ESPON

INTERCO
Indicators of territorial cohesion

Scientific Platform and Tools Project 2013/3/2

Indicators Factsheets

Version 29 Sep. 2012

EUROPEAN UNION
Part-financed by the European Regional Development Fund
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This report presents the final results of a “Scientific Platform and Tools” Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

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This basic report exists only in an electronic version.

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Cohesion indicators : an approach by territorial objectives

Territorial cohesion, the impossible definition

As a cross-cutting territorial dimension of EU policies, territorial cohesion has been a priority in the ESPON research framework from the beginning. Policy documents, actions and funding of the EU during the previous decades have already dealt with territorial issues, but the current crisis and its asymmetric territorial impacts have increased the importance of the territorial approach. As such, it should be at the centre of the new Cohesion policy, which represents the second biggest envelop of EU budget and whose key role in the recovery from the crisis is recognised by the Commission.

The concept of territorial cohesion has been e.g. disseminated by the Green Paper (EC, 2008a), which presented a comprehensive approach and did further nurture the debate around its different understandings. Highlighting the rich diversity of European territory, territorial cohesion aims at turning this diversity into an asset for all places. It is thus ensuring a harmonious and balanced territorial development and contributing to a sustainable Europe. Territorial capital and potential are at the centre of these broad objectives, but the scale and the territory considered may change the way to achieve them.

Based on the observation of these recent policy developments, as well as on the abundant technical and theoretical literature published on the subject, one can rapidly recognize that the concept of territorial cohesion does not fit into one single definition. From the beginning, the INTERCO team embarked in a combined approach linking theoretical and participatory activities to reach indicators that are robust, relevant and usable for the persons interested in territorial cohesion at the European level.

From a fuzzy concept to a few single indicators grouped by territorial objectives

From more than 600 potential indicators identified in the first phase of the project, the INTERCO process allowed, in a second phase, the filtering and the prioritisation of the indicators, and finally the specification of 32 top indicators organised in 6 policy-oriented territorial objectives:

- **strong local economies ensuring global competitiveness**
- **innovative territories**
- **fair access to services, market and jobs**
- **inclusion and quality of life**
- **attractive regions of high ecological values and strong territorial capital**
- **integrated polycentric territorial development**

For each of these territorial objectives, a number of so-called "top indicators" were selected through a participatory process combined with an analytical framework, which in turn helped taking into account data constraints.

The INTERCO indicators should be able to measure diverging goals of TC and the means to achieve them, using a few understandable indicators (no complex) that are yet able to represent many policy orientations and thematic issues. This challenge was to be achieved despite the lack of data and the huge number of potential indicators (problem of level and coverage). But the even more problematic challenge to face was to find indicators able to reflect on recent policy development and emerging challenges.

Throughout the process of selecting existing indicators to measure territorial cohesion, the INTERCO team has been confronted to the multidimensional and undefined nature of the concept of territorial cohesion. This notion appears to be essentially of political nature and therefore to have moving targets regarding the agenda of each political actor. Within this perception, it has been decided to focus on the two main European strategies that should be defining the overall territorial political objectives for the next decade: the Europe 2020 Strategy and the Territorial Agenda 2020.

The selection of indicators complies with the different criteria proposed by the INTERCO team and the stakeholders during the project. The 32 selected territorial indicators reflect on the policy objectives, challenges and issues at stake. Following stakeholders recommendations, no composite indicators are proposed. Instead, coherent groups of indicators were designed under each territorial objective, which, by linking them one with the other, should represent the aim of convergence for a coherent territorial policy.(Table 1).

If the first two territorial objectives seems to be rather well covered by indicators, the third territorial objective would need a further development of the indicators of accessibility. They would not need only to be aggregated by data from national level or subdivided by degree of urbanisation, but rather by raster level or LAU 2 level and then aggregated at NUTS 3, when they actually are available only for a few ESPON regions. The fourth territorial objective is also rather complete, except for the proportion of early school leavers that should be available at NUTS 3 level rather than NUTS 1. However, the fifth one would need a better coverage on mortality, risks and hazards, as well as biodiversity data and renewable energy potential. These three indicators are actually not available at NUTS 3 levels and missing for too many ESPON territories. For the few data available at satisfying level, there are no time series to help analysing convergence. Therefore, using the existing indicators as such would not be relevant for analysis due to the many gaps and differences in scales availability for comparison. However, they are still important as they would depict a number of important dimensions of territorial cohesion, through the indication of natural assets and wealth of each territory. Notably, it will be important to emphasis some aspects of these indicators underlying the environmental challenges

that will become more and more acute in the future years. As for the last territorial objective, only the polycentricity index needs to be redefined with new FUAs.

Territorial objectives	Indicators
Strong local economies ensuring global competitiveness	GDP per capita in PPS
	Overall unemployment rate
	Old age dependency ratio
	Labour productivity in industry and services
	Labour productivity per person employed
Innovative territories	Population aged 25-64 with tertiary education
	Intramural expenditures on R&D
	Employment rate 20-64
Fair access to services, market and jobs	Access to compulsory school
	Access to hospitals
	Accessibility of grocery services
	Access to universities
	Accessibility potential by road
	Accessibility potential by rail
	Accessibility potential by air
Inclusion and quality of life	Disposable household income
	Life expectancy at birth
	Proportion of early school leavers
	Gender imbalances
	Difference in female-male unemployment rates
	Ageing index
Attractive regions of high ecological values and strong territorial capital	Potential vulnerability to climate change (ESPON Climate)
	Air pollution: PM_{10}
	Air pollution: Ozone concentrations
	Soil sealing per capita
	Mortality, hazards and risks
	Biodiversity
	Renewable energy potential
Integrated polycentric territorial development	Population potential within 50 km
	Net migration rate
	Cooperation intensity (number of common projects between partners, from ESPON TERCO)
	Cooperation degree (the number of regions cooperating with each other, from ESPON TERCO)
	Polycentricity index

Table 1. Final list of indicators *(wish indicators in italic)*

The territorial objectives have been designed to better group indicators by coherent sets. They are explicitly linked to TA 2020 and cover also the three dimensions of Europe 2020 Strategy. The indicators assigned to each of these objectives are to be meaningful not per se, but in relation to each other for the purpose of giving better drive for Cohesion policy. When put all together, the territorial objectives should shape tomorrow's cohesion between diverse territories building a strong, smart and sustainable Europe. It is expected that this presentation of indicators allows representing divergence or convergence of territories towards main EU territorial policy priorities, by visualizing the regions that diverge clearly from average, thus helping targetting the policy priorities. This leads to help classifying the regions by results of policy actions, building new typologies. Meanwhile, the set of indicators are flexible enough to follow policy future developments and data availability.

Indicators factsheets

The INTERCO territorial cohesion indicators are presented by territorial objective. First, the territorial objectives and the rationale behind the indicator selection is described. Then, each indicator is presented in a standardised manner, in the form of a fact sheet. Each fact sheet starts with basic information on the indicator, along with an indicator description, followed by a diagram illustrating the minima, mean and maxima values per country for the latest available year. Graphs of convergence are also shown (if available) :

- sigma convergence : evolution of disparities
- beta convergence : trends in relation to states, i.e. revealing possible catching-up process (lagging behind territories should progress better than other ones)

These graphs are followed by the indicator map, which also includes the sigma convergence graphs (if available).

Indicator presentation for each territorial objective concludes with a short summary highlighting the main findings and focusing on the indicator developments (trends towards cohesion or towards increasing disparities).

Territorial objective 1. Strong local economies ensuring global competitiveness

A more balanced and sustainable competitiveness is needed within Europe and for its role in a globalised economy. This was already the objective of ESDP and continues to be of great importance in TA 2020 and Europe 2020. Regions should aim at a sustainable growth through a more competitive economy based on higher productivity. Strong local economies and communities are key players for that. Thus, one should look at local challenges to underline local disparities, especially on what can shadow long-term growth: demographic challenge (ageing) and quality of labour market.

Four indicators are proposed as territorial cohesion indicators under this objective:

- GDP per capita in PPS
- Overall unemployment rate
- Old age dependency ratio
- Labor productivity

These indicators are dedicated to measure the overall economic output of all activities (GDP per capita in PPS), the quality of the regional labour markets (unemployment rate), the labour market age structure (old age dependency ratio), and the competitiveness of a region compared to global market (labour productivity). As for the indicator on labour productivity, European statistics provide time series data for a period of 1995-2010 only at national level. Therefore, the related indicator called labour productivity in industry and services was also tested, which is available at least at NUTS 2 level, but only for one point in time and not as time series. So the reader will find two productivity maps here.

Consequently, in the indicator wishlist it is recommended to collect data on labour productivity per persons employed at regional level (NUTS 3).

As all four indicators are available for several years, sigma and beta convergence plots have been generated helping to analyse the temporal dimension of cohesion, i.e. to analyse trends towards cohesion (for labour productivity only at national level). For indicators at NUTS 3 level (GDP per capita in PPS, unemployment rate, old age dependency ratio), this analysis was furthermore conducted by differentiating five types of regions (predominantly urban regions, intermediate regions close to a city, intermediate regions remote, rural regions close to a city, rural regions remote) which may provide additional insights into the spatial development of cohesion trends in Europe.

GDP per capita in PPS

Theme:

0708 ECONOMY, LABOUR FORCE. Business, all sectors

Policy relevance:

This indicator measures the overall economic output of all economic activities. It provides insight into economic strength and regional growth.

Desired direction of change:

Increase of GDP per capita is desired generally for all regions; however, lagging regions and regions in rural or peripheral areas should catch up faster.

Description:

The map highlights two main spatial divides: first, there is a strong concentration of GDP per capita in capital city regions and in big agglomerations. Second, the map illustrates the still existing clear East-West divide between the old and the new EU Member States, with Eastern Europe experiences significant lower GDP levels compared to Western Europe.

The temporal development of disparities between European regions was quite distinct, as the sigma convergence graph shows: until 2001 disparities slightly increased for all types of regions; since then disparities decreased with highest decreases for intermediate, remote regions as well as predominantly rural regions (Figure 2); differences between predominantly urban regions, however, remained stable over time. Across all NUTS 3 regions, a slight trend towards cohesion could be observed for entire Europe.

This is generally confirmed by the beta convergence graphs (Figure 3), illustrating that for all region types those regions with lower levels of GDP per capita developed faster compared to those regions with higher GDP levels; however, because there are for all region types (except for remotely predominantly rural regions) regions with negative GDP developments, watering down the positive results, the overall sigma convergence trend is not as clear as it seems at a first glance.

