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Democracy's Vital Signs: Unravelling the Nexus between Healthcare Access and Voting Trends in Europe

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Abstract

With the recent rise in anti-establishment voting within Europe, it is evident that certain regions are feeling increasingly marginalised. Recent studies have shown the association between individual and contextual socioeconomic determinants on political discontent. Simultaneously, healthcare, as a core service of national governments, has seen centralisation policies in the name of efficiency impose barriers to healthcare access in certain regions. This thesis examines the influence of barriers to healthcare access on political discontent within the European Union. The individual and structural barriers to healthcare access were analysed on three levels; individual, regional and country level. A multilevel regression analysis with random intercepts was employed to identify the variance between these levels. The results indicate that sex, income and educational attainment have significant negative associations with political discontent. 8% of variation in political discontent was identified as country-specific, whilst 3% of variation was linked to the regional level. The remaining variation (89%) can be attributed to the individual level. Future research should explore the country-specific variations of these findings, as well as expand on healthcare access barriers to include perceived barriers.

Keywords: political discontent, healthcare access, places that don't matter, multilevel regression.

1. Introduction

The recent European Parliament elections have once again confirmed the trend of the past decade. The political landscape of Europe is changing and populism is on the rise (European Parliament, 2024). Populist ideology centralises around representing 'the people' against 'the other', it is therefore not exclusive to either end of the 'left-right' political spectrum (Balfour, 2017). That being said, the strongest populist parties of the European Parliament elections were right-wing (European Parliament, 2024). Most notable gains in power were seen by the right-wing parties in Austria ('Die Freiheitliche Partei Österreichs', 25.7%), France ('Rassemblement national' , 31.4%), and Germany ('Alternative für Deutschland', 15.9%) (European Parliament, 2024).

Europe's most recent wave of populism started in 2016 while the continent was in a sea of economic crisis and an unprecedented influx of migrants (Balfour, 2017). The COVID-19 pandemic further accelerated the growth of populism due to the associated rise in Eurosceptic discourse (Berti & Ruzza, 2022). COVID-19 highlighted the differences in healthcare coverage and response capacity not only between EU countries, but also between regions on a national scale (Reinl et al, 2024). The inequalities in healthcare access between regions was reflected in severity and mortality of the COVID-19 outbreaks, which lead to health inequalities still felt to this day (Fiske et al., 2022). The pandemic therefore highlighted large-scale inequalities between EU regions, in terms of healthcare, social and economic conditions, which further empowered the populist sentiment in the EU (Berti & Ruzza, 2022).

Populism is rooted in this fight against inequality, and has been linked to the consequences of globalisation and a fear of loss of cultural identity (Balfour, 2017). It is an outlet for inhabitants who feel discontent towards the policies implemented by current governing bodies. Certain regions have borne the brunt of this inequality, as a result of national development and investment policies overlooking them (Pellegata & Visconti, 2022). These regions are termed the 'places that don't matter' (Rodríguez-Pose, 2018). They are characterised by low economic opportunity and poor development prospects (Rodríguez-Pose, 2018). In addition, they face depopulation, a decline in essential social services, and transformation into food or financial deserts (Rodríguez-Pose, 2018).

While shifts in voting behaviour can be observed all across Europe, the largest proportions of anti-establishment votes are stemming from these 'places that don't matter' (Rodríguez-Pose, 2018). Existing literature on the "places that don't matter" has been able to provide valuable insights on the socioeconomic determinants of their political discontent. On an individual level, residents of the "places that don't matter" are categorised as having low income levels, low educational attainment, a lack of technological skills, and as a population suffering under high unemployment rates (Lenzi & Perucca, 2021). Moreover, regional attributes such as the quality of natural environment, amenities and social capital have also been associated with influencing voting behaviour towards more anti-establishment voting patterns (Koeppen et al., 2021). Although an array of variables have been identified that influence the regional level variation in political discontent, much of the variability is still unexplained (Koeppen et al., 2021).

Regarding amenities, the inequality in access to government services such as healthcare institutes has long been a point of contention. As mentioned previously, the COVID-19 pandemic highlighted these inequalities in healthcare coverage. Moreover, in recent years, in the name of efficiency, national healthcare policies have centralised healthcare services to form large highly-specialised clinics in big cities, whilst decreasing the number of local healthcare centres in rural regions (Simonet, 2010). These cost-saving policies have been met with large resistance from residents of more rural regions, as the smaller rural clinics are often the first to go (Simonet, 2010). The communities affected the most are those with low income, low education and employment, elderly and ethnic minorities (Benfer & Wiley, 2020).

However, despite this perceived overlap between individual characteristics of a resident of the "places that don't matter" and vulnerable populations for healthcare access inequalities (Hunter, 2007), research into the influence of healthcare access on political discontent is limited. To the best of the author's knowledge, Ziegenfuss et al. (2008) have been the only researchers to investigate this potential relationship. Their research showed a significant association between healthcare access and voting behaviour in the United States. However, the findings of their study cannot be generalised to the European context, since these relationships are highly dependent on national policies and healthcare systems of individual countries. Moreover, this study took place

prior to the COVID-19 pandemic and the large wave of populist voting that has been seen recently. This emphasises the need for a study on the potential association between healthcare access and voting behaviour.

