



Contents lists available at ScienceDirect

Health Policy

journal homepage: www.elsevier.com/locate/healthpol



Cognitive determinants of healthcare evaluations – A comparison of Eastern and Western European countries

Simone M. Schneider^{a,*}, Tamara Popic^b

^a Max Planck Institute for Social Law and Social Policy, Germany

^b Institute of Social and Political Science, University of Lisbon, Portugal

ARTICLE INFO

Article history:

Received 3 August 2017
Received in revised form
30 November 2017
Accepted 29 December 2017

Keywords:

Attitudes
Public opinion
Healthcare
Efficiency
Performance

ABSTRACT

Knowing the public opinion of healthcare is essential when assessing healthcare system performance; but little research has focussed on the links between the public's general attitude to the healthcare system and its perceptions and expectations of specific healthcare-related aspects. Using data from the fourth round of the European Social Survey 2008/09, we explore the cognitive determinants of global evaluations of the healthcare system in 12 Eastern and 16 Western European countries. We find that healthcare evaluations follow a *coherent cognitive reasoning*. They are associated with (i) *perceptions* of the performance of healthcare systems (i.e. efficiency, equality of treatment, health outcomes), (ii) *expectations* of the government's role in providing healthcare, and (iii) *reflections* on demographic pressures (i.e. aging populations). Contrary to the general assumption that normative expectations are responsible for differences in healthcare evaluations between Eastern and Western Europe, our results suggest that regional differences are largely due to a more negative perception of the performance of healthcare systems within Eastern Europe. To enhance the public opinion of healthcare, policy makers should improve the efficiency of healthcare systems and take measures to assure equality in health treatment.

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1. Introduction

There is growing scholarly interest in the public opinion of healthcare and in the assessment and comparison of healthcare system performance [1–11]. Global evaluation measures of healthcare, such as satisfaction ratings, are often used to study the public's general attitude to the healthcare system [4,5]. They address the general public – users and non-users alike – and provide a composite assessment of the healthcare system more broadly [12,13]. The more positively individuals evaluate healthcare services in their country, the higher the (subjective) performance of the system.

How the public rates healthcare services provides relevant information on the (mal-)functioning of the healthcare system and informs health policy makers of areas requiring improvement [14–16]. In contrast to expert opinion and other objective performance measures, subjective evaluations directly echo the experiences and perceptions of the public [12] and provide an

assessment of healthcare systems that is often described as more accurate, legitimate, and sensitive [15,17,18]. By holding the system accountable for the provision of healthcare services financed by the larger public [1,19], such evaluations can serve as an important indicator of the approval of healthcare reforms [12,20]. Evaluations of healthcare services are of wider political relevance as well, as they can affect the stability of political systems (e.g. trust in government [21,22]) and are related to the utilization of healthcare services and population health [13,15,16].

The background variables that affect healthcare evaluations are important for health policy makers [17,23,24]. Scholars find the institutional design of healthcare systems [20,25–29], an individual's demographic and socio-economic background [19,26,28,30–33], his/her experiences with healthcare services [29,34], and his/her confidence in finding affordable and effective care [35] can influence healthcare evaluations. These findings largely support theoretical approaches highlighting structural (i.e. interest-based), cultural (i.e. value-based) and contextual (e.g. institutional) factors as important in the formation of welfare attitudes [24,36–38].

Less well researched is how and to what degree beliefs about specific dimensions of healthcare services and expectations of the government's role in providing them shape the public's general

* Corresponding author at: Max Planck Institute for Social Law and Social Policy, Amalienstrasse 33, 80799 Munich, Germany.

E-mail addresses: s.schneider@mpisoc.mpg.de (S.M. Schneider), tpopic@iscsp.ulisboa.pt (T. Popic).

<https://doi.org/10.1016/j.healthpol.2017.12.012>

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attitude towards the healthcare system [13,23]. Although health outcomes, healthcare efficiency and equity in healthcare have been addressed as important dimensions in the assessment of the 'actual' or 'objective' performance of healthcare systems [11], information on how individuals perceive these aspects and how their perceptions shape the public's general evaluation of the healthcare system is missing. Similarly, and despite existing research on the expectations of the government's role in providing healthcare [25,26,39–43], expectations have often been studied separately from global healthcare evaluations, and little is known about their association. We believe that research on the relationship between the public's global evaluations of healthcare and its perceptions and expectations of specific healthcare-related aspects will shed light on the cognitive factors driving healthcare evaluations. This, in turn, will help policy makers identify priorities for action amidst the demographic pressures of aging societies and budgetary constraints faced by many European countries [35,44].

Cognitive approaches to attitude formation suggest individuals form attitudes based on *consistent* cognitive reasoning [45,46]. Attitudes are portrayed as a function of different *beliefs* about an object [47]: the stronger the belief that the object is connected with certain positive attributes, the more positive the individual's attitude about the object. If this is true, global evaluations of healthcare will be based on a set of beliefs formed about specific attributes of the healthcare system. As stated above, healthcare systems promoting population health, efficiency in delivery, and equal access to those in equal need are preferred by health policy scholars over systems low on these dimensions [11]. Whether these attributes are also perceived relevant by the individual and shape his/her evaluation of healthcare systems is an empirical question which has not (yet) been examined. At this point, it remains unclear *whether global healthcare evaluations are more positive if respondents have a more positive perception of the performance of the various healthcare dimensions, that is, if they perceive fewer sick people in society, greater efficiency in healthcare delivery, and more equality in healthcare treatment.*

