



Regional Focus

A series of short papers on regional research and indicators
produced by the Directorate-General for Regional Policy

The European regional Human Development and Human Poverty Indices

By Rocco L. Bubbico and Lewis Dijkstra

Contents

1. Introduction.....	1
2. The United Nations Development Programme Approach.....	1
3. Regional Human Development and Poverty in Europe.....	3
4. Conclusions.....	8
5. Methodology.....	8
References.....	10

1. Introduction

This Regional Focus analyses the regional Human Development Index (HDI) and Human Poverty Index (HPI) as published in the Fifth Cohesion Report (EC 2010). They are based on a slight variation of the methodology developed by the United Nations Development Programme (UNDP).

This Regional Focus shows that a high level of human development is no guarantee of a low level of human poverty or vice versa. Several regions in the UK, Spain, France, Belgium and Italy combine a high level of human development with a high level of human poverty. Estonia, Slovenia, the Czech Republic, Slovakia and Poland show that a low level of human development can still be combined with a low level of human poverty. The three Nordic Member States as well as Germany, Austria and the Netherlands are most successful at combining a high level of human development with a low level of human poverty. Many regions in Portugal, Spain, Italy, Greece, Romania, Bulgaria and Hungary scored poorly on both indices (see Map 4).

This paper is structured as follows: first, the description of the United Nations (UN) national HDI and HPI indicators; second, the results of the application to European regions; third, the conclusions which can be drawn from this analysis. The detailed methodology and indicator definition is included in the annex.

The data can be downloaded here: https://circabc.europa.eu/d/a/workspace/SpacesStore/16b1d1b9-5f7b-4a3b-b60a-6fa35187bed5/hdi_hpi.xls

2. The United Nations Development Programme Approach

2.1. Human Development Index

Since 1990, the United Nations Development Programme (UNDP) has calculated the HDI and included it in its Human Development Report. It measures the average achievements in three basic dimensions: a long and healthy life, access to knowledge and a decent standard of living. It underlines the multidimensional nature of development in the policy debate by going beyond the traditional economic perspective based on GDP or income (Sagar and Najam 1998). The HDI emphasises that aspects other than economic activities and their growth (namely GDP and its growth rate) are important for development, including life expectancy, literacy and enrolment rates.

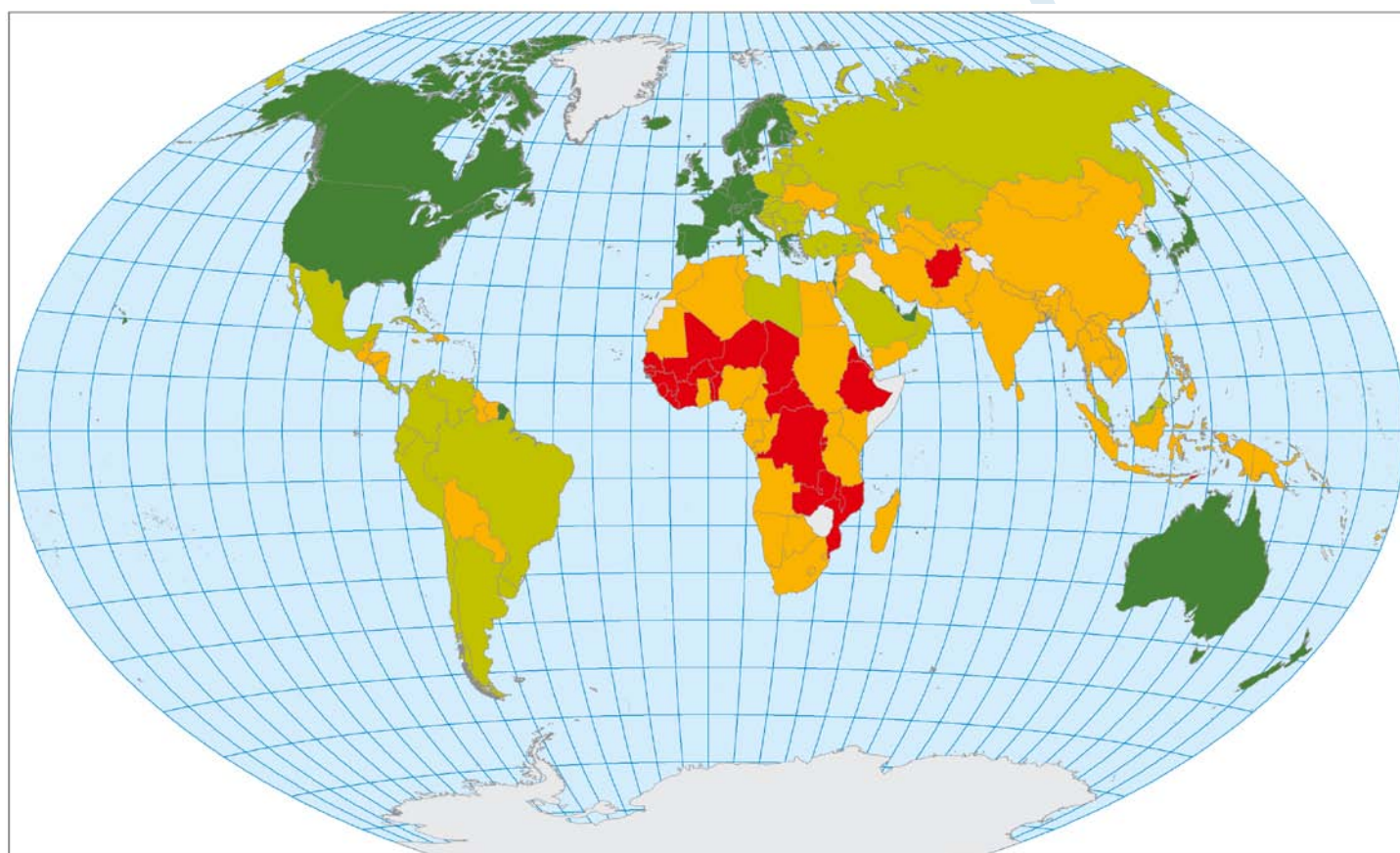
This approach argues that income, commodities and wealth are means to an end. They do not constitute a direct measure of the living standard itself. Development should benefit people, and therefore should consider the life that people lead: their achievements, freedoms and capabilities (Anand and Sen 1994). GDP per head fails to capture some basic features of people's standards of living, as well as the quality and quantity of public and publicly-provided goods and amenities.

