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The second Health Inequalities Module in the European Social Survey (ESS): Methodology and research opportunities

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ABSTRACT

The European Social Survey (ESS) is a pan-European social survey that has mapped and explained stability and change in the attitudes, beliefs, and behaviour patterns of European populations since 2002. In 2013/14, the ESS introduced a rotating module on health and its social determinants. With this Health Inequalities module, the ESS contributed substantially to social epidemiological research and inquiry into social inequalities in health and it became a vital data source for public health research, advancing knowledge of why social inequalities in health exist in Europe and how they vary between countries and welfare states. With the second rotating Health Inequalities module in 2023/24, the ESS enables new research opportunities, primarily by generating robust and cross-national comparative data on stability and change of social inequalities in health in times of various economic, demographic, public health, and political developments. The aims of the current paper are threefold. First, we summarize key insights on health inequalities in Europe provided by data from the first ESS Health Inequalities Module. Second, we describe the methodology of the second ESS Health Inequalities Module. Third, we point to future research opportunities and offer some critical reflections. By describing in detail the analytical opportunities that the two ESS Health Inequalities Modules provide, we aim to increase engagement with the survey from a wide range of health-focused disciplines including anthropology, geography, health economics, psychology and sociology.

1. Introduction

Social inequalities in morbidity and mortality remain a critical public health challenge, persisting for decades across all European countries (Dugravot et al., 2020; Mackenbach et al., 2017). Health inequalities occur as systematic and enduring inequalities in health outcomes according to placement in social and socioeconomic hierarchies. These inequalities emerge from a wide range of circumstances in which people

work and live (Marmot and Wilkinson, 2005b), usually referred to as “the social determinants” of health. They are not inherently “natural”; rather, they are socially produced and as such, they are potentially avoidable. The social determinants include access to essential goods and services (e.g., water, sanitation, and food); housing and living environments; lifestyle and behavioural factors; access to health care; unemployment and social security; working conditions; and transport (Dahlgren and Whitehead, 1991). Health inequalities are evident both

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for ascribed (e.g., birthplace, gender, and immigrant background), and for attained characteristics (e.g., education, occupation, income, and wealth). Such inequalities do not only exist between the top and bottom of social and socioeconomic hierarchies. Rather, they take the form of a gradient, where health improves for every step up the societal ladder and “even comfortably off people somewhere in the middle tend to have poorer health than those above them” (Marmot and Wilkinson, 2005a). This phenomenon is termed “the social gradient in health”.

The European Social Survey (ESS), a repeated cross-sectional survey in up to 31 European countries, included a rotating module on health and its social determinants (hereafter: ESS Health Inequalities Module) in 2013/14 (see Eikemo et al. (2016) for details). The Health Inequalities Module has been extensively used by the social science research community (Malnar, 2019) and has contributed to the knowledge of why social inequalities in health exist, and how they vary across European countries. The module has, moreover, been used to examine the importance of institutions (e.g., healthcare services, tax systems) for population health. However, such macro-level institutions, policies and societal structures are no static entities but continuously undergo substantial recalibration (Busemeyer et al., 2018). Institutions provide key social benefits and services for Europeans experiencing disadvantages, and it is therefore imperative to monitor the impact of (changing) institutional arrangements on health and its social distribution. Until now, cross-national comparative data with repeated measurements of health and its social determinants have been missing. With the second 2023/24 ESS Health Inequalities Module, this data gap is filled. The 2023/24 ESS Health Inequalities Module will enable a broad array of new research opportunities in social science and medicine.

The necessity of a repeated module is underscored by several economic, demographic, public health, and political developments in Europe since the 2013/14 ESS Health Inequalities Module. First, the *COVID-19 pandemic* has deeply impacted societies in Europe and worldwide. The spread of the SARS-CoV-2 virus put immense pressure on European healthcare systems. Furthermore, the infection control measures implemented, of varying strength and length, affected local businesses, welfare provision, the economy at large, and societal structures more broadly. It is, therefore, crucial to monitor and compare the health adverse effects of the COVID-19 pandemic across European countries with varying pandemic management and policy response (Hoven et al., 2022). Cross-national differences in supporting vulnerable groups, as well as differing trends in population health and social determinants of health, seems likely (Friedman et al., 2021; Huijts et al., 2023). Second, *major conflicts* have unfolded, most notably through Russia's invasion of Ukraine, which has triggered a large-scale war on European territory. This conflict has not only inflicted war-torn Ukraine and caused a large number of Ukrainian refugees in several European countries, but has also affected European societies through e.g., increased energy prices and higher costs of living. Third, noticeable trends of growing *income and wealth inequalities* have been identified in several European countries, often accompanied by increasing poverty rates (OECD, 2015). Health adverse effects of poverty arise from prolonged financial hardship and other material burdens, exposure to more psychosocial stress, possibly supplemented by less healthy behaviour (e.g., smoking and/or alcohol as a maladaptive coping strategy), and barriers to healthcare access (e.g., out-of-pocket payments). Fourth, *precarious labour market situations* appear to be persistent in many European countries (Kalleberg, 2009; Latner, 2022). Different types of non-standard employment relationships, such as insecure jobs, temporary employment contracts, involuntary part-time work, and solo self-employment, can both lead to weak labour market positions, and also to health deterioration. Fifth, *educational expansion* and longer average educational qualifications in younger cohorts has yielded positive outcomes for many individuals in Europe. However, those left behind (i.e., individuals unable or unwilling to stay long in school) may be even more trapped in cycles of marginalization, leading to a further deterioration of their social and economic circumstances, with potential