Also critical for attitude formation are *expectations* [48,49]; these function as referential standards against which individuals compare their perceptions of the status quo [16,50,51]. Evaluations are a direct function of the discrepancy between (i) expectations of the object's attributes and (ii) the perception of the object's actual attributes, the 'status quo' [52,53]. Lack of valid indicators and measurement instruments in the area of healthcare can impede a direct comparison of perceptions and expectations. Consequently, scholars yield to the assumption that expectations are simply inversely related to evaluations: the higher the expectation of healthcare, the lower the overall evaluation of the healthcare system [32,54]. Against the backdrop of recent reforms moving towards the privatization and marketization of healthcare [55,56], *global healthcare evaluations are expected to be more negative when expectations of government involvement are higher.*

Further, individuals are unlikely to form global evaluations on healthcare in a social vacuum without considering the public discourse on the demographic pressures of aging societies and budgetary constraints [57]. Individuals who are aware of these pressures may be more willing to excuse – at least to some degree – shortcomings of healthcare systems. Therefore, *global healthcare evaluations are expected to be more positive when awareness of demographic pressures on healthcare systems, in this case, the perceptions of aging populations as a burden for healthcare systems, is greater.*

In the European context, research on healthcare evaluations looks at either Western European [20,25–27] or Eastern European countries [19]. Only recently, and with the availability of larger data sets, have scholars begun to explore healthcare evaluations in both parts of Europe [28]. The general finding is that Eastern Europeans evaluate healthcare systems less positively than West-

ern Europeans. It is unclear whether these regional differences reflect perceptions of the actual performance of healthcare systems or expectations that stem from socialisation processes in different socio-political contexts. Despite fundamental reform processes, Eastern European healthcare systems still score lower on objective performance measures provided by official registries, e.g. financing and provision of healthcare services [58–62]. Recent research suggests these institutional differences at least partly explain the generally lower evaluations of healthcare systems in Eastern European countries [63]. This argument competes with scholarship claiming that the formation of preference structures within different socio-political contexts explains regional differences in public expectations and evaluations [64–68]. Termed 'legacies of communism', past experiences and socialisation processes within the former communist regime are declared responsible for higher expectations of the welfare state and its provision of social services in Eastern Europe. Older generations have lived and experienced communism for a longer period of time, arguably explaining why differences in welfare attitudes between Eastern and Western Europeans are more distinct among older birth cohorts [66,68].

The analysis of expectations vis-a-vis other cognitive factors will yield new insights on the relevance of the socio-political context of healthcare evaluations. More specifically, if differences in healthcare evaluations stem from preference structures evolving from socio-political contexts, *expectations will be the dominant cognitive component explaining East-West differences in healthcare evaluations. Further, differences in healthcare evaluations will be more distinct for older generations.* But if differences in healthcare evaluations between Eastern and Western Europe are due to the performance of healthcare systems, *perceptions of healthcare-related aspects (i.e. efficiency, equality in treatment, and health outcomes) will be the dominant cognitive components; we will not see significant variation between birth cohorts.*

The aim of this empirical study is twofold. Firstly, we examine whether healthcare evaluations follow a consistent cognitive reasoning. We seek to understand the extent to which evaluations of healthcare services are determined by three cognitive factors: (i) *perceptions* of the performance of the healthcare system in terms of efficiency, equality, and population health; (ii) *expectations* of the government's role in providing healthcare; and (iii) *reflections* on demographic pressures, i.e. the burden on healthcare of an aging society. Secondly, we investigate the extent to which these cognitive components explain differences in the healthcare evaluations of Eastern and Western Europeans. The intention is to understand whether Eastern Europeans are, on average, more critical of their healthcare services because of their higher expectations of government's role in providing healthcare or because of their negative perception of the actual performance of the healthcare system. Fig. 1 illustrates the research model.

2. Material and methods

2.1. Data

The empirical analyses are based on the fourth round of the European Social Survey (ESS) from 2008/09. The ESS is a high quality, cross-comparative data set that provides biannual information representative of the European population living in private households aged 15 and above. The fourth round of the ESS included a special module on welfare attitudes and was therefore selected for the empirical analysis. In total, the sample includes 43,460 individuals living in private households in 28 European countries (Eastern Europe: N = 12; Western Europe: N = 16) for whom information on all variables was available.

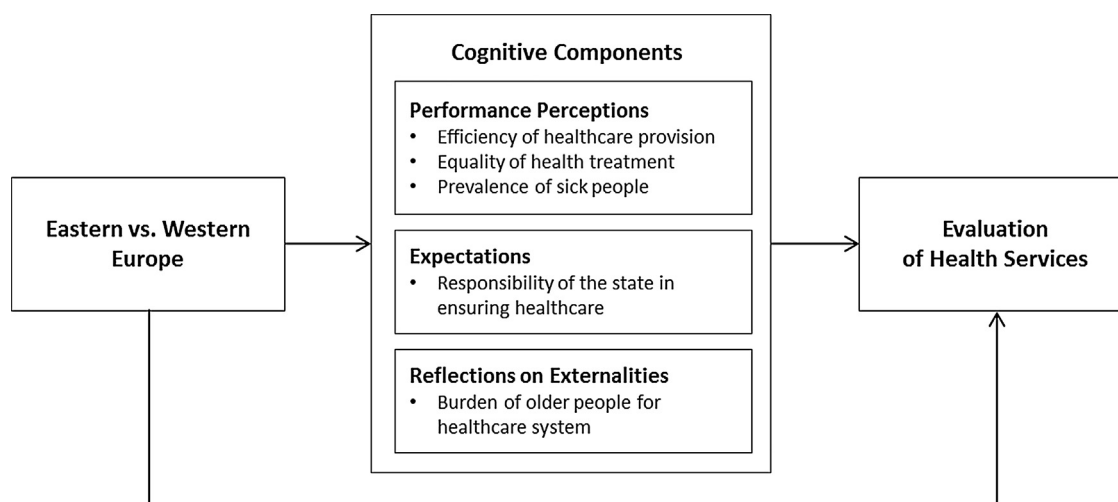


Fig. 1. Research Model.

