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Article

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Contemporary Economics

Provided in Cooperation with:

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Suggested Citation: Węziak-Białowolska-Białowolska, Dorota (2015) : Poverty in the regions of the European Union: Measurement with a composite indicator, Contemporary Economics, ISSN 2084-0845, Vizja Press & IT, Warsaw, Vol. 9, Iss. 2, pp. 113-154, <https://doi.org/10.5709/ce.1897-9254.163>

This Version is available at:

<https://hdl.handle.net/10419/141901>

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Primary submission: 21.07.2014 | Final acceptance: 23.02.2015

Poverty in the regions of the European Union – measurement with a composite indicator

Dorota Węziak-Białowska¹

ABSTRACT

We measure area-specific human poverty in the European Union (EU) at the second level of the nomenclature of territorial units for statistics (NUTS 2). We construct a regional human poverty index (RHPI), which comprises four dimensions: social exclusion, knowledge, a decent standard of living, and a long and healthy life. The RHPI provides information regarding the relative standing of a given country with respect to its level of poverty and shows the variability of poverty within a country with respect to NUTS 2. The RHPI shows satisfactory statistical coherence, confirmed by the results of correlation analysis and a principal component analysis. As confirmed by an uncertainty analysis, the RHPI also shows satisfactory robustness to the normative assumptions made during the construction process.

The RHPI is computed for all NUTS 2 regions in 28 EU countries. Our results show that the poverty scale differs considerably among EU countries, with RHPI scores ranging between 9.23 for Prague and more than 65 for Bulgarian Yugoiztochen and Severozapaden. We also find that substantial differences in levels of poverty between regions are present in all EU countries. The only exceptions to this finding are small EU countries where neither NUTS 1 nor NUTS 2 regions exist.

KEY WORDS: composite indicator, European Union, NUTS, poverty, uncertainty analysis

JEL Classification: I32

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1 Introduction

In 2012, 124.5 million people, or 24.8% of the European Union (EU) population, were at risk of poverty or social exclusion, compared with 24.3% in 2011 (Eurostat, 2013). These numbers change considerably when poverty is analyzed between countries, age groups, and genders, and especially when the sub-national di-

mension is taken into account. However, information about the distribution of different types of poverty at the sub-national level remains limited, which seems surprising because EU regions, not countries, are the key focus of the EU's regional policy (Becker, Egger, & von Ehrlich, 2010). Understanding local differences in poverty and social exclusion are essential to adequately targeting policies, alleviating the causes of poverty, and mitigating the consequences of poverty.

The measure of poverty officially used in the EU, the 'at risk of poverty or social exclusion' (AROPE) rate, combines both income and non-income indica-

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tors. It is reported not only at the country level but also for different levels of the nomenclature of territorial units for statistics (NUTS) and for areas differently defined with respect to population density. Nevertheless, the AROPE rate is not reported consistently for all countries. Namely, sub-national estimates of the AROPE rate are not available for several large countries, including Germany and the United Kingdom. With this knowledge, it seems reasonable to provide a composite measure of poverty that, in combination with the AROPE rate, will enable better identification of the NUTS 2 regions where aid is most needed.

Therefore, inspired by the Human Poverty Index (HPI) (UNDP, 2007), which measured human poverty between countries, we provide information in this study on the level of human poverty at the sub-national level (NUTS 2). This information is presented in the form of the Regional Human Poverty Index (RHPI), which comprises four dimensions: a long and healthy life, standard of living, knowledge, and social exclusion. Additionally, we show the results of the uncertainty analysis performed with respect to the scores and ranks of the RHPI to show the possible volatility of our results.

The approach we propose has three useful properties. First, the RHPI comprises only six indicators, which makes it relatively simple to replicate. Second, the RHPI takes into account both monetary and non-monetary perspectives in the poverty measurement. Third, the RHPI not only provides information about the absolute magnitude of human poverty experienced by Europeans in a given country and the relative standing of the country but also shows the variability of human poverty within a country with respect to NUTS 2.

The RHPI also has some limitations. First, the conceptual model of the RHPI corresponds mostly to the conceptualization of HPI and, thus, to the Human Development Index (HDI) proposed by the UNDP (UNDP, 2007) and the availability of indicators at the NUTS 2 level. Second, although research on poverty has developed rapidly in recent years, there is currently no research on the “one-size-fits-all” weights that could be applied in all circumstances; therefore, we apply a weighting scheme resulting from the importance analysis, assuming the equal importance of dimensions.

In the following sections, we first present the concept of poverty with a focus on the multidimensional measurement. Second, we shortly describe the HPI proposed by UNDP (UNDP, 2007). Third, the conceptualization of our approach to poverty measurement is discussed. Fourth, the methods used to construct a composite indicator of poverty are presented. The results section follows, and the final section concludes the paper.

2 Concept of poverty

Poverty both in relative terms, compared to other people in society, and in absolute terms, whether people enjoy life's basic necessities, is a reflection of whether people “have insufficient command of resources over time” (Gordon, 2006, p. 32). However, numerous studies on the notion of poverty show not only that is this concept understood differently in different contexts but also that there are many distinct approaches to the conceptualization of this notion. To list only a few, Wagle (2008) and Saunders (2005) enumerate three main approaches to the conceptualization and operationalization of poverty: (1) economic well-being, (2) capability and (3) social inclusion. However, Stewart, Ruggeri Laderchi and Saith (2007) propose a classification of (1) monetary poverty, (2) a capability approach, (3) social exclusion and (4) a participatory approach. Finally, Gordon (2006) proposes discerning (1) income poverty, (2) subjective poverty and (3) consensual poverty resulting from low income and a low standard of living.

Alternatively, Foster (1998), Hagenaars and de Vos (1988) and Lok-Dessallien (2000), among others, report that types of poverty can be expressed in

- absolute terms, meaning that poverty entails having less than an objectively defined, absolute minimum,
- relative terms, meaning that poverty entails having less than others in society, and
- self-assessed terms, meaning that poverty is a feeling that you do not have enough to get by.

More information about approaches to the measurement of poverty can be found in Callander, Schofield and Shrestha (2012), Dini and Lippit (2009), Lok-Dessallien (2000), among others.

It is worth noting that poverty is often conceptualized as a multidimensional concept. For example, Al-

kire and Santos (2013), Weziak-Białowolska (2014), Whelan, Nolan and Maitre (2014) propose to include dimensions such as health, education and living standard – which are all non-income based – in a multidimensional poverty index. However, multidimensional poverty measures may comprise income- and non-income-related types of indicators because, as Bourguignon and Chakravarty (2003, p. 26) state, “a genuine measure of poverty should depend on income indicators as well as non-income indicators that may help in identifying aspects of welfare not captured by incomes.” Examples of such an approach are the UNDP’s HPI-2 developed for the developed OECD countries or the EU’s AROPE rate, which comprise – in combination with the income-based poverty rate – indicators of material deprivation and social exclusion.

It is worth mentioning, however, that the only example of poverty measurement performed on a unidimensional basis is income poverty. Nevertheless, even in this case, the available measures of poverty are sufficient to show it from different perspectives (see Foster, Greer, & Thorbecke, 1984; 2010).

Even if there are many studies on poverty, it must be noted that most such analyses focusing on its sub-national differentiation are often limited to a single country. For example, McNamara, Tanton, & Phillips (2006), Miranti et al. (2011), Tanton, Harding and McNamara (2010) conduct analyses of Australia. Hutto et al. (2011), Jolliffe (2006), and Ziliak (2010) analyze poverty among US states. Pittau, Zelli and Massari (2011) are interested in poverty distribution between Italian regions, and Kemeny and Storper (2012) investigate poverty within American cities. Therefore, in this study, we attempt to address this gap by investigating the sub-national variability of human poverty in the EU.

3 UNDP Human Poverty Index

The HPI was developed by the UNDP to complement the Human Development Index and was first reported as part of the Human Development Report in 1997. It served as an additional indicator of the standard of living in a country, measuring human poverty. However, in 2010, the HPI was substituted with the UNDP’s Multidimensional Poverty Index (UNDP, 2013). Nevertheless, before 2010, the HPI was computed separately for

developing countries (HPI-1) and developed countries (HPI-2) (UNDP, 2007). The conceptual features of the HPI are broadly presented in Anand and Sen (1997).

The HPI-1 is defined as “a composite index measuring deprivations in the three basic dimensions captured in the human development index — a long and healthy life, knowledge and a decent standard of living” (UNDP, 2007). The HPI-1 is calculated as the generalized mean of power 3 and takes the following form:

$$HPI-1 = \left[\frac{1}{3} (P_1^3 + P_2^3 + P_3^3) \right]^{\frac{1}{3}},$$

where

P_1 - Probability at birth of not surviving to age 40,

P_2 - Adult illiteracy rate,

P_3 - Unweighted average of population without sustainable access to an improved water source and children who are underweight for their age.

The HPI-2 is defined as “a composite index measuring deprivations in the four basic dimensions captured in the human development index — a long and healthy life, knowledge and a decent standard of living — and also capturing social exclusion” (UNDP, 2007). The formula for calculating the HPI-2 is again the generalized mean of power 3, as follows:

$$HPI-2 = \left[\frac{1}{4} (P_1^3 + P_2^3 + P_3^3 + P_4^3) \right]^{\frac{1}{3}},$$

where

P_1 - Probability at birth of not surviving to age 60,

P_2 - Adults lacking functional literacy skills,

P_3 - Population below the income poverty line (50% of median adjusted household disposable income¹),

P_4 - Rate of long-term unemployment (lasting 12 months or more).

4 Conceptualization of the Regional Human Poverty Index

In this study, we aim to measure area-specific human poverty in the EU. To this end, we propose measuring human poverty at the sub-national level defined by NUTS 2. The measurement of human poverty is carried out with the use of the UNDP’s approach, namely, the Human Poverty Index for developed countries (HPI-2) (UNDP, 2007). Although the index is currently not computed, we adopt this approach following

Table 1. Comparison of indicators used in the UNDP's approach and in the RHPI

Dimension	Indicators of the HPI-2 by the UN	Indicators of the RHPI	Definition of the indicator of the RHPI
Long and healthy life	P ₁ – Probability at birth of not surviving to age 60 (times 100)	I ₁ – Life expectancy at birth (Eurostat, 2010-2012)	Life expectancy at a given age represents the average number of years of life remaining if a group of persons at that age were to experience the mortality rates for a particular year over the course of their remaining life. Life expectancy at birth is a summary measure of the age-specific all-cause mortality rates in an area in a given period
		I ₂ – Infant mortality rate (Eurostat, 2010-2012)	The number of deaths of infants (younger than one year of age at death) per 1,000 live births (based on one year data)
Knowledge	P ₂ – Adults lacking functional literacy skills	I ₃ – Percentage of population aged 25-64 with low educational attainment (Eurostat, 2011-2013)	The percentage of people aged 25 to 64 with an education level ISCED (International Standard Classification of Education) of 2 or less. ISCED levels 0-2: pre-primary, primary and lower secondary education
		I ₄ – Percentage of population aged 18-24 neither employed nor in education or training (NEET) (Eurostat, 2011-2013)	Youth (aged 18-24) who are either unemployed or inactive and who do not participate in any education or training
Poverty			
Decent standard of living	P ₄ – Rate of long-term unemployment (lasting 12 months or more)	I ₅ – Long-term unemployment rate (Eurostat, 2011-2013)	Persons unemployed for more than 12 months as a percentage of the labor force based on the International Labour Office (ILO) definition. The labor force is the total number of people employed and unemployed. Unemployed persons comprise persons aged 15 to 74 who (1) are without work during the reference week; (2) are available to start work within the next two weeks; (3) and have been actively seeking work in the past four weeks or had already found a job to start within the next three months.
Social exclusion	P ₂ – Population below the income poverty line (50% of median adjusted household disposable income)	I ₆ – Percentage of population below the income poverty line (60% of median adjusted household disposable income) (Eurostat, 2010-2012)	Persons at risk of poverty are those living in a household with an equivalized disposable income below the risk-of-poverty threshold, which is set at 60% of the national median equivalized disposable income (after social transfers). The equivalized income is calculated by dividing the total household income by its size determined after applying the following weights: 1.0 to the first adult, 0.5 to each other household member aged 14 or over and 0.3 to each household member aged less than 14 years old

Bubbico and Dijkstra (2011), who measured human poverty in the EU at the NUTS 2 level in 2007/2008. The changes that we introduce are in the set of indicators. Those used in the approach of the UNDP are neither appropriate nor available at the NUTS 2 level for the EU. On the other hand, indicators proposed by Bubbico and Dijkstra (2011) did not satisfy all statistical requirements of the construction of the composite indicators suggested by JRC-OECD (2008). At this point, it must also be noted that our objective is, on one hand, to keep the index simple, i.e., with a limited number of indicators, but with both income and non-income related indicators included and, on the other hand, to construct a statistically sound composite indicator. It should be noted, however, that lack of internal coherence of index components might subsequently lead to problems with intertemporal comparisons of index values as shown by Białowolski (2014).

In our approach, the composite measure of poverty is assumed to have the following dimensions: a long and healthy life, knowledge, a decent standard of living, and social exclusion, which are summarized and fitted into a composite indicator, namely, the RHPI. The dimensions are populated using indicators published by Eurostat and publicly available in the Eurostat database. The final set of indicators with the definitions provided by Eurostat and the time span are presented in Table 1. The spatial distribution of poverty with respect to each poverty dimension at NUTS 2 in the EU is presented in Figures A1–A4 in the Appendix.

To eliminate the risk of unexpected transitions or outliers in the data series, we calculate the moving average of the last three available data points in the series. Therefore, the data mostly cover the period of 2010–2012 or that of 2011–2013.