spillover effects on health (Heisig et al., 2019). Marginalization processes for those with short education will probably differ noticeably between country contexts. Sixth, *populist and far-right political parties* have entered into parliaments and coalition governments in numerous European countries, indicative of increasing societal conflict and political polarization, with potential impact on trust and social cohesion (Backhaus et al., 2023). Seventh, there are indications of concerning trends in mortality and increasing prevalence of various *non-communicable diseases* (NCD), such as diabetes and obesity (Mortensen et al., 2017). Relatively little attention has been directed towards tracking changes in social inequalities in NCDs over time, and the cross-national differences and similarities herein.

The aim of this design paper is to provide an overview of the ESS Health Inequalities Module. We outline the theoretical foundation of the module, and we reflect on the insights into health inequalities in Europe provided by data from the first 2013/14 Module. In addition, the methodology of the second 2023/24 ESS Health Inequalities Module is described. Finally, we point to future research opportunities, and also offer some critical reflections. Most of the previous health inequalities analyses of the ESS has applied a sociological or social epidemiological lens. By describing in detail the analytical opportunities that the ESS provide, we hope to increase engagement with the survey from a wider range of health-focused disciplines including anthropology, geography, health economics, and psychology.

2. The European Social Survey

The ESS is an academically driven, biennial repeated cross-sectional, pan-European, general social survey, which has mapped and explained change and stability in the attitudes, beliefs, and behaviour patterns of European populations and their interactions with Europe's evolving institutions since 2002 (Fitzgerald et al., 2013; Fitzgerald and Jowell, 2010). The ESS has set new and improved methodological and coordination standards in cross-national survey research, for instance, regarding questionnaire design, translation, response measurement, fieldwork design, cross-national harmonization, data archiving, and the provision of free and non-privileged access to the data and documentation (Fitzgerald and Jowell, 2010). The ESS enables both cross-national and sub-national geographical analyses by providing data on levels 1 and 2 of the Nomenclature of Statistical Territorial Units (NUTS) (Niedzwiedz et al., 2020; Thomson et al., 2017). Eleven ESS rounds have been completed thus far, employing a rigorous survey methodology and covering up to 31 nations with a target effective sample size of 1500 cases per country or 800 for countries with populations of 2 million or less. Data are based on random probability samples of each country and are designed to be representative of all residents aged 15 years or more in each country (i.e., not only citizens).

The questionnaire for each round consists of two main elements: a core module of substantive and sociodemographic items (around 100 items); and two rotating modules, each including up to 30 items (Fitzgerald and Jowell, 2010). These modules are administered together, and the questionnaire takes approximately 1 h to answer in British English. This combination has enabled social science researchers to measure changes over time, as well addressing new topics. Each rotating module covers a single academic topic and/or policy concern within Europe and is drafted by a selected research team. The ESS provides a questionnaire design template for the rotating modules which ensures a conceptually anchored approach to the design and testing of the module (Fitzgerald, 2015). The questionnaire design template, full questionnaire and the data can be downloaded from <https://www.europesocialsurvey.org>.

The new data collected in the eleventh round, which included the second ESS Health Inequalities Module, covered 31 countries, up from 22 in Round 7 when the first ESS Health Inequalities Module was fielded. The countries taking part in Round 11 were: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece,

Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Montenegro, the Netherlands, Norway, Poland, Portugal, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine and the UK (see Table 1). Data was collected face-to-face for all countries with the exception of Czechia, where a self-completion approach was used as no face-to-face provider was available. Data for Ukraine was collected only in areas of Ukraine under the control of the government at the time of fieldwork. Data collection in Israel was also severely disrupted by the conflict there.