2.2. Measures

2.2.1. Dependent variable

The evaluation of healthcare services is our main dependent variable. Respondents were asked what they think overall about the state of healthcare services in their country on an 11-point scale ranging from 0, extremely bad, to 10, extremely good.

2.2.2. Mediator variables

We measure *perceptions* of the performance of healthcare systems [69] with three indicators: the perceived *efficiency* of healthcare services, the perceived *equality in treatment*, and the *health status of the population*. Respondents were asked how efficient they think the provision of healthcare is in their country on an 11-point scale, ranging from 0, extremely inefficient, to 10, extremely efficient. They were also asked whether they think doctors and nurses in their country give special advantages to certain people or deal with everyone equally using an 11-point scale, ranging from 0, give special advantages to certain people, to 10, deal with everyone equally. Information on the state of population health was measured by asking respondents how many of every 100 people of working age in their country are long-term sick or disabled, using a list of 11 categories. We recode this item into 8 categories (grouping the last four categories into one), ranging from 0–4, 5–9, 10–14, 15–19, 20–24, 25–29, 30–34, >35 persons out of 100 being long-term sick or disabled.

Expectations of the healthcare system are measured by the state responsibility to provide healthcare for citizens and to cure illnesses. Respondents were asked how much responsibility governments should have in ensuring adequate healthcare for the sick, using an 11-point scale, ranging from 0, should not be the government's responsibility at all, to 10, should be entirely the government's responsibility.

The contextual pressures on healthcare systems are measured by the *perceived burden* on health services because of demographic changes. Respondents were asked whether or not they think people over 70 are a burden on the country's health services on an 11-point scale, ranging from 0, no burden, to 10, a great burden.

These questions were not asked consecutively, but were integrated in various subsections throughout the interview. Questions appeared in the following order: the core module on politics (section B) included the question on the overall evaluation of healthcare services (B29); questions on the perceived health status of the population (D8), expectations of the government's responsibility to provide healthcare (D16), the perceived efficiency of healthcare

services (D30), the perceived equality of health treatment (D32), and the perceived burden of older people on health services (E12) were asked in the rotating modules on attitudes towards the welfare state (section D) and ageism (section E). Fig. 2 gives an overview of the average scores of the dependent and mediator variables across European countries.

2.2.3. Independent variables – country level

Differences between Eastern European and Western European countries are of particular interest to this study. Eastern European countries are characterized by their communist past and the radical transformations in their healthcare systems since the fall of communism [58,70,71]. With the regional exception of East Germany, Western European countries do not share a common institutional history and lack the experience of the post-communist transformation process. We include a dummy variable at the country level to group countries according to their regional and socio-political history. Out of the 28 countries in the sample, 12 are considered Eastern European, and 16 are Western European. Eastern European countries include Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, the Russian Federation, Slovenia, Slovakia and Ukraine. Western European countries include Austria, Belgium, Cyprus, Switzerland, Germany, Denmark, Spain, Finland, France, the United Kingdom, Greece, Ireland, the Netherlands, Norway, Portugal, and Sweden.

2.2.4. Independent variables – individual level

We control for demographic and socio-economic characteristics of the individual as these might affect the evaluation of health services. The respondent's sex and age (mean-centred) are standard control variables. We test for the u-shaped relationship between age and healthcare attitudes by including the squared term of age. To control for health needs, we include the respondent's self-reported health status measured on a 5-point scale, ranging from very good to good, fair, bad, and very bad (recoded as -2 = very bad, -1 = bad, 0 = fair, 1 = good, 2 = very good). We introduce socio-economic characteristics, such as years of education (mean-centred) and the current status of employment (paid work (ref.), unemployed, retired, other status). The actual household income is not included in the analysis because comparable income information is missing for three countries (Bulgaria, Slovakia, Cyprus). Instead, we include a subjective income indicator. Respondents were asked how they feel about their household income and whether they live comfortably on their present income (ref.), cope on their present income, find it difficult on their present

