Does health affect attitudes towards immigration?[1]

Artjoms Ivlevs[2]

Bristol Business School (UWE Bristol) and IZA

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Preliminary, please do not quote

Abstract

This paper examines whether people's health affects their attitudes towards immigration. I first discuss various mechanisms through which health might affects attitudes towards immigration, including competition for scarce resources, channels related to subjective wellbeing, and behavioural immune system response. Using data from the German Socio-Economic Panel (1999-2020) and the European Social Survey (2002-2021), I find that poorer subjective health, as well as longstanding physical and mental health conditions, are strong predictors of anti-immigration sentiment. To understand what is driving these results, I explore the interplay between health and 1) individual perceptions of immigrants' use of public services, 2) subjective wellbeing, and 3) COVID-19 related variables, including testing positive, as well as identify health conditions and wellbeing dimensions that are most strongly correlated with the anti-immigration sentiment. Overall, this study reveals physical and mental health as important determinants of attitudes toward immigration and highlights an overlooked dimension of the growing migration-wellbeing literature.

Keywords: Health, attitudes towards immigration, subjective well-being, mental health, Covid-19, German Socio-Economic Panel, European Social Survey

JEL codes: H51, I12, I31, J61

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[2] a.ivlevs@uwe.ac.uk

INTRODUCTION

The COVID-19 pandemic shook the world, claiming hundreds of thousands of lives, putting an unprecedented strain on health services and forcing governments to introduce lockdowns. One of the insidious effects of the pandemic was the rise in hate crime against immigrants: as the virus was first reported in China, people projected their Covid-related fears and frustrations onto Chinese or those believed to be of the Chinese descent (Brussels Times, 2020; Liu, 2020; Mercer, 2020; Rich, 2020). While the effect of the Coronavirus outbreak on anti-immigration sentiment and Sinophobia has now been well documented in the literature (Gray and Hansen, 2021; Reny and Barreto, 2022; Schumann and Moore, 2023; Viladrich, 2021), surprisingly little remains known about the broader effects of health on attitudes towards immigration. This study fills this knowledge gap, by, first, discussing various theoretical channels through which people's health and health-related concerns might affect attitudes towards immigration and then testing empirically the link between the two groups of variables in Europe.

I hypothesise that individual health may affect attitudes towards immigration through three broad channels: 1) perceived competition for scarce resources, whereby people in poorer health may perceive themselves to be in competition with immigrants over access to limited health services; 2) well-being effects and affect misattribution, whereby health-induced changes in emotional well-being get projected onto immigrants, and 3) the behavioural immune system response, where the threats of pandemics, such as Covid-19, trigger aversive emotional responses, including outgroup hostility. To test for the effects of health on attitudes towards immigration, I use the individual-level data spanning two decades (1999-2021) from two large surveys: the German Socio-Economic Panel (SOEP) and the European Social Survey (ESS). The longitudinal setting of SOEP offers an opportunity to control for unobserved respondent heterogeneity, effectively allowing to determine how, for the same individuals, changes in health status relate to changes in attitudes immigration. The ESS, best described as repeated-cross-sectional survey, provides access to a large pool of respondents from more than 20 European countries and, among other things, allows to check if any relationships observed in the Germany panel apply to a wider European context.

Empirical results confirm a strong association between individual health and attitudes towards immigration: people reporting poorer health and lower health satisfaction are less favourable to immigration. This relationship is observed in both between- and within-person

analyses. Controlling for the measures of subjective wellbeing, perceptions of the immigrants' use of public services, and perceptions of the state of public health services, the association between health and attitudes gets smaller, implying that the health effect partially (but not fully) operates through these factors. Among the pandemic-related factors, vaccine hesitancy, beliefs about Covid-19 conspiracies and dissatisfaction with the way country coped with the pandemic are associated with more anti-immigration attitudes, while the belief of having had Covid-19 is, intriguingly, associated with more positive stance towards immigration.

This study contributes to several strands of literature. First, it highlights physical health as an overlooked individual-level determinant of attitudes towards immigration, thus adding to the broad social science literature on what shapes attitudes towards immigration in receiving countries (see e.g. Fussell (2014) and Hainmueller and Hopkins (2014) for cross-disciplinary overviews and Mayda (2006), Facchini and Mayda (2009) and Margaryan et al. (2021) for contributions in economics). Second, this paper contributes to the burgeoning literature on wellbeing and migration (see e.g. Hendriks and Burger (2021) for an overview). While this literature has started to consider the effects of subjective well-being on attitudes towards immigrants (Bazán-Monasterio et al., 2021; Korol and Bevelander, 2023; Tenenbaum et al., 2018; Welsch et al., 2021), an important (and related) manifestation of wellbeing – physical as well as mental health – and its effect on attitudes towards immigration have so far remained overlooked; this paper fills this knowledge gap. Finally, an emerging and related to this paper strand of literature examines how attitudes towards immigration affect physical health (Pinillos-Franco and Kawachi, 2022a; Pinillos-Franco and Kawachi, 2022b). A fundamental difference is that the present paper starts from a theoretical premise that health affects attitudes towards immigration, rather than the other way around.

The remainder of the paper is organised as follows. Section 2 reviews the theoretical channels and related literature. Section 3 introduces the data and methodology. Section 4 presents and discusses the results, followed by a conclusion.

2. THEORETICAL CHANNELS AND RELATED LITERATURE

There are at least three broad reasons why people's health and health-related factors would affect their attitudes towards immigration: 1) perceived competition with immigrants over scarce resources, 2) indirect wellbeing-related effect and affect misattribution, and 3)

behavioural response to infection threats. This section provides a brief description of each channel.

2.1. Perceived competition with immigrants over scarce resources

The Social Identity Theory (Tajfel and Turner, 1979; Tajfel and Turner, 1986) – a well-established theoretical framework in the field of Social Psychology and broader social sciences – posits that people create mental "in-groups" and "out-groups", by categorising themselves and others into various social groups based on shared characteristics, such as ethnicity and nationality, and show favouritism towards members of their own in-group and prejudice and discrimination towards members of out-groups. The theory further contends that the context in which people find themselves can affect their social identity and sense of belonging. Specifically, in situations where groups are in competition for resources, people are more likely to identify with, and show favouritism towards, their in-group, and to view members of out-groups as a threat, resulting in negative attitudes and behaviour towards members of out-groups.

