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IS IMPARTIALITY ENOUGH?

Government Impartiality and Citizens' Perceptions of Public Service Quality

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ABSTRACT

Government impartiality is considered a core feature of government quality that leads to favorable macro-level outcomes. We still have limited knowledge, however, of how impartiality affects citizens' perceptions of public service quality. Understanding this relationship is important because citizens are the main beneficiaries of public services and are directly affected by administrative impartiality. Using the European Quality of Government Index (EQI) data for 56,925 citizens in 174 European regions, results of multilevel analysis show that impartiality positively influences perceived public service quality. However, we also find that such positive impacts of impartiality are contingent on the socio-economic backgrounds of citizens. Impartiality does not lead to positive evaluations of public services among citizens with low educational background. The findings are robust across regions even after controlling for lagged service quality level and individual and regional factors. Results suggest the importance of impartiality, but all citizens do not benefit equally from impartiality.

Key words: impartial government; public service quality; citizen perceptions; bureaucracy; comparative public administration; European regions.

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One of the theoretical cores of good governance and high-quality government is impartiality in implementation (Rothstein and Teorell 2008). Past empirical research shows a positive link between government impartiality and favorable macro-level outcomes. However, it is not clear to what extent impartiality leads to citizens' perceptions of public service quality or whether all layers of society benefit equally from impartiality. Using data from 56,925 citizens in 174 European regions, this research shows that government impartiality leads to higher perceived service quality, but impartiality does not work in the same way among citizens with socially-vulnerable backgrounds.

The last two decades have seen increasing scholarly attention to the characteristics of public administration and their effects on macro-level outcomes. Past empirical research shows that certain characteristics of public administration (often called "quality of government")—which typically but do not necessarily include impartiality, strong rule of law, low corruption, and meritocratic recruitment of civil servants—positively influence socio-economic development (Evans and Rauch 1999, Nistotskaya et al. 2015, Rauch and Evans 2000), corruption prevention (Charron et al. 2017, Dahlström et al. 2012a), regulatory quality and entrepreneurship (Nistotskaya and Cingolani 2016), scientific productivity and innovation (Fernández-Carro and Lapuente-Giné 2016, Suzuki and Demircioglu 2018), economic activities or infrastructure efficiency (Crescenzi et al. 2016, Kyriacou et al. 2019, Rodríguez-Pose and Garcilazo 2015), environmental outcomes (Povitkina and Bolkvadze 2019), and government effectiveness or performance (Dahlström and Lapuente 2017, Cho et al. 2013). Impartiality in the exercise of public authority has been considered a theoretical core for determining government quality (Rothstein and Teorell 2008). However, several studies have critiqued the use of impartiality as a key measure of government quality (Fukuyama 2013, Im and Hartley 2017, Im and Choi 2018, Longo 2008, Rotberg 2014). One convincing argument is that output measures of government—such as public service quality—should be distinguished from government quality (Fukuyama 2013, Im and Choi 2018). Since previous studies tend to regard impartiality and service quality as partial measures of a total indicator of government quality (for instance, see Charron et al. (2015, 2014), Charron et al. (2019)), we still do not know to what extent impartiality is connected to public service quality.[1] In particular, it is not certain how citizens in different layers of society evaluates performance of government under high impartiality norms.

Responding to this gap in the literature, we first investigate the relationship between impartiality and citizens' perceptions of public service quality. Impartial government typically accompanies meritocratic recruitment practices (Aucoin 2012), which attract professional civil servants with relevant skills and qualifications and ensure a "credible commitment" of public servants to professional norms and standards (Miller and Whitford 2016). In addition to expected higher quality in the supply side of public services,

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[1] See Im and Choi (2018) for their critique of the existing cross-national indicators.

citizens also favorably evaluate government performance when the government assures equal treatment and procedural justice in administrative processes (Mazerolle et al. 2013, Van Ryzin 2015). Thus, we hypothesize that impartiality leads to higher evaluation of public services. Second, we argue that citizens' socio-economic backgrounds matter for the impartiality-service quality link. Following literature on vulnerable citizens (Clifton, Díaz-Fuentes, et al. 2017, Clifton, Fernández-Gutiérrez, et al. 2017, Jilke 2015, Jilke and Van de Walle 2013) and recent studies on administrative burden (Moynihan et al. 2014), we hypothesize that impartiality negatively influences perceptions of public service for socially-vulnerable citizens (as measured by income and education level). Vulnerable citizens with limited capacities and available resources may not benefit equally from public services, and more personalized and partial treatment may be needed for those citizens (Stensöta 2010, 2012). Results of the multilevel analysis provide empirical supports for our hypotheses.

This study contributes to existing good governance and public administration studies in the following ways. First and most importantly, this paper investigates an understudied link between impartiality and citizens' perceived service quality. Understanding this relationship is important as citizens are the beneficiaries of public services who are directly affected by administrative impartiality. In particular, existing studies do not pay sufficient attention to variations in the effects of government quality on citizens from different socio-economic backgrounds. Secondly, this study contributes to the recent debate over "statelessness" in public management literature by bringing macro-factors into the analysis. A substantial body of public management literature has examined the determinants of individual behavior or attitudes within an organizational setting using a single country study. Despite the recent increase in the study of comparative public management (Meier et al. 2017), the field is mainly made up of single country studies that neglect the national characteristics of bureaucracies, assuming that "all states are alike" (Milward et al. 2016, p.312, Roberts 2018). We aim to connect the study of comparative bureaucracies with literature on public administration and management.

Theory and Hypotheses

This section defines impartiality, briefly discusses its importance, and offers two hypotheses. Impartiality in public administration means (1) impartial treatment of citizens and (2) civil servants can behave and make decisions without the influence of any political party (Aucoin 2012). Similarly, Rothstein and Teorell (2008, 170) define impartiality as "[w]hen implementing laws and policies, government official shall not take into consideration anything about the citizen/case that is not beforehand stipulated in the policy or the law" (Rothstein and Teorell 2008, p.170). Impartiality, neutrality, or equality before the law is one critical component of the classic Weberian model of bureaucracy (Byrkjeflot et al. 2018). Although Westminster countries' bureaucratic structures have traditionally focused on creating an impartial bureaucracy (Grube and Howard 2016), many other countries also aim to make their bureaucracies impartial in order to

improve transparency and government performance in addition to other benefits (Peters 2010).[2] According to Jørgensen and Sørensen (2012), who investigated national codes of conduct for civil servants in fourteen countries, impartiality and neutrality seem to be used synonymously and are standard public service values. Moreover, equal treatment of citizens, neutrality, and impartiality are considered critical public values (Jørgensen and Bozeman 2007, Nabatchi 2017).

Scholars have discussed the importance of government impartiality and the benefits of impartiality. For instance, Wilson (1887) argues that impartiality increases government efficiency. Impartiality is a central to good government and governance (Fukuyama 2013, Rothstein and Teorell 2008) and for maintaining trust in societies (Fukuyama 1995). Furthermore, previous research shows a positive link between impartiality and, for example, reduced corruption and patronage (Lodge and Gill 2011), improved government service quality in new democracies (Neshkova and Kostadinova 2012), and scientific productivity and innovation (Fernández-Carro and Lapuente-Giné 2016, Suzuki and Demircioglu 2018).

Although previous empirical research examines government impartiality on macro-level outcomes, few studies examine how impartiality affects citizens' perceptions of the quality of public services. This may be partly due to the fact that both impartiality and government effectiveness (such as public service quality) are treated as components of government quality in existing studies (Holmberg et al. 2009). In particular, existing comparative studies have paid little attention to how citizens perceive and evaluate administrative impartiality. We argue that government impartiality enhances service quality both from the recipients' (i.e. citizens) and the supply side of public services (i.e. civil servants). In a public administration with high impartial norms, one of the significant guiding principles for civil servants is to follow impartial or impersonal rules rather than partial or personal ones (Fernández-Carro and Lapuente-Giné 2016). Decisions about public service provisions are subject to written rules and regulations stipulated in policy or law rather than to personal likes and dislikes and personal relationships (Rothstein and Teorell 2008). From the citizens' side, impartiality or neutrality in the administrative process means that rules and expectations for public services are known and equally applicable to everyone in a way that is stipulated in laws and regulations. This increases predictability and fairness in the provision of public services.