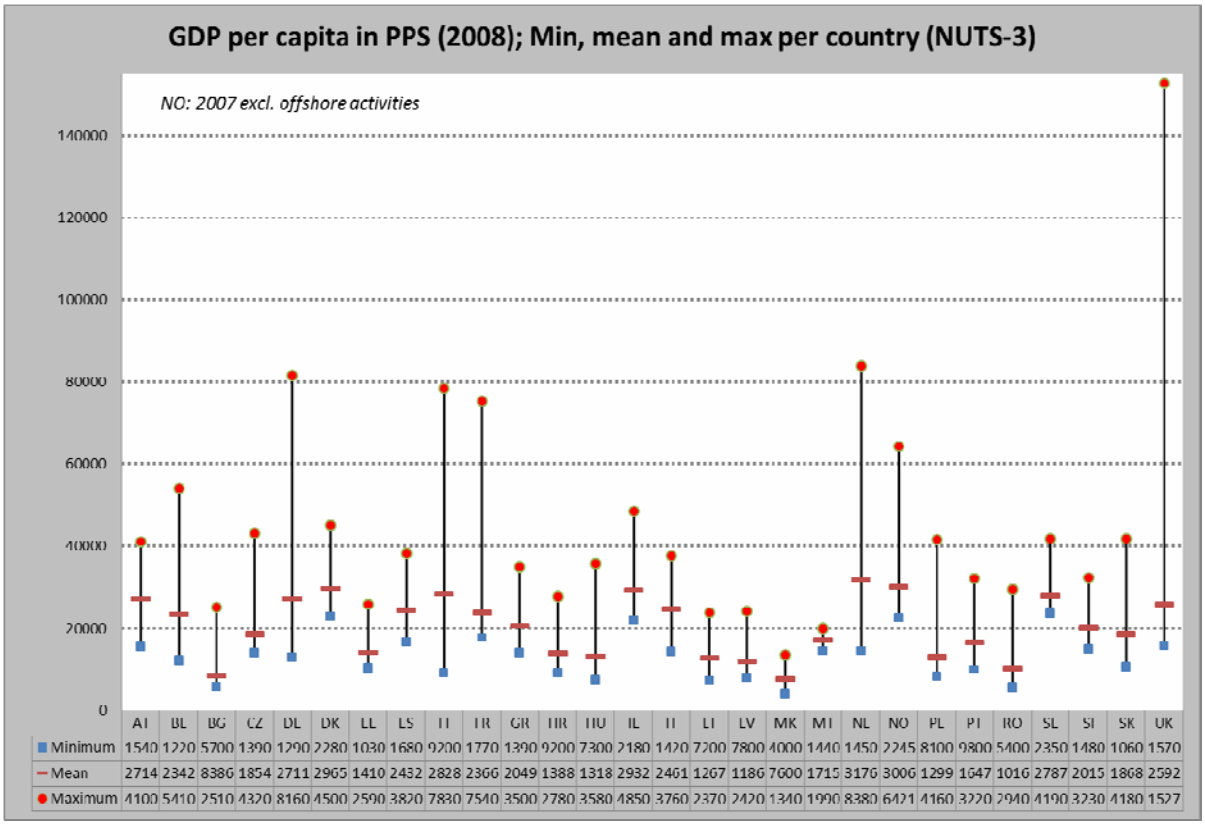

Figure 1. GDP per capita in PPS by country – Minima, maxima and averages

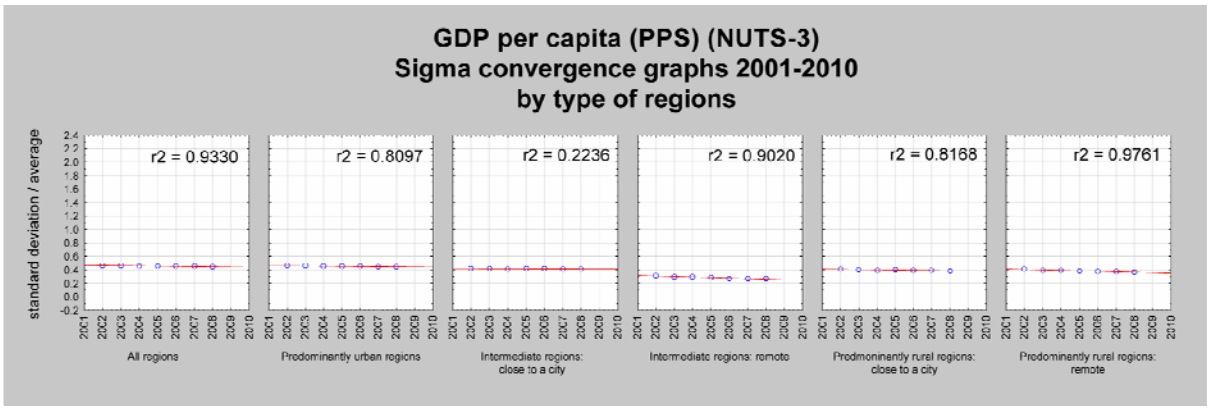

Figure 2. GDP per capita in PPS by type of region – development of disparities 2001-2010

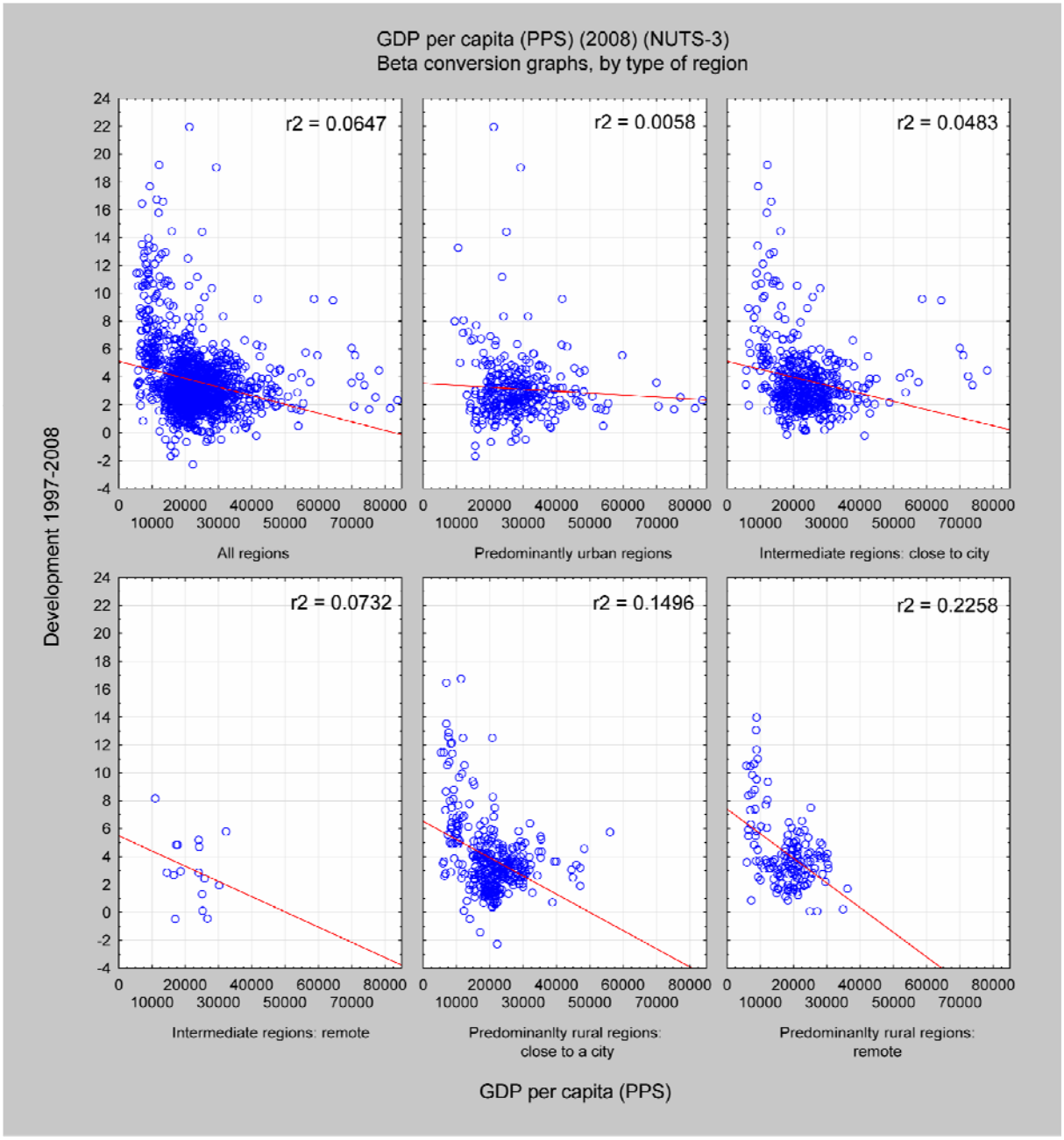

Figure 3. GDP per capita in PPS by type of region – beta convergence

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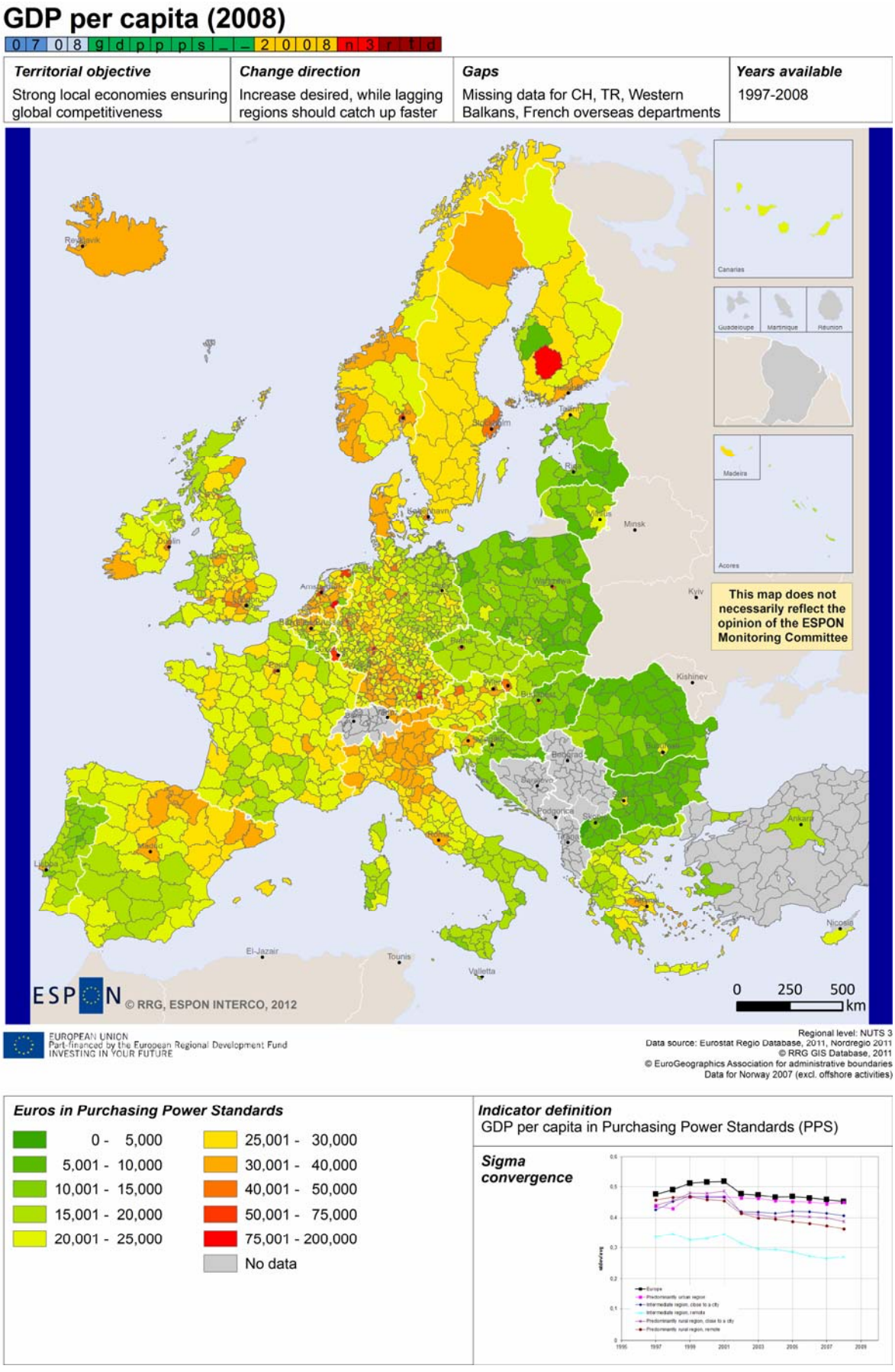


Figure 4. Indicator – GDP per capita 2008 (PPS).

Unemployment rate

Theme:

0702 ECONOMY, LABOUR FORCE. Employment, Unemployment

Policy relevance:

This indicator measures the quality and performance of regional labour markets. It constitutes a contextual indicator important to assess regional flexibility as well as sustainability of local economic activities.

Desired direction of change:

Generally a decrease of unemployment rates over total population is desired; particular attention needs to be paid to decrease unemployment in old industrialised areas and in rural areas or areas with specific geographical handicaps (such as islands, mountain regions or border regions).