In response to the gap in current research, this study aims to investigate the influence of inequalities to healthcare access on political discontent within the European Union. The focal point of this study revolves around the question:

To what extent do individual, regional and country level inequalities in healthcare access influence political discontent in Europe?

This research question is best answered with a series of subquestions:

> *What proportion of the variance in political discontent in Europe is associated with individual level characteristics?*
> *What proportion of the variance in political discontent in Europe is associated with regional level characteristics?*
> *What proportion of the variance in political discontent in Europe is associated with country level characteristics?*

The remainder of this thesis is structured as follows. The next section discusses the relevant theories underpinning this research. The theoretical framework is then translated into a conceptual model representing the relationship between political discontent and barriers to healthcare access. This is followed by a presentation of the methodological approach and a discussion of the results. The final section discusses political implications and conclusions that can be drawn from this research.

2. Theoretical Framework

2.1 Political discontent in 'places that don't matter'

The rise of discontent in a city or community mirrors a failure in the political realm (OECD, 2021). In other words, political discontent is an externalisation of dissatisfaction within a

community. Recent theories claim that political discontent of the "places that don't matter" has manifested itself in anti-establishment voting behaviour (Rodríguez-Pose, 2018).

Thus far, the identified causes for political discontent in these regions are territorial inequalities, such as demographic and economic decline, and socio-demographic inequalities, including lower education and unemployment (Dijkstra, 2019). The author of this thesis argues that the theories thus far have identified surface-level social and territorial characteristics and neglected to analyse how structural changes in public sector provisions in detail (eg. public transport, healthcare) influence residents' discontent. Experts in the field have acknowledged this knowledge gap in regional-level variability in political discontent (Koeppen et al, 2021). The identification and improvement of structural differences, which impact residents' discontent, is necessary to reverse the failures of the political realm for these regions (Broz et al, 2021).

The term "places that don't matter" elucidates the impact of national development policies on the economic and social decline of rural regions. This concept aligns with Bourdieu's theory of economic capital, in that regions with lower economic opportunities have limited access to goods and services, fewer growth opportunities and less feelings of power (Bourdieu, 1986). The limited economic capital reduces the regions ability to invest in cultural capital (eg. investing in education, healthcare) and social capital (eg. building influential networks), thereby exacerbating existing social inequalities (Bourdieu, 1986). The loss of feeling of power and lack of control of diminishment of essential resources has been shown to drive the change in voting behaviour of these regions (Rodríguez-Pose, 2018). This thesis draws upon these theories and uses them as a geographical framework on which the concepts of political discontent and healthcare access can be reflected.

2.2. Healthcare access as a driver of political discontent

Healthcare access is essential to the success of healthcare systems worldwide (Levesque et al., 2013). Easy access to healthcare reduces the burden of disease and significantly enhances social and economic outcomes for communities (Tzenios, 2019). Healthcare access is commonly assessed using the Conceptual Framework of Access to Healthcare developed by Levesque et al. in 2013 (Cu et al., 2021). This framework conceptualises access in terms of ability to identify

healthcare needs, as well as being able to seek and obtain healthcare services (Levesque et al., 2013). The dimensions of healthcare access are denoted as the five As: 1) Approachability; 2) Acceptability; 3) Availability and accommodation; 4) Affordability; 5) Appropriateness (Levesque et al, 2013). In terms of measurable metrics, these dimensions are commonly translated into individual and structural barriers (Tzenios, 2019). The specific metrics are income, educational attainment, health literacy, availability of healthcare institutions, quality of healthcare institutions and distribution of healthcare services (Tzenios, 2019).

There is large regional variability in access to healthcare in terms of Levesque's framework, both on the European scale as well as on a regional level (Wendt, 2009). So far, only one pioneer study has assessed the association between healthcare access and political discontent (Ziegenfuss et al, 2008). However, monitoring and evaluating alternative rural assets associated more with liveability, such as built environment characteristics, has been gaining importance in understanding how to re-energise 'left behind' communities (Jablonski & Scally, 2022). Healthcare infrastructure is a vital rural asset and the change in density of healthcare institutions has a strong influence on the liveability of a region (Buzza et al, 2011). Therefore, for this study it has been decided that a shift from analysing economic metrics to liveability metrics is a vital and relevant transition in this field of research.

2.3 Establishing a multilevel modelling framework

Healthcare access and political discontent are nuanced in their determinants. As mentioned previously, healthcare access is generally analysed on an individual or structural level (Tzenios, 2019). The individual barriers (approachability, acceptability and affordability) are nested in structural barriers (availability and accommodation, and appropriateness) (Levesque et al., 2013). Stated differently, there is a need to consider whether political discontent in a region is a result of a high concentration of individuals facing the same individual barriers (eg. income, education, health literacy), or whether the geographic contextual characteristics (eg. distribution, availability and quality of healthcare institutions) are the source of the discontent. A concrete example of this differentiation is the observation that distance to the nearest healthcare institution as a contextual barrier is strongly influenced by the individual's specific healthcare needs and capabilities (Buzza et al, 2011). This highlights the importance of being able to disentangle the

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individual (compositional) effects from the spatial (contextual) effects. This differentiation between the 'people' and the 'place' takes inspiration from the study conducted by Koeppen et al. (2021).