5 Methods

Our index was based on data with satisfactory coverage, namely, 98.5% of data were available. Missing values were spotted in three out of six indicators, namely, in the percentage of the population aged 18–24 neither employed nor in education or training (I_4), the long-term unemployment rate (I_5), and the percentage of the population below the income poverty line (I_6). The missing data present in our dataset were imputed using an expected maximization algorithm (Rubin, 1987; Schafer, 1997). The imputations were based on

the indicators of the RHPI (see Table 1) and one additional variable, namely, early leavers from education and training, which is expressed as a percentage of the population aged 18–24. In total, 24 of 1,620 values were imputed.

The following step detected outliers. We decided to perform this step because outliers may artificially introduce spurious variability to the data, as clearly stated by JRC-OECD (2008) or implemented in a multi-dimensional case by Białowolski and Węziak-Białowolska (2014). We applied a combination of two criteria. For each indicator, we checked if the distribution of an indicator is characterized by skewness > 2 and kurtosis > 3.5 (Dybczyński, 1980; Velasco & Verma, 1998), indicating the lack of a normal distribution and the presence of outliers. Using this criterion, the possible presence of outliers was found only with respect to one indicator, infant mortality (I_1). However, an analysis of the histogram revealed that no observation stands out. Therefore, no outlier treatment was conducted.

The data were then normalized to the range of 1 to 100 using the min-max method, with the minimum and maximum values taken from the dataset and with 100 meaning the worst observable score (the highest deprivation/human poverty) and 1 meaning the best observable score (the lowest deprivation/human poverty). This type of aggregation implied that the orientation of the indicators was such that the higher the score, the worse the situation with respect to human poverty. The normalized indicators belonging to the same dimension were averaged using the arithmetic mean. In this way, dimension scores for “long and healthy life” and “knowledge” were obtained.

In the next step, we verified the underlying structure of the RHPI data. Because we assumed that the RHPI is more formative than reflective in nature, principal component analysis (PCA) was employed. However, we would like to underline that the PCA was not used to calculate the RHPI scores.

Our criteria for component extraction were based on the Keiser-Mayer-Olkin statistic (KMO), which was expected to be above 0.5; the Keiser criterion (i.e., only one eigenvalue above 1); the amount of variance explained and the pattern of principal component loadings. The results of the PCA confirm the one-dimensionality of the RHPI. Namely, the KMO

Table 2. Importance measures and weights for the RHPI

RHPI dimension	Kernel estimates of the Pearson correlation ratio*	Weights used in the computation of the RHPI	Importance of the dimension assuming the weights from column (3)	Squared correlation coefficient (R ²) rescaled unity sum between the RHPI scores and dimension
(1)	(2)	(3)	(4)	(5)
Long and healthy life	0.4463	0.45	0.264	0.257
Knowledge	0.3046	0.30	0.243	0.246
Decent standard of living	0.1535	0.15	0.244	0.247
Social exclusion	0.0956	0.10	0.249	0.250

Note: * as in Paruolo et al. (2013)

amounted to 0.658, the first eigenvalue amounted to 2.342, the first principal component explained 58.54% of the variance observed in the four indicators, and all loadings related to the first principal component were positive (detailed results are presented in Table A1 in the Appendix).

Having confirmed the one-dimensionality of the RHPI, we aggregated variables into the RHPI. As the RHPI dimensions are believed to be non-compensatory in nature, which implies that an improvement in one dimension cannot fully compensate for equal deterioration in another dimension, we employed a generalized mean with power 0.5. This aggregation method ensures that the compensation of low results in one dimension with high results in others is only partial (Decancq & Lugo, 2013; Ruiz, 2011). Using this approach also means that a rise in the lower tail of the distribution of any variable will improve the composite indicator more than a similar increase in the upper tail. This approach is consistent with recent developments in the field: it has been used to compute the Human Development Index (HDI) since 2010 (Klugman, Rodríguez, & Choi, 2011) and the Material Condition Index proposed by Ruiz (2011) for the OECD.

The generalized mean with power 0.5 is in between the arithmetic mean (i.e., the generalized mean with power 1) and the geometric mean (the generalized mean with power 0). The former allows for full compensation of the results. Although the latter is not fully

compensatory, we acknowledged that the penalization on compensability it imposes and the extent to which it rewards improvements in low scores are too high. The influence of this strong assumption on the results was verified through uncertainty analysis (Saisana, Saltelli, & Tarantola, 2005) (section 7).

We also aimed for the RHPI to be statistically well balanced, implying that the importance of dimensions in the index was relatively equal. We wanted each of four dimensions to explain 25% of the total variation in the RHPI scores. To this end, in the aggregation process, we applied the weighting scheme resulting from the analysis of the “main effect,” also known as the correlation ratio or first-order sensitivity measure (Saltelli et al., 2008). This measure, as argued by Paruolo, Saisana and Saltelli (2013), offers a precise definition of importance, i.e., “the expected reduction in variance of the composite indicator that would be obtained if a variable could be fixed.” Although the weights we used seem unequal when expressed in the nominal terms, they ensured the equal contribution of each dimension in the aggregating formula toward explaining the total variation in the RHPI scores (more about the relationship between the explicit and normative weights can be found in Paruolo et al. (2013)). The final weights applied, the kernel estimates of the Pearson correlation ratio and the squared correlation coefficients measuring the relative input of each dimension into the variability of RHPI scores are presented in Table 2. These squared

correlation coefficients are almost even, confirming the aforementioned equal contribution of each of the dimensions to the RHPI scores.

Finally, to assess the robustness of the RHPI with regard to the normative assumption related to compensability that was made during the conceptualization step, we performed an uncertainty analysis. The aim of this analysis was to measure the overall variation in RHPI scores and ranks resulting from the uncertainty linked to the assumption about the power of the generalized mean. To verify the assumption, we modified the power of the generalized mean, which was allowed to range between 0 and 1, implying that we tested an influence of the range of the generalized means from the arithmetic to geometric means on the RHPI scores and ranks. In particular, in the uncertainty analysis, its values were sampled from the uniform distribution $U[0; 1]$. As a result, the final scores of the RHPI were presented with uncertainty expressed by the error terms (please see Figure 3 and Figure 4 as well as Table A5 in the Appendix).

6 Spatial distribution of the RHPI

When taking into consideration country-level estimates of the RHPI (see Figure 1 and Table A3 in the Appendix), we can definitively observe that the best-scoring country (with the lowest poverty level expressed by the lowest RHPI score) is Sweden (RHPI of 16.6), followed by Austria, Finland, and the Netherlands, which all have RHPI scores below 20. Germany, the Czech Republic, Luxembourg, Slovenia, Denmark, and France follow, with RHPI scores ranging between 20 and 25. A moderate situation is observed in Belgium, Cyprus, the United Kingdom, and Italy, where RHPI scores range from 25 to 30, and in Ireland, Poland, Spain, and Estonia, with RHPI scores between 30 and 35. Worse situations with respect to human poverty, as measured by the RHPI at the country level, exist in three Southern European countries, namely, Malta, Portugal, and Greece, and in two Central and Eastern European countries: Slovakia and Hungary. The worst situations are recorded in Lithuania, Croatia, Latvia, Romania, and Bulgaria, with RHPI scores exceeding 40.

With regard to NUTS 2 (see Figures 1 and 2 and Table A4 in the Appendix), even larger dissimilarities are observed. Namely, Prague, the Finnish is-

land of Aland, the German cities of Oberbayern and Freiburg, and Stockholm are the best-scoring in terms of NUTS 2, according to the RHPI. By contrast, the ten worst-scoring NUTS 2 regions include (apart from most Bulgarian and Romanian regions) two overseas French regions (Reunion and Guyana), one autonomous Portuguese region (Acores) and one autonomous Spanish region (Ceuta). An analysis of the spatial distribution of poverty in the EU (see Figure 2) showed that the best situations with respect to human poverty exist in most German, Swedish, and Austrian regions. The worst situations exist in most regions of the Central and Eastern European countries and in the most southern regions of the Southern European countries.

It was expected that especially large countries with many NUTS 2 regions would demonstrate higher dissimilarities with respect to poverty. Our results confirm this assumption. The differences in RHPI scores between the lowest- and highest-scoring NUTS regions amounted to more than 40 points in Spain and France and slightly below 40 points in Italy. It must be noted, however, that in smaller countries, differences in terms of poverty are also present. Namely, differences of 40 points between the best- and the worst-scoring NUTS 2 regions exist for Bulgaria and Romania. In the case of the Czech Republic, Portugal, Slovakia, and Hungary, the difference is almost 30 points, and in the case of Germany, Belgium, the United Kingdom, and Greece, it amounts to approximately 20 points. Surprisingly, a small difference in RHPI scores amounting to approximately 12 points was observed for Poland. Nevertheless, our results imply that considerable differences in poverty levels are observed in all countries that are sufficiently large to comprise NUTS 2 regions and, therefore, that poverty-related country rankings may be misleading because there may be a considerable variation in human poverty within a country.

Our results also show that in NUTS 2 regions comprising a capital, the poverty level is generally lower than the country average. Namely, Bucharest, Sofia, Bratislava, Prague, Budapest, and Madrid exhibit decisively lower levels of poverty than their country averages. The only exceptions are Vienna, Brussels, and Berlin, where poverty measured by the RHPI is higher than the country average. Such results may be

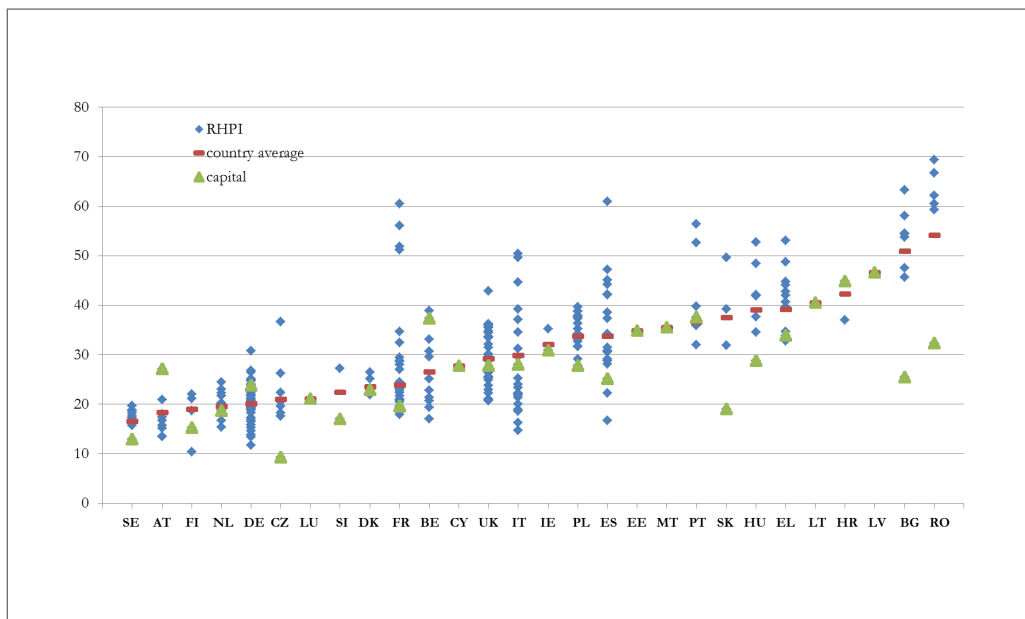


Figure 1. Poverty in the European Union – scores of the RHPI at the NUTS 2 and country levels

related to the issue of immigration. It is known that well-developed countries, especially those with open labor markets and relatively healthy economies, are attractive to immigrants, who most often settle in large cities. Such behavior seems natural because in large cities, there are more opportunities for a better quality of life. Nevertheless, immigrants are often poor and comprise small and closed local communities, bringing about an increase in social and material inequality.

Additionally, we observed that Prague and Stockholm are among the top-ten performers, and the lowest-scoring capital – Bruxelles – scored 210 when all NUTS 2 regions were analyzed. Prague exhibited such high performance mainly because it achieved the best and the second-best scores with respect to knowledge and social exclusion, respectively, as well as the eighth-best score with respect to a decent standard of living. Stockholm was also among the best performers, especially regarding a long and healthy life and social exclusion. The relatively poor performance of Bruxelles is due in particular to its poor

performance in social exclusion (the 13th worst score) and decent standard of living (the 30th worst score).

Distinctive results related to the capital regions seem to be in line with the findings of other researchers. For example, Athanasoglou and Dijkstra (2014) find not only that four EU capital regions – Prague, Bratislava, Helsinki and Stockholm – are among the top ten NUTS 2 regions with respect to the Europe 2020 index, which they proposed, but also that capital regions score the best or are among the best performers in almost all EU countries. The only exception to this regularity is Bruxelles, which performed the worst among all Belgian regions. Athanasoglou and Dijkstra (2014) explain, however, that this poor performance is mainly driven by poor performance with respect to employment and poverty: the two factors that are also taken into account in the RHPI. Then, Annoni and Dijkstra (2013) show that according to the competitiveness measured by the Regional Competitiveness Index (RCI) 2013, a polycentric pattern with strong capital and metropolitan regions in many parts of Europe can be observed.