The expectancy theory (Hackman and Porter 1968, Vroom 1964) suggests a positive link between efforts and expected outcomes. Therefore, if citizens know when and how to expect public services, they will believe that the government provides better services. Furthermore, past research shows that citizens' perceptions of administrative procedures influence their evaluations of government performance, legitimacy, and support for government institutions. For example, when citizens positively evaluates administrative processes because governments treat citizens fairy, follow rules, and treat citizens with respects, citizens are likely to highly rate government performance (Van Ryzin 2015). Citizens' perceptions of the procedural

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[2] Please see Suzuki and Demircioglu (2018) for visualization of cross-country differences in the degree of administrative impartiality.

fairness of legal institutions positively affects their willingness to use the same institutions in the future (Young and Hassan 2018). When citizens perceive high procedural justice in the police service, they tend to view the police as legitimate (Mazerolle et al. 2013).

We also expect perceived impartiality to positively impact government service quality from the supply side of services. Impartiality of public administration has been achieved in conjunction with securing independent administrative staff in the evolution of the Westminster system (Aucoin 2012). Protecting public servants from partisan political influences and demands is one of the crucial objectives of personnel policy in the impartial administration. Meritocratic recruitment (i.e. recruitment based on merits and qualifications rather than personal or political connections) ensures staffing independent and competent civil servants. As Miller (2000), Miller and Whitford (2016) argue, such recruitment practices attract more professional public servants with relevant skills and ensure their "credible commitment" to public services (Miller and Whitford 2016). As shown in previous empirical research, meritocratic recruitment (as opposed to recruitment based on political connections) has a positive link with favorable macro-level outputs and outcome measurements such as regulatory quality, entrepreneurship, innovation, economic activities, and government effectiveness and performance. These arguments lead to the following hypothesis:

H1: Government impartiality is positively associated with citizen perception of public services.

Although the ideal Weberian types of bureaucracy are still relevant to today's public organizations, organizational and national contexts differ significantly between Weber and today (Stensöta 2010). For example, the problems that civil servants are facing today are more complex, ranging from ageing societies to mass migration, environmental issues, and widening disparities between rich and poor. Therefore, the modern administration needs more flexible and innovative solutions to respond to these issues (Chicot and Matt 2018, Demircioglu and Audretsch 2017). These changes also reflect changes in the desirable values of civil servants. In the classic Weberian bureaucracy, values such as neutrality, equal treatment under the law, and adherence to law and order are key principles of good public servants (Wise 2004). However, today's public values more dynamic and diverse values beyond impartiality, such as equity, representation, participation, procedural justice, benevolence, flexibility, and innovation (Nabatchi 2017). Such desirable values for public servants are dynamic as they can be changed based on political and social contexts (Rosenbloom 2017, Van der Wal et al. 2011). One can even find tensions between conflicting values in the public sector, as some citizens prefer certain values over others (Fernández-Gutiérrez and Van de Walle 2019, Fukumoto and Bozeman 2018, Van der Wal et al. 2011).

One such value conflict exists between impartiality and equity. Social equity requires a more active commitment on the part of civil servants to fairness, justice, and equality in the administrative process (Johnson and Svara 2015) that goes beyond the neutral and impersonal treatment of citizens under the law. Affirmative action involves active government intervention to eliminate barriers to equal opportunity (Crosby

et al. 2003). Thus, affirmative action conflicts with impartiality by treating citizens in relatively disadvantaged groups more favorably. Research suggests that organizations such as schools that support affirmative action tend to perform better than organizations that do not have an affirmative action policy (Crosby and VanDeVeer 2000).

The principal of impartiality may not equally benefit citizens from different socio-economic backgrounds. In particular, we argue that government impartiality alone may not be a good solution for citizens who are socially-vulnerable. Results of previous studies suggest that people with low income and education are vulnerable, as they have structural disadvantages such as having fewer available resources, less knowledge about administrative procedures, and lower cognitive abilities (Clifton et al. 2014, Clifton, Díaz-Fuentes, et al. 2017, Clifton, Fernández-Gutiérrez, et al. 2017, Jilke 2015). For instance, citizens with less education may "face greater hindrances in making 'optimal' choices because of the increased transaction costs they face in accessing, processing, and comparing information" (Jilke 2015, p.71). Thus, education can empower citizens, and it is strongly associated with individuals' cognitive ability to understand and interpret rules. Since the implementation of market-based reforms, low-income families aim to receive cheaper and better service as they have become more sensitive to the prices of services (Clifton et al. 2011, Jilke 2015). Thus, impartiality is not enough for socially-disadvantaged people. More vulnerable citizens may prefer equality in outcomes rather than equal treatment or equality in procedure. In other words, citizens in relatively disadvantaged groups in society may prefer being more favorably treated by the government rather than treated equally with other citizens. Thus, there may be a potential conflict between principles of impartiality and the needs of socially-vulnerable citizens. In fact, such a conflict coincides with the feminist critique of the impartiality tenet. Stensöta (2010, 2012) argues that an ethic of care rather than the impartiality norm should serve as one of the key guiding principles for public administration, especially in welfare state administration; public services, and particularly those pertaining to care, should be more personal and needs-based rather than strictly following stipulated rules.

A further challenge to impartiality emanates from the discussion of administrative burden. Administrative burden can be defined as "the costs that individuals experience in their interactions with the state" (Moynihan et al. 2014, p.45), and it refers to how citizens encounter bureaucratic rules and regulations (Herd and Moynihan 2019). Although any citizen can experience administrative burden, vulnerable citizens are more likely to be affected. More specifically, people with low income and education typically have more difficulties in approaching and utilizing public services compared to those with high income and education due to the complexity of policy processes. Many bureaucratic forms require proficiency in a national language along with applications fees, and visiting different government offices further discourages people with low income and education (Herd and Moynihan 2019, Moynihan et al. 2014). Furthermore, citizens with high income and education may go to private hospitals for treatment or send their children to private schools if they are not satisfied with public services or if the administrative burden is intolerable, but citizens with low

income and education typically do not have enough resources to access alternative care and education.

Similarly, analyzing why public organizations fail in the United States, Kettl (2008) argues that the application process for many government programs is complex, difficult, and time-consuming, and people with low income and education have relatively less knowledge, resources, and experience to help them succeed in applying to these programs. Hurricane Katrina and other disasters demonstrated that poorer and less educated people are more vulnerable to disasters. For example, socially-disadvantaged people do not have financial resources or large social networks like more educated people, so relocation to safer places is harder for these individuals (Kettl 2008). Thus, impartial bureaucracy does not satisfy vulnerable citizens, as these citizens expect better treatment from public organizations. In sum, vulnerable citizens prefer equality, justice, and special treatment, which leads to the following hypothesis:

H2: Government impartiality does not lead to higher perceived public service quality among citizens with a disadvantaged status.

Methods

Data

The study of public administration and bureaucracy includes few comparative studies (Dahlström et al. 2012b, Fitzpatrick et al. 2011, Hammerschmid et al. 2016). One reason for this has been a lack of systematic and reliable comparative data on the characteristics and performances of bureaucracies. Fortunately, the recent development of new data sets on the quality of government institutions by the Quality of Government Institute in Gothenburg, Sweden provides valuable opportunities for researchers to conduct rigorous comparative analyses related to government quality. Our study utilizes the individual and regional level data of 56,925 citizens in 174 EU regions from the 2013 European Quality of Government survey (Charron et al. 2015).

This survey was conducted via telephone interviews in the local majority language in each country/region in spring 2013. Over 85,000 respondents from 212 regions in 24 countries answered the questions. The survey was primarily designed to collect data on and create a general picture of how citizens perceive the quality of government in *their* region, asking questions regarding the quality, impartiality, and corruption of their public administration. Therefore, the survey aims to collect "the perceptions and experiences of the consumers of public services—ordinary citizens" (Charron et al. 2015, p.317). These questions were mainly concerned with the implementation of laws and public policies rather than with law-making or policy decisions. Therefore, this data fits well with the primary purpose of our analysis, which is to test the relationship between impartiality in the administrative process and perceived public service quality. The survey focuses on three specific areas of public services—education, healthcare, and law enforcement—because these services are primarily administered or governed by sub-national government bodies (unlike

other areas of public services such as immigration, customs, defense, or the judicial system) (Charron et al. 2015). The focus of the data collection is the regional-level. A total of 400 respondents were randomly selected per region. The regional level in the survey is selected based on the European Union's NUTS statistical regional level. Using regional level data is appropriate because even in centralized countries such as Bulgaria, Romania, and Portugal, there exist significant regional variations in characteristics of government, public service quality, and other significant socio-economic indicators. Thus, the regional data avoids a "whole-nation-bias" in a comparative analysis (Rokkan 2009). Please see Charron et al. (2015) for the details of the EQI 2013 survey and Charron (2013) for its sensitivity analysis.