However, looking at HDIs in Europe from a global perspective reveals little variation in Europe. For example, in 2009, HDIs¹ for all EU Member States were classified as 'high or very high human development'². Furthermore, within the EU, the HDI is highly correlated with GDP per head; primarily because literacy, enrolment and life expectancy are all high compared to the rest of the world.

¹ Based on 2007 data.

² With the new 2010 methodology, all EU Member States are classified as 'very high human development' with the exception of Bulgaria ('high human development').

Map 1 - 2009 Human Development Index



Human Development Index, 2007



Source of Administrative boundaries:
The Global Administrative Unit Layers (GAUL) dataset,
implemented by FAO within the EC FAO Food Security
for Action Programme.

REGIOgis

The HDI has sparked a debate on the appropriate methodology, the limitations and significance of a synthetic indicator, and the lack of relevant data and its technical qualities (Noorbakhsh 1998). Yet, the HDI has been accepted as a relevant indicator of human development, in part thanks to constant methodological refinements³. Nevertheless, a single index cannot synthesise the full spectrum of human development issues (Streeten 1994), which is why another measure such as the Human Poverty Index was added.

2.2. Human Poverty Index

The 1997 Human Development Report introduced an index of poverty (Human Poverty Index - HPI). While the HDI focuses on the average of three dimensions of well-being, the HPI targets the distribution of dimensions of quality of life. It captures the disparities in a society by focussing on people with a lower life expectancy, lower income, low education and the long-term unemployed. Furthermore, the formula used to aggregate these four issues penalises countries with high values for one dimension. If a simple average was used, a country with 5% for each of the four dimensions would score the same as a country with 37% for low life expectancy, but 1% for the three other dimensions. The formula used here give higher weights to extreme scores, giving the country with 5% for all four dimensions a better score for human poverty than the country with an extreme value for one dimension.

³ For instance, the 2010 version introduces relevant changes in the calculation of HDI.

3. Regional Human Development and Poverty in Europe

Despite the very high HDI scores in Europe, there is significant variation between EU countries and regions in terms of human development and poverty (see EC 2010). For instance, low education attainment in European regions ranges from 3.3% to 81.4%⁴; healthy life expectancy ranges between 52 and 78 years. To gain a better perspective of regional disparities within the EU, an EU regional HDI and HPI was calculated with a modified set of indicators (see annex).

3.1. EU regional human development

The regions with a high HDI are concentrated in southern England, southern Germany, the Netherlands, Scotland and Sweden (see Map 1). All French regions, except Picardie and Corse, are above the EU average. Most EU-12 regions and those in Portugal, Greece and Italy have an HDI below the EU average, except Praha (CZ), Attiki (EL) and four Italian regions. In Spain, eight regions are below and eight above the EU average, with high scores in Madrid, Navarra and Pais Vasco.

The top 10 HDI regions include five English regions, the capital city regions of Sweden and France, and two regions surrounding Brussels (see Map 1). Although the EU regional HDI is correlated with GDP, only a few regions register high levels of both GDP per head and HDI. Of the top 10 regions, only three appear in the top 10 based on GDP per head. The first in both rankings of HDI and GDP per capita is Inner London. However, the second region in the HDI ranking (Surrey, East and West Sussex, UK) is only 45th in the ranking of GDP per capita in Europe. Similarly, Outer London is 8th for HDI and 95th for GDP.