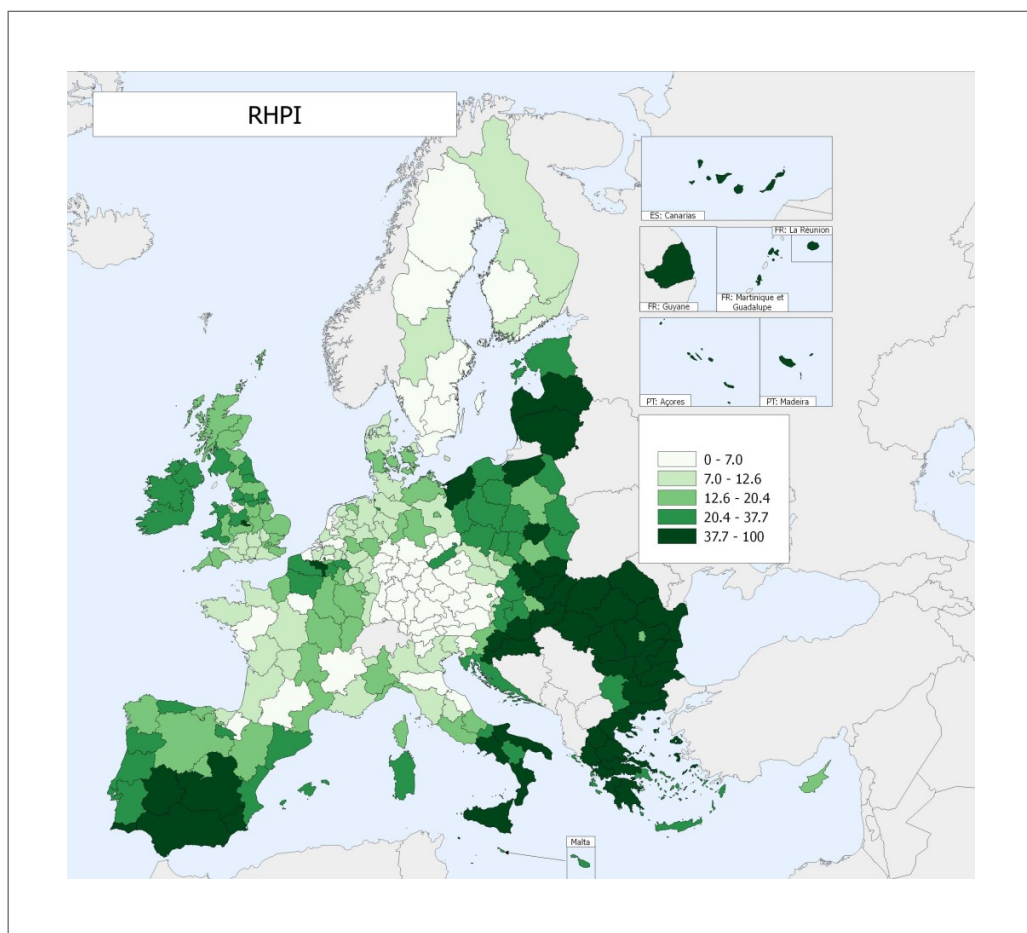


Figure 2. Spatial distribution of poverty in the European Union

Note: Thresholds correspond to quintiles; the darker the color, the worse the conditions

7 Results of an uncertainty analysis

An uncertainty analysis was performed to assess the influence of the power of the generalized mean separately on the scores and ranks of the RHPI. The analysis revealed that the RHPI ranks and scores are considerably robust to the strength of compensability among the dimensions (detailed results are provided in Table A5 in the Appendix). However, it must be noted that changes in the power value led to some modifications in the index scores and ranks, especially in cases of unequal performance with respect to all dimensions.

In particular, with regard to ranks, we verified the difference between the median simulated score and the reference rank. The maximum observed difference amounted to 2, which corresponds to 0.74% of the maximum possible shift in rank. The length of the 90% confidence interval, constructed as the 5th and 95th percentiles of the simulated ranks, was then analyzed. It appeared that in only 14 cases (noted in Figure 3) did the length of this interval exceed 20 positions (i.e., 7.4% of the maximum possible shift in ranks). The largest fluctuations in terms of ranks were recorded for the best-scoring Romanian region (i.e., the capital

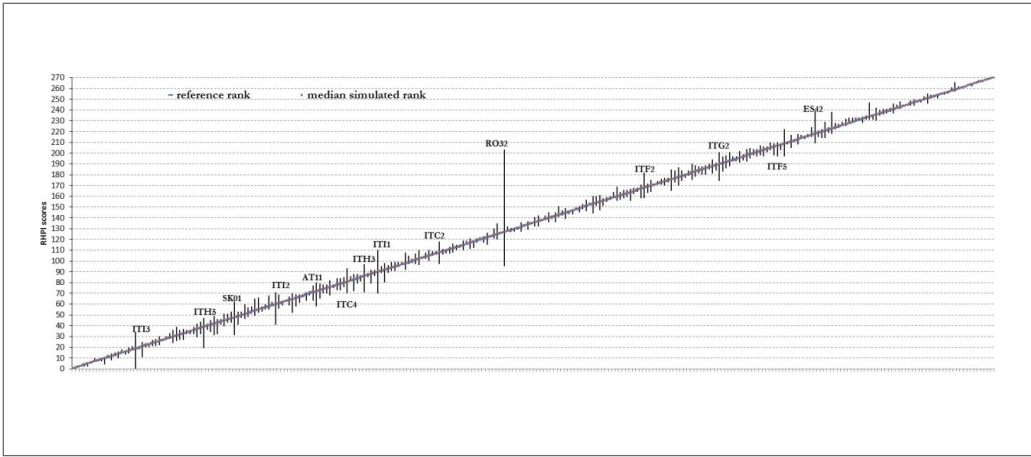


Figure 3. Results of uncertainty analysis – reference ranks, median simulated ranks, and 90% confidence intervals

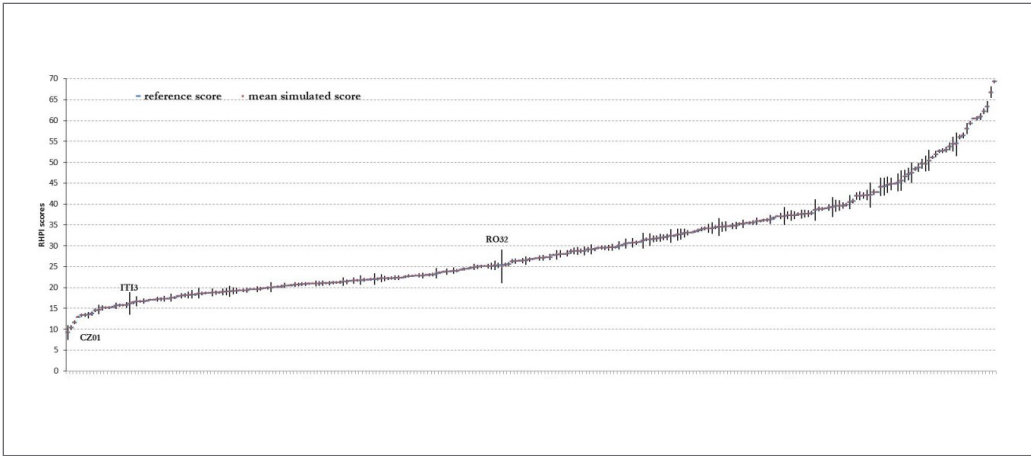


Figure 4. Results of the uncertainty analysis – reference scores, mean simulated scores, and mean±SD confidence intervals

region), which scored very well with respect to a decent standard of living (the best result of all NUTS 2) and social exclusion (29th of all NUTS 2) but also very poorly in terms of health (245th of all NUTS 2).

Regarding the uncertainty analysis of the RHPI scores, we analyzed the difference between the mean simulated scores and the reference scores. It appeared that in all cases, they were similar. The variation coefficients were then examined. This analysis confirmed low variation of RHPI scores. In only three out of 270 cases (noted in Figure 4) did the coefficient of variation exceed 10%.

8 Conclusions

In this study, we attempted to measure area-specific human poverty in the European Union (EU). First, we adapted the conceptual model of this phenomenon proposed by the UNDP to the area of interest, namely, the NUTS 2 regions of the EU. Following the UNDP’s (2007) conceptualization, we decided to keep the four-dimensional structure of the composite indicator measuring human poverty comprising a long and healthy life, knowledge, a decent standard of living, and social exclusion dimensions. After taking data availability into

consideration, we summarized and fitted the dimensions of human poverty into a composite indicator, namely, the Regional Human Poverty Index (RHPI).

The RHPI was computed for 28 EU countries. Our results show that levels of poverty in the EU range from 9 to almost 70 RHPI points, with Sweden scoring unequivocally the best and Latvia, Bulgaria, and Romania scoring the worst. We also found that considerable differences in levels of poverty exist in all EU countries sufficiently large to have NUTS 2.

The RHPI has some limitations. When computing the RHPI, we had to make a certain assumption about the compensability rate between RHPI dimensions captured by the power of the generalized mean. Although the RHPI turned out to be quite robust to this assumption, we also observed that changes in the strength of compensation among dimensions led to some modifications in the index scores and ranks.

Data citation and disclaimer

The responsibility for all results and conclusions presented in this study lies entirely with the author.

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Endnotes

- ¹ Household net-adjusted disposable income is the amount of money that a household earns, or gains, each year after taxes and social transfers in kind. It represents the money available to a household for spending on goods or services.

Appendix

Table A1. The PCA results

Dimension	Communalities	Loadings of the first PC
Health	0.084	0.291
Knowledge	0.788	0.888
Decent standard of living	0.682	0.826
Social exclusion	0.787	0.887
KMO 0.658		
Eigenvalues 2.342 0.989 0.450 0.219		
Variance explained by the first principal component 58.54%		

Table A2. Correlations

	Health	Knowledge	Decent standard of living	Social exclusion	RHPI
Health	1				0.722
Knowledge	0.046	1			0.692
Decent standard of living	0.246	0.605	1		0.694
Social exclusion	0.164	0.764	0.562	1	0.701

Table A3. The RHPI scores and ranks at the country level

Code	Country	RHPI score	RHPI rank
AT	Austria	18.39	2
BE	Belgium	26.57	11
BG	Bulgaria	54.24	28
CY	Cyprus	27.81	12
CZ	Czech Republic	21.03	6
DE	Germany	20.14	5
DK	Denmark	23.57	9
EE	Estonia	34.84	18
EL	Greece	39.22	23
ES	Spain	33.83	17
FI	Finland	19.01	3
FR	France	23.87	10
HR	Croatia	42.27	25
HU	Hungary	39.14	22
IE	Ireland	32.11	15
IT	Italy	29.94	14
LT	Lithuania	40.51	24
LU	Luxembourg	21.09	7
LV	Latvia	46.65	26
MT	Malta	35.59	19
NL	Netherlands	19.61	4
PL	Poland	33.80	16
PT	Portugal	36.64	20
RO	Romania	51.01	27
SE	Sweden	16.62	1
SI	Slovenia	22.43	8
SK	Slovakia	37.57	21
UK	United Kingdom	29.22	13

Table A4. The RHPI scores and ranks, NUTS 2

NUTS 2	Label	RHPI score	RHPI rank	NUTS 2	Label	RHPI score	RHPI rank
CZ01	Praha	9.23	1	DEA5	Arnsberg	26.81	136
FI20	Åland	10.41	2	FR41	Lorraine	27.06	137
DE21	Oberbayern	11.69	3	AT13	Wien	27.09	138
SE11	Stockholm	12.96	4	UKD1	Cumbria	27.15	139
DE13	Freiburg	13.40	5	SI01	Vzhodna Slovenija	27.24	140
AT33	Tirol	13.46	6	UKI2	Outer London	27.29	141
AT32	Salzburg	13.50	7	CY00	Kypros	27.81	142
DE14	Tübingen	13.77	8	PL12	Mazowieckie	27.85	143
DE27	Schwaben	14.57	9	IT14	Lazio	28.04	144
ITH1	Provincia Autonoma di Bolzano/Bozen	14.70	10	FR23	Haute-Normandie	28.04	145
AT22	Steiermark	15.14	11	ES13	Cantabria	28.16	146
DE11	Stuttgart	15.22	12	FR81	Languedoc-Roussillon	28.64	147
FI1B	Helsinki-Uusimaa	15.23	13	ES24	Aragón	28.75	148
NL31	Utrecht	15.37	14	HU10	Közép-Magyarország	28.75	149
AT31	Oberösterreich	15.74	15	UKF2	Leicestershire, Rutland and Northamptonshire	28.78	150
SE23	Västsverige	15.75	16	FR83	Corse	28.82	151
DE12	Karlsruhe	15.80	17	PL21	Malopolskie	29.13	152
DE26	Unterfranken	15.85	18	ES41	Castilla y León	29.15	153
IT13	Marche	16.21	19	UKM2	Eastern Scotland	29.21	154
DE25	Mittelfranken	16.44	20	FR21	Champagne-Ardenne	29.51	155
ES22	Comunidad Foral de Navarra	16.68	21	UKF3	Lincolnshire	29.54	156
NL34	Zeeland	16.73	22	UKF1	Derbyshire and Nottinghamshire	29.55	157
AT21	Kärnten	16.73	23	UKL2	East Wales	29.59	158
DE71	Darmstadt	16.86	24	ITF1	Abruzzo	29.61	159
BE24	Prov. Vlaams-Brabant	17.04	25	BE34	Prov. Luxembourg (BE)	29.62	160
SI02	Zahodna Slovenija	17.05	26	UKI1	Inner London	30.06	161
DE23	Oberpfalz	17.25	27	UKM5	North Eastern Scotland	30.12	162
SE21	Småland med öarna	17.27	28	ES11	Galicia	30.52	163
DED2	Dresden	17.31	29	BE35	Prov. Namur	30.67	164
AT34	Vorarlberg	17.32	30	ES23	La Rioja	30.75	165

Table A4. The RHPI scores and ranks, NUTS 2 (Continued)