Description:

Unemployment rates in Europe range from one percent (Norway, Alpine regions, Benelux, parts of Germany and the UK) up to almost 30 percent in Southern Spain. Some countries show only little variations (France, Portugal, Finland, and Sweden), other countries such as Germany, Spain, and Turkey or Romania reveal great differences among their regions (Figure 5). Development of unemployment rates differed to large extent across Europe. While regions in Poland, Finland and Southern Italy experienced a fall in unemployment, Sweden, Iceland, Ireland, England, parts of Spain, Italy and Hungary experienced significant increases in unemployment rates, partly as high as 20 percentage points. During 2006-2009, unemployment rates again increased in many countries due to the economic crisis. This increase, however, had quite different impacts on the development of disparities among different types of regions (Figure 6).

While disparities among predominantly urban regions remained unchanged, disparities increased among remote intermediate regions and also among remote rural regions; in contrast, disparities slightly decreased for intermediate regions that are close to a city, and significantly decreased for rural regions close to a city. Altogether, at European level this lead to a slight decrease in unemployment across all regions.

When analyzing the development of regional unemployment rates over a longer period since 1999, the beta convergence confirms (Figure 7) these heterogeneous developments: even though generally in regions with higher unemployment rates unemployment even increased, the situation in regions with lower unemployment rates is not that clear: there are regions with increasing but also with decreasing unemployment. This observation holds true for all types of regions.

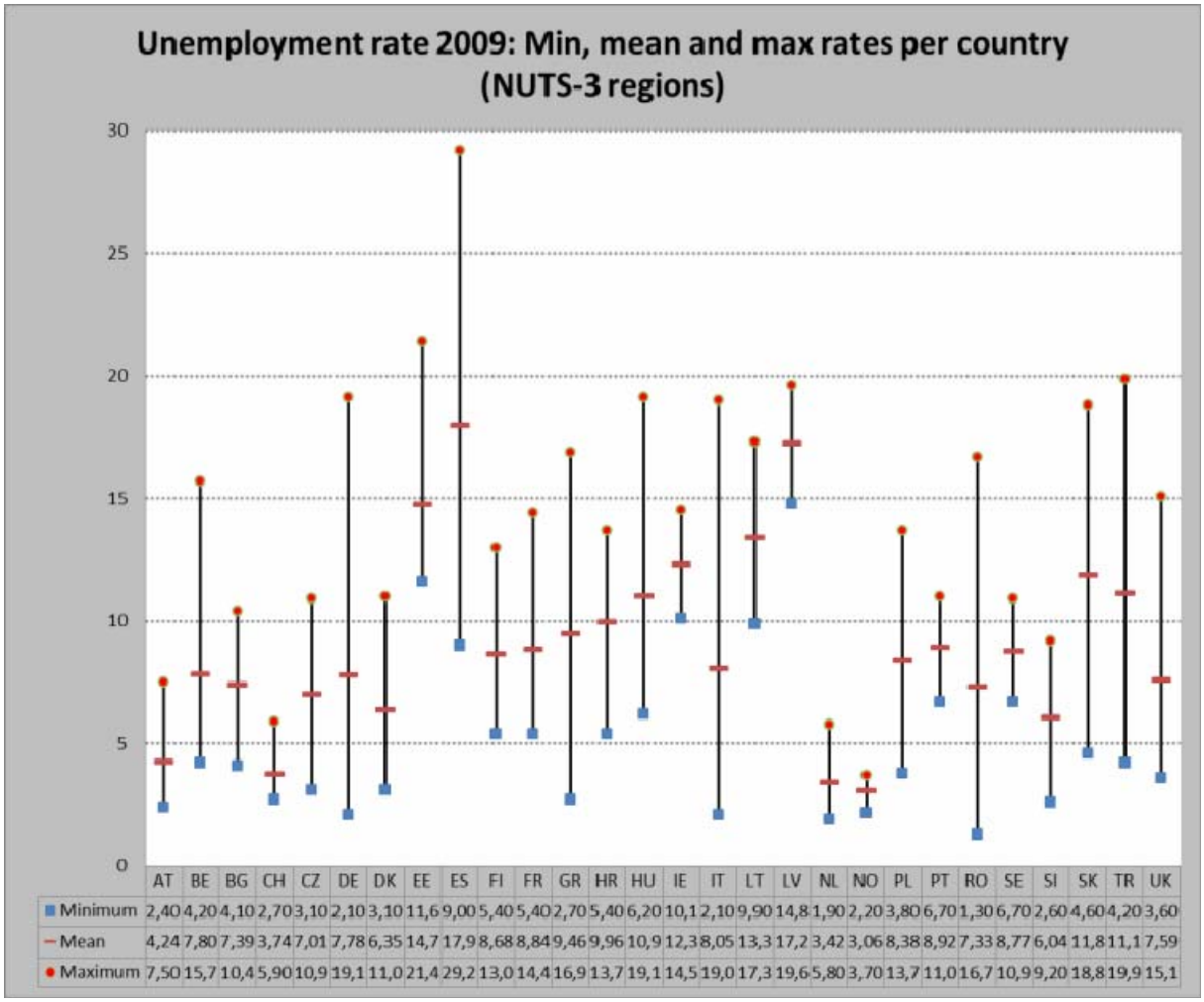


Figure 5. Unemployment rates by country – Minima, maxima and averages.

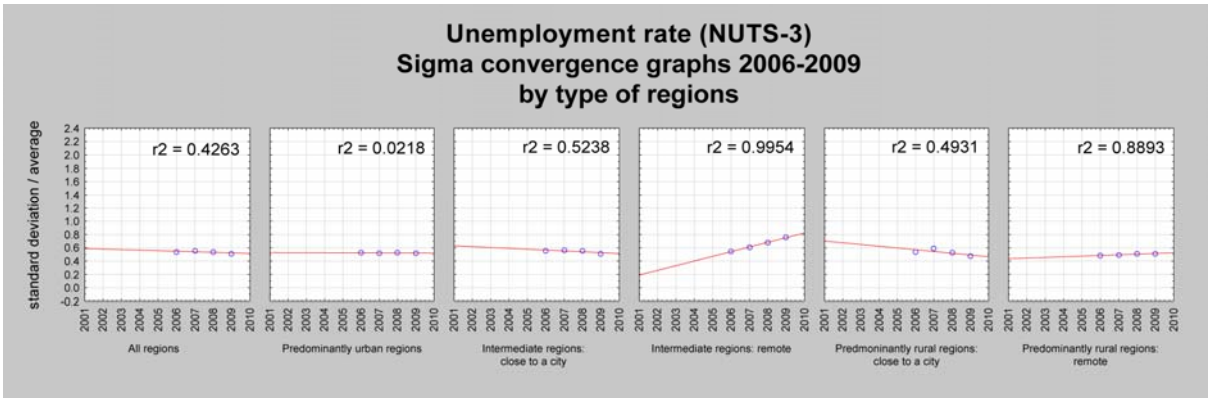


Figure 6. Unemployment rate by type of regions - development of disparities 2006-2009.

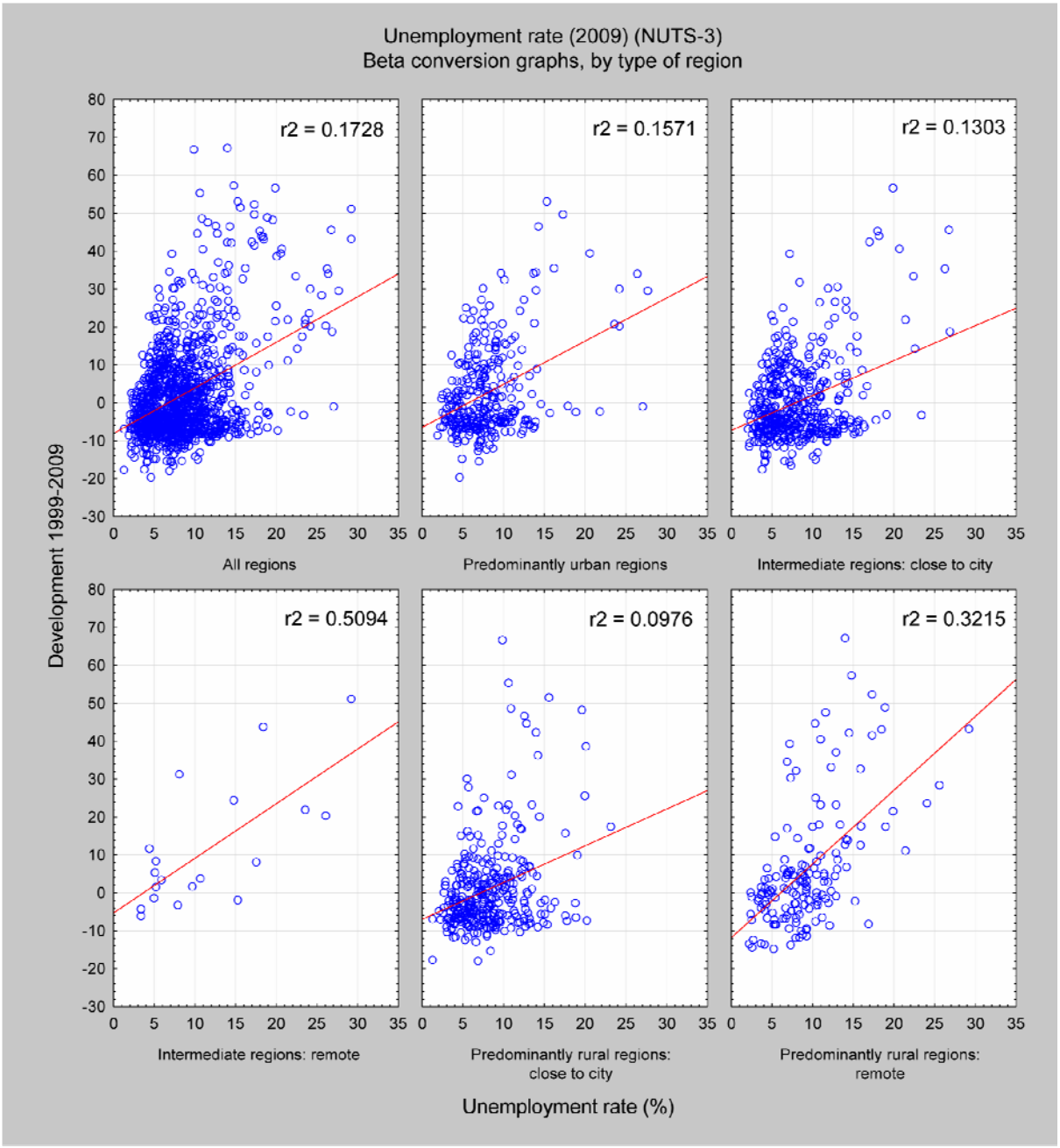


Figure 7. Unemployment rate – beta convergence.