The EQI survey measures the *de facto* level of impartiality and quality of public services rather than the *de jure* side of administrative characteristics or objective government performance data, asking citizens about *their* perceptions of government quality (Charron, Dahlström, et al. 2016). This is the advantage of the EQI data set compared to the data collected through expert surveys, as citizens have more direct experience of public services. Using such experienced-based measures has various advantages. For example, experts' judgement and statistical reports do not always reflect what citizens perceive. Government reports and data also reflect the supply side, so they do not always match with citizens' perspectives (i.e. demand-side) (Ma and Zheng 2017). The EQI data set has been used in many publications, including top academic journals, demonstrating its reliability and the validity of the data (Agerberg 2017, Bauhr and Charron 2018, Bubbico et al. 2017, Charron and Rothstein 2016, Filippetti and Cerulli 2018, Nistotskaya et al. 2015, Rodríguez-Pose and Garcilazo 2015).

We use the 2013 EQI survey primarily for dependent variables and individual-level controls. However, we use the 2010 EQI survey data (Charron et al. 2014) for the independent variable, which is the regional-level aggregated variable of impartiality of public institutions in the areas of public education and healthcare. We use this previous survey to avoid a common source bias issue by collecting the dependent and independent variables from different data sets. We also use the 2010 survey data set to control a lagged variable for regional level public service quality. We use Charron, Dahlberg, et al. (2016), Ivanyna and Shah (2014), and Dahlström et al. (2015) for regional- and country-level control variables.

Variable operationalization

Our dependent variable is citizens' perceptions of public service quality in the areas of public education and public health care. This is a perception-based measurement. As Andersen et al. (2016) argue, when researchers assess organizational performance, it is important to recognize from which stakeholder's perspective they do so. There are subjective and objective assessments of public services (Van de Walle 2018). However, scholars have not reached a consensus on how to measure the quality of public services (Dahlström et al. 2018). This study uses a subjective measurement. The variable is constructed from a survey

question: "How would you rate the quality of public education (or the public health care system) in your area?" Respondents are asked to select one from 0 to 10, with "0" being very poor and "10" being excellent quality. Thus, this is an ordinal variable, with 0 as the lowest and 10 as the highest value.

We have three independent variables: aggregated regional level government impartiality, individual-level education, and individual income level. The impartiality variable is obtained from a previous EQI survey to avoid common source bias. This variable is a standardized z-score variable ranging from -2.43 to 2.36 in public education and -1.99 to 2.43 in public health care. Higher values indicate more impartiality in the administrative process. The variable is constructed and standardized at the regional level from the question, "all citizens are treated equally in the public education (or public health care) system in my area (1-4, Agree, rather agree, rather disagree or Disagree')." Education and income variables are individual-level. Each variable has three scales with 0: higher education (or income), 1: medium education (or income), and 2: lower education (or income). See details of the variables in table A1 in appendices. Figures 1-2 show country variations in the dependent and independent variables sorted by mean values of country. As seen from the figures, there exist significant within-country variations. It is clear that the highest or higher values within a country sometimes exceed mean values of countries that score higher in country means. This explains why we use regional level data.

[Figure 1 about here]

[Figure 2 about here]

We include a range of individual-level as well as regional-level control variables that may affect the dependent variables. Individual controls include gender, age, unemployed, occupation, and population in respondent's area. We emphasize that we also control for the respondent's experience of public education and health care. Previous studies suggest potential bias in citizens' perceptions between users and non-users of public services (Van de Walle 2018). We control for this bias. Regional-level controls include population density, GDP/capita, education level, life expectancy, and public education (or health care) quality in 2010. Note that the last variable is a lagged variable of the dependent variable, aggregated at the regional level obtained from the 2010 EQI survey. Our robustness check models include country-level variables, including impartiality of public administration, decentralization index, educational level, trust in the national government, and public sector corruption. See table A1 for details.

Table 1 presents descriptive statistics of all variables in the analysis. We conducted collinearity diagnostics using Variance Inflation Factors (VIF) based on model 5.1 and 5.2. Mean values of VIF is 1.57 and the maximum VIF value is 3.13 (impartiality) in the public education model. Mean VIF value is 1.77 and the maximum value is 3.61 (GDP/capita) in the public health care model. These results suggest that the models do not have serious multicollinearity issues. Table A2 in the appendices reports the correlation matrix.

[Table 1 about here]

Estimation Strategy

The unit of analysis is the individual citizen. Our dataset has a hierarchical structure, with citizens (level 1) nested in regional-level factors (level 2); thus, multilevel analysis seems to be an appropriate method (Jones 2008). We employ random intercept models as well as random slope models for the interaction models. Since the main dependent variables are in ordinal form from 0 to 10, we utilize multilevel ordered logit models. The first model includes only individual-level independent variables (education and income). The second model adds individual controls. The third model adds a regional-level dependent variable (impartiality) and other regional controls. The fourth model employs random slope model, and the fifth model includes an interaction term between education and impartiality. The sixth model includes an interaction term between income and impartiality. The last model shows two interaction terms together. The last three models test our second hypotheses.

Results

We start with a description of the bivariate relationship between impartiality and perceived public service quality. Figures 3 and 4 show a bivariate graph of predicted probability of dependent variables and government impartiality based on models 3.1-3.2. X axis shows level of impartiality and Y axis shows predicted probability for respondents to select each outcome. Our dependent variable is in ordinal form ranging from 0 to 10. Mean value is 6.46 in public education and 6.34 in public health care (see table 1). With such a large scale ordinal variable, it is not effective and convenient to present results of each of the eleven outcomes (0-10). Therefore, for illustrative purposes our study focuses on the outcome 10 as highest service quality (i.e. highest satisfaction), outcome 8 as high service quality, outcome 5 as low quality, and outcome 0 as the lowest quality. As seen in figure 3, impartiality of public education seems to be positively correlated to predicted probabilities for selecting highest quality or high quality outcome. Furthermore, government impartiality is negatively correlated to probabilities for selecting lowest or low quality outcomes. These results suggest that higher impartiality seems to be connected to higher satisfaction. We observed a clearer bivariate relationship between impartiality in health care and perceived service quality (figure 4).

[Figure 3 about here]

[Figure 4 about here]

Having shown the variation, we now turn to results of the multilevel analysis. Table 2 reports results of multilevel models for perceived quality of public education and Table 3 for public health care. We report only independent variables although all control variables are included in the models. Results of control variables are reported in tables A3-4. Impartiality in public education is statistically significant and positively associated with perceived public education quality. Even after adding individual controls, regional controls, and lagged dependent variables (models 2.1-4.1), we see the same positive results of impartiality. This

demonstrates the robustness of our findings. Models 5.1-7.1 include cross-level interaction terms, and the significance of the impartiality effect on the dependent variable is still not lost. Interestingly, the impacts of education on service quality alone is not statistically significant in models 1.1-4.1 except for the medium education in model 1.1. However, in the interaction models 5.1-7.1, the interaction between impartiality and lower education (ref.=higher education) is negative and statistically significant ($p<0.01$). Our robustness models, which conducted three level analysis (country-region-individual), confirm this result (table A5). However, we do not find any statistically significant effects in the interaction term between income and service quality.

Table 3 reports results of multilevel analysis for perceived quality of public health care. Impartiality has a positive and statistically significant association with quality of public health care across all models. Our first hypothesis receives an empirical support. Medium level education is negatively and significantly associated with the dependent variable ($p<0.05$ or 0.01). This means that citizens with medium level of educational background tend to give lower ratings for service quality than those with high educational background. However, citizens with low education background tend to give higher ratings for health care service quality compared with citizens who are highly-educated. This gap between medium education and low education is somewhat unexpected and needs further exploration. Interaction terms fail to achieve statistical significance. This does not provide an empirical support for our second hypothesis.