NUTS 2	Label	RHPI score	RHPI rank	NUTS 2	Label	RHPI score	RHPI rank
CZ02	Střední Čechy	17.59	31	DE50	Bremen	30.77	166
SE12	Östra Mellansverige	17.60	32	IE02	Southern and Eastern	30.95	167
FR71	Rhône-Alpes	17.89	33	ITF2	Molise	31.21	168
AT12	Niederösterreich	18.06	34	UKC2	Northumberland and Tyne and Wear	31.49	169
SE33	Övre Norrland	18.14	35	ES51	Cataluña	31.51	170
CZ03	Jihozápad	18.21	36	PL52	Opolskie	31.63	171
DED5	Leipzig	18.31	37	PL41	Wielkopolskie	31.73	172
NL41	Noord-Brabant	18.38	38	SK02	Západné Slovensko	31.92	173
ITH5	Emilia-Romagna	18.58	39	PT16	Centro (PT)	32.02	174
SE32	Mellersta Norrland	18.61	40	UKG2	Shropshire and Staffordshire	32.12	175
NL32	Noord-Holland	18.70	41	BG41	Yugozapaden	32.37	176
FI19	Länsi-Suomi	18.75	42	FR22	Picardie	32.42	177
DED4	Chemnitz	18.80	43	PL22	Slaskie	32.65	178
DE73	Kassel	18.81	44	EL42	Notio Aigaio	32.73	179
SE22	Sydsverige	18.86	45	EL43	Kriti	33.03	180
ITH2	Provincia Autonoma di Trento	18.92	46	PL63	Pomorskie	33.14	181
DE22	Niederbayern	19.05	47	BE33	Prov. Liège	33.16	182
SK01	Bratislavský kraj	19.08	48	UKN0	Northern Ireland (UK)	33.44	183
DEG0	Thüringen	19.24	49	UKL1	West Wales and The Valleys	33.69	184
DE24	Oberfranken	19.25	50	EL30	Attiki	33.91	185
FR62	Midi-Pyrénées	19.32	51	ES12	Principado de Asturias	34.11	186
DE72	Gießen	19.34	52	PL34	Podlaskie	34.18	187
BE25	Prov. West-Vlaanderen	19.38	53	ES53	Illes Balears	34.23	188
FR10	Île de France	19.54	54	UKE1	East Yorkshire and Northern Lincolnshire	34.42	189
FR51	Pays de la Loire	19.57	55	ITG2	Sardegna	34.51	190
CZ06	Jihovýchod	19.59	56	HU22	Nyugat-Dunántúl	34.56	191
SE31	Norra Mellansverige	19.70	57	EL22	Ionía Nisia	34.64	192
NL13	Drenthe	19.81	58	FR30	Nord - Pas-de-Calais	34.67	193
NL22	Gelderland	19.95	59	UKD4	Lancashire	34.82	194
IT12	Umbria	20.02	60	EE00	Eesti	34.84	195

Table A4. The RHPI scores and ranks, NUTS 2 (Continued)

NUTS 2	Label	RHPI score	RHPI rank	NUTS 2	Label	RHPI score	RHPI rank
NL33	Zuid-Holland	20.11	61	IE01	Border, Midland and Western	35.24	196
DEF0	Schleswig-Holstein	20.20	62	PL11	Lódzkie	35.26	197
NL21	Overijssel	20.26	63	UKE3	South Yorkshire	35.47	198
CZ05	Severovýchod	20.48	64	UKC1	Tees Valley and Durham	35.52	199
FR52	Bretagne	20.48	65	MT00	Malta	35.59	200
DEB2	Trier	20.54	66	PT11	Norte	35.89	201
UKJ3	Hampshire and Isle of Wight	20.72	67	UKM3	South Western Scotland	35.93	202
BE22	Prov. Limburg (BE)	20.73	68	UKE4	West Yorkshire	36.14	203
FR53	Poitou-Charentes	20.81	69	UKD3	Greater Manchester	36.17	204
DEB1	Koblenz	20.85	70	PL51	Dolnoslaskie	36.30	205
DE60	Hamburg	20.92	71	CZ04	Severozápad	36.62	206
AT11	Burgenland (AT)	20.92	72	HR03	Jadranska Hrvatska	37.00	207
UKK2	Dorset and Somerset	20.94	73	PT18	Alentejo	37.06	208
UKJ2	Surrey, East and West Sussex	21.00	74	ITF5	Basilicata	37.11	209
UKJ1	Berkshire, Buckinghamshire and Oxfordshire	21.04	75	BE10	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	37.28	210
FR61	Aquitaine	21.07	76	ES52	Comunidad Valenciana	37.29	211
LU00	Luxembourg	21.09	77	PL31	Lubelskie	37.34	212
FI1C	Etelä-Suomi	21.18	78	PT17	Lisboa	37.57	213
DEA4	Detmold	21.20	79	PL43	Lubuskie	37.62	214
DEB3	Rhein Hessen-Pfalz	21.26	80	HU21	Közép-Dunántúl	37.68	215
ITC4	Lombardia	21.41	81	PL61	Kujawsko-Pomorskie	37.68	216
BE23	Prov. Oost-Vlaanderen	21.41	82	PL32	Podkarpackie	37.87	217
FR24	Centre (FR)	21.65	83	ES42	Castilla-la Mancha	38.58	218
DE94	Weser-Ems	21.72	84	PL42	Zachodniopomorskie	38.77	219
NL12	Friesland (NL)	21.75	85	PL62	Warmińsko-Mazurskie	38.82	220
ITH3	Veneto	21.76	86	BE32	Prov. Hainaut	38.89	221
DK04	Midtjylland	21.89	87	SK03	Stredné Slovensko	39.17	222
DEA2	Köln	21.90	88	ITF4	Puglia	39.26	223
DK05	Nordjylland	21.98	89	EL21	Ipeiros	39.56	224

Table A4. The RHPI scores and ranks, NUTS 2 (Continued)

NUTS 2	Label	RHPI score	RHPI rank	NUTS 2	Label	RHPI score	RHPI rank
IT11	Toscana	22.03	90	EL14	Thessalia	39.63	225
FI1D	Pohjois- ja Itä-Suomi	22.04	91	PL33	Swietokrzyskie	39.63	226
ITH4	Friuli-Venezia Giulia	22.21	92	PT15	Algarve	39.78	227
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area	22.21	93	LT00	Lietuva	40.51	228
NL42	Limburg (NL)	22.22	94	EL41	Voreio Aigaio	40.65	229
ES21	País Vasco	22.28	95	HU23	Dél-Dunántúl	41.94	230
DE93	Lüneburg	22.33	96	EL23	Dytiki Ellada	41.96	231
CZ07	Střední Morava	22.38	97	HU33	Dél-Alföld	42.06	232
FR42	Alsace	22.40	98	ES62	Región de Murcia	42.14	233
DE92	Hannover	22.56	99	ES64	Ciudad Autónoma de Melilla (ES)	42.16	234
DE40	Brandenburg	22.76	100	EL12	Kentriki Makedonia	42.83	235
BE21	Prov. Antwerpen	22.79	101	UKG3	West Midlands	42.85	236
FR63	Limousin	22.83	102	EL24	Stereia Ellada	44.10	237
UKH2	Bedfordshire and Hertfordshire	22.87	103	ES43	Extremadura	44.20	238
DK01	Hovedstaden	22.90	104	ITF6	Calabria	44.66	239
NL23	Flevoland	23.04	105	EL13	Dytiki Makedonia	44.81	240
DEA3	Münster	23.04	106	HR04	Kontinentalna Hrvatska	44.87	241
FR82	Provence-Alpes-Côte d'Azur	23.14	107	ES70	Canarias (ES)	45.15	242
ITC2	Valle d'Aosta/Vallée d'Aoste	23.39	108	RO11	Nord-Vest	45.67	243
FR25	Basse-Normandie	23.57	109	LV00	Latvija	46.65	244
DE30	Berlin	23.77	110	ES61	Andalucía	47.16	245
UKE2	North Yorkshire	23.81	111	RO42	Vest	47.55	246
FR26	Bourgogne	23.83	112	HU32	Észak-Alföld	48.41	247
ITC3	Liguria	23.98	113	EL25	Peloponnisos	48.74	248
DE91	Braunschweig	24.03	114	SK04	Východné Slovensko	49.64	249
FR43	Franche-Comté	24.23	115	ITF3	Campania	49.69	250
NL11	Groningen	24.45	116	ITG1	Sicilia	50.44	251
FR72	Auvergne	24.46	117	FR92	Martinique (FR)	51.17	252
DECO	Saarland	24.74	118	FR91	Guadeloupe (FR)	51.92	253
DE80	Mecklenburg-Vorpommern	24.91	119	PT30	Região Autónoma da Madeira (PT)	52.66	254

Table A4. The RHPI scores and ranks, NUTS 2 (Continued)

NUTS 2	Label	RHPI score	RHPI rank	NUTS 2	Label	RHPI score	RHPI rank
UKH1	East Anglia	24.95	120	HU31	Észak-Magyarország	52.78	255
DK03	Syddanmark	25.09	121	EL11	Anatoliki Makedonia, Thraki	53.05	256
BE31	Prov. Brabant Wallon	25.10	122	RO12	Centru	53.78	257
DEE0	Sachsen-Anhalt	25.12	123	RO41	Sud-Vest Oltenia	54.42	258
ES30	Comunidad de Madrid	25.13	124	RO21	Nord-Est	54.48	259
ITC1	Piemonte	25.29	125	FR94	Réunion (FR)	56.05	260
UKK4	Devon	25.38	126	PT20	Região Autónoma dos Açores (PT)	56.42	261
RO32	Bucuresti - Ilfov	25.41	127	RO31	Sud - Muntenia	58.11	262
UKJ4	Kent	25.47	128	BG42	Yuzhen tsentralen	59.35	263
UKM6	Highlands and Islands	25.56	129	FR93	Guyane (FR)	60.47	264
CZ08	Moravskoslezsko	26.28	130	BG32	Severen tsentralen	60.52	265
UKH3	Essex	26.35	131	ES63	Ciudad Autónoma de Ceuta (ES)	60.98	266
DEA1	Düsseldorf	26.43	132	BG33	Severoiztochen	62.18	267
DK02	Sjælland	26.46	133	RO22	Sud-Est	63.31	268
UKG1	Herefordshire, Worcestershire and Warwickshire	26.46	134	BG34	Yugoiztochen	66.78	269
UKK3	Cornwall and Isles of Scilly	26.72	135	BG31	Severozapaden	69.34	270

Note: In smaller countries, in which the entire country would be placed on the NUTS 2 or even NUTS 3 level (e.g., Luxembourg, Cyprus), levels 1, 2 and/or 3 are identical to the level above and/or to the entire country.