3. The ESS health inequalities module

Several theories to explain social inequalities in health were considered when designing the ESS Health Inequalities Module, primarily the material, cultural-behavioural, psychosocial, fundamental cause, and the political economy approach (Bartley, 2017). The *material explanation* highlights the importance of economic resources (i.e., income and wealth) for access to goods and services. Moreover, various material burdens, such as pollution, poor housing quality, and work hazards, accumulate over the life course, and adds to the health toll of individuals in a socially structured way. The *psychosocial explanation* emphasises inequalities in stress and stressors (i.e., the cause of stress). Negative health consequences can arise from exposure to both acute (e.g., family death) and more chronic (e.g., financial hardship, work stress) psychosocial stressors. The *cultural-behavioural explanation* focuses on variations in health-related behaviours. Lifestyles and habits of relevance for health – including smoking, alcohol consumption, dietary patterns, physical activity, and healthcare utilization – vary according to socioeconomic position. Typically, accumulation of material burdens and/or psychosocial stress will often lead to less healthy behaviour. The *fundamental cause theory* (Link and Phelan, 1995) underscores that high

socioeconomic position provides various flexible resources – including money, power, network and prestige – that can be used to improve health and prolong life. Thus, higher socioeconomic position is beneficial for health in and of itself, above and beyond what the three above-mentioned explanatory models stipulate. Health-related social mobility is also of explanatory importance. Having poor health can influence where a person ends up in socioeconomic hierarchies. For instance, health problems may have a negative impact on educational attainment (e.g., due to long and/or repeated hospitalizations), which in turn may hamper both labour market opportunities, income development, and wealth accumulation. Poor health can even lead to downward social mobility through myriads of mechanisms such as loss of productivity while employed, job loss due to extended periods of sickness absence, stigmatization and discrimination on key societal arenas, and financial difficulties spurred by increasing health care expenditures (Jiménez-Solomon et al., 2024; Wicke et al., 2022). According to the *political economy approach*, the social determinants of health are themselves shaped by meso- and macro-level structural determinants: politics, the economy, the state, the organisation of work and the labour market (Schrecker and Bambra, 2015). Health inequalities are thus considered as politically determined by institutional (in)action (Beckfield et al., 2015). Even within the constraints of unequal societies, the behavioural, material and psychosocial determinants of health inequalities are amenable to public policy interventions. Health inequalities vary between countries and the political economy approach argues that political choices and resulting policies are responsible for these differences (Beckfield and Bambra, 2016). In fact cross-country comparisons form the foundation for a key query in health inequality research: how best to structure societies to reduce or even eliminate health disparities. The institutional approach recognises the persistence and variability of health inequalities across countries, and analyses the extent to which they are determined by differences in countries' social and economic policies (Beckfield et al., 2015). As such, social determinants of health are shaped 1) directly by macro-level institutional and structural determinants, and 2) indirectly by the mediating influence of socioeconomic circumstances, which are themselves shaped by macro-level institutional and structural determinants, policies, the economy, labour markets and the organisation of work (Schrecker and Bambra, 2015).

The ESS has two questions on health in the core module: a) self-rated general health, and b) limiting longstanding illness (LLSI). Moreover, mental health (as measured by the eight-item version of the Center for Epidemiological Studies Depression scale [CES-D]) was included in ESS rounds 3 and 6. However, more detailed cross-national comparative information on health and its social determinants was required to address public health- and health inequality topics in a comprehensive manner. The selection and subsequent fielding of the first Health Inequalities Module in Round 7 (2013/14) fulfilled this data need. Since its release, the first ESS Health Inequalities Module has become a vital data source, by e.g., enabling studies of social structures and the distributions of social determinants throughout Europe (Huijts et al., 2017a, 2017b). The module has also been used to test sociological theories of health and health inequalities in different country contexts (Balaj and Eikemo, 2022; Rydland et al., 2020). Progress has been made in the understanding of social inequalities in health, and the role of welfare states in mitigating or aggravating health-adverse effects of social circumstances (Wiertsema et al., 2023). Importantly, whilst some countries have detailed health surveys of their own (e.g., the French CONSTANCES study) this is not the case for many countries in Europe and the module therefore fills a population health data gap.

30 items were included in the ESS Health Inequalities Module, covering a broad array of social determinants and health outcomes. Most items have been repeated in the second ESS Health Inequalities module to ensure comparability over time. Only a couple of changes in the questionnaire have been made between the ESS Health Inequalities Module in 2013/14 and 2023/24. First, a new item asking respondents

Table 1

Countries participating in ESS Round 7 and Round 11. Number of respondents and response rates (in %).