People with poor health will rely more heavily on public health services to receive medical care. Often, there may be limited resources available to provide these services, particularly in areas with high demand or limited funding. In such situations, people, and especially those in poorer health, may *perceive* or *assume* that immigrants are putting additional strain on these resources. Such perceived competition with immigrants – members of the "out-group" – over limited health services will fuel negative attitudes towards immigration.

Note that a view that immigrants are putting an extra strain on health services may contradict the evidence, which, if anything, would suggest that immigrants improve the host countries' health provision (see, e.g., Giuntella et al. (2018) on the beneficial effect of immigration on reducing NHS waiting times in the UK) and that immigrants, generally being healthier than natives (Constant et al., 2018), use host countries' medical services disproportionately less (Sarría-Santamera et al., 2016).[3] There is, of course, no guarantee that people are familiar with this evidence or, if familiar, would accordingly adjust their perceptions about immigrants use of public services. Furthermore, the negative perceptions of immigration putting an extra strain on medical services could be fuelled by the news outlets portraying

3 In addition, immigrants are likely to improve natives' health directly, through natives' reallocation away from risk-intensive, physically demanding jobs and into communication-intensive jobs (Giuntella et al., 2019; Gunadi, 2020).

immigrants in unfavourable light (Matthews, 2017; Migration Watch UK, 2021; The Telegraph, 2016).

+ competition over other social benefits (not only health) as people in poor health disproportionately rely on these too.

2.2. *Indirect well-being effects and affect misattribution*

A growing literature in Social and Political Psychology offers a theoretical framework and evidence that emotions and psychological well-being shape political tolerance, open-mindedness and attitudes towards outgroups, such as immigrants and refugees (Hainmueller and Hopkins, 2014; Tenenbaum et al., 2018; Korol and Bevelander, 2023; Welsch et al., 2021.) This approach argues that negative life experiences worsen attitudes toward outgroups, while positive experiences and greater psychological wellbeing have an opposite effect (Korol and Bevelander, 2023). The underlying mechanisms include affect misattribution, whereby our judgements, beliefs and orientations, especially when they concern unfamiliar groups, are informed by unrelated feelings (Tenenbaum et al., 2018). Experimental evidence shows that incidental emotions, such as happiness and fear, affect attitudes towards asylum seekers (Tenenbaum et al., 2018), and a growing literature suggests that greater life satisfaction – a key manifestation of subjective well-being – goes hand in hand with more positive stance towards immigrants (Bazán-Monasterio et al., 2021; Korol and Bevelander, 2023; Welsch et al., 2021).

The link between poor health and low subjective well-being is well-documented (Diener et al., 2018; Ngamaba et al., 2017), with the effect of poor health and health conditions on subjective well-being assumed to be working through, for example, the poor-health-induced negative emotions, such as pain, discomfort and stress; limitations that impact people's ability to engage in daily activities and socialise with others; and reduced sense of control and independence as people in poor health rely on others for assistance with daily activities or medical care. If poor health adversely affects subjective well-being and subjective well-being adversely affects attitudes towards immigration, poor health will indirectly make people more anti-immigration – through changes in subjective wellbeing.

+ reverse causality of SWB to health.

+ bitterness in life and attitudes (Poutvaara and Steinhardt, 2018, EJPE)

2.3. Behavioural responses to threats of infection

The "behavioural immune system" hypothesis posits that people facing pathogen threats adopt social behaviours to avoid pathogens - a psychological system that works alongside immunological defences (Schaller, 2011; Schaller at el., 2023). During times of increased threat from pathogens (such as the Covid-19 epidemic), the behavioural immune system can affect *social attitudes and social behaviour, including stigma, prejudice, and attitudes towards outgroups, such as immigrants* (Freitag and Hofstetter, 2022; Schaller et al., 2023). This may be due to the perception that immigrants carry pathogens from their home countries – which would explain the rise in Sinophobia at the early stages of the Covid-19 pandemic – or through the pandemic-triggered *aversive emotional responses (fear, anger, dislike, disgust),* which in turn foster outgroup hostility (Freitag and Hofstetter, 2022).

The recent contributions that have empirically examined the relationship between Covid-related concerns and attitudes toward immigration (Freitag and Hofstetter, 2022; Pickup et al., 2021; Reny and Barreto, 2022) as well as sought to provide a direct test for the behavioural immune system hypothesis in the context of Covid-19 (Freitag and Hofstetter, 2022) have indeed revealed a strong relationship between the two groups of variables, even if important differences emerged regarding people's political attitudes, types of emotion generated by the pandemic, and the origin of immigrants. Interestingly, Heizmann and Huth-Stöckle (2022) also revealed that higher Covid-19 deaths at the country level were associated with more positive attitudes towards immigration (or more precisely, less blaming of immigrants for the pandemic), which the authors explain by the suppression of the salience of migration as the pandemic hit.

2.4. Hypotheses

The discussion above leads us to the following hypotheses:

H1: Poorer health leads to more negative attitudes towards immigration

H2: Health affects attitudes towards immigration through changes in subjective well-being

H3: Health affects attitudes towards immigration through perceptions of immigrants' use of public services

H4: Being concerned about COVID-19 leads to more negative attitudes towards immigration

3. DATA, VARIABLES AND ESTIMATION STRATEGY

3.1. Data

To test the proposed hypotheses, I use two datasets: the German Socio-Economic Panel and the European Social Survey.

German Socio-Economic Panel (SOEP) is a longitudinal, representative survey of approximately 15,000 households in Germany from 1984 (from 1990 in the former Democratic Republic of Germany) to 2020 (the latest release). Besides standard socio-demographic indicators, the survey includes information on health and social attitudes, including worries about immigration, making it suitable for the purposes of this study. Given the availability of data for the key outcome variable (worries about immigration), this study will use the 1999-2020 span of the survey.