Table A5. Results of the uncertainty analysis

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
CZ01	1	1	[1; 2]	9.23	9.21	9.23	[6.38; 11.99]
FI20	2	2	[1; 2]	10.41	10.41	10.41	[9.62; 11.22]
DE21	3	3	[3; 3]	11.69	11.66	11.69	[11; 12.24]
SE11	4	4	[4; 6]	12.96	12.95	12.96	[12.52; 13.33]
DE13	5	5	[5; 8]	13.40	13.37	13.40	[12.73; 13.92]
AT33	6	6	[6; 7]	13.46	13.41	13.46	[12.69; 13.97]
AT32	7	7	[4; 7]	13.50	13.38	13.50	[12.06; 14.37]
DE14	8	8	[8; 9]	13.77	13.74	13.77	[12.94; 14.44]
DE27	9	9	[9; 11]	14.57	14.54	14.57	[13.87; 15.13]
ITH1	10	10	[9; 16]	14.70	14.72	14.70	[12.98; 16.51]
AT22	11	12	[11; 13]	15.14	15.07	15.14	[13.99; 15.98]
DE11	12	12	[10; 16]	15.22	15.21	15.22	[14.73; 15.62]
FI1B	13	13	[11; 14]	15.23	15.21	15.23	[14.71; 15.65]
NL31	14	14	[12; 18]	15.37	15.35	15.37	[14.88; 15.77]
AT31	15	16	[13; 17]	15.74	15.62	15.74	[14.22; 16.67]
SE23	16	16	[15; 19]	15.75	15.74	15.75	[15.13; 16.33]
DE12	17	17	[14; 20]	15.80	15.79	15.80	[15.4; 16.16]
DE26	18	18	[15; 18]	15.85	15.82	15.85	[14.71; 16.87]
IT13	19	19	[4; 55]	16.21	16.20	16.21	[11.99; 20.4]
DE25	20	20	[19; 22]	16.44	16.42	16.44	[15.8; 17]
ES22	21	21	[17; 31]	16.68	16.70	16.68	[14.87; 18.57]
NL34	22	22	[20; 24]	16.73	16.71	16.73	[16.15; 17.19]
AT21	23	22	[21; 25]	16.73	16.72	16.73	[15.68; 17.73]
DE71	24	24	[21; 27]	16.86	16.85	16.86	[16.47; 17.21]
BE24	25	25	[22; 29]	17.04	17.03	17.04	[16.72; 17.29]
SI02	26	26	[22; 30]	17.05	17.04	17.05	[16.78; 17.3]
DE23	27	27	[26; 28]	17.25	17.22	17.25	[16.35; 17.99]
SE21	28	28	[26; 29]	17.27	17.24	17.27	[16.51; 17.9]
DED2	29	29	[25; 30]	17.31	17.33	17.31	[16.29; 18.41]
AT34	30	30	[24; 36]	17.32	17.31	17.32	[17.06; 17.54]
CZ02	31	31	[23; 36]	17.59	17.59	17.59	[16.12; 19.09]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
SE12	32	32	[28; 37]	17.60	17.59	17.60	[17.13; 18.04]
FR71	33	33	[29; 39]	17.89	17.89	17.89	[17.44; 18.35]
AT12	34	34	[32; 36]	18.06	18.01	18.06	[17.06; 18.84]
SE33	35	35	[34; 38]	18.14	18.11	18.14	[17.26; 18.85]
CZ03	36	36	[33; 40]	18.21	18.21	18.20	[16.95; 19.5]
DED5	37	37	[32; 45]	18.31	18.36	18.31	[16.89; 19.97]
NL41	38	38	[32; 44]	18.38	18.36	18.38	[17.88; 18.79]
ITH5	39	39	[31; 59]	18.58	18.64	18.58	[16.85; 20.59]
SE32	40	40	[38; 44]	18.61	18.57	18.61	[17.86; 19.18]
NL32	41	41	[37; 48]	18.70	18.69	18.70	[18.18; 19.14]
FI19	42	42	[35; 53]	18.75	18.74	18.75	[18.42; 19.01]
DED4	43	43	[40; 54]	18.80	18.84	18.80	[17.48; 20.32]
DE73	44	43	[41; 46]	18.81	18.80	18.81	[17.98; 19.59]
SE22	45	45	[39; 50.5]	18.86	18.86	18.86	[18.37; 19.35]
ITH2	46	46	[41; 49]	18.92	18.93	18.92	[17.66; 20.23]
DE22	47	47	[41; 51]	19.05	19.01	19.05	[17.66; 20.25]
SK01	48	48	[34; 65]	19.08	19.09	19.08	[17.05; 21.18]
DEG0	49	49	[45; 57]	19.24	19.23	19.24	[17.9; 20.52]
DE24	50	50	[47; 53]	19.25	19.22	19.25	[18.08; 20.26]
FR62	51	51	[42; 56]	19.32	19.32	19.32	[18.95; 19.7]
DE72	52	51	[46; 55]	19.34	19.33	19.34	[18.61; 20.03]
BE25	53	52	[47; 53]	19.38	19.32	19.38	[18.41; 20.04]
FR10	54	54	[43; 59]	19.54	19.54	19.54	[19.26; 19.82]
FR51	55	55	[44; 58]	19.57	19.58	19.57	[19.24; 19.92]
CZ06	56	56	[54; 59]	19.59	19.59	19.59	[18.59; 20.58]
SE31	57	56	[53; 58]	19.70	19.68	19.70	[19; 20.29]
NL13	58	58	[48; 61]	19.81	19.80	19.81	[19.45; 20.11]
NL22	59	59	[56; 60]	19.95	19.93	19.95	[19.33; 20.47]
IT12	60	60	[49; 79]	20.02	20.03	20.02	[18.21; 21.9]
NL33	61	61	[53; 66]	20.11	20.11	20.11	[19.89; 20.3]
DEF0	62	61	[60; 64]	20.20	20.20	20.20	[19.68; 20.7]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
NL21	63	63	[62; 63]	20.26	20.24	20.26	[19.65; 20.76]
CZ05	64	64	[61; 69]	20.48	20.48	20.48	[19.51; 21.47]
FR52	65	65	[60; 78]	20.48	20.48	20.48	[20.28; 20.66]
DEB2	66	66	[63; 74]	20.54	20.53	20.54	[20.08; 20.96]
UKJ3	67	67	[65; 73]	20.72	20.71	20.72	[19.72; 21.66]
BE22	68	67	[66; 68]	20.73	20.69	20.73	[19.9; 21.39]
FR53	69	70	[68; 76]	20.81	20.82	20.81	[20.17; 21.47]
DEB1	70	71	[70; 73]	20.85	20.83	20.85	[20.06; 21.53]
DE60	71	72	[66; 80]	20.92	20.91	20.92	[20.5; 21.3]
AT11	72	72	[64; 86]	20.92	20.92	20.92	[20.76; 21.06]
UKK2	73	73	[67; 81]	20.94	20.94	20.94	[19.91; 21.97]
UKJ2	74	74	[70; 78]	21.00	20.98	21.00	[20.03; 21.88]
UKJ1	75	75	[72; 80]	21.04	21.02	21.04	[20.04; 21.94]
FR61	76	76	[70; 84]	21.07	21.07	21.07	[20.64; 21.5]
LU00	77	76	[75; 78]	21.09	21.06	21.09	[20.24; 21.8]
FI1C	78	78	[72; 83]	21.18	21.16	21.18	[20.62; 21.65]
DEA4	79	79	[74; 85]	21.20	21.19	21.20	[20.68; 21.68]
DEB3	80	80	[75; 84]	21.26	21.24	21.26	[20.62; 21.79]
ITC4	81	81	[69; 92]	21.41	21.45	21.41	[19.96; 23.05]
BE23	82	82	[78; 82]	21.41	21.34	21.41	[20.29; 22.19]
FR24	83	83	[78; 94]	21.65	21.65	21.65	[21.42; 21.88]
DE94	84	85	[81; 90]	21.72	21.69	21.72	[20.52; 22.78]
NL12	85	85	[83; 89]	21.75	21.74	21.75	[21.22; 22.22]
ITH3	86	86	[75; 101]	21.76	21.80	21.76	[20.15; 23.57]
DK04	87	87	[85; 89]	21.89	21.86	21.89	[21.19; 22.43]
DEA2	88	88	[84; 97]	21.90	21.89	21.90	[21.55; 22.22]
DK05	89	89	[86; 92]	21.98	21.95	21.98	[21.36; 22.46]
ITI1	90	90	[70; 110]	22.03	22.08	22.03	[19.99; 24.28]
FI1D	91	91	[87; 93]	22.04	22.03	22.04	[21.41; 22.6]
ITH4	92	92	[86; 104]	22.21	22.24	22.21	[20.79; 23.78]
UKK1	93	93	[90; 97]	22.21	22.22	22.21	[21.23; 23.21]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
NL42	94	94	[89; 97]	22.22	22.19	22.22	[21.54; 22.77]
ES21	95	95	[91; 99]	22.28	22.28	22.28	[21.63; 22.92]
DE93	96	95	[92; 96.5]	22.33	22.32	22.33	[21.4; 23.2]
CZ07	97	97	[95; 98]	22.38	22.37	22.38	[21.47; 23.27]
FR42	98	98	[88; 104]	22.40	22.40	22.40	[22.13; 22.68]
DE92	99	99	[93; 101]	22.56	22.56	22.56	[22.05; 23.07]
DE40	100	101	[99; 103]	22.76	22.75	22.76	[22.13; 23.37]
BE21	101	101	[95; 105]	22.79	22.77	22.79	[22.31; 23.18]
FR63	102	102	[94; 108]	22.83	22.82	22.83	[22.49; 23.15]
UKH2	103	103	[102; 104]	22.87	22.87	22.87	[22.11; 23.64]
DK01	104	104	[100; 106]	22.90	22.88	22.90	[21.8; 23.91]
NL23	105	105	[100; 110]	23.04	23.02	23.04	[22.58; 23.43]
DEA3	106	106	[103; 107]	23.04	23.03	23.04	[22.37; 23.66]
FR82	107	107	[105; 108]	23.14	23.14	23.14	[22.46; 23.83]
ITC2	108	108	[98; 119]	23.39	23.45	23.39	[21.57; 25.5]
FR25	109	109	[107; 112]	23.57	23.57	23.57	[23.14; 24.01]
DE30	110	110	[109; 113]	23.77	23.78	23.77	[23.38; 24.21]
UKE2	111	111	[109; 115]	23.81	23.81	23.81	[22.56; 25.06]
FR26	112	112	[108; 116]	23.83	23.84	23.83	[23.66; 24.02]
ITC3	113	113	[111; 116]	23.98	23.99	23.98	[22.84; 25.19]
DE91	114	113	[112; 115]	24.03	24.02	24.03	[23.38; 24.65]
FR43	115	115	[111; 120]	24.23	24.23	24.23	[24.01; 24.45]
NL11	116	117	[114; 117]	24.45	24.44	24.45	[23.78; 25.05]
FR72	117	117	[113; 123]	24.46	24.46	24.46	[24.23; 24.69]
DECO	118	118	[117; 124]	24.74	24.73	24.74	[24.26; 25.19]
DE80	119	120	[119; 122]	24.91	24.92	24.91	[23.86; 26.04]
UKH1	120	121	[119; 122]	24.95	24.93	24.95	[24.05; 25.78]
DK03	121	122	[120; 126]	25.09	25.07	25.09	[24.43; 25.65]
BE31	122	122	[118; 129]	25.10	25.10	25.10	[24.76; 25.46]
DEE0	123	123	[122; 124]	25.12	25.13	25.12	[24.19; 26.08]
ES30	124	124	[118; 127]	25.13	25.12	25.13	[23.83; 26.41]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
ITC1	125	125	[115; 130]	25.29	25.31	25.29	[23.54; 27.16]
UKK4	126	126	[125; 127]	25.38	25.35	25.38	[24.32; 26.3]
RO32	127	127	[50.5; 159]	25.41	25.05	25.41	[18.37; 30.73]
UKJ4	128	128	[124; 129]	25.47	25.47	25.47	[24.75; 26.17]
UKM6	129	127.5	[126; 129]	25.56	25.53	25.56	[24.67; 26.31]
CZ08	130	130	[129; 133]	26.28	26.27	26.28	[25.51; 27.01]
UKH3	131	131	[131; 133]	26.35	26.33	26.35	[25.27; 27.33]
DEA1	132	132	[128; 137]	26.43	26.42	26.43	[26.08; 26.75]
DK02	133	133	[132; 134]	26.46	26.43	26.46	[25.42; 27.34]
UKG1	134	133	[130; 138]	26.46	26.44	26.46	[24.84; 27.97]
UKK3	135	135	[134; 136]	26.72	26.69	26.72	[25.79; 27.52]
DEA5	136	136	[131; 140]	26.81	26.81	26.81	[26.4; 27.21]
FR41	137	137	[132; 142]	27.06	27.06	27.06	[26.87; 27.26]
AT13	138	138	[137; 139]	27.09	27.07	27.09	[26.13; 27.96]
UKD1	139	139	[136; 140]	27.15	27.15	27.15	[26.07; 28.24]
SI01	140	140	[135; 144]	27.24	27.24	27.24	[27.05; 27.43]
UKI2	141	140	[139; 142]	27.29	27.31	27.29	[26.23; 28.48]
CY00	142	142	[139; 148]	27.81	27.81	27.81	[27.41; 28.21]
PL12	143	143	[135; 145]	27.85	27.83	27.85	[26.06; 29.54]
ITI4	144	144	[141; 146]	28.04	28.04	28.04	[26.63; 29.46]
FR23	145	145	[141; 151]	28.04	28.04	28.04	[27.83; 28.26]
ES13	146	144	[143; 146]	28.16	28.16	28.16	[27; 29.29]
FR81	147	147	[146; 151]	28.64	28.64	28.64	[27.74; 29.55]
ES24	148	149	[149; 150]	28.75	28.74	28.75	[27.5; 29.97]
HU10	149	149	[147; 153]	28.75	28.75	28.75	[27.37; 30.14]
UKF2	150	150	[147; 152]	28.78	28.77	28.78	[27.86; 29.64]
FR83	151	151	[145; 156]	28.82	28.81	28.82	[27.15; 30.46]
PL21	152	153	[152; 153]	29.13	29.12	29.13	[28.12; 30.1]
ES41	153	153	[146; 162]	29.15	29.14	29.15	[27.28; 30.97]
UKM2	154	154	[148; 157]	29.21	29.18	29.21	[28.46; 29.83]
FR21	155	155	[149; 163]	29.51	29.51	29.51	[29.12; 29.91]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
UKF3	156	156	[154; 161]	29.54	29.54	29.54	[28.78; 30.28]
UKF1	157	157	[155; 159]	29.55	29.54	29.55	[28.68; 30.37]
UKL2	158	158	[156; 159]	29.59	29.56	29.59	[28.43; 30.6]
ITF1	159	159	[154; 160]	29.61	29.61	29.61	[28.37; 30.86]
BE34	160	160	[151; 164]	29.62	29.61	29.62	[29.14; 30.06]
UKI1	161	161	[158; 165]	30.06	30.11	30.05	[28.59; 31.79]
UKM5	162	162	[158; 166]	30.12	30.12	30.12	[29.6; 30.63]
ES11	163	163	[160; 167]	30.52	30.52	30.52	[28.74; 32.28]
BE35	164	164	[161; 172]	30.67	30.67	30.67	[30.41; 30.92]
ES23	165	165	[162; 168]	30.75	30.74	30.75	[28.99; 32.48]
DE50	166	166	[164; 168]	30.77	30.76	30.77	[29.93; 31.53]
IE02	167	167	[163; 176]	30.95	30.95	30.95	[30.81; 31.1]
ITF2	168	168	[154; 178]	31.21	31.21	31.21	[28.27; 34.11]
UKC2	169	169	[166; 175]	31.49	31.50	31.49	[30.78; 32.23]
ES51	170	170	[165; 176]	31.51	31.50	31.50	[29.19; 33.81]
PL52	171	170	[169; 171]	31.63	31.62	31.63	[30.37; 32.84]
PL41	172	172	[170; 173]	31.73	31.72	31.73	[30.46; 32.95]
SK02	173	173	[170; 175]	31.92	31.91	31.92	[30.35; 33.45]
PT16	174	174	[171; 178]	32.02	32.04	32.02	[30.94; 33.2]
UKG2	175	175	[173; 177]	32.12	32.09	32.12	[30.86; 33.23]
BG41	176	176	[167; 187]	32.37	32.38	32.37	[29.86; 34.94]
FR22	177	177	[170; 181]	32.42	32.43	32.42	[31.98; 32.89]
PL22	178	178	[169; 186]	32.65	32.64	32.65	[30.35; 34.9]
EL42	179	179	[174; 184]	32.73	32.76	32.73	[30.73; 34.86]
EL43	180	180	[179; 183]	33.03	33.03	33.03	[31.44; 34.62]
PL63	181	181	[178; 183]	33.14	33.13	33.14	[32.11; 34.12]
BE33	182	182	[174; 189]	33.16	33.16	33.16	[33.01; 33.32]
UKN0	183	183	[177; 188]	33.44	33.43	33.44	[32.92; 33.93]
UKL1	184	184	[180; 187]	33.69	33.68	33.69	[32.91; 34.41]
EL30	185	185	[182; 190]	33.91	33.94	33.91	[33.2; 34.76]
ES12	186	186	[183; 192]	34.11	34.12	34.11	[33.44; 34.82]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
PL34	187	187	[184; 189]	34.18	34.17	34.18	[32.56; 35.74]
ES53	188	188	[182; 195]	34.23	34.22	34.23	[32.11; 36.31]
UKE1	189	189	[187; 194]	34.42	34.41	34.42	[33.73; 35.08]
ITG2	190	190	[179; 206]	34.51	34.52	34.51	[31.21; 37.84]
HU22	191	191	[185; 199]	34.56	34.56	34.56	[32.65; 36.47]
EL22	192	192	[186; 198]	34.64	34.64	34.64	[32.83; 36.47]
FR30	193	193	[185; 198]	34.67	34.68	34.67	[34.48; 34.87]
UKD4	194	193	[190; 194]	34.82	34.77	34.82	[33.54; 35.85]
EE00	195	193	[191; 195]	34.84	34.83	34.84	[33.43; 36.2]
IE01	196	196	[190; 201]	35.24	35.24	35.24	[34.66; 35.82]
PL11	197	197	[195; 201]	35.26	35.26	35.26	[33.73; 36.77]
UKE3	198	198	[192; 204]	35.47	35.47	35.47	[35.01; 35.92]
UKC1	199	199	[193; 203]	35.52	35.52	35.52	[34.95; 36.1]
MT00	200	200	[196; 202]	35.59	35.57	35.59	[34.7; 36.36]
PT11	201	201	[198; 205]	35.89	35.90	35.89	[34.54; 37.3]
UKM3	202	202	[197; 206]	35.93	35.92	35.93	[35.41; 36.39]
UKE4	203	203	[200; 209]	36.14	36.13	36.14	[35.58; 36.65]
UKD3	204	204	[202; 207]	36.17	36.16	36.17	[35.5; 36.79]
PL51	205	205	[200; 207]	36.30	36.31	36.30	[34.63; 38]
CZ04	206	206	[203; 214]	36.62	36.62	36.62	[36.03; 37.22]
HR03	207	207	[204; 217]	37.00	37.00	37.00	[36.75; 37.25]
PT18	208	208	[208; 213]	37.06	37.08	37.06	[35.95; 38.25]
ITF5	209	209	[196; 221]	37.11	37.10	37.11	[33.81; 40.36]
BE10	210	210	[209; 212]	37.28	37.29	37.28	[35.77; 38.84]
ES52	211	211	[205; 217]	37.29	37.28	37.29	[35.29; 39.25]
PL31	212	211	[210; 212]	37.34	37.32	37.34	[35.89; 38.73]
PT17	213	213	[208; 218]	37.57	37.57	37.57	[36.91; 38.23]
PL43	214	214	[211; 215]	37.62	37.59	37.62	[35.85; 39.22]
HU21	215	215	[214; 217]	37.68	37.68	37.68	[36.15; 39.24]
PL61	216	215	[213; 216]	37.68	37.67	37.68	[36.32; 39.01]
PL32	217	217	[210; 219]	37.87	37.87	37.87	[37.06; 38.67]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
ES42	218	218	[197; 227]	38.58	38.55	38.57	[34.45; 42.57]
PL42	219	220	[219; 224]	38.77	38.77	38.77	[37.87; 39.67]
PL62	220	220	[218; 226]	38.82	38.82	38.82	[38.18; 39.45]
BE32	221	221	[213; 228]	38.89	38.89	38.89	[38.78; 39]
SK03	222	222	[220; 225]	39.17	39.16	39.17	[37.96; 40.35]
ITF4	223	223	[208; 228]	39.26	39.25	39.26	[35.52; 42.94]
EL21	224	224	[220; 226]	39.56	39.55	39.56	[37.24; 41.82]
EL14	225	224	[222; 226]	39.63	39.62	39.63	[37.68; 41.53]
PL33	226	226	[223; 227]	39.63	39.62	39.63	[38.4; 40.8]
PT15	227	227	[222; 229]	39.78	39.79	39.78	[39.08; 40.52]
LT00	228	228	[223; 229]	40.51	40.48	40.51	[37.82; 43.03]
EL41	229	229	[225; 230]	40.65	40.66	40.65	[39.78; 41.54]
HU23	230	232	[230; 233]	41.94	41.94	41.93	[40.54; 43.33]
EL23	231	232	[231; 233]	41.96	41.97	41.96	[40.3; 43.64]
HU33	232	232	[230; 236]	42.06	42.05	42.05	[40.9; 43.2]
ES62	233	233	[231; 235]	42.14	42.13	42.14	[40.19; 44.05]
ES64	234	234	[221; 237]	42.16	42.13	42.16	[37.34; 46.82]
EL12	235	235	[234; 239]	42.83	42.84	42.82	[41.75; 43.97]
UKG3	236	236	[230; 242]	42.85	42.85	42.85	[42.51; 43.18]
EL24	237	237	[234; 239]	44.10	44.09	44.10	[40.71; 47.42]
ES43	238	238	[235; 240]	44.20	44.18	44.20	[40.85; 47.47]
ITF6	239	239	[237; 241]	44.66	44.64	44.66	[41.58; 47.67]
EL13	240	240	[238; 242]	44.81	44.81	44.81	[42.44; 47.18]
HR04	241	241	[236; 245]	44.87	44.87	44.87	[44.77; 44.97]
ES70	242	242	[239; 242]	45.15	45.14	45.15	[41.77; 48.46]
RO11	243	243	[238; 245]	45.67	45.58	45.67	[41.65; 49.23]
LV00	244	244	[243; 245]	46.65	46.63	46.64	[44.26; 48.95]
ES61	245	245	[245; 246]	47.16	47.15	47.16	[44.81; 49.47]
RO42	246	246	[243; 248]	47.55	47.47	47.54	[43.5; 51.2]
HU32	247	247	[244; 250]	48.41	48.41	48.41	[47.62; 49.19]
EL25	248	248	[247; 249]	48.74	48.73	48.74	[47.01; 50.45]