Similar to healthcare access, political discontent in a region can be separated into individual and contextual effects. Research on the relative importance of these levels has shown that individual characteristics are more important in elucidating the political discontent in a region (Gallego et al, 2014). That being said, contextual effects still influence political discontent (Koeppen et al., 2021).

This thesis will further extend the multilevel approach to include another spatial unit - the comparison on a country level. This level acknowledges the variation of healthcare access barriers between countries, by including GDP per capita. The combination of the individual effects, effects within a region (regional) and effects on a country level will allow for the explanation of interactions that would otherwise remain unobserved in an individual level modelling methodology (Krull & MacKinnon, 2010).

3. Conceptual Model

As mentioned previously, barriers to healthcare access can generally be divided into two main levels, individual and structural (Tzenios, 2019). The three largest individual barriers to healthcare access are low income, low education level and low health literacy (Tzenios, 2019), in this model they are depicted as the individual healthcare access barriers.

Structural barriers to healthcare access include the availability of healthcare services, the geographic distribution of healthcare services and the quality of healthcare services (Tzenios, 2019). These structural barriers can be analysed from a regional perspective. Naturally, these barriers to healthcare access differ by the prosperity of a country, therefore both the individual and regional variables are further nested by country-specific factors such as GDP per capita.
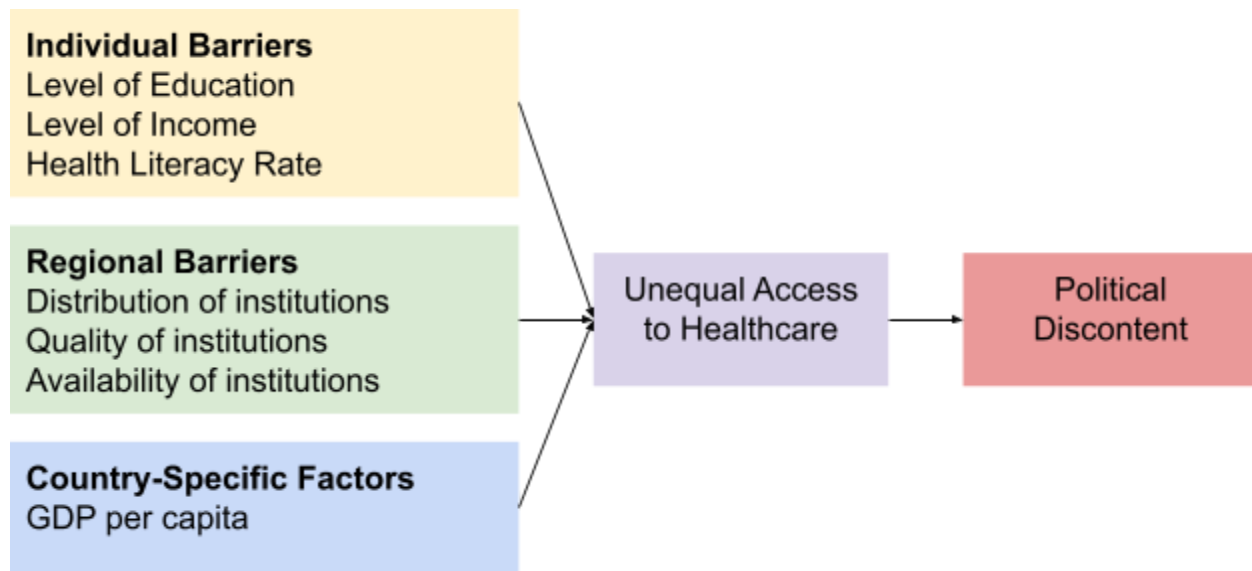
Figure 1. Conceptual Model of Influence of Healthcare Access on Political Discontent

As can be seen in the conceptual model (Figure 1), the individual, regional and national inequalities in access to healthcare could all influence the political discontent of a community. Crucially, it is anticipated that any types of disadvantage, whether individual, regional or national, will lead to heightened levels of impact on political discontent, both independently and through their interrelated dynamics.

These reflections and the theoretical framework give rise to an initial set of expectations (H) for the models. The previous section introduced the importance of individual level characteristics in explaining political discontent, however it is still unclear what role healthcare access plays in this (Gallego et al., 2014). Therefore, the first expectation is that individual inequalities in healthcare access is influencing political discontent (H1). The second expectation builds on the variance observed at a regional level in previous studies on political discontent (Koeppen et al., 2021). The expectation is that regional inequalities in healthcare access is influencing political discontent (H2). Finally, it is known that healthcare access varies greatly between countries and is in large part influenced by government expenditure (Onofrei et al., 2021). Thus, the third hypothesis is that country level inequalities in healthcare access influence political discontent (H3).