3.2. EU human poverty

The highest levels of human poverty (HPI-2) are registered in southern Europe, in particular in Portugal, Spain, Italy, Greece and Malta (see Map 2). The lowest levels of human poverty can be found in highly, moderately and less developed Member States – in particular in the Czech Republic, Sweden, Germany, Slovenia and Slovakia. Human poverty is closely correlated with low education attainment, which is the most common source of a low HPI-2 score. HPI-2 is also positively correlated with at-risk-of-poverty income.

The top 10 HPI-2 regions include six Portuguese regions, Malta, two Spanish regions (Ceuta and Extremadura) and one Italian region (Campania). All these regions, except Campania, are also in the top 10 in terms of low education attainment. Ceuta, Extremadura and Campania are the top three in terms of at-risk-of-poverty income.

The 10 regions with the lowest level of HPI-2 include five Czech regions, three Swedish regions, one Austrian and one German. Four of these regions are among those with the 10 lowest at-risk-of-poverty income rates, while three regions are among those with the 10 lowest shares of people with a low education attainment.

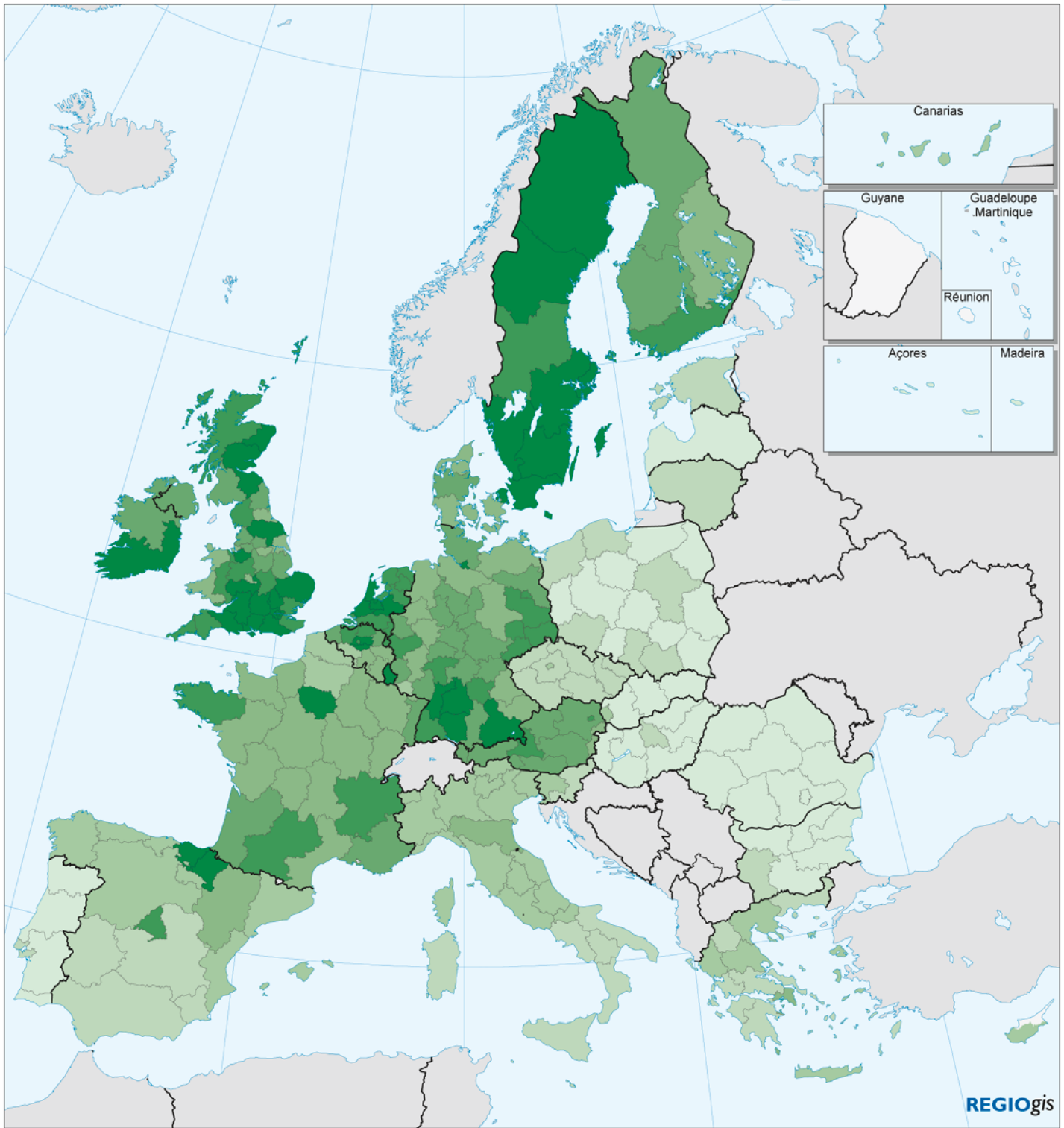
Long-term unemployment has, instead, no correlation with the performance in HPI-2. The 10 regions with the highest long-term unemployment consist of two Slovak regions, six German regions, Brussels and Ceuta (ES). Only one of these regions (Ceuta) is also among the 10 regions with the highest HPI-2.