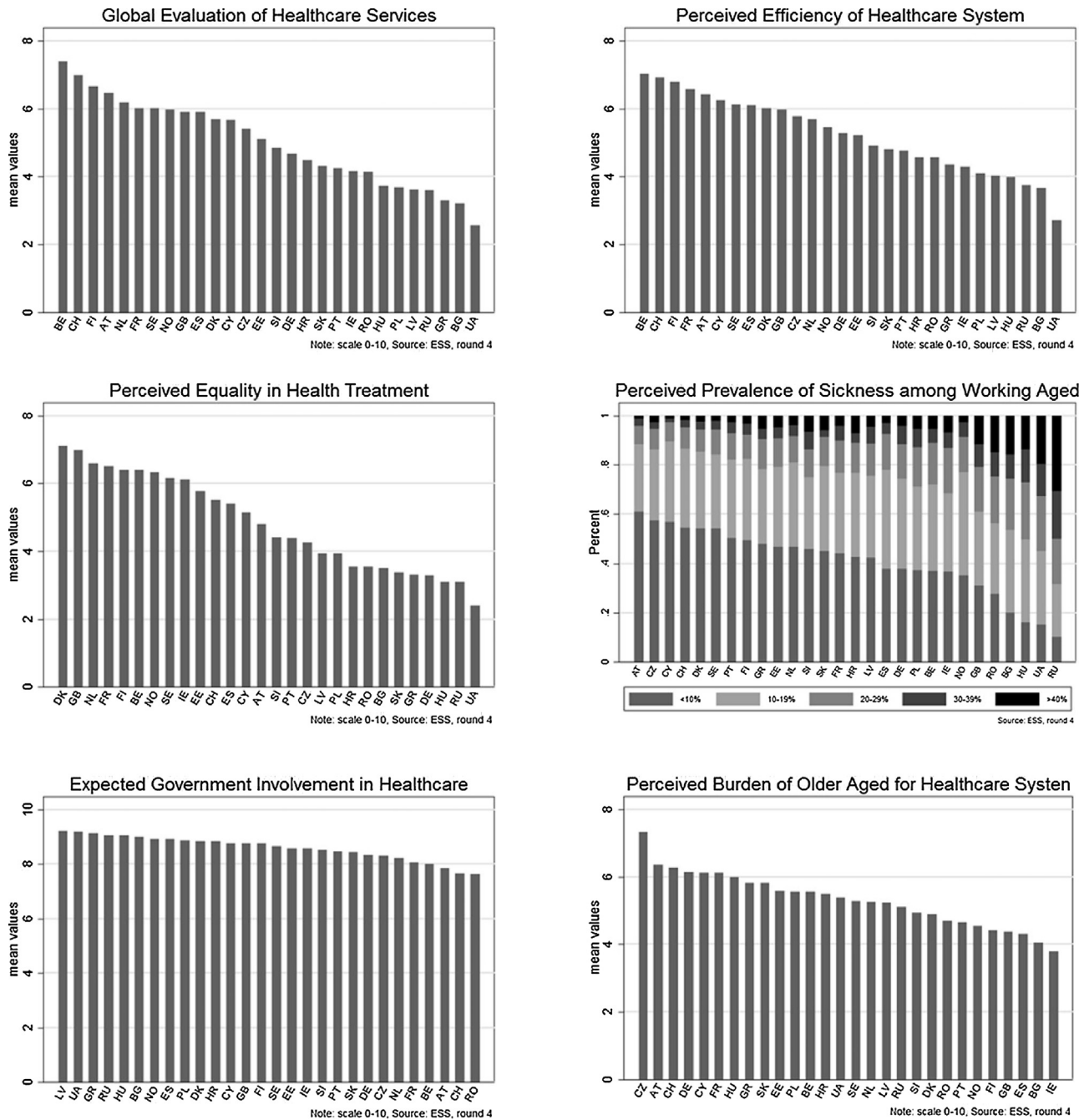


Fig. 2. Evaluations, Perceptions and Expectations towards Healthcare Services across Europe.

income, or find it very difficult on their present income. To control for other household characteristics, we include the household size and whether children are living in the household.

2.3. Statistics

We apply multilevel modelling techniques to estimate the effects of both individual and country level characteristics. Unlike conventional regression analysis, multilevel models account for the hierarchical or nested data structure, whereby observations at the lower (individual) level are nested in higher order units (countries). Considering the multiple levels in the computation process takes into account the interdependency of observations within countries. With an intraclass correlation of 0.21 for the main dependent variable (healthcare evaluation), the use of multilevel models

for the analysis is highly recommended. *Random intercept models* allow for the variation of intercepts across countries. Variations in intercepts can be explained (i) by country level predictor variables (here: region), explaining the contextual variation in the outcome variable, and (ii) by individual level variables, explaining the compositional variation.

Multilevel mediation models offer the opportunity to model complex relationships and to estimate direct and indirect relationships between a set of variables within a multilevel framework. We apply a 2-1-1 multilevel mediation analysis (MMA) [72], as our independent variable, region (East/West), is located at level 2; perceptions, expectations, and evaluations are individual level characteristics and located at level 1. The mediation is measured at the between level, partitioning the variances of the individual level variables into a between and within level component. The media-

Table 1
The Evaluation of Healthcare Services in Eastern and Western Europe.

	Model 1		Model 2		Model 3	
	Total Sample		Eastern Europe		Western Europe	
	β	SE	β	SE	β	SE
Intercept	5.10***	.15	3.83***	.14	5.62***	.15
Within Level						
Cognitive Components						
Efficiency	.55***	.02	.53***	.03	.55***	.02
Equality of treatment	.10***	.01	.11***	.02	.09***	.01
Prevalence of sickness	-.04***	.01	-.02	.02	-.04***	.01
Expected gov. involvement	-.03***	.01	-.02***	.01	-.04*	.02
Burden of older people	.01*	.01	.01	.01	.02*	.01
Controls						
Gender (0 = male)	-.15***	.04	.04	.06	-.27***	.03
Age	-.00*	.00	-.01***	.00	-.00	.00
Age-Squared	.00***	.00	.00**	.00	.00***	.00
Subj. health status	.13***	.02	.19***	.02	.10***	.02
Education (in years)	-.02**	.01	-.04***	.01	-.01	.01
Subj. income (0 = living comfortably)						
Coping on present income	-.11***	.03	-.09	.08	-.11***	.03
Difficult on present income	-.22***	.04	-.25**	.09	-.21***	.04
Very difficult on present income	-.29***	.06	-.42***	.08	-.14	.08
Labor market position (0 = paid work)						
Unemployed	.04	.04	.09*	.04	-.00	.07
Retired	.10	.05	.19**	.07	.02	.07
Other employment status	.08*	.03	.10*	.04	.06	.05
Number of persons in HH	.02	.01	.02	.01	.02	.02
Kids in HH (0 = no kids)	.09*	.04	.08	.06	.09	.06
Between Level						
Eastern European (Ref. Western E.)	-.48**	.17	-	-	-	-
Variance (R²) – within	3.20***	(.42)	3.59***	(.39)	2.93***	(.38)
Variance (R²) – between	.22**	(.21)	.07***	(.00)	.32**	(.00)

Note: Table presents results of multilevel regression analysis, unstandardized β coefficients and robust standard errors (SE); standard weights applied; Source: ESS-4; N = 43460/28; Eastern Europe Sample: N = 16671/12; Western European Sample: N = 26789/16; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

tion effect is the product of (i) the effect of region (East/West) on the mediator (perceptions/expectations) and (ii) the sum of the effect of the mediator on health system evaluation at the macro level and the mean of the random slope of the same effect at the micro level.