	Round 7	Round 11
	N (Response Rate in %)	N (Response Rate in %)
Austria	1795 (52)	2354 (39)
Belgium	1769 (57)	1594 (32)
Bulgaria		^a
Croatia		1563 (42)
Cyprus		685 (36)
Czechia^b	2148 (68)	^a
Denmark	1502 (52)	
Estonia	2051 (60)	^a
Finland	2087 (63)	1563 (42)
France	1917 (51)	1771 (35)
Germany	3045 (31)	2420 (27)
Greece		2757 (53)
Hungary	1698 (53)	2118 (46)
Iceland		842 (29)
Ireland	2390 (61)	2017 (53)
Israel	2562 (74)	^a
Italy		2865 (50)
Latvia		^a
Lithuania	2250 (69)	1365 (41)
Montenegro		^a
Netherlands	1919 (59)	1695 (34)
Norway	1436 (54)	1337 (37)
Poland	1615 (66)	1442 (41)
Portugal	1265 (43)	1373 (38)
Serbia		1563 (43)
Slovakia		1442 (47)
Slovenia	1224 (52)	1248 (54)
Spain	1925 (68)	1884 (39)
Sweden	1791 (50)	1230 (24)
Switzerland	1532 (53)	1384 (46)
Ukraine ^b		^a
United Kingdom	2264 (44)	1684 (27)

^a data not yet available, countries highlighted in bold took part in both rounds.

^b Data for Czechia and Ukraine will be published in country specific files.

for how long they have been cancer-free was added, which enables more detailed analyses of cancer survivors based on the length of their survivorship. Second, the two smoking items included in the first module have been integrated into one item. The answer category "daily smoker" now further differentiates between daily smokers of 10 or more vs. 9 or less cigarettes (as a proxy for smoking intensity). Number of cigarettes smoked daily was dropped because the variable was seldom used. Third, for housing, the response categories were improved and respondents are now provided a list with typical housing problems and specifically asked which of these problems apply to them. Finally, an item for sense of control, which taps into the psychosocial explanation, was added. A greater sense of control over one's life is expected to lead to better mental health, fewer and less severe somatic symptoms, and healthier lifestyle.

Taken together, the Health Inequalities Module in ESS rounds 7 (in 2013/14) and 11 (in 2023/24) provide new and exciting research opportunities. Below, we present the rationale for the health outcomes and social determinants that were included in the Health Inequalities Module together with empirical findings from studies using data from the first Module.

3.1. Health outcomes

3.1.1. Chronic conditions

The self-reported measurement of chronic conditions in the ESS Health Inequalities Module allows for a thorough examination of the relationship between social circumstances and chronic health issues from a cross-national comparative perspective. As described, this relationship is bidirectional: Chronic conditions can increase the risk of reduced wages and low labour productivity non-employment and poverty. At the same time, social circumstances (e.g., poor housing, work hazards, and health care access barriers) increase the risk of chronic conditions. Respondents are given a list of chronic conditions and are asked which of these they have experienced during the last 12 months. A broad array of conditions is covered, including back pain, heart issues, high blood pressure, allergies, respiratory problems, digestive disorders, skin conditions, diabetes, and severe headaches. Respondents are also asked separately whether they have ever had cancer, whilst a list of cancer types like leukaemia, malignant tumors, lymphoma, melanoma, carcinoma, and other skin cancers is shown to them. Respondents are then asked if this cancer affected them in the past or if this is a current condition. The second ESS Health Inequalities Module offers researchers the opportunity to examine socioeconomic inequalities in chronic conditions in 31 European countries.

Leveraging data from the 2013/14 module, several studies have been published on social inequalities in numerous chronic or non-communicable diseases. Duntava et al. (2021) and McNamara et al. (2017b) demonstrated socioeconomic disparities in the prevalence of chronic diseases across European countries. Balaj et al. (2017b) and Pérez-Hernández et al. (2019) highlighted that behavioural, work-related, and living conditions are linked to poor health and disability. In addition, studies have shown that the associations between diabetes and depressive symptoms vary as a function of the quality of the diabetes care (Graham et al., 2018). Other studies found associations between cancer, depressive symptoms, and quality of life (G. I. Ringdal and Ringdal, 2019; K. Ringdal and Ringdal, 2017).

3.1.2. Mental health

Depression is one of the most prominent health concerns worldwide, significantly affecting individuals' overall well-being and quality of life (Vos et al., 2020). Beyond the personal anguish it causes, depression can severely impact one's immediate social environment and relationships. In the ESS Health Inequalities Module, depressive symptoms is assessed by the eight-item version of the Center for Epidemiological Studies Depression Scale (CES-D scale) (Radloff, 1977). This variable was also included in ESS rounds 3 and 6, and is thus measured four times in total.

CES-D evaluates various dimensions of depression, including feelings of being depressed, perceiving tasks as effortful, experiencing restless sleep, feeling lonely, enjoying life, feeling sad, feeling happy, and struggling to get started with daily activities. Analyses of data from the first ESS Health Inequalities Module has observed associations between social discrimination and elevated depressive symptoms, which are specifically pronounced in Europe's poorer countries (Alvarez-Galvez and Rojas-Garcia, 2019). Reibling et al. (2017) found that the mental health disadvantage of the inactive and precariously employed has increased over time. Analyses of changes over time in depressive symptoms from 2006 to 2013/14 across various countries and age groups found a general decrease in depressive symptoms, most pronounced in older adults (Beller et al., 2021). Moreover, Gkiouleka et al. (2018) found significantly higher levels of depressive symptoms among migrants in some European countries.