European Social Survey (ESS) is a cross-national survey of social values, norms, behaviours and attitudes conducted biannually in a range of European countries since 2002. Altogether 38 European countries participated in the first ten rounds (2002/03, 2004/05, ... 2020/21) of the survey. The number of respondents in nationally representative samples varies from 579 to 3,045 in each country-round, and the survey is best described as repeated cross sections. All rounds of the survey include information on both attitudes towards immigration and general health, complemented by specialised question on health in specific rounds, as well as questions on COVID-19 in the round 2020/21.

3.2. Variables

Dependent variable(s): attitudes towards immigration

I use the following SOEP question to capture attitudes towards immigration: "How is it with the following topic – immigration to Germany – do you have worries about it?", with

possible answers “no worries”, “some worries” and “big worries”. The answers are assigned values 1 to 3, with higher values corresponding to greater worries.[4]

All ESS waves contain six standardised questions that I use to capture attitudes towards immigration. These questions are (emphasis added):

1) *To what extent do you think [country] should allow people of the same race or ethnic group as most of [country]’s people to come and live here?*
2) *To what extent do you think [country] should allow people of a different race or ethnic group from most of [country]’s people to come and live here?*
3) *To what extent do you think [country] should allow people from the poorer countries outside Europe to come and live here?*

Possible answers to questions 1-3 are: “Allow none”, “Allow a few”, “Allow some” and “Allow many” and are coded with values 1, 2, 3 and 4, respectively.

4) *Would you say it is generally bad or good for [country]’s economy that people come to live here from other countries? (Possible answers on a scale of 0 to 10, where 0 is “bad for the economy” and 10 is “good for the economy”)*
5) *Would you say that [country]’s cultural life is generally undermined or enriched by people coming to live here from other countries? (Possible answers on a scale of 0 to 10, where 0 is “cultural life undermined” and 10 is “cultural life enriched”)*
6) *Is [country] made a worse or a better place to live by people coming to live here from other countries? (Possible answers on a scale of 0 to 10, where 0 is “worse place to live” and 10 is “better place to live”)*

As the answers to the six questions are highly correlated (Cronbach’s $\alpha = 0.83$), I create an index of pro-immigration attitudes using the first factor of the principal component analysis (the Eigenvalue of which is 3.802; the Eigenvalue of the second component is 0.921). the index is rescaled to have a mean on zero and a standard deviation of one, and its higher values always correspond to more positive attitudes towards immigration.

[4] Previous literature has used this question to capture attitudes towards immigration in Germany (see e.g. Poutvaara and Steinhardt (2018) and references therein).

Key regressor: health

SOEP includes a number of questions allowing to capture the health status of the respondent:

1) Current self-rated health status, with answers ranging from "very bad" (1) to "very good" (5)
2) Satisfaction with health, with answers ranging from "completely dissatisfied" (0) to "very satisfied" (10)
3) Number of annual doctor visits
4) Overnight hospital stays
5) Disability status of individual (0/1)
6) Physical and mental health summary scales (NBS).

Questions 1-5 are available on annual basis, while physical and mental health summary scales are available biannually from 2002.

All waves of the ESS contain the following questions allowing to capture the health status:

1) Subjective health: "How is your health in general? Would you say it is… very good (5), good (4), fair (3), bad (2) or very bad (1)"
2) Health conditions: "Are you hampered in your daily activities in any way by any longstanding illness, or disability, infirmity or mental health problem?", with possible answers "Yes, a lot", "Yes, to some extern" and "No"

In addition, in Round 7 (2014/15) of the ESS respondents were asked about specific health issues: "Which of the health problems that you had or experienced in the last 12 months hampered you in your daily activities in any way?: heart or circulation problem; high blood pressure; breathing problems such as asthma; allergies; back or neck pain; muscular or joint pain in hand or arm; muscular or joint pain in foot or leg; problems related to stomach or digestion, skin condition; severe headaches; diabetes; cancer."

Finally, Round 10 (2020/21) contains a number of questions related to Covid-19, allowing to capture both the experience of, and attitudes towards, Covid-19:

1) "Have you had Covid-19?", with possible answers "No", "Yes, I tested positive" and "Yes, I think I had Covid-19"

2) "Has someone in your household had Covid-19?", with possible answers "No", "Yes, they tested positive" and "Yes, they think they had Covid-19"
3) "Will you get vaccinated?", with possible answers "I already have", "I will" and "No, I will not".
4) "Do you agree with the following statement: Coronavirus is the result of deliberate and concealed efforts of some government or organisation?"
5) "Are you satisfied with how health services coped with the coronavirus pandemic and its consequences?"

Control variables

The individual-level control variables that will be included in the empirical analyses are age, education level, satisfaction with household income, and registered unemployed for SOEP (time-variant characteristics only, as all time-invariant characteristics will be captured by the individual-fixed effects); and age, gender, education, income (income band and subjective evaluation), employment status, type of geographical residence (rural-urban), political leaning (right-left), religiousness, foreign born, parent(s) immigrant for ESS.

In addition, the moderation analyses will rely on the information on subjective well-being and the perceptions of immigrants' use of public services. The subjective wellbeing measures include the standard life satisfaction (evaluative wellbeing, available both SOEP and ESS in all years/rounds) and happiness (hedonic wellbeing, available in ESS in all rounds). Perceptions of immigrants' use of public services, as well as the general state of health services, are based on the ESS questions: 1) "Social benefits/services encourage people from other countries to come and live here", from 1 (agree strongly) to 5 (disagree strongly), available in Round 4 only; 2) "Taxes and services: immigrants take out more than they put in or less", from 0 (take out more) to 10 (put in more), available in Rounds 1 and 7 only; and 3) "State of health services in country nowadays", from 0 (extremely bad) to 10 (extremely good), available in all rounds of the ESS.

The summary statistics of all variables included in the analysis are available in the Appendix.