For our analyses, we use Mplus, version 7 [73]. Maximum likelihood with robust standard errors is used as an estimator. At all stages, we control for individual characteristics, i.e. demographic and socio-economic characteristics of the individual, including health needs. We mean centre all metric independent variables before including them in the analysis. To assure representative estimations for the country populations, we apply post-stratification weights following the recommendations of the ESS.

3. Results

3.1. Cognitive determinants of healthcare evaluations across Europe

Multilevel analyses show healthcare evaluations follow a coherent cognitive reasoning (Table 1, Model 1). Perceptions of efficiency are most strongly associated with healthcare evaluations ($\beta = 0.55$, $SE = 0.02$), followed by the perceived equality in health treatment ($\beta = 0.10$, $SE = 0.01$). This implies that the higher the perceived efficiency of the healthcare system and equality of health treatment, the more positive the overall evaluation of healthcare services. The perceived prevalence of sickness/long term illness among those of working age ($\beta = -0.04$, $SE = 0.01$) and expectations of government involvement in healthcare ($\beta = -0.03$, $SE = 0.01$) are negatively related to healthcare evaluations; in other words, the higher the perceived level of sickness and the higher the expectation of government involvement, the lower the overall evaluation of healthcare services. Perceptions of demographic pressures positively affect healthcare evaluations suggesting individuals form

their evaluations by also reflecting on contextual factors that put healthcare systems under additional pressure, e.g. aging societies. However, the effect size suggests these reflections are of only minor importance ($\beta = 0.01$, $SE = 0.01$).

The results are largely comparable between Eastern and Western European countries (Table 1, Model 2 and 3). However, regional differences exist; perceived health outcomes and considerations of demographic pressures are not significantly associated with healthcare evaluations in Eastern Europe.

Across Europe, cognitive determinants, together with demographic and socio-economic characteristics, explain 42.1% of the variance in healthcare evaluations at the individual level; 39.2% in Eastern Europe and 38.3% in Western Europe.

Country specific regression analyses reveal healthcare evaluations are strongly and consistently associated with the perceived efficiency of the healthcare system in all 28 European countries (Appendix, Tables A1 and A2). Similarly robust is the association with the perceived equality of health treatment, with the exception of three countries – Denmark, Hungary, and Ukraine – where there is no significant association. Effects of the three other cognitive components – the perception of population health, the perceived burden of older people, and expectations of government involvement – vary more strongly between countries. Paradoxically, expectations of government involvement show a reverse effect in Austria and Belgium, suggesting a positive association between healthcare evaluations and support for government intervention.

3.2. Regional differences in healthcare evaluations: an East-West comparison

Regional differences in healthcare evaluations between Eastern and Western Europe are salient and solid. After controlling for

