal-Delgado et al., 2018). To a large extent, health services are publicly provided (the public sector accounted for 70.8% of total health spending in 2019) (*OECD Statistics*, 2020). Decentralisation was negotiated region by region over a period of twenty years (1981-2001) in a transformation that was largely politically motivated (Bustillo et al., 2014; Costa-Font & Ferrer-i-Carbonell, 2019). In addition to a comprehensive common health

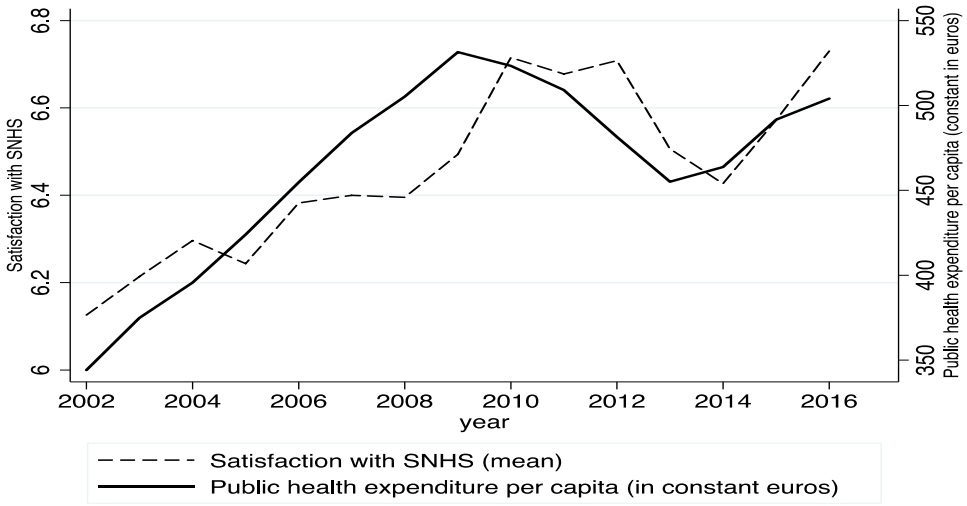
care package, a complementary package is provided at the discretion of each of the highly devolved Autonomous Communities.While the Spanish NHS provides universal health care to all individuals residing in the country and is funded mainly by general taxation, the last decade has witnessed a considerable increase in the importance of health services that are publicly financed but privately produced, through different forms of management (Bernal-Delgado et al., 2018). In addition, the proportion of the population covered by private insurance rapidly increased from 7.6 per cent in 2001 to 16.5 per cent in 2017 (OECD Statistics, 2020), a growing trend that have also experienced many other countries in recent years (OECD, 2019). To a large extent, private insurance in Spain provides either a larger choice of providers or a faster access to health care services (duplicate insurance), a feature which is also shared by many other OECD countries.

In view of the strong decentralisation of the Spanish health system and the resulting geographic heterogeneity (see Figure 1.1), this country provides an excellent setting in which to study the drivers of health service quality (Bustillo et al., 2014; Costa-Font & Ferrer-i-Carbonell, 2019). Interestingly, as Figure 1.2 shows, despite a considerable decrease in public health expenditure during the recession, the level of satisfaction with the Spanish NHS actually increased at first, although it later fell. Gallo and Gené-Badia (2013) suggested that the economic crisis and the consequent cutbacks had the initial effect of lowering expectations, making them easier to meet.

Figure 1.1 Average satisfaction with the Spanish NHS, 2002-2016.

[1] Source: The authors, based on the Spanish National Health Barometer

Figure 1.1 Evolution of satisfaction with the Spanish National Health System (SNHS) and public expenditure in Spain (2002-2016)



[1] Source: The authors, based on the Spanish National Health Barometer and the Health Ministry Data Base.

[2] Regional public health expenditure in constant euros

3. Empirical strategy

3.1 Data source

This study is mainly based on microdata drawn from the Spanish Health Barometer (SHB) survey for the years 2002-2016. The SHB survey (Ministerio de Sanidad, Consumo y Bienestar Social, 2018) is conducted annually, with a representative sample of the Spanish population, aged 18 and above, totalling more than 7,800 people per year, and collects information on opinions, attitudes, utilisation and perceptions of health services. Our total study sample is composed of 103,509 individuals. Data for public health care resources and health spending were obtained from the Spanish Health Ministry Database (2018). Data for GDP and other regional covariates were obtained from the Spanish National Statistics Institute (INE, 2018).

3.2 Study variables

The main dependent variable is the level of satisfaction with the Spanish public health system, as measured by the Spanish Health Barometer using the question: "How well do you think the Spanish public health system is working?". As an alternative dependent variable, we use the level of satisfaction with specific health care services, with the questions: "How would you rate the following services: Primary Care (general practice or paediatrics), Specialist Care; Hospital service; Emergency service?". Opinions about general and specific health care services are rated by both actual and potential users of public health services, on a scale from 1 (very dissatisfied) to 10 (very satisfied).

The socioeconomic variables considered at the individual level include gender; age; and education and employment status as proxies for socio-economic status. Finally, a set of dummies for area of residence are included to account for rurality (areas with

fewer than 10,000 inhabitants). We adjust for frequency of use by including a set of dummies for respondents who made one or two health visits and those who made three or more visits, to one or more health services, during the year immediately prior to the survey. For estimations based on specific health services, the self-assessed health (SAH) status of individuals is also included to take into account the possibility of reporting heterogeneity in terms of health status, following the procedure adopted previously by Fiorentini, Ragazzi and Robone (2015).

Among the region-specific characteristics that might be considered, we focus in particular on public health expenditure, which is a major driver of health system performance and health care satisfaction (Malhotra & Do, 2017; Xesfingi & Vozikis, 2016). The influence of private healthcare on patients' satisfaction with the health services received is measured by reference to regional expenditure on private health insurance (PHI) per capita. Previous studies have shown that there is a high level of interdependence between public and private provision of healthcare (Jofre-Bonet, 2000; Costa-Font & García, 2003; Augurzky & Tauchmann, 2011; Chan et al., 2015; Wang et al., 2020), with private insurance often revealing some deficiencies in publicly provided health care. Our study also controls for public health resources in terms of clinical staff (doctors and nurses) and hospital beds, which is in line with the approach adopted by Xesinfingis and Vozikis (2016). Detailed analyses of health service resources are based on the ratios of doctors and nurses in primary and in specialised care and (for hospital and emergency services), the ratio of hospital beds. The impact of regional economic development is addressed by a dummy variable[4] which equals one if income is below the

[4] We use a dichotomous variable of regional income in our baseline results. However, results are generally qualitatively very similar using the log of regional GDP (results not shown here for the sake of brevity but available from authors upon request).

average of the sample, which we expect to highlight income-related differences among Spanish regions. The descriptive statistics considered and the definitions of the variables employed in our estimations are presented in Table 1.1.

Table 1.1 Sample characteristics for satisfaction and covariates

Variable	Mean	SD	Min	Max	Period
Satisfaction					
Health public system	6.39	1.95	1	10	2002-2016
Primary services	7.34	1.88	1	10	2010-2016
Specialist services	6.81	1.99	1	10	2010-2016
Hospital care	6.83	2.04	1	10	2010-2016
Emergency service	6.13	2.29	1	10	2010-2016
Individual level covariates					
Gender					
Female	51.11%	0.5	0	1	2002-2016
Education					
No qualification	2.90%	0.17	0	1	2002-2016
Primary studies	22.43%	0.42	0	1	2002-2016
Secondary studies	49.08%	0.5	0	1	2002-2016
University degree	20.28%	0.4	0	1	2002-2016
Age					
18 to 35	29.45%	0.46	0	1	2002-2016
36 to 45	19.76%	0.4	0	1	2002-2016
46 to 65	29.56%	0.46	0	1	2002-2016
66 to 75	12.10%	0.33	0	1	2002-2016
76 or more	9.13%	0.29	0	1	2002-2016
Activity					
Employed	45.06%	0.5	0	1	2002-2016

Unemployed	17.76%	0.38	0	1	2002-2016
Retired	25.04%	0.43	0	1	2002-2016
Inactive	11.97%	0.32	0	1	2002-2016
Area of residence					
Rural (<10,000 inhabitants)	23.55%	0.42	0	1	2002-2016
Self-assessed health status					
Good	73.81%	0.44	0	1	2010-2016
Fair	21.95%	0.41	0	1	2010-2016
Poor	4.24%	0.2	0	1	2010-2016
Health services use					
0 visits	29.47%	0.46	0	1	2002-2016
1-2 visits	35.27%	0.48	0	1	2002-2016
3 or more visits	28.55%	0.45	0	1	2002-2016
Regional level covariates					
Public health spending					
Regional public expenditure per capita (real)	454.37	69.39	306.1	648	2002-2016
Private healthcare					
Private health insurance expenditure p.c.	18.28	14.99	1.04	67.33	2002-2016
Public healthcare resources					
Hospital beds per 1,000 pop.	2.5	0.47	1.65	3.7	2004-2016
Physicians per 1,000 pop.	2.41	0.26	1.88	3.4	2004-2016
Nurses per 1,000 pop.	3.78	0.52	2.92	5.65	2004-2016
Primary care resources					
Nurses per 1,000 pop.	0.77	0.1	0.58	1.11	2004-2016
Physicians per 1,000 pop.	0.65	0.1	0.45	0.89	2004-2016
Specialist care resources					
Nurses per 1,000 pop.	3.08	0.49	2.31	4.93	2004-2016
Physicians per 1,000 pop.	1.61	0.22	1.19	2.6	2004-2016

Hospital/Emergency service resources					
Nurses per 1,000 pop.	3.08	0.49	2.31	4.93	2004-2016
Physicians per 1,000 pop.	1.61	0.22	1.19	2.6	2004-2016
Beds per 1,000 pop.	2.5	0.47	1.65	3.7	2004-2016
Sociodemographic factors					
Ageing index	119.91	34.24	68.13	207	2002-2016
Poorer (Centred log GDP)	0.51	0.5	0	1	2002-2016
Regional GDP per capita (real)	7925.99	1481.72	4645.72	11966.88	2002-2016

[1] Source: The authors, based on the Spanish National Health Barometer and the Health Ministry Data Base.

3.3 Analysis technique: specification and estimation

According to previous research , the variance of health care-related variables might be influenced not only by patients' individual characteristics or their own experience but also by regional attributes (Robone et al., 2011; Pérez-Romero et al., 2017; Valentine & Bonsel, 2016). Some characteristics of regional health systems are under the direct influence of policy makers and managers, and thus constitute potential policy levers. In the highly decentralised Spanish NHS, the financing and management of the health system is controlled directly by regional governments, and therefore it is highly likely that individuals in the same region will report a more similar degree of satisfaction than individuals living in a different region. Accordingly, our analysis must take into account the fact that individuals are clustered hierarchically within regions. In view of these considerations, random intercepts are included to allow mean values to differ across regions. Two levels were analysed: individuals, as level 1, and region-year combinations, as level 2. On this basis, we consider the following equation:

$$Y_{i,j} = (\beta_0 + u_j) + \beta_1 X_{ij} + \beta_2 Z_j + \epsilon_{i\,j} \quad \text{or}$$

$$Y_{i,j} = \beta_{0i} + \beta_1 X_{ij} + \beta_2 Z_j + \epsilon_{i\,j}$$

$$\text{where } \beta_{0i} = \beta_0 + u_j$$

Let $Y_{i,j}$ denote the reported health satisfaction with the Spanish public health system or with respect to the primary, specialist and hospital care received by an individual *i* living in region *j*. β_0 is the overall intercept coefficient. X includes a set of individual variables (level 1) and Z reflects the regional characteristics (level 2). $\epsilon_{i\,j}$ is the random error at the individual level. The residuals, σ_ϵ^2 and σ_u^2, are assumed to have a normal distribution with zero mean and a variance of one. The STATA 15 (StataCorp, 2017) command *mixed* was used to perform the econometric analysis. The marginal effects of the explanatory variables are estimated via maximum likelihood.

Various robustness tests are carried out in this study. The multilevel regressions detailed in Table 1.3 illustrate the lag assumed in public expenditure and resources to allow for the possibility of non-contemporary effects of these variables on health care-related outcomes. Furthermore, since the estimations based on overall health services are obtained using a very long time series dataset (2002-2016), we provide estimations based on first differences (see Table 1.4), which is an efficient means of dealing with the problems of omitted variables and of spurious correlations, and of addressing regional variations in quality over time. Lastly, in order to test whether any of the regions was driving the results, leaving-one-out tests were performed, by deleting in turn the observations for each of the Spanish regions included.

4. Results and discussion

4.1 Satisfaction with the Spanish National Health System

Table 1.2 presents the linear multilevel estimations obtained for overall satisfaction with the Spanish NHS. Model 0 represents the empty model, and shows the extent to which the data on satisfaction with the Spanish NHS are nested. The intraclass correlation[5] (ICC) for level 2 (region-year) is 0.0577, implying that there is a 5.77% of variance between groups. Accordingly, the total variance for the dependent variable is explained not only by the variations among individuals but also by those among regions.

Models 1, 2 and 3 represent the regressions of each random-intercept model on individual level covariates, including health spending and other region-specific socioeconomic characteristics. These models show that female sex, higher-education qualifications and employed status are all negatively associated with the perceived quality of health services. Our detection of a negative gradient for the relationship between education background and health system satisfaction corroborates previous research in the field (e.g. Park et al., 2016), which suggested that individuals with higher education qualifications have greater expectations of public health services. In contrast, in line with previous studies, age is found to be positively associated with health care quality. This finding may be explained by the fact that older people in Spain have had access to universal tax-funded healthcare since 1986, and they seem to value this provision[6]. Interestingly, low-frequency users

[5] The intra class correlation (ICC) is defined as the proportion of total variance that can be explained by the upper level [39]. In our study, for the level 2 (country- year) as 0.2214/(0.2214+3.6170)=0.0577.

[6] Alternative explanations point to the fact that higher frequency of utilization by elderly people is related to higher levels of satisfaction due to more realistic expectations (Park et al., 2016).

(one or two visits per year) of public health services are more satisfied with the Spanish NHS than are non-users.

Our results show there are statistically significant differences among individuals according to their area of residence, with individuals from rural areas reporting a higher level of satisfaction than those living in urban ones. This finding might be explained by the fact that patients in rural areas are assigned a higher priority in waiting lists for specialist attention (Abásolo et al., 2014).

A significant positive relationship was recorded between the level of regional health expenditure and patients' satisfaction with the Spanish NHS. Specifically, an increase of 10% in regional public health expenditure per capita was associated with an increase of around 0.1 points on the perceived quality scale. However, after controlling for differences in health staff and hospital beds (see model 5), this relationship was found to be weaker. Although Robone et al. (2011), among others, have reported that greater expenditure on public health, per se, may not lead directly to improvements in public health care quality, other authors (e.g. (Malhotra & Do, 2017; Xesfingi & Vozikis, 2016) maintain that higher public expenditure does indeed enhance the quality of care provided. Moreover, according to Banka et al. (2015) and Fiorentini, Robone and Verzulli (2018), increases in the level of health resources reduce workloads and thus improve the relationship between patients and staff.

Models 4 and 5 represent the estimations obtained when private health insurance expenditure (PHI) per capita and public resources devoted to healthcare are included in the estimations. Remarkably, whereas the ratio of doctors per 1,000 inhabitants is positively associated with health system satisfaction (see model 5), with an increase of

0.8 points in satisfaction for each additional doctor per 1,000 inhabitants, persons living in regions with a higher ratio of public beds per 1,000 inhabitants reported a significantly lower level of satisfaction with health system quality (0.4 points less).

With respect to PHI, persons living in regions with a larger per capita expenditure on PHI are less satisfied with the Spanish NHS than those living where this expenditure is less, even after controlling for various levels of public health resources (in Model 5). This might be explained by the fact that those who opt out of public services tend to be generally less satisfied with publicly funded healthcare (e.g. see Costa-Font and García (2003)). However, as suggested by Robone et al. (2011), choice and competition may also play an important role in explaining the higher level of responsiveness associated with private health care.

The level of satisfaction with the Spanish NHS in low-income regions is significantly lower than in richer regions, even after adjusting for other regional characteristics, such as aging, private healthcare expenditure and public health resources. According to the results obtained from model 5, persons living in low-income regions are likely to perceive 0.26 points lower health system quality than those in higher-income regions.

The Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit[7] of each model considered. According

[7] AIC and BIC are written in the form $[-2\log L + kp]$, where L is the likelihood function, p is the number of parameters in the model and k is 2 for AIC and $\log(n)$ for BIC. In the case considered, a smaller AIC or BIC indicates a better-fitting model.

to these test results and the ICC values obtained, model 5 (which includes all regional characteristics) performs best. Regarding the sensitivity analysis, the results obtained from the first-differences models are generally in line with those of the baseline multilevel results (see Tables 1.4). However, with respect to private expenditure, although still negative and substantial in magnitude, the power of the estimations for the first-differences model is slightly reduced, especially for the estimations including other public health-related resources, probably due to the more limited time span corresponding to these variables (see Table 1.1). As for our baseline model, the multilevel estimations, there seems to be a considerable non-contemporary effect of public resources (according to the AIC-BIC analyses, the model in which two lags are included performs best; see Table 1.3). Finally, as an alternative sensitivity analysis, we performed leaving-one-out tests in which we estimate all six models, deleting in turn the observations for each of the 17 regions considered, to address the possibility that one of the regions in particular may be driving the results. From these findings, we conclude that in general the effect of public expenditure is substantial across all regions, regardless of their income level (results of this sensitivity analysis not reported for brevity here but available upon request from authors).

Table 1.2 Estimations of satisfaction with the SNHS. Random-intercept multilevel models (2002-2016).

VARIABLES	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed part						
Individual level covariates						
Gender		-0.101***	-0.101***	-0.102***	-0.101***	-0.103***
Female		(0.0123)	(0.0123)	(0.0123)	(0.0123)	(0.0131)
Age						
36 to 45		-0.00125	-0.00194	-0.00185	-0.00299	-0.0120
		(0.0170)	(0.0170)	(0.0170)	(0.0170)	(0.0183)
46 to 65		0.132***	0.130***	0.130***	0.130***	0.115***
		(0.0161)	(0.0161)	(0.0161)	(0.0161)	(0.0172)
66 to 75		0.547***	0.545***	0.545***	0.543***	0.510***
		(0.0268)	(0.0268)	(0.0268)	(0.0268)	(0.0291)
76 or more		1.008***	1.006***	1.005***	1.002***	0.986***
		(0.0301)	(0.0301)	(0.0301)	(0.0302)	(0.0325)
Education						
Primary studies		-0.0132	-0.0144	-0.0158	-0.0180	-0.0247
		(0.0247)	(0.0247)	(0.0247)	(0.0247)	(0.0272)
Secondary studies		-0.151***	-0.153***	-0.154***	-0.155***	-0.157***
		(0.0260)	(0.0260)	(0.0260)	(0.0260)	(0.0287)
University degree		-0.0458	-0.0485*	-0.0499*	-0.0505*	-0.0462
		(0.0283)	(0.0283)	(0.0283)	(0.0283)	(0.0310)
Activity						
		-0.0644***	-0.0629***	-0.0633***	-0.0630***	-0.0488*
Retired						
		(0.0240)	(0.0240)	(0.0240)	(0.0240)	(0.0259)
Employed		-0.190***	-0.188***	-0.189***	-0.189***	-0.190***
		(0.0206)	(0.0206)	(0.0206)	(0.0206)	(0.0221)
Unemployed		-0.141***	-0.139***	-0.139***	-0.140***	-0.141***
		(0.0227)	(0.0227)	(0.0227)	(0.0227)	(0.0243)
Area of residence						
Rural		0.0932***	0.0924***	0.0930***	0.0933***	0.0803***

		(0.0142)	(0.0142)	(0.0142)	(0.0142)	(0.0153)
Health services use						
1-2 visits		0.0455***	0.0454***	0.0455***	0.0447***	0.0439**
		(0.0170)	(0.0170)	(0.0170)	(0.0170)	(0.0177)
3 or more visits		-0.0249	-0.0236	-0.0235	-0.0235	-0.0209
		(0.0152)	(0.0152)	(0.0152)	(0.0153)	(0.0160)
Regional level covariates						
Public healthcare resources						
Regional public expenditure per capita (log)			1.181***	1.096***	1.115***	0.717***
Sociodemographics						
Ageing index				0.00207***	0.00177**	0.00161
				(0.000754)	(0.000778)	(0.00103)
Higher-income region				ref.	ref.	ref.
Lower-income region				-0.127**	-0.146**	-0.262***
				(0.0530)	(0.0581)	(0.0767)
Private health insurance per capita (log)					-0.0237	-0.0900**
					(0.0379)	(0.0402)
Public healthcare resources						
Hospital beds per 1,000 pop.						-0.408***
						(0.0787)
Nurses per 1,000 pop.						-0.0425
						(0.0810)
Physicians per 1,000 pop.						0.800***
						(0.159)
Constant	6.457***	6.500***	-0.736	-0.396	-0.402	1.560
	(0.0302)	(0.0450)	(1.051)	(1.036)	(1.031)	(1.329)
Random part						
ICC	5.77%	5.56%	4.68%	4.48%	4.42%	3.42%
AIC	429775	423485	423442.5	423429.5	422399.9	368588.1
BIC	429803.6	423637.7	423604.8	423429.5	422609.9	368823.3
Observations	104,027	103,509	103,509	103,509	103,236	89,995
Number of groups	255	255	255	255	254	220

[1]Model 0: empty model. Model 1: only variables at individual level. M2: M1+ public expenditure. M3: M2: + socioeconomic characteristics. Model 4: M3+ Private healthcare insurance. Model 5: M4+ Public healthcare resources.

[2]Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

[3]Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit. A smaller AIC or BIC indicates a better-fitting model.

[4]Source: The authors, based on the Spanish National Health Barometer and the Health Ministry Data Base

Table 1.3 Multilevel estimations for satisfaction with the SNHS with lagged public expenditure and resources.

Variables	Model 1	Model 2
Lag of public health care resources		
Lag regional public expenditure per capita (real) (log)	1.991***	1.510***
	(0.507)	(0.524)
Lag physicians per 1,000 pop.	0.669***	0.558***
	(0.157)	(0.166)
Lag nurses per 1,000 pop.	-0.0282	-0.0193
	(0.0791)	(0.0837)
Lag hospital beds per 1,000 pop.	-0.405***	-0.421***
	(0.0773)	(0.0828)
Lag of private health care resources		
Lag of private health Insurance per capita	-0.00228	-0.00232
	(0.00212)	(0.00229)
ICC	2.92%	2.91%
AIC	342142.9	315880.5
BIC	342366.8	316102.5
Observations	83,437	76,872
Number of groups	203	186

[1] Model 1: Public spending and resources are included with lagged resources for one year. Model 2: Lagged effect for two years.

[2]Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

[3] Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit. A smaller AIC or BIC indicates a better-fitting model.

