Development of a cross-cultural deprivation index in five European countries

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ABSTRACT

Background Despite a concerted policy effort in Europe, social inequalities in health are a persistent problem. Developing a standardised measure of socioeconomic level across Europe will improve the understanding of the underlying mechanisms and causes of inequalities. This will facilitate developing, implementing and assessing new and more effective policies, and will improve the comparability and reproducibility of health inequality studies among countries. This paper presents the extension of the European Deprivation Index (EDI), a standardised measure first developed in France, to four other European countries—Italy, Portugal, Spain and England, using available 2001 and 1999 national census data.

Methods and Results The method previously tested and validated to construct the French EDI was used: first, an individual indicator for relative deprivation was constructed, defined by the minimal number of unmet fundamental needs associated with both objective (income) poverty and subjective poverty. Second, variables available at both individual (European survey) and aggregate (census) levels were identified. Third, an ecological deprivation index was constructed by selecting the set of weighted variables from the second step that best correlated with the individual deprivation indicator.

Conclusion For each country, the EDI is a weighted combination of aggregated variables from the national census that are most highly correlated with a country-specific individual deprivation indicator. This tool will improve both the historical and international comparability of studies, our understanding of the mechanisms underlying social inequalities in health, and implementation of intervention to tackle social inequalities in health.

INTRODUCTION

Tackling social inequalities in health is a persisting priority for international health authorities and for many national governments in Europe.[1] The level and nature of inequalities vary between countries according to the distribution of determinants of health inequalities. Along with increasing or decreasing trends in social inequalities, economic crises often quickly worsen inequalities. Measuring and comparing social inequalities in health between countries with different economies, social structures, and healthcare systems will facilitate developing more efficient policies to tackle social inequalities in health, and will increase our understanding of the underlying mechanisms and causes of social inequalities. Evidence-based health policies require reliable and accurate measures of a population's socioeconomic environment. From a European perspective, it is important that these measurements can be comparable or at least transferable between different European countries, despite their socio-cultural differences, in order to improve the comparability and reproducibility of health inequality studies across countries.

Townsend's pioneering work conceptualized poverty in terms of relative deprivation and has shaped subsequent research on the topic. It is the conceptual bedrock of what is now both a significant sub-disciplinary field and a focus of social policy across the developed world.[2] Deprivation refers to unmet need, which is caused by a lack of all kinds of resources, rather than financial needs alone, needs varying between societies and periods. A distinction has to be made between material and social deprivation. Material deprivation is easily measured with indicators relating to diet, health, clothing, housing, household facilities, environment and work.[3] Social deprivation is more difficult to measure. It has been described as providing a useful means of generalising the condition of those who do not or cannot enter into ordinary forms of family or other relationships.[4] By distinguishing between social and material deprivation, Townsend anticipated aspects of what might now be called 'social exclusion', and developed the theory of multiple deprivations as an accumulation of several types of deprivation.

Deprivation can also be categorised as objective or subjective. Objective deprivation relates to conditions, relationships, and behaviours, whereas subjective deprivation relates to

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attitudes or beliefs. Objective deprivation is perceived collectively or socially and is registered in the census; subjective deprivation is individually perceived and is assessed by questionnaire in specific surveys.[3, 4]

Because individual socioeconomic data are often absent or poorly collected in routine health databases, individual socioeconomic position can be assessed using socioeconomic characteristics of the place of residence. The ecological bias induced by this type of assessment is inevitable but it can be limited by the use of the smallest possible geographical scale.[5-7] Studies are therefore usually conducted with area-based measures developed from census data that are commonly known as ecological deprivation indices. These studies assess the impact of socio-economic characteristic of place of residence on health inequalities integrating composition and contextual effect.[8, 9]

Ecological deprivation indices were first developed in the early 1980s in the United Kingdom [3, 10, 11] , then in numerous countries across the world, including United States [12], Canada [13, 14], New Zealand [15] and more recently in Italy [16-18], France [19-22], Spain [23, 24], Sweden [25], Czech republic [26] and Denmark.[27] Since 2000, an index measuring multiple deprivation (IMD) at the small-area level became the official area deprivation index in the whole UK.[28-30] The approach used conceptualizes multiple deprivation as a composite of different dimensions or domains of deprivation as anticipated by Townsend. Index of Multiple Deprivations was also developed and used in Germany.[31, 32] According to data availability at individual or aggregated level, the type of poverty measured by theses indices and the approaches used to build them, vary widely making European and international comparisons difficult.