[Table 2 about here]
[Table 3 about here]

Visualizing predicted probabilities helps to interpret the results of the multilevel ordered logit model. Figures 5 and 7 visualize predicted probabilities for selecting highest, high, low, and lowest levels of perceived service quality of public education and public health care based on model 5.1 and model 5.2. As seen in the graphs, higher values of impartiality lead to higher predicted probabilities of selecting highest and high quality outcomes and lower probabilities of selecting low and lowest quality outcomes. This provides an empirical support for our first hypothesis for both dependent variables. Figure 6 visualizes estimated average marginal effects of educational level on perceived service quality with public education based on model 5.1. Recall that the reference point of education is the high education group. In the graphs of lowest and low quality of public education, marginal effects of lower education on service quality are positive and statistically different from zero in a context of high impartiality. However, the effects are negative in the context of low impartiality. These results suggest that being in the low education group positively affects the probability of selecting lowest or low service quality outcomes compared with being in the high education group when impartiality is high. However, being in the low education groups reduces the probability of giving lowest or low service quality score compared with highly educated people when impartiality is low. Thus, citizens in the

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low education group have a high chance of giving low ratings for the quality of public education when impartiality is high, but they are less likely to give low ratings when impartiality is low.

As for highest or high service quality outcomes, being in the low education group decreases the probability of selecting highest or high service quality ratings compared with citizens in the high education group in the context of high impartiality. On the other hand, in the low impartiality context, low educational background positively affects probabilities for selecting highest and high service quality compared with those with high educational background. In sum, citizens with low educational background are less likely to give higher ratings for quality of public education in the context of high impartiality compared with highly-educated citizens. However, they are more likely to give such high scores in the context of low impartiality. In addition, citizens in low education groups are more likely to give lower scores of service quality when impartiality is high. The marginal effects of medium education seem to be statistically insignificant. These results provide support for our second hypothesis regarding public education.

[Figure 5 about here]
[Figure 6 about here]
[Figure 7 about here]

Discussion and Conclusion

The last two decades have seen a reappraisal of Weberian bureaucratic structures and of the role played by bureaucracy in shaping public policies, their implementation, and the related socio-economic outcomes (Dahlström and Lapuente 2017, Evans and Rauch 1999, Fukuyama 2013, Miller 2000, Olsen 2006, 2008, Painter and Peters 2010, Rauch and Evans 2000). Among administrative characteristics, impartiality in the exercise of public authority has been considered a core element of good governance and high quality of government (Rothstein and Teorell 2008). However, we still have a limited understanding of to what extent administrative impartiality leads to public service quality and of how citizens with different backgrounds perceive impartiality and service quality. We have argued that citizens' perceptions of public service quality increase as governments focus on impartiality in the administrative process, such as neutral treatment of citizens under the law (H1). We have also argued, however, that impartiality does not lead to higher perceived service evaluation equally among different layers of society (H2). Vulnerable citizens may have limited resources and capacities to gain benefits from public services compared to non-vulnerable citizens. These citizens may encounter more administrative burdens when they attempt to access public services. Therefore, impartiality does not necessarily lead to higher perceived quality of public services.

We focus on two areas of public services, public education and public health care, as these are the services that citizens interact with most on a daily basis. In operationalizing service quality, we use subjective assessments of public services by citizens rather than objective assessment indicators. Although subjective

assessment such as citizen satisfaction tend to suffer from cognitive biases and may not necessarily reflect the performance of the service, it is still a useful and valuable indicator for service quality as it provides aggregate judgements of public services that can inform policy makers that something is wrong (Van de Walle 2018). Furthermore, such subjective assessments have been used as measures for government quality in many previous studies. Therefore, it represents a significant indicator. The results of our multilevel study show that government impartiality leads to higher perceived quality of public education and health care services. However, we do not find that impartiality positively impacts the perception of public services citizens across all socio-economic backgrounds. Citizens with low educational background do not assess the quality of public education positively when administrative impartiality is high. Instead, those vulnerable citizens positively evaluate service quality when the government does not strictly enforce policies and regulations in a neutral way (i.e. low impartiality).

Our findings reveal understudied links among government impartiality, citizen perceptions of public service quality, and the socio-economic conditions in a society. Most studies on good governance and bureaucracy focus on macro-level outcomes such as country-level corruption and socio-economic development. Individual citizens are often left out of the analysis. We still do not know how government impartiality leads to a perceived service quality among individual citizens. Unlike previous studies which assume that impartiality works equally well for all citizens, this study finds that strict neutrality is not necessarily the best answer for vulnerable citizens.

This research has practical implications for policy makers. Policy makers should consider impartiality one of the key guiding principles of the administrative process, as emphasized in the classic model of Weberian bureaucracy. Citizens should feel that they are treated equally with others, leading to higher perceived quality of public services. However, administrative processes should also be flexible and personal enough for vulnerable citizens and respond to their needs for services rather than strictly enforcing laws and regulations in a neutral way.

There are limitations associated with our study. First, the external validity of the findings is one of the crucial limitations. Our study is based on EU regions. Even though these European countries still have variations, as shown in the literature on public administration (Painter and Peters 2010), our sample does not include countries outside Europe or countries with significantly low impartiality such as Bangladesh and Mexico (Suzuki and Demircioglu 2018). The findings may be different for less impartial and more corrupt countries, where individuals—including citizens with low income and education—may demand more impartiality rather than more favorable treatment. Therefore, we do not claim to generalize from these findings. Second, we could not take differences in public education and health care systems into account. In some countries or regions, citizens may prefer private services over public services, but lack of available data at the regional level prevents us from considering these differences. Instead, we controlled for regional- and country-level factors pertaining to education and health care. Also using multilevel model also alleviates

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concerns for such biases. Thus, even if we cannot measure how education and health care systems differ across regions, the findings still shed light on the importance of impartiality. Finally, use of a subjective indicator of public service quality may be one of the limitations of the present study. Several scholars have raised concerns that citizens' judgments of public services may not always be consistent with performance (e.g. cognitive biases), particularly when those services are abstract (e.g. citizens do not often use those services) (Andersen and Hjortskov 2015, Van de Walle 2018). We still believe, however, that these subjective measures reflect reality because citizens interact with education and health services frequently, suggesting that their judgement are valid. We also control for citizens' direct experiences of these services in our models. As Andersen et al. (2016, p.860) argue "it is difficult to measure user satisfaction without using perceptual measures." Despite these limitations, the results of this study contribute to our understanding of government quality and good governance. As more cross-national data becomes available, future research should undertake the task of furthering the comparative study of bureaucratic systems.

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TABLE 1, DESCRIPTIVE STATISTICS

	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Citizen perception of public education quality	56,925	6.46	1.95	0	10
Citizen perception of quality of public health care systems	56,816	6.34	2.29	0	10
Independent variables					
Impartiality of public education	56,925	0.04	0.97	-2.43	2.36
Impartiality of public health care systems	56,925	0.06	0.99	-1.99	2.43
Education level	56,925	0.88	0.80	0	2
Income level	56,925	0.97	0.79	0	2
Individual level controls					
Gender	56,925	0.53	0.50	0	1
Age	56,925	47.94	16.84	18	106
Unemployed	56,925	0.08	0.27	0	1
Enrolled or employed in the public school system	56,925	0.40	0.49	0	1
Use of public health care system	56,900	0.83	0.38	0	1
Occupation	56,925	1.25	0.75	0	2
Population	56,925	1.97	0.92	1	4
Regional level controls					
Quality of public education	56,925	0.04	1.03	-3.53	2.41
Quality of public health care systems	56,925	0.06	1.00	-2.46	1.83
Population density	56,925	335.36	806.55	5.95	7,151.55
GDP/capita	56,925	23,637.03	12,107.69	3,450.00	62,325.00
Education level	56,925	72.92	15.17	23.08	96.58
Life expectancy	56,925	80.00	2.83	73.08	84.28

Samples are based on model 5.1 in table 2.

TABLE 2, MULTILEVEL MODELS MEASURING CITIZENS' PERCEPTIONS OF PUBLIC EDUCATION QUALITY

	Model1.1	Model2.1	Model3.1	Model4.1	Model5.1	Model6.1	Model7.1
Independent variables							
Level 2 (region)							
Impartiality of public education			0.14***	0.11***	0.12***	0.13***	0.13***
			(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Level 1 (individual)							
Education level (ref.=higher education)							
Medium education	-0.04**	-0.02	-0.02	-0.03	-0.03	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Lower education	-0.02	0.01	-0.01	-0.01	-0.00	-0.01	0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)
Income level (ref.=higher income)							
Medium income	-0.01	-0.02	-0.02	-0.03*	-0.03*	-0.02	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Lower income	-0.02	-0.01	-0.01	-0.03	-0.03	-0.01	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Cross-level interactions							
Impartiality *medium education					-0.01		-0.01
					(0.02)		(0.02)
Impartiality *lower education					-0.11***		-0.09***
					(0.03)		(0.03)
Impartiality *medium income						0.01	0.02
						(0.02)	(0.02)
Impartiality *lower income						0.01	0.03
						(0.02)	(0.03)
Random intercept (region)	0.19***	0.21***	0.06***	0.06***	0.06***	0.06***	0.07***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Random slope (education)				0.03***	0.03***		0.02***
				(0.01)	(0.01)		(0.00)
Random slope (income)						0.01***	0.01***
						(0.00)	(0.00)
Number of individuals	71,848	66,144	56,925	56,925	56,925	56,925	56,925
Number of regions	212	212	174	174	174	174	174

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

*Results of control variables are reported in table A3. in appendix. Individual level controls include gender, age, employment status, enrollment or employed in the public school, occupation, and population. Regional level controls include quality of public education, population density, GDP per capita, and education level.