4. Data and Methods

4.1 Data Sources

Individual-level variables for this study are derived from the European Social Survey (ESS) round 9 (ESS, 2018). The ESS is a biennial cross-national survey with the aim of measuring Europe's social and political attitudes. Data is collected via face-to-face interviews every two years, with each country aiming to collect 1500 responses. Participants are selected by a strict random probability method and are anonymised prior to publication. The survey asks questions pertaining to attitudes, beliefs and behaviours of people across Europe (ESS, 2018). Each round of the ESS focuses on a specific theme, in addition to the standard questions. Round 9, conducted in 2018-2019, focussed on Justice and Fairness in Europe and was therefore used for this study.

Variables pertaining to regional data, were derived from the Eurostat database (ESS, 2018). Eurostat aggregates data from national statistical institutions and ensures standardised data collection. Datasets with relevant variables at the European Nomenclature of Territorial Units for Statistics (NUTS) II level were selected, as this is seen as the most representative context for decision-making. In order to achieve the third level of analysis (country), national averages of regional variables were also obtained and then later processed (see 4.2 Variables).

Initially, data was collected from all 27 EU member states. However, after removing cases with missing variables, the dataset was reduced to include only 8 countries: Bulgaria (BG), Denmark (DK), Finland (FI), Croatia (HR), Hungary (HU), Poland (PL), Sweden (SE), and Slovakia (SK). This selection primarily consists of Eastern European and Scandinavian countries. This is advantageous because these regions have a large land mass, which is more likely to exhibit regional variability (Heidenreich & Wunder, 2008). A total of 2276 individual observations were utilised for this analysis, which were spread across 45 NUTS II regions observed within these eight countries. Weighting was not applied in the analyses due to the absence of appropriate weighting methodology.

4.2 Variables

Measuring Discontent

Political discontent will be measured in terms of distrust towards EU Parliament. This is in contrast to the commonly used metric of 'share of votes for antisystem and Eurosceptic parties' (Dijkstra et al., 2020; Lenzi & Perucca, 2021). The reason for this alternative metric is the growing assumption that simply measuring the share of votes for antisystem and eurosceptic parties is an underestimation of the true political discontent and does not reflect non-voting related distrust (Lenzi & Perucca, 2021). Moreover, the use of electoral data would simply inhibit the use of individual level data that is relevant for analysing barriers to healthcare access. Next to this, it should be acknowledged that not all antisystem parties are eurosceptic nor is there a clear definition of euroscepticism that is the standard across the EU (Dijkstra et al., 2020; Crespy & Verschueren, 2009).

Distrust towards EU institutions will therefore be quantified using responses to the following question from the ESS: "On a score of 0-10, 0 means you do not trust an institution at all, and 10 means you have complete trust, how much do you personally trust the European Parliament?". This data is available on an individual basis and can be easily compared with other individual level data. In addition, this data does not associate political discontent with voting behaviour and allows for a more accurate representation of discontent, even identifying discontent prior to it influencing election results (Lenzi & Perucca, 2021).

Measuring Healthcare Access - Individual Barriers

Individual healthcare access inequalities that will be considered in this study include: education level, income level and health literacy. These demographics will be obtained from the ESS Round 9 (2019).

Education level is measured according to ES-ISCED (European Survey version of the International Standard Classification of Education) classification in the ESS. This provides 7 categories of educational attainment ranging from less than lower secondary education (ES-ISCED I) to higher tertiary education (ES-ISCED V2).

Participants of the ESS are asked to classify their household net income according to country-specific decile groups. This variable provides 10 deciles (1 = lowest decile, 10 = highest decile) which will be used in this analysis as a metric for income levels. The advantage of this variable is that the income is scaled to the country of the participant and thus allows for adequate comparisons between nations.

To measure health literacy, responses from two ESS survey questions were combined into one metric. The first question asked "what do you think overall about the state of health services in [country] nowadays?", and the second question asked "How is your health in general? Would you say it is ...", with both questions including an option for "I don't know." A new dummy variable was created where respondents who selected "I don't know" for either question were classified as having low health literacy. This dummy variable was coded as 1 for low health literacy and 0 for adequate health literacy. This method enabled an integration of responses from both questions into a single indicator for health literacy status.

Measuring Healthcare Access - Regional Barriers

The regional inequalities included in this analysis are distribution, quality and availability of healthcare institutions. The regions were defined according to NUTS II classifications. The data was obtained from Eurostat datasets for these metrics.

Availability of institutions assesses the technical capacity dimensions of the healthcare institutions in a NUTS II region by using the metric of hospital bed availability per 100,000 inhabitants. Hospital beds that are readily available for the care of admitted patients per year are included in this metric, thereby focussing on the capacity dimension of healthcare provision. The analysis uses a rate per 100,000 inhabitants to allow for comparison across regions.