In a previous paper, we developed a method for constructing a small area level ecological deprivation index that is replicable in all European Union members, based on a European survey on deprivation (European Union Statistics on Income and Living Conditions: EU-SILC) and national census data [33] The previous paper provided the French version of this European Deprivation Index (EDI), which has since been used in several studies on social inequalities in cancer incidence [34] and screening uptake.[35]

An informal European network of English, French, Italian, Portuguese, and Spanish experts was created in 2012 to develop a comparable index measuring socioeconomic deprivation status across participant countries. In this paper, we present the EDI version developed for these five countries: Italy, Portugal, Spain, England and France.

MATERIALS AND METHODS

Data sources

1. Individual data: the EU-SILC common questionnaire framework

We used the EU-SILC (European Union Statistics on Income and Living Conditions - http://www.eui.eu/Research/Library/ResearchGuides/Economics/Statistics/DataPortal/EU-SILC.aspx) survey to obtain individual data to construct the indices. EU-SILC is a cross-sectional and longitudinal sample survey providing data on income, poverty, social exclusion and living conditions in the European Union. The common EU-SILC framework provides a recommended design for implementing EU-SILC, with common requirements (for imputation, weighting, sampling errors, and calculation), common concepts (household and income), and common classifications (ISCO: International Standard Classification of Occupations, NACE: Statistical Classification of Economic Activities, and ISCED: International Standard Classification of Education) aimed at maximising the comparability of the information produced. From these data, the statistical office of the European Union (Eurostat - http://ec.europa.eu/eurostat/web/main) produces a European standardised questionnaire that is specifically designed to study deprivation. It consists of nine questions common to European Union members evaluating needs that directly or indirectly induce financial inability. Only these individual data from the survey conducted in 2006, common to all European Union members, were used in this work.

For each European Union member, the sum of weights for the sample design and the response rate to a national questionnaire were tailored on the basis of the national population size. All analyses were weighted for non-response and adjusted for sample design to ensure the representativeness of the results for each member.

2. Ecological data: national population censuses

Ecological data came from the last exhaustive national population censuses which were conducted in 2001 for Italy (Italian National Institute of Statistics: ISTAT - http://www.istat.it/en/censuses), Portugal (National Institute of Statistics : INE-https://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE&xlang=en), Spain (National Institute of Statistics: INE - http://www.ine.es/en/welcome.shtml), and England (Office for national statistics: ONS - http://www.ons.gov.uk/ons/index.html), and in 1999 for France (National Institute for Statistics and Economic Studies: INSEE - http://www.insee.fr/fr/). To minimise the unavoidable ecological bias as much as possible [36-38], the smallest area for which census data were available was identified for each country (Table 1).

Table 1. Census population and smallest geographical units for the five European countries

	Total population	Year of Census	Smallest geographical unit	Average population per unit	N° of units
France	58,500,000	1999	IRIS[1]	2,000	50,000
Italy	57,000,000	2001	Census tracts	170	352,205
Portugal	10,500,000	2001	Census tract block groups	640	16,090
Spain	40,850,000	2001	Census tracts	1,000	34,300
England	59 950 000	2001	LSOA[2]	1,500	34,400

[1] IRIS = aggregated units for statistical information ,
[2] LSOA = Lower Super Output Areas

European Deprivation Index construction

EDI is based on the methodology first developed by sociologists in England [3, 39] that uses the concept of relative deprivation measured by fundamental needs associated with both objective (income) and subjective poverty. The full methodological and theoretical concepts have been reported previously.[33] The method of index construction was identical for each country, based on three steps and using first EU-SILC individual data and second data from each country census.

Step 1: Construction of an individual deprivation indicator

The first step was constructing an individual indicator for deprivation that was exclusively based on EU-SILC data for fundamental needs identification.

1.1 Selection of fundamental needs at the individual level

Needs directly inducing financial inability were assessed in the survey by questions formulated with the phrasing "ability to" or "capacity to" followed by fixed answer choices of "yes" or "no". Needs not directly inducing a financial inability were assessed with the formulation "Do you have…". At least 50% of households had to possess something for it to be considered a potential fundamental need. Among these pre-selected needs, the goods/services that less than 50% of households did not have because they could not afford them were considered as fundamental needs.