Regions performing significantly better in GDP per head than in HDI are capital regions such as Praha (CZ), Bratislava (SK) and Brussels (BE). This may be partially due to commuting, which inflates GDP per head figures. If the more affluent prefer to live outside the capital region, this would also explain a part of the gap between GDP per head (based on where people work) and net adjusted household income (based on where people live).

The bottom 10 regions for HDI comprise seven regions in Romania, two in Hungary and one in Bulgaria. Half of them are also in the bottom 10 regions in terms of GDP per head.

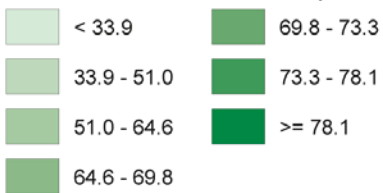
⁴ Population aged 25-64, year 2007.

Map 2 - Human Development Index at NUTS 2 level



EU Human Development Index, 2007

0 = low level of human development 100 = high level of human development

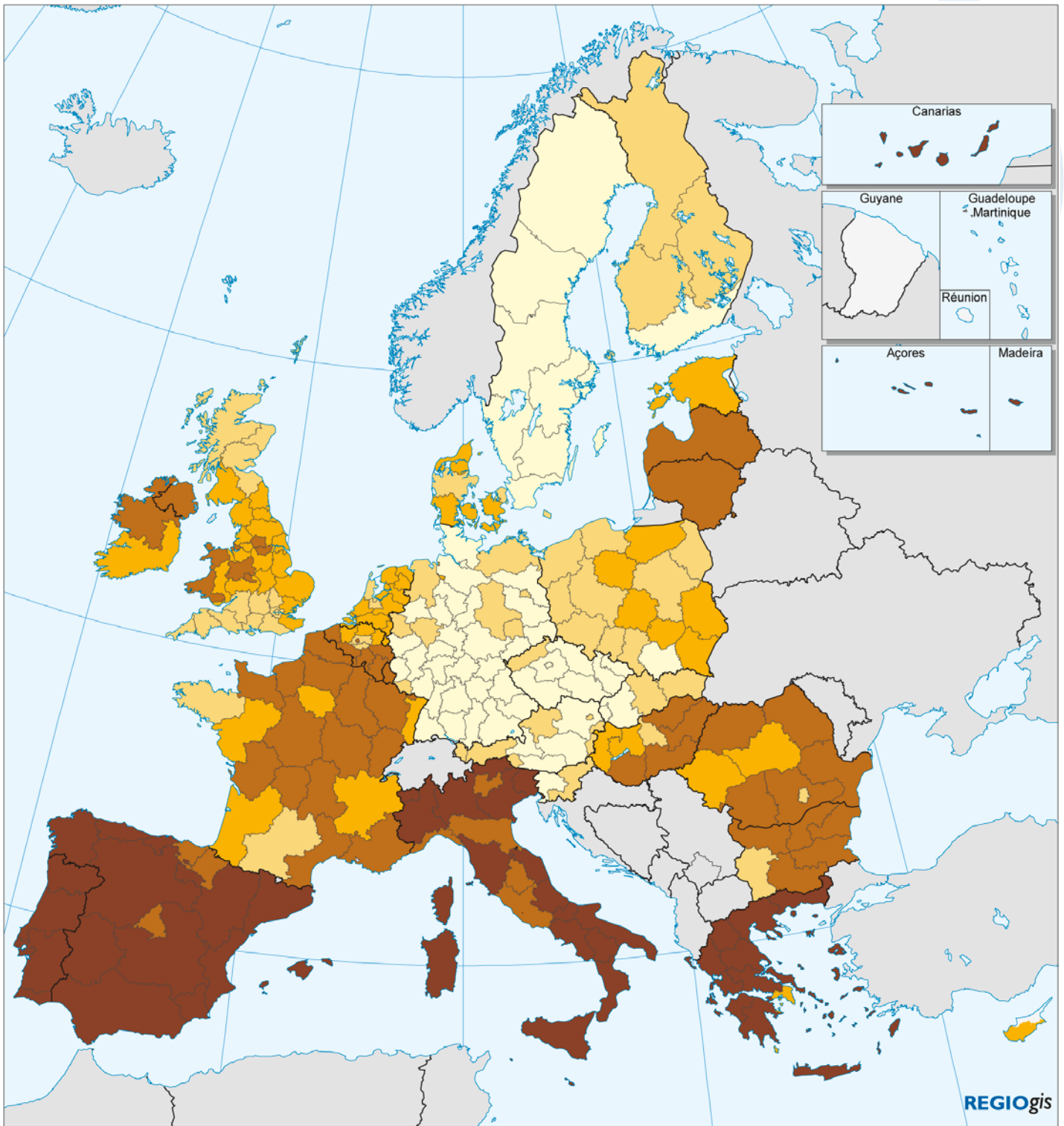


Based on life expectancy in good health,
 Net adjusted household income per head,
 high and low educational attainment population aged 25-64
 EU27 = 62
 Source: Eurostat, DG REGIO