[4]Source: The authors, based on the Spanish National Health Barometer and the Health Ministry Data Base.
[5]Results for Individual-level variables and for no-lagged covariates at regional level not shown for simplicity but available upon request from authors

Table 1.4 First-differences estimations for satisfaction with the Spanish NHS

	Model 0	**Model 1**	**Model 2**	**Model 3**
Variables				
Public healthcare resources				
Regional public expenditure per capita (log)	0.250	0.278*	0.305**	0.381**
	(0.156)	(0.136)	(0.136)	(0.152)
Physicians per 1,000 pop.				0.618**
				(0.277)
Nurses per 1,000 pop.				-0.242*
				(0.135)
Hospital beds per 1,000 pop				0.183
				(0.183)
Sociodemographics				
Ageing index		0.010*	0.009*	0.009
		(0.005)	(0.005)	(0.008)
Higher education index		-0.054**	-0.056**	-0.046**
		(0.019)	(0.019)	(0.020)
Lower-income region		-0.096*	-0.088*	-0.062
		(0.047)	(0.042)	(0.045)
Private healthcare				
Private health insurance per capita (log)			-0.007**	-0.007*
			(0.003)	(0.004)
Time trend	-0.001	-0.003	-0.003	0.000
	(0.002)	(0.003)	(0.003)	(0.004)
Constant	2.016	6.538	5.130	-0.600
	(4.518)	(5.479)	(5.395)	(8.953)
AIC	-33.13	-42.77	-41.09	-41.04
BIC	-22.52	-21.94	-16.84	-7.958
Observations	254	238	236	202

[1] Model 0: Regional health expenditure. Model 1: M0 + socioeconomic characteristics. M2: M1+ Private healthcare insurance expenditure. M3: M2 + public healthcare resources.

[2] Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

[3] Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit. A smaller AIC or BIC indicates a better-fitting model.

[4]Source: The authors, based on the Spanish National Health Barometer.

4.2 Satisfaction with the primary, specialist, hospital and emergency services of the Spanish National Health System

Table 1.5 describes the multilevel regressions obtained for patients' satisfaction with primary, specialist hospital care and emergency care for the period 2010-2016. The explained variance of satisfaction with public health services, by region and year (ICC), taking into account regional variables, ranges from 2.05% for primary care, 2.24% for specialist services, 3.57% for hospital services and 3.34% for emergency services in the empty model.

The associations between each of these variables and satisfaction with all public health services are mostly similar to those for overall satisfaction with the public health system. The estimations obtained for specific health services also include self-assessed health status[8] (SAH). In this respect, our analysis shows that persons with a lower self-reported health status report greater dissatisfaction with the quality of the services provided by the Spanish NHS, all else being equal. This result shows a pattern of reporting bias in terms

[8] Information about self-assessed health is only available from 2010 onwards (see Table 1.1). However, estimations for overall satisfaction with health services controlling for SAH generally yield very similar results and with the magnitude of SAH in line with those for specific healthcare services (results available from authors upon request).

of health status which is in line with Fiorentini et al. (2015) for health system responsiveness.

The influence of regional variables on indicators of quality varies according to the health service considered. In this respect, the impact of public expenditure remains positive and is of considerable magnitude for primary health care. Although patients who live in poorer regions appear to be far less satisfied with public health services (in all cases), this effect only persists for primary care once we control for public health resources. As in the case of general services, the effect of public health resources is substantial and highly significant for all health services. However, for emergency care, spending has a weaker impact, but a larger (and positive) association is found with the patient-nurse ratio than that obtained for general health services. In this line, too, Kotzian (2009) argues that the lower the doctor-patient ratio, the greater the degree of satisfaction with the health system, since staff shortages can seriously impact on the quality of the service and ultimately on health-related outcomes. In this respect, Jofre-Bonet (200) and Fernández and Sánchez (2020), among others, have suggested that the time spent waiting for health care attention is one of the most important responsiveness domains related to patients' satisfaction with the public health care system. Similarly, Irving et al. (2017) recorded significant associations between national health care spending, the duration of consultations and the burnout that may be suffered by medical personnel. These authors argue that shorter consultations in primary care due to budget constraints are prejudicial to patients' health and to physicians' workloads and mental health.

Interestingly, while PHI per capita is negatively associated with satisfaction, for all services, the magnitude of this effect is only large and statistically significant for

emergency services. Lastly, for hospital care, the ratio of public beds (per 1,000 inhabitants) is negatively associated with health system satisfaction. This finding is in line with Xesfingi and Vozikis (2016), and may reflect a problem of over-supply. The latter authors argue that the number of hospital beds is decreasing across Europe as a result of less invasive surgical procedures and more effective drugs, both of which reduce the length of hospital stays. However, as concerns Spain, this question requires further research. It could also be the case that despite increases in the number of hospital beds, levels of bed occupancy remain high. In fact, in a study conducted in the UK, lowering levels of bed occupancy below 90% was found to be positively associated with better hospital performance and with lower rates of mortality (Boden et al., 2016).

Table 1.5 Estimations of satisfaction with health care services of the SNHS. Random-intercept multilevel models (2010-2016).

	Primary			Specialist			Hospital			Emergency		
VARIABLES	**Model 0**	**Model 1**	**Model 2**	**Model 0**	**Model 1**	**Model 2**	**Model 0**	**Model 1**	**Model 2**	**Model 0**	**Model 1**	**Model 2**
Regional level covariates												
Public health care resources												
Regional public expenditure per capita (in constant euros)		0.452**	0.534**		0.474*	0.0578		0.942***	0.467		0.841***	-0.0839
		(0.218)	(0.217)		(0.257)	(0.302)		(0.303)	(0.371)		(0.312)	(0.399)
Sociodemographics												
Ageing index		0.000800	0.000332		0.000800	0.000332		0.000788	0.000217		0.00255**	0.000131
		(0.000705)	(0.000793)		(0.000829)	(0.000974)		(0.000977)	(0.00136)		(0.00101)	(0.00146)
Lower-income region		-0.174***	-0.187***		-0.180***	-0.0665		-0.291***	-0.215*		-0.263***	0.0537
		(0.0564)	(0.0582)		(0.0665)	(0.0887)		(0.0785)	(0.126)		(0.0806)	(0.136)
Private health care												
Private health insurance per capita (log) (in constant euros)		-0.0194	-0.0120		-0.0354	-0.0379		-0.0755	-0.103*		-0.174***	-0.186***
		(0.0451)	(0.0513)		(0.0531)	(0.0494)		(0.0627)	(0.0555)		(0.0643)	(0.0596)
Public health care resources												
Physicians			1.043**			0.981***			0.937***			0.551**

			(0.452)			(0.230)			(0.258)			(0.277)
Nurses			-0.819*			-0.116			0.0416			0.322***
			(0.472)			(0.0907)			(0.116)			(0.124)
Beds									-0.279***			-0.0244
									(0.0886)			(0.0951)
Constant	7.378***	4.127***	6.258***	6.837***	4.263***	5.735***	6.889***	1.152	3.128	6.190***	1.149	5.061**
	(0.0262)	(1.384)	(1.399)	(0.0289)	(1.624)	(1.698)	(0.0368)	(1.917)	(1.997)	(0.0400)	(1.967)	(2.145)
Random part												
ICC	2.05%	1.59%	1.22%	2.24%	1.94%	1.64%	3.57%	2.67%	2.09%	3.34%	2.19%	1.82%
AIC	202807.1	199656.2	199644.2	199680	175978.2	175965.4	193647	170562.5	170539.9	211748.8	186689.4	186677.4
BIC	202833.5	199841.2	199864.5	199706.3	176177.3	176181.7	193673.1	170760.6	170755.2	211775.1	186888.3	186902.3
Observations	49,661	49,501	44,231	47,594	42,332	42,332	45,697	40,659	40,659	47,348	42,138	42,138
Number of groups	119	119	119	119	119	119	119	119	119	119	119	119

[1] Model 0: empty model. M1: Variables at individual level + public spending. M2: M1 + socioeconomic characteristics+ private healthcare + public health resources.

[2]Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

[3] Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit. A smaller AIC or BIC indicates a better-fitting model.

[4]Source: The authors, based on the Spanish National Health Barometer and the Health Ministry Data Base.

[5]Results for Individual-level variables not shown for simplicity but available upon request from authors

5. Conclusions

This study explores the determinants of an increasingly employed patient-reported dimension of quality of care, as measured by satisfaction with health care and drawing on micro-data provided by the Spanish Health Barometer (SHB) together with macro-data related to regional characteristics.

We provide novel evidence on the role of regional factors in shaping the quality of a health system (proxied by health system satisfaction) drawing special attention to the effects of relevant supply-side factors which can be considered important policy levers and have been insufficiently addressed in previous research. According to our results, the most important drivers of satisfaction at an aggregate level seem to be the level of public resources available and, in particular, staffing levels in the health system (positively) and the amount of private spending on health care (negatively). Therefore, we tentatively suggest that policymakers seeking to enhance health system satisfaction may require higher spending levels in health care, most notably in the form of clinical staff. Indeed, the health sector already had insufficient human resources in many high and low-income countries even before the COVID-19 crisis, a shortcoming that has become even more evident today (ILOSTAT, 2020).

Our results also indicate that a growing importance of the private health sector within a universal NHS may be a revealing indicator of inefficiencies in the public health system and/or the existence of features of private insurance which are deemed important by patients, such as shorter waiting lists or greater choice.

In addition, we find evidence of a considerable non-contemporary effect for some of the main policy levers, including expenditure in health care, which should be taken into consideration when analysing the impact of budgetary cuts (or increases) in health system satisfaction. Finally, our results suggest that a sector-specific analysis such as the one we present may detect important relationships among variables which a more aggregated analysis might not, like the role of specific sector-level supply characteristics.

The results of this study offer interesting and novel insights into the key drivers of a core dimension of healthcare quality which may be particularly relevant for tax-funded health systems heavily dependent on the economic cycle, especially those more willing to implement pro-cyclical fiscal policies as a response to economic downturns such as the one we examine (see e.g. Grigorakis et al., 2018).

Our findings highlight that any worsening of the quality of public health care should be of great concern to policy makers since this could impel wealthier individuals towards the private sector, thus undermining one of the main pillars of social cohesion in the modern welfare state and possibly exacerbating health-related disparities (Costa-Font & García, 2003). This consideration is of particular interest in view of the fact that health systems in many countries must address a growing public-sector deficit, respond to increasing pressures on the health care system (due to COVID-19) and coexist with a considerable increase in the take-up of private health care insurance.

Some limitations of this study should be mentioned. Firstly, since vignettes are not included in the SHB questionnaires, we cannot correct for possible reporting bias in the self-reported levels of satisfaction (Angelopoulou et al., 1998; Jones et al., 2012) with

the NHS. However, as noted in our introduction, previous studies have corroborated the use of self-reported measures of perceived quality as credible indicators of how patients are treated by health care systems. Proxy measures for private healthcare were used in our estimations since no data were available on out-of-pocket spending in this respect at the regional level for the period under study. Moreover, due to the nature of the SBH survey, data for specific health services are only available since 2010 and so the time span covered is relatively short. Another significant consideration is that some public-sector workers in Spain can opt out of the public health system (Epstein & Jiménez-Rubio, 2019), and so the amount of PHI obtained, in each of the regions considered, may be influenced by the number of public servants employed in each case.

As useful areas for future research, studies could be undertaken to explore in more detail the relationship between satisfaction and essential aspects of private healthcare such as waiting lists and choice. In addition, alternative supply side factors of satisfaction with the health services, such as the type of health provider could be examined in more depth.

In short, studies such as the present one may help policymakers and managers design and implement evidence-informed policy regarding key dimensions of health service quality which complements and enriches more traditional measures of health system performance and which may ultimately benefit health outcomes throughout the population.

Chapter 2 ***Waiting times in healthcare: equal treatment for equal need?***

- A preliminary version of this chapter was published as working paper for the EvaluAES workshop. Likewise, a part of the results has been in the paper titled Waiting times in healthcare: Equal treatment for equal need? *International Journal for Equity in Health*, *21*(1), 184. https://doi.org/10.1186/s12939-022-01799-x (See García-Corchero & Jiménez-Rubio, 2022).

1. Introduction

The issue of waiting times for healthcare is a major topic of political discussion in most countries that enjoy a universal healthcare system (OECD, 2020). Due to increasing pressures on health systems worldwide, treatments often have to be postponed, causing patients further deterioration in their health status. Moreover, long waiting times may be seen as a barrier to accessing health services, a question that is particularly sensitive for publicly funded health systems. When patients are dissatisfied with the health service, they may make insufficient use of it, with negative consequences for health levels in the population. Moreover, when waiting times are long, patients may opt out of the public health system, purchasing private health insurance or increasing out-of-pocket expenses. Privately insured individuals are less likely to favour increased spending on the NHS, or to view public healthcare spending as a priority. Such attitudes would ultimately increase the pressure on NHS funding (Costa-Font & Ferrer-i-Carbonell, 2022). Long waiting times and reduced support for publicly funded health systems are major challenges, and could be exacerbated by the COVID-19 crisis as treatments and elective interventions are postponed (Findling, Blendon & Benson, 2020). Additionally, there is robust evidence of inequality in this regard, such that patients with a higher socioeconomic status (SES) enjoy privileged access to publicly funded health systems (see Landi, Ivaldi & Testi (2018) and Siciliani (2016), on recent literature in this area and section 2.1 for a a recent literature review for this topic).

In the present study, pooled cross-sectional data for GPs and specialist consultations within the Spanish NHS are used to test whether outpatient waiting times depend on SES, measured by education and labour market status. We also determine how much of the SES gradient remains after controlling for nationality and other sociodemographic differences.

This study contributes to the literature in the following ways. First, in contrast to much previous work, we consider not only specialist care, but also primary health care, thus examining whether inequalities start with the patient's first contact with the health system. Second, the primary dependent variable is continuous, which enables us to implement quantile regression (QR) estimation techniques to examine whether the SES determinants of waiting times vary within the distribution of waiting times. QR techniques are particularly useful for exploring the possible existence of selection bias in specialist care, a factor that might lead to inequalities being overestimated and one that has been relatively neglected in earlier work. While some papers have considered selection bias in inpatient care, we believe ours is the first to empirically address this issue for specialist services. Third, also in contrast to much previous research in this field, our dependent variable is waiting times for medical visits within a universal health system that is specifically mandated to deliver equal treatment for equal need. Moreover, our abundant dataset includes a proxy for the use of private health care, which is useful as an alternative test for possible selection bias. This question is of great significance to health system policymakers, because if the SES gradient can be explained by sample selection, then it should not be interpreted as evidence of systemic inequality. Fourth, we look deeper into inequalities in waiting times on the basis of SES by analysing potentially-relevant factors which have been omitted or underestimated in earlier research, such as nationality status and language fluency.

Our results indicate the existence of a SES gradient in waiting times for specialist services, mainly due to differences in education. We show that patients with university studies wait on average 10.6-18.6.7% (9-16 days) less than those with no educational qualifications. However, for GP visits, the hypothesis of a negative SES gradient in waiting times is not supported by our results. Additionally, while the SES gradient flattens with longer waiting times, our findings do not provide evidence that reliance on private health care drives the association between SES and waiting times for specialist care. Finally, our findings appear to be consistent, according to the robustness checks applied.

The remainder of this paper is organised as follows: in section 2, we provide a literature review and the Spanish seeting for waiting time, in section 3 we present the data source and the main characteristics of the Spanish NHS, after which we set out the empirical strategy employed. The study findings are detailed in section 4, and discussed in detail in section 4. In the final section, we present the main conclusions drawn and identify relevant policy implications.

2. Literature review and the Spanish case

2.1 Literature review

The generally accepted criterion for healthcare waiting time is that patients should be prioritised according to the nature of their clinical condition, rather than by characteristics such as their education, income or nationality ((Siciliani, 2014; Simonsen et al., 2020). However, there is robust evidence of inequality in this regard, such that patients with a higher socioeconomic status (SES) enjoy privileged access to publicly funded health systems (see Landi, Ivaldi & Testi (2018) and Siciliani (2016), on recent literature in this area) .

Sharma et al. (2013) and Johar et al. (2013) provide strong evidence of inequalities in waiting times for elective surgical procedures, drawing on administrative and census data for Australia. Both studies find that the socioeconomic gradient in waiting times persists even after controlling for possible sample selection by which richer patients may opt for the private sector if they fear a long wait for public sector attention. Similarly, Simonsen et al. (2020) in their study of the health system in Denmark, found significant inequalities in waiting times for certain procedures (e.g., 9-17 days' longer wait for cataract surgery for less favoured individuals), mostly explained by geographical and institutional factors affecting the hospitals concerned. These authors also revealed important differences for non-Western immigrants, whose average waiting time for health care was 11-26% more than that for Danish nationals.

Regarding specialist consultations and non-emergency surgery within the public sector, Siciliani & Verzulli (2009) in their analysis of survey data from older adults, obtained evidence of inequality in favour of the most educated patients in nine European countries,

together with a moderate effect of personal income. However, the socioeconomic gradient was considerably larger for specialist consultations than for non-emergency interventions. In this line too, Schoen et al. (2009) examined health systems in Australia, New Zealand, Canada, USA and five European countries and found that, on average, waiting times to see a specialist were around two months less for patients who were financially better off. However, there was no SES gradient for elective surgery.

Abásolo et al. (2014) investigated specialist waiting times within the Spanish NHS, drawing on data from the 2006 Spanish National Health Survey. These authors showed that an increase of 10% in household income was associated with a fall of 2.6% in waiting times for diagnostic visits. Education also seemed to play an important role in this respect, with more highly educated patients waiting 28% less time.

Overall, most previous research suggests that patients with a lower SES are at far greater risk of experiencing longer waiting times, especially for specialist visits. However, there is only limited evidence of inequalities in waiting times for primary care. Drawing on survey data, Roll et al. (2012) analysed the impact of income and type of insurance on waiting time for GP and specialist consultation in Germany. This study provides strong evidence of inequalities in access to both specialist and primary care services. A recent multi-country study by Martin, Siciliani & Smith (2020) found evidence of strong disparities in access to primary care in Canada, Norway and Sweden, according to household income.

2.2 Institutional setting

Spain has a universal health care system that is to a large extent free at the point of delivery (Bernal-Delgado et al., 2018). Health services are mostly publicly provided (public healthcare accounted for 70.8% of total health spending in 2019) (OECD, 2020). While the Spanish NHS provides universal health care to all individuals residing in the country and is funded mainly by general taxation, the proportion of the population covered by private insurance is rapidly increasing, with out-of-pocket spending accounting for 21.8 percent of total expenditure and voluntary health insurance accounting for 7.9 percent (OECD, 2020). To a large extent, private insurance in Spain provides either a larger choice of providers or a faster access to health care services (duplicate insurance), a feature which is also shared by many OECD countries (OECD, 2020).

Under the Spanish NHS, individuals visit first the primary health care doctor with whom they are registered to make an appointment following the onset of any symptoms (Bernal-Delgado et al., 2018). As in most universally provided health systems, GPs act as gatekeepers and decide whether specialised care is necessary. In addition to in-person appointments in health centres, patients have usually access to web or telephone-based services to get appointments for the GP and specialised care.

3. Data and Methods

3.1 Data source

This study is based on microdata drawn from the Spanish Health Barometer (SHB) survey for the years 2010-2019. The SHB survey (Ministerio de Sanidad, Consumo y Bienestar Social, 2020) is conducted annually, with a representative sample of the Spanish population, aged 18 and above, totalling more than 7,800 people per year, and collects information on opinions, attitudes, utilisation and perceptions of health services. Table 2.1 shows the characteristics of the study sample, which was composed of 16,036 individuals who had paid at least one visit to a GP and of 6,825 who had visited a specialist doctor within the Spanish NHS. The average waiting time for primary care was 3.32 days while for specialist care it was 88.03 days.

3.2 Study variables

3.2.1 *Waiting time*

Waiting time to see a GP in the Spanish NHS is measured as the number of days elapsed since the appointment was made until the medical visit took place, during the twelve months prior to the survey. For specialist consultations, waiting time is defined as the time elapsed since the GP's referral until the patient was seen by the specialist. The main dependent variables are based on the questions:

"The last time you requested a consultation with your doctor or general practitioner, how long did it take from the day you requested the appointment to the day the consultation took place?"

"The last time your doctor or general practitioner referred you to the specialist, how long did it take from the day you made an appointment with the specialist until the specialist saw you?"

Only visits within the Spanish NHS are taken into account for our analysis. We exclude patients who made no appointment due to the emergency nature of the visit and were attended on the same day. The time frame considered is restricted to those years with homogeneous information on waiting time in the survey (i.e., 2010-2019). Additionally, for specialist care, our focus is restricted to the 2010-2013 period since information on speciality type is only available for that period.

3.2.2 *Independent variables*

Our core socioeconomic variables are the patients' education and employment status. Education is split into four categorical variables (no qualifications; primary studies; secondary studies; university studies). Activity status is also categorised into four variables (employed; inactive; retired; unemployed), with employment status subdivided into 9 additional groups on the basis of the National Classification of Occupations (CNO-2011) In addition, we have included household income categorised into 5 quintiles ranging from 0-600 monthly euros to over 4500 euros (see Table 2.1)[9]. However, for the sake of simplicity, given the high number of employment variables, and to make the most of our estimating sample (as household income has a high number of missing values, see Table 2.1), we have used education and employment status (aggregated into 4 categories) as the baseline SES indicators and have included the estimations with the additional SES variables in Tables A.2.2-A.2.6 of the appendix of the chapter 2.

[9] As an extra SES indicator, we included personal income which was only available in the SHB for the period 2015-2019, and thus was only included in the estimations for primary care (see descriptives for this variable in Table 2.1 and estimation results when including this variable as a covariate in Table A.2.6 in the appendix of chapter 2).

Severity of the patient's condition is measured by age, self-assessed health status and the presence of chronic diseases. Since severe health conditions might be correlated (negatively) with waiting and SES, failure to control for this parameter might generate biased results. Age is assigned to one of five categories (ranging from 18-35 years to 76 years or older). Self-assessed health status is measured by a categorical indicator by which general health is considered to be "excellent" "good", "fair", "bad" or "very bad'. Finally, a dummy variable controls for the presence of any chronic conditions. The number of visits to a publicly-funded specialist doctor is categorised into three groups (one, two and three or more consultations) to proxy either the type of consultation diagnosis (first visit) or a review (subsequent visits) for specialist care or to address the clinical need.

Our analysis also controls for the patient's gender, size of area of residence, citizenship status and fluency in Spanish. Nationality has received little attention in the literature, with the exception of Simonsen et al. (2020) and Tinghög et al. (2014). Differences in citizenship status may be a source of inequality in waiting times. Thus, studies such as Simonsen et al. (2020) and Jiménez-Rubio and Hernández-Quevedo (2011) have documented inequalities not only in access but also in waiting times according to the patient's nationality. Finally, we also include the number of visits to the private GP or specialist doctor, to take into account the possibility that patients might seek private healthcare if NHS attention is subject to long waiting times. This option might bias our inequality estimates by generating an apparent negative gradient between SES and waiting time for patients receiving treatment within the NHS.