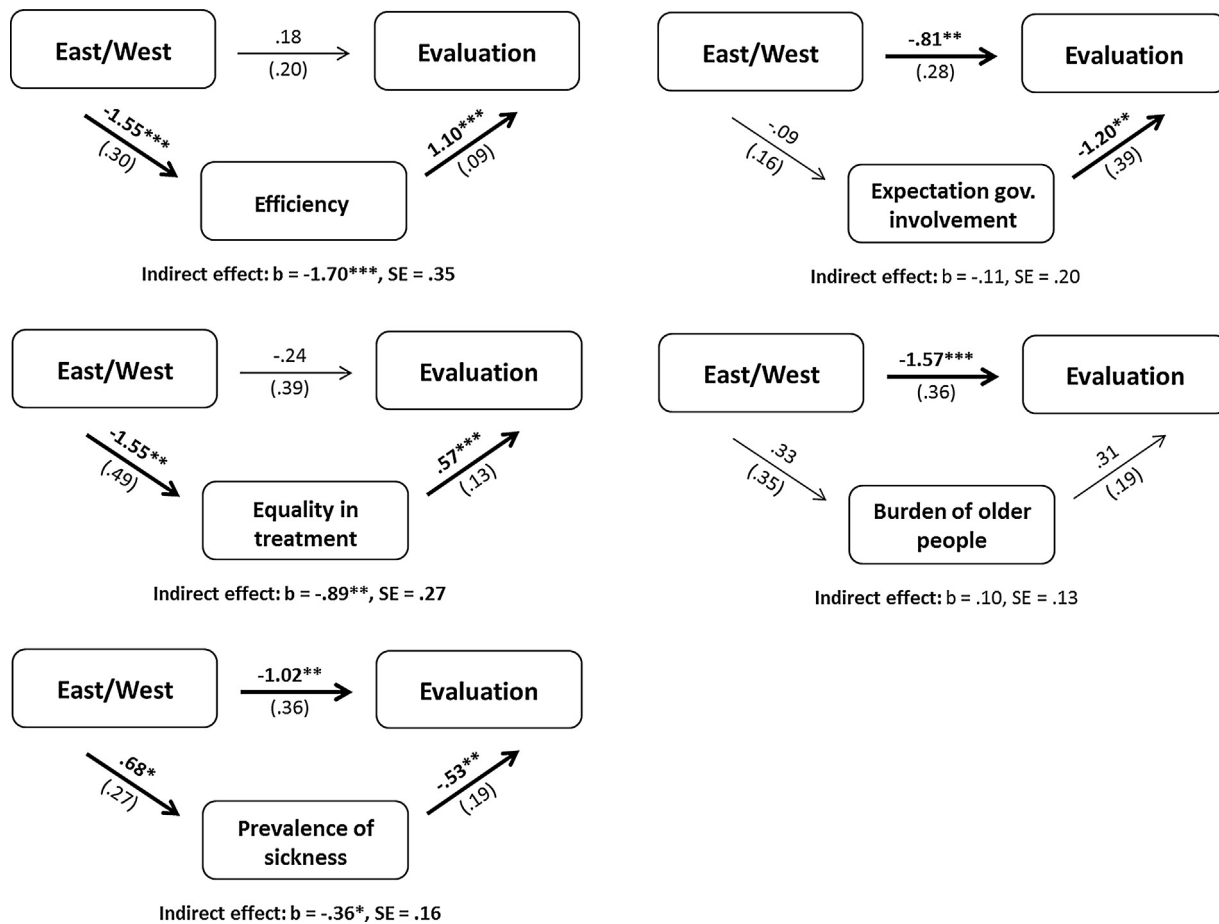


Fig. 3. Regional Differences in Healthcare Evaluations – Direct and Indirect Effects. Note: Figure presents results of multilevel mediation analyses; unstandardized β coefficients; robust standard errors (SE) in parenthesis; all analyses control for demographic and socio-economic characteristics; standard weights applied; Source: ESS-4; N=43460/28; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

demographic and socio-economic characteristics, we find Eastern Europeans evaluate health services 1.38 (SE=0.33) points lower than Western Europeans. The inclusion of cognitive determinants in the analysis leads to a decrease in effect size, but differences remain significant ($\beta = -0.48$, SE=0.17). In total, region explains 20.6% of the between variance in healthcare evaluations at the macro/country level (Table 1, Model 1).

Fig. 3 presents the results of the multilevel mediation analysis which accounts for regional differences in the cognitive components of healthcare evaluations and tests whether cognitive components mediate the relationship between region (East/West) and healthcare evaluations. All analyses were run separately for each mediator, with a random slope specification for each mediator and control for demographic and socio-economic characteristics at the individual-level. Two of the three subjective performance indicators – perceptions of efficiency and equality in treatment – fully explain regional differences in healthcare evaluations between Eastern and Western Europe. Eastern Europeans perceive health systems as less efficient and more unequal than Western Europeans, and this results in lower overall healthcare evaluations. Eastern Europeans also perceive a higher prevalence of sickness among the working age population than Western Europeans, which partly accounts for regional differences. Interestingly, we find no empirical support that regional differences in healthcare evaluations are due to expectations of government involvement, nor do we find the perceived burden of older people for the health system explains regional differences.

To test whether our results on regional differences are robust for different age cohorts and, thus, different experiences of the socio-political context (i.e. the communist regime), we re-run the multilevel mediation analyses separately for the following sub-groups: (i) individuals born before 1951 who grew up and lived in the socialist system for the majority of their life; (ii) individuals born between 1951 and 1974 who were in full adulthood by the time of the fall of communism; (iii) and individuals born after 1974 who, at best, experienced communism for 14 years [66]. Results largely support our previous findings on the association between healthcare evaluations, cognitive determinants, and East/West differences and indicate that our results are robust across age cohorts (Table 2). This suggests that the length of time individuals have been socialized in different political systems is not an essential explanation of East-West differences in healthcare evaluations and their cognitive determinants.

4. Discussion

This study explored the cognitive determinants of healthcare evaluations in 12 Eastern and 16 Western European countries. We studied the links between global evaluations of healthcare systems and (i) perceptions of the performance of healthcare systems (i.e. efficiency, inequality in treatment, health outcomes), (ii) expectations of the government's role in providing healthcare, and (iii) reflections on demographic factors (i.e. aging society) that put current health systems under pressure. In a second step, we explored whether the more negative evaluations of healthcare systems in

Table 2
Direct and Indirect Effects of Region (East/West) on Healthcare Evaluation – Cohort Specific Analysis.

	Efficiency		Equality in Health Treatment		Prevalence of Sickness		Expectation Gov. Involvement		Burden of Older People	
	β	SE	β	SE	β	SE	β	SE	β	SE
Cohort 1: >1950										
Direct effect	.24	.22	-.60	.34	-1.21**	.36	-.82*	.33	-1.67***	.32
Indirect effect (via mediator)	-1.96***	.34	-.91***	.24	-.41*	.20	-.23	.21	.13	.14
Cohort 2: 1951–1975										
Direct effect	.05	.19	-.38	.38	-.94*	.42	-.94**	.28	-1.58***	.36
Indirect effect (via mediator)	-1.54***	.37	-.87**	.27	-.37*	.16	-.05	.19	.04	.09
Cohort 3: <1975										
Direct effect	.23	.21	.19	.37	-1.05**	.34	-.98**	.31	-1.45***	.34
Indirect effect (via mediator)	-1.65***	.34	-.98**	.32	-.26	.14	-.16	.24	.04	.13

Note: Table presents results of multilevel mediation analysis, unstandardized β coefficients and robust standard errors (SE); all analyses control for demographic and socio-economic characteristics; standard weights applied. Source: ESS-4, Cohort 1: N = 12984/28; Cohort 2: N = 19290/28; Cohort 3: N = 11186/28; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Eastern than Western Europe are due to the negative perception of the actual performance of healthcare systems in Eastern Europe or to higher normative expectations of the government's involvement.