3.3. Estimation strategy

Given the longitudinal/panel structure of SOEP, models drawing on it will be estimated with individual-fixed effects. The effect of age – one of the key determinants of attitudes towards immigration – will be captured through age-fixed effects, implying, among other things, that year-fixed effects cannot be included because of perfect collinearity.[5] I, however, control for two time periods of potentially increased concern about immigration in Germany – the EU enlargement of 2004 and the European Refugee "Crisis" of 2015-16 – by adding two dummy variables for the time periods 2004-06 and 2015-17. Furthermore, given the mobility of residents within Germany and the conjecture that some regions may attract residents with specific attitudes towards immigration, I include federal state (Bundesländer) fixed effects. Formally, for individual *i* living in state *j* in year *t*:

$$Worries\ about\ immigration_{ijt} = health_{ijt} + X_{ijt} + age_{it} + \mu_i + state_j + t_{2004\text{-}06} + t_{2015\text{-}17} + \varepsilon_{itj} \quad (1)$$

where *X* is a vector of time-variant individual-level control variables (education level, satisfaction with household income, and registered unemployed), age_{it} are age-fixed effects, μ_i are individual-fixed effects, and ε_{itj} is the error term.

The given the categorical and ordered nature of the dependent variable (worry about immigration), the ordered logit or probit would be appropriate ways to estimate the models drawing on SOEP. However, estimating non-linear models is problematic with fixed effects, which is why the OLS FE estimator will be used. The standard errors will be clustered at the respondent level at all times.

Given the repeated-cross-sectional nature of the ESS, the estimations drawing on it will use country and round fixed effects. Formally, for individual *i* living in country *j* in survey round *t*:

$$Attitudes\ towards\ immigration_{ijt} = health_{ijt} + X_{ijt} + country_j + ESS\ round_t + \varepsilon_{itj} \quad (2)$$

[5] The inclusion of year-fixed effects (without controlling for age) yields similar estimate for the effect of variables of interest (health) on attitudes towards immigration.

where X is a vector of individual-level control variables (age, gender, education, income (income band and subjective evaluation), employment status, type of geographical residence (rural-urban), political leaning (right-left), religiousness, foreign born, parent(s) immigrant) and ε_{itj} is the error term.

4. RESULTS

Table 1 reports the results of the models testing the relationship between various measures of health and worries about immigration in Germany. The longitudinal nature of the data allows to establish how, for the same people, the two variables co-evolve over time (within-person estimates), and the inclusion of individual-fixed effects eliminates the risk of endogeneity potentially stemming from time-invariant individual-level characteristics. The results reveal that positive health changes are associated with the lowering of worries about immigration: subjective health evaluation, satisfaction with health, and the physical health summary scale measure are all negative and statistically significant ($p < 0.01$) and negative predictors of the worries (Specifications 1-3). The associations are non-negligeable in terms of terms of magnitude – for example, one step up on the subjective 1 to 5 subjective health scale or two steps up on the 0 to 10 health satisfaction scale imply a similar reduction in worries as one step up on the 0 to 10 satisfaction with household income scale.

While the changes in the disability status and the number of annual doctor visits are statistically non-significant (Specifications 4 and 5), an increase in the number of nights spent in hospital is associated with lower worries about immigration (Specification 6). This seemingly counter-intuitive result could be explained by the conjecture that longer time spent in hospital would ultimately lead to an improvement in one's health. Finally, similarly to physical health, an improvement in mental health, as captured by the NBS mental health summary scale, is also associated with a reduction of worries about immigration.

Table 1. Health and worries about immigration, German Socio-Economic Panel, 1999-2020

	Dependent variable: "Do you have worries about immigration to Germany?" 1 "No worries", 2 "Some worries", 3 "big worries", OLS FE						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Health status (1 – very bad, … 5 – very good)	-0.004***						
	(0.002)						
Health satisfaction (0 – low, … 10 – high)		-0.002***					
		(0.001)					
Physical health summary scale (higher = better health)			-0.001***				
			(0.000)				
Disabled (0/1)				0.010			
				(0.006)			
Annual doctor visits					-0.000		
					(0.000)		
Nights spent at hospital per year						-0.001***	
						(0.000)	
Mental health summary scale (higher = better health)							-0.001***
							(0.000)
Satisfaction with HH income	-0.004***	-0.004***	-0.005***	-0.005***	-0.005***	-0.005***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Registered unemployed	-0.003	-0.003	-0.013	-0.003	-0.003	-0.004	-0.013
	(0.005)	(0.005)	(0.008)	(0.005)	(0.005)	(0.005)	(0.008)
Education							
Primary	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Secondary	-0.027**	-0.028**	0.008	-0.027**	-0.028**	-0.025*	0.009
	(0.013)	(0.013)	(0.022)	(0.013)	(0.013)	(0.013)	(0.022)
Tertiary	-0.079***	-0.079***	-0.034	-0.079***	-0.079***	-0.076***	-0.033
	(0.018)	(0.018)	(0.028)	(0.018)	(0.018)	(0.018)	(0.028)
Age-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Federal state-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years 2004-06	0.152***	0.152***	0.151***	0.152***	0.152***	0.152***	0.152***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Years 2015-17	0.246***	0.246***	0.362***	0.246***	0.246***	0.246***	0.363***
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Constant	1.853***	1.850***	2.124***	1.835***	1.839***	1.835***	2.113***
	(0.037)	(0.037)	(0.062)	(0.037)	(0.037)	(0.037)	(0.062)
R^2 (within)	0.034	0.034	0.060	0.034	0.034	0.033	0.060
Number of person-years	471728	472036	212346	471210	470734	468444	212345
Number of persons	73450	73464	60469	73418	73414	72714	60469

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors, clustered at the person level, in parentheses.

Table 2 reports the results of the models testing the relationship between health-related variables and attitudes towards immigration, based on the repeated-cross-sectionalal ESS data. Better subjective health is a strong ($p < 0.01$) positive predictor of attitudes towards immigration, with one unit on the 1 to 5 subjective health scale being associated with an increase of approximately 0.07 of the standard deviation of the attitudes index (Specifications 1 and 2). The Shapley decomposition (Israeli, 2007; Shorrocks, 2013) based on Specification 1 suggests that variation in subjective health contributes close to 5% of the explained

variance of the pro-immigration attitudes index – more, for example, than the variation in age (Figure 1). Having a hindering, long-standing health condition is also strongly associated with less favourable attitudes towards immigration (Specification 3) – a result that, among other things, provides further support for the hypothesis that health affects attitudes towards immigration (rather than the other way around). .