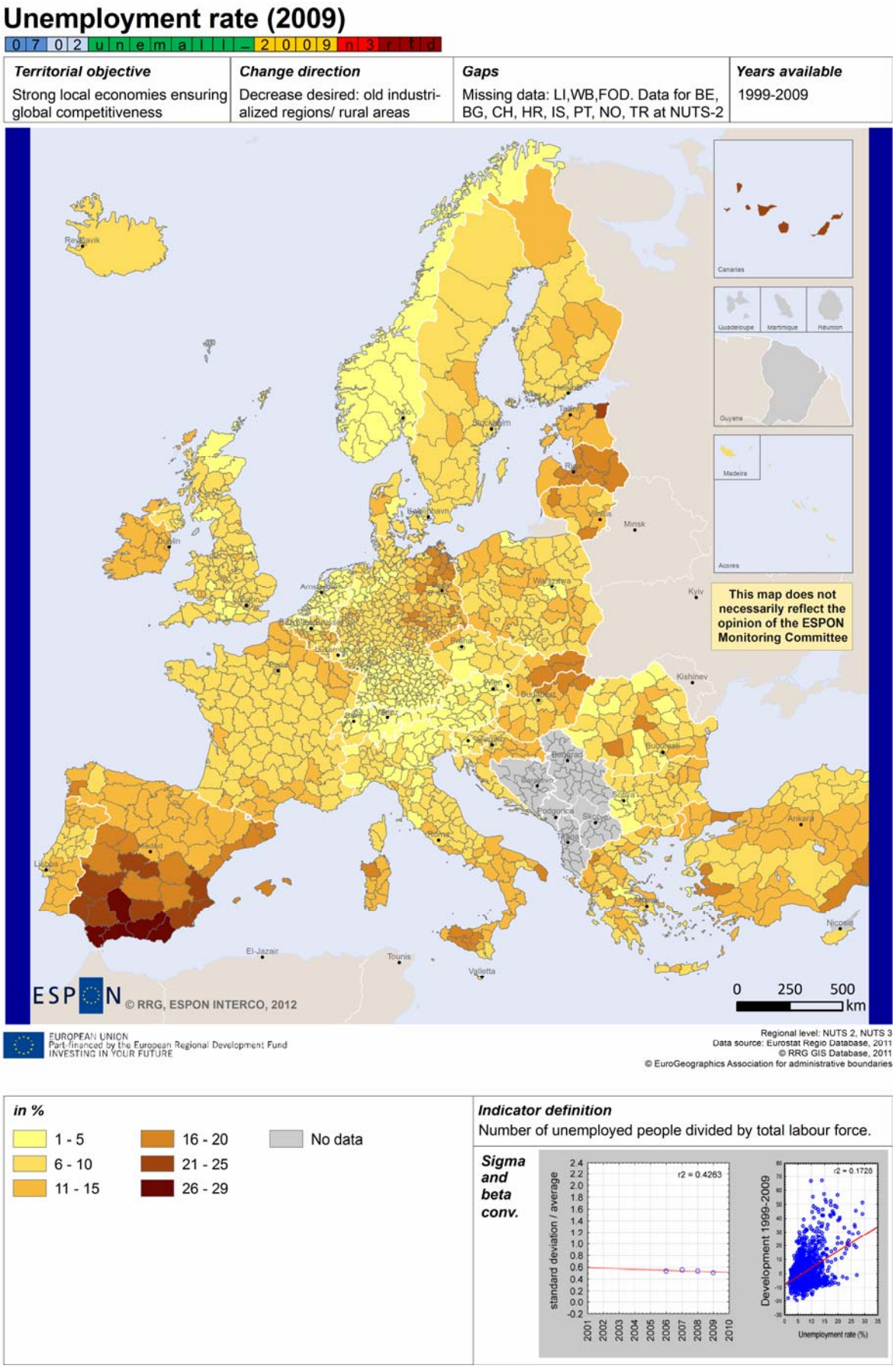


Figure 8. Indicator – Unemployment rate (%).

Old age dependency ratio

Theme:

0201 DEMOGRAPHY. Population structure

Policy relevance:

This indicator measures the percentage of working class population in relation to elderly, retired people. It warns about overaging of population that may lead to severe problems in pension systems and also to social disruptions, affecting sustainability of local economies.

Desired direction of change:

Generally a society should strive for a balanced population structure in terms of percentage of different cohorts. Thus, development over time should ensure a balanced age structure and should try avoiding overaging.

Description:

Generally the indicator illustrates that the size of the working-class population in East European countries is higher compared to West European or Scandinavian countries, as more people in working-age exist compared to elderly people. But even in Western Europe there are distinct areas with extremely high dependency ratios, such as in Southern France, Eastern Germany, the border area between Spain and Portugal or Greece, leading to high variations in indicator performance at NUTS 3 level within the countries (Figure 9). Even though variations for all countries are quite high with often 10-15 percentage points difference between the worst and best performing regions, Spain, Germany, Portugal, Greece and France are remarkable since they yield extremely high variations up to 30 percentage points (Figure 9).

Even though in remote rural regions disparities decreased between 2007 and 2009 or remained stable for rural regions close to a city (Figure 10), slightly increasing disparities for intermediate regions and for predominantly urban regions led to a small increase in disparities over all NUTS 3 regions in Europe until 2009.

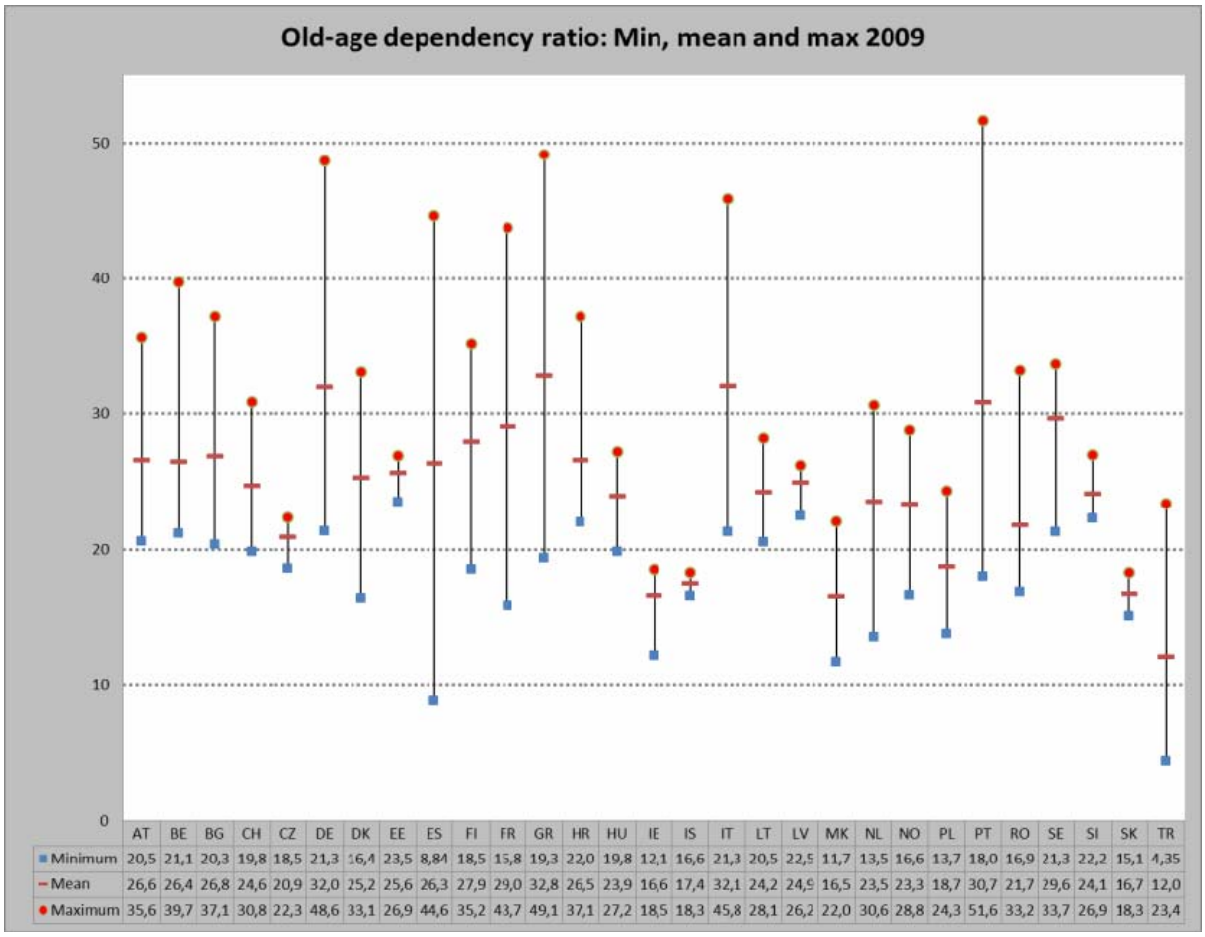


Figure 9. Old-age dependency ratio by country – minima, maxima and averages

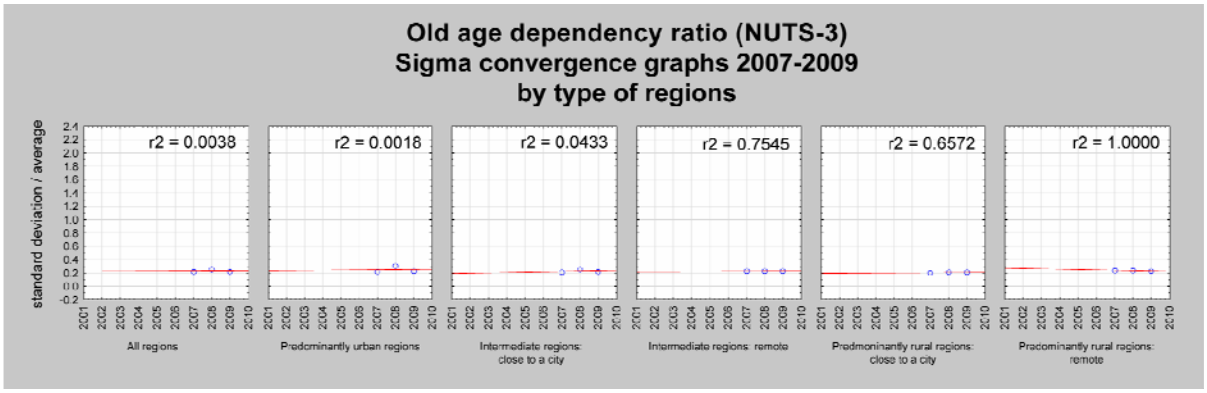


Figure 10. Old age dependency ratio – development of disparities 2007-2009

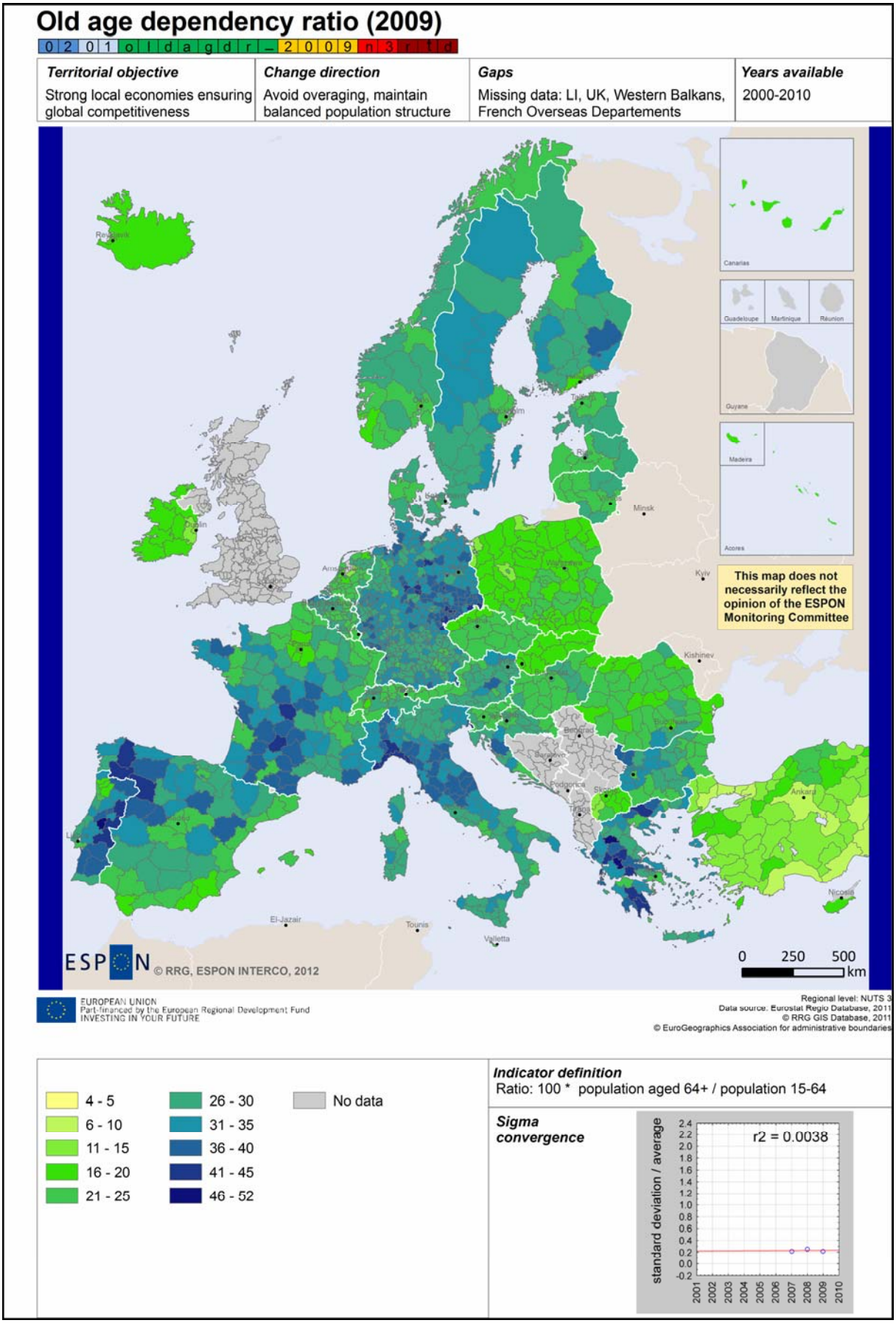


Figure 11. Indicator – Old age dependency ratio.