0 500 Km

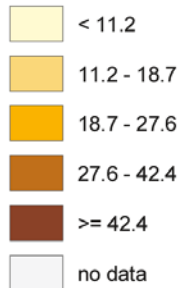
© EuroGeographics Association for the administrative boundaries

Map 3 - Human Poverty Index-2 at NUTS 2 level



UN Human Poverty Index 2, 2007

0 = low level of human poverty 100 = high level of human poverty



- share of population aged 25-64 with a low educational attainment
 - long-term unemployed as share of labour force
 - probability of not living to 65 at birth
 - % population with an at-risk-of-poverty income relative to the national median.
- Source: UN methodology, DG REGIO calculations, Eurostat data



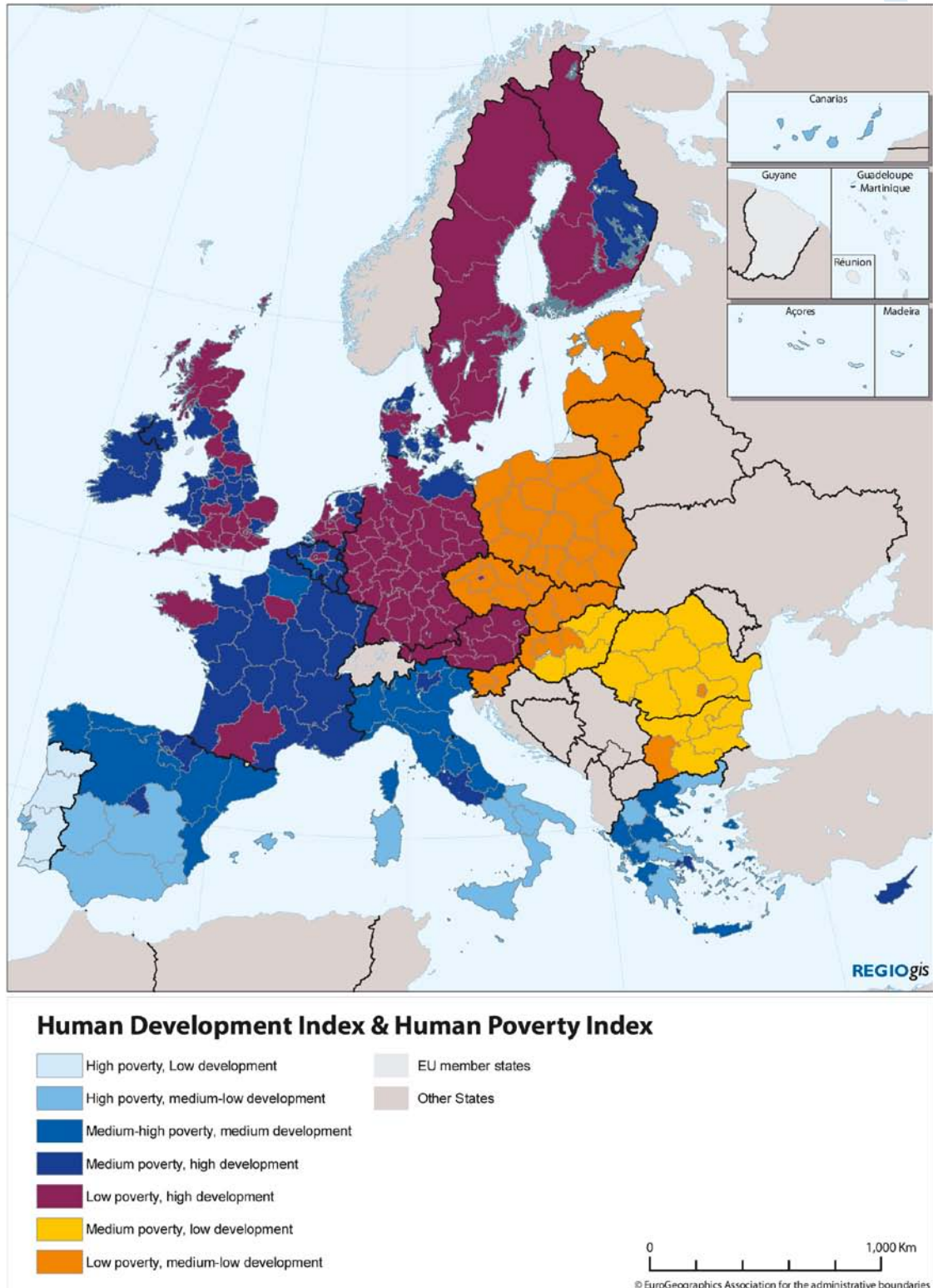
© EuroGeographics Association for the administrative boundaries

3.3. Combining human development and poverty scores

The regional HPI and HDI are only weakly correlated. Only a few regions score particularly well on both, such as Stockholm, or poorly on both, such as Açores. A large number of regions combine a high score on one index and a low one on the other. Some examples are Brussels, Luxembourg, Navarra and Pais Vasco, where the Human Poverty Index is much higher than the Human Development Index would imply.