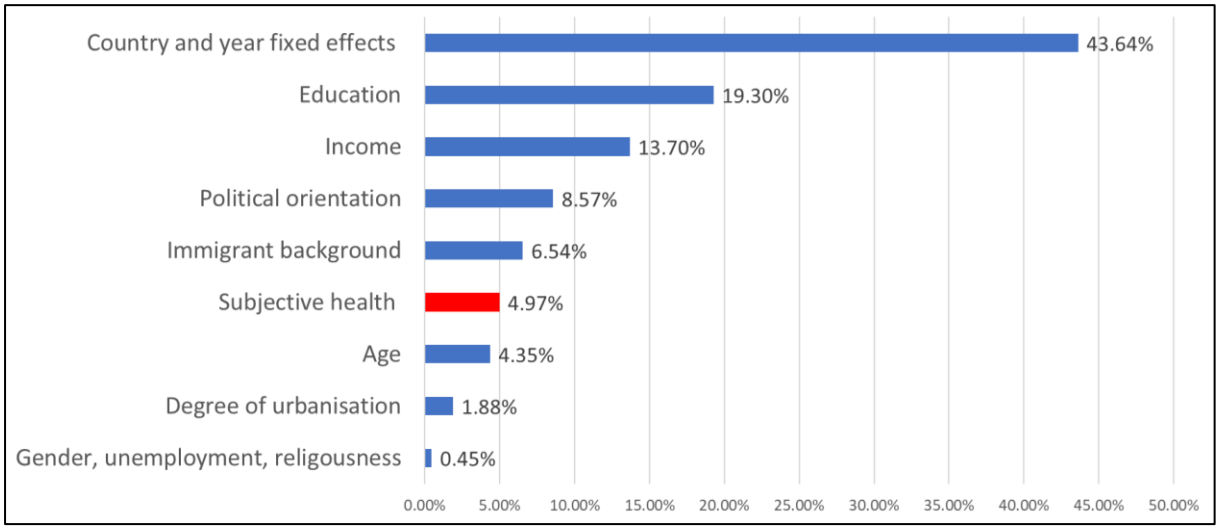
Overall, both within-person analyses in Germany (Table 1) and between-person analyses in European countries (Table 2) suggest that health is significant determinant of worries and attitudes towards immigration.

Table 2. Health and attitudes towards immigration in Europe, European Social Survey, 2002-2021

	Dependent variable: Index of pro-immigration attitudes, OLS		
	(1)	(2)	(3)
Subjective health (1 – very bad, …, 5 – very good)	0.072***		
	(0.003)		
Subjective health			
Very bad		-0.147***	
		(0.025)	
Bad		-0.076***	
		(0.012)	
Fair		Ref.	
Good		0.073***	
		(0.007)	
Very good		0.140***	
		(0.008)	
Are you hampered in your daily activities in any way by any long-standing illness, or disability, infirmity, or mental health problem?			
No			Ref.
Yes, to some extent			-0.037***
			(0.007)
Yes, a lot			-0.125***
			(0.012)
Individual controls	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
ESS round fixed effects	Yes	Yes	Yes
Number of observations	380,795	380,795	380,795
R^2	0.211	0.211	0.211

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses. Individual controls: age, gender, education, household income terciles, subjective evaluation of household income, political orientation, unemployed not looking for a job, unemployed looking for a job, religiousness, born abroad, having immigrant parents, level of urbanisation.

Figure 1. The relative importance of subjective health



Notes: The graph shows contribution of different (groups of) variables to the total explained variance of model 1 in Table 2, based on the method of Shapley decomposition.

Table 3 summarises the results of the models that test the relationship between specific health conditions and attitudes towards immigration, based on data from the ESS Round 7 (2014-15). The coefficients for most health conditions are negative and several are statistically significant: people reporting back and neck problems, diabetes, high blood pressure, muscular/joint issues, and skin conditions are all more likely to have less favourable attitudes towards immigration (Specification 1-11). Given that several health conditions can be mutually dependent, I also estimate a model with all conditions included at the same time (Specification 12). High blood pressure, muscular/joint (foot/leg) issues and skin conditions now emerge as the only drivers of the anti-immigration sentiment.

Table 3. Specific health conditions and attitudes towards immigration in Europe, 2014-15 (Round 7)

	Dependent variable: Index of pro-immigration attitudes, OLS											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Allergies	-0.019											0.014
	(0.040)											(0.041)
Back and neck problems		-0.041**										-0.027
		(0.019)										(0.020)
Breathing problems			-0.041									-0.020
			(0.040)									(0.040)
Diabetes				-0.120**								-0.087
				(0.060)								(0.061)
High blood pressure					-0.135***							-0.114***
					(0.040)							(0.042)
Heart and circulation problems						-0.006						0.043
						(0.037)						(0.038)
Muscular/joint: arm/hand							-0.061**					-0.024
							(0.025)					(0.026)
Muscular/joint: foot/leg								-0.084***				-0.066***
								(0.022)				(0.023)
Skin condition									-0.185***			-0.160**
									(0.070)			(0.072)
Stomach/digestion problem										0.008		0.036
										(0.031)		(0.031)
Headaches											-0.041	-0.027
											(0.030)	(0.031)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ESS wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	35,311	35,311	35,311	35,311	35,311	35,311	35,311	35,311	35,311	35,311	35,311	35,311
R^2	0.241	0.241	0.241	0.241	0.241	0.241	0.241	0.242	0.241	0.241	0.241	0.243

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses. Individual controls: age, gender, education, household income terciles, subjective evaluation of household income, political orientation, unemployed not looking for a job, unemployed looking for a job, religiousness, born abroad, having immigrant parents, level of urbanisation.

Table 4 proceeds with the analysis of the moderating effects of subjective well-being on the relationship between health and worries/attitudes towards immigration. Specification 1 and 4 provide the benchmark coefficients of the subjective health status in the models without wellbeing controls, for SOEP and ESS. Subjective well-being measures – life satisfaction and happiness – are statistically significant predictors of the outcomes variables in their own right: greater life satisfaction and happiness are associated lower worries about and more positive attitudes towards immigration (Specifications 2 and 5-7). A joint inclusion of the subjective health status and subjective well-being reduces the importance of the former: in the SOEP sample, the health status coefficient drops by 25% and is now statistically

significant only at the 10% level (specification 3), and in the ESS sample the health status coefficient is reduced by half (but remains statistically significant at the 1% level), Specification 8. All in all, our results suggest that the effect of (physical) health on attitudes towards immigration is partially explained by the changes in subjective well-being.

