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.

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 dimension 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-
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 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, Wagfe (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) conceptual poverty resulting from low income and a low standard of living.

Alternatively, Foster (1998), Hugenaars and de Vos (1988) and Lok-Dessallien (2000), among others, report that types of poverty can 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-Bialowolska (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 subnational 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:

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

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:

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

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 income),
- \(P_4\) - 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                            |                                    | \( P_3 \) – 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. |
|                                    |                                    | \( I_6 \) – Percentage of population below the income poverty line (50% 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 (I4), the long-term unemployment rate (I5), and the percentage of the population below the income poverty line (I6). 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 (I2). 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
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 rescaled unity sum between the RHPI scores and dimension.

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 (R²) rescaled unity sum between the RHPI scores and dimension |
|----------------|---------------------------------------------------|------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| 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)
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 island 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 2 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
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.
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 2. Spatial distribution of poverty in the European Union
Note: Thresholds correspond to quintiles; the darker the color, the worse the conditions
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 | RHIPI  |
|------------------|--------|-----------|---------------------------|------------------|--------|
| 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         | DEAS   | Amsberg                        | 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         | ITI4   | Lazio                          | 28.04      | 144       |
| ITH1   | Provincia Autonoma di     | 14.70      | 10        | FR23   | Haute-Normandie                | 28.04      | 145       |
|        | Bolzano/Bozen             |            |           |        |                                |            |           |
| 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    | 28.78      | 150       |
|        |                            |            |           |        | Northamptonshire               |            |           |
| 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       |
| IT3    | 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        | 16.68      | 21        | UKF3   | Lincolnshire                   | 29.54      | 156       |
|        | Navarra                   |            |           |        |                                |            |           |
| NL34   | Zeeland                   | 16.73      | 22        | UKF1   | Derbyshire and Nottinghamshire | 29.55      | 157       |
| AT21   | Karnten                   | 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   | Vzhodna 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   | Strední 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 Norland           | 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 Norland      | 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   | Ionia 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       |
| ITI2   | 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   | Malta | 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   | Jaderzalacza Hrvatska | 37.00 | 207 |
| AT11   | Burgenland (AT) | 20.92   | 72        | HR03   | Jaderzalacza Hrvatska | 37.06 | 208 |
| UKK2   | Dorset and Somerset | 20.94   | 73        | PT18   | Alentejo | 37.06 | 208 |
| UKJ2   | Surrey, East and West Sussex | 21.00   | 74        | ITFS   | 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   | Rheinhesen-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-Emms | 21.72   | 84        | PL42   | Zachodniopomorskie | 38.77 | 219 |
| NL12   | Friesland (NL) | 21.75   | 85        | PL62   | Warminsko-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   | Iperios | 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 |
|--------|-------|------------|-----------|--------|-------|------------|-----------|
| ITI1   | Toscana | 22.03      | 90        | EL14   | Thessalia | 39.63      | 225       |
| F1D    | Pohjois- ja Itä-Suomi | 22.04      | 91        | PL33   | Świetokrzyskie | 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   | Litouva | 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   | Strední 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   | Kertniki Makedonija | 42.83      | 235       |
| BE21   | Prov. Antwerpen | 22.79      | 101       | UKG3   | West Midlands | 42.85      | 236       |
| FR63   | Limousin | 22.83      | 102       | EL24   | Sterea 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 Makedonija | 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   | Dusseldorf                                 | 26.43      | 132       | BG33   | Severoiztochen                             | 62.18      | 267       |
| DK02   | Sjælland                                   | 26.46      | 133       | RO22   | Sud-Est                                    | 63.31      | 268       |
| UKG1   | 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]             |
| IT3     | 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]              |
| DED0  | 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             | 52          | [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]              |
| IT2   | 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 | Median CI for ranks [p5; p95] | Reference score | Mean score | Median score | Median 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        | [20.55; 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]             |
| UKH2  | 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]             |
| DE0   | 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]             |
| UHK3  | 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]             |
| IT4   | 144            | 144         | [141; 146]                 | 28.04          | 28.04      | 28.04        | [28.63; 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]                |
| FRB1  | 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]             |
| FRB3  | 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        | [28.1; 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]              |
| UKI   | 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]              |
| PLS2  | 171            | 171         | [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 | Median score | Mean 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]            |
| EEO0  | 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]            |
| E52   | 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; 41.53]              |
| 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   | Severoižtočten                              | 81.82  | 44.74     | 56.62                     | 46.18            |
| BG34   | Yugoiztočten                               | 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   | Stredni Cechy                              | 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    | Strední 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             |
| DEC0   | 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   | Sterea 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            |
| 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           |
| 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            |
| IT1    | Toscana                    | 10.71  | 48.48     | 23.68                     | 16.23            |
| IT2    | Umbria                     | 9.23   | 40.68     | 26.33                     | 17.96            |
| IT3    | Marche                     | 3.14   | 44.47     | 27.27                     | 19.87            |
| IT4    | 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   | Latvia                     | 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   | Ostra 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            |
| UKE5   | Derbyshire and Nottinghamshire                                      | 27.00  | 31.85     | 50.89                      | 11.22            |
| UKF1   | Leicestershire, Rutland and Northamptonshire                        | 27.56  | 28.93     | 50.89                      | 10.18            |
| UKF2   | Lincolnshire                                                        | 27.33  | 30.63     | 50.89                      | 12.43            |
| UKF3   | Herefordshire, Worcestershire and Warwickshire                      | 22.70  | 29.01     | 57.30                      | 6.20             |
| UKG1   | Shropshire and Staffordshire                                         | 32.89  | 30.02     | 57.30                      | 9.48             |
| UKG2   | 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