Figure 1 reports the distribution of regions by HDI and HPI-2, showing two clear differentiated roads to the ideal situation of high development and low poverty: a 'high poverty road', with relatively high HPI-2 in comparison to HDI levels, and a 'low poverty road', with relatively low HPI-2 in comparison to HDI. A cluster analysis has been conducted to identify groups with common characteristics and different levels of poverty and development⁵, also mapped in map 4.

Map 4 - Regional HDI and HPI-2

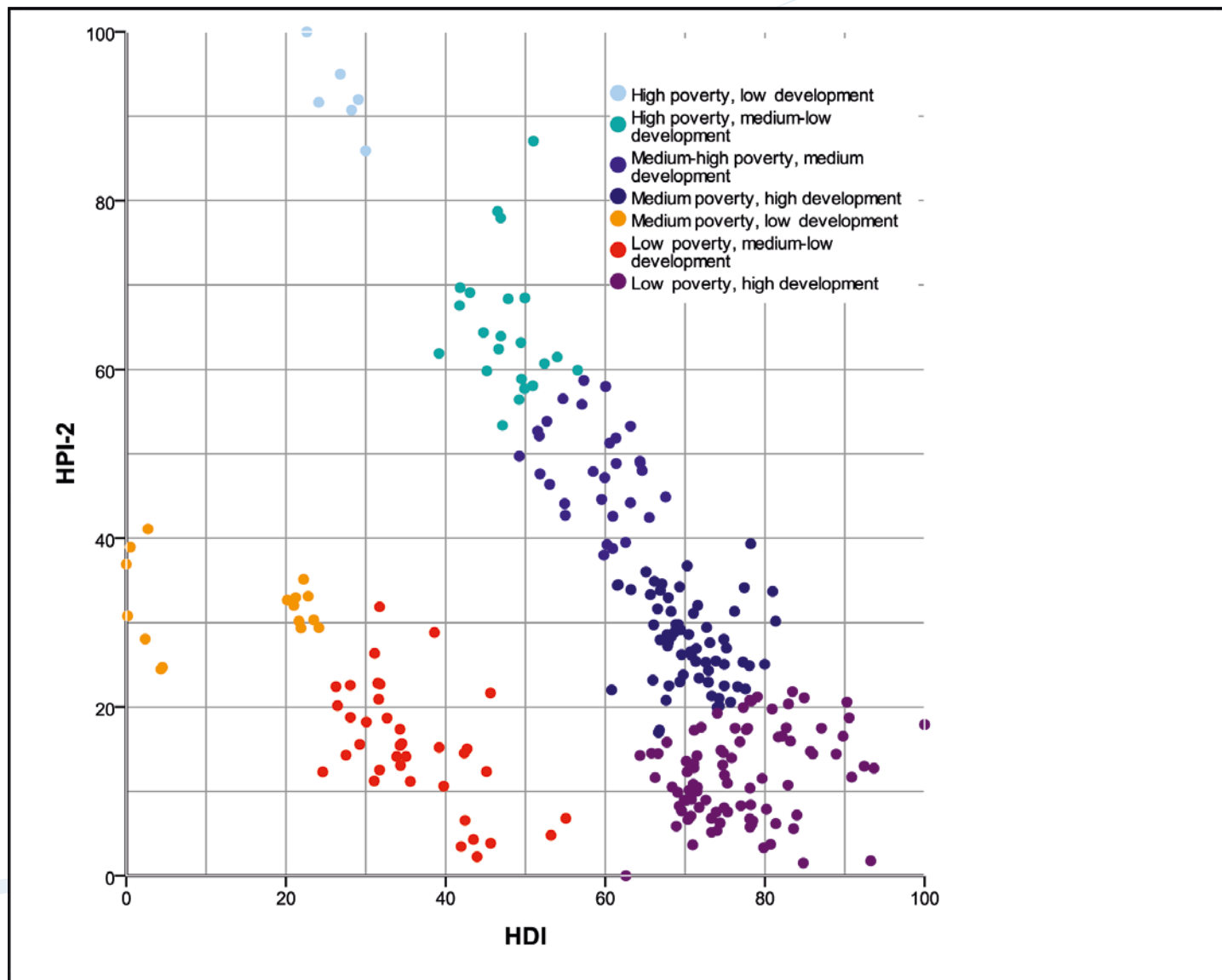


The group of high development and low poverty includes a relatively large number of regions located in particular in Germany, Austria, Finland and Sweden. Also, a large number of regions in the UK and the Netherlands and a few in Belgium, Denmark and France achieved the target of low poverty and high development.

Eastern European regions are located in the 'low poverty road' to development. A large group of regions register medium-low human development (low HDI) and low levels of human poverty (low HPI-2). On average, these regions score relatively well in basic education, poverty and unemployment but register unsolved challenges in indicators such as economic wealth and specialised human capital. This is the case of regions located in the Czech Republic, Baltic States, Poland, Slovakia and Slovenia. Other Eastern European regions in Hungary, Romania and Bulgaria also register low levels of poverty measures but score very poorly in terms of human development.