1.2 Selection of fundamental needs associated with both objective (income) and subjective poverty

Income poverty was directly available in the EU-SILC survey and subjective poverty was assessed by the "Ability to make ends meet" question in EU-SILC. This variable with 6 modalities of response (from "With great difficulty" to "Very easily") was dichotomised. The threshold at which a person felt 'poor' was determined by the best fit (highest Wald test's) of the relationship between income poverty and subjective poverty by univariable logistic regressions. Among the preselected fundamental needs those associated with both objective (income) poverty and subjective poverty were selected by multivariable logistic regressions. Selected fundamental needs are those for which the p-value was significant at the 5% level for both models.

1.3 Definition of an individual deprivation indicator

Then the individual deprivation indicator was defined by the minimal number of fundamental needs lacking by financial incapacity. The threshold of the number of lacking fundamental needs explaining both income poverty and subjective poverty was determined statistically by the best fit of the relationship between income poverty and subjective

poverty and the minimal lacking fundamental needs. This defined the individual deprivation indicator.

Step 2: Identification and dichotomisation of variables available both at aggregate (census) level and individual (EU-SILC) level

The second step was identifying the domains of variables available both at individual (EU-SILC survey) and aggregate levels (census) in each country. These variables were then dichotomised based on the results of logistic regression.

Step 3: Construction of an ecological deprivation index, the EDI

The third and final step was constructing an ecological deprivation index.

First, the univariable logistic regression model selected the variables of the step 2, that explained the individual indicator (p < .05) (step 1.3). These variables were then grouped together in a new model. The multivariable logistic regression facilitated the selection of the individual variables that were available in both the EU-SILC and National Census datasets, when they were associated with the EU-SILC individual deprivation indicator. As these selected variables were also available in the census data at the smallest level, we were able to build for each country the ecological deprivation index by using these variables. The regression coefficients associated with these selected variables in the final model became the weights of these variables measured at the aggregated level in the ecological index. The final index is the sum of these weighted variables.

RESULTS

Step 1: Construction of an individual deprivation indicator

1.1. Selection of fundamental needs at the individual level

In accordance with the concept of relative deprivation, we investigated how individuals define deprivation based on what they can or cannot afford in a specific societal and cultural context. Using EU-SILC household databases, a list of potential fundamental needs involving

"possession" was constructed. Their lack reflects deprivation in a specific cultural context (Table 2).

Table 2. Identification of fundamental needs (Proportion of households that indicated that specific goods and services were not within their means, EU-SILC survey 2006)

Type of needs	France	Italy	Portugal	Spain	England-Wales [1]
Eating a meal containing meat, fish, or the vegetarian equivalent once every two days	6.7%	6.2%	4.4%	4.0%	5.0%
Taking a week's annual holiday away from home	32.5%	38.7%	60.5%[2]	38.3%	22.7%
Using your own means to cover a necessary yet unplanned expense	34.1%	28.4%	18.2%	31.2%	28.8%
Keeping your house adequately warm	6.7%	10.4%	41.6%	9.3%	4.9%
Having a phone (including mobile phone)	0.9%	1.5%	5.4%	0.5%	0.2%
Having a colour TV	0.4%	0.5%	1.1%	0.1%	0.1%
Having a computer	8.3%	‡	‡	9.0%	5.7%
Having a washing machine	1.4%	0.8%	4.8%	0.4%	0.8%
Having a personal car	4.6%	3.8%	11.6%	4.8%	5.3%

(1) England and Wales could not be distinguished for these data
(2) Because >50% of Portugal's population cannot afford "to take a week's annual holiday away from home", this item is not considered a fundamental need.
‡ Because <50% of the households have a computer, this item is not considered a fundamental need.

Table 2 shows that the identified fundamental needs were similar across the countries, except "taking a week's annual holiday away from home" in Portugal and "having a computer" in Portugal and Italy, which were lacking in >50% of the population in these countries and thus were not treated as fundamental needs there.

1.2. Selection of fundamental needs associated with both objective (income) and subjective poverty

Objective poverty represents low income. An individual was considered poor when their household had a standard of living below 60% of the median national standard of living,

following the official Eurostat definition. The standard of living is equal to the net income of the household divided by the number of units of consumption.