In line with cognitive approaches to attitude formation [45–47], our findings suggest individuals hold *consistent views* on healthcare systems. They also suggest that the public's view on healthcare is largely congruent with health policy research that recognizes healthcare systems as 'high performing' if they promote population health, increase efficiency in healthcare delivery, and ensure equal access to those in equal need [11]. We find individuals who evaluate healthcare services positively are also more likely to perceive the healthcare system as more efficient and more equal in treatment and to consider a lower number of working age people to be long-term sick or disabled. The perceived *efficiency* of healthcare systems is the strongest cognitive determinant of healthcare evaluations, followed by *equality* in health treatment; their association with healthcare evaluations is robust and strong across most European countries. At the same time, and in line with research on *expectations* [16,48–53], we find individuals who evaluate healthcare services positively are also more likely to have lower expectations of government responsibility in healthcare. Interestingly, however, expectations of the government's role in providing healthcare are of only minor importance in healthcare evaluations. This might be related to the fact that Europeans show a high support for government responsibility in healthcare, with personal interests of remarkably little importance [41] and minor variations observed between countries [20,26,65]. Further, our results reveal that individuals who evaluate the system more positively are also more likely to see the aging society as a burden for current healthcare systems. This suggests that evaluations of healthcare are not dissociated from larger societal trends. Perceptions of demographic pressures on healthcare systems caused by an aging society are acknowledged and considered by individuals in their overall evaluation of healthcare systems. If older individuals are perceived as a burden, individuals adjust their evaluations accordingly and are less critical of the current state of healthcare.

With regard to *regional* differences in healthcare evaluations between Eastern and Western Europe, our results indicate that Eastern Europeans perceive their healthcare systems as less efficient and more unequal. At the same time, they perceive a higher prevalence of sick people in their society. While all three dimensions of performance perception mediate the relationship between region and healthcare evaluations, perceptions of efficiency and inequality of treatment fully explain regional differences. Put otherwise, Eastern Europeans have negative perceptions of the actual performance of healthcare systems in their countries; these perceptions explain why Eastern Europeans evaluate healthcare systems

less positively than Western Europeans. Thus, public's perceptions are consistent with research that shows Eastern European healthcare systems still score lower on objective performance measures, e.g. financing and provision of healthcare services [58–62]. These institutional differences matter for the public's evaluation of healthcare systems [63]. Despite the radical, often market-oriented reforms implemented during transition, policy outcomes have not always met the concerns of the broader public; nor have they helped to improve the efficiency and equality of post-communist healthcare systems [74]. Corruption, for example, common under communism, remains a major concern in many Eastern European countries [75–77] and may explain why Eastern Europeans often perceive inefficiencies and inequalities in health treatment. Eradicating informal payments and introducing measures to improve efficiency and equality in accessing and obtaining medical care may result in more positive healthcare evaluations, particularly in post-communist countries. Interestingly, and in contrast to prior research on East-West differences in welfare attitudes [64,66–68], we find no empirical support for differences in expectations of government involvement as an explanation of East-West differences in healthcare evaluations. Cohort specific analyses yield similar results. As stated above, government involvement in healthcare enjoys strong and fairly similar support across Eastern and Western European countries [65], reminding health policy makers of the need to take action against market forces and pressures to privatize.

These findings raise a larger question. Are the public's general attitudes to the healthcare system related to objective characteristics of European healthcare systems [78]? In line with prior research [20,26], our findings suggest Europeans favour a strong state involvement in healthcare; while the general evaluation and perceptions of specific healthcare-related aspects vary strongly between countries and healthcare systems. For example, in continental Europe, *Social Health Insurance (SHI)* systems favouring a contribution-based model of healthcare financing independent of the general government budget [79] receive the highest healthcare ratings. Belgium, Switzerland, Austria, the Netherlands, and France rank among the six top rated healthcare systems in Europe. SHI systems are also characterized by comparatively high efficiency ratings, lower expectations of government's involvement in healthcare, and a comparatively high awareness of demographic pressures. An exception to this general picture is Germany. With its distinct healthcare system, increasing health insurance contributions, and growing out-of-pocket payments [80], Germany is only rated moderately well by the public. Unlike other countries of continental Europe and despite its awareness of demographic pressures, the German public has high expectations of state involvement in

healthcare and perceives the efficiency of its healthcare system and the equality in health treatment rather poorly.

In contrast, *National Healthcare Service (NHS)* systems of the Nordic and Anglo-Saxon countries [81,82] are recognized for their egalitarian character. Our findings support this notion; Denmark, Great Britain, Finland, Norway, Sweden, and Ireland rank among the ten European countries with the highest perceptions of equality in health treatment. However, NHS countries often score lower than SHI countries in perceived efficiency and performance in promoting population health. Two exceptions exist and are noteworthy. The Finnish healthcare system, with its comparatively high quality of healthcare services at reasonable costs [83], is rated particularly high, and its efficiency and equality in health treatment is acknowledged by the Finnish public. Ireland is different, ranking below other Nordic and Anglo-Saxon NHS countries in terms of efficiency and equality, as well as general healthcare ratings; the distinct features of the Irish healthcare system, a mixture of a universal tax-financed public health service and a fee based private system [84–86], may explain this difference. Further, high fertility rates in Ireland may explain why the aging of society is not perceived as a pressing topic for the Irish healthcare system.

Interestingly, the ratings of Southern European NHS systems are lower than the ratings of Nordic and Anglo-Saxon NHS systems. This may be explained by the low public investments, weak administrative capacities and less developed infrastructures [87]. The healthcare systems of Portugal and Greece, countries hit hard by the economic crisis, are perceived as particularly inefficient and unequal in health treatment and are rated lower than some of the Eastern European countries.