Distribution of institutions is measured using the proxy of number of inhabitants per practising medical doctors by NUTS II region. This metric provides insight into the distribution of medical doctors within a country. Manpower in the healthcare sector is a relevant indicator for accessibility of healthcare for patients. The reference period of 2019 was used, as this provided the most complete recent data.

Quality of institutions is measured using the health module of the European Statistic of Income and Living Conditions (EU SILC) survey, where respondents are asked about their self-reported unmet needs for medical care. The response categories are grouped into 'reasons of barriers of access' which combine the reasons 'Could not afford to (too expensive)', 'Waiting list' and 'Too far to travel or no means of transportation'. The indicator is reported as a percentage. Data from 2021 was used, the most recent and complete data.

Control Variables

Individual control variables of age, sex, marital status, number of children and region-specific characteristics such as GDP per capita, employment rate, net migration, and population density have already been shown to have a significant association with political discontent (Lenzi & Perucca, 2021). For this reason, these variables will be included as control variables in the models.

Individual characteristics, including age, sex, marital status, number of children are derived from the ESS-9, thereby providing individual level data on these variables. The region-specific characteristics of employment rate, net migration and population density are derived from the Eurostat database.

To account for the country level in the nested data structure, group mean centering was conducted. Group mean centering involves subtracting the group-specific mean of a variable from each individual score within that group (Brincks et al, 2016). The centred variable is thus the deviance from the group mean. This technique was applied to the variable GDP per capita. GDP per capita was then further transformed by dividing the values by 1000. This rescaling was performed to improve the model fit and improve interpretability. Refer to Table 1 for a summary of the descriptive statistics of all variables.

Table 1. Descriptive Statistics of Variables

	%	Mean	SD	Min	Max
		Descriptive Statistics			
Political Discontent		4.4	2.6	0	10
Individual Healthcare Access Barriers					
income		4.2	2.7	1	10
education		4.0	1.8	1	7
health literacy	0.85	0.002	0.042	0	1
Individual Control Characteristics					
age		59.8	16.2	16	90
marital status		4.7	1.2	1	6
sex	63.3	0.6	0.5	0	1
number of children		2.0	1.0	1	10
Regional Healthcare Access Barriers					
quality		1.9	1.4	0.2	6.1
availability		473.1	243.5	184.7	1195.7
distribution		376.9	66.8	222.1	648.5
Regional Control Characteristics					
Age dependency		73.7	7.9	61.4	88.3
Employment		73.0	4.4	61.7	80.4
Net Migration		-9.6	26.8	-94.0	11.6
Population Density		153.8	405.1	3.4	3405.9
Country Control Characteristics					
GDP per capita (gmc)		-6.2	8.9	-28.5	17.7

4.3 Data Management

All data used in this thesis is freely available from the individual EU institutions (ESS, 2018). The data had already been anonymised to safeguard the participants prior to publication. Moreover, to guarantee the integrity and accuracy of the results, regular checks and validation procedures were conducted throughout the data compilation and analysis. Measures were taken to ensure that the data is stored only on university harddrives and not susceptible to data breaches. Data will be securely archived for a period of six months, after which it will be appropriately destroyed.

4.4 Analyses

The methodology for this study involves conducting a multilevel regression analysis on the data obtained. This analysis was chosen due to the hierarchical nature of barriers to healthcare access. A multilevel regression accounts for the non-independence of the data obtained and can effectively model the variability between the levels. The use of the three-level analysis in this study thus allows the identification of how the predictor variables operate on the different levels and how this influences political discontent. Moreover, the exploration of contextual effects means that conclusions can be generalised and are thus more informative for the large scope of this research. Particularly regarding healthcare and political discontent, the generalisability of these findings to a wider context is very relevant.

This study will make use of random intercepts within the multilevel model. By including a random intercept for all three levels (individual, regional and national) each level will have its own baseline. In other words, the random intercept is able to acknowledge any systematic differences within a level due to unmeasured heterogeneity. Additionally, the random intercept methodology once again enhances interpretability of the findings.

A total of four models will be conducted for this study. Starting with a null model, each subsequent model incorporates a further level of data; individual level, then regional, then national. Refer to Table 2 for an overview of the variables included in each model. The analyses will be conducted using R Studio.

Table 2. Overview of Models

Model	Included Variables
Model 1: Null Model	Only includes three levels (individual, regional (NUTS II), country)
Model 2: Individual Characteristics	Income, Education, Health Literacy Age, Sex, Marital Status, Number of Children
Model 3: Regional Characteristics	Model 2 + Age Dependency, Employment Rate, Net Migration, Population Density
Model 4: Country Characteristics	Model 3 + GDP per capita (gmc)

As an example of how the analyses were conducted, the formula of Model 4 is as follows:

discontent(p) = a(individual inequalities in healthcare access) + b(regional inequalities in healthcare access) + c(country level inequalities in healthcare access) + δXi + ηQr + εi

The primary objective of this thesis is to estimate the coefficients of a, b and c in the Equation above for each model. These coefficients depict the effect of the different kinds of inequalities on political discontent (see Expectations). The relationship between the inequalities and political discontent is estimated, the individual and contextual controls are seen as constant variables to be controlled for. Individual level control variables that are taken into account (represented by X) include age, sex, marital status, and number of children. The contextual factors (Q) are based on those used by the study of Dijkstra et al. (2020). They include regional economic characteristics (employment rate) and regional social characteristics (age dependency ratio and the net migration rate). $εi$ is the residual error term.