Table 2.1 Sample characteristics for waiting times

Variable	Mean	SD	Min	Max	Missings (%)	Period
Waiting time (days)						
Gp doctor (n=24,935)	3.36	3.79	1	97	3.39%	2010-2019
Specialist doctor (n=6,825)	88.03	92.68	1	1440	5.48%	2011-2013
Education					0.17%	2010-2019
No qualification	6.90%	0.25	0	1		
Primary studies	22.73%	0.42	0	1		
Secondary studies	47.98%	0.50	0	1		
Bachelor studies	22.40%	0.42	0	1		
Laboral status					0.21%	2010-2019
Employed	39.70%	0.4925	0	1		
Managers (private and public institutions)	2.00%	0.14	0	1		
Technical and profesional scientists and intellectuals	6.20%	0.24	0	1		
Support technicians and professionals	6.00%	0.24	0	1		
Office workers	1.80%	0.13	0	1		
Hospitality and shop workers	8.80%	0.28	0	1		
Security and protection workers	0.50%	0.07	0	1		
Qualified workers in the agricultural industry	1.20%	0.11	0	1		
Artisans and qualified workers in the industry, building and mining sectors	4.60%	0.21	0	1		
Industrial machinery and installations´ operators	4.00%	0.20	0	1		
Unqualified workers	4.60%	0.21	0	1		
Non-employed						

Retirement pensioner	27.22%	0.45	0	1		
Inactived	12.44%	0.33	0	1		
Unemployed	18.91%	0.39	0	1		
Household income					28.31%	2010-2019
Q1 [0-600 monthly euros]	8.40%	0.28	0	1		
Q2 [601-1,200 monthly euros]	39.20%	0.49	0	1		
Q3 [1,201-2,400 monthly euros]	38.20%	0.49	0	1		
Q4 [2,401- 4,500 monthly euros]	12.20%	0.33	0	1		
Q5 [More than 4,500 monthly euros]	2.00%	0.14	0	1		
Personal income					25.90%	2015-2019
Q1 [0-600 monthly euros]	28.70%	0.452	0	1		
Q2 [601-1,200 monthly euros]	29.20%	0.455	0	1		
Q3 [1,201-2,400 monthly euros]	15.20%	0.359	0	1		
Q4 [2,401- 4,500 monthly euros]	1.30%	0.115	0	1		
Q5 [More than 4,500 monthly euros]	0.20%	0.042	0	1		
Age					0.01%	2010-2019
18 to 35	24.55%	0.43	0	1		
36 to 45	19.23%	0.39	0	1		
46 to 65	32.59%	0.47	0	1		
66 to 75	13.41%	0.34	0	1		
76 or plus	10.22%	0.30	0	1		
Severity						
Chronic diseases	37.23%	0.48	0	1	0.45%	2011-2019
Self-reported health status					0.22%	2010-2019
Excellent	12.65%	0.33	0	1		

Good	54.17%	0.50	0	1		
Average	27.44%	0.45	0	1		
Poor	4.85%	0.21	0	1		
Worst	0.89%	0.09	0	1		
Living area					0.00%	2010-2019
Rural (Hab <10,000)	20.82%	0.41	0	1		
Gender					0.00%	2010-2019
Female	56.01%	0.50	0	1		
Immigrant status					0.05%	2010-2019
Spanish only	90.80%	0.24	0	1		
Double Spanish nationality	3.21%	0.18	0	1		
European Union	1.74%	0.13	0	1		
Rest of Europe	0.30%	0.05	0	1		
Latin American	2.90%	0.17	0	1		
North American	0.04%	0.02	0	1		
African	1.04%	0.10	0	1		
Asian	0.10%	0.03	0	1		
Fluency					0.90%	2010-2019
Low fluency	0.13%	0.04	0	1		
Medium fluency	3.01%	0.17	0	1		
High fluency	96.87%	0.17	0	1		
Utilization of Spanish National Health System						2010-2019
Gp doctor (number of visits)					0.04%	
1	20.00%	0.40	0	1		
2	23.80%	0.43	0	1		

3 or more	50.80%	0.50	0	1	
Specialist doctor (number of visits)					0.08%
1	44.50%	0.50	0	1	
2	27.60%	0.45	0	1	
3 or more	28.00%	0.45	0	1	
Utilization of private healthcare					
Gp doctor (number of visits)					0.04%
0	93.50%	0.25	0	1	
[1-2]	4.60%	0.21	0	1	
[3 or more)	1.90%	0.14	0	1	
Specialist doctor (number of visits)					0.08%
0	89.80%	0.30	0	1	
[1-2]	7.20%	0.26	0	1	
[3 or more)	3.10%	0.17	0	1	

Source: Spanish Barometer (Ministerio de Sanidad, 2018)

3.4 Analysis technique: specification and estimation

2.4.1 Empirical specification

We model the waiting time for primary or specialist care visits w_{ijt} for patient *i* within the NHS in region *j* in year *t* as:

$$\ln(W_{ijt}) = \beta_0 + \beta_1 SES_{ijt} + \beta_2 Sev_{ijt} + \beta_3 Z_{ijt} + d_j + d_t + e_{ijt}$$

where SES_{ijt} is a set of variables measuring SES; Sev_{ijt} is a vector of variables measuring severity; Z_{ijt} denotes the effect of other explanatory variables which may explain the SES gradient; d_j and d_t represent region and year effects, respectively; and e_{ijt} is the error term. Since waiting times are highly skewed to the left, the dependent variable is transformed into the log form. For specialist health care, we also control for specialty fixed effects (d_s).

Our coefficient of interest, β_1, measures the association between patients' SES and the waiting time for publicly funded primary and specialist visits. Our main coefficient of interest is $\hat{\beta}_1$, which captures the gradient between SES and waiting times. We also control for severity in order to eliminate possible bias in this respect, since health status and SES may be correlated. Our initial assumption is that more severe patients will have shorter waiting times [5,10]. Severity is measured by the patient's age and by the presence of chronic illness.

Our extended models demonstrate how much of the SES gradient remains after controlling for (i) additional individual attributes (gender and area of residence), (ii) citizenship status and fluency with the language and (iii) utilisation of private health

services, all of which may be relevant determinants of access to health services. Appendix 1 details the role played by citizenship status and fluency in Spanish in explaining differences in waiting times; we assume that greater fluency will help the patient to better navigate the health system.

In this analysis, we employ ordinary least squares (OLS) and robust standard errors clustered at region level. In addition, we include sampling weights throughout to make the sample as representative as possible of the Spanish population. We are cautious about interpreting our results as causal relationships, since the assumption of exogeneity does not hold for SES and waiting time, because we cannot control unobserved factors such as health illiteracy, which may be correlated with both waiting time and SES (Simonsen et al., 2020). However, the inclusion of variables such as language fluency and immigrant status together with the longitudinal nature of our data are expected to improve the reliability of our analysis.

3.4.2 Quantile regression

Since the relationship between SES and waiting times may vary at different points of the waiting time distribution, we make use of quantile regression (QR), in line with previous research (see e.g. Sharma et al., 2018). Accordingly, Eqs. (1) and (2) can be rewritten for the τth conditional quantile (Qτ) as follows (Buchinsky, 1998):

$$Q_\tau(\ln(W_{ijt})) = \beta_0(\tau) + \beta_1(\tau)SES_{ijt} + \beta_1(\tau)Sev_{ijt} + \beta_3(\tau)Z_{ijt} + d_j(\tau) + d_t(\tau) + e_{ijt}\ (\tau)$$

where β_τ represents the slope coefficients and e_τ is the idiosyncratic error term at the τth conditional quantile. Quantile regressions are based on minimising the sum of the

weighted absolute values of waiting times. This approach has the following advantages: (1) it allows the effect of the explanatory variables to vary within the distribution of waiting times; (2) it is robust to outliers in the observations of waiting times. The command *sqreg* was performed to estimate values of q in Stata 15 (STATA, 2017) and to test various hypotheses about our dependent variables.

4. Results

4.1 Inequalities in waiting times for primary care.

Table 2.2 presents the OLS estimations obtained for waiting times in primary care. Model 1 includes SES (measured by education and activity status), gender, severity (proxied by the presence of chronic disease) and age. Model 2 includes the following additional control variables; type of area of residence (rural vs. urban); citizenship status; fluency in Spanish and utilisation of primary services in private healthcare.

Our analysis revealed significant differences in waiting times for primary care according to gender, severity and area of residence. On average, women waited around 4% longer than men. Regarding SES, while the baseline model revealed no evidence of important differences in this respect, the estimations in Tables A.2.1 and A.2.2 of the Supplementary Material provided suggestive evidence of a SES gradient in favour of moderate to highly qualified workers (approximately 8% less wait). Moreover, waiting times for primary care were slightly longer for chronically ill patients and for private insurance holders. In particular, patients who reported at least one chronic disease, and those who were frequent users of private healthcare services were more likely to experience longer waiting times. On the other hand, waiting times in primary care were shorter for older patients.

Interestingly, those who lived in rural areas waited considerably less than their counterparts in urban areas (approximately 25% less wait or 0.8 days). Moreover, we found statistically significant differences in waiting time for double nationality individuals albeit moderate in size(about 6% more wait, or 0.2 days) (see Table A.2.2 and Supplementary Material 1). Finally, according to Figure A.2.1 in the Supplementary material only four regions Cataluña, Canarias, Comunidad Valenciana and Islas Balearesare above the reference region in terms of primary care wait.

The Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit[10] of each model considered. According to these test results and the ICC values obtained, model 2, which represents the extended model, performs best.

Table 2.2. OLS estimations for waiting time in primary care. 2011-2019.

Waiting times in primary care	**Model 1**	**Model 2**
Education		
No qualifications	Ref.	
Primary studies	0.003	-0.007
	(0.029)	(0.023)
Secondary studies	0.011	-0.009
	(0.030)	(0.023)
University studies	0.000	-0.031
	(0.031)	(0.022)
Employment status		
Inactive	Ref.	
Retirement pensioner	-0.005	-0.003

	(0.013)	(0.014)
Unemployed	-0.012	-0.010
	(0.014)	(0.017)
Employed	0.004	0.004
	(0.025)	(0.026)
Gender		
Male	Ref.	
Female	0.043***	0.038***
	(0.011)	(0.011)
Severity		
Age (years)		
18 to 24	Ref.	
35 to 44	-0.050***	-0.049***
	(0.010)	(0.010)
45 to 64	-0.042***	-0.041***
	(0.009)	(0.010)
65 to 75	-0.064***	-0.066***
	(0.015)	(0.017)
75 or more	-0.129***	-0.132***
	(0.026)	(0.026)
Chronic illness		
Presence of chronic illness	0.058***	0.053***
	(0.012)	(0.013)
GP visits		
1 visit	Ref.	
2 visits	0.029*	0.030*
	(0.016)	(0.017)

3 or more visits	0.038*	0.040*
	(0.018)	(0.019)
Area of residence		
Urban	Ref.	
Rural		-0.236***
		(0.043)
Citizenship status		
Native Spanish	Ref.	
Spanish acquired		0.060***
		(0.016)
Foreign		0.033
		(0.028)
Fluency		
High	Ref.	
Medium		-0.066**
		(0.029)
Low		-0.105
		(0.072)
Private healthcare visits		
0 visits	Ref.	
1 to 2 visits		0.006
		(0.020)
3 or more visits		0.128**
		(0.049)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Constant	0.893***	0.945***

	(0.052)	(0.046)
Observations	24,935	24,935
R-squared	0.249	0.261
AIC	51325	50919
BIC	51455	51049

[1] Our individual of reference is a male with no studies; inactive; between 18 and 34 years old; no chronic disease; no visit to private GPs; Spanish; fluent and living in an urban area.

[2] Model 1: SES, severity variables and time and region fixed effects. M2: M1+ area of residence+ immigrant status+ Spanish fluency

[3] Double nationality: Spanish nationality and other.

[4] Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

3.2 Inequalities in waiting times for specialist visits

Table 2.3 shows the OLS estimations obtained for waiting times for specialist attention. The results show the presence of a robust SES gradient, mostly on the basis of education and, to a lesser extent, employment status. According to Model 2, the most highly educated patients wait 18.6% (16.4 days for a sample mean of 88.03 days) less than those with no qualifications. Regarding activity status, unemployed patients wait 12.9-13.7% (12 days) more than employed patients. With respect to the alternative SES indicators employed, substantial differences were found in waiting times on the basis of both employment type and household income, reinforcing our baseline results (see Tables A.2.2 and A.2.4 of the appendix). It is important to remark, however, that the size of the education effect attenuates considerably when household income is included in the estimations, and that the magnitude of the effect is considerably high for highly skilled workers (around 19% less wait). In addition, our results provide suggestive evidence of differences on the basis of health, with an average additional wait of 19.4-19.2% (17 days) for individuals diagnosed with a chronic condition.

Among the other control variables, a gender gap was also found for specialist healthcare, with female patients having to wait 19.4-19.5% (17 days) longer than men, even after controlling for SES and severity. On the other hand, patients who paid 1 or 2 visits to private healthcare suppliers faced a slightly longer wait. Interestingly, marked differences were also found according to nationality, with EU nationals reporting substantially shorter waiting times (around 22%, see Table A.2.1 in Supplementary Material). Finally, some interesting differences were found regarding the region of residence, with Madrid and La Rioja being the regions with less wait in comparison to the region of reference (Andalucía) (see Figure A.2.2 in the appendix of chapter 2).

According to the goodness-of-the-fit measures of each model considered, Model 2, which controls for area of residence, nationality and utilisation of private healthcare, performs best.

Table 2.3 OLS estimations for waiting times for specialist care. 2011-2013.

Waiting times in specialist care	**Model 1**	**Model 2**
Education		
No qualifications	Ref.	
Primary studies	-0.081	-0.085
	(0.055)	(0.055)
Secondary studies	-0.158***	-0.163***
	(0.037)	(0.038)
University studies	-0.169***	-0.186***
	(0.041)	(0.043)
Employment status		
Inactive	Ref.	
Retirement pensioner	0.090	0.092

	(0.089)	(0.088)
Unemployed	0.129***	0.137***
	(0.042)	(0.043)
Employed	0.044	0.046
	(0.054)	(0.054)
Gender		
Male	Ref.	
Female	0.195***	0.196***
	(0.028)	(0.029)
Severity		
Age (years)		
18 to 24	Ref.	
35 to 44	0.023	0.023
	(0.038)	(0.039)
45 to 64	0.012	0.002
	(0.030)	(0.028)
65 to 75	0.005	-0.010
	(0.053)	(0.052)
75 or more	-0.191***	-0.204***
	(0.059)	(0.057)
Chronic illness		
Presence of chronic illness	0.194***	0.192***
	(0.037)	(0.037)
Specialist visits		
1 visit	Ref.	
2 visits	0.030	0.032
	(0.030)	(0.029)

3 or more visits	-0.176***	-0.172***
	(0.041)	(0.040)
Area of residence		
Urban	Ref.	
Rural		-0.027
		(0.042)
Citizenship status		
Native Spanish	Ref.	
Spanish acquired		-0.158
		(0.133)
Foreign		-0.103
		(0.077)
Fluency		
High	Ref.	
Medium		0.005
		(0.136)
Low		-0.334
		(0.570)
Private healthcare visits		
0 visits	Ref.	
1 to 2 visits		0.167**
		(0.077)
3 or more visits		0.018
		(0.071)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Specialist FE	Yes	Yes

Constant	3.641***	3.650***
	(0.069)	(0.074)
Observations	6,825	6,825
R-squared	0.045	0.047
AIC	21556	21541
BIC	21665	21650

[1] Our individual of reference is a male with no studies; inactive; between 18 and 34 years old; no chronic disease; one visit to public GPs; no visit to private GPs; Spanish; fluent and living in an urban area.

[2] Model 1: SES severity variables and region, year and specialties' fixed effects. M2: M1+ area of residence+ immigrant status+ Spanish fluency. Model 3 also control for other non-observable effects at time or region level.

[3] Double nationality: Spanish nationality and other.

[4] Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4.3 Inequalities in waiting times across the distribution.

Table 2.4 shows the quantile regressions obtained for waiting times for specialist care. Columns 2–6 show the estimates for the 10th, 25th, 50th, 75th and 90th quantiles. These results illustrate differences in the distribution of waiting times for specialist healthcare services, with respect to education background, especially in moderate levels of the waiting distribution (quantile 25th). There is also evidence of socioeconomic differences according to employment status, also mostly in moderate segments as well (the 25th quantile). Moreover, there were important differences in the distribution of waiting times for specialist consultations when the patients presented chronic diseases (longer waiting times) and for higher numbers of visits (shorter waiting times). Finally, our baseline findings, and our estimations based on alternative SES covariates (Tables A.2.3 and A.2.5 of the Supplementary Material) suggest that there is evidence of greater use of private consultations when waiting times for Spanish NHS services are longer (the 50th and 75th quantiles).

Table 2.4. Quantile regression for waiting times for specialist care (2011-2013).

Waiting time for specialist	Q(0.10)	Q(0.25)	Q(0.50)	Q(0.75)	Q(0.90)
Education					
Primary	-0.132	-0.137	0.0076	-0.0272	0.0484
Secondary	-0.273	-0.292**	-0.0872	-0.0793	0.00000643
University	-0.198	-0.279*	-0.163*	-0.138	-0.0832
Employment status					
Retired	0.0059	0.0901	0.095	0.119	0.0693
Unemployed	0.219	0.173**	0.0876	0.119*	0.0883
Employed	-0.0839	0.0613	0.0336	0.101*	0.107
Gender					
Female	0.272***	0.203***	0.168***	0.163***	0.0919***
Age (years)					
35 to 44	0.0672	0.00655	0.00591	-0.0482	-0.111
45 to 64	0.147	-0.0243	-0.0154	-0.05	-0.0659
65 to 74	0.00495	-0.007	-0.077	-0.0326	-0.037
75 or more	-0.121	-0.328*	-0.186*	-0.166	-0.0793
Chronic illness					
Presence of chronic illness	0.111	0.177***	0.210***	0.196***	0.166***
Number of visits to GP					
2 visits	0.260***	0.135*	0.0496	-0.0202	-0.0831*
3 or more visits	0.00921	-0.0911	-0.148***	-0.249***	-0.256***
Area of residence					
Rural	-0.0599	-0.0501	-0.0517	0.0199	0.0186
Citizenship status					
Spanish	-0.0694	-0.231	-0.00478	-0.0968	-0.161
Foreign	-0.285	-0.0824	-0.145	-0.183**	-0.201*

Private consultations					
1 or 2 visits	0.121*	0.161*	0.146**	0.154*	0.053
3 or more visits	-0.45	0.00697	0.145	0.0977	0.0126
Fluency					
Medium	0.0619	-0.063	0.159	0.137	0.235
Low	-1.662	-0.915	-0.0364	0.132	-0.0103
Specialist fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	3.636***	3.221***	3.788***	4.313***	4.968***

[1] Our individual of reference is a male who has visited Traumatology services; with no studies; inactive; between 18 and 34 years old; with no chronic disease; one visit to public specialist care; no visit to a private specialist doctor; Spanish citizenship; fluent and living in an urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status+ fluency + private healthcare utilization + region and -year fixed effects.

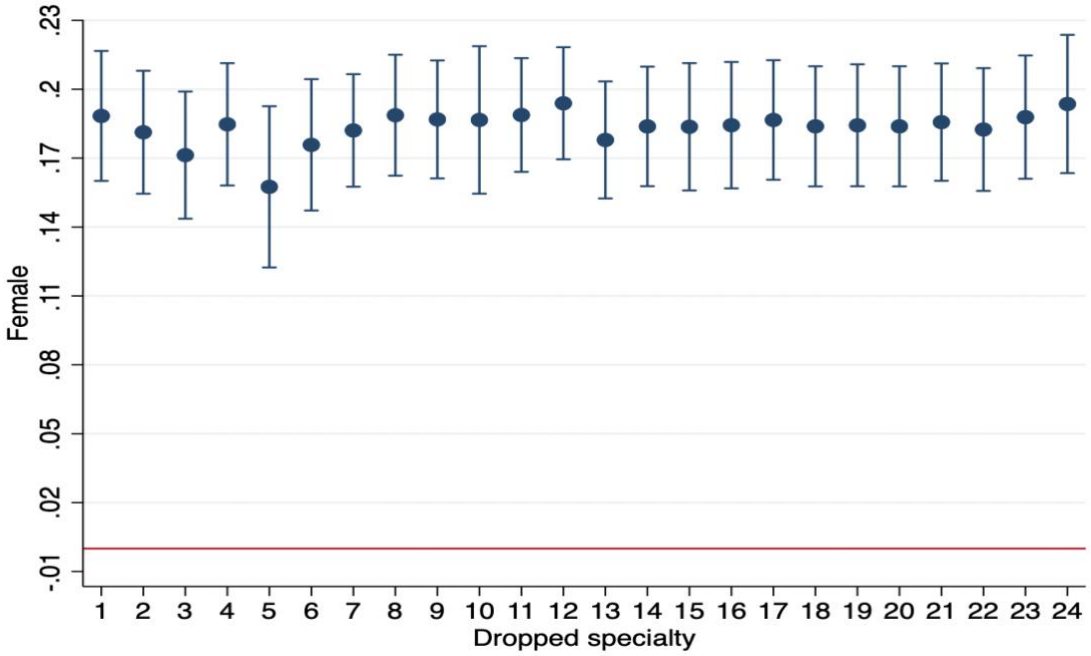
[3] Note: *** p<0.01, ** p<0.05, * p<0.1

4.4 Robustness tests

Several robustness checks were performed. First, region-specific time trends were included to take into account potential differential trends in the outcome variables across regions. Table 2.5 shows that this flattens the SES gradient for specialist care, but the results vary only marginally. Second, the models were implemented with the addition of self-assessed health (SAH) as another control variable. As can be seen in Table 2.6, adding SAH affected neither the statistical significance nor the size of the rest of variables for waiting times for primary or specialist care. However, only marginally significant effects of SAH were found for waiting times in primary care. Therefore, it was not included in the baseline model.

Third, by means of a leaving-out test for the different specialties, we tested the hypothesis that the gender gap for waiting times may be driven by related differences in the use of specialist healthcare (for example, gynaecological attention). However, as Figure 2.1 shows, the gender gap remained throughout the sample, although when the observations for ophthalmology was omitted, the gender differences decreased slightly.

Figure 2.1. Leaving-out test for female gender, across specialties.



1. General and digestive surgery 2. Obstetrics and gynaecology 3. Ophthalmology 4. Otorhinolaryngology 5. Traumatology and orthopaedic surgery 6. Urology 7. Neurology 8. Digestive system 9. Circulatory system 10. Dermatology (skin diseases) 11. Pneumology (respiratory system) 12. Medical oncology 12. Psychiatry 13. Rehabilitation 14. Endocrinology 15. Allergology 16. Cardiovascular surgery 17. Geriatrics 18. Haematology 19. Haemotherapy 20. Immunology 21. Internal medicine 22. Nephrology 23. Rheumatology 24. Other.

Table 2.5. OLS estimations for primary and specialist services, controlling for region-specific time effects.

Waiting times	**Primary care**	**Specialist care**
Education		
No qualifications	Ref.	
Primary studies	-0.005	-0.085
	(0.022)	(0.055)
Secondary studies	-0.006	-0.157***
	(0.023)	(0.040)
University studies	-0.028	-0.179***
	(0.021)	(0.046)
Employment status		
Inactive	Ref.	
Retirement pensioner	-0.002	0.094
	(0.015)	(0.088)
Unemployed	-0.011	0.134***
	(0.017)	(0.045)
Employed	0.002	0.042
	(0.026)	(0.054)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Region-Trend	Yes	Yes
Specialist fixed effects	No	Yes
Constant	0.899***	3.640***
	(0.037)	(0.068)
Observations	24,935	6,825
R-squared	0.263	0.054
AIC	50829	21493

BIC	50959	21602

[1] For primary care, our individual of reference is a male with no studies; inactive; between 18 and 34 years old; no chronic disease; one visit to public GPs; no visit to private GPs; Spanish citizenship; fluent and living in a urban area. For specialist consultations, our individual of reference is a male who has visited Traumatology services; with no studies; inactive; between 18 and 34 years old; with no chronic disease; one visit to public specialist services; no visit to private specialist doctor; Spanish and living in a urban area.