3.1.3. Health behaviour

The ESS Health Inequalities Module rigorously collects data on health behaviours such as smoking, alcohol consumption, physical activity, and fruit and vegetable consumption. Smoking is one of the leading causes of poor health and premature death in Europe, accounting for approximately one-fifth of all deaths (Reitsma et al., 2021). Research has established a causal link between tobacco smoking and mortality as well as various measures of morbidity (Dai et al., 2022). However, less is known about how smoking behaviour and its social determinants vary across European countries. The first ESS Health Inequalities Module enabled researchers to study social gradients in smoking across European countries. Results suggest that the likelihood of being a daily smoker is higher for respondents with short education, compared to those with a medium or long education (Huijts et al., 2017). In addition, Gugushvili et al. (2020) demonstrated that intergenerational mobility affects smoking behaviour, with upward educational mobility reducing the likelihood of smoking, while downward mobility increases it. The ESS Health Inequalities Module also enabled estimation of smoking prevalence within specific subgroups. For example, Disney et al. (2020) found that individuals with disabilities exhibit higher smoking rates compared to those without disabilities.

Alcohol consumption is another leading cause of mortality and morbidity in European countries. Again, less is known about how the relationships between alcohol consumption and social and economic factors vary across European countries. A new methodology to measure alcohol intake was introduced in the first Health Inequalities Module by assessing three aspects of alcohol consumption, including 1) frequency of alcohol consumption, 2) quantity of alcohol consumed, and 3) binge drinking. Country-specific show cards were provided with typical drinks and the likely grams of alcohol included was calculated to derive a measure of total alcohol consumption for each respondent. For binge drinking, interviewers presented possible drink combinations on a show card and asked if respondents had consumed that amount or more in one session. Respondents with short education have a lower prevalence of frequent alcohol consumption but a higher prevalence of frequent binge drinking, compared to those with long education (Huijts et al., 2017). Moreover, Pérez-Hernández et al. (2019) showed that alcohol consumption is the leading contributor to inequalities in disability among females.

Insufficient physical activity is linked to numerous health outcomes, e.g., ischemic heart disease and diabetes (Warburton et al., 2006). To assess ESS respondents' physical activity, a general question asks respondents how many of the past seven days they have been engaged in activities such walking quickly, sports or other physical activity for at least 30 min. Respondents' Body-Mass-Index can be calculated based on self-reported information on height and weight. Empirical results have found social inequalities in physical activity and overweight (Huijts et al., 2017; Marconcin et al., 2021; Marques et al., 2018). Fruit and vegetable consumption have also been included with two questions in the ESS Health Inequalities Module. Findings indicate that low fruit and

vegetable consumption is associated with a range of adverse health outcomes (Balaj et al., 2017a; Marques et al., 2019; Pérez-Hernández et al., 2019).

3.2. Social determinants of health

Important measures of socioeconomic position and social determinants of health are covered by the core ESS questionnaire. Measures of socioeconomic position include educational attainment (based on the International Standard Classification of Education [ISCED]), occupation (based on the International Standard Classification of Occupations [ISCO]), and household income (measured in ten country specific income range deciles). Other social determinants covered include employment status, migration, psychosocial working conditions, social capital, and family structure. These measures have been utilized to examine health-related inequalities based on e.g., gender (Bačák and Ólafsdóttir, 2017), education (Huijts et al., 2017)), occupational class (Toch-Marquardt, 2017), income (Svalestuen, 2022), social networks (Fjær et al., 2017a)), and immigrant background (Stathopoulou et al., 2018). The ESS Health Inequalities Module additionally incorporated social circumstances that are missing in the core questionnaire, based on Dahlgren and Whitehead's (1991) model, which resulted in a fairly comprehensive pan-European data set on the social determinants of health. These include childhood conditions (Andersson and Vaughan, 2017; Andersson et al., 2023; Bøe et al., 2017), quality of housing (McNamara et al., 2017a), physical working conditions and work hazards, provision of unpaid care (Verbakel, 2018), and healthcare utilization. Barriers to accessing the healthcare system are in many countries linked to insufficient health care coverage. These barriers are not experienced equally, but are rather influenced by a combination of factors, such as the availability of healthcare in underserved areas, discrimination against patients with low income and/or short education, the ability to take time off work for medical appointments, referrals to and utilization of specialist healthcare, and the capacity to cover out-of-pocket expenses (Levesque et al., 2013). Analyses of the first ESS Health Inequalities Module have found social inequalities in specialist healthcare utilization (Fjær et al., 2017a) as well as associations between financial strain and unmet healthcare needs (Fjær et al., 2017b).