5. Multilevel Regression Results

5.1 Model (1): null model

The theoretical and methodological justifications for utilising a multilevel approach were outlined in the previous sections. The null model serves as an empirical test to confirm the theoretical expectations. To this end, a multilevel (three-level) null model was performed, which

includes a random intercept, with respondents nested within NUTS II regions and on a country level.

The aim of this methodology is to identify what proportion of overall variation in political discontent is attributable to individuals, their surroundings (NUTS II regions) and how their surroundings compare to neighbouring countries (country level). The estimated variance components from the null model were $\tau 00 = 0.37$, $\tau 00 = 0.16$ and $\tau 00 = 0.44$ at individual, NUTS II and country level respectively (Table 2: null model). The intraclass correlation coefficient (ICC), which represents the proportion of the variance in political discontent between-individuals, within-regions and between-regions within countries, was computed as:

Individual level ICC: $\tau 00$ individual $+ \sigma^2 / (\tau 00$ individual $+ \tau 00$ NUTS II $+ \tau 00$ country $+ \sigma^2)$
* $= (0.37 + 5.93) / (0.37 + 0.16 + 0.44 + 5.93) = 0.912$*
NUTS II level ICC: $\tau 00$ NUTS II $/ (\tau 00$ individual $+ \tau 00$ NUTS II $+ \tau 00$ country $+ \sigma^2)$
* $= 0.16 / (0.37 + 0.16 + 0.44 + 5.93) = 0.023$*
Country level ICC: $\tau 00$ country $/ (\tau 00$ individual $+ \tau 00$ NUTS II $+ \tau 00$ country $+ \sigma^2)$
* $= 0.44 / (0.37 + 0.16 + 0.44 + 5.93) = 0.064$*

This indicates that 2.3% and 6.4% of the total variance in political discontent is accounted for by the NUTS II and country level, respectively. Ninety-one point two percent of the variance is due to individual level differences. The total ICC of the null model, which includes no covariates, supports the use of a multilevel regression since it shows that 14% of the variance in political discontent is distributed across these levels.

Table 3. Model (1): Null Model

Predictors	Estimates	CI	p value
	Political Discontent		
(Intercept)	4.51	4.01 - 5.00	**<0.001**
Random Effects			
σ^2	5.93		
τ_{00} individual	0.37		
τ_{00} NUTS II	0.16		
τ_{00} country	0.44		
ICC individuals	0.912		
ICC NUTS II	0.023		
ICC country	0.064		
Observations	2276		
Marginal R^2 / Conditional R^2	0.000 / 0.140		

4.2 Model (2): understanding the individual level variance

To ascertain what proportion of the variance in political discontent is associated with individual level characteristics, a model with individual healthcare access barriers and control variables was constructed. This first model (Table 4: Model 2) includes standard individual control variables (age, sex, marital status, number of children) that have previously been shown to have a significant association with political discontent (Lenzi & Perucca, 2021). In addition, this model includes the known individual level barriers to healthcare access (income, education, health literacy).

This model (Model 2) accounted for 92% of the total individual-level variance. Sex was the strongest predictor of political discontent; with male sex being associated with a 0.35 increase in political discontent (p = 0.002). Educational attainment and income were also significantly associated with political discontent. Educational attainment was the second strongest predictor,

each level increase in ES-ISCED was associated with a 0.12 (p = 0.001) increase in political satisfaction. This was followed by income level - a one category increase of household net income was associated with a 0.09 (p < 0.001) increase in political satisfaction. In other words, this model highlights how lower income and lower educated individuals of male sex show more political discontent than their counterparts. There was no statistically significant link between health literacy, age, marital status and number of children with political discontent.

Table 4. Model (2): Individual Level Variance

	Political Discontent		
Predictors	*Estimates*	*CI*	*p value*
(Intercept)	2.92	1.96 – 3.88	**<0.001**
Age	0.01	-0.00 – 0.01	0.117
Sex: male	0.35	0.13 – 0.57	**0.002**
Marital status	-0.02	-0.11 – 0.06	0.616
No. of children	-0.02	-0.13 – 0.09	0.704
Income	0.09	0.04 – 0.14	**<0.001**
Education	0.12	0.05 – 0.18	**0.001**
Health Literacy	-1.03	-3.50 – 1.44	0.412
Random Effects			
σ^2	5.88		
τ_{00} individual	0.30		
τ_{00} NUTS II	0.18		
τ_{00} country	0.37		
Individual ICC	0.92		
Total ICC	0.13		
Observations	2276		
Marginal R^2 / Conditional R^2	0.020 / 0.143		