In 2006, the poverty threshold per one consumption unit, independent of the size and structure of the household, was €800 in France, €728 in Italy, €341 in Portugal, €525 in Spain, and €876 in England. By this definition, the percentage of low-income households as identified in EU-SILC was 14.0% in France, 20.3% in Italy, 20.7% in Portugal, 21.3% in Spain, and 20.5% in England-Wales.

Because the concept of deprivation cannot be determined solely by income, subjective poverty was evaluated using the variable "Ability to make ends meet" (six modalities of response: 1. With great difficulty 2. With difficulty 3. With some difficulty 4. Fairly easily 5. Easily 6. Very easily) in EU-SILC survey. The cut-off point for each country, was 1 for Portugal, 2 for Italy, England-Wales and France, and 3 for Spain. This results show that the feeling of poverty varied between Latin countries, even for nearest countries as Spain and Portugal, reflecting the inter-countries cultural differences.

Table 3 shows the percentage of people reporting difficulty "making ends meet" according to country.

Table 3. Percentage of subjectively and objectively (income) poor households in France, Italy, Portugal, Spain and England

	Subjectively poor households	Objectively (income) poor households
France	16.0%	14.0%
Italy	34.7%	20.3%
Portugal	15.7%	20.7%
Spain	60.0%	21.3%
England-Wales*	13.3%	20.5%

* England and Wales could not be distinguished for these data

The most important inter-country difference in index construction was the much higher percentage of subjectively poor households in Spain. Among the previously identified fundamental needs (step 1.1), those associated with both objective and subjective poverty were selected by logistic regressions (Table 4).

Table 4. Selecting fundamental needs associated with both objective and subjective poverty in France, Italy, Portugal, Spain and England-Wales in 2006 using univariable and multivariable logistic regression (Symbol X).

	France	Italy	Portugal	Spain	England-Wales[*]
Eating a meal containing meat, fish, or the vegetarian equivalent once every two days	x		x		x
Taking a week's annual holiday away from home	x	x		x	x
Using your own means to cover a necessary yet unplanned expense	x	x	x	x	x
Keeping your house adequately warm	x	x	x		
Having a phone (including a mobile phone)			x		
Having a colour TV					
Having a computer				x	x
Having a washing machine					
Having a personal car		x	x		x

[*] England and Wales could not be distinguished for these data

Table 4 shows that fundamental needs associated with both objective and subjective poverty were partly shared in the focus countries. "Using your own means to cover a necessary yet unplanned expense" seemed to be a "European" fundamental need, while items about holidays, eating, warming the house, and having a personal car were shared by three countries or more. Colour TV and a washing machine were not relevant in any country. The number of fundamental needs associated with objective and subjective poverty (between four and five) was quite constant.

1.3. Definition of an individual deprivation indicator

A binary individual deprivation indicator was obtained by determining the best threshold for the number of fundamental needs unmet due to financial inability. The threshold best-fitting poverty in all countries was the lacking of two fundamental needs. Then, the households were defined as deprived only if they could not afford at least two of the country-specific fundamental needs.

Step 2: Identification and dichotomisation of variables available both at aggregate (census) level and individual (EU-SILC) level

The aggregated index, based on each country's available census data, must fit with the common individual deprivation index to the best possible degree. Therefore, in order to compute this index, for each country it was necessary to identify the variables that were available, phrased and coded in the same way in both the EU-SILC and census datasets. Six domains of deprivation were identified across all five European countries (Table 5).

Step 3: Construction of an ecological deprivation index, the EDI

For each country, EDI was derived from a weighted combination of aggregated variables from the national census. These variables were those best correlated with the individual deprivation indicator.

Table 5 shows variables selected for the ecological deprivation index for each country, which were variables associated with the binary individual deprivation indicator.

In the final model, the regression coefficients associated with the selected variables became the variables' weights measured at the aggregated level in the ecological index (Table 5). For each country, the weighted sum of these variables constituted an ecological measure.

Table 5. Weights (regression model coefficients) of variables selected for the ecological deprivation index (EDI) in Italy, Portugal, Spain and England from 2001 and 1999 from France census data.