TABLE 3, MULTILEVEL MODELS MEASURING CITIZENS' PERCEPTIONS OF PUBLIC HEALTH CARE QUALITY

	Model 1.2	Model 2.2	Model 3.2	Model 4.2	Model 5.2	Model 6.2	Model 7.2
Independent variables							
Level 2 (region)							
Impartiality of public health care systems			0.15***	0.13***	0.13***	0.15***	0.13***
			(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Level 1 (individual)							
Education level (ref.=higher education)							
Medium education	-0.06***	-0.04**	-0.05***	-0.05**	-0.05**	-0.05***	-0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Lower education	0.12***	0.07***	0.04**	0.05	0.06*	0.04**	0.06*
Income level (ref.=higher income)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)
Medium income	0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Lower income	0.07***	0.02	0.01	-0.01	-0.01	0.00	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Cross-level interactions							
Impartiality *medium education					-0.02		-0.02
					(0.02)		(0.02)
Impartiality *lower education					-0.05		-0.05
					(0.03)		(0.03)
Impartiality *medium income						-0.01	-0.00
						(0.02)	(0.02)
Impartiality *lower income						0.01	0.02
						(0.02)	(0.02)
Random intercept (region)	0.43***	0.45***	0.06***	0.05***	0.05***	0.05***	0.06***
	(0.04)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Random slope (education)				0.03***	0.03***		0.02***
				(0.00)	(0.00)		(0.00)
Random slope (income)						0.01***	0.00
						(0.00)	(0.00)
Number of individuals	73,365	67,520	58,146	58,146	58,146	58,146	58,146
Number of regions	212	212	174	174	174	174	174

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
 *Results of control variables are reported in table A4. in appendix. Individual level controls include gender, age, employment status, use of public health care systems, occupation, and population. Regional level controls include quality of public education, population density, GDP per capita, and life expectancy.

FIGURE 1, GOVERNMENT IMPARTIALITY: NATIONAL AVERAGE AND WITHIN-COUNTRY VARIATION
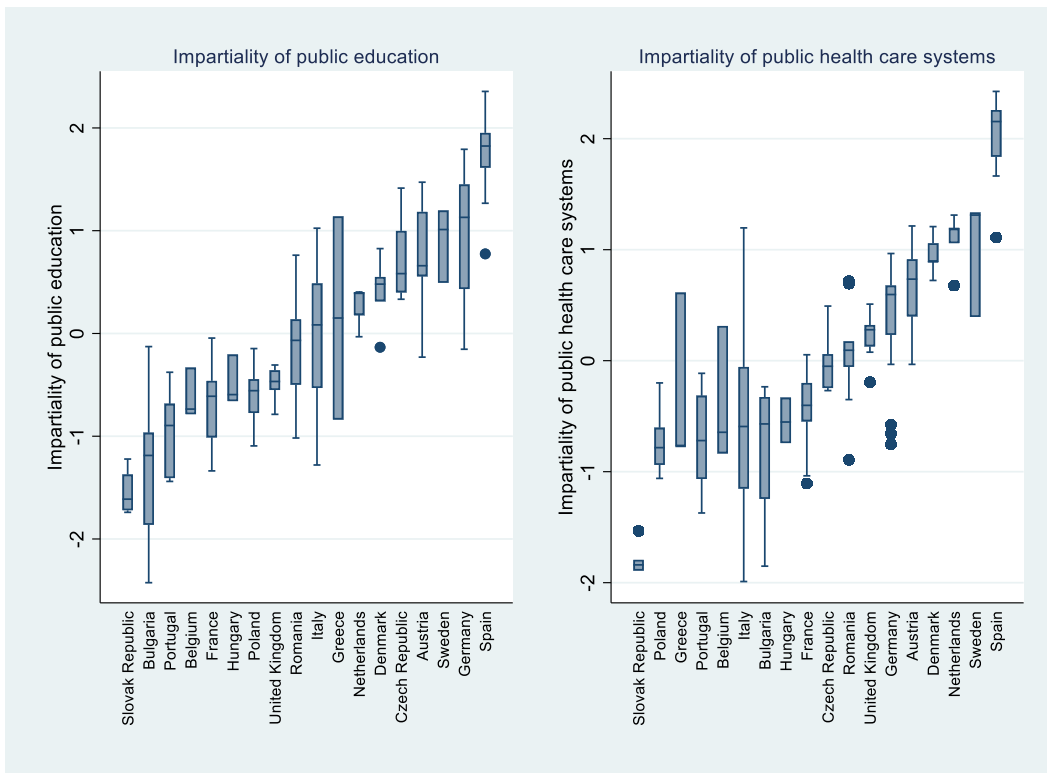
FIGURE 2, CITIZENS' PERCEPTIONS OF PUBLIC SERVICE QUALITY: NATIONAL AVERAGE AND WITHIN-COUNTRY VARIATION
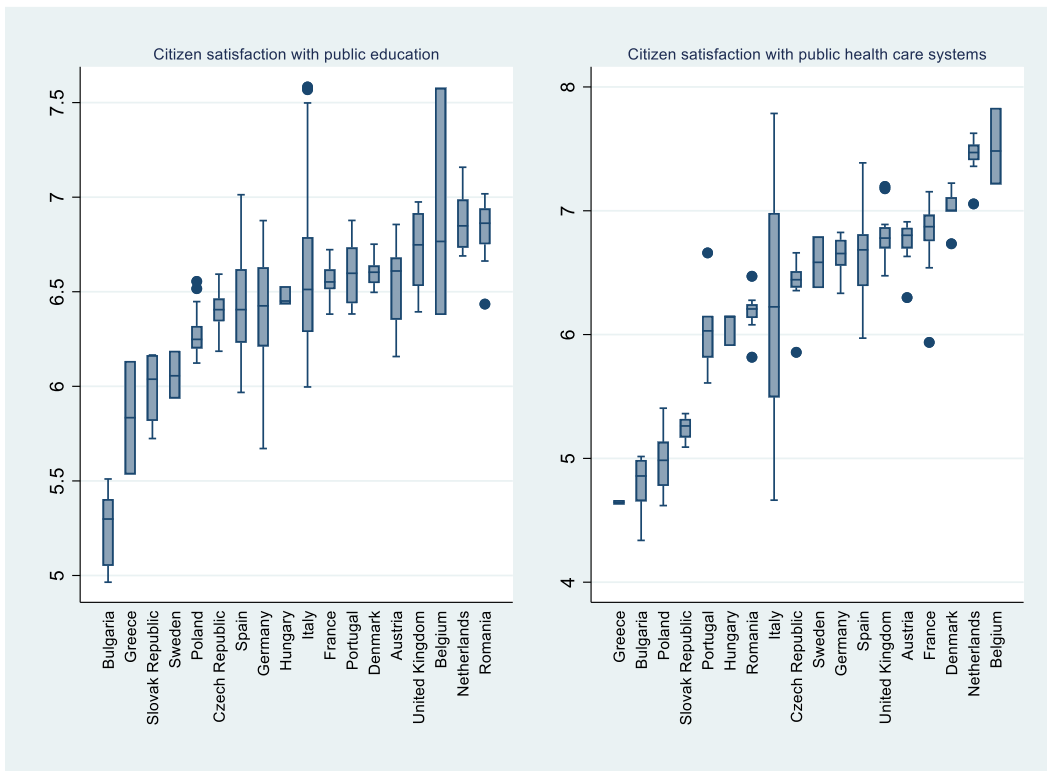
FIGURE 3, IMPATIALITY AND CITIZENS' PERCEPTIONS OF PUBLIC EDUCATION QUALITY
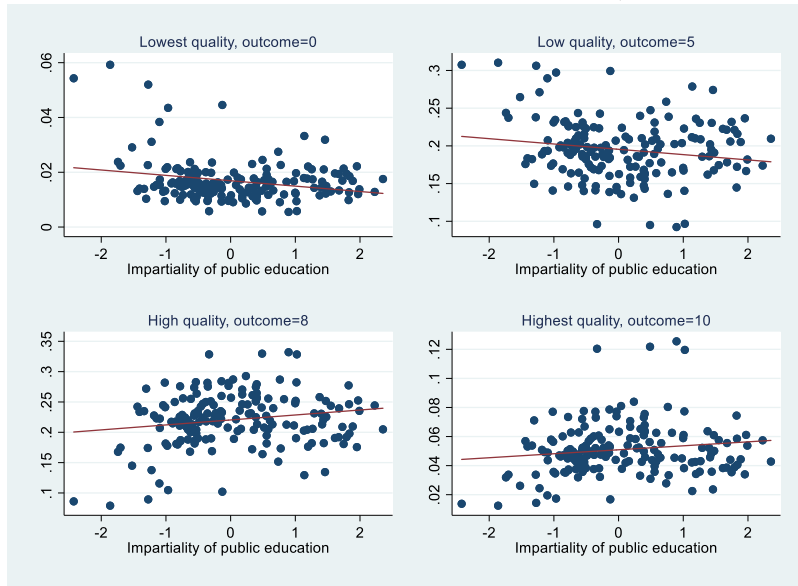
FIGURE 4, IMPATIALITYT AND CITIZENS' PERCEPTIONS OF PUBLIC HEALTH CARE QUALITY
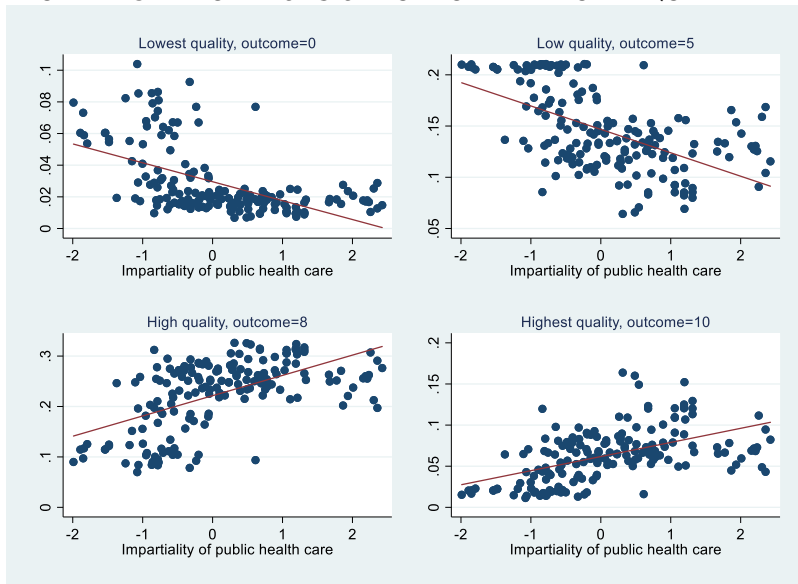
FIGURE 5, PREDICTED PROBABILITY OF CITIZENS' PERCEPTIONS OF PUBLIC EDUCATION QUALITY BY GOVERNMENT IMPARTIALITY