[2] Full model specification: Only SES variables are reported.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

Table 2.6. OLS estimations for waiting time for primary and specialist care, controlling for self-assessed health.

Waiting times	**Primary care**	**Specialist care**
Education		
No qualifications	Ref.	
Primary studies	0.004	-0.086
	(0.023)	(0.060)
Secondary studies	0.007	-0.155***
	(0.023)	(0.051)
University studies	-0.011	-0.169**
	(0.023)	(0.060)
Employment status		
Inactive	Ref.	
Retirement pensioner	-0.006	0.083
	(0.014)	(0.091)
Unemployed	-0.010	0.128**
	(0.017)	(0.045)
Employed	0.006	0.039
	(0.026)	(0.054)
Severity		
Self-assessed health status		

Very bad		Ref.
Poor	-0.101	0.194
	(0.080)	(0.131)
Average	-0.139*	0.204
	(0.077)	(0.151)
Good	-0.194**	0.149
	(0.076)	(0.155)
Excellent	-0.203**	0.012
	(0.071)	(0.190)
Chronic illness	0.029**	0.166***
	(0.012)	(0.050)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Region-Trend	Yes	Yes
Specialist fixed effects	No	Yes
Constant	1.124***	3.518***
	(0.087)	(0.156)
Observations	24,900	6,814
R-squared	0.262	0.049
AIC	50746	21495
BIC	50875	21604

[1] For primary care, our individual of reference is a male with no studies; inactive; between 18 and 34 years old; no chronic disease but very bad self-reported health status; one visit to public GOs; no visit to private GPs; Spanish and living in an urban area. For specialist consultations, our individual of reference is a male who has visited Traumatology services; with no studies; inactive; between 18 and 34 years old; with no chronic disease but very bad self-reported health status; one visit to public specialist doctor; no visits to private specialist doctor; Spanish and living in an urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status + private healthcare utilization + region-year fixed effects.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

5. Discussion

The main aim of the study described in this paper is to determine empirically whether there exists a SES gradient for waiting times in primary and specialist care within the Spanish NHS for patients presenting the same level of severity. Using rich data from the Spanish Health Barometer and making use of OLS and quantile regression, we examine how much of the SES gradient remains after controlling for potentially relevant confounding variables such as level of severity, utilisation of private healthcare services and nationality.

Although most previous studies in this field have focused on waiting times in inpatient care, the presence of a SES gradient in access to health services may originate in primary care and continue throughout the patient's experience with the health system. The channels which may account for this gradient include differences in the availability of GPs according to the patient's place of residence, in access to networks or in employment flexibility (usually more available to the more highly educated) (Martin, Siciliani & Smith, 2020). Although we did not detect strong inequalities arising from the patients' household income in primary care, we did detect some modest effects on the basis of employment status, which are in line with recent research conducted in several OECD countries (Martin, Siciliani & Smith, 2020). Another study, by Roll et al. (2012) drawing on German data, found that for patients who earn 2,000 or more euros monthly, the waiting time for primary care was one day shorter than for those on lower incomes. Our own analysis provides evidence of inequalities in waiting time to see a GP on the basis of gender (favouring males), severity (pro-healthy gradient) and area of residence (favouring rural areas). The latter result may be explained by the fact that rural areas have relatively more healthcare facilities (especially outpatient clinics) and because access to these is easier than to similar facilities in urban areas (Abásolo, Negrín-Hernández &

Pinilla, 2014). Previous studies have detected a gender gradient in waiting time, attributing this to different patterns of service utilisation between men and women. Furthermore, differences in severity, and the fact of shorter waiting times for men, may be due to the latter presenting a more advanced stage of the disease when they contact the health care provider.

Regarding specialist consultations, evidence of SES-related inequalities in waiting times persists even after adjusting for severity and other potential confounding factors. This finding corroborates the earlier work of Siciliani and Verzulli (2009) and Abásolo et al. (2014) in this respect. While Siciliani and Verzulli (2009) found modest effects for income but substantial ones for education (68% less waiting time according to education background), Abásolo et al. (2014) showed that patients with only primary studies had to wait 28% longer than those with university studies. In line with this previous work, we show that patients with university studies wait around 19% (approx. 16 days) less than those with no educational qualifications.

Concerning other relevant explanatory variables, we found that patients who had a chronic illness were likely to wait longer for primary or specialist attention, despite their higher level of severity. In this respect, Abásolo et al. (2014) Roll et al. (2012) and Carrière and Sanmartin (2010) argue that the treatments for chronic illness may be more complex, thus provoking increased waiting time. With respect to nationality, we found evidence of a considerate pro-immigrant gradient for waiting times in specialist consultations, favouring EU nationals (whose average waiting time was 24% less). The opposite result was found for elective surgery in Denmark (Simonsen et al., 2020) but not in Sweden, where active workforce immigrants waited around 41% less for gynaecology

services (Tinghög et al., 2014). Interestingly, we detected a slightly longer waiting time (5.7%) for primary care for those citizens who hold the Spanish nationality and other. Various factors might account for the inequalities found favouring relatively more educated patients. Firstly, they have lower transaction costs (with better-informed networks, better information about how the NHS works and lower travelling costs) (Siciliani & Verzulli, 2009) and are more engaged with the health system, perhaps because those who are better educated make a more convincing case for higher priority or because they better articulate their needs and thus are more persuasive to the GP (Laudicella, Siciliani & Cookson, 2012). In addition, better-educated patients may work in more flexible jobs and thus have greater freedom to attend the first available medical appointment. Finally, the doctors consulted might be subject to prejudices regarding health behaviour, thus giving rise to inequalities in the attention provided.

Quantile regressions were performed to determine whether the effects of the study variables varied across the distribution of waiting times for specialist care. This analysis revealed marked SES inequalities across the distribution of waiting times, which is consistent with our finding that more frequent users of private health care experience longer waiting times for NHS attention than those making less use of the private system. Interestingly, this frequency of use seems to better capture the potential self-selection issue than a dummy for private insurance, an approach that has been employed in earlier studies (e.g. Abásolo et al., [12]). However, in line with (Johar et al., 2013; Sharma et al., 2013) and Johar et al.(2013), we find that regardless of self-selection, there is a strong SES gradient for specialist services, concentrated among moderate levels of the waiting time distribution.

6. Conclusions

There is evidence that waiting times for limited healthcare resources are not assigned equitably among patients. This issue is of particular importance in the current global crises – COVID-19 and economic – which could exacerbate these disparities as rising numbers of treatments are being postponed. In contrast to previous studies in this field, we use a rich longitudinal dataset to study the SES gradient in waiting times for both primary and secondary care. Additionally, we examine how much of the SES gradient remains after controlling for nationality and other relevant sociodemographic differences (such as gender and the use of private healthcare), which have been somewhat neglected in the literature. We also contribute new knowledge by investigating whether these differences vary significantly at different levels of waiting times, using quantile estimation techniques.

Our analysis did not detect a strong SES gradient related to education, income or labour market status regarding waiting times for GP visits. However, we did find some evidence of a strong SES gradient in favour of moderate to high skilled workers. Nevertheless, the results obtained suggest such a gradient does exist for specialist services, and is mainly explained by differences in education, employment level and income. In addition, for GP services we find evidence of inequalities according to gender, severity (pro-healthy gradient) and area of residence. A similar gender gap was also found for specialist medical attention. Our quantile estimations show that for women, the SE gradient is stronger the shorter the waiting time is of their condition, the longer they must wait. The fact that men have shorter waiting times in this situation may be due to their presenting more advanced stages of disease and a greater number of pathologies (Carrière & Sanmartin, 2010). Interestingly, in contrast to a previous study on elective surgery, in which Western Europeans reported longer waiting times than other nationalities (Simonsen et al., 2020), we detected disparities in waiting times for specialist attention

according to citizenship status, but favouring EU citizens in their wait for specialist services.

The strengths of this study enable us to draw significant conclusions. For example, we exploit the richness of our data to investigate a potential selection bias in access to healthcare, by which some users of private healthcare systems resort to the NHS only when waiting times are relatively short. This pattern of use would bias the SES gradient. Furthermore, we employ quantile regression to investigate differences within the distribution of results for SES, and also control for the number of private medical consultations to determine whether there is any association between this parameter and waiting times. Our findings strongly suggest that patients make significant use of private healthcare when waiting times for NHS attention are above the median. Nevertheless, there exists a substantial SES gradient for specialist care (favouring the better educated individuals) regardless of the presence or absence of selection bias. Selective waiting time barriers pose an important challenge, especially within universal health care systems, and they may impact negatively on population health, possibly exacerbating existing health inequalities.

This study is subject to certain limitations. First, data for waiting times in private healthcare were not available and so we were unable to adjust for sample selection bias using a Heckman selection type model. However, unlike much previous research, we had access to rich information on waiting times in the NHS and on visits to both publicly and privately funded health services, data which are very useful for investigating potential self-selection and for detecting differences in waiting time distribution according to SES. The second major limitation is that although the dataset provided detailed information about waiting times and other relevant socioeconomic factors, our analysis incorporated only a limited number of need-related variables. This issue might be more significant

regarding the situation of waiting time inequalities in primary care, since for specialist visits first and subsequent visits are determined by the health professionals concerned. Lastly, our key variable of waiting times is self-reported. Offsetting potential problems in this regard, our use of rich survey data in this area could have some advantages over the use of administrative records on waiting times, since it avoids the bias that may arise from health providers misreporting waiting times due to political motivations. Nevertheless, it should be noted that survey data is not exempt from problems, such as the lack of continuity in the availability of relevant variables (for instance, in our case in the SHB speciality type is not included after 2013 and personal income is only included after 2014).

Uncovering the sources of inequality in waiting times within the Spanish NHS is crucial to effective policy design, since the reality of rationing by waiting times seems to be less equitable than is desirable. Since the current system by which GPs determine the scheduling of medical attention does not ensure equity in waiting times, we suggest that better-detailed guidelines should be given for referral and that greater transparency in this respect should be provided. For example, there should be more robust and simpler mechanisms for booking (taking into account that on-line scheduling might exacerbate inequalities) and more transparency from hospitals in the form of reports on waiting times for procedures according to SES indicators (such as the patient's postcode), in order to highlight differences in this regard. Finally, we believe that further research in this area is needed, for a more comprehensive investigation of the mechanisms underlying potential barriers of access to healthcare, in terms of inequality in waiting times, thus helping policymakers and managers design and implement evidence-informed policies to address existing disparities in access to healthcare.

Appendix

Appendix 2.1 Estimations of waiting times for specialist services with the Spanish NHS by country of origin.

Table A.2.1 Waiting time estimations for country of origin.

Waiting times	**Primary care**	**Specialist care**
Native	Ref.	
Double nationality	0.057***	-0.189
	(0.017)	(0.154)
European Union	0.009	-0.224**
	(0.035)	(0.105)
Europe	0.046	-0.065
	(0.060)	(0.332)
Latin American	0.028	-0.109
	(0.034)	(0.132)
North American	-0.106	-0.314
	(0.295)	(0.268)
African	0.029	0.095
	(0.057)	(0.205)
Asian	0.081	-0.209
	(0.083)	(0.290)
High fluency	Ref.	
Medium fluency	-0.123	0.043
	(0.085)	(0.179)
Low fluency	-0.062	-0.461
	(0.039)	(0.474)
Specialist FEs	No	Yes
Regions FEs	Yes	Yes
Year FEs	Yes	Yes
Observations	24,872	6,799
R-squared	0.261	0.051
AIC	50789	21440
BIC	50919	21550

[1] For primary care, our individual of reference is a male with no studies; inactive; between 18 and 34 years old; no chronic disease; one visit to public GP; no visit to private GPs; Spanish; fluent and living in a urban area. For specialist consultations, our individual of reference is a male who has visited Traumatology services; with no studies; employed; between 18 and 34 years old; with no chronic disease; one visit to public GP; no visits to private specialist doctor; Spanish; fluent and living in a urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status + private healthcare utilization + region-year fixed effects.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

Appendix 2.2 Estimations of waiting times for primary and specialist services with the Spanish NHS by disaggregated employment status.

Table A.2.2 OLS estimations for waiting including disaggregated employment status

Waiting times in specialist care	**Primary care**	**Specialist care**
Education		
No qualifications	Ref.	
Primary studies	-0.007	-0.085
	(0.023)	(0.056)
Secondary studies	-0.009	-0.173***
	(0.023)	(0.036)
University studies	-0.021	-0.155***
	(0.023)	(0.052)
Employment status		
Inactive	Ref.	
Retirement pensioner	-0.013	0.129
	(0.009)	(0.088)
Unemployed	-0.022***	0.179***
	(0.006)	(0.048)
Managers (private and public institutions)	-0.026	0.060
	(0.023)	(0.149)
Technical and profesional scientists and intellectuals	-0.083***	-0.003
	(0.021)	(0.102)
Support technicians and professionals	0.002	-0.007
	(0.036)	(0.084)
Office workers	0.004	0.217

	(0.045)	(0.155)
Hospitality and shop workers	-0.001	0.092
	(0.022)	(0.072)
Security workers	-0.065	0.226
	(0.052)	(0.234)
Qualified workers in the agricultural industry	0.049	0.044
	(0.058)	(0.073)
Artisans and qualified workers in the industry, building and mining sectors	-0.013	0.195
	(0.041)	(0.126)
Industrial machinery and installations´ operators	-0.004	0.335**
	(0.020)	(0.119)
Unqualified workers	-0.030	0.159
	(0.024)	(0.093)
Gender		
Male	Ref.	
Female	0.038***	0.218***
	(0.012)	(0.035)
Severity		
Age (years)		
18 to 24	Ref.	
35 to 44	-0.047***	0.018
	(0.011)	(0.038)
45 to 64	-0.039***	-0.001
	(0.009)	(0.029)
65 to 75	-0.065***	-0.003
	(0.016)	(0.050)

75 or more	-0.131***	-0.198***
	(0.025)	(0.057)
Chronic illness		
Presence of chronic illness	0.053***	0.192***
	(0.013)	(0.035)
Public visits		
1 visit	Ref.	
2 visits	0.029	0.032
	(0.017)	(0.028)
3 or more visits	0.039*	-0.172***
	(0.019)	(0.040)
Area of residence		
Urban	Ref.	
Rural	-0.237***	-0.031
	(0.044)	(0.043)
Citizenship status		
Native Spanish	Ref.	
Spanish acquired	0.060***	-0.166
	(0.015)	(0.138)
Foreign	0.033	-0.120*
	(0.030)	(0.067)
Fluency		
High	Ref.	
Medium	-0.068**	-0.328
	(0.029)	(0.598)
Low	-0.105	0.008
	(0.071)	(0.139)

Private healthcare visits		
0 visits	Ref.	
1 to 2 visits	0.007	0.168*
	(0.020)	(0.080)
3 or more visits	0.128**	0.017
	(0.048)	(0.072)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Specialist FE	No	Yes
Constant	0.957***	3.601***
	(0.039)	(0.084)
Observations	24,935	6,825
R-squared	0.261	0.050
AIC	50905	21522
BIC	51035	21631

[1] For primary care, our individual of reference is a male with no studies; inactive; between 18 and 34 years old; no chronic disease; one visit to public GP; no visit to private GPs; Spanish; fluent and living in an urban area. For specialist consultations, our individual of reference is a male who has visited Traumatology services; with no studies; employed; between 18 and 34 years old; with no chronic disease; one visit to public specialist services; no visits to private specialist doctor; Spanish; fluent and living in a urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status + private healthcare utilization + region-year fixed effects.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

Table A.2.3 Quantile estimations for waiting time in specialist services including disaggregated employment status.

Waiting time for specialist	Q(0.10)	Q(0.25)	Q(0.50)	Q(0.75)	Q(0.90)
Education					
Primary	-0.0235	-0.118	0.00259	-0.0367	0.0433
Secondary	-0.199	-0.276**	-0.0962	-0.0926	0.00312
University	-0.134	-0.218	-0.136	-0.11	-0.0591
Employment status					
Retirement pensioner	0.125	0.158*	0.0993	0.133**	0.0689
Unemployed	0.348***	0.221**	0.0912	0.137**	0.0851
Managers (private and public institutions)	-0.0879	0.134	0.025	0.153	-0.0642
Technical and profesional scientists and intellectuals	0.0637	-0.129	-0.0618	-0.00464	0.0758
Support technicians and professionals	0.0958	0.000607	-0.0134	0.0384	0.083
Office workers	-0.107	0.168	0.15	0.000631	-0.101
Hospitality and shop workers	0.0458	0.136	0.0413	0.117	0.106
Security and protection workers	-0.0024	0.0504	-0.199	0.0314	0.335
Qualified workers in the agricultural industry	-0.0468	0.168	0.113	0.182	-0.0738
Artisans and qualified workers in the industry, building and mining sectors	0.186	0.166	0.0655	0.12	0.142
Industrial machinery and installations´ operators	0.346	0.417***	0.199	0.145	0.293
Unqualified workers	0.161	0.0767	0.0886	0.227**	0.125
Gender					

Female	0.313**	0.248***	0.180***	0.161***	0.106**
Age (years)					
35 to 44	0.0995	0.0231	0.0127	-0.0442	-0.125**
45 to 64	0.167	-0.02	-0.0108	-0.0571	-0.0687
65 to 74	0.0258	0.000425	-0.0591	-0.0538	-0.0276
75 or more	-0.0878	-0.338**	-0.183**	-0.174***	-0.0722
Chronic illness					
Presence of chronic illness	0.126	0.180**	0.206***	0.201***	0.171***
Number of visits to GP					
2 visits	0.252**	0.127**	0.0519	-0.021	-0.0833*
3 or more visits	0.00293	-0.111**	-0.150***	-0.240***	-0.258***
Area of residence					
Rural	-0.0681	-0.0643	-0.0702	-0.00355	0.00946
Citizenship status					
Spanish	-0.0173	-0.217	-0.00882	-0.13	-0.169
Foreign	-0.322	-0.0692	-0.149	-0.222*	-0.237**
Fluency					
Medium	-1.591	-0.882	-0.0272	0.164	0.0622
Low	0.127	-0.0654	0.159	0.132	0.265
Private consultations					
1 or 2 visits	0.12	0.165	0.146	0.138*	0.0632
3 or more visits	-0.393	0.0341	0.154	0.139	0.022
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Specialist fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	1.992***	3.109***	3.793***	4.314***	4.977***
Observations	6825	6825	6825	6825	6825

[1] Our individual of reference is a male who has visited Traumatology services; with no studies; inactive; between 18 and 34 years old; with no chronic disease; one visit to public specialist services; no visit to a private specialist doctor; Spanish citizenship; fluent and living in a urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status + private healthcare utilization + region and -year fixed effects.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

Appendix material 3 Estimations of waiting times for specialist services with the Spanish NHS including household income.

Table A.2.4 OLS estimations for waiting times by SES including disaggregated employment status and household income.

Waiting times	**Primary care**	**Specialist care**
Education		
No qualifications	Ref.	
Primary studies	-0.016	-0.032
	(0.026)	(0.063)
Secondary studies	-0.007	-0.081**
	(0.030)	(0.034)
University studies	-0.035	-0.106**
	(0.033)	(0.043)
Employment status		
Inactive	Ref.	
Retirement pensioner	-0.019	0.159
	(0.017)	(0.099)
Unemployed	-0.020	0.165***
	(0.011)	(0.049)

Managers (private and public institutions)	-0.077**	0.089
	(0.030)	(0.098)
Technical and profesional scientists and intellectuals	-0.075**	0.129
	(0.028)	(0.131)
Support technicians and professionals	-0.005	-0.003
	(0.045)	(0.094)
Office workers	0.010	0.189
	(0.055)	(0.165)
Hospitality and shop workers	-0.019	0.118
	(0.029)	(0.076)
Security and protection workers	-0.161***	0.410
	(0.047)	(0.262)
Qualified workers in the agricultural industry	-0.001	-0.056
	(0.070)	(0.129)
Artisans and qualified workers in the industry, building and mining sectors	-0.040	0.167
	(0.038)	(0.133)
Industrial machinery and installations´ operators	-0.005	0.361**
	(0.021)	(0.129)
Unqualified workers	-0.029	0.153
	(0.033)	(0.089)
Household income		
Q1 income	Ref.	

Q2 income	-0.020	-0.034
	(0.015)	(0.029)
Q3 income	-0.003	-0.038
	(0.020)	(0.043)
Q4 income	-0.012	-0.184**
	(0.018)	(0.075)
Q5 income	-0.017	-0.356
	(0.028)	(0.208)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Region-Trend	Yes	Yes
Specialist fixed effects	No	Yes
Constant	0.995***	3.466***
	(0.050)	(0.076)
Observations	16,994	5,104
R-squared	0.237	0.060
AIC	34885	16045
BIC	35008	16149

[1] For primary care, our individual of reference is a male with no studies; inactive; Q1 household income (below 600 monthly euros); between 18 and 34 years old; no chronic disease; one visit to public GPno visit to private GPs; Spanish and living in a urban area. For specialist consultations, our individual of reference is a male who has visited Traumatology services; with no studies; Q1 household income (below 600 monthly euros); inactive; between 18 and 34 years old; with no chronic disease; no visits to private specialist doctor; Spanish and living in a urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status + private healthcare utilization + region-year fixed effects.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

Table A.2.5 Quantile estimations for waiting times by SES including disaggregated employment status and household income.