Overall, our research findings contribute to the general debate on healthcare attitudes. Scholars often use structural, cultural, and institutional factors to explain healthcare attitudes [19,20,24–33]. They explore different components of healthcare attitudes separately [6,8,20,26] or use composite measures, combining, for example, perceptions of efficiency with the overall evaluation of healthcare services [28]. In contrast, we focused on the cognitive determinants of healthcare evaluations. Our findings suggest healthcare evaluations are distinct and context specific. Individuals are able to provide meaningful answers to survey questions related to various aspects of healthcare. Their views seem to be congruent and cognitively consistent.

4.1. Study recommendations

Our findings suggest that in order to improve the public's general attitude to the healthcare system, policy makers should pay particular attention to the improvement of healthcare system efficiency without sacrificing equality [88]. Cost containment strategies that reduce the costs for unnecessary administrative tasks and internal operations [27] and control the payment mechanisms of healthcare providers are therefore preferable over strategies that shift healthcare financing onto users and potentially increase inequity in accessing medical care [3,30,89–92]. At the same time, strategies that detect, eradicate, and prevent informal payments within the health sector, which put a financial strain on the users, must be radical to reduce the unequal treatment of patients [75]. Equity can be attained only if individuals are treated according to their health needs irrespective of their demographic or socio-economic characteristics [90,93]. At the same time, the high support for the government's role in healthcare across European countries suggests that policy makers should rethink strategies of privatisation and marketization which diminish the state's role in the financing and delivery of medical care.

4.2. Study limitations

This study is not without limitations. We were not able to empirically test intra-individual changes in the evaluation of healthcare services and its cognitive components across time, as our data are cross-sectional. Any assumptions on causality remain speculative and require the inclusion of relevant indicators in longitudinal survey studies. Nor do the data allow us to determine the type of services individuals consider in their evaluations and to differentiate between the availability and quality of primary and secondary healthcare services that may have different implications for healthcare evaluations [94,95]. At the same time, our results do not account for individual experiences with healthcare services or respondents' insurance status (public or private), something likely to influence their judgment of healthcare services [34].

Because of the limitations of available cognitive indicators, we were also not able to study the interaction between expectations and perceptions or to quantify the discrepancy between the two. Perceptive and normative indicators differ in our study, depending on the healthcare dimensions they relate to. Indicators of perceptions target the efficiency of healthcare systems, the inequality of health treatment, and the prevalence of sickness among the working age population, while the indicator on the normative component is directed at expectations of government involvement in healthcare more generally. The implementation of suitable indicators in large scale population surveys is therefore highly recommendable. It will allow scholars to empirically explore differences in perceptions and expectation of healthcare specific aspects and to calculate its discrepancy with possible consequences for global evaluations of healthcare.

4.3. Implications for future research

More research is warranted, particularly on cross-country variations in the degree to which cognitive components are related to global healthcare evaluations. Our findings show that not all cognitive factors are equally important for healthcare evaluations across European countries. Previous research suggests this variation is related to systematic differences in the institutional design of healthcare systems [35]. Research in this area will help health policy makers develop country specific strategies to address public concerns about healthcare systems.

Country specific analyses should be complemented by cross-comparative research on the influence of the institutional context on people's perceptions and expectations of healthcare. Even though existing research has shown institutional characteristics of the healthcare system matter for global healthcare evaluations [20,25–29], little is known about the contexts in which perceptions and expectations of certain dimensions of the healthcare system are formed. More research is needed on how specific institutional arrangements (e.g. access regulations, availability of health services) shape perceptions and experiences of healthcare services, as this may explain differences in healthcare evaluations across European countries. This will provide more detailed policy advice on how the actual institutional design of healthcare systems and system-specific treatment procedures influence perceptions of efficiency and equality among the broader public, aspects which will improve the public's global evaluation of healthcare services.

Equally important is subgroup-specific analysis and the identification of vulnerable groups. Previous research shows that people support welfare arrangements from which they expect to benefit [96] or arrangements complying with their ideological beliefs about fairness or deservingness [38]. Given the particularities of the various healthcare institutions and access regulations, people of different socio-economic and ideological backgrounds may not only perceive the performance of healthcare systems differently

but also attribute different importance to the various subcomponents. This requires further research.

5. Conclusion

We conclude that healthcare evaluations follow a coherent cognitive reasoning. Individuals base their evaluations on their perceptions of the performance of the healthcare system (i.e. efficiency, equality, health outcomes), their expectations of the government's role in providing healthcare, and their understanding of demographic pressures. While all factors seem relevant, the perception of the efficiency of the system and equality of health treatment are the most important components influencing healthcare evaluations across European countries. Analyses of the cognitive determinants of healthcare evaluations help scholars and health policy makers understand why Eastern and Western Europeans come to different conclusions. Eastern Europeans are more critical as they perceive their systems as less efficient and more unequal in terms of treatment. To improve the public's general attitude to the healthcare system, policy makers should pay particular attention to the improvement of healthcare system efficiency without sacrificing equality.

Conflict of interest

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

Funding

This research is part of the NORFACE Welfare State Futures funded research project 'The Paradox of Health State Futures' (HEALTHDOX) (EC ERA-Net Plus funding, grant agreement number 618106, File Number 462-14-070).

Acknowledgements

We sincerely thank the anonymous reviewers for their valuable comments on earlier drafts of this article. For all statements of fact, data analyses and interpretation of results the authors alone bear responsibility.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.healthpol.2017.12.012>.

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