FIGURE 6, ESTIMATED AVERAGE MARGINAL EFFECS OF EDUCATIONAL LEVEL ON PERCEIVED QUALITY OF PUBLIC EDUCATION

FIGURE 7, PREDICTED PROBABILITY OF CITIZENS' PERCEPTIONS OF PUBLIC HEALTH QUALITY BY GOVERNMENT IMPARTIALITY

APPENDICES

TABLE A1, VARIABLE OPERATIONALIZATION

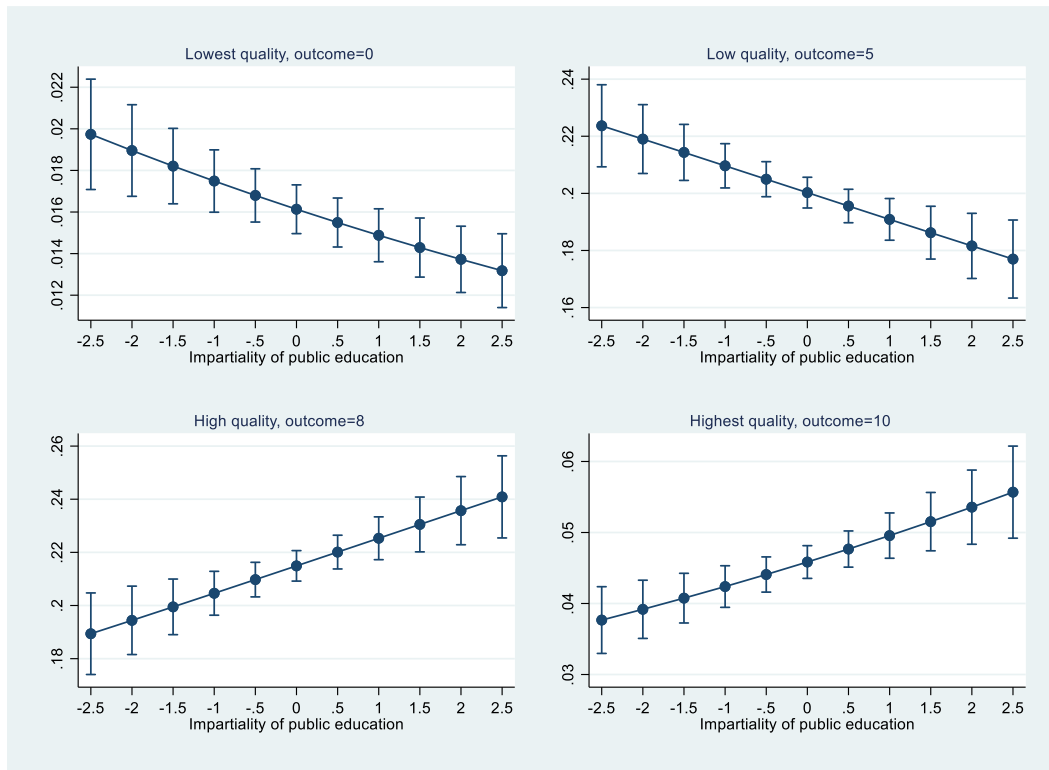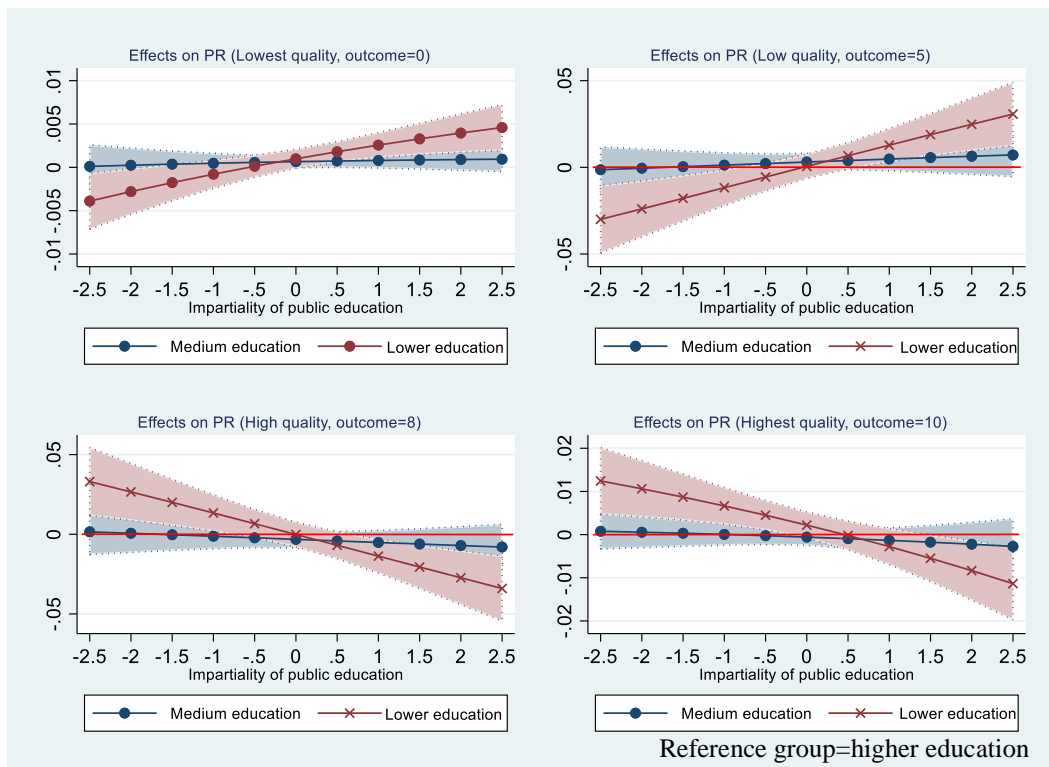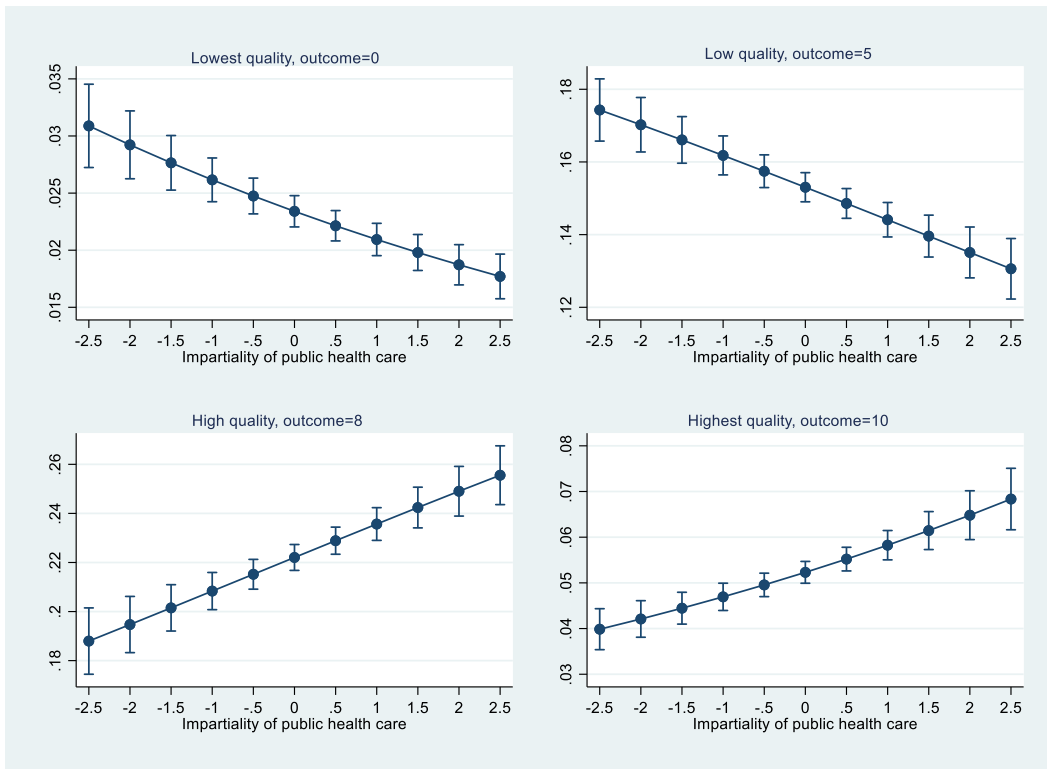| Dependent Variables	Operationalization
Citizens' Perceptions of Quality of Public Services	Education: "How would you rate the quality of public education in your area?" Public health: "How would you rate the quality of the public health care system in your area?" (0-10, with '0' being very poor and '10' being excellent quality)
Independent Variables	
Education	0 = Higher education (post-secondary) includes ISCED level 5 and higher levels, i.e. any stage of tertiary education (e.g. BA, BSc, MA, PhD), including vocational ISCED 5B programs which have different names in different countries. 1 = Medium education (higher secondary and post-secondary, non-tertiary) includes ISCED level, 3 Upper secondary (A, B, C) and 4 Post-secondary, non-tertiary. 2 = Lower education (lower secondary or less) includes ISCED "level 0 Not completed primary education,1 Primary or _rst stage of basic, and, Lower secondary or Second stage of basic education. Also short vocational programs (less than 3 years) taken after primary school (shorter 3C programs), labeled in LFS with 22. Original survey question: "education level of respondent. 1-Elementary (primary) school or less (no diploma), 2-High (secondary) school (but did not graduated from it), 3-Graduation from high (secondary) school, 4-Graduation from college, university or other third-level institute, 5-Post-graduate degree (Masters, PHD) beyond your initial college degree, 99 Don't know/Refused"
Income	Categorical re-code of the following income survey question, country specific 0=high 1=medium 2=low " Please tell me your average total household net income per month (after taxes). In Euros (€)" Then, the income amount is recorded in local currency.
Impartiality	Regional-level aggregated variable (z-score standardized, mean=0, standard dev.=1) from the EQI 2010 survey. See Charron, Dijkstra, and Lapuente (2014) and Codebook for the European QoG Index[3]. Public education: "all citizens are treated equally in the public education system in my area (1-4, Agree, rather agree, rather disagree or Disagree')" Public health care systems: " all citizens are treated equally in the public health care system in my area (1-4, Agree, rather agree, rather disagree or Disagree')"
Individual-Level Controls	
Gender	" Gender of respondent" 0 = Male 1 = Female
Age	"Age of respondent"
Unemployed	0= otherwise 1= unemployed
Service experience	0=No direct contact with public education (or health care systems) 1=Direct contact Recoded from the following questions. Public education: " Have you or any of your immediate family been enrolled or employed in the public school system in your area in the past 12 months? (1 yes, 2 no) 99=Don't know/Refused" Public health care systems: " In the past 12 months have you or anyone in your immediate family used public health care services in your area? (1 yes, 2 no) 99=Don't know/Refused"
Occupation	0= public sector employees 1=private sector employees

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[3] *Available from https://qog.pol.gu.se/digitalAssets/1510/1510026_eqi-codebook.pdf*