In comparison, regions located in Northern Spain and Northern Italy are on the 'high poverty road' to development, achieving good levels of human development (high HDI) but registering considerable levels of human poverty (relatively high HPI-2). These regions are therefore well developed, but their internal inequalities are rather high. As a consequence, the challenge for these regions is to increase the basic education attainment and healthcare quality, and to fight poverty also through employment policies. To a lesser extent, this is the case of the regions located in Ireland, France, areas of the UK and Denmark which feature medium poverty and high development. Finally, southern Europe regions, with the exception of Cyprus, register medium-low human development (low HDI) and at the same time high levels of human poverty (high HPI-2). This means that these regions have not achieved high development and are characterised by relevant internal disparities, scoring relatively poorly in terms of basic well-being measures (at-risk-of-poverty income, unemployment and basic education) and development measures (economic wealth, higher education, healthy life). The regions with these characteristics are located mainly in Spain, southern areas of Italy and Spain, Greece and, to a larger extent, Portugal.

Figure 1 - Regional HPI-2 and Regional HDI



⁵ With k-means methodology.

One of the main reasons for the difference in the two indices is that the HDI is based on a per capita average of an absolute measure of income (net adjusted household income), while HPI-2 includes a relative measure (the portion of population below the national poverty threshold). Accordingly, a region with an unequal distribution of a high level of income can have both a high average level of human development and a high level of poverty. A region with low income, but relatively equal distribution of it, will have a low HDI and a low HPI-2.

The increases in average income in the five less developed countries did, in fact, lead to higher levels of life satisfaction and happiness, despite the at-risk-of-poverty rate remaining unchanged. It could be argued, therefore, that improving well-being, especially in less developed Member States depends on improving the factors behind the HDI and other absolute measures of well-being. Relative measures of poverty add nuance and can guide policy choices in situations where circumstances are similar. For example, in regions with similar levels of HDI, average well-being is likely to be higher in the region with a lower HPI-2. Relative measures, however, are difficult to compare in radically different situations. For example, Stockholm and Bratislava have a very similar HPI-2, yet residents in Stockholm report being much more satisfied with their life and happier than those in Bratislava (EC 2010).

4. Conclusions

This paper has highlighted the wide variety of human development within Europe and its regions. From a global perspective, Europe appears to be uniformly highly developed. By narrowing down the analysis, a wide variety of human development levels emerge across and within European countries, targeting both elements for overall well-being (HDI) and the distribution of these elements across society (HPI-2). From a policy perspective, the analysis shows that most European regions face challenges in the area of human development or poverty. In less developed regions, improvements in the HDI can have a strong impact on well-being, while in the more developed regions a reduction in HPI-2 and inequalities is more likely to increase the overall well-being.

5. Methodology

5.1. UNDP methodology for Human Development Index (HDI)

The 2009 methodology for HDI is to take the average of three normalised indices, one in each 'dimension' of human development. These indices (Life, Education and Income) measure the achievements in each area, considering the following indicators:

- Life expectancy at birth;
- Knowledge and education (combining adult literacy rate and total gross enrolment ratio);
- GDP per capita (PPP US\$).

The formula used is the following:

$$HDI = 1/3 (I_{LIFE} + I_{EDUCATION} + I_{INCOME}) \quad (1)$$

Where the sub-index of education is the combination of gross enrolment and literacy rates, as shown in the following formula:

$$I_{EDUCATION} = 1/3 (I_{GROSS ENROLMENT}) + 2/3 (I_{LITERACY RATE}) \quad (2)$$

Each sub-index (I) is normalised taking into account the minimum and maximum value observed:

$$Dimension \ Index = \frac{actual \ value - \min \ value}{\max \ value - \min \ value} \quad (3)$$

The income indicator of GDP per head is transformed through the natural logarithm of the actual minimum and maximum values used.

The index has a value between 0 and 100, where 0 is equal to low levels of human development and 100 to high levels of human development.

5.2. EU methodology for regional HDI

This index is the mean of the normalised dimension sub-indices which are calculated through the formula (6) and is calculated in the same way as the UNDP HDI:

$$RHDI = 1/3 (I_{LIFE} + I_{EDUCATION} + I_{INCOME}) \quad (6)$$

The indicators considered for the regional HDI are: years of healthy life expectancy; net adjusted disposable household income per capita⁶ (as an index of EU-27 average); low and high education attainment for people aged 25–64 (% of population 25–64 with low and % with high education attainment). In particular, is combined as shown below.

$$I_{EDUCATION} = 1/3 (1 - I_{LOW EDUCATION}) + 2/3 (I_{HIGHER EDUCATION}) \quad (7)$$

All indicators are available at NUTS 2 level for 2007 and published by Eurostat or are the Directorate-General for regional policy (DG REGIO) estimates based on Eurostat data. The two main

⁶ These figures have been estimated using regional disposable household income figures and the difference between disposable household income and net adjusted disposable household income at the national level where available. For Romania, the difference between disposable and net adjusted disposable household income was not available. For Cyprus, Malta and Luxembourg, household income estimates from the 2nd European Quality of Life Survey have been used.

differences with the UNDP index are (1) the use of the low and high education attainment instead of literacy, since the latter is not available at the regional level and (2) the use of net adjusted household income in the purchasing power consumption standard (PPCS) instead of GDP in PPP. The use of net adjusted household income instead of GDP per head in PPS brings the indicator closer to the household perspective as advocated by the Stiglitz-Sen-Fitoussi report (2009). As the differences in net adjusted household income in the EU are considerably smaller than GDP per head worldwide, normalisation without a natural logarithm was used.