Domains	Variables	France	Italy	Portugal	Spain	England
Social exclusion	Crime/vandalism				0.49	
	Foreign nationality	0.41				
Household data	Overcrowding*	0.21	0.83	0.40	0.99	0.95
	Single-parent household	1.00				1.35
	Household with ≥6 persons	0.97				
Basic amenities of housing	No bath or shower	0.71	2.08	0.06	1.33	
	No indoor flushing		0.56	1.46		
	No detached house					0.85
Home ownership	Non-owner§	1.02	1.07	1.19	0.73	1.46
Car	No car	0.71			1.74	0.83
Marital status	Not married		0.15		0.37	0.45
Year of birth /	Women aged ≥65 years		0.33	0.25		

Sex						
Employment status	Permanently disabled or/and unable to work					0.98
	Unemployed	0.94	1.18	0.37		
Education level	No higher education‡	1.17	1.07	1.29	1.30	0.31
Occupation	Status in employment : no self-employer with employees				0.95	
	Occupation : Low-income occupations†	0.57	0.19	0.01	0.62	0.39

*Overcrowding: "> 1 person per room", except for Portugal : "household with 6 rooms or more"

§Non-owner: "all non-owners" in France and Spain; "renters" in Italy and Portugal; "social renters" in the England.

‡No higher education: "no tertiary education" in France, Italy, Spain and the England; "primary education" in Portugal.

†Elementary occupations: "unskilled workers" in France and in Spain; "people in a different situation than employee" in Italy; "manual workers" in Portugal; "no business leaders/company managers/intermediate occupations" in England.

For the target countries, EDI was composed of 8–10 census variables. Four were shared in common: "overcrowding", "non-owner", "no higher education", and "low-income occupations". "Unemployed" was not a variable for the Spanish and English EDI, where working situation was represented by "no self-employer with employees" and "permanently disabled or/and unfit to work", respectively. One peculiarity of the composition of the Spanish EDI was the "crime/vandalism" census variable, which was not available in other censuses at the smallest level. Finally, because the domains of deprivation for which variables were available in both the EU-SILC survey and the national censuses were not shared in common in all five countries, and because the variables associated with the individual deprivation indicator were different among countries, the variables comprising the final deprivation index differed among countries. We obtained a country-specific index approximating individual deprivation indicators by the available census tract data. Although the variables differ among countries, the index was based on the same theoretical concept of relative poverty, and it was comparable across countries (Supplementary material 1).

Mapping of EDI

To develop more easily readable maps for Italy and Spain, EDI scores were computed (SAS 9.1 in France and England, R 3.0.1 in Spain, SPSS v21.0 in Portugal and SPSS v19.0 in Italy)

and mapped (ArcMap version 10.2.1) at the municipal level, while the Portugal and England maps are readable at the smallest level (census tract block groups and lower super output areas (LSOA). (Supplementary material 2).

DISCUSSION

This paper demonstrates that it was possible to construct an aggregate deprivation index at the small area level for five European countries (France, Italy, Spain, Portugal and England) based on the concept of relative deprivation. Using individual data common to all European members makes it possible to conduct European comparative studies.

The purpose of EDI is to measure the social environment in a comparable manner across countries, despite the differences in the census variables available, and to incorporate the social and cultural specificities concerning each country. The ecological deprivation indices are built according to shared methodological principles, by selecting fundamental needs associated with both objective and subjective poverty, and use the same theoretical concept of relative deprivation. The basis of this concept is that the experience of being deprived in a community is common to any culture or country, but that this deprivation may be produced by different mechanisms. The concept of relative deprivation [3] makes it possible to measure comparable social-economic status using variables that may differ in each country.

Another advantage of this index is that it can be calculated at the small area census level. Despite the differences in population size at this level across countries, it was possible to account for contextual factors. The indices are composed of weighted census elements because these best reflect country-specific individual experiences of deprivation.[40] At this purpose, the much higher proportion of subjectively poor households in Spain compared with the other countries could reflect a more diffuse perception of the effect of the anticipated (2006-2010) inner socio-economic crises on the family capability of affording fundamental needs.

The similarities observed between countries in different stages of development indicate that the impact of cultural differences may be less than expected. For instance, among the nine needs studied, fundamental needs were the same for all countries, except for "taking a week's annual holiday away from home" in Portugal, and "having a computer" in Portugal and Italy. Consequently, the final national deprivation indices are very similar. Among the 17 census variables that make up the five national indices, eight are shared by at least three indices, and four are shared by all indices. Italy and Portugal shared the same components for their indices, but "Not married" existed only in Italy. Only 3 variables are specific to one country: "Crime/Vandalism" and "No employer with employees" in Spain, "Foreign nationality" and "Household with at least 6 persons" in France, and "No detached house" and "Permanently disabled and/or unable to work" in England.