4.3 Model (3) and Model (4): separating the regional and country level variance

In an attempt to separate the regional and country level variance, two further models were introduced. The first model (Model 3), includes socioeconomic characteristics on a regional (NUTS II) scale, such as regional employment rates, age dependency ratio, population density and net migration. These characteristics have shown significant association with political discontent in previous studies (Lenzi & Perucca, 2021; Koeppen et al., 2021). In order to test the influence of regional healthcare access barriers, availability, quality and distribution of healthcare institutions were also included in Model 3. The second model (Model 4) expands on Model 3 and includes the group-mean centred GDP per capita. The group-mean centering allows for the interregional comparison of the GDP per capita across multiple NUTS II regions in a country. The differentiation between these two models allows for the disentangling of regional and country-level variability.

Model 3 (Table 5) accounted for 3% of the variance on a NUTS II level and 7% of the variance on a country level. Sex (0.35, p = 0.002), income (0.09, p = <0.001) and education (0.12, p = 0.001) all maintained significance. This again reiterates the influence of low income, low education and male sex on increasing levels of political discontent. Regional level variables did not show a significant association with political discontent.

Table 5. Model (3): Regional Level Variance

	Political Discontent		
Predictors	*Estimates*	*CI*	*p value*
(Intercept)	2.21	-5.11 – 9.54	0.553
Age	0.01	-0.00 – 0.01	0.110
Sex: male	0.35	0.13 – 0.56	**0.002**
Marital status	-0.02	-0.11 – 0.06	0.626
No. of children	-0.02	-0.13 – 0.08	0.671
Income	0.09	0.04 – 0.14	**<0.001**

Education	0.12	0.05 – 0.18	**0.001**
Health Literacy	-1.06	-3.54 – 1.42	0.401
Availability of HI	-0.00	-0.00 – 0.00	0.678
Distribution of HI	0.00	-0.00 – 0.01	0.247
Quality of HI	0.11	-0.09 – 0.31	0.281
Regional Employment	-0.02	-0.09 – 0.06	0.686
Age Dependency	0.01	-0.02 – 0.05	0.452
Population Density	-0.00	-0.00 – 0.00	0.927
Net Migration	0.00	-0.01 – 0.02	0.610
Random Effects			
σ^2	5.90		
τ_{00} individual	0.29		
τ_{00} NUTS II	0.18		
τ_{00} country	0.47		
NUTS II ICC	0.03		
Country ICC	0.07		
Total ICC	0.14		
Observations	2276		
Marginal R^2 / Conditional R^2	0.035 / 0.169		

In contrast, Model 4 (Table 6) with the addition of group-mean centred GDP per capita variables had more explanatory power. The total ICC of this model was 14%, further broken down into 3% and 8% for NUTS II and country levels respectively. This suggests that there are meaningful differences between countries which influence political discontent. Regional variation is lower than country variation, but still indicates some differences that influence political discontent. Sex, income and education remained significant, maintaining the association that was seen in previous models. Specific regional and country characteristics (group mean centred) do not have

the same level of explanatory power. Of the regional and country level characteristics, quality of healthcare institutions showed the strongest association with political discontent (0.11, p = 0.284). Although this association is non-significant, it suggests a degree of influence that can be further researched in future studies. The non-significance of regional and country level variables is in alignment with the sentiment that although variation is observed on these levels most variation is attributed to the individual level (Gallego et al, 2014).

Table 6. Model (4): Country Level Variance

	Political Discontent		
Predictors	*Estimates*	*CI*	*p value*
(Intercept)	2.10	-5.36 – 9.55	0.581
Age	0.01	-0.00 – 0.01	0.109
Sex: male	0.35	0.13 – 0.56	**0.002**
Marital status	-0.02	-0.11 – 0.06	0.627
No. of children	-0.02	-0.13 – 0.08	0.674
Income	0.09	0.04 – 0.14	**<0.001**
Education	0.12	0.05 – 0.18	**0.001**
Health Literacy	-1.07	-3.54 – 1.41	0.399
Availability of HI	-0.00	-0.00 – 0.00	0.673
Distribution of HI	0.00	-0.00 – 0.01	0.357
Quality of HI	0.11	-0.09 – 0.31	0.284
Regional Employment	-0.02	-0.09 – 0.06	0.655
Age Dependency	0.02	-0.03 – 0.07	0.477
Population Density	-0.00	-0.00 – 0.00	0.886
Net Migration	0.00	-0.01 – 0.02	0.650
GDP per capita (gmc)	0.01	-0.04 – 0.05	0.788

Random Effects

σ^2	5.90
τ_{00} individual	0.28
τ_{00} NUTS II	0.19
τ_{00} country	0.51
NUTS II ICC	0.03
Country ICC	0.08
Total ICC	0.14
Observations	2276
Marginal R^2 / Conditional R^2	0.036 / 0.174

6. Concluding Comments

The objective of this thesis was to identify whether barriers to healthcare access, on an individual, regional or country level, had an influence on political discontent. The analyses showed that individual level characteristics such as sex, education and income have significant negative associations with political discontent. This thesis extends previous studies on political discontent by assessing the contribution of barriers to healthcare access on political discontent (Lenzi & Perucca, 2021). In doing so, this study provided valuable insights into the complex interplay between healthcare and political discontent. Specifically, this study highlighted the variation in political discontent attributed to regional and country levels with regards to barriers to healthcare access. 8% of variation in political discontent was identified as country-specific, whilst 3% of variation was linked to the regional level. The remaining variation (89%) can be attributed to the individual level.