Table A5. Results of the uncertainty analysis (Continued)

NUTS2	Reference rank	Median rank	90% CI for ranks [p5; p95]	Reference score	Mean score	Median score	90% CI for scores [p5; p95]
SK04	249	249	[249; 251]	49.64	49.63	49.64	[47.74; 51.49]
ITF3	250	250	[247; 251]	49.69	49.68	49.69	[46.69; 52.64]
ITG1	251	251	[247; 256]	50.44	50.44	50.44	[46.58; 54.31]
FR92	252	252	[250; 253]	51.17	51.18	51.17	[50.64; 51.74]
FR91	253	253	[252; 254]	51.92	51.94	51.92	[50.74; 53.2]
PT30	254	254	[253; 257]	52.66	52.66	52.66	[51.95; 53.4]
HU31	255	255	[254; 256]	52.78	52.78	52.78	[51.89; 53.69]
EL11	256	256	[255; 258]	53.05	53.05	53.05	[52.03; 54.08]
RO12	257	257	[257; 259]	53.78	53.76	53.77	[52.25; 55.22]
RO41	258	258	[255; 259]	54.42	54.37	54.42	[51.48; 57.1]
RO21	259	259	[252; 261]	54.48	54.29	54.48	[49.57; 58.44]
FR94	260	260	[258; 260]	56.05	56.07	56.05	[55.25; 56.93]
PT20	261	261	[260; 261]	56.42	56.43	56.42	[55.44; 57.43]
RO31	262	262	[262; 262]	58.11	58.08	58.11	[55.99; 60.05]
BG42	263	263	[263; 263]	59.35	59.34	59.34	[58.54; 60.15]
FR93	264	264	[264; 266]	60.47	60.47	60.47	[60.13; 60.82]
BG32	265	265	[264; 265]	60.52	60.52	60.52	[59.74; 61.29]
ES63	266	266	[264; 266]	60.98	60.98	60.98	[59.67; 62.29]
BG33	267	267	[267; 268]	62.18	62.18	62.18	[61.13; 63.24]
RO22	268	268	[267; 268]	63.31	63.28	63.31	[61.12; 65.35]
BG34	269	269	[269; 269]	66.78	66.76	66.78	[64.61; 68.84]
BG31	270	270	[270; 270]	69.34	69.33	69.34	[68.72; 69.92]

Table A6. Indicators of the RHPI

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
AT11	Burgenland (AT)	22.72	20.09	24.10	12.10
AT12	Niederösterreich	25.32	14.75	18.11	3.77
AT13	Wien	33.98	19.16	39.85	10.35
AT21	Kärnten	18.51	12.24	36.17	4.12
AT22	Steiermark	19.06	11.80	24.79	2.22
AT31	Oberösterreich	21.77	14.62	16.23	1.35
AT32	Salzburg	17.86	11.61	18.80	1.00
AT33	Tirol	14.86	14.71	17.94	2.20
AT34	Vorarlberg	18.01	19.69	18.71	7.43
BE10	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	22.86	44.00	69.97	50.33
BE21	Prov. Antwerpen	24.70	27.83	19.05	8.97
BE22	Prov. Limburg (BE)	20.37	29.59	19.05	5.50
BE23	Prov. Oost-Vlaanderen	26.54	23.53	19.05	3.95
BE24	Prov. Vlaams-Brabant	18.89	17.68	19.05	6.54
BE25	Prov. West-Vlaanderen	22.05	23.20	19.05	3.60
BE31	Prov. Brabant Wallon	24.36	23.05	40.49	15.54
BE32	Prov. Hainaut	36.15	44.92	40.49	31.98
BE33	Prov. Liège	29.79	37.44	40.49	26.27
BE34	Prov. Luxembourg (BE)	27.52	34.17	40.49	13.98
BE35	Prov. Namur	28.11	34.17	40.49	19.70
BG31	Severozapaden	81.89	60.51	71.25	42.89
BG32	Severen tsentralen	75.83	45.25	61.92	43.93
BG33	Severoiztochen	81.82	44.74	56.62	46.18
BG34	Yugoiztochen	94.46	51.39	55.59	28.00
BG41	Yugozapaden	56.90	15.34	19.74	20.56
BG42	Yuzhen tsentralen	75.61	47.15	54.74	38.56
CY00	Kypros	23.35	37.48	31.72	17.45
CZ01	Praha	23.99	1.02	5.79	2.91
CZ02	Střední Čechy	31.41	9.41	10.93	6.54
CZ03	Jihozápad	31.24	9.84	11.35	9.31

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
CZ04	Severozápad	47.96	27.66	32.66	25.06
CZ05	Severovýchod	32.33	12.34	13.58	12.95
CZ06	Jihovýchod	30.51	9.99	17.69	13.12
CZ07	Střední Morava	33.27	12.33	20.85	15.72
CZ08	Moravskoslezsko	35.65	15.14	28.81	21.77
DE11	Stuttgart	18.94	12.85	18.71	4.81
DE12	Karlsruhe	17.86	13.35	23.59	6.20
DE13	Freiburg	15.83	11.54	20.59	2.91
DE14	Tübingen	18.50	9.85	19.57	2.91
DE21	Oberbayern	15.95	8.36	15.72	2.56
DE22	Niederbayern	28.90	11.32	23.59	4.29
DE23	Oberpfalz	22.72	12.18	24.96	4.47
DE24	Oberfranken	26.90	12.09	27.53	4.98
DE25	Mittelfranken	20.26	12.29	24.79	5.33
DE26	Unterfranken	22.35	8.80	25.73	4.12
DE27	Schwaben	19.07	10.91	19.74	3.77
DE30	Berlin	21.33	19.09	41.82	26.62
DE40	Brandenburg	26.77	13.30	35.74	20.39
DE50	Bremen	34.67	25.77	47.38	11.73
DE60	Hamburg	24.91	16.51	27.70	10.18
DE71	Darmstadt	20.58	13.62	21.28	7.06
DE72	Gießen	24.33	12.57	30.35	8.27
DE73	Kassel	23.44	12.20	31.72	7.06
DE80	Mecklenburg-Vorpommern	25.60	13.78	52.60	26.27
DE91	Braunschweig	30.08	16.22	33.69	12.60
DE92	Hannover	26.25	16.25	34.63	12.43
DE93	Lüneburg	31.21	14.18	27.44	8.79
DE94	Weser-Ems	28.71	13.94	34.46	6.20
DEA1	Düsseldorf	31.42	21.62	31.03	15.02
DEA2	Köln	24.47	18.24	30.78	11.56