Table 4. Health and worries about immigration: controlling for subjective wellbeing

	SOEP Dependent variable: "Do you have worries about immigration to Germany?" 1 "No worries", 2 "Some worries", 3 "big worries", OLS FE			ESS Dependent variable: Index of pro-immigration attitudes OLS				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Health status (1 very bad… 5 very good)	-0.004***	-	-0.003*	0.072***	-	-	-	0.034***
	(0.002)		(0.002)	(0.003)				(0.003)
Life satisfaction (0 low… 10 high)	-	-0.004***	-0.004***	-	0.051***	-	0.025***	0.024***
		(0.001)	(0.001)		(0.001)		(0.002)	(0.002)
Happiness (0 low… 10 high)	-	-	-	-	-	0.065***	0.048***	0.046***
						(0.002)	(0.002)	(0.002)
R^2 (within)	0.034	0.034	0.036	-	-	-	-	-
R^2	-	-	-	0.211	0.219	0.221	0.223	0.224
Number of person-years	471,728	471,415	470,959	380,795	379,926	379,997	378,976	378,747
Number of persons	73,450	73,445	73,430	-	-	-	-	-

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses. The same controls as in Table 1 included in Specifications 1-3 and the same controls as in Table 2 included in Specifications 4-8.

Table 5 reports tests for the conjecture that the effect of health on attitudes towards immigration is driven by the competition for resources (public services), all based on the ESS data. First, the inclusion of perceptions of the state of public health services reduces the coefficient of subjective health by one fifth (Specifications 1 and 2). Second, believing that public benefits encourage migrants to come does not seem to affect the coefficient of the subjective health status (Specifications 3 and 4). Finally, believing that migrants contribute to taxes more than they take out reduces the coefficient of the health status by a third. There is, thus, some indication that the effect of health on attitudes towards immigration is partly (but not fully) driven by the perceptions of resource competition. Note also that the perceptions of the state of health services and beliefs about migrants' use of country's public services are significant predictors of the immigration attitudes in their own rights.

Table 5. Health, perceptions of migrants' use of social services and attitudes towards immigration, European Social Survey

	Dependent variable: Index of pro-immigration attitudes, OLS					
	(1)	(2)	(3)	(4)	(5)	(6)
Subjective health	0.072***	0.058***	0.069***	0.070***	0.076***	0.051***
	(0.003)	(0.003)	(0.010)	(0.010)	(0.007)	(0.006)
State of health services: good	-	0.053***	-	-	-	-
		(0.001)				
Benefits encourage migrants to come: disagree	-		-	0.120***	-	-
				(0.008)		
Taxes: Migrants put in more than they take out	-		-		-	0.190***
						(0.003)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
ESS round fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	377,903	377,903	45,449	45,449	67,921	67,921
R^2	0.211	0.225	0.204	0.218	0.222	0.403

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses. Specifications 3 and 4: ESS Round 4; Specifications 5 and 6: ESS Rounds 1 and 7. Individual controls: age, gender, education, household income terciles, subjective evaluation of household income, political orientation, unemployed not looking for a job, unemployed looking for a job, religiousness, born abroad, having immigrant parents, level of urbanisation.

(text based on limited sample results – see the new table below) Finally, the results of some exploratory analyses into the relationship between Covid-19-related variables and attitudes towards immigration are reported in Table 6. The sample consists European countries (mainly Eastern European countries) that have participated in the latest (2020/21) ESS round and for which the data have been released.

Having had Covid-19 (as indicated by a positive test) is not associated with attitudes towards immigration, while the respondent's belief that they had Covid-19 (not tested) is associated with more positive attitudes (Specification 1). A possible explanation here is that positive tests may be linked to otherwise symptomatic cases – i.e. the health of the respondent may not have been affected. The respondent's belief that they had Covid-19 could, however, indicate that they underwent serious illness (Covid or not) and got recovered. A recovery from a serious illness during times of great uncertainly could lead to positive feelings of joy and relief, which, in turn, would feed into more positive attitudes towards immigration. A similar reasoning could be applied to explain the positive effect of having someone in the household who had Covid-19 (either tested or thought they had) on attitudes towards immigration (Specification 2).

More negative attitudes towards Covid-19 vaccination – and indeed the refusal to get a vaccine – are associated with more negative attitudes towards immigration, as are the beliefs

that Covid-19 is a result of deliberate and concealed efforts of some government or organisation and unsatisfaction with how health services coped with the coronavirus pandemic and its consequences (Specifications 3-5). Overall, beliefs in conspiracy theories and perceptions of overstrained health services could be indicative of a high degree of anxiety, fear and worry during a major pandemic. As predicted by the behavioural immune system theory, people would project such feelings into outgroups, including immigrants.

(new results based on data downloaded on June 26, 2023 – nearly all countries)

Table 6. Covid-19 and attitudes towards immigration, European Social Survey, 2020-21

	Dependent variable: Index of pro-immigration attitudes, OLS							
	(1)	(2)	(3)	(4)	(5)	(6)	West	East
Respondent had Covid-19?								
No	Ref.					Ref.	Ref.	Ref.
Yes, tested positive	0.028					-0.011	-0.007	-0.050
Yes, I think I had Covid-19	-0.041					-0.054	0.085	0.033
Someone in the household had Covid-19?								
No		Ref.				Ref.	Ref.	Ref.
Yes, tested positive		0.070***				0.091***	0.086*	0.118***
Yes, I think they had Covid-19		0.054				0.142***	0.109	0.149***
Will you get vaccinated?								
Already have			Ref.			Ref.	Ref.	Ref.
I will			0.035			0.020	0.036	-0.056*
No, I will not			-0.202***			-0.070***	-0.054	-0.130***
Agree: **Coronavirus is the result of deliberate and concealed efforts of some government or organisation**				-0.148***		-0.135***	-0.142***	-0.078***
Not satisfied how health services coped with the coronavirus pandemic and its consequences					-0.045***	-0.033***	-0.034***	-0.031***
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ESS round fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	31,895	31,895	33,371	28,900	30,168	27,171	15,700	11,471
R^2	0.296	0.297	0.298	0.335	0.320	0.344	0.322	0.188

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses. Individual controls: age, gender, education, household income terciles, subjective evaluation of household income, political orientation, unemployed not looking for a job, unemployed looking for a job, religiousness, born abroad, having immigrant parents, level of urbanisation.