Labour productivity

Theme:

0701 ECONOMY, LABOUR FORCE. Labour force

Policy relevance:

This indicator tells us the robustness of GDP produced and shows the competitiveness of a region in global economies.

Desired direction of change:

Generally increase is desired to prepare European regions for difficult global markets; however, regions with less than 50% of EU27 average should catch up faster.

Description:

There is a clear divide between the old EU Member States and the new EU Member States, with all of the latter ones experiencing productivity levels below the EU average (with Bulgaria and Romania experiencing the least productivities). From the old EU Member States only Greece and Portugal have levels slightly below EU average. At the contrary, Luxembourg, Belgium, Ireland and Norway gain the highest labour productivities with up to 178 of the EU27 average. When looking at the productivity in industry and service sector, the picture is even more distinct. In addition to the above patterns, there is also a clear North-South divide in several countries (Spain, Italy, Germany), and also a urban-rural divide (UK, Greece, France, Germany) with urban areas experiencing higher productivities compared to their surrounding regions, leading to large intra-national disparities (see also min, mean, max graph in Figure 12).

At national level, disparities in labour productivity decreased in the period of 1998-2009 (Figure 13) remarkably as an effect both of improvements in productivity of least-performing regions and slight decreases of productivity of better performing regions (Figure 14).

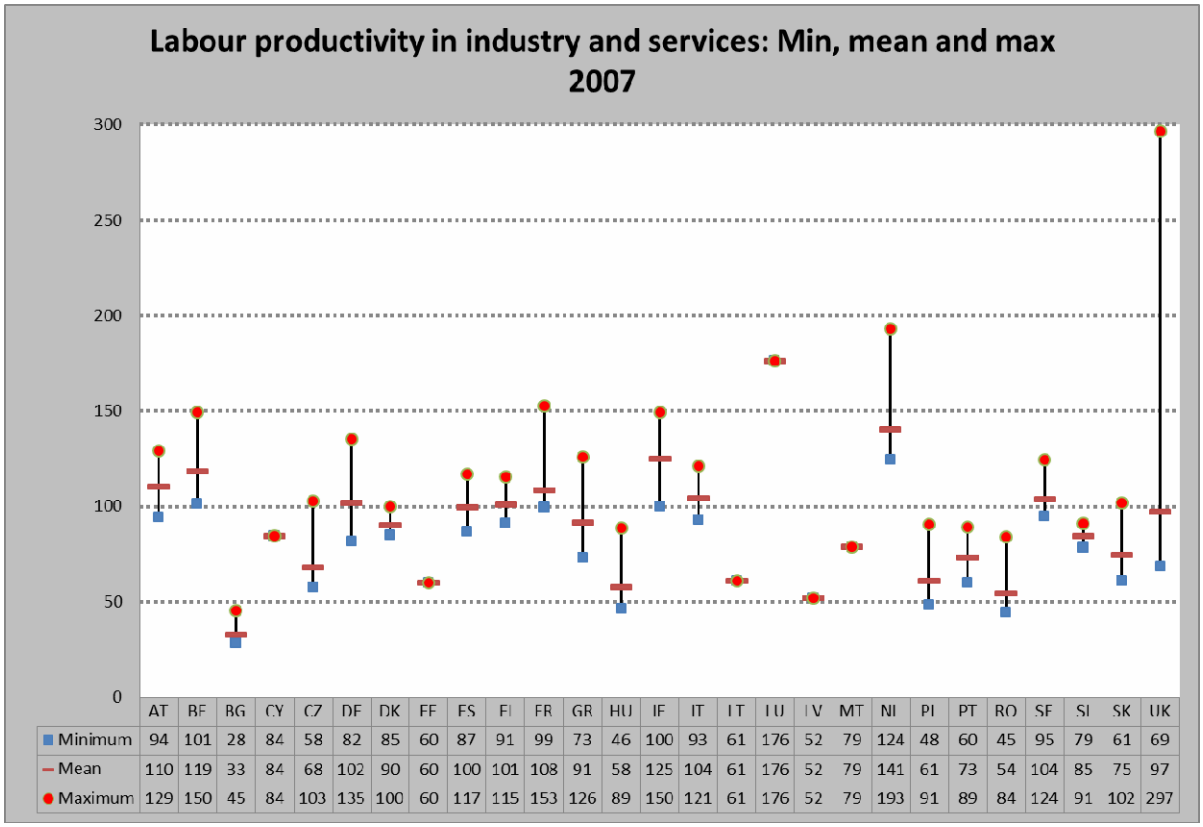


Figure 12. Labour productivity in industry and services by country – minima, maxima and averages