This thesis offers several notable strengths, beginning with its EU-wide perspective on the influence of healthcare access on political discontent. By encompassing a broad geographic scope, the study captures a diverse range of healthcare systems and political contexts, providing a more comprehensive understanding of the issue. The analysed countries are particularly relevant, considering factors such as their rural-urban structure and the land mass-to-population

ratio. The inclusion of these countries ensures that the analysis accounts for various demographic and geographic scenarios, enhancing the generalizability of the findings.

The study employs a comprehensive multilevel analysis, examining data at three levels: individual, NUTS II, and country level. This detailed approach allows for a nuanced comparison of individual and regional data, highlighting the broader regional differences in healthcare access and political discontent. The ICC of 0.14 in the final model signifies the importance of group-level factors and validity of the multilevel regression methodology. Moreover, the analysis incorporates a robust set of control variables to account for both regional and individual differences. This thorough control enhances the validity of the results, ensuring that the findings are not confounded by extraneous factors.

Healthcare access was analysed on two levels: individual and structural, with structural factors assessed using three key metrics. While this approach provided valuable quantifiable data, it may underestimate perceived barriers to healthcare access. For instance, the mere presence of a certain number of hospitals in a region does not necessarily equate to high availability, as factors such as public transport routes and healthcare referral or insurance systems can still pose significant perceived barriers. Although efforts were made to include perceived barriers, such as the quality of institutions, these were limited by data accessibility. Future research should place greater emphasis on perceived barriers rather than solely relying on geographical data.

The variable for health literacy likely underestimates the prevalence of "low health literacy". Identifying a health literacy rate would have been more appropriate, but this was not feasible as most health literacy data is collected at the country level and is typically not easily compared across many countries. The HLS-EU survey provides health literacy data on a country-specific basis, which should be utilised in future research that is more country-specific. Additionally, health literacy is often measured as either functional health literacy or objective health literacy instead of as a composite. Analysing both forms would be highly relevant in understanding the influence of health literacy on political discontent.

A recent study concerning myocardial infarct (MI) mortality in rural Germany showed that longer travel times do not systematically contribute to the rural disadvantage of MI related mortality (Ebeling et al, 2024). This is comparable to the non-significant associations of regional healthcare access barriers to political discontent found in this study. Instead, the aforementioned study argued that the elevated fatality rates in rural regions are attributed to the overall higher incidence of MI and its pre-conditions. This higher incidence in turn is associated with undertreatment of an individuals' MI risk factors, lack of long-term follow up and few prevention programmes in place in those regions (Ebeling et al, 2024). The findings of this study thereby support the notion that individual level characteristics, both regarding healthcare access and socioeconomic characteristics, play a vital role.

The concept of individual level characteristics carrying a significant importance, is in accordance with the theories of the "revenge of the places that don't matter". Territorial inequalities for the individual, have already been shown to have a significant impact on political discontent (Gallego et al., 2014). This thesis has been able to further extend this theory to include barriers to healthcare access, particularly on the individual level. That is to say, the burden of disease in a community impacts the capabilities of the individual and further increases their political discontent.

Healthcare has been and remains a priority for national governments (Onofrei et al., 2021). Adequate healthcare is seen as a national necessity (Onofrei et al., 2021). Extreme healthcare disparities are relatively uncommon due to this prioritisation, particularly within EU countries (Onofrei et al., 2021). However, the presence of perceived barriers to healthcare access remain a pertinent concern with direct implications for individual political contentment, as evidenced by the analyses. The ongoing trend towards centralising healthcare institutions as a cost-saving measure warrants careful consideration. While such measures may offer economic benefits, their implementation must be approached cautiously to prevent the marginalisation and dissatisfaction of certain regions. Individual level barriers to healthcare access, such as education and health literacy, should continue to be a priority in the political agenda. These not only serve to enhance citizen health outcomes but also fosters trust in governmental institutions. By addressing these

barriers, policymakers can effectively contribute to the overall well-being and satisfaction of the population.

The findings of this study open several avenues for future research. Country-specific case studies could improve the robustness of this research, as sensitive data such as health literacy could be obtained more easily. This would address potential limitations related to data accessibility encountered in this study. Secondly, employing qualitative methods or micro-data alongside quantitative methods would be of great value to place a focus on the perceived barriers to healthcare access as opposed to the currently researched geographical barriers . In-depth interviews or focus groups could uncover 'invisible' barriers that play a large role in healthcare access, which quantitative analyses alone may overlook.

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