In summary, the first ESS Health Inequalities Module has contributed with new empirical evidence on the social distribution of health throughout Europe. Investigations of numerous health outcomes have put forward accumulated evidence for social inequalities in health. The Module has also yielded insights into how health inequalities emerge throughout social strata. Intersectional analyses have revealed complex patterns of health inequalities in groups that combine both social privilege and disadvantage (Gkiouleka and Huijts, 2020). The ESS Health Inequalities Module represents a significant advancement beyond traditional unidimensional analyses of social inequalities in health. Notably, the ESS enables investigations into whether the associations between social circumstances and poor health differ cross-nationally (Álvarez-Gálvez et al., 2022; Widding-Havneraas and Pedersen, 2020) and between regions (Thomson et al., 2017).

4. New explanations by analysing societal change and trends

The second ESS Health Inequalities Module provides several new research opportunities, ten years after the introduction of the first module. First, as the data has been collected in 2023/24, up-to-date information on health and its social determinants is available, thus enabling researchers and projects to describe and monitor health inequalities over time in Europe, as well as to replicate previous empirical findings. A broad array of theoretically informed variables is covered, including material burdens, psychosocial stress, working conditions and work hazards, health-related behaviour, and healthcare access. Second, the 2023/24 questionnaire has been administered in 31 European countries (including 24 out of 27 European Union member states), up

from 22 countries in the 2013/14 Health Inequalities module. Third, by providing data on NUTS levels 1 and 2, the module allows for in-depth investigation of regional differences, e.g., in three-level multilevel modelling approaches (i.e., individuals-regions-countries). Fourth, until now, there has been a lack of repeated comparative data on chronic conditions and social determinants of health needed to analyze the burden of disability, the living conditions of the disabled, and health perception more broadly across time and space. Thus far, it has only been possible to show time trends for two health measures: self-rated health (SRH) and limiting longstanding illness (LLSI). Gaps in self-reported health are the early warning signs of the unequal risk of morbidity and mortality (DeSalvo et al., 2006) and findings from the ESS indicate improving SRH during the past 14 years (Mackenbach et al., 2018). This improvement seems to be driven by Central/Eastern European countries such as Czechia and Poland, while the trends among Western and Nordic countries have started to flatten or decrease in recent years (Vonneilich et al., 2020). On the other hand, the trend for LLSI indicates an overall increase in disability in most European countries. However, these trends are more favourable among people with higher socioeconomic status, thereby contributing to increasing social inequalities in health (Mackenbach et al., 2018). These contradictory trends in overall levels of SRH and LLSI cannot be fully explained with current data. Without detailed, repeated measurement of NCDs it is impossible to identify which conditions that are driving these diverging trends. The repeated cross-sectional approach of the ESS Health Inequalities Module enables researchers to identify how poor self-rated health is being translated into different health conditions across European countries and over time. Such research insights may even strengthen knowledge on the design of chronic disease management strategies from national public health and healthcare institutions.

Several developments in Europe call for investigations of their impact on population health and health inequalities. One prominent example is the COVID-19 pandemic where the second Health Inequalities Module add to the COVID-19-specific module included in ESS round 10. With a specific COVID questionnaire in round 10, the ESS provides a unique opportunity to explore the short-term impacts of the COVID-19 pandemic on various outcomes, such as mental health, chronic conditions, health behaviour, healthcare access, and trust in healthcare systems. With the Health Inequalities Modules in rounds 7 and 11, researchers can examine the medium-to-long-term impacts of the pandemic by comparing of social inequalities in health between pre- and post-pandemic Europe.

Importantly, the two rounds of the ESS Health Inequalities Module provide a promising opportunity to assess the impact of policies implemented across Europe between waves. By comparing health outcomes and social inequalities over time, researchers can evaluate the effectiveness of various policy measures among different social groups. Both European Union (EU) and national-level policies may have influenced key determinants of health over the past decade. The EU has made significant strides in reinforcing the social dimension of Europe, launching initiatives such as the European Pillar of Social Rights, the integration of social priorities into the European Semester, efforts to facilitate youth employment, and policies supporting the reintegration of long-term unemployed individuals into the labour market (European Commission, 2021). Additionally, the European Commission provides annual country-specific recommendations in areas such as education, active labour market policies, child care, housing, social inclusion, skills development, healthcare, and elderly care (see e.g., European Commission (2024)). In the following, we will outline seven policy domains that can be scrutinized with the two ESS Health Inequalities Modules.