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
DEA3	Münster	29.56	16.32	30.09	10.18
DEA4	Detmold	24.57	16.87	31.29	9.14
DEA5	Arnsberg	31.23	20.89	35.83	15.54
DEB1	Koblenz	24.19	16.97	33.26	6.37
DEB2	Trier	23.94	16.70	28.81	8.99
DEB3	Rheinhessen-Pfalz	25.56	18.01	28.21	7.06
DECO	Saarland	29.72	19.05	32.57	12.60
DED2	Dresden	17.59	8.43	40.96	19.52
DED4	Chemnitz	18.03	8.94	50.29	21.60
DED5	Leipzig	16.21	8.60	50.29	27.48
DEE0	Sachsen-Anhalt	27.02	13.82	47.63	27.31
DEF0	Schleswig-Holstein	25.03	14.31	28.12	9.83
DEG0	Thüringen	23.87	7.84	39.50	16.41
DK01	Hovedstaden	32.94	14.34	27.18	8.10
DK02	Sjælland	36.49	21.84	24.45	7.93
DK03	Syddanmark	31.69	21.16	27.78	9.31
DK04	Midtjylland	26.33	19.80	26.93	6.54
DK05	Nordjylland	25.71	20.92	26.50	6.89
EE00	Eesti	50.48	18.36	36.60	26.27
EL11	Anatoliki Makedonia, Thraki	37.91	71.66	56.28	71.96
EL12	Kentriki Makedonia	29.96	47.10	56.28	80.44
EL13	Dytiki Makedonia	24.68	64.59	56.28	85.12
EL14	Thessalia	22.05	56.80	56.28	63.31
EL21	Ipeiros	20.67	58.69	57.99	64.52
EL22	Ionia Nisia	19.69	53.66	57.99	30.08
EL23	Dytiki Ellada	25.43	53.04	57.99	77.67
EL24	Stereia Ellada	20.77	72.74	57.99	79.06
EL25	Peloponnisos	30.24	73.45	57.99	62.96
EL30	Attiki	27.01	36.91	29.24	72.48
EL41	Voreio Aigaio	29.06	54.73	39.25	62.62

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
EL42	Notio Aigaio	18.52	61.51	39.25	24.20
EL43	Kriti	18.69	52.15	39.25	48.43
ES11	Galicia	16.10	49.72	38.48	45.31
ES12	Principado de Asturias	25.99	47.38	26.84	49.64
ES13	Cantabria	16.59	41.17	37.37	39.94
ES21	País Vasco	14.61	32.21	24.19	31.29
ES22	Comunidad Foral de Navarra	7.07	35.16	14.86	28.18
ES23	La Rioja	16.28	47.80	47.72	38.39
ES24	Aragón	16.72	43.48	36.94	39.94
ES30	Comunidad de Madrid	13.85	38.08	31.38	41.85
ES41	Castilla y León	14.69	45.87	43.70	42.37
ES42	Castilla-la Mancha	15.30	60.98	76.04	64.00
ES43	Extremadura	20.93	65.55	82.03	64.35
ES51	Cataluña	15.35	54.43	36.17	53.96
ES52	Comunidad Valenciana	20.19	55.22	50.54	62.27
ES53	Illes Balears	17.70	57.16	48.23	41.85
ES61	Andalucía	26.16	65.10	72.70	75.08
ES62	Región de Murcia	23.98	58.31	67.06	59.16
ES63	Ciudad Autónoma de Ceuta (ES)	42.55	76.49	72.19	95.15
ES64	Ciudad Autónoma de Melilla (ES)	16.08	66.81	76.55	85.46
ES70	Canarias (ES)	21.53	63.81	79.98	79.92
FI19	Länsi-Suomi	20.16	20.71	20.08	7.41
FI1B	Helsinki-Uusimaa	19.72	13.93	14.61	4.47
FI1C	Etelä-Suomi	23.13	19.19	31.72	7.75
FI1D	Pohjois- ja Itä-Suomi	23.33	20.33	35.23	7.75
FI20	Åland	5.36	17.98	18.80	6.88
FR10	Île de France	14.97	25.66	24.62	17.27
FR21	Champagne-Ardenne	24.68	40.91	29.92	20.91
FR22	Picardie	27.40	46.00	29.41	24.02
FR23	Haute-Normandie	24.87	36.49	25.90	22.64

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
FR24	Centre (FR)	17.76	28.93	22.73	18.31
FR25	Basse-Normandie	18.96	33.38	26.84	14.85
FR26	Bourgogne	20.48	30.54	24.62	19.70
FR30	Nord - Pas-de-Calais	29.29	41.41	39.93	33.02
FR41	Lorraine	23.20	34.42	28.21	22.81
FR42	Alsace	19.82	30.56	21.02	14.68
FR43	Franche-Comté	21.40	31.32	25.04	16.93
FR51	Pays de la Loire	15.54	27.91	21.54	13.64
FR52	Bretagne	23.05	20.02	21.54	10.70
FR53	Poitou-Charentes	14.07	31.29	28.12	16.06
FR61	Aquitaine	16.03	29.76	26.24	14.68
FR62	Midi-Pyrénées	14.64	24.68	28.81	14.33
FR63	Limousin	19.63	28.24	30.43	13.12
FR71	Rhône-Alpes	12.92	26.29	22.82	12.77
FR72	Auvergne	21.07	30.67	28.81	17.10
FR81	Languedoc-Roussillon	18.39	41.17	40.53	29.39
FR82	Provence-Alpes-Côte d'Azur	15.44	33.09	33.26	20.39
FR83	Corse	15.34	46.31	44.21	32.14
FR91	Guadeloupe (FR)	38.67	65.07	44.21	97.92
FR92	Martinique (FR)	42.73	59.77	44.21	80.10
FR93	Guyane (FR)	60.00	62.91	44.21	83.56
FR94	Réunion (FR)	47.16	63.94	44.21	100.00
HR03	Jadranska Hrvatska	39.00	28.57	46.44	41.85
HR04	Kontinentalna Hrvatska	46.88	38.86	46.44	52.58
HU10	Közép-Magyarország	44.92	19.56	13.66	21.60
HU21	Közép-Dunántúl	57.59	25.73	24.36	21.25
HU22	Nyugat-Dunántúl	55.45	22.36	24.36	13.64
HU23	Dél-Dunántúl	60.99	33.09	24.36	24.54
HU31	Észak-Magyarország	70.10	41.27	40.02	38.56
HU32	Észak-Alföld	63.01	40.16	40.02	28.70

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
HU33	Dél-Alföld	58.57	28.64	40.02	23.68
IE01	Border, Midland and Western	25.88	46.17	37.62	47.39
IE02	Southern and Eastern	26.80	35.26	29.92	39.94
ITC1	Piemonte	13.43	49.83	26.84	23.50
ITC2	Valle d'Aosta/Vallée d'Aoste	15.33	51.47	14.61	12.17
ITC3	Liguria	15.14	42.77	26.93	16.41
ITC4	Lombardia	12.73	44.52	17.26	15.72
ITF1	Abruzzo	17.89	44.14	46.61	27.14
ITF2	Molise	13.46	54.37	57.05	34.93
ITF3	Campania	25.96	73.99	86.82	60.54
ITF4	Puglia	16.77	71.06	66.12	45.48
ITF5	Basilicata	16.52	62.27	69.88	41.16
ITF6	Calabria	22.03	70.86	74.84	55.87
ITG1	Sicilia	24.26	77.82	100.00	54.66
ITG2	Sardegna	15.00	68.98	43.27	42.71
ITH1	Provincia Autonoma di Bolzano/Bozen	8.53	33.96	15.80	3.08
ITH2	Provincia Autonoma di Trento	12.52	36.27	21.28	6.72
ITH3	Veneto	12.53	45.82	20.77	12.77
ITH4	Friuli-Venezia Giulia	13.37	44.05	22.99	12.77
ITH5	Emilia-Romagna	9.76	43.06	14.78	12.95
ITI1	Toscana	10.71	48.48	23.68	16.23
ITI2	Umbria	9.23	40.68	26.33	17.96
ITI3	Marche	3.14	44.47	27.27	19.87
ITI4	Lazio	15.98	46.89	37.28	27.66
LT00	Lietuva	63.61	16.72	43.01	31.98
LU00	Luxembourg	26.31	16.32	30.09	6.20
LV00	Latvija	71.56	22.64	43.70	36.48
MT00	Malta	34.90	48.34	32.66	13.29
NL11	Groningen	30.91	18.62	30.78	10.00
NL12	Friesland (NL)	28.15	18.55	21.02	8.79

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
NL13	Drenthe	23.58	20.49	16.92	8.45
NL21	Overijssel	26.29	17.53	20.25	6.89
NL22	Gelderland	25.95	18.93	16.74	6.54
NL23	Flevoland	28.64	20.67	22.65	9.83
NL31	Utrecht	18.85	12.79	20.00	4.98
NL32	Noord-Holland	23.24	15.27	23.08	6.89
NL33	Zuid-Holland	22.56	19.40	22.22	10.18
NL34	Zeeland	17.27	22.59	14.69	4.81
NL41	Noord-Brabant	22.56	18.89	16.06	6.02
NL42	Limburg (NL)	28.51	21.65	18.54	7.23
PL11	Łódzkie	53.36	19.81	32.15	21.60
PL12	Mazowieckie	43.52	13.70	32.15	12.08
PL21	Małopolskie	41.33	16.48	30.09	21.43
PL22	Śląskie	54.21	14.70	30.09	18.31
PL31	Lubelskie	48.45	21.76	57.05	19.87
PL32	Podkarpackie	44.17	26.91	57.05	22.46
PL33	Świętokrzyskie	50.16	22.53	57.05	30.43
PL34	Podlaskie	44.49	18.14	57.05	18.83
PL41	Wielkopolskie	45.69	18.72	35.23	16.23
PL42	Zachodniopomorskie	53.02	27.81	35.23	22.81
PL43	Lubuskie	55.34	26.71	35.23	11.91
PL51	Dolnośląskie	56.42	20.86	29.32	21.43
PL52	Opolskie	46.35	21.26	29.32	13.29
PL61	Kujawsko-Pomorskie	54.75	22.83	36.51	21.95
PL62	Warmińsko-Mazurskie	49.94	31.35	36.51	21.60
PL63	Pomorskie	45.49	22.31	36.51	15.89
PT11	Norte	23.07	59.86	33.26	41.33
PT15	Algarve	30.14	57.91	40.47	35.96
PT16	Centro (PT)	22.97	54.70	27.18	25.06
PT17	Lisboa	27.40	52.00	40.26	43.41

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
PT18	Alentejo	25.85	60.51	34.04	34.93
PT20	Região Autónoma dos Açores (PT)	45.57	80.62	60.85	37.18
PT30	Região Autónoma da Madeira (PT)	41.24	73.12	53.12	50.16
RO11	Nord-Vest	76.92	28.92	36.34	8.62
RO12	Centru	74.18	44.88	41.04	23.68
RO21	Nord-Est	82.20	32.46	74.93	8.62
RO22	Sud-Est	88.44	44.88	65.00	25.58
RO31	Sud - Muntenia	82.05	46.15	49.52	20.56
RO32	Bucuresti - Ilfov	54.81	19.56	1.00	5.42
RO41	Sud-Vest Oltenia	78.62	32.36	69.71	18.31
RO42	Vest	79.66	28.19	41.82	10.00
SE11	Stockholm	12.60	14.43	19.91	3.77
SE12	Östra Mellansverige	16.30	18.66	29.66	7.06
SE21	Småland med öarna	16.24	19.04	30.01	4.47
SE22	Sydsverige	17.13	19.59	33.26	8.27
SE23	Västsverige	14.03	17.43	28.98	4.98
SE31	Norra Mellansverige	19.11	21.06	32.32	5.85
SE32	Mellersta Norrland	19.12	20.42	27.01	4.47
SE33	Övre Norrland	21.22	15.10	29.41	4.29
SI01	Vzhodna Slovenija	30.06	21.29	34.11	24.20
SI02	Zahodna Slovenija	20.81	11.29	19.65	16.23
SK01	Bratislavský kraj	36.62	8.24	9.04	11.04
SK02	Západné Slovensko	48.12	16.34	21.88	37.69
SK03	Stredné Slovensko	52.41	23.81	27.61	56.04
SK04	Východné Slovensko	69.50	27.61	35.40	68.16
UKC1	Tees Valley and Durham	30.96	39.19	56.02	20.73
UKC2	Northumberland and Tyne and Wear	28.54	31.59	56.02	15.89
UKD1	Cumbria	22.96	29.35	54.74	10.18
UKD3	Greater Manchester	36.47	35.36	54.74	16.23
UKD4	Lancashire	36.70	34.19	54.74	9.66

Table A6. Indicators of the RHPI (Continued)

NUTS 2	Label	Health	Knowledge	Decent standard of living	Social exclusion
UKE1	East Yorkshire and Northern Lincolnshire	29.95	40.59	52.17	16.75
UKE2	North Yorkshire	20.23	25.22	52.17	7.06
UKE3	South Yorkshire	34.68	35.46	52.17	19.00
UKE4	West Yorkshire	35.71	36.95	52.17	17.27
UKF1	Derbyshire and Nottinghamshire	27.00	31.85	50.89	11.22
UKF2	Leicestershire, Rutland and Northamptonshire	27.56	28.93	50.89	10.18
UKF3	Lincolnshire	27.33	30.63	50.89	12.43
UKG1	Herefordshire, Worcestershire and Warwickshire	22.70	29.01	57.30	6.20
UKG2	Shropshire and Staffordshire	32.89	30.02	57.30	9.48
UKG3	West Midlands	41.41	44.47	57.30	26.45
UKH1	East Anglia	22.13	27.97	44.47	8.45
UKH2	Bedfordshire and Hertfordshire	21.11	22.16	44.47	9.14
UKH3	Essex	21.41	34.18	44.47	8.79
UKI1	Inner London	28.61	22.06	73.99	14.16
UKI2	Outer London	22.48	27.54	59.87	12.60
UKJ1	Berkshire, Buckinghamshire and Oxfordshire	19.67	21.81	40.62	5.50
UKJ2	Surrey, East and West Sussex	19.09	22.36	40.62	5.85
UKJ3	Hampshire and Isle of Wight	17.17	24.41	40.62	6.20
UKJ4	Kent	20.88	32.11	40.62	11.22
UKK1	Gloucestershire, Wiltshire and Bristol/Bath area	17.37	26.68	44.47	8.27
UKK2	Dorset and Somerset	17.01	23.58	44.47	6.89
UKK3	Cornwall and Isles of Scilly	26.91	26.70	44.47	8.10
UKK4	Devon	23.37	28.34	44.47	7.06
UKL1	West Wales and The Valleys	30.31	38.63	52.17	14.33
UKL2	East Wales	28.17	31.14	52.17	8.62
UKM2	Eastern Scotland	31.94	27.33	41.90	10.35
UKM3	South Western Scotland	41.45	32.68	41.90	16.93
UKM5	North Eastern Scotland	35.28	22.45	41.90	17.90
UKM6	Highlands and Islands	26.65	24.43	41.90	7.75
UKN0	Northern Ireland (UK)	30.39	38.51	47.03	16.93