~~(limited sample) Table 6. Covid-19 and attitudes towards immigration, European Social Survey, 2020-21~~

	~~Dependent variable: Index of pro-immigration attitudes, OLS~~					
	~~(1)~~	~~(2)~~	~~(3)~~	~~(4)~~	~~(5)~~	~~(6)~~
~~Respondent had Covid-19?~~						
~~*No*~~	~~Ref.~~					
~~*Yes, tested positive*~~	~~-0.007~~					
	~~(0.028)~~					
~~*Yes, think had Covid-19*~~	~~0.080**~~					
	~~(0.035)~~					
~~Someone in the household had Covid-19?~~						
~~*No*~~		~~Ref.~~				~~Ref.~~
~~*Yes, tested positive*~~		~~0.062**~~				~~0.077***~~
		~~(0.029)~~				~~(0.029)~~
~~*Yes, think had Covid-19*~~		~~0.117***~~				~~0.158***~~

		(0.043)				(0.043)
Will you get vaccinated?						
Already have			Ref.			Ref.
I will			-0.057*			-0.057*
			(0.032)			(0.033)
No, I will not			-0.205***			-0.128***
			(0.025)			(0.025)
Agree: Coronavirus is the result of deliberate and concealed efforts of some government or organisation				-0.104***		-0.081***
				(0.009)		(0.010)
Not satisfied how health services coped with the coronavirus pandemic and its consequences					-0.039***	-0.028***
					(0.004)	(0.004)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
ESS round fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	12,623	12,623	12,623	11,926	12,433	11,780
R^2	0.175	0.176	0.181	0.188	0.183	0.198

Notes: * p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses. Individual controls: age, gender, education, household income terciles, subjective evaluation of household income, political orientation, unemployed not looking for a job, unemployed looking for a job, religiousness, born abroad, having immigrant parents, level of urbanisation.

CONCLUSION

This paper set out to explore the relationship between health and attitudes towards immigration – an overlooked dimension in the burgeoning literature exploring the links between health, well-being and migration. Both longitudinal and cross-sectional analyses confirm that better individual health is associated with more positive attitudes towards immigration. This applies to various measures of health, including subjective health status, satisfaction with health, the presence of long-standing hindering health conditions, as well as specific health conditions, such as high blood pressure, muscular and join pains and skin conditions. The effect of health on attitudes towards immigration is partially explained by changes in subjective/emotional well-being (specifically, affect misattribution, whereby people project their negative emotions onto outgroups) and perceptions of immigrants use of public services (in line with the competition for resources conjecture, whereby people concerned about resource availability develop more negative attitudes towards outgroups).

Regarding the effects of the Covid-19 pandemic, people believing in Covid-conspiracies (including the vaccine-hesitant) and those perceiving health services to be struggling with consequences of the pandemic are more negative towards immigration – a finding that can be explained by the behavioural immune system theory assuming that these Covid-related attitudes reflect fear and worry. Interestingly, people thinking that they or someone from their household had Covid-19 are particularly likely to be more positive towards immigration; this finding can be explained by the increase in positive emotions following a recovery from serious illness which, in turn, feed into more positive attitudes towards outgroups.

By identifying health as a key determinant of attitudes towards immigration, this study potentially holds an important policy implication that health improvements can lead to more positive attitudes towards immigration and, through them, affect immigration policy, migration flows.[6] The usual caveat, however, applies, as the evidence presented in this study is correlational rather than causal – even if the use of longitudinal data has allowed to eliminate endogeneity due to unobserved, time-invariant individual-level characteristics. Further research should seek to mitigate other potential causes of endogeneity and establish the causal effects of heath on attitudes towards immigration.

[6] For the effects of attitudes towards immigration on immigration policy formation, see Facchini and Mayda (2008), on immigrant flows, Gorinas and Pytliková (2017), and for immigrant integration, Fussell (2014).

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APPENDIX

Table A1. Summary statistics of the variables included in the analysis (based on corresponding estimation samples)

Variable	Mean	Standard deviation	Min	Max	Source	Question used to construct the variable
Worries about immigration	2.011	0.751	1	3	German Socio-Economic Panel	"How is it with the following topic – immigration to Germany – do you have worries about it?" Possible answers: "no worries" (1), "some worries" (2) and "big worries" (3).
Subjective health	3.378	0.959	1	5	German Socio-Economic Panel	Current self-rated health status (1 – very bad, … 5 – very good)
Satisfaction with health	6.652	2.208	0	10	German Socio-Economic Panel	Satisfaction with health (0 – low, … 10 – high)
Physical health summary scale	49.290	10.087	8.760	79.603	German Socio-Economic Panel	BNS physical health summary scale measure provided by SOEP (higher = better health)
Disabled	0.114	0.318	0	1	German Socio-Economic Panel	Disability status: yes(1)/no(0)
Annual doctor visits	9.851	15.576	0	396	German Socio-Economic Panel	
Nights spent at hospital per year	1.534	7.667	0	360	German Socio-Economic Panel	
Mental health summary scale	50.468	9.954	0.557	80.598	German Socio-Economic Panel	BNS physical health summary scale measure provided by SOEP (higher = better health)
Satisfaction with HH income	6.582	2.255	0	10	German Socio-Economic Panel	Satisfaction with HH income (0 – low, … 10 – high)
Registered unemployed	0.065	0.246	0	1	German Socio-Economic Panel	
Education					German Socio-Economic Panel	
Primary	0.138	0.345	0	1		Less than High School
Secondary	0.603	0.489	0	1		High school
Tertiary	0.259	0.438	0	1		More than High school
Age	49.476	16.896	18	105	German Socio-Economic Panel	Age in years
Life satisfaction	7.160	1.749	0	10	German Socio-Economic Panel	Overall life satisfaction (0 – low, … 10 – high)
Allow migrants of the same race	2.810	0.856	1	4	European Social Survey	"To what extent do you think [country] should allow people of *the same race or ethnic group as most [country]'s people to come and live here?" Possible answers: "Allow none" (1), "Allow a few" (2), "Allow some" (3) and "Allow many" (4).*