First, the EU has recently placed a stronger emphasis on cancer prevention and treatment through initiatives such as Europe's Beating Cancer Plan and national cancer control programs (European Commission, 2025b). Both rounds of the ESS Health Inequalities Module collect data on individuals currently living with cancer and cancer survivors, enabling analyses of healthcare access, overall well-being, and

socioeconomic inequalities following national and EU-wide cancer policies. Second, the changing nature of work and its mental health consequences, particularly in response to policies introduced during and after the COVID-19 pandemic is another critical research avenue. The EU Strategic Framework on Health and Safety at Work (2021–2027) and national labour reforms aimed at improving job security, regulating remote work, and strengthening workplace mental health support provide a relevant context for examining changes in job stressors and their impact on well-being (European Commission, 2025a). ESS data can also be used to assess the impact of youth labour market integration policies on mental health outcomes by comparing young people's well-being in 2013/14 and 2023/24. Third, rising consumer prices may have affected affordability and access to essential health determinants such as healthy food. The policy response to rising costs varied across European countries and included policies such as increasing minimum wages, tax reductions, subsidies for energy prices, expansion of social assistance programs, food subsidy and rent freezes (Amores et al., 2025). By linking ESS health and behavioural determinants with national cost-of-living policies, it may be possible to examine which policies, or combination of policies, succeeded in limiting the negative health consequences of inflation, especially among the most disadvantaged. Fourth, housing policies are a fundamental determinant of health, shaping living conditions and access to stable, adequate housing (Kulesa et al., 2024). Rising housing costs may have contributed to housing instability and deteriorating living conditions, particularly for vulnerable social groups. ESS data offer a valuable resource for examining the link between housing conditions and health disparities in Europe, as well as assessing the extent to which national and EU-level housing policies may have mitigated or exacerbated these inequalities. Fifth, migration policies have played a crucial role in shaping the living conditions, healthcare access, and social integration of migrant populations (Juárez et al., 2019). Over the past decade, European countries have adopted widely divergent policy approaches with potential implications for the social integration and well-being of migrant communities. ESS data may contribute towards scientific knowledge on how policy changes may have influenced the health outcomes of migrants over time, providing insights into the role of migration governance in shaping health inequalities across Europe. Sixth, EU regional policy has likely contributed to population health and health inequalities across European regions. One prominent example is the EU Cohesion Fund that aims to reduce regional disparities by financing infrastructure and development projects, including investments in healthcare facilities, environmental improvements, and social inclusion programs (European Union, 2021). By linking ESS data to regional classifications using the Nomenclature of Statistical Territorial Units (NUTS 1 and 2), researchers can investigate whether regions that received substantial Cohesion Fund investments experienced improvements in key health indicators, such as self-reported health, mental well-being, and healthcare access. This regional-level analysis allows for a critical assessment of whether EU structural investments have contributed to reducing health inequalities and whether their benefits have been equitably distributed among different social groups.

The completion of the second rotating module in 2023/24 provides opportunities to develop valuable insights into the overall state of health and its social determinants across Europe. Such analyses could uncover key opportunities for social policy and health interventions by pinpointing countries and regions across Europe where action is most needed to address health inequalities. The second Health Inequalities Module also enables analyses of spatial trends at national and subnational level between 2013/14 and 2023/24. Currently, classical multi-level modeling is commonly employed to analyze ESS health data. However, stratifying by subnational region, gender, and age, presents challenges due to relatively small effective sample sizes. With approximately 2000 respondents per country, statistical inference might become difficult when applying socio-geographical models to smaller geographical units, such as NUTS 2-level regions, in country-specific

analyses or across all ESS countries. The limited data available for these smaller units often result in large statistical uncertainty. Additionally, observations in geographically adjacent areas may exhibit residual spatial dependence, even after controlling for different social determinants in the statistical model. This spatial dependence can be leveraged to improve risk estimates by smoothing across neighboring areas. Accounting for spatial dependence is considered crucial when analyzing the relationship between social determinants and health outcomes in spatial regression models (Wakefield, 2003). Bayesian multilevel models provide one effective approach, as smoothing priors can be easily incorporated. The degree of spatial smoothing can be controlled by a single parameter, and existing knowledge from previous studies can be integrated to refine risk estimates (Riebler et al., 2016).

The two rotating ESS Health Inequalities Modules can be further enhanced by integrating country-specific surveys, data from administrative registries and health information systems, and country-level information, for example on policy changes and economic inequalities. Effectively leveraging all available data is crucial for providing policy-makers with the most accurate and precise estimates, enabling them to design targeted interventions within financial constraints. However, a key challenge remains: addressing biases and uncertainties inherent in the different data sources, a persistent issue in global health inequalities research. A major objective is, therefore, to develop new statistical methods and models that can seamlessly integrate these diverse data sources into a unified analytical framework.