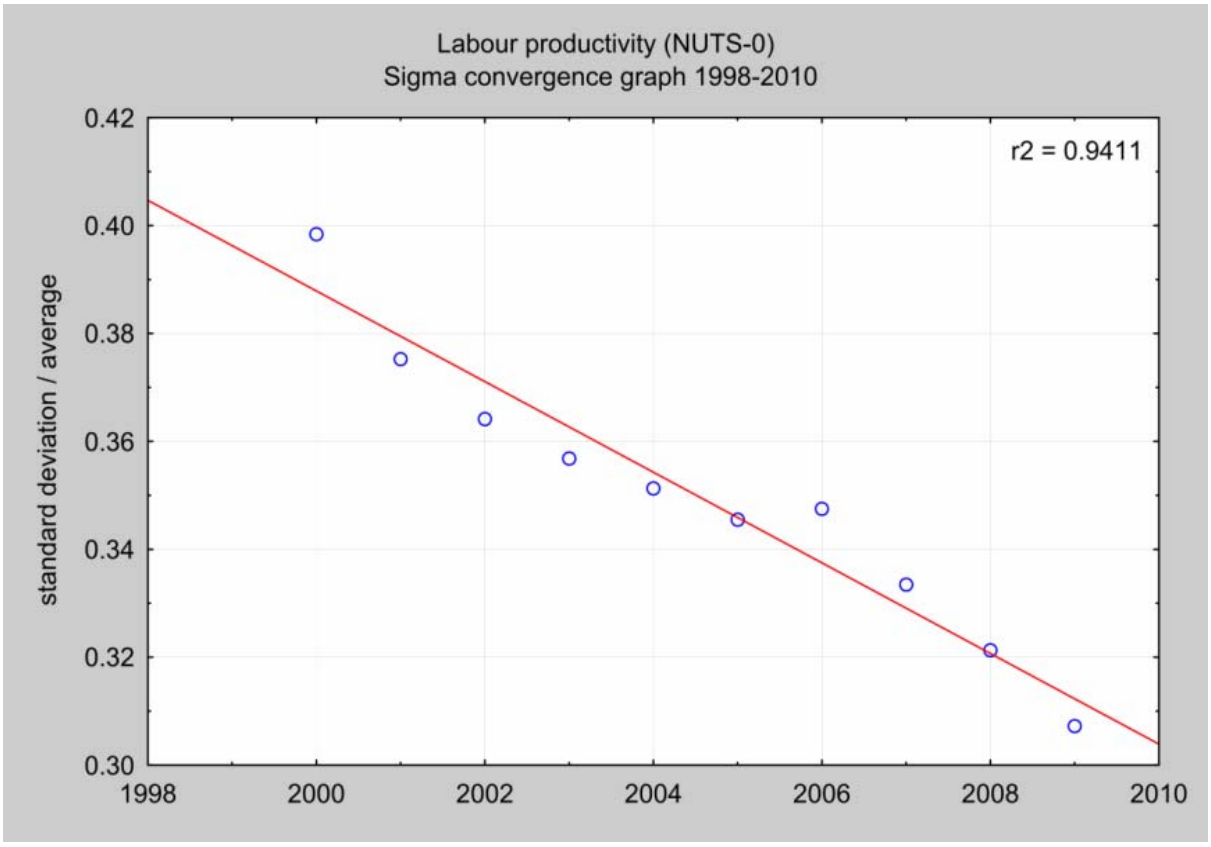


Figure 13. Labour productivity (NUTS 0) – development of disparities 1998-2010

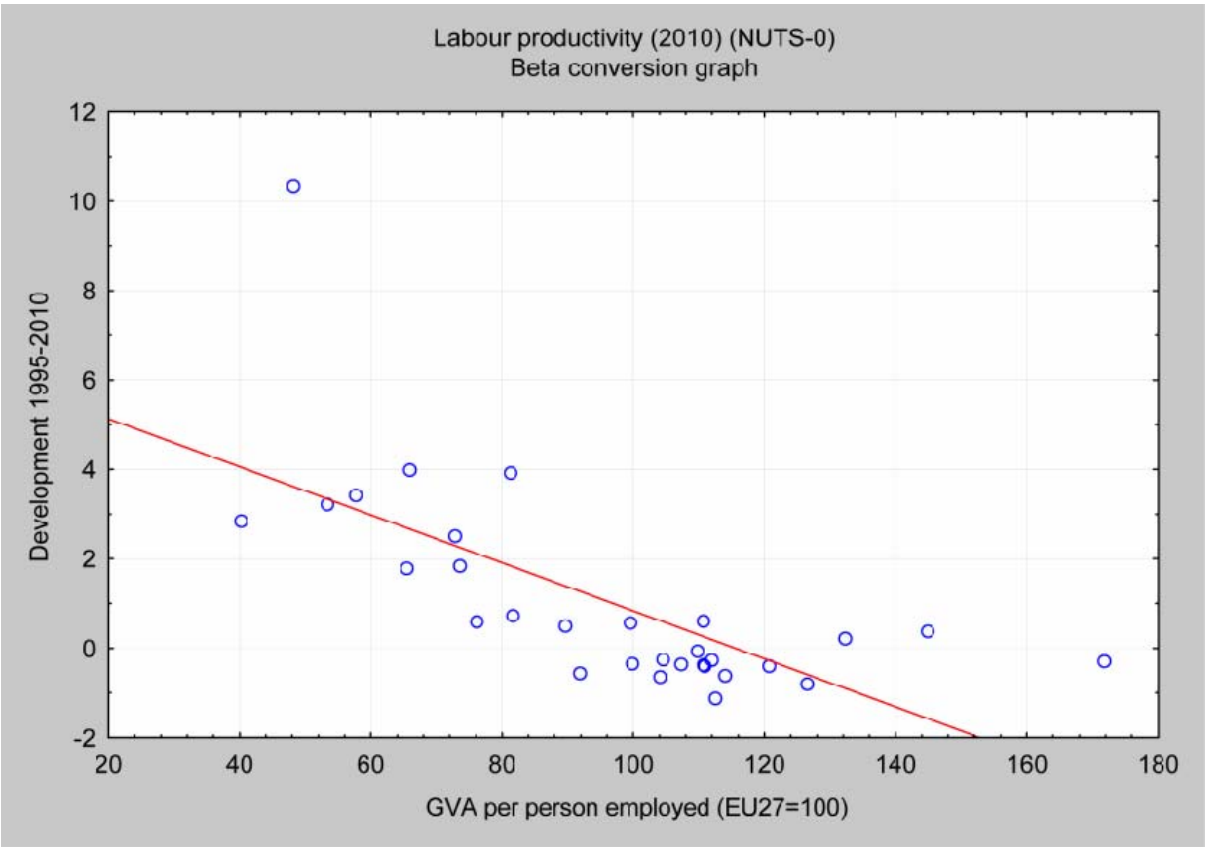


Figure 14. Labour productivity (NUTS 0) – beta convergence

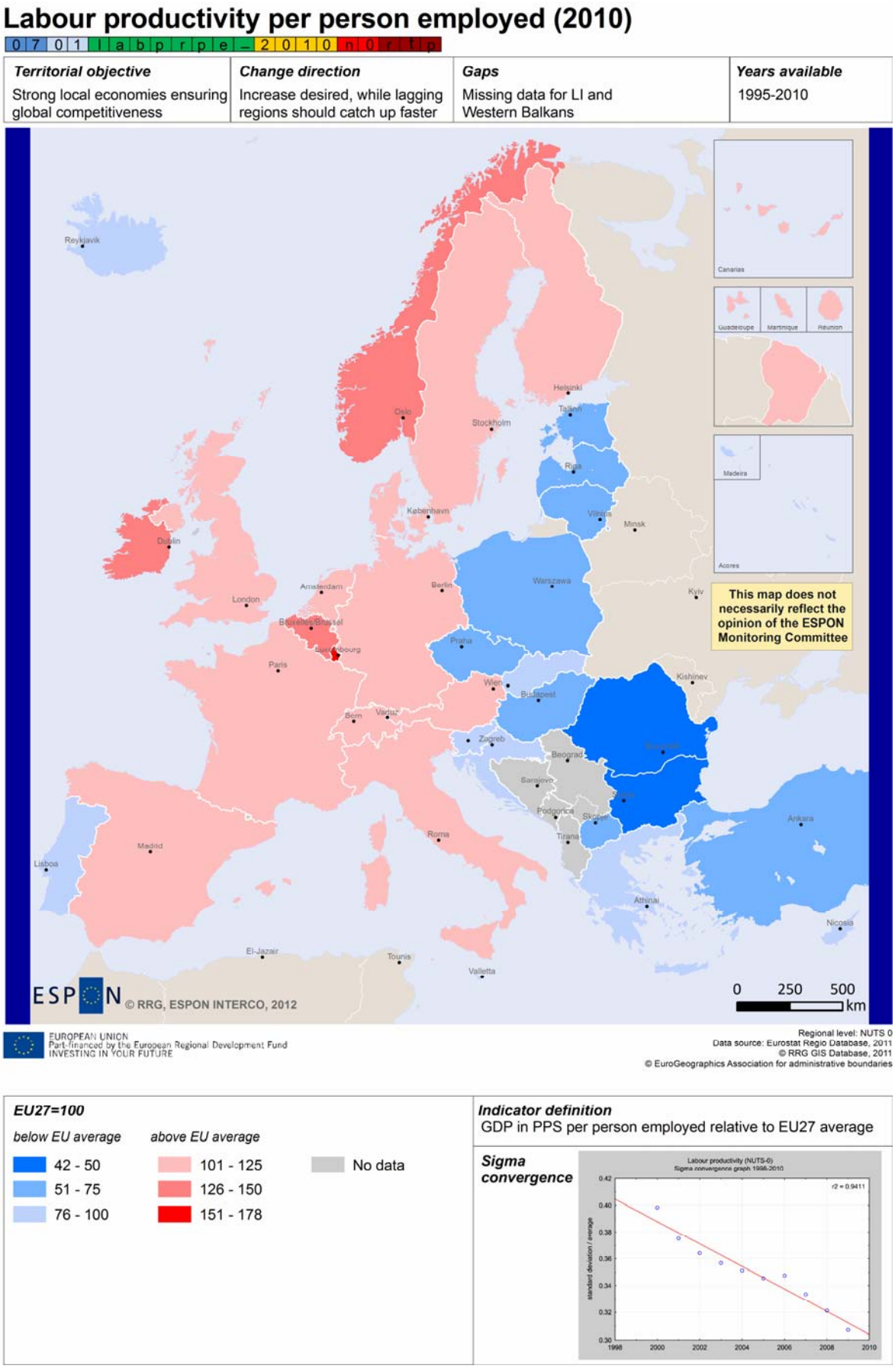


Figure 15. Indicator – Labour productivity per person employed (NUTS 0).

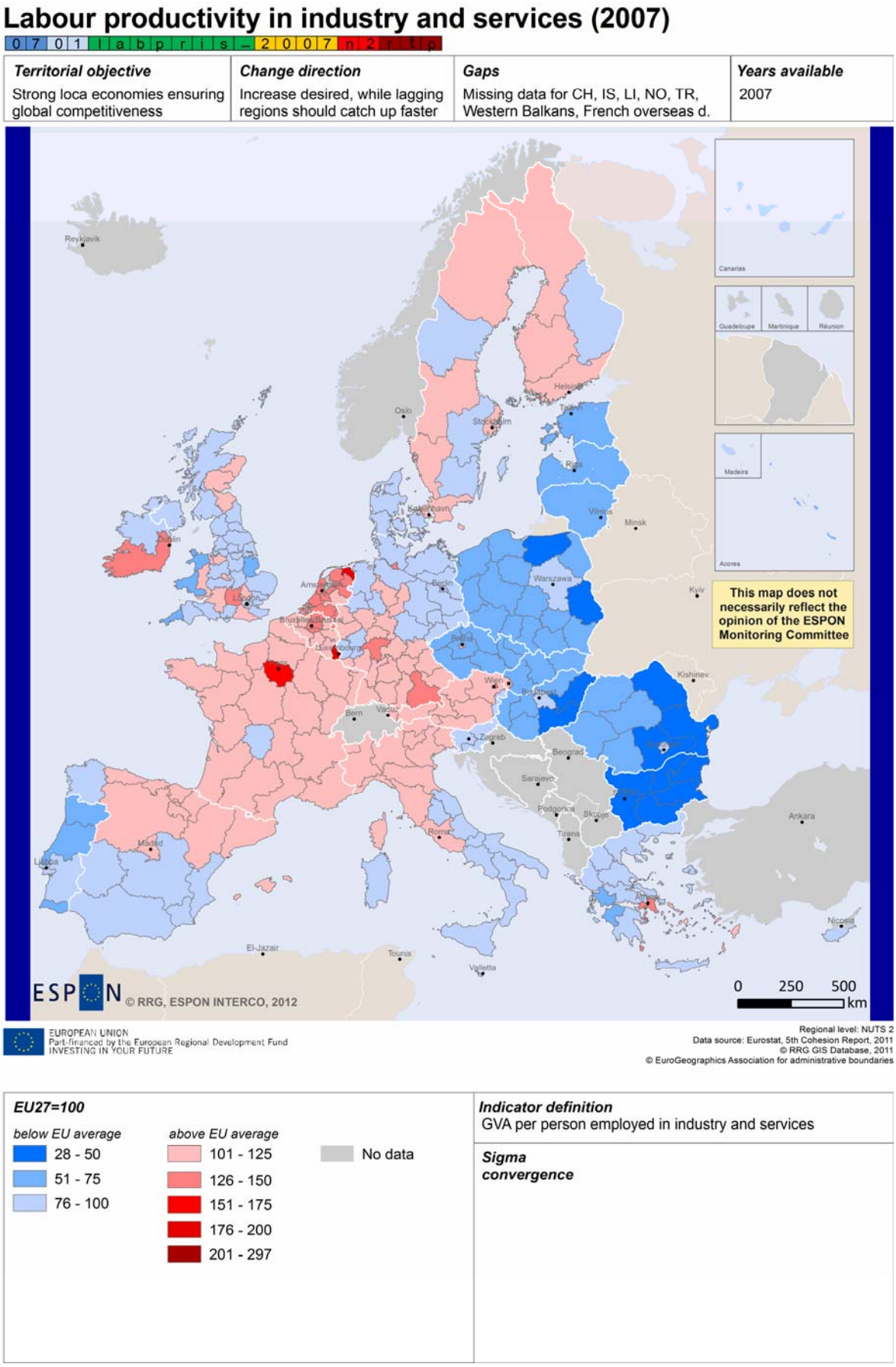


Figure 16. Indicator – Labour productivity in industry and services (NUTS 2)

Summary

What are the territorial disparities of the indicators selected for the territorial objective of strong local economies ensuring global competitiveness? And how have these indicators developed over the last decade?

The indicator ***GDP per capita in PPS*** revealed quite distinct developments of disparities, with slight increase until 2001 for all type of regions, and slight trend of convergence afterwards (however, with some differences for different types of regions). As desired, results show that trend of convergence in remote regions (intermediate and rural) was highest, while disparities in urban regions or regions close to a city remained stable.

For all European regions, a slight trend towards convergence of ***unemployment rates*** could be observed over the recent past (2006-2009). Even though this overall trend of convergence is appreciated, there is no harmonious trend of convergence for all rural regions, as desired, since only those rural regions close to a city reduced disparities in unemployment, while the same disparities for remote rural areas increased in the same period. For urban regions, including the old industrialised ones, disparities remained.

Despite slight convergence trends in the ***old age dependency ratio*** for rural regions, slight increases in disparities for intermediate and urban regions led to an overall increase in disparities. Thus, the desired direction of change is not met, neither in terms of cohesion trends as a whole nor in terms of striving for a balanced age structure.

For ***labour productivity***, remarkable trends toward cohesion at national level could be observed with least performing regions catching up faster than good performing ones. Thus, the indicator moved into the desired direction of change.

Over all four indicators, there is no general trend towards convergence. While GDP per capita and unemployment rates only reveal slight positive effects, opposite negative development can be observed for the old age dependency ratio (Figure 17). Only labour productivity showed clear trends towards cohesion, albeit measured at national level.

Notwithstanding the recent development trends, big disparities among NUTS regions in Europe for GDP per capita and unemployment rates still remained, as Figure 18 illustrates, while disparities for the old age dependency ration is lowest, followed by labour productivity (at NUTS 0).

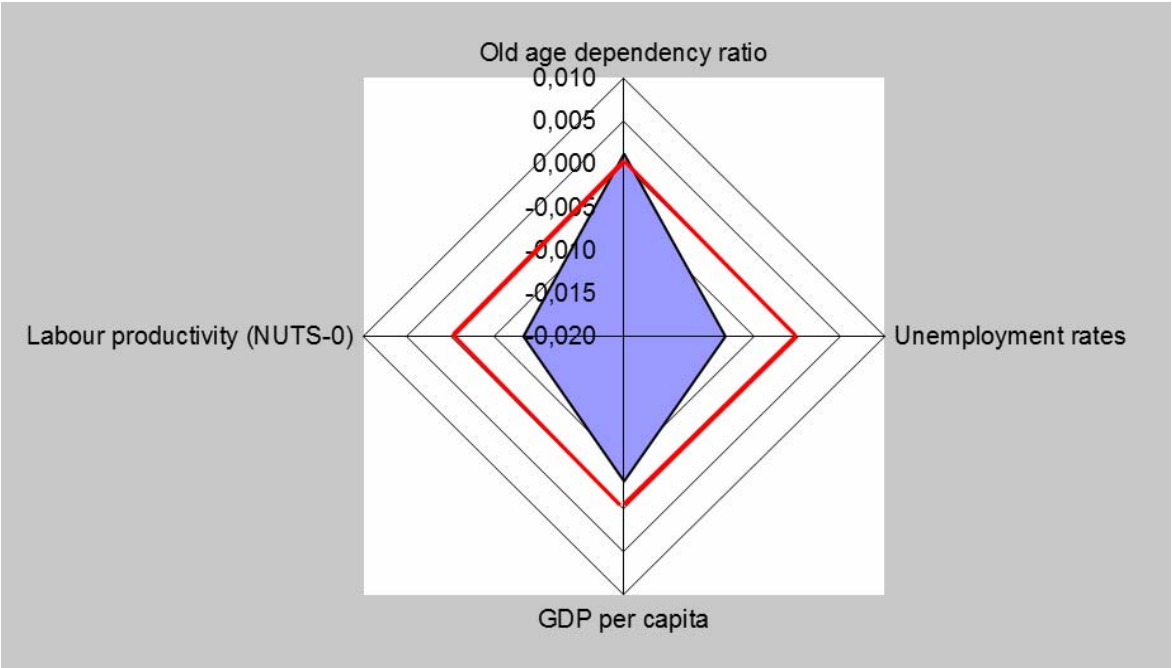


Figure 17. Degree of convergence (slope) for indicators under Territorial Objective "Strong local economies ensuring global competitiveness"