	2=without professional employment Recoded from the following questions. "As far as your current occupation is concerned, would you say you work in the public sector (a public sector organization is either wholly owned by the public authorities or they have a majority share), the private sector or would you say that you are without a professional activity? (1=public sector, 2=private sector, 3=without professional employment, 99= Don't know/Refused) "
Population	1= <10,000 (rural) 2 = 10,000-100,000 (small town or city) 3 = 100,000-1,000,000 (large city or urban area) 4 => 1,000,000 (Very large city or urban area) Recoded from the following questions. " About how many people live in the place the interview was conducted? 1= <10,000 (rural), 2=10,000-100,000 (small town or city), 3=100,000-1,000,000 (large city or urban area), 4= >1,000,000 (Very large city or urban area), 99=Don't know/Refused"
Regional-level controls	
Quality of public education	Regional-level aggregated variable (z-score standardized, mean=0, standard dev.=1) from the EQI 2010 survey. Used as a lagged variable for the dependent variable. See Charron et al. (2014) and Codebook for the European QoG Index[4]. "How would you rate the quality of public education in your area? (0-10, with '0' being very poor and '10' being excellent quality)"
Quality of public health care systems	Regional-level aggregated variable from the EQI 2010 survey. " q5 - How would you rate the quality of the public health care system in your area? (0-10, with '0' being very poor and '10' being excellent quality)
Population density	Population density, average population per square km Data source: Charron et al. (2016). Original data is from Eurostat: Demographic Statistics (2016).
GDP/capita	GDP at current market prices, Euro per inhabitant Data source: Charron et al. (2016). Original data is from Eurostat: Economic Accounts (2016).
Education level	Percentage of population 25-64 years old whose the highest level of education successfully completed is upper secondary, post-secondary non-tertiary and tertiary education (levels 3-8). Data source: Charron et al. (2016). Original data is from Eurostat: Education Statistics (2016).
Life expectancy	Life expectancy in age < 1year, total. The mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age specific probabilities of dying). Data source: Charron et al. (2016). Original data is from Eurostat: Demographic Statistics (2016).
Country-level controls (robustness check models only)	
Impartiality of public administration	"The index measures to what extent government institutions exercise their power impartially. The impartiality norm is defined as: "When implementing laws and policies, government officials shall not take into consideration anything about the citizen/case that is not beforehand stipulated in the policy or the law." Data source: Teorell et al. (2017). Original data is from Dahlström et al. (2015).
Decentralization index	Aggregated measurement composed from political, fiscal, and administrative decentralization indexes. Data source: Ivanyna and Shah (2014).
Educational attainment	Educational Attainment, 26-64 years, Level 5-8 (Total) Data source: Teorell et al. (2017). Original data is from
Trust in the national government	"Trust in the National Government. Eurobarometer Question: "I would like to ask you a question about how much trust you have in certain institutions. For each of the following institutions, please tell me if you tend to trust it or tend not to trust it? The (NATIONALITY) government". Higher score means "Tend to trust", lower score means "Tend not to trust"."