Waiting time for specialist	Q(0.10)	Q(0.25)	Q(0.50)	Q(0.75)	Q(0.90)
Education					
Primary	-0.123	-0.132	0.0148	0.00158	0.0728
Secondary	-0.0826	-0.255**	-0.0529	-0.0345	0.00664
University	0.018	-0.167	-0.119	-0.161**	-0.112
Employment status					
Retirement pensioner	0.12	0.146**	0.0815	0.201***	0.103**
Unemployed	0.299**	0.213***	0.0866	0.176***	0.114**
Managers (private and public institutions)	0.0571	0.216**	0.103	0.202*	-0.068
Technical and profesional scientists and intellectuals	0.0682	-0.121	0.0676	0.154*	0.0971
Support technicians and professionals	0.199	0.0658	-0.00585	0.00851	0.0925
Office workers	-0.268	0.0379	0.123	0.0753	0.0205
Hospitality and shop workers	0.146	0.186	0.0774	0.127	0.064
Securityand protection workers	0.217	0.197	0.292	0.167	0.525
Qualified workers in the agricultural industry	-0.584	0.162	0.0272	0.235**	-0.099
Artisans and qualified workers in the industry, building and mining sectors	0.122	0.103	-0.00149	0.148	0.216*
Industrial machinery and installations´ operators	0.373	0.431***	0.113	0.232**	0.218

Unqualified workers	0.206	0.0969	0.0834	0.249***	0.217***
Household income					
Q2	-0.0477	0.0302	-0.0778	-0.049	0.0522
Q3	-0.0483	-0.0085	-0.069	0.0419	0.122
Q4	-0.235	-0.0601	-0.247**	-0.0953	0.0401
Q5	-0.397	-0.314**	-0.713**	-0.286**	-0.202
Gender					
Female	0.314**	0.267***	0.158***	0.205***	0.127***
Age (years)					
35 to 44	0.168	0.0903	0.0611	-0.0296	-0.0816
45 to 64	0.227**	0.0246	0.0274	-0.0736	-0.071
65 to 74	0.169	0.0704	0.0443	-0.0236	0.0478
75 or more	0.144	-0.193*	-0.0682	-0.124*	-0.0354
Chronic illness					
Presence of chronic illness	0.160**	0.159***	0.197***	0.197***	0.195***
Number of visits to GP					
2 visits	0.247***	0.107**	0.0334	-0.0189	-0.0559
3 or more visits	0.0544	-0.0871	-0.128***	-0.210***	-0.205***
Area of residence					
Rural	0.00745	-0.041	-0.0667	-0.0188	0.0232
Citizenship status					
Spanish	-0.13	-0.225	-0.0146	-0.187**	-0.0921
Foreign	-0.278	0.00257	-0.169*	-0.170**	-0.223***
Fluency					
Medium	0.137	0.0287	0.240*	0.166	0.2
Low	0.334	-0.447	0.113	0.207	0.241
Private consultations					

1 or 2 visits	0.255*	0.152	0.114	0.103*	0.0469
3 or more visits	-0.629**	0.0149	0.186**	0.170*	0.0572
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Specialist fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	1.793***	2.934***	3.745***	4.128***	4.688***
Observations	5104	5104	5104	5104	5104

[1] Our individual of reference is a male who has visited Traumatology services; with no studies; Q1 household income (below 600 monthly euros); inactive; between 18 and 34 years old; with no chronic disease; one visit to public specialist care; no visit to a private specialist doctor; Spanish citizenship; fluent and living in a urban area.

[2] Full model specification: SES and severity variables + area of residence+ immigrant status+fluency + private healthcare utilization + region and -year fixed effects.

[3] Note: *** p<0.01, ** p<0.05, * p<0.1

Appendix material 4 Estimations of waiting times for specialist services with the Spanish NHS including household income

Table A.2.6 OLS estimations for waiting times in primary care by SES including disaggregated employment status and personal income.

Waiting times	**Primary care**
Education	
No qualifications	Ref.
Primary studies	-0.028
	(0.021)
Secondary studies	-0.037
	(0.025)
University studies	-0.047*
	(0.027)
Employment status	

Inactive	Ref.
Retirement pensioner	-0.019
	(0.017)
Unemployed	-0.020
	(0.011)
Managers (private and public institutions)	-0.077**
	(0.030)
Technical and profesional scientists and intellectuals	-0.075**
	(0.028)
Support technicians and professionals	-0.005
	(0.045)
Office workers	0.010
	(0.055)
Hospitality and shop workers	-0.019
	(0.029)
Security and protection workers	-0.161***
	(0.047)
Qualified workers in the agricultural industry	-0.001
	(0.070)
Artisans and qualified workers in the industry, building and mining sectors	-0.040
	(0.038)
Industrial machinery and installations´ operators	-0.005
	(0.021)

Unqualified workers	-0.029
	(0.033)
Personal income	
Q1 income	Ref.
Q2 income	-0.001
	(0.015)
Q3 income	-0.008
	(0.038)
Q4 income	0.003
	(0.054)
Q5 income	0.142
	(0.149)
Region fixed effects	Yes
Year fixed effects	Yes
Region-Trend	Yes
Specialist fixed effects	No
Constant	0.977***
	(0.044)
Observations	14,344
R-squared	0.276
AIC	29998
BIC	30120

[1] Full model: our individual of reference is a male with no studies; inactive; Q1 household income (below 600 monthly euros); between 18 and 34 years old; no chronic disease; one visit to public GPno visit to private GPs; Spanish and living in a urban area.

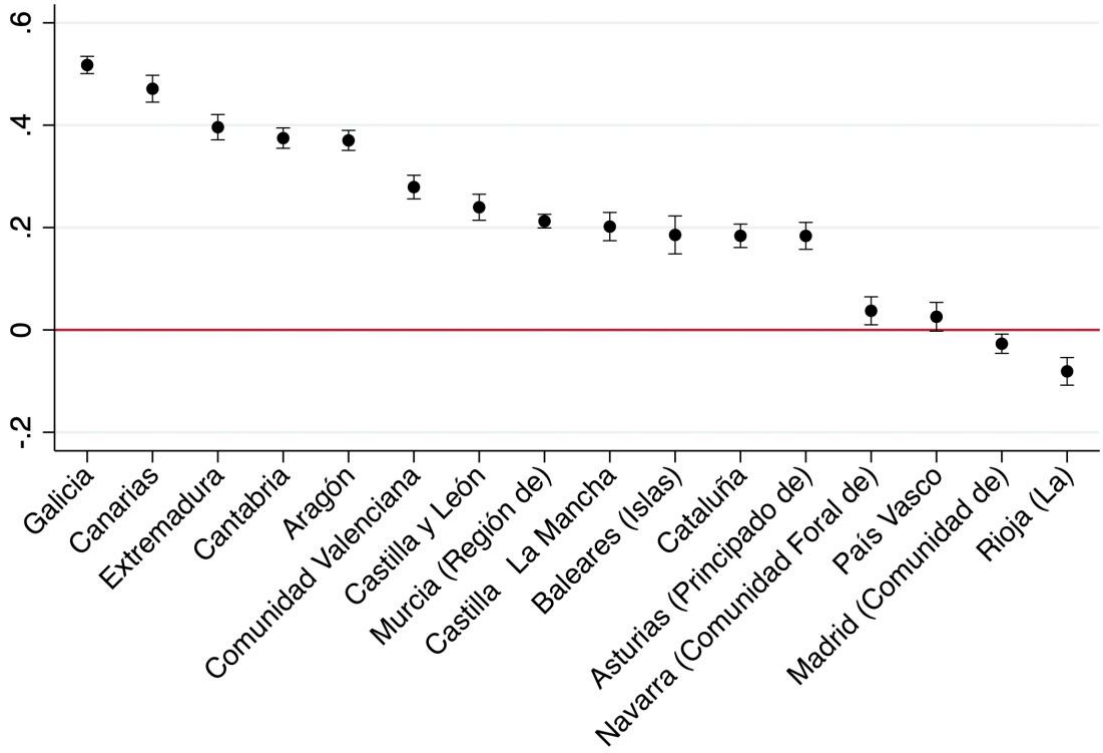
[2]Note: Standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

[3] Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were calculated to compare the goodness-of-the-fit. A smaller AIC or BIC indicates a better-fitting model.

[4]Source: *The authors, based on the Spanish National Health Barometer*

Appendix material 5 Differences in waiting times by region.

Figure A.1.1. Coefficients for regional fixed effects. Waiting times for primary care (2011-2019).



Notes: N=6,825. Results of estimating a multiple linear regression by the ordinary least squares method where the dependent variable is waiting times for specialist care. 95% confidence intervals obtained from estimates of waiting times for specialist care. Data from the Health Barometer for the 2011-2013 waves. Our reference region is Andalusia.

Chapter 3. ***Political Identity and the Demand for Health Care Post-Austerity***

1. Introduction

The interaction of public and private healthcare in publicly funded health systems can result from how the publicly funded national health system (NHS) satisfies individuals preferences for health care quality (Besley et al, 1999, Costa-Font and Jofre-Bonet, 2008), including the effect of congestion and increasing waiting times on their continuous support for the NHS. However, how people react to such NHS congestion is arguably influenced by their political identities, alongside their budget constraint. Indeed, given that only a so many people have direct experience with health care at any given time, narratives that highlight the congestion in access to the NHS might play a role in health care decision making. Such narratives might be more salient after austerity policies in some European countries reduced NHS investment, combined with increased demand from ageing and morbidity, as well as increased migration. However, whether one of another narrative is more relevant largely depends on individuals' political identity, which influences how reactive their health care decisions are. This paper aims at studying such an effect.

A new stream of the literature reveals the impact of political ideology on health insurance decision making in in the context of the extension of the Affordable Care Act (ACA) in the United States (Trachtman, 2019; Draca & Schwarz, 2020), as well as in influencing vaccine acceptance and adherence to social distancing measures during the COVID-19 pandemic (Clinton et al., 2021; Cornelson and Miloucheva, 2022; Serrano-Alarcón et al., 2023). However, the extent to which ideology informs healthcare utilisation remains an important phenomenon we know little about (Kannan & Veazie, 2018). In Europe, some phenomena such as the Great Recession in 2008 and its subsequent austerity reforms to address escalating budget deficits by cutting health-care

spending acted as tipping points (Gabriel, Klein & Pessoa, 2022; Moreno et al., 2021). Given that such austerity reform impacted on the health care system, and public health insurance coverage and access to many publicly funded health services was constrained in different forms (Stuckler et al., 2017), it is an empirical question whether the austerity measures gave rise to changes in the demand for health care towards an increasing use of health care among individuals that are both economically, and ideologically more prone to use private health care. In 2020, privately funded health services accounted for nearly 20% of total European Union health spending, with household out-of-pocket payments accounting for 15% of total health spending (OECD, 2022). However, so far, it is unclear whether political identity exerted a differential reaction to health care.

So far, theories of the demand for health care are based on the role of costs, including quality shortcomings (Besley et al, 1999) but do not consider that individuals reaction to changes in the perceived quality of care depends on individuals' ideology. This adds to the fact that ideas, interests, or 'expert knowledge' of individuals, groups, or networks play a role in policy process (Bowen et al, 2005). Individual specific health care choices towards using private health care are not equally sensitive to information on the performance of the NHS. In recent years many stable democracies around the world such as the United Kingdom, the United States and Italy have witnessed important extreme right populism movements which have in common a strong opposition to expert knowledge and a distrust of evidence based health interventions. In practice, populism consists of a combination of powerful rhetoric including concerns over public services such as health care, and unrealistic goals which is motivated by electoral votes, and as we argue here advancing the agenda of further expansion of private health care even in traditionally NHS health systems.

The previous literature has documented that an increasing reliance on the private health sector may reveal inefficiencies in the public system, such as longer waiting times (Besley et al., 1999) or poor quality of care (Costa-Font & García, 2003, Costa-Font and Ferrer-i-Carbonell, 2022). Additionally, private healthcare may offer features that patients may value, such as more personalized care or greater choice in terms of times and location, or direct access to specialized services or technology without NHS barriers to access (Costa-Font & Jofre-Bonet, 2008; Epstein and Jiménez-Rubio (2019); Pinilla & López-Valcárcel, 2020). In summary, the uniformity of provision and barriers to access of the NHS may result in a "quality gap" (Costa-Font & García, 2003) between the NHS and private health care, leading to an increasing "partial opting out" of the NHS (dual coverage while continuing to contribute to the NHS). Additionally, Propper (1993) posited that political beliefs were a significant major factor in individual's decision to purchase private medical insurance. This is further stated by studies such as Propper (2000), and Costa-Font and Jofre-Bonet (2008), which claimed that individuals' political identity is a crucial factor influencing the evaluation of NHS performance and ultimately impacting the utilization of private healthcare. For the English NHS, King and Mossialos (2005) found that Conservative supporters were more likely to purchase a Private Health Insurance (PHI). However, empirical evidence on the effect of ideology and partisan bias on the use of healthcare services is still scarce.

We study the effect of political narratives measured by an individual's ideological support, on the utilization of private healthcare within publicly funded healthcare systems. We draw on evidence from Spain after austerity cuts, where significant budget cuts were implemented in the Spanish National Health Service (Spanish NHS) in 2012 (Gallo & Gené-Badia, 2013 & Bacigalupe et al., 2016). We show that austerity driven

budget cuts implemented exerted a detrimental effect on perceived performance, and the narratives driving the demand for public vs private health care (Costa-Font and Ferrer-i-Carbonell, 2022), resulting in an increase in demand for private healthcare services among individuals who identify with right-wing ideologies. Using a difference-in-differences (DiD) design, we estimate the causal effect of political ideology on demand for private health services. Specifically, we employ a treatment group that consists of individuals that uphold right-wing ideology measures form a self-positioning score (exceeding the value of 6 on a scale from 1 –left- to 10 –right-), for our baseline estimation, and voters of right-wing parties for alternative specifications. The control group, on the other hand, is composed of individuals with centrist and left-wing views. In addition, given the devolution of decision-making powers to regions in Spain, we exploit the asymmetrical implementation of austerity measures across regions following the Great Recession of 2008. The validity of our empirical strategy is contingent upon the existence of parallel trends between the treatment and control groups prior to 2012.

We find evidence of increased demand for private services among individuals identifying as right-wing in regions where budget cuts were intensively implemented. Specifically, there was an increase of 34.23% for private specialist services and 211% for hospital care. Additionally, our analysis suggests that the relationship between political identity and the demand for private services exhibits heterogeneous effects depending on individual's household income and health status. We then explore various mechanisms related to the resources and capacity of the NHS at individual and at macro level.

This paper contributes to the literature as follows. First, we show that political identity exerts an influence on people's health care choices, which in turn influences health care behaviors. Given the potential for partisan bias to lead to disparities in access to health care and health outcomes, understanding the impact of political identity on

health service utilization is of paramount importance for promoting public health and improving individual and population health outcomes. Further, despite an emerging body of literature documenting the consequences of political fragmentation on the willingness to contribute to public goods, mostly in terms of vaccination, our study departs from most previous evidence by focusing on the demand for private health care in a typical European country with a universal health system. Second, we contribute to the literature on the socioeconomic effects of the Great Recession. In particular, by examining the differential effects of austerity policies, we provide insights into the potential long-term consequences of these policies in a context of political polarization, which poses a significant threat to the role of public policies in healthcare. Finally, we contribute to understand the mechanisms explaining potential effects of private alternatives on NHS support. While some argue that the expansion of private alternatives may lead to reduced pressure on the NHS, as affluent individuals are more likely to opt for private insurance alternatives (Fabbri & Monfardini, 2016), this may also result in a decreased support for tax-financed health services, thereby increasing pressure on NHS funding. Therefore, a comprehensive examination of the relationship between political beliefs and health service utilization is crucial for understanding the potential implications of these dynamics for the provision of public healthcare.

The rest of the paper is structured as follows. Section 2 provides a summary of the related literature in the area, whereas section 3 outlines the institutional setting. Section 4 describes the data employed while section 4 informs about the empirical strategy. Section 5 shows the main results and section 6 discusses several mechanisms that may have contributed to the observed results. Finally, the last section discusses the results and main implications of our study.

2. Literature review and the Spanish case

2.1 Literature review

Ideology and the demand for health care. While empirical evidence on the political drivers of demand for private healthcare remains limited, there is a growing body of literature on the impact of political ideology on health behaviours. Recent research has documented partisan differences in diet, exercise habits, and smoking (Kannan & Veazie, 2018), and the COVID-19 pandemic has highlighted the issue of partisan bias, particularly in vaccination and social distancing measures (Clinton et al., 2021; Cornelson and Miloucheva, 2022; Serrano-Alarcón et al., 2023). For instance there is evidence that the “freedom of choice” discourse by far right politicians in Spain seems to have encouraged vaccination resistance, despite being one of the countries with the most effective vaccination roll out (Serrano-Alarcón et al., 2023). That is, individuals ideological reference points play a role in influence the drivers of the demand for health care.

The literature on the Patient Protection and Affordable Care Act (ACA) of 2010, commonly referred to as "*Obamacare*" has consistently showed the impact of partisan and political bias on ACA enrolments. Trachtman (2019) conducted a study that revealed that in areas with a higher concentration of Republican voters, insurance companies increased marketplace premiums at higher rates due to a lower ACA enrolment by Republicans. This suggests that partisan bias can influence ACA enrolments, thereby affecting insurance premiums and financial aid for enrolees. Similarly, Draca and Schwarz (2020) estimated a lower enrolment by approximately three million people and increased average costs in the marketplaces (approximately $105 yearly per enrolee). This

paper focuses on a similar question, namely the ideological reaction austerity cuts in European countries.

Ideological bias in health care supply. Not only there are ideologically driven differences in demand for healthcare but also on the supply side. Studies such as Montanari and Nelson (2013) and Herwartz and Theilen (2014) found that when governments remain in power for long enough, right-wing governments tend to spend significantly less on public health in comparison to their left-wing counterparts, However, factors such as whether the government rules in coalition or in majority or not, pre-election years, or an intense competition between parties in pre electoral campaigns may attenuate or increase these differences.

In short, these findings provide evidence for the role of partisan and political bias affecting decision in health and healthcare which may have significant implications for public policy effectiveness in contexts where individuals' engagement with public programs generates externalities, such as vaccination campaigns or public education or health services. In other words, given the effects of polarization and declining trust one can argue that different demand for health care is due to lower funding by right win governments, which potentially reduces the effectiveness of further state funded programs, which in turn feeds into political narratives undermining its role (Milosh et al., 2021). Below we will examine whether the political ideology of the incumbents influences the demand for health care.

2.2 The Spanish case

The Spanish NHS. The Spanish health care system is a tax funded and regionally decentralised health care system, access to health care is free of charge at the point of delivery (Bernal-Delgado et al., 2018), and funding is mainly through block grants allocated primarily based on capitation, alongside decentralized transfers which play a moderate role. Regional health services play a significant role in the provision of health services, and most health spending in publicly funded, more specifically about 71% of total in 2019 (OECD Statistics, 2020). The provision and funding of health care, like education, is primarily the responsibility of regional governments and entails comprehensive common health care package, which encompasses prevention, diagnosis, treatment, rehabilitation services and emergency medical transportation which are decided by regional parliaments, and governments.

Use of private health care. In recent years there has been a significant increase in the utilization of private health insurance (PHI) in Spain which, like in many Organization for Economic Cooperation and Development (OECD) countries. PHI offers increased choice of providers and expedited access to healthcare services (OECD, 2020). As a result, private healthcare spending constitutes 29.4% of the total healthcare spending in Spain (OECD, 2022). Additionally, 11.5 million individuals in Spain currently take up a private healthcare insurance plan and there is a discernible trend of individuals opting for complementary private health insurance In particular, during the period 2001-2020 the proportion of private insurance holders has more than doubled ranging from 7,6% in 2001 to 15.3% in 2020 5% (OECD, 2022).

Austerity policies. In accordance with the European Commission's response to Spain's prolonged economic crisis, the newly appointed government in 2011 implemented Royal Decree Law 16/2012 in April 2012, significantly altering the structure and operations of the national healthcare system. This legislation, titled "Urgent measures to ensure the sustainability of the National Health System and improve service quality and safety," aimed to address a variety of cost-cutting measures, such as redefining system beneficiaries, changing the universality of healthcare access, and implementing cost-sharing measures for specific services (Gallo & Gené-Badia, 2013). The intervention aimed included the implementation of pharmaceutical co-payments for pensioners, restrictions on undocumented immigrants' access to healthcare, and the implementation of prescription co-payments in some regions (see Table A.3.1 for further information).

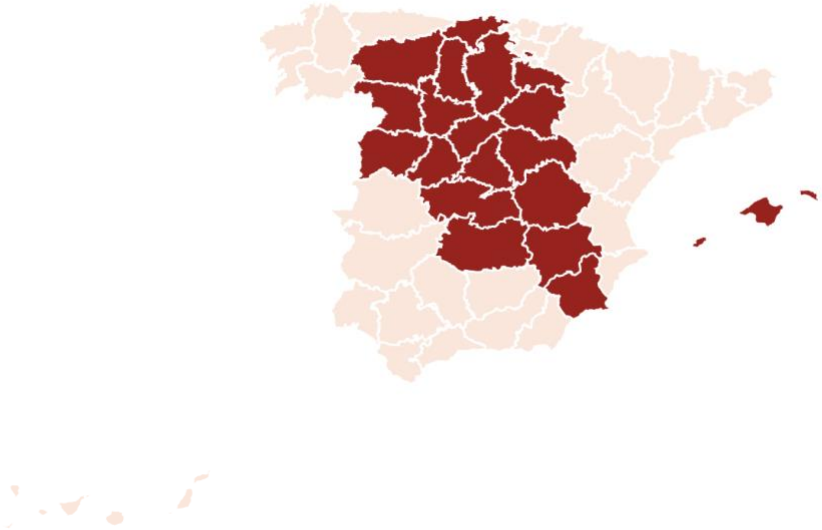
Regional Heterogeneity in austerity policies. Austerity policies were asymmetrically implemented across Spanish regions. Figure 3.1 depicts such heterogeneity and show that some regions enforced stricter versions of the national healthcare regulations, while others, such as the Canary Islands, Andalusia, and the Basque Country, introduced alternative programs to continue providing healthcare access to undocumented migrants (see Jiménez-Rubio & Vall-Castelló, 2020). Castilla-La Mancha fully implemented the national regulations, while five other regions implemented the national ban with minor exceptions (Bacigalupe et al., 2016).

Political context Over the past four decades, Spain's political landscape has been characterized by an imperfect bipartisanship system, with the socialist (PSOE) and conservative (PP) parties alternating in power. However, since the 2008 Great Recession,

both parties have seen a decline in support, with the emergence of new challengers, namely the leftist (Podemos) and centrist (Ciudadanos) parties since 2015 (Serrano-Alarcón et al., 2023). Another contender, the right-wing party Vox, emerged in 2018. In the 2019 elections, Vox won 15% of the votes, while the current government comprises a coalition between PSOE and Podemos.

Given the geographical heterogeneity in the implementation of 2012 budget-cuts and the growing political polarization, which has been recently manifested in attitudes towards COVID-19 vaccination (Serrano-Alarcón et al, 2023), we argue that Spain serves as a valuable case study to examine the effects of political identity on individuals' decisions to opt for private healthcare in the event of spending cuts in an NHS. Generally speaking, Figure 3.1 reveals that regions run by the incumbent central level government were more likely to implement austerity reforms. However, this was not the case in all regions, hence the effect is not supply-driven as we will document later in the paper.

Figure 3.1. Regional heterogeneity in the implementation of the 2012 national austerity measures.



Notes: "Intensively treated provinces" in red and "less intensively provinces" in pink based on Bacigalupe et al. (2016).

3. Data

We employ microdata from the Spanish Health Barometer (SHB), conducted by the Ministry of Health, Social Services, and Equality in collaboration with the Center for Sociological Research on a yearly basis since 1996. The SHB is an annual survey that employs a representative sample of the Spanish population aged 18 and older, comprising more than 7,800 individuals per year. This survey collects data on a wide range of variables, including opinions, attitudes, utilization, and perceptions of health services, as well as individual and household socioeconomic and demographic characteristics, such as political views and voting records in the national elections prior to the survey. Given that information on the two main outcomes of interest (self-reported political ideology on a 1 –right- to 10 –left-scale and party voted in the last national election) is only included from 2010, we restrict or period analysis to the year 2010 onwards. In addition, to ensure the validity of our findings, we will limit our analysis to 2018 in order to capture the effects of the reform before any subsequent changes in regional and national incumbents

may have an impact, so that the relevant period included in our data is restricted to the period 2010-2017. In spite of this, the time frame considered includes a reasonable amount of data before and after the implementation of the austerity measures (2012).