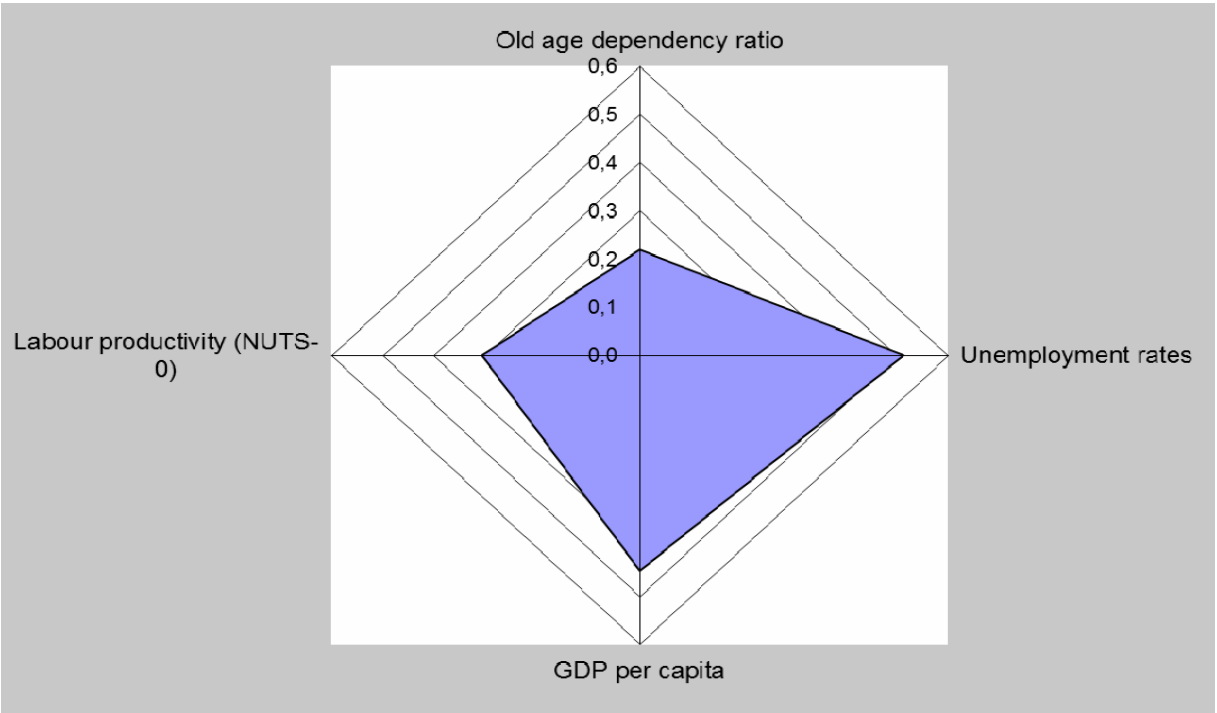


Figure 18. Degree of actual disparities for indicators under Territorial Objective "Strong local economies ensuring global competitiveness"

Territorial objective 2. Innovative territories

Innovation is at the centre of EU strategies for recovery, growth and sustainable development. Because it can help creating and distributing wealth and facing current challenges, it is central for territories which can find their proper way to make good use of their assets. Especially, eco-innovation is expected to deliver appropriate response to the need of energy efficiency and low carbon economy, while innovation in the governance process will help rationalising and improving the institutional framework for better territorial governance. Thus, research and development should not be only for top class territories and actors. But the key determinant of innovation capacity and regional growth is certainly human capital, which means not only educated population but also its effective participation to growth.

Three indicators are proposed as territorial cohesion indicators under this objective:

- Population aged 25-64 with tertiary education (sometimes "tertiary education")
- Intramural R&D expenditures
- Employment rate 20-64

These indicators are dedicated to measure the qualification level of regional labour forces (tertiary education), the degree of participation of population in working age in actual economic activities (employment rate), and the future orientation of the regional economies in terms of investments in R&D.

Sufficient time series data are only available for the two indicators on tertiary education and employment rate, allowing generating sigma and beta convergence plots and thus allowing analyses of convergence trends over time. Since these two indicators are currently available only at NUTS 2 level, a further differentiated analysis by types of regions at NUTS 3 level could unfortunately not be performed.

Population aged 25-64 with tertiary education

Theme:

0602 SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE. Education

Policy relevance:

This indicator measures the highly-qualified labour force as basis for current and future R&D activities in a region. Human capital is an essential factor for innovation potential.

Desired direction of change:

Generally increase in skills and qualification levels of the entire labour force is desired; however, lagging regions, and regions in rural or peripheral areas should catch up faster than agglomerations.

Description:

The results are quite interesting. On the one hand they reveal great differences in the educational attainment at European level, ranging from mere 5 percent up to 52 percent at the top (capital cities, agglomerations). On the other hand the results also suggest that the intra-national differences are rather small, compared to the differences between the countries, so that one can assume that the differences are the outcome of the different national education systems (Figure 19).

The sigma convergence graph (Figure 20) illustrates convergence for the three analysed years (2008-2010), mainly driven by regions with relatively low levels of tertiary education who developed stronger compared to those regions who already had a rather high level of education (Figure 21).