In order to obtain values between 0 and 100, normalisation is carried out following the formula:

$$\text{Normalised RHDI} = \frac{\text{actual value} - \text{min value}}{\text{max value} - \text{min value}} \quad (8)$$

5.3. UNDP methodology for Human Poverty Index 2 (HPI-2)

The index is calculated using the following formula⁷:

$$\text{HPI-2} = \left[\frac{1}{4} \left(P_{\text{LONGEVITY}}^3 + P_{\text{KNOWLEDGE}}^3 + P_{\text{STANDARD OF LIVING}}^3 + P_{\text{LONG TERM UNEMPLOYMENT}}^3 \right) \right]^{1/3} \quad (9)$$

First, $P_{\text{LONGEVITY}}$ relates to survival probability and the likelihood of not surviving to age 60. Second, $P_{\text{KNOWLEDGE}}$ corresponds to being excluded from reading and communication, and is measured by the adult illiteracy rate. Finally, $P_{\text{STANDARD OF LIVING}}$ is measured by the percentage of the population below the income poverty line (50% of median household disposable income). Social exclusion is the fourth dimension of the index ($P_{\text{LONG TERM UNEMPLOYMENT}}$) and is measured as the long-term unemployment rate (over 12 months). The index is expressed as a percentage, where higher percentages equal higher levels of human poverty. In the 2010 report, the HPI has been replaced by the Multidimensional Poverty Index (MPI) which includes a larger set of standard of living indicators.

5.4. EU methodology for regional HPI-2

To develop the regional HPI, the starting point has been to adapt the methodology behind the index of developed countries (HPI-2). In this case, the following indicators have been considered:

- Probability of not living to 65 at birth ($P_{\text{LONGEVITY}}$);
- Share of population aged 25-64 with low education attainment ($P_{\text{KNOWLEDGE}}$);
- Share of population with an at-risk-of-poverty income, i.e. 60% below the national median income after transfers ($P_{\text{STANDARD OF LIVING}}$);
- Long-term unemployed as a share of the labour force ($P_{\text{LONG TERM UNEMPLOYMENT}}$).

All the indicators are available at NUTS 2 level for the year 2007 and published by Eurostat⁸. Also in this case the differences with the UN methodology are related to the choice of available or more meaningful indicators within the EU context. In particular, the

differences are: a higher threshold for the longevity probability rate (65 years instead of 60); a different indicator for low education (low attainment instead of illiteracy); and a different poverty line (the at-risk-of-poverty income is equal to 60% of the national median instead of 50% used in the UNDP methodology). The formula is identical to the HPI-2 formula (9).

To obtain values between 0 and 100, normalisation is carried out following the same formula used for the HDI (8).

Acknowledgements

The authors would like to thank Beatriz Torighelli, Angela Winkelhorst, Hugo Poelman and Cécile Hulet for their support in the preparation of this paper.

References

Anand, S., Sen, A.K., *Human Development Index: Methodology and Measurement*, Occasional Papers – Human Development Report Office, 1994

Fifth report on economic, social and territorial cohesion, European Commission, 2010, available online at http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/cohesion5/index_en.cfm

Sagar, A.D., Najam, A., 'The Human Development Index: a critical review', *Ecological Economics*, Volume 25, Issue 3, June 1998, pp. 249-264

Stiglitz, J., Sen, A.K., Fitoussi, J., *Report of the Commission on the measurement of economic performance and social progress*, 2009, available online at <http://www.stiglitz-sen-fitoussi.fr/en/index.htm>

Streeten, P., 'Human Development: Means and ends', *American Economic Review*, Papers and Proceedings 84, 1994, pp. 2132-2237

Human Development Report 1997, UNDP, 1997, available online at <http://hdr.undp.org/en/reports/global/hdr1997/>

Human Development Report 2010, UNDP, 2010, available online at <http://hdr.undp.org/en/reports/global/hdr2010/chapters/en/>

⁷ Calculating HPI is less complex than calculating HDI, since the indicators used are already expressed as percentages, so it is not necessary to create dimension indices for normalisation as for the HDI.

⁸ The data is available for all NUTS 2 except French outermost regions;

**Any questions, comments or contributions
should be sent to the following address:**

regio-papers@ec.europa.eu

Consult this website for further information:

http://ec.europa.eu/regional_policy/index_en.htm