Allow migrants of different race	2.520	0.885	1	4	European Social Survey	"To what extent do you think [country] should allow people of a *different race or ethnic group from most [country] people?" Possible answers: "Allow none" (1), "Allow a few" (2), "Allow some" (3) and "Allow many" (4).*
Allow migrants from poor countries outside Europe	2.449	0.903	1	4	European Social Survey	"To what extent do you think [country] should allow people from the *poorer countries outside Europe?" Possible answers: "Allow none" (1), "Allow a few" (2), "Allow some" (3) and "Allow many" (4).*
Immigrants good for the economy	4.949	2.433	0	10	European Social Survey	Would you say it is generally bad or good for [country]'s *economy that people come to live here from other countries? (Possible answers on a scale of 0 to 10, where 0 is "bad for the economy" and 10 is "good for the economy")*
Immigrants good for culture	5.583	2.522	0	10	European Social Survey	Would you say that [country]'s *cultural life is generally undermined or enriched by people coming to live here from other countries? (Possible answers on a scale of 0 to 10, where 0 is "cultural life undermined" and 10 is "cultural life enriched")*
Immigrants make the country a better place to live	4.918	2.291	0	10	European Social Survey	Is [country] made a *worse or a better place to live by people coming to live here from other countries? (Possible answers on a scale of 0 to 10, where 0 is "worse place to live" and 10 is "better place to live")*
Index of attitudes towards immigration (standardised variable)	0.030	0.983	-2.391	2.234	European Social Survey	The first factor of the principal component analysis (Eigenvalue = 3.802) using the six questions above. The variable has been standardised (a mean of zero and a standard deviation of one).
Subjective health	3.809	0.915	1	5	European Social Survey	Self-rated health status (1 – very bad, … 5 – very good)
Long-standing, hampering health conditions					European Social Survey	Are you hampered in your daily activities in any way by any long-standing illness, or disability, infirmity, or mental health problem?
No	0.750	0.433	0.000	1.000		
Yes, to some extent	0.190	0.392	0	1		
Yes, a lot	0.057	0.232	0	1		
Missing info	0.003	0.054	0	1		
Life satisfaction	6.972	2.246	0	10	European Social Survey	"How satisfied with life are you as a whole?"
Happiness	7.292	1.963	0	10	European Social Survey	"How happy are you?"
State of health services	5.358	2.554	0	10	European Social Survey	"State of health services in country nowadays": 0 (extremely bad) to 10 (extremely good)
Benefits encourage migrants to come: agree	2.719	1.161	1	5	European Social Survey	"Social benefits/services encourage people from other countries to come and live here": 1 (agree strongly) to 5 (disagree strongly)
Migrants put in more taxed than they take out	4.366	2.207	0	10	European Social Survey	"Taxes and services: immigrants take out more than they put in or less": 0 (take out more) to 10 (put in more)
Have you had Covid-19?					European Social Survey	

No	0.751	0.432	0	1		
Yes, I tested positive	0.155	0.362	0	1		
Yes, I think I had COVID-19 but was not tested	0.077	0.266	0	1		
Missing information	0.017	0.130	0	1		
HH member had Covid-19?					European Social Survey	
No, no one living with me had COVID-19	0.580	0.494	0	1		
Yes, someone living with me tested positive for COVID-19	0.152	0.359	0	1		
Yes, I think someone living with me had COVID-19 but they were not tested	0.050	0.218	0	1		
I have not lived with anyone since the start of the pandemic	0.205	0.404	0	1		
Missing information	0.013	0.113	0	1		
Vaccine hesitancy					European Social Survey	Will you will get vaccinated against COVID-19 with vaccine approved by government?
Already have	0.493	0.500	0	1		
I will	0.118	0.323	0	1		
I will not	0.300	0.458	0	1		
Missing information	0.090	0.286	0	1		
Agree: Coronavirus is the result of deliberate and concealed efforts of some government or organisation	3.045	1.202	1	5	European Social Survey	
Satisfied with how health services coped with the coronavirus pandemic and its consequences	5.744	2.698	0	10	European Social Survey	
Age	48.356	18.445	15	123	European Social Survey	Age in years
Female	0.530	0.499	0	1	European Social Survey	
Years of education	12.473	4.096	0	60	European Social Survey	
Subjective evaluation of household income					European Social Survey	Which of the descriptions on this card comes closest to how you feel about your household's income nowadays?
Living comfortably on present income	0.314	0.464	0	1		

Coping on present income	0.459	0.498	0	1		
Difficult on present income	0.169	0.375	0	1		
Very difficult on present income	0.059	0.235	0	1		
Within-country household income tercile					European Social Survey	
1st	0.309	0.462	0	1		
2nd	0.253	0.435	0	1		
3rd	0.218	0.413	0	1		
Income non-reported	0.220	0.415	0	1		
Political leaning					European Social Survey	In politics people sometimes talk of "left" and "right". Using this card, where would you place yourself on this scale, where 0 means the left and 10 means the right?
Left	0.284	0.451	0	1		If the answer is in the range 0 to 4
Centre	0.291	0.454	0	1		If the answer is 5
Right	0.310	0.463	0	1		If the answer is in the range 6 and 10
No answer	0.114	0.318	0	1		
Unemployed, actively looking for job	0.042	0.201	0	1	European Social Survey	
Unemployed, not looking for job	0.020	0.139	0	1	European Social Survey	
Religiousness	4.644	3.026	0	10	European Social Survey	Regardless of whether you belong to a particular religion, how religious would you say you are? (0 not at all religious, …, 10 very religious)
Not born in the country	0.087	0.282	0	1	European Social Survey	
At least one parent not born in the country	0.147	0.354	0	1	European Social Survey	
Degree of urbanisation					European Social Survey	Self-reported
A big city	0.193	0.395	0	1		
Suburbs or outskirts of big city	0.122	0.327	0	1		
Town or small city	0.311	0.463	0	1		
Country village	0.307	0.461	0	1		
Farm or home in countryside	0.067	0.249	0	1		