5. Critical reflections and limitations

We conclude this paper with some critical reflections on the ESS Health Inequalities data material. First, the ESS is a repeated cross-sectional survey that enables investigation of stability and change through representative samples from 22 European countries. A significant constraint of this design is the absence of longitudinal follow-up of respondents, which prevents the analysis of within-individual trajectories over time. The cross-sectional structure of the ESS data represents a crucial limitation, precluding causal conclusions between social determinants and health and restricting the evaluation of policy and intervention efficacy. Nonetheless, the application of ESS design, population, and post-stratification weights helps to minimize cohort effects, thereby permitting an accurate assessment of temporal changes within the general population. Second, only a handful of health measures and indicators of social determinants were included in the survey module(s) due to space constraints. Many important aspects, topics, and nuances of relevance for population health and health inequalities is therefore not covered here. Rather few variables address the psychosocial explanation, for instance. In addition, prevalences of chronic diseases are likely to be under-estimated, because, due to space limitations, chronic health conditions are measured by asking which apply form a long list rather than by asking each in turn. Third, all measures of the Health Inequalities Module are self-reported, which might lead to reporting bias, for instance over- or underreporting of health problems in certain social strata. This type of data skewness is particularly concerning if the bias varies non-negligibly between countries. Fourth, there is a risk of measurement error and comparability issues in cross-national comparative surveys (Smith, 2011), and some scholars have pointed to possible differences in the quality of the questions between countries (Saris and Gallhofer, 2011). Fifth, cross-national differences in response rates may affect the empirical results. Previous rounds of the ESS highlight large differences in response rates between countries, although evidence of non-response bias were found to be small (Stoop et al., 2010). ESS sets out very high targets for response rates (70 per cent) and low rates for non-contacts (3 per cent). At the time of writing, ESS Health Inequalities Module data had been published for 24 countries. Response rates ranged from 24 per cent in Sweden to 54 per cent in Slovenia. Response rates are lower overall than in Round 7, when the Health Inequalities Module was last fielded. Table 1 shows the response rates for ESS countries in Round

7 compared to Round 11. Post-stratification weighting should reduce the impact of this response rate decline. However, data users should always examine the sample composition of the countries included in the analyses to check for any issues. Details of response rates and key deviations found with particular questions are published on the ESS website, to allow data users to consider these when using the data and to report any further issues discovered as the data are explored in detail. Sixth, the time period of data collection differs between countries. The data collection was due to take place between March and December 2023 in all countries. However, as in previous rounds, the actual data collection periods deviate in some countries due to delays in funding confirmation or organizational or technical reasons. In fact, many countries in the final data release will have carried on into 2024. We note, seventh, that the significant public health relevance of social inequalities in health requires close monitoring of the living and working conditions of Europe's populations. For this purpose, the ESS provides excellent opportunities. However, the 10-year-interval between data collections (i.e., the time gap between the health inequalities modules wave 7 and -11) is clearly quite long. Preferably, monitoring of health inequalities should occur more regularly. This can be done either by increasing the frequency of the ESS Health Inequalities Module or by incorporating more health variables and social determinants into ESS's core questionnaire. This is especially important during times of rapid societal changes – as we have experienced the past years – due to digitalization, economic crises, migration, climate change, and geopolitical challenges. Furthermore, to investigate these rapid societal changes, the ESS Health Inequalities Module needs to be critically reviewed in order to include the most important and new emerging determinants of health (e.g. social media), and to enable intersectional analyses.

6. Conclusions

The repeated 2023/24 Health Inequalities Module of the European Social Survey (ESS) provides rich data on health and its social determinants of the general population across 31 European countries. Together with the first 2013/14 ESS Health Inequalities Module, it enables insights into stability and change of health inequalities in Europe. The two Health Inequalities Modules offer unique research opportunities and enable a deeper and more nuanced understanding of population health, health inequalities and their social determinants, and the impact of (changing) institutional arrangements. Research based on the modules could lead to better informed healthcare decisions and improved public health policies.

CRedit authorship contribution statement

Hanno Hoven: Writing – original draft, Conceptualization. **Terje Andreas Eikemo:** Writing – review & editing, Conceptualization. **Insa Backhaus-Hoven:** Writing – review & editing. **Andrea Riebler:** Writing – review & editing. **Rory Fitzgerald:** Writing – review & editing, survey design and data collection. **Sara Martino:** Writing – review & editing. **Tim Huijts:** Writing – review & editing. **Kristian Heggebø:** Writing – review & editing. **Pilar Vidaurre-Teixidó:** Writing – review & editing. **Clare Bambra:** Writing – review & editing. **Mirza Balaj:** Writing – review & editing.

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Data availability

ESS data can be downloaded from <https://www.europeansocialsurvey.org>.

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