We consider right wing supporters as those individuals who self-identify with a score of 6 or higher on a 1 –left- to 10 –right- ideology scale, To identify the political views of parties supported by individuals in the last general elections, the study employs data from the Chapel Hill Survey of Experts (CHSE), which estimates the ideological and policy positions of political parties (Bakker et al., 2021). The data include evaluations of 337 experts who examined 268 political parties from across the European Union. The study concentrates on the positions of Spanish parties on overall ideological stances, such as the importance of public services vs reducing taxes, redistribution of wealth, and state intervention. Additionally, the study examines the position of parties on immigration policy, nationalist and anti-elite rhetoric, and minorities.

To examine potential discrepancies in economic and ideological beliefs within political parties, we analyze individuals' endorsement of economically right-leaning parties. Our study employs a comprehensive framework that accounts for the multifaceted nature of parties' economic positions. Specifically, we evaluate five key dimensions: (1) their overall ideological stance regarding economic matters; (2) their attitude towards government intervention in the economy; (3) their inclination towards improving public services or lowering taxes; (4) their outlook on market deregulation; and (5) their perspective on redistributing wealth from the affluent to the impoverished. Drawing from the CHSE methodology, we employ dummies to designate a party as economically rightist if their average rating across these five dimensions is equals to 6 or more, and

politically right-wing if the party's score equals or exceeds six in terms of ideological positioning.

Table 3.1 presents a summary of the key independent and dependent variables for the control and the treatment group suggesting evidence of balanced sample. The table presents the number of observations, mean, and standard deviation of three dependent variables and a number of cofounders. Overall, treatment and control groups show similar descriptive statistics on all variables except for number of visits to private GP doctors, specialists and emergency care. Interestingly, the fact that no substantial differences are found with respect to hospital admissions on the basis of ideology is consistent with the high valuation of the Spanish NHS with respect to technology and doctor training, even by those who hold a private insurance, but not so much in terms of comfort and prompt attention (Epstein and Jiménez, 2019). The differences in the utilization of private health care on the basis of political ideology are in line with expectations and previous studies (e.g. Propper 2000, Costa-Font and Jofre-Bonet, 2008, King and Mossialos, 2005). About half of the sample is composed of females and the average age is about 46 years old with household earnings below the Q3 (1,201-2,400 monthly euros).

Figure 3.2 and 3.3 depicts an event-study that reveals, as expected, evidence of parallel trends in the use of private specialist services and hospital services. These results provide compelling evidence that the parallel trend assumption is satisfied (See appendix for private GPs, specialist, hospital and emergency visits).

Table 3.1. Descriptive statistics (2010-2012, pre-reform period).

	Intensively treated regions				Less intensively treated regions			
	Right-wing support		Other support		Right-wing support		Other support	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Utilization of private healthcare (number of visits)								
Gp doctor	0.294	1.648	0.173	0.976	0.255	1.684	0.231	1.376
Specialist doctor	0.26	1.011	0.307	1.298	0.29	1.15	0.311	1.299
Hospital admissions	0.027	0.369	0.021	0.206	0.021	0.199	0.022	0.378
Emergency	0.072	0.572	0.093	1.521	0.064	0.617	0.08	0.717
Education								
No qualification	0.078	0.268	0.049	0.216	0.099	0.298	0.062	0.242
Primary studies	0.243	0.429	0.183	0.387	0.271	0.444	0.193	0.395
Secondary studies	0.522	0.5	0.553	0.497	0.489	0.5	0.544	0.498
Bachelor studies	0.159	0.366	0.216	0.412	0.142	0.349	0.203	0.402
Laboral status								
Employed	0.422	0.494	0.507	0.5	0.383	0.486	0.473	0.499
Non-employed								
Retirement pensioner	0.253	0.435	0.178	0.383	0.268	0.443	0.199	0.399
Inactive	0.165	0.372	0.156	0.363	0.165	0.371	0.139	0.346
Unemployed	0.16	0.366	0.157	0.364	0.183	0.387	0.189	0.391
Household income								
Q1 [0-600 monthly euros]	0.072	0.259	0.037	0.189	0.092	0.288	0.066	0.247
Q2 [601-1,200 monthly euros]	0.283	0.45	0.283	0.45	0.303	0.459	0.288	0.453
Q3 [1,201-2,400 monthly euros]	0.227	0.419	0.303	0.46	0.229	0.42	0.333	0.471
Q4 [2,401- 4,500 monthly euros]	0.064	0.245	0.1	0.3	0.053	0.224	0.091	0.288
Q5 [More than 4,500 monthly euros]	0.016	0.124	0.016	0.126	0.007	0.082	0.012	0.109
Miss income	0.339	0.473	0.261	0.439	0.317	0.465	0.21	0.407

Age								
18 to 35	0.284	0.451	0.315	0.464	0.276	0.447	0.304	0.46
36 to 45	0.195	0.396	0.228	0.42	0.188	0.391	0.214	0.41
46 to 65	0.277	0.447	0.308	0.462	0.288	0.453	0.317	0.465
66 to 75	0.118	0.322	0.09	0.286	0.133	0.339	0.097	0.296
76 or plus	0.127	0.333	0.06	0.237	0.115	0.319	0.068	0.252
Self-reported health status								
Excellent	0.157	0.364	0.176	0.381	0.166	0.372	0.159	0.366
Good	0.228	0.42	0.2	0.4	0.247	0.431	0.208	0.406
Average	0.569	0.495	0.59	0.492	0.535	0.499	0.597	0.491
Poor	0.038	0.192	0.029	0.168	0.045	0.208	0.031	0.174
Worst	0.008	0.089	0.005	0.067	0.006	0.078	0.005	0.067
Gender								
Female	0.527	0.499	0.482	0.5	0.539	0.499	0.479	0.5

Source: The authors, based on the Spanish National Health Barometer.
Note: Descriptive statistics for the pre-reform period (2010-2012) for regions classified based on the degree of implementation of 2012 budget-cuts, namely "intensively" and "less" intensively treated regions, according to Bacigalupe et al. (2016). Then, we distinguished between right-wing supporters (treatment group) vs non-right supporters (treatment group).

4. Empirical strategy

Model specification. This study's goal is to investigate the impact of the 2012 reform on the utilization of private health care services among individuals upholding right-wing political views (political ideology equals or higher to 6 on a 1 –left- to 10 –right- scale) and/or who are voters of right-wing parties, employing a comparative design with a control group composed of individuals with left-wing and centrist views. The primary outcome measure is the number of private consultations with private general practitioners and specialists before and after the implementation of the reform. We show later that the reforms did not increase right wing support (see Table A.3.2 in the Appendix), which is expected given that political identity in Spain is generally stable, though affective polarisation across political ends has increased in the period of study (Torcal and Comellas, 2022).

We model the number of visits for private primary or specialist care visits Y_{ijt} for patient *i* within the NHS in region *j* in year *t* as:

$$Y_{ijt} = \beta_0 + \beta_1 Right_{ij} + \beta_2 Post2012_{jt} + \beta_3 Right_{ij} * Post2012_{jt} + \beta_4 X_{ijt} + d_j + d_t + e_{ijt}$$

Where $Right_{ij}$ depicts the effects of a dummy variable identifying whether their political identity of the individual "i" is a right-wing measuring in a self-reported ideology scale. $Post2012_{jt}$ identifies the period of application of the reform (2012-2017). Our main coefficient of interest β_3 measures the impact of the 2012 budget-cuts legislation on

individuals holding conservative political views. The equation also includes a set of several individual controls (X_{ijt}) such as socioeconomic status (SES) proxied by education background, occupation and household income; gender, age and self-reported health as well as living area. To control for regional and time fixed effects we include a vector of region a year dummy variables. In addition, we exploit the heterogeneity in the implementation of the reform across regions by estimating the above model in two separate groups: highly treated regions and less treated regions (see appendix 1)

Given that voting records of the last national elections are available in our dataset, following Pástor and Veronesi (2021) and drawing on the classification of the CHSE dataset, we also proxy political identity by individual's voting support for a ideologically rightist party (Equals or higher to 6 regarding to the position of the party in terms of its overall ideological stance) or economically righist-party (if their average rating across these five dimensions is six or more) .Additionally, we also test whether the preference for private vs public provision for health services has increased among right-wingers as consequence of the 2012 budget-cuts in the Spanish NHS.

Empirical strategy. As previously stated, the uneven implementation of the 2012 budget-cuts across Spanish regions (see Table A.3.1 and Figure 3.1) allows to classify the regions into those that according to Bacigalupe et al. (2016) were more "intensively treated" (enforced stricter versions of the national health-care legislation): Madrid, Murcia, Balearic Islands, Rioja, Cantabria; Castilla-Leon, and Castilla-La Mancha and those that were "less intensively treated": Galicia, Asturias, Basque Country, Navarra, Aragón, Cataluña, Valencia, Extremadura, Andalusia and Canary Islands. We consider the regions as belonging to each group during the entire period. The more intensively treated regions

represent 36.82% of the observations in our sample, whereas the less intensively treated regions represent 63.18% of the observations in our sample.

We compare regions more and less intensively exposed to spending cuts using a differences-in-differences (DID) approach, which allows to control for confounding factors, such as differences in those regions before the spending cuts, and isolate the impact of the policy on the demand for private health services, given that endogeneity may be particularly relevant in the association between private use and political ideology. We estimate linear probability models, with standard errors clustered at the province level (52 units), though estimates using probit specifications reveal a comparable effect size. Sampling weights were applied throughout the analysis to make the sample as representative as possible of the Spanish population.

For a DiD analysis to be valid, any pretends across regions prior to the 2002 reform should be comparable, which is generally labelled as the parallel trends' assumption. We evaluate this effect formally using an event study model, which considers interactions between pre-reform dummy variables and the treatment group in order to assess variations in outcome variables between these two groups prior to the policy implementation.

5. Empirical findings: baseline results

*Effects on Private healthcare***.** Table 3.2 reports the difference-in-differences (DiD) estimates of the impact of 2012 budget-cuts on the demand for private healthcare proxied by the number of total visits to: any type of private healthcare service; visits to a private GP and visits to specialist services in our treated regions. We report the estimates with and without individual controls for the entire period (2010-2017). In addition to region and time fixed effects, we include as additional control variables education, household income and a dummy variable for missing in household income, employment status, gender, age and self-reported health. Results remain largely unchanged following the addition of these explanatory variables.

The baseline results indicate a positive effect of the 2012 budget-cuts on the demand for private specialist services among individuals who self-report as right-wing in terms of ideology. However, no effect is found for the demand for total private services or for GPs. Specifically, our results demonstrate a 28.85-34.23% increase in the number of visits to specialist services in regions where the 2012 budget-cuts in the Spanish National Health System were intensively implemented. In the same line, the number of visits to private hospital increase a 207-211% for right-wingers in those regions where the austerity policies in the Spanish NHS were intensively implemented.

Since it could be argued that individual´s ideology, preferred party and voting behaviour may differ due to the electoral system rules (Artés, 2014), we estimate the partisan bias in demand for private health services. Tables 3.3 and 3.4 reports the DiD estimates, namely, for political and economic voting behaviour as parties may vary in their support

for more rightist economic policies or more conservative social policies. Our estimates reveal that supporters of rightist parties in economic policies exhibit an increase in their demand for specialist health services. We observe a similar effect across voters political identity, though the coefficient fare relatively smaller than for economic sphere. Following the austerity measures, we observed an increase of the number of visits by voters of right-wing economic parties in approximately 66.79%-76.08% for private specialist consultations. As the baseline levels for hospital visits are quite low in the group of right-wing individuals, the reform increased the probability of having bad health by 160%, a rather large effect whereas the increase for private hospital visits is 371.05%-379.21%. These findings are consistent with previous estimates for self-reported ideology. Additionally, as table 3.8, we also observed a shift of preferences of right-wingers for private healthcare vs public provision as consequence of the 2012 budget-cuts for all health services. However, these results are not solely limited to intensively treated regions but for all Spanish regions (see table A.3.6 in Appendix)

Heterogeneity. Next, the following section examines whether our baseline for private specialist services results are heterogeneous across gender, age, socio-economic backgrounds and health status. It seems reasonable that the political identity effect in the demand for private health services may differ according to certain individuals´ characteristics. For instance, the political bias may boost adverse selection effect in which unhealthier individuals may partially opting out the NHS due to solely ideological views thus, increasing their demand for private health services.

Table 3.5 reports the results of the heterogeneity analysis of our variables for the demand of private health services according to our socioeconomic and health status. Although the

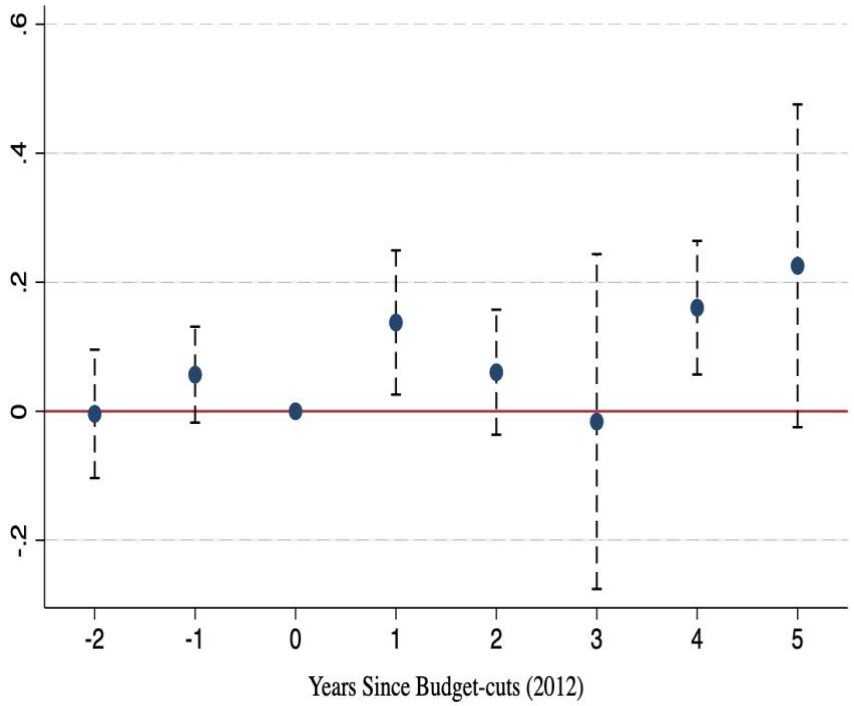
differences in the ideological bias are not significant for age or gender, we do find differences in the political effect of private healthcare across income and health status. There is exist an "income effect" by which affluent right-wing individuals do increase their number of visits to private specialist services in contrast to a decrease by right-wing individuals of lower income. As for self-reported health status, the ideological effect is higher for those individuals with excellent health.

Table 3.2. Difference-in-Differences: private healthcare utilization. Impact of conservative ideology in private healthcare in more intensively treated Spanish regions.

Treated	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	0.037	-0.066	-0.036	-0.176***	-0.079	-0.088*	0.007	-0.016*
	(0.033)	(0.041)	(0.023)	(0.042)	(0.048)	(0.050)	(0.008)	(0.008)
Right-wing	0.142***	0.143***	0.041	0.072	-0.042	-0.045*	0.020	0.023
	(0.030)	(0.029)	(0.058)	(0.074)	(0.024)	(0.025)	(0.022)	(0.024)
Right-wing*Post 2012	-0.040	-0.032	0.075***	0.089***	0.056**	0.057**	-0.001	0.001
	(0.028)	(0.027)	(0.025)	(0.022)	(0.026)	(0.027)	(0.005)	(0.006)
Constant	0.035	-0.543***	0.324***	0.092	0.078*	0.005	0.028**	-0.060
	(0.028)	(0.124)	(0.018)	(0.064)	(0.044)	(0.052)	(0.010)	(0.044)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable	0.294		0.26		0.027		0.072	
% Impact of the policy			28.85%	34.23%	207%	211%		
Observations	20,918	20,835	20,905	20,822	20,949	20,867	20,954	20,871

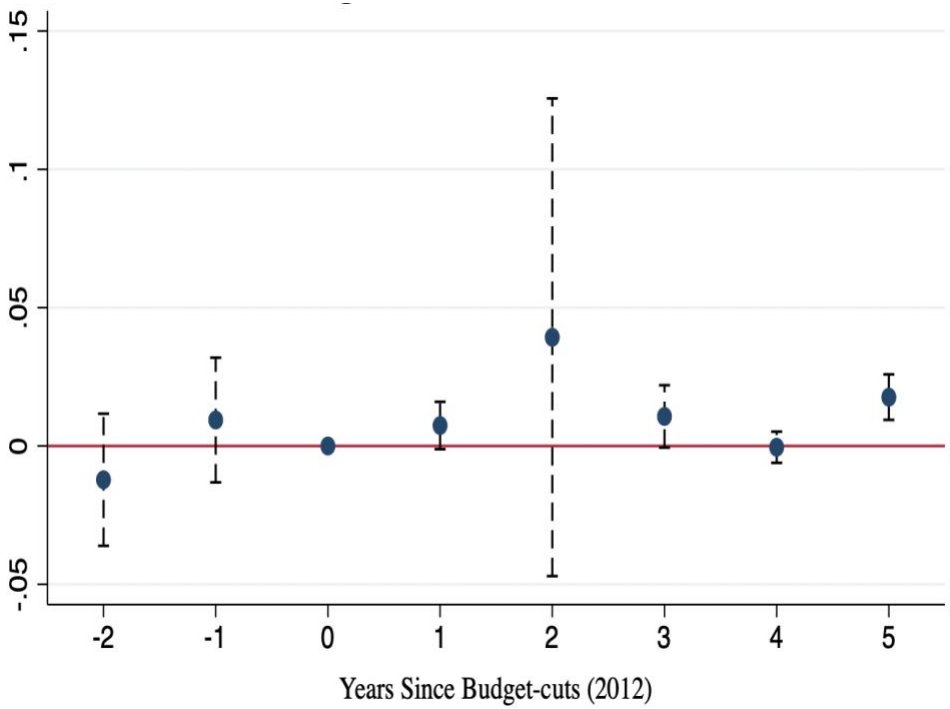
Note: Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Figure 3.2. Event study for specialist services by right-wing individuals in intensively treated regions (2010-2017)



Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure 3.3. Event-study for private hospital care utilization by right-wing individuals in intensively treated regions (2010-2017).



Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Table 3.3. Difference-in-Differences: private healthcare utilization. Impact of conservative vote in private healthcare in more intensively treated Spanish regions.

Economic support	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	0.017	-0.093*	-0.141**	-0.293***	-0.117*	-0.126*	-0.012	-0.037**
	(0.036)	(0.048)	(0.064)	(0.091)	(0.062)	(0.063)	(0.015)	(0.015)
Economically Right-wing voter	0.140***	0.134***	-0.059	-0.047	-0.076*	-0.079*	0.013	0.009
	(0.025)	(0.024)	(0.041)	(0.036)	(0.040)	(0.041)	(0.011)	(0.011)
Economically Right-wing voter*Post 2012	-0.009	0.006	0.187**	0.213**	0.091**	0.093**	0.022	0.026
	(0.045)	(0.047)	(0.078)	(0.076)	(0.039)	(0.039)	(0.018)	(0.017)
Constant	0.007	-0.544***	0.391***	0.203**	0.113*	0.043	0.029**	-0.047
	(0.022)	(0.108)	(0.068)	(0.095)	(0.061)	(0.063)	(0.014)	(0.032)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable	0.266		0.280		0.025		0.089	
% Impact of the policy			66.79%	76.08%	371.05%	379.21%		
Observations	20,636	20,557	20,623	20,544	20,667	20,589	20,672	20,593
R-squared	0.005	0.025	0.011	0.044	0.001	0.002	0.004	0.013

Note: Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4. Difference-in-Differences: private healthcare utilization. Impact on private healthcare in more intensively treated Spanish regions by political vote.

Political support	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	0.026	-0.085*	-0.121*	-0.273***	-0.113*	-0.122*	-0.004	-0.030**
	(0.034)	(0.045)	(0.061)	(0.088)	(0.061)	(0.062)	(0.014)	(0.013)
Politically Right-wing voter	0.142***	0.134***	-0.054	-0.042	-0.072*	-0.076*	0.015	0.011
	(0.025)	(0.024)	(0.041)	(0.037)	(0.038)	(0.039)	(0.012)	(0.011)
Politically Right-wing voter*Post 2012	-0.018	-0.002	0.170**	0.197**	0.089**	0.091**	0.014	0.019
	(0.043)	(0.045)	(0.077)	(0.076)	(0.038)	(0.038)	(0.017)	(0.016)
Constant	0.003	-0.559***	0.384***	0.172*	0.109*	0.037	0.027*	-0.054
	(0.022)	(0.112)	(0.068)	(0.090)	(0.059)	(0.062)	(0.013)	(0.033)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable	0.266		0.280		0.025		0.089	
% Impact of the policy			60.72%	70.37%	362.90%	371.05%		
Observations	20,918	20,835	20,905	20,822	20,949	20,867	20,954	20,871
R-squared	0.005	0.025	0.011	0.044	0.001	0.002	0.004	0.013

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.5. Heterogeneous effects of the demand of PHC by right-wing individuals.

Gender & age	Female	Old (65 years or older)	
Post12*right-wing	-0.113	-0.100	
	(0.103)	(0.141)	
Income	Middle-low income (Q3)	Middle-low income (Q4)	High income (Q5)
Post12*right-wing	-0.165	0.287***	0.721**
	(0.145)	(0.088)	(0.255)
SAH	Average	Good	Excellent
Post12*right-wing	0.118	0.050	0.161**
	(0.084)	(0.083)	(0.057)

Note: Old equals to 1 if age is above 65. The reference for income is low-income (Q1 & Q2); for self-assessed health is bad health.
*** p<0.01, ** p<0.05, * p<0.1

6. Robustness Analysis

In this section, we employ a series of robustness tests to validate the findings of our study. Firstly, we examine the potential impact of the austerity measures implemented in 2012 in individuals' priority regarding four relevant welfare policies. Futhermore, we present several robustness tests, including controlling for region-specific linear trends which account for any time-varying linear trends that may influence the demand for private healthcare differently across regions (e.g., variations in region specific policies due to the high level of decentralization of provision and financing). Finally, two additional specifications are employed as robustness tests to determine whether the effect of right-wing individuals is driven by far-right individuals or whether the results vary when treatment regions are those with the same party in charge as the national government which implemented the 2012 budget-cuts (alignment effect).

*Falsification tests***.** One thread with our baseline results is that 2012 budget-cuts in the SNHS were part of a broad body of laws to implement austerity policies in the Spanish public finances which may affect other policies far from the health policies such as defense, education, housing and retirement pensions. Table 3.6 provides the DiD estimates on the priorities of the citizens which we use as a placebo (falsification) test. Our findings reveal that there is no statistically significant ideologically-driven impact of the 2012 SNHS budget cuts on the opinion of respondents about the welfare policy considered as the main concern to citizens. Thus, it can be inferred that the effects of the budget cuts were specific to the SNHS. We provide the effects of the 2012 budget-cuts in all regions and in less intensively treated regions (control regions) in the appendix (see

table A.3.4). The estimations show no effect of the austerity policies in the Spanish NHS on the demand for private healthcare by right-wingers.