Exploratory studies must be conducted on the impact of heterogeneity of the size of geographical areas on comparability among countries. The geographical level of the census data varies widely, with a mean population ranging from 170 subjects per unit in Italy to 2000 subjects per unit in France. A dilution effect should be observed, caused by the greater population in larger units and the associated increase in social heterogeneity.[36] EDI can be computed at several geographical scales and sizes and can be harmonised across Europe. Further studies will be conducted to compare the ability of each country's EDI to correctly identify disadvantaged areas. One specific trait of EDI is that it assesses deprivation in the same way in urban and rural areas. However, health inequalities tend to be more marked in urban areas (especially in the England), as highlighted in the European project INEQ-CITIES.[41]

The EU-SILC survey data used was those from the survey conducted in 2006, which was the complete data available at the beginning of the study. Eurostat indicators analyses on monetary poverty, material deprivation and low work intensity show that the number of people at risk of poverty or social exclusion in the European union (28 members) was decreasing before the economic crisis to reached its lowest level in 2009 and grew again in the following years, marked by the economic crisis. The number of people living in severe material deprivation had thus increased in the majority of countries. (Eurostat website: http://ec.europa.eu/eurostat/statistics-

explained/index.php/Europe_2020_indicators_poverty_and_social_exclusion). According to these trends the present EDI version is likely to under-estimate the material deprivation. Thanks to its construction modalities, EDI is easily updated and can thus integrate such recent trends in further versions. Since EU-SILC survey data is renewed annually, the frequency of EDI upgrading could be annual even if the census frequency is multiannual in certain European countries.

Beyond intra-country validation by comparison with other available indices, the major advantage of an index like EDI is that it provides not only a powerful tool in each country, but since it is constructed from one European study using the same questionnaire, it also constitute a cross-cultural tool for conducting relevant international comparisons on social inequities in health. Another strength of these indices is their ability to be replicable over time and adaptable to the available data, thanks to the dynamic cohort in the EU-SILC survey.

Because the EU-SILC survey is available for all members of the European community, EDI should be constructed for all 28 members. EDI will produce an improved understanding of the mechanisms underlying health inequalities while accounting for the cultural and historical context of each country. Developing a standardised EDI across Europe will allow European comparative studies to be undertaken and replicated over time and space. From a pragmatic point of view, EDI can be used to investigate links between socioeconomic environment and health in all fields where health data are available at aggregated level and comparable from one country to another. Many studies on deprivation and mortality data as health indicator have been developed in European countries [17, 42, 43] but no comparison between countries have been done. Cancer for which registries are already organized in a European network could be the first field for application of EDI.[34] Moreover, EDI is a useful tool for targeting public health interventions at socioeconomically deprived individuals. For example, persisting, wide socioeconomic inequalities in cancer survival have been observed in many countries where their healthcare system is based on universal free access and equity principles. Mechanisms underlying these inequalities remain poorly understood and international comparisons may enlighten the origins of these challenging inequalities. EDI can provide technical support to assist EU member states in implementing and

strengthening patient and community empowerment policies, strategies and programs, including guidance on how to reach those groups and individuals who are most likely to be disadvantaged, as recommended in World Health Organization-Europe plans for 2012–2016.

What is already known on this subject?

- Studying social inequalities in health requires the ability to measure them accurately, to compare them between different areas or countries, and to follow trends over time.
- Several European countries have already developed ecological deprivation indices; however, the approaches used to generate such indices vary widely, making international comparison difficult.
- To address this issue, a European transnational ecological deprivation index at the small area level has recently been developed in France: the French version of EDI.

What this study adds?

- This study shows that a small area level European deprivation index could be developed. By the concept and methods of construction, this index is likely to be replicable across Europe and able to be updated flexibly annually. We argue that the EDI provides the focus and comparability required for studying social inequalities in health.
- The development of EDI across Europe contributes to the priorities of Horizon 2020 and World Health Organization-Europe recommendations by facilitating comparative analyses of public health systems and research on the specifics and evolution of social inequalities in health. The potential effectiveness of new policies informed by EDI data at reducing inequalities in health will help to create greater fairness and equality in healthcare systems throughout the EU.

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CP conducts the study, and monitoring across all participants. EG wrote the manuscript. All authors reviewed and approved the final version of the manuscript.

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