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[4] *Available from https://qog.pol.gu.se/digitalAssets/1510/1510026_eqi-codebook.pdf*

	Data source: Teorell et al. (2017). Original data is from The Hertie School of Governance (2014-2016).
Public sector corruption	Corruption Perception: Public Officials/Civil Servants To what extent do you perceive the following categories in this country to be affected by corruption? Public officials/Civil servants. 1 (Not at all corrupt) - 5 (Extremely corrupt). Data source: Teorell et al. (2017). Original data is from Hardoon and Heinrich (2013).

TABLE A2, CORRELATION MATRIX

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Perceived quality of public education	1																		
2	Perceived quality of public health care	0.42	1																	
3	Impartiality of public education	0.04	0.15	1																
4	Impartiality of public health care systems	0.06	0.21	0.85	1															
5	Education level	-0.01	0.01	0.00	-0.06	1														
6	Income level	0.00	0.01	0.02	-0.02	0.34	1													
7	Gender	0.05	0.02	-0.01	-0.01	0.01	0.11	1												
8	Age	-0.02	0.08	0.05	0.03	0.14	0.12	0.04	1											
9	Unemployed	-0.02	-0.04	0.03	0.04	0.08	0.16	0.01	-0.15	1										
10	Enrolled or employed in the public school system	0.08	-0.01	-0.07	-0.08	-0.09	-0.10	0.04	-0.17	-0.03	1									
11	Use of public health care system	0.04	0.05	-0.02	0.01	-0.04	-0.05	0.04	0.01	-0.02	0.13	1								
12	Occupation	-0.03	0.02	0.03	0.01	0.27	0.31	0.06	0.30	0.29	-0.14	-0.02	1							
13	Population	-0.07	-0.02	0.09	0.07	-0.14	-0.10	-0.04	-0.04	-0.02	0.00	-0.01	-0.01	1						
14	Quality of public education	0.14	0.16	-0.15	0.06	-0.08	0.01	0.01	0.04	-0.08	-0.02	0.00	-0.03	-0.13	1					
15	Quality of public health care systems	0.14	0.31	0.16	0.38	-0.08	-0.01	0.01	0.04	-0.08	-0.02	-0.01	-0.04	-0.05	0.72	1				
16	Population density	-0.01	0.06	0.03	0.02	-0.08	-0.01	-0.01	-0.03	-0.02	0.00	-0.04	-0.01	0.28	-0.02	0.14	1			
17	GDP/capita	0.07	0.24	0.30	0.35	-0.09	-0.02	0.00	0.05	-0.04	-0.03	-0.06	-0.02	0.15	0.20	0.58	0.43	1		
18	Education level	-0.03	-0.03	-0.02	-0.11	-0.10	-0.03	-0.01	-0.02	-0.12	0.05	0.00	-0.06	0.08	0.06	0.07	0.09	0.03	1	
19	Life expectancy	0.07	0.20	0.39	0.39	0.02	0.01	0.01	0.06	0.05	-0.05	-0.02	0.03	0.00	0.07	0.33	0.07	0.66	-0.40	1

TABLE A3, RESULTS OF CONTROL VARIABLES (FROM TABLE 2, PUBLIC EDUCATION)

	Model1.1	Model 2.1	Model 3.1	Model 4.1	Model 5.1	Model 6.1	Model7.1
Individual level controls							
Gender (ref.=male), female		0.13***	0.13***	0.13***	0.13***	0.13***	0.13***
		(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age		-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Unemployed		-0.09***	-0.12***	-0.12***	-0.12***	-0.12***	-0.12***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Enrolled or employed in the public school system		0.38***	0.40***	0.40***	0.40***	0.40***	0.40***
		(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Occupation (ref.=Public sector employee)							
= Private sector employee		-0.20***	-0.19***	-0.20***	-0.20***	-0.19***	-0.19***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
= Without professional employment		-0.07***	-0.07***	-0.07***	-0.07***	-0.07***	-0.07***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Population (ref.=rural (less than 10,000))							
= Small town or city (10,000-100,000)		-0.02	-0.01	-0.01	-0.01	-0.01	-0.01
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
= Large city or urban area (100,000-1,000,000)		-0.13***	-0.13***	-0.12***	-0.12***	-0.13***	-0.12***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
= Very large city or urban area (>1,000,000)		-0.21***	-0.20***	-0.21***	-0.20***	-0.20***	-0.20***
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Regional level controls							
Quality of public education			0.27***	0.25***	0.25***	0.26***	0.25***
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Population density			0.00	0.00	0.00	0.00	-0.00
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP/capita			0.00	0.00**	0.00**	0.00*	0.00***
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level			-0.01***	-0.01***	-0.01***	-0.01***	-0.00***
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of individuals	71,848	66,144	56,925	56,925	56,925	56,925	56,925
Number of regions	212	212	174	174	174	174	174

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE A4, RESULTS OF CONTROL VARIABLES (FROM TABLE 3, PUBLIC HEALTH CARE SYSTEMS)

	Model1.2	Model2.2	Model3.2	Model4.2	Model5.2	Model6.2	Model7.2
Individual level controls							
Gender (ref.=male), female		0.01	0.01	0.01	0.01	0.01	0.01
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age		0.00***	0.01***	0.01***	0.01***	0.01***	0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Unemployed		-0.24***	-0.26***	-0.26***	-0.26***	-0.26***	-0.26***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Use of public health care system		0.29***	0.30***	0.30***	0.30***	0.30***	0.30***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Occupation (ref.=Public sector employee)							
= Private sector employee		-0.17***	-0.18***	-0.17***	-0.17***	-0.17***	-0.17***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
= Without professional employment		0.08***	0.08***	0.08***	0.08***	0.08***	0.08***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Population (ref.=rural (less than 10,000))							
= Small town or city (10,000-100,000)		-0.07***	-0.07***	-0.06***	-0.06***	-0.07***	-0.06***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
= Large city or urban area (100,000-1,000,000)		-0.03	-0.02	-0.01	-0.01	-0.02	-0.01
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
= Very large city or urban area (>1,000,000)		-0.00	-0.01	-0.02	-0.02	-0.02	-0.02
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Regional level controls							
Quality of public education			0.45***	0.45***	0.45***	0.45***	0.43***
			(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
Population density			0.00	0.00	0.00*	0.00*	0.00
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP/capita			0.00	0.00**	0.00	0.00	0.00**
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Life expectancy			0.05***	0.05***	0.06***	0.04***	0.06***
			(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Number of individuals	73,365	67,520	58,146	58,146	58,146	58,146	58,146
Number of regions	212	212	174	174	174	174	174

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE A5, MULTILEVEL MODELS MEASURING CITIZENS' PERCEPTIONS OF PUBLIC EDUCATION QUALITY: THREE LEVEL MODELS

	Model 5.1.1	Model 5.1.2	Model 5.1.3	Model 5.1.4
Independent variables				
Level 2 (region)				
Impartiality of public education	0.08**	0.08**	0.07**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)
Level 1 (individual)				
Education level (ref.=higher education)				
Medium education	-0.02	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Lower education	0.02	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Income level (ref.=higher income)				
Medium income	-0.03*	-0.03*	-0.03*	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)
Lower income	-0.03	-0.03	-0.03	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Cross-level interactions				
Impartiality *medium education	-0.00	-0.00	-0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.02)
Impartiality *lower education	-0.08**	-0.08**	-0.08**	-0.07**
	(0.03)	(0.03)	(0.03)	(0.03)
Level 3 (Country-level controls)				
Impartiality of public administration	0.04	0.08	0.03	0.01
	(0.08)	(0.08)	(0.09)	(0.08)
Decentralization index	-0.01			
	(0.01)			
Educational attainment		-0.02*		
		(0.01)		
Trust in the national government			-0.35	
			(0.53)	
Public sector corruption				-0.10
				(0.18)
Random intercept (country)	0.06**	0.05**	0.07**	0.05**
	(0.03)	(0.02)	(0.03)	(0.02)
Random intercept (region)	0.04***	0.04***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
Random slope (education)	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Number of individuals	56,925	56,925	56,925	55,907
Number of regions	174	174	174	171
Number of countries	18	18	18	17

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1*

Country level variables are added to model 5.1 in table 2. Individual-level and regional-level controls are not reported.

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