Table 3.6. Falsification tests: effects on citizens´ priorities

Treated	In your opinion, area of main concern to citizens (LOGIT)			
	Defence	Education	Housing	Retirement pensions
Post 2012	0.090	0.113*	0.040	0.116
	(0.137)	(0.062)	(0.120)	(0.080)
Right-wing	0.194*	-0.090*	0.051	-0.050*
	(0.106)	(0.052)	(0.042)	(0.029)
Right-wing*Post 2012	-0.080	-0.023	-0.019	0.066
	(0.240)	(0.049)	(0.068)	(0.057)
Constant	5.741***	-1.884***	-1.537***	-2.019***
	(0.320)	(0.162)	(0.261)	(0.131)
Individual Covariates	X	X	X	X
Region FE	X	X	X	X
Time FE	X	X	X	X
Observations	20,874	20,874	20,874	20,874

Note: Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Finally, as an alternative robustness check, we control for any potential regional linear trends that may differentially impact the demand for private healthcare across various regions, such as variations in decentralization or regional trends. Our results are largely unaffected following the inclusion of these additional control variables (see Table A.3.5 in Appendix).

6.2.2 Supply side effects: the political alignment of regional incumbents

Since regional incumbents are not only representatives of their electorate, but also of their political party (Fabre, 2011), we test for the existence of political alignment in the demand of private healthcare services. Regional governments that are aligned with the national government may implement more strictly the austerity measures imposed by the central government. Although, as figure 3.1 shows, certain regions ruled during our period of study by the conservative party (PP) such as Aragón, Galicia or Valencia did not apply fully the 2012 budget-cuts, we contrast whether the political identity effect found in our baseline estimations remain in the presence of a "political alignment" of right-wing individuals with regional and central government. We present our estimates in table 3.7 on the basis of "ideological alignment" (Columns 1 & 2) and "partisan alignment" (Columns 3 & 4). Our dummy variable "PP" takes the number one for those individuals who voted for the party in charge of the national government. The results indicate that there is a significant increase in the demand for private specialist consultation services when the regional and central governments are ruled by the party with the same ideology as that of the respondent (PP conservative party). Nonetheless, our results do not show higher use of private healthcare by supporters of the party in charge of both regional and national governments. Thus, these results are consistent with the hypothesis of "ideological alignment" but not for the "partisan alignment" hypothesis, suggesting a considerable increase in ideologically driven demand for private specialist consultation when the regional and central governments are governed by the same political party. The magnitude of the effect observed for ideological alignment is somewhat smaller in comparison to that observed for the 2012 budget-cut reform, with an increase in the number of specialist visits of 25.79% vs 34.23% respectively. The

coefficient for hospital visits is positive, suggesting ideologically driven demand for inpatient care, but in this specification, it is not statistically significant possibly due to the reduced sample size.

Table 3.7. Differences-in-differences: private healthcare utilization. Impact on private healthcare in Spanish regions ruled by the same party as national government.

Treated	Ideology				Supported party				
	Specialist care		Hospital care			Specialist care		Hospital care	
Private	No controls	Controls	No controls	Controls		No controls	Controls	No controls	Controls
Post 2012	0.028	-0.083*	-0.023	-0.029	Post 2012	0.060	-0.042	-0.016	-0.021
	(0.040)	(0.042)	(0.028)	(0.029)		(0.037)	(0.038)	(0.022)	(0.023)
Right-wing	0.025	0.048	-0.011	-0.012	PP voter	0.139***	0.117***	0.004	0.001
	(0.030)	(0.033)	(0.013)	(0.014)		(0.039)	(0.035)	(0.006)	(0.007)
Right-wing*Post 2012	0.043	0.067**	0.022	0.022	PP voter*Post 2012	-0.013	0.004	0.023	0.022
	(0.028)	(0.028)	(0.018)	(0.018)		(0.050)	(0.050)	(0.023)	(0.023)
Constant	0.264***	0.073	0.028	-0.028	Constant	0.247***	0.098	0.023	-0.031
	(0.024)	(0.081)	(0.023)	(0.034)		(0.023)	(0.089)	(0.018)	(0.029)
Individual Covariates		X		X			X		X
Region FE	X	X	X	X		X	X	X	X
Time FE	X	X	X	X		X	X	X	X
Pre-reform mean outcome variable	0.2597	0.2597	0.021	0.021		0.34	0.34	0.02	0.02
% Impact of the policy		25.79%							
Observations	27,723	27,611	27,780	27,669	Observations	27,723	27,611	27,780	27,669
R-squared	0.010	0.038	0.001	0.001	R-squared	0.011	0.038	0.001	0.001

Note: Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

7. Mechanisms

In this section, we investigate mechanisms that may account for our empirical observations. Utilizing the DiD strategy, we employ a series of potential explanatory variables, including satisfaction and prompt attention (see Table A.3.7 in appendix) for the public health care system at the individual. Table 3.8 analyse the effect of 2012 budget cuts on the preference for private vs public healthcare services. Additionally, Tables 3.9 and 4.10 replicate the above-mentioned strategy at the regional level, incorporating variables related to resource allocation and waiting times. Finally, the study explores the potential role of migration in complementing the effects of the increasing demand for private health services (see tables A.3.9 y A.3.10 in appendix). Additionally, we investigate the possibility of an "imitation effect" whereby individuals with conservative political views in regions with a conservative government ("PP") within highly treated regions may be more inclined to utilize private healthcare as a response to the 2012 budget cuts.

*Satisfaction and prompt attention***.** The literature has extensively identified the quality gap as a primary determinant in the decision to opt out of the National Health Service (NHS). Empirical analysis, as presented in Table A.3.7 in appendix, demonstrates an increase of satisfaction with the public health system and prompt attention in diagnostic testing among right-wing individuals residing in regions where the 2012 budget cuts were more intensively implemented. However, no statistically significant effect is observed in regards to other mechanisms on the individual levels of satisfaction and responsiveness with the Spanish National Health System (SNHS).

Preference for private vs public healthcare. The deficiencies present in publicly funded healthcare may stimulate the request for private healthcare. In this study, we investigate the impact of budget reductions in 2012 on the inclination towards private versus public provision for various health services, as detailed in Table 3.8. Our findings indicate that the preference towards private provision was reinforced by the adoption of austerity measures in the National Health Service (NHS), not only in regions receiving intensive treatment, but also throughout the entire country. As evidenced by Table A.3.6, this pattern is discernible in the case of general GP services, specialist consultations, and hospital care.

*Longer Waiting times***.** Longer waiting times in the NHS are argued to explaining dissatisfaction with publicly funded health system. To investigate this mechanism, data on the number of days individuals reported waiting for primary or specialist care in the last year was analysed. The results, presented in Table 3.9, indicate that budget cuts implemented in 2012 led to a significant increase in waiting times reported by right-wings patients for specialist services, with a mean increase of 8.52 days.

Regional NHS Capacity. Table 3.10 presents an empirical examination of the consequences of SNHS budgetary cuts in 2012 in terms of health expenditure and private health insurance expenditure. The findings show a decrease in public health spending in regions where budget cuts were implemented; however, the effect is not statistically significant. Table A.3.8 in appendix shows similar findings in relation to the effect of budget cuts on public clinical staff in treated regions. Notably, there is a perceptible trend of publicly funded health care being outsourced to private providers, as well as an

increase in householders´ expenditure on private health insurance in regions where budget cuts were implemented more intensely.

·*Regional Waiting times.* We test potential impact of the 2012 budget cuts on waiting times in in regions where the reform was more fully implemented. According to the findings presented in table 3.11, there is a significant increase in waiting times for these services in these regions. These findings support the hypothesis that, even in a universal healthcare system, prolonged waiting times in public health systems can increase demand for private health services.

Table 3.8. Differences-in-differences: preference for private healthcare. Impact on right-wingers in more intensively treated regions.

Treated	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	-0.044***	0.043***	0.093***	0.098***	0.092***	0.089***	-0.060**	-0.058**
	(0.010)	(0.011)	(0.017)	(0.016)	(0.010)	(0.010)	(0.022)	(0.024)
Right-wing	0.023**	0.037***	0.012	0.028**	0.019**	0.032***	0.037**	0.050***
	(0.008)	(0.008)	(0.011)	(0.010)	(0.009)	(0.010)	(0.014)	(0.016)
Right-wing*Post 2012	0.029*	0.029**	0.053*	0.053**	0.034*	0.032**	0.017	0.016
	(0.014)	(0.012)	(0.027)	(0.024)	(0.017)	(0.015)	(0.013)	(0.013)
Constant	0.260***	0.384***	0.362***	0.460***	0.261***	0.355***	0.291***	0.416***
	(0.011)	(0.030)	(0.023)	(0.077)	(0.009)	(0.036)	(0.023)	(0.052)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable	0.264		0.382		0.339		0.283	
% Impact of the policy	11.33%	11.33%	13.87%	13.87%	10.03%	9.44%		
Observations	20,831	20,750	20,814	20,733	20,775	20,694	20,772	20,694
R-squared	0.014	0.037	0.039	0.065	0.040	0.060	0.078	0.102

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table 3.9. Difference-in-Differences: individuals waiting times in the SNHS. Impact on right-wing individuals in more intensively treated Spanish regions.

Treated		
	Waiting days primary care	Waiting days specialist care
Post 2012	-0.730***	17.652***
	(0.099)	(1.121)
Right-wing	0.007	-6.669**
	(0.039)	(2.757)
Right-wing*Post 2012	0.177	8.521***
	(0.152)	(2.891)
Constant	2.737***	36.496***
	(0.275)	(7.116)
Individual Covariates	X	X
Region FE	X	X
Time FE	X	X
Observations	7,346	6,240
R-squared	0.042	0.030

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table 3.10. Difference-in-Differences: Resources of Spanish NHS (expenditure).

Mechanisms 1	Health expenditure			
	Health expenditure per capita	Health expenditure (% regional GDP)	Public expenditure agreements expenditure per capita	Private expenditure per capita
Post 2012	57.288	0.734	-8.387**	1.957
	(38.485)	(0.538)	(3.753)	(2.391)
Right-wing	121.370*	1.630*	-17.467	27.817***
	(68.200)	(0.909)	(12.489)	(5.470)
Treated*Post 2012	-5.388	-0.050	4.719***	1.946**
	(12.607)	(0.164)	(1.631)	(0.944)
Constant	989.961* (519.924)	18.276** (7.138)	-169.390** (72.293)	-49.653 (35.397)
Regional confounders	X	X	X	X
Region FE	X	X	X	X
Time FE	X	X	X	X
Observations	119	119	102	119
R-squared	0.798	0.938	0.979	0.980

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.11. Difference-in-Differences: Waiting times in the Spanish NHS (capacity).

	Waiting times	
	Primary care	Specialist care
Post 2012	0.579*	0.389
	(0.313)	(15.083)
Treated regions	-0.553**	-13.896*
	(0.215)	(7.268)
Treated*Post 2012	0.045	8.820**
	(0.121)	(4.331)
Constant	6.211	-302.051
	(7.903)	(292.294)
Regional Covariates	X	X
Region FE	X	X
Time FE	X	X
Observations	170	170
R-squared	0.940	0.699

Note: Standard errors are clustered at the provincial level. Regional covariates include dummies for regional GDP per capita and aging index.
*** p<0.01, ** p<0.05, * p<0.1
Individual covariates: education, employment status, household income gender, age and self-reported health.

8. Conclusion

We study effect of a political identity in the demand for health care in a publicly funded health system, consistently with a hypothesis of a politically driven demand for health care. We document that the relationship between political identity and the utilization of private health services by analysing quasi-experimental evidence from the 2012 budget cuts in the Spanish National Health System (SNHS). The study utilizes a DiD approach to investigate how the reform affected the demand for private health services depending on individuals' political identities.

We document evidence of a differential ideologically driven variation of the effect of that the budget cuts of 2012 led to an increase in the demand for private specialist services and hospital visits among right-wing individuals in regions where the budget cuts were extensively implemented. This supports the hypothesis that demand for private health services is linked to the quality and delivery of public health (e.g., higher waiting times or limited choice in specialist services as Jofre-Bonet (2000) showed) systems, as well as the literature on the influence of political identity in shaping health behaviours. Our results are robust to different specifications and falsification tests, and we find evidence of heterogeneous effects with respect to socioeconomic background and health status.

We also investigate the underlying mechanisms that drive the relationship between political identity and health-care demand, based on the capacity and resources of the public health system at both the individual and regional levels. Despite the 2012 budget cuts, we find that right-wing individuals in more treated regions have an increased satisfaction with the SNHS, however, there is an increase in wait times for specialist services for right-wing individuals. Additionally, we find an increase in regional public health expenditure on outsourcing health services and additionally an increase in household expenditure on private health insurance in regions where the 2012 budget cuts were intensively implemented.

Our limitations include the inability to control for PHI tenders and origin (voluntary or company health insurance), and the spam of data on ideology and voting is only from 2010. Future research could further investigate how political identity influences the ideologically driven demand for private health services in different countries. Our study contributes to the literature by providing causal evidence in the utilization of private health services driven by the ideological identity of individuals. We also provide

mechanisms to explain the links between the NHS and demand for private healthcare. Our focus on political identity helps to deepen the understanding of the effects and unintended consequences of certain public policies. Our findings demonstrate that political beliefs and affiliations play a significant role in determining whether individuals choose to seek care in the private sector or through government-funded programs. This study may also inform research on the impact of political polarization on healthcare outcomes.

In conclusion, studies such as this one provides evidence of how political allegiance may compromise the effectiveness and goals of public institutions. In the case of the SNHS, an increasing partial opting out of the system due to budget cuts driven by ideological reasons may result in a high reliance on privately provided healthcare, which, combined with a lack of 'voice' and dissatisfaction among taxpayers, may turn universal health systems into a 'bad service for the poor'. This is particularly relevant in light of the fact that many countries' health systems must address a growing public-sector deficit and respond to increasing pressures due to COVID-19 with an aging population in a context of increasing political polarization.

Appendix

Tables

Table A.3.1. Regional heterogeneity in health policies to implement austerity reforms

	Legal measures				Private healthcare		Funding and resources	
	Medical co-payment	Pensioner co-payment	Undocumented immigrants restrictions	1 euro prescription	Private centers	Private beds	Health spending cuts	Clinical staff cuts
Andalucía	√				√		√	√
Aragón	√						√	√
Asturias	√					√	√	√
Baleares	√	√	√		√	√	√	√
Canarias	√				√		√	√
Cantabria	√				√	√	√	√
Castilla-La Mancha	√		√			√	√	√
Castilla y León	√	√	√				√	√
Cataluña	√			√			√	
Comunitat Valenciana	√						√	
Extremadura	√					√	√	√
Galicia	√						√	√
Madrid	√	√	√		√		√	√
Murcia	√	√	√	√			√	√
Navarra	√				√		√	√
País Vasco								
La Rioja	√	√	√		√	√	√	√

Source: Based on Bacigalupe et al. (2016), austerity policies are presented: legal measures, public-private collaborations and budget cuts in spending and clinical staff.

Table A.3.2. Difference-in-Differences: ideology and voting behaviour. Effect of 2012 budget-cuts in ideology and voting behaviour.

	Right-wing supporter		Right-wing ideological voter		Right-wing economic voter	
	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	-0.171***	-0.126***	-0.085	-0.057	-0.069	-0.042
	(0.042)	(0.048)	(0.052)	(0.060)	(0.051)	(0.058)
Treated	0.866***	0.752***	0.205*	0.026	0.932***	0.771***
	(0.113)	(0.105)	(0.113)	(0.097)	(0.042)	(0.045)
Treated*Post 2012	0.080	0.076	0.052	0.046	0.020	0.015
	(0.097)	(0.096)	(0.056)	(0.050)	(0.056)	(0.048)
Constant	-0.626***	-0.521***	1.146***	1.208***	0.466***	0.561***
	(0.103)	(0.170)	(0.110)	(0.172)	(0.038)	(0.145)
Individual Covariates	X	X	X	X	X	X
Region FE	X	X	X	X	X	X
Time FE	X	X	X	X	X	X
Observations	56,966	56,859	56,966	56,859	56,236	56,132
R-squared	77928	75788	66648	65129	65829	64279

Notes: Regression with controls include: female, age, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table A.3.3. Difference-in-Differences: private healthcare utilization. Impact on private healthcare in all Spanish regions.

All	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	0.098**	-0.003	0.061	-0.067	-0.021	-0.030	0.009	-0.014
	(0.039)	(0.041)	(0.038)	(0.045)	(0.022)	(0.023)	(0.011)	(0.010)
Right-wing	0.081***	0.095***	0.025	0.053**	-0.012	-0.013	-0.000	0.005
	(0.025)	(0.022)	(0.024)	(0.026)	(0.011)	(0.012)	(0.010)	(0.011)
Right-wing*Post 2012	-0.038	-0.030	-0.008	0.010	0.022*	0.023*	0.009	0.012
	(0.023)	(0.023)	(0.029)	(0.028)	(0.012)	(0.013)	(0.010)	(0.010)
Constant	0.025	0.307	0.265***	0.244	0.027	0.067	0.033***	0.082
	(0.016)	(0.447)	(0.021)	(0.206)	(0.020)	(0.065)	(0.007)	(0.076)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable								
% Impact of the policy								
Observations	56,880	56,658	56,853	56,632	56,948	56,727	56,952	56,730
R-squared	0.004	0.018	0.007	0.036	0.001	0.002	0.002	0.010

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Table A.3.4. Difference-in-Differences: private healthcare utilization. Impact on private healthcare in less intensively treated Spanish regions.

Control	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	0.124**	0.026	0.102**	-0.017	0.003	-0.005	0.011	-0.013
	(0.049)	(0.052)	(0.047)	(0.051)	(0.005)	(0.006)	(0.016)	(0.014)
Right-wing	0.051*	0.070**	0.018	0.045**	0.000	-0.000	-0.010	-0.003
	(0.029)	(0.026)	(0.021)	(0.017)	(0.005)	(0.006)	(0.007)	(0.007)
Right-wing*Post 2012	-0.034	-0.025	-0.044	-0.029	0.009	0.010	0.014	0.017
	(0.032)	(0.032)	(0.032)	(0.031)	(0.007)	(0.007)	(0.015)	(0.015)
Constant	0.103***	0.734	0.291***	0.303	0.011***	0.097	0.036***	0.136
	(0.034)	(0.593)	(0.025)	(0.311)	(0.003)	(0.097)	(0.011)	(0.098)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable								
% Impact of the policy								
Observations	35,962	35,823	35,948	35,810	35,999	35,860	35,998	35,859
R-squared	0.003	0.018	0.006	0.032	0.001	0.005	0.002	0.009

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table A.3.5. Baseline with linear-trends

Treated	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	0.123***	0.105***	-0.128***	-0.156***	-0.022	-0.024	-0.033***	-0.035***
	(0.015)	(0.016)	(0.015)	(0.016)	(0.013)	(0.014)	(0.003)	(0.003)
Right-wing	0.142***	0.142***	0.043	0.074	-0.039	-0.042	0.023	0.026
	(0.031)	(0.029)	(0.060)	(0.076)	(0.024)	(0.025)	(0.020)	(0.023)
Right-wing*Post 2012	-0.038	-0.030	0.077***	0.089***	0.053*	0.054*	-0.003	-0.001
	(0.028)	(0.027)	(0.025)	(0.022)	(0.026)	(0.027)	(0.005)	(0.005)
Constant	-0.027*	-0.640***	0.344***	0.092	0.027**	-0.048	0.035***	-0.058
	(0.015)	(0.135)	(0.029)	(0.092)	(0.012)	(0.037)	(0.010)	(0.045)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Region linear trends	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable	0.294		0.26		0.027		0.072	
% Impact of the policy			29.62%	34.23%	196.30%	200.00%		
Observations	20,918	20,835	20,905	20,822	20,949	20,867	20,954	20,871
R-squared	0.006	0.026	0.013	0.046	0.002	0.003	0.007	0.016

Note: Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Table A.3.6. Difference-in-Differences: preference for private healthcare. Impact on private healthcare in all Spanish regions.

All	GP visits		Specialist visits		Hospital visits		Emergency visits	
Private healthcare	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Post 2012	-0.034***	-0.033***	-0.046***	-0.045***	-0.061***	-0.056***	-0.031**	-0.029**
	(0.008)	(0.009)	(0.015)	(0.017)	(0.015)	(0.016)	(0.013)	(0.014)
Right-wing	0.035***	0.046***	0.015*	0.029***	0.025***	0.036***	0.039***	0.050***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)
Right-wing*Post 2012	0.019*	0.019**	0.038***	0.038***	0.025**	0.024**	-0.006	-0.006
	(0.010)	(0.009)	(0.012)	(0.012)	(0.012)	(0.012)	(0.009)	(0.008)
Constant	0.240***	0.336***	0.332***	0.398***	0.241***	0.338***	0.274***	0.403***
	(0.008)	(0.031)	(0.012)	(0.048)	(0.008)	(0.045)	(0.010)	(0.034)
Individual Covariates		X		X		X		X
Region FEs	X	X	X	X	X	X	X	X
Time FEs	X	X	X	X	X	X	X	X
Pre-reform mean outcome variable								
% Impact of the policy								
Observations	56,712	56,492	56,656	56,436	56,557	56,338	56,537	56,321
R-squared	0.025	0.046	0.045	0.071	0.047	0.068	0.070	0.091

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects.
*** p<0.01, ** p<0.05, * p<0.1

Table A.3.7. Differences-in-differences: capacity of Spanish NHS. Impact on right-wingers in more intensively treated regions.

Treated	Spanish NHS						
	Satisfaction with SNHS	Satisfaction with primary care of SNHS	Satisfaction with specialist care of SNHS	Prompt attention in appointment for primary care	Prompt attention in diagnosis for primary care	Prompt attention in appointment for specialist care	Prompt attention in diagnosis for specialist care
Post 2012	-0.076**	0.071*	-0.142***	0.236***	0.072**	-0.156***	-0.262***
	(0.028)	(0.036)	(0.045)	(0.040)	(0.030)	(0.030)	(0.038)
Right-wing	0.183	0.113	0.197*	0.165*	0.136**	0.212**	0.216***
	(0.110)	(0.105)	(0.111)	(0.092)	(0.048)	(0.077)	(0.063)
Right-wing*Post 2012	0.201***	0.093	0.063	0.089	0.188***	0.016	-0.003
	(0.064)	(0.076)	(0.094)	(0.068)	(0.050)	(0.058)	(0.076)
Constant	5.784***	7.143***	7.170***	6.454***	6.262***	5.506***	5.618***
	(0.173)	(0.211)	(0.237)	(0.198)	(0.335)	(0.656)	(0.550)
Individual Covariates	X	X	X	X	X	X	X
Region FE	X	X	X	X	X	X	X
Time FE	X	X	X	X	X	X	X
Observations	20,691	20,390	19,337	17,569	16,792	16,596	16,083
R-squared	0.059	0.058	0.048	0.066	0.062	0.051	0.056

Note: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. As for prompt attention, we include number of waiting days for each health service. *** p<0.01, ** p<0.05, * p<0.1

Table A.3.8. Difference-in-Differences: Resources of Spanish NHS (clinical staff).