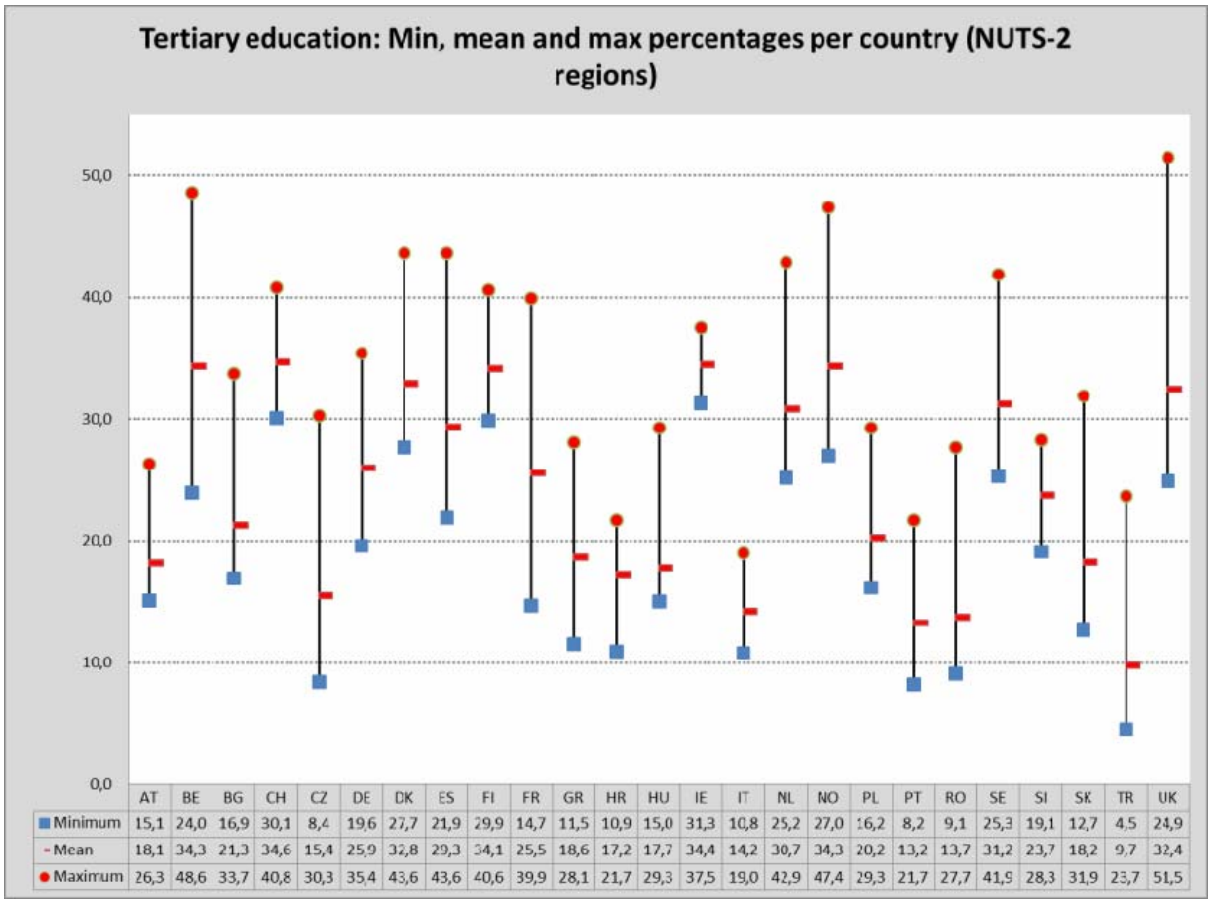


Figure 19. Tertiary education – minima, mean and maxima

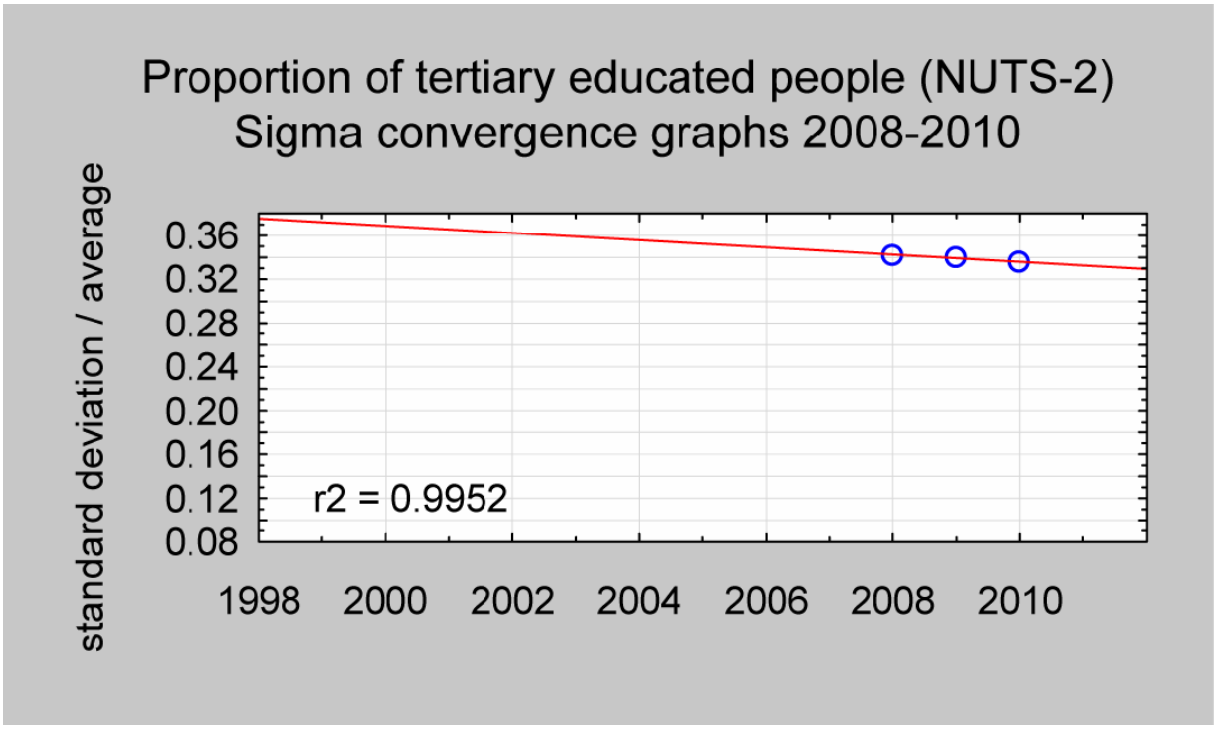


Figure 20. Tertiary education – development of disparities 2008-2010

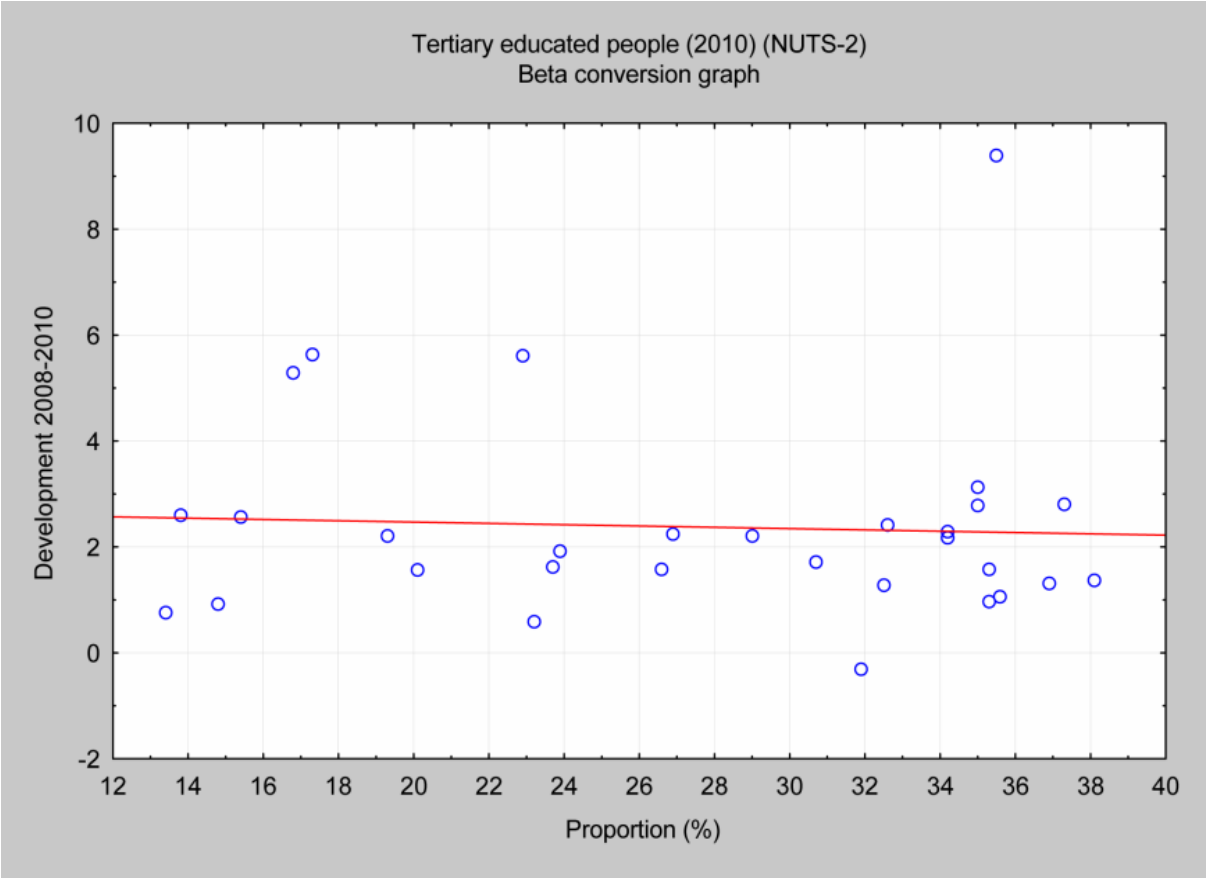


Figure 21. Tertiary education – beta convergence

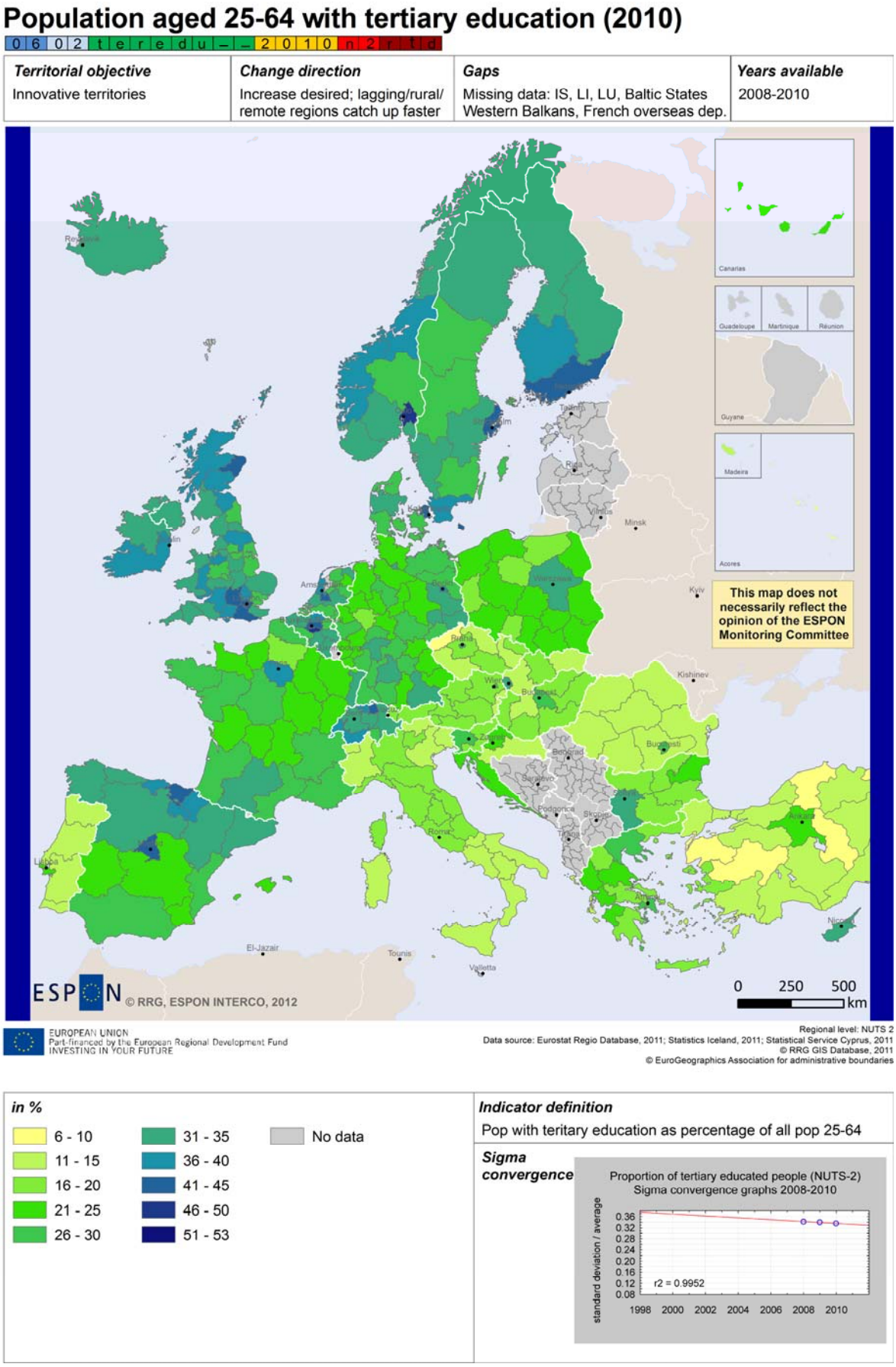
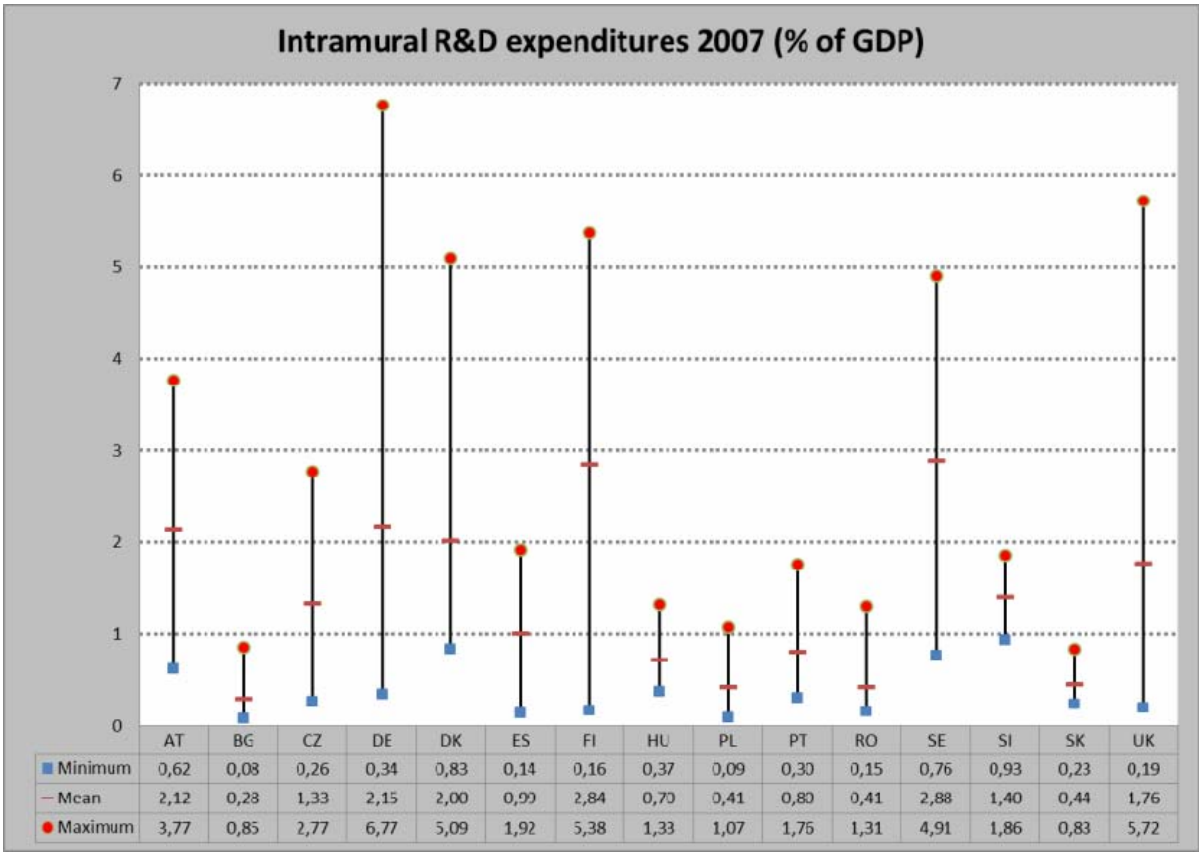


Figure 22. Indicator – Population aged 25-64 with tertiary education

Total intramural R&D expenditures

Theme: 0707 ECONOMY, LABOUR FORCE. Innovation
Policy relevance: This indicator measures the future orientation of the regional economy in terms of investments in R&D. This support to innovation capacity is considered as a key driver of regional growth.
Desired direction of change: Generally each region should have a minimum level of R&D activities, either at public research institutes, or at private companies. Increase is desired until this minimum level is reached.
Description: Regions considered as high-tech regions in Europe clearly appear (for instance, southern Germany, England, Scandinavia) in the map as regions gaining the highest intramural R&D expenditures. Percentages are generally lower in new EU Member States compared to the old ones. The value ranges are great for Germany, UK, Finland and Sweden, once again illustrating the steep divide between high-tech regions and low-tech regions; only for Bulgaria, Hungary and Slovakia rather small regional variations within the countries can be detected (Figure 23).



	AT	BG	CZ	DE	DK	ES	FI	HU	PL	PT	RO	SE	SI	SK	UK
Minimum	0,62	0,08	0,26	0,34	0,83	0,14	0,16	0,37	0,09	0,30	0,15	0,76	0,93	0,23	0,19
Mean	2,12	0,28	1,33	2,15	2,00	0,99	2,84	0,70	0,41	0,80	0,41	2,88	1,40	0,44	1,76
Maximum	3,77	0,85	2,77	6,77	5,09	1,92	5,38	1,33	1,07	1,76	1,31	4,91	1,86	0,83	5,72

Figure 23. Intramural R&D expenditures – Minima, mean and maxima