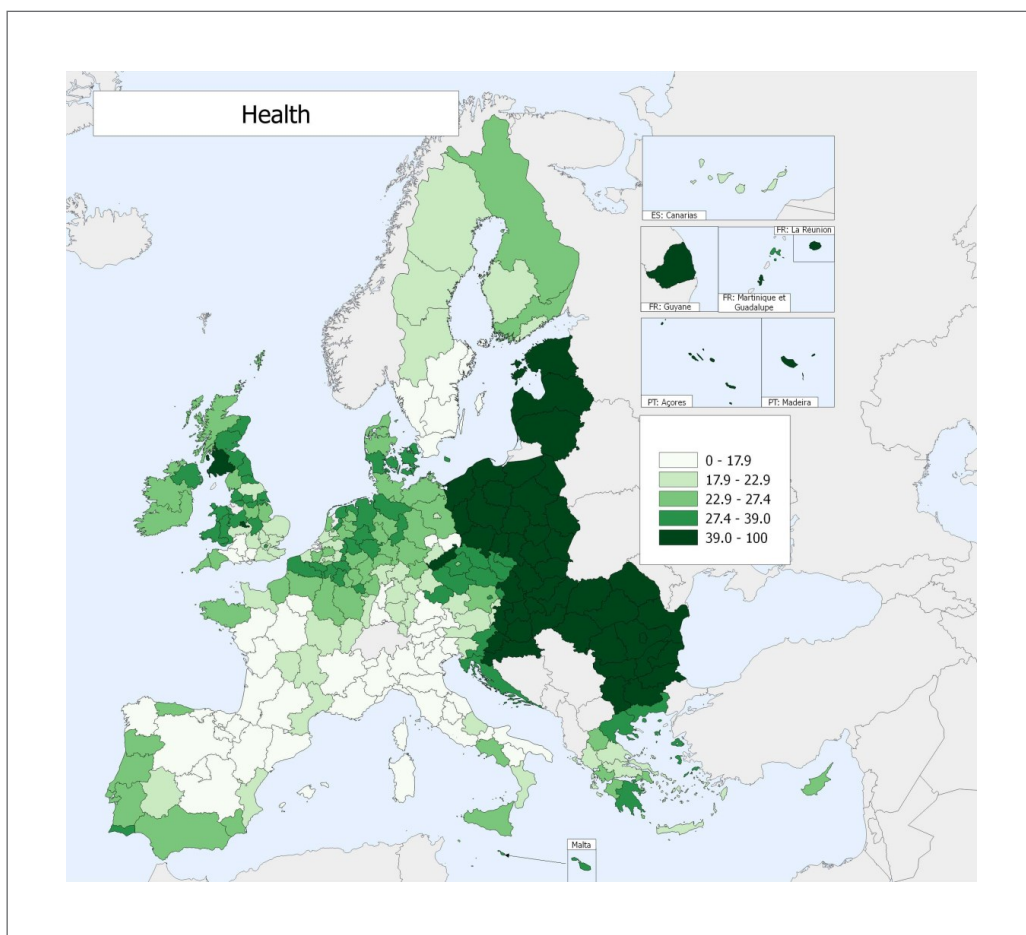


Figure A1. Spatial distribution (NUTS 2) of the health dimension in the EU

Note: Thresholds correspond to quintiles; the darker the color, the worse the conditions

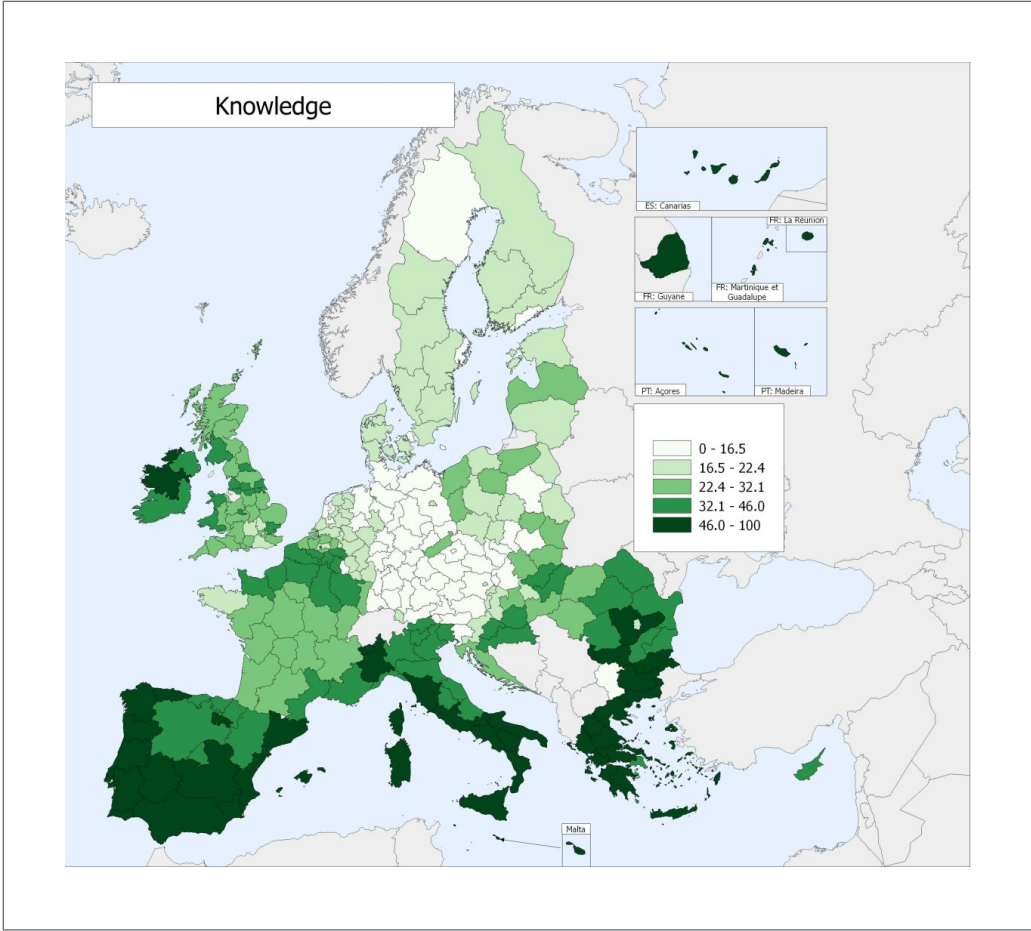


Figure A2. Spatial distribution (NUTS 2) of the knowledge dimension in the EU
Note: Thresholds correspond to quintiles; the darker the color, the worse the conditions

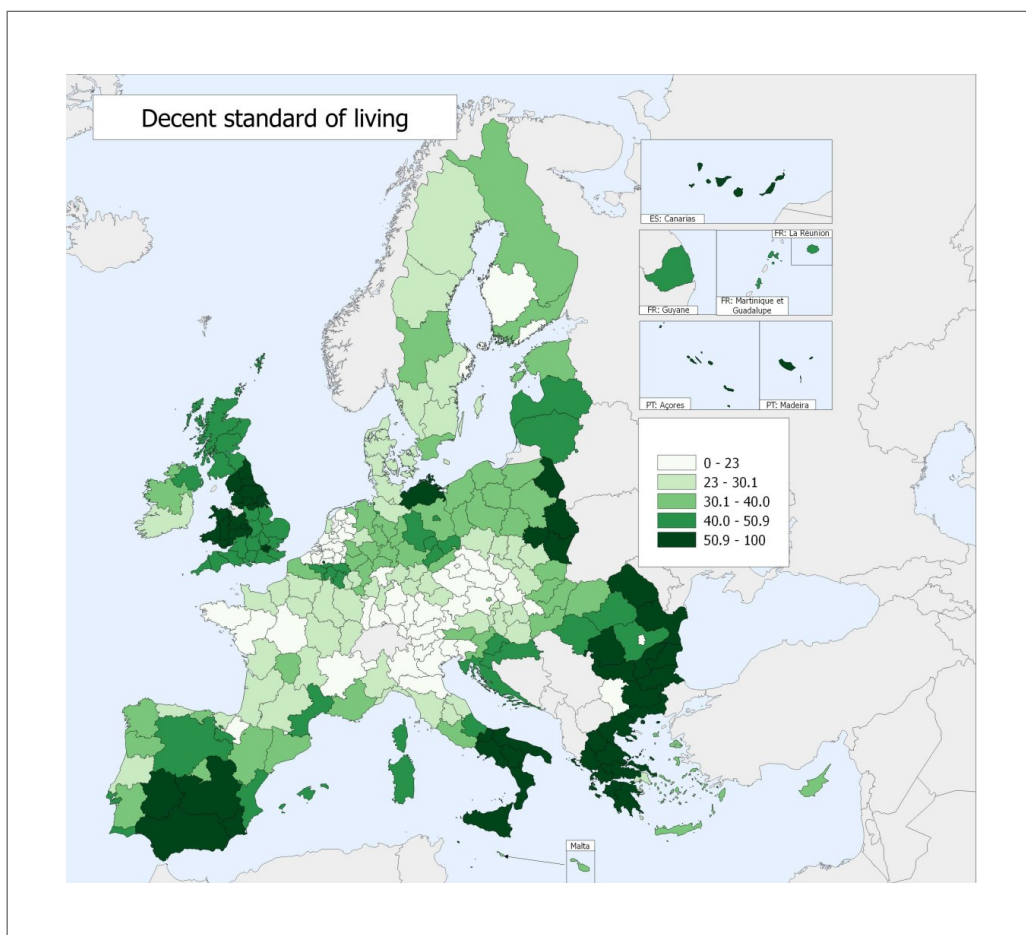


Figure A3. Spatial distribution (NUTS 2) of the decent standard of living dimension in the EU

Note: Thresholds correspond to quintiles; the darker the color, the worse the conditions

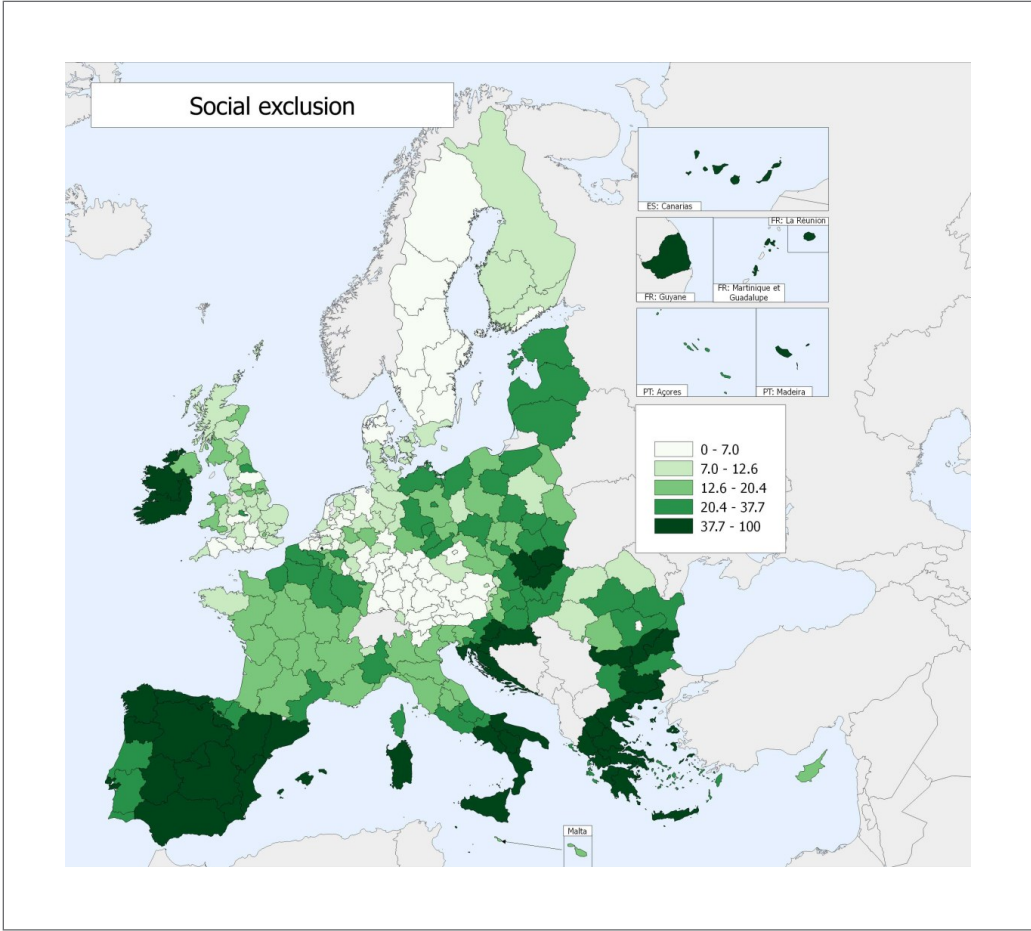


Figure A4. Spatial distribution (NUTS 2) of the social exclusion dimension in the EU
Note: Thresholds correspond to quintiles; the darker the color, the worse the conditions