Mechanisms 2	Primary		Specialist	
	Physicians per 1,000 inhab.	Nurses per 1,000 inhab.	Physicians per 1,000 inhab.	Nurses per 1,000 inhab.
Post 2012	0.000	-0.003	-0.043	0.219*
	(0.011)	(0.020)	(0.044)	(0.120)
Treated	-0.009	-0.108**	-0.096	-0.328
	(0.025)	(0.043)	(0.108)	(0.345)
Treated*Post 2012	-0.003	-0.002	0.013	0.050
	(0.008)	(0.010)	(0.019)	(0.048)
Constant	0.856***	0.446	0.276	3.955**
	(0.172)	(0.293)	(0.683)	(1.522)
Individual Covariates	X	X	X	X
Region FE	X	X	X	X
Time FE	X	X	X	X
Observations	119	119	119	119
R-squared	0.974	0.952	0.954	0.956

Note: Standard errors are clustered at the provincial level. Regional covariates include regional GDP per capita and aging index.
*** p<0.01, ** p<0.05, * p<0.1

Table A.3.9. Differences-in-differences: Impact on right-wingers in regions with PP conservative government in charge in more intensively treated regions.

	Private specialist consultations	
Treated	No controls	Controls
Right-wing*Post 2012*PP regional	0.001	-0.003
	(0.052)	(0.042)
Individual Covariates		X
Region FE	X	X
Time FE	X	X
Observations	20,905	20,822
R-squared	0.011	0.045

Notes: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

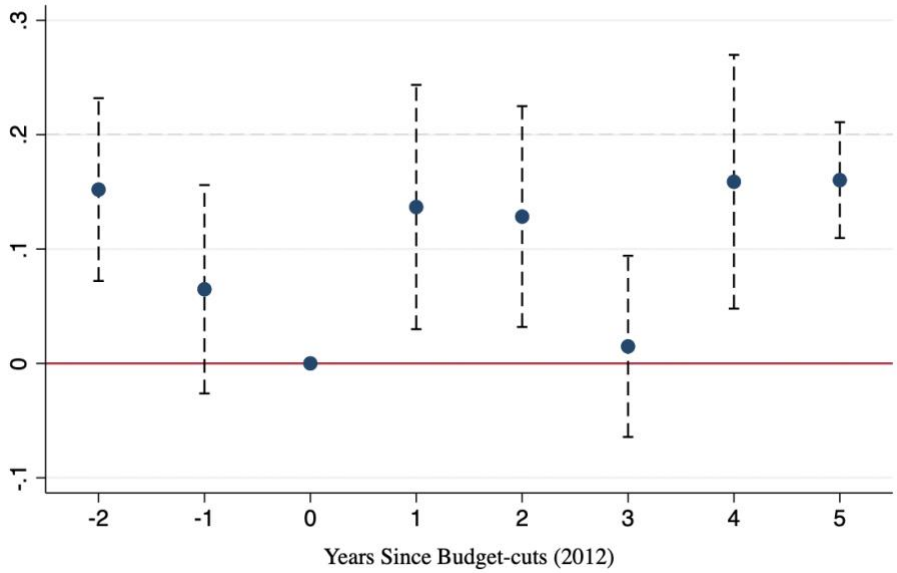
Table A.3.10. Differences-in-differences: Impact on right-wingers in regions more exposed to migration in more intensively treated regions.

	Private specialist consultations	
Treated	No controls	Controls
Right-wing*Post 2012*Migration	0.028	0.006
	(0.054)	(0.050)
Individual Covariates		X
Region FE	X	X
Time FE	X	X
Observations	20,905	20,822
R-squared	0.011	0.045

Notes: Regression with controls include: female, age, self-reported health, income, education level, occupation, and a dummy for missing income. All regressions include year and region fixed effects. *** p<0.01, ** p<0.05, * p<0.1

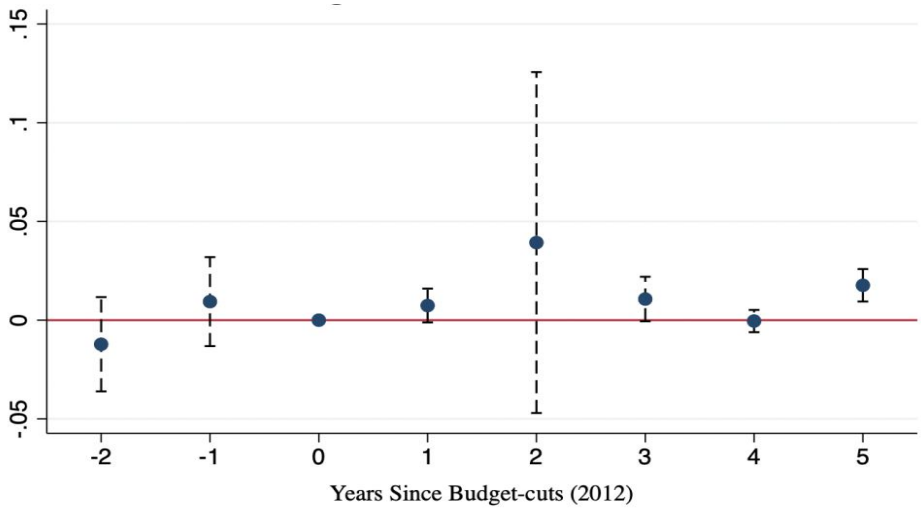
Figures

Figure A.3.1. Event-study for private primary care utilization.



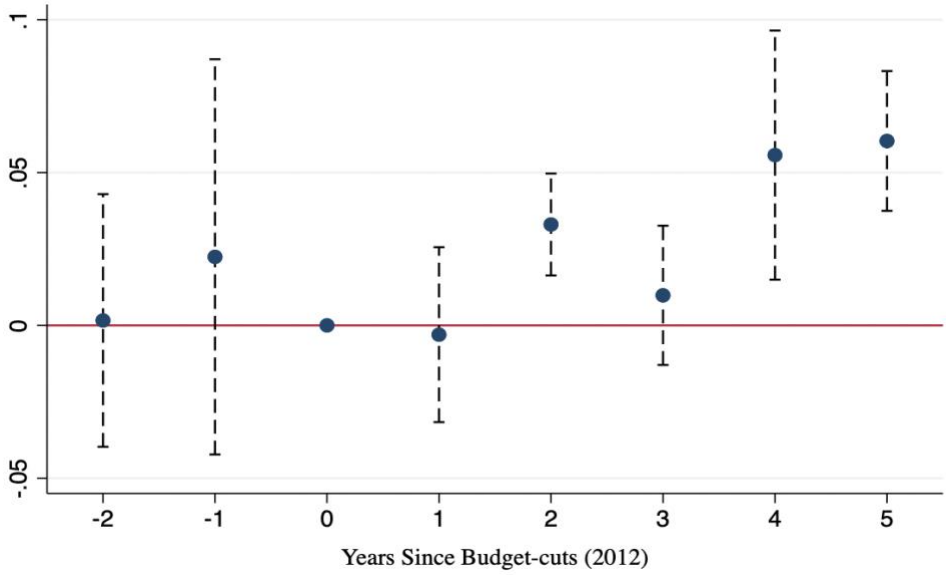
Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure A.3.2. Event-study for private hospital care utilization.



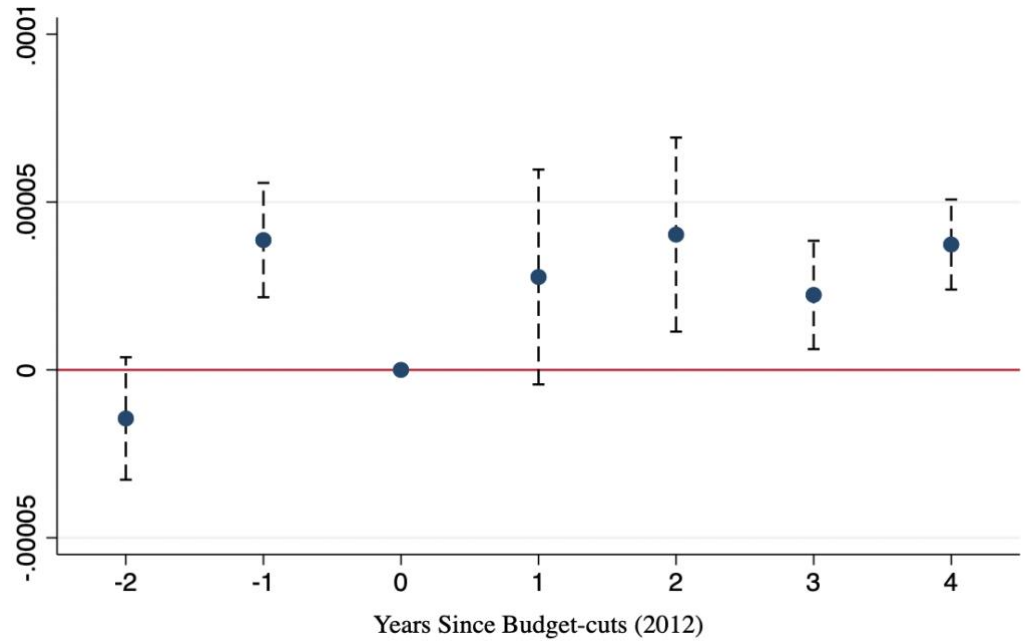
Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure A.3.3. Event-study for private emergency care.



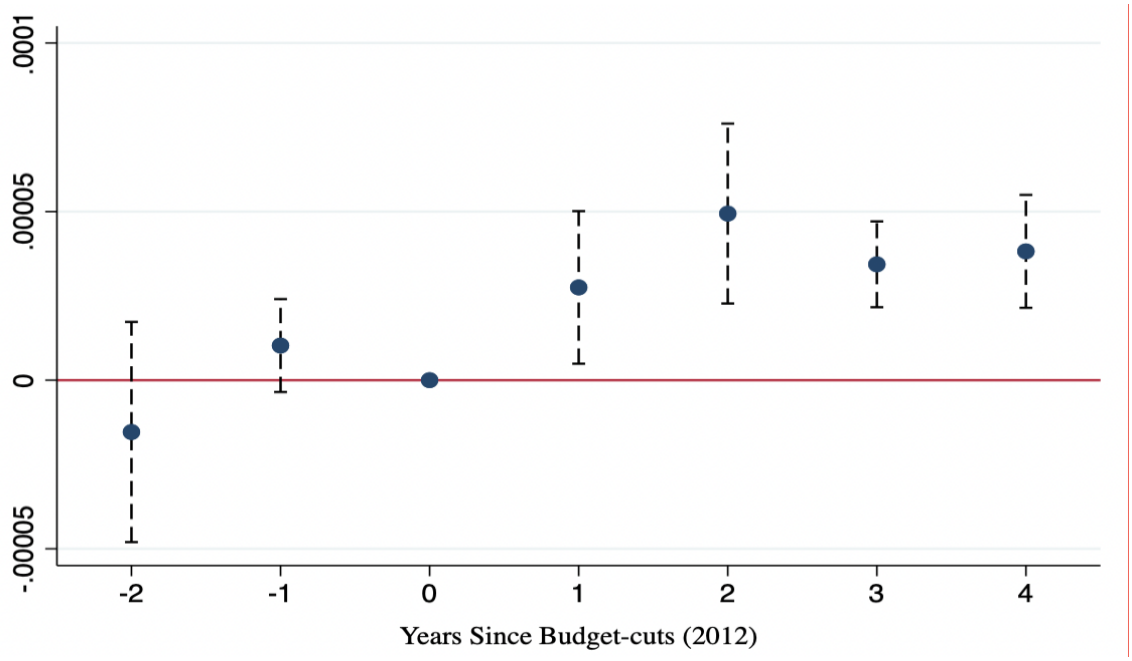
Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure A.3.4. Event-study for preferences private vs public for GP consultations.



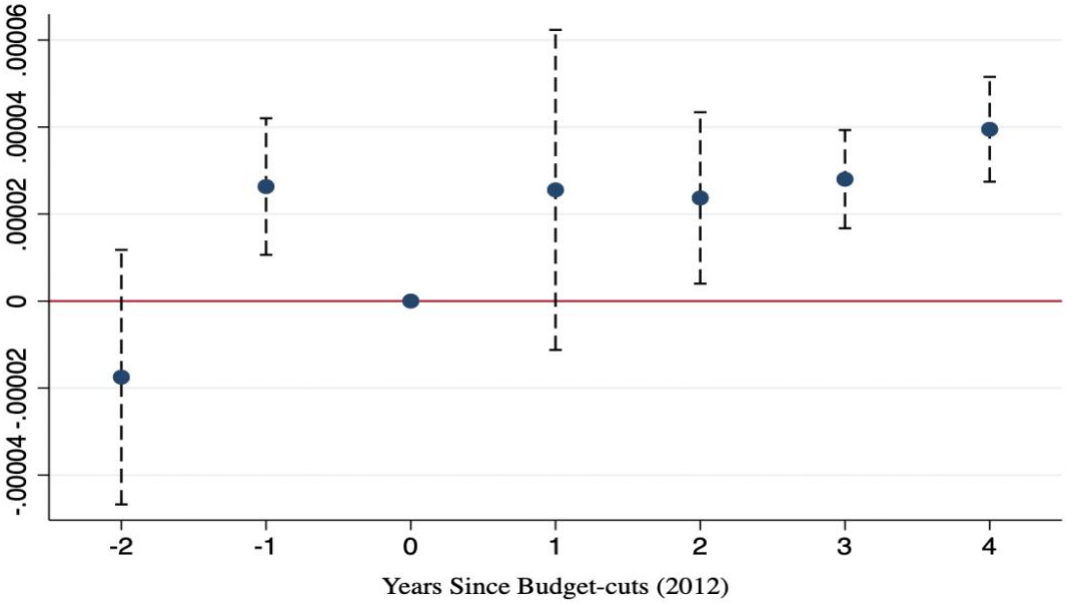
Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure A.3.5. Event-study for preferences private vs public for specialist visits.



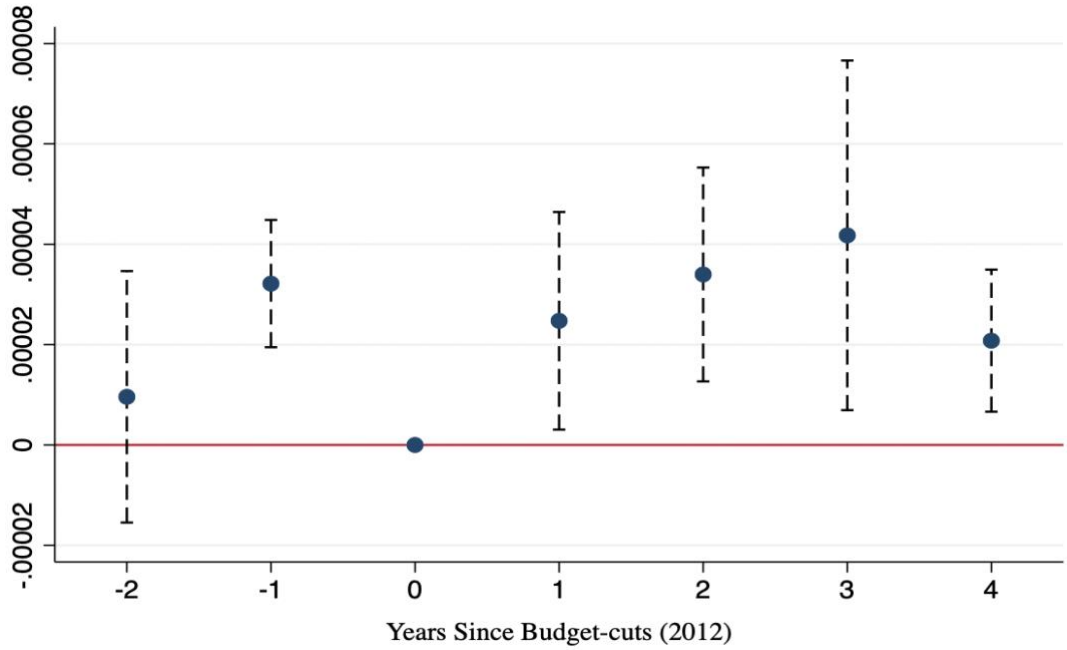
Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure A.3.6. Event-study for preferences private vs public for specialist visits.



Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Figure A.3.7. Event-study for preferences private vs public for emergency visits.



Notes: Event study model follows the impact of budget-cuts for right-wingers in intensively treated region prior and after the implementation in 2012 (year 0). Point estimates are displayed along with their 95% confidence intervals. The baseline (omitted) base period is the year of the reform in each treated region.

Conclusions

The core focus of this PhD thesis is to evaluate the determinants of several measures of quality of healthcare from the patients' perspective, as well as identifying any potential sources of socioeconomic inequalities along these measures within a universal and decentralized healthcare system. The research questions are addressed in three chapters.

The first chapter explores the **drivers of satisfaction with the Spanish Health System, an increasingly employed measure of perceived quality in health systems**. By taking advantage of multilevel statistical techniques, we provide empirical evidence of the important role that policy levers play on our subjective measures of healthcare quality. The findings indicate that boosting public expenditure in healthcare, specifically in the area of clinical staff, has the potential to enhance satisfaction levels.

Our results also indicate that conducting sector-specific analysis, as demonstrated in our study, can uncover significant associations between variables that may not be apparent in a more aggreagate analysis.

Additionally, the growing importance of the private sector in some regions may uncover certain drawbacks in the Spanish National Health Service (NHS). This increasing reliance on private insurance highlights features of private healthcare that might be highly valued by patients, such as reduced wait times and a greater choice of physicians. This result is of especial concern since any deterioration in the quality of public healthcare services can lead to wealthier individuals switching to private healthcare providers. This partial oping-

out of more affluent individuals might harm the fundamental principles of social solidarity in modern welfare states and worsening health inequalities.

The second chapter is related to identifying the key determinants of prompt attention, one of the key health responsiveness domains and one of the most im portant determinats of health system satisfaction. In particular, in this chapter we explore **whether there is a socioeconomic gradient for waiting times during the initial phases of contact with the Spanish Health System, encompassing both primary and specialist care**. Additionally, this chapter explores how much of the SES gradient remains after controlling for other sociodemographic differences such as citizenship status, living area or Spanish fluency.

Our results provide empirical evidence of a SES gradient for specialized healthcare services, primarily due to differences in education levels. Patients with university-level background tend to wait significantly shorterless, for these services compared to those without any formal educational qualifications. In line with the previous literature, for GP services we only find evidence of inequalities mostly on the basis of gender, severity (pro-healthy gradient) and area of residence. A similar gender gap favouring male patients was also found for specialist medical attention.

Due to the richness of our data, we are able to investigate a potential selection bias in access to healthcare. In this sense, some users of private healthcare systems may only resort to the NHS when waiting times are relatively shorter for them in publicly-funded healthcare. This pattern of use might bias the SES gradient. To address this potential selection bias, we employ quantile regression to investigate differences within the distribution of wating times on the basis of SES after controlling for the number of private medical consultations. Our findings strongly suggest that patients make significant higher

use of private healthcare when waiting times for NHS attention are above the median. All things considered, there exists a substantial SES gradient for specialist care (favouring better educated patients) regardless of the presence or absence of selection bias.

In closing, our last chapter addresses whether the quality differential or "quality gap" between public and private healthcare leads to a partial opting out of individuals. We focus in particular on **the role of political narratives on the utilization of private healthcare within publicly funded healthcare systems** drawing evidence from Spain after the 2012 austerity cuts. Our results show a considerable increase on the number of private specialist consultations and hospital stays among right-wing supporters residing in regions that have experienced more intensive budget cuts. These results suggest that austerity cuts signal future lower health care quality and congestion which motivate a partial opting out form the NHS. We also find evidence of heterogeneous effects with respect to socioeconomic background and health status. The ideologically-driven demand for private healthcare is stronger among relatively more affluent and healthier individuals. We also investigated the underlying mechanisms behind this ideologically-driven demand for private healthcare, focusing on the capacity and resources of the public health system at the individual and regional levels. We observed an increase in outsourcing health services and household expenditure on private health insurance in regions where the budget cuts were more intensively implemented. Additionally, waiting times also increased these regions.

This study is certainly subject to some limitations. Firstly, our main dataset, the Spanish Health Barometer (SHB) does not include vignettes in the questionnaires, which can potentially lead to reporting bias in the self-reported levels of satisfaction with the NHS. However, previous research has shown that self-reported measures of perceived quality can still be reliable indicators of patients' experiences within healthcare systems

(Angelopoulou et al., 1998; Jones et al., 2012). Additionally, we were not able to directly adjust for sample selection due to the lack of data for waiting times in private healthcare. However, the study did include rich information on waiting times in the NHS as well as the number visits to publicly and privately funded health services. The availability of these data helped in exploring self-selection and identifying differences in waiting times based on socio-economic status. An additional challenge was the lack of continuity in the availability of relevant variables in the SHB, such as personal income data and private health insurance (PHI). Despite these limitations, using survey data can help circumvent potential bias from healthcare providers misrepresenting waiting times due to political reasons. As a final point regarding limitations, with respect of the Spanish setting, it is important to note that in Spain, some public-sector workers have the option to choose private health insurance instead of relying solely on the public health system (Epstein & Jiménez-Rubio, 2019). This means that the proportion of individuals with private health insurance in different Spanish regions may be driven by the number of public servants who partially opt out of the public health system which may vary across Spanish regions..

In short, the results of this PhD thesis suggest that any deterioration in the satisfaction and responsiveness of the Spanish National Health System should be of special concerns since taxpayers' dissatisfaction and lack of voice combined with a growing reliance on private health care could transform universal health systems into a "*poor service for the poor*" in words of Propper (2000). That is, potentially undermining the effectiveness of public policies in contexts where citizens' participation in public programs generates externalities, such as vaccination campaigns or public education or health services. This consideration is of particular interest in light of the challenges that many countries, not only Spain, face today. The COVID-19 pandemic has placed significant pressure on health systems already grappling with public-sector deficits and

an aging population. Moreover, increasing political polarization makes it challenging to implement evidence-based health policies.

As useful areas for future research, studies could explore in more detail the relationship between satisfaction and essential aspects of private healthcare such as waiting lists and choice of provider. In addition, alternative supply side factors of satisfaction with the health services, such as the type of health provider could be examined in more depth. As well, a more comprehensive investigation of the mechanisms underlying potential barriers of access to healthcare, in terms of inequality in waiting times, is needed. Uncovering the sources of inequality in waiting times within Universal NHS is crucial to effective policy design, since the reality of rationing by waiting times seems to be less equitable than is desirable. However, more transparency from hospitals in the form of reports on waiting times for procedures according to SES indicators (such as the patient's postcode) is of paramount importance to address the mechanisms behind this SES gradient. Finally, further research is needed to establish how political identity might undermine the efficacy and objectives of health policy, concerning the growing political influence on health behaviour (Kannan & Veazie, 2018). It would be valuable to explore in future studies how political identity impacts the demand for private healthcare services that are driven by ideology across different countries.

Despite the limitations, studies such as the present one, despite limitations, can significantly contribute to the existing literature. In addition, empirical findings of these studies can assist policy-makers and managers in monitoring the performance of health systems by offering evidence-based policy recommendations that evaluate the efficiency, equity, and quality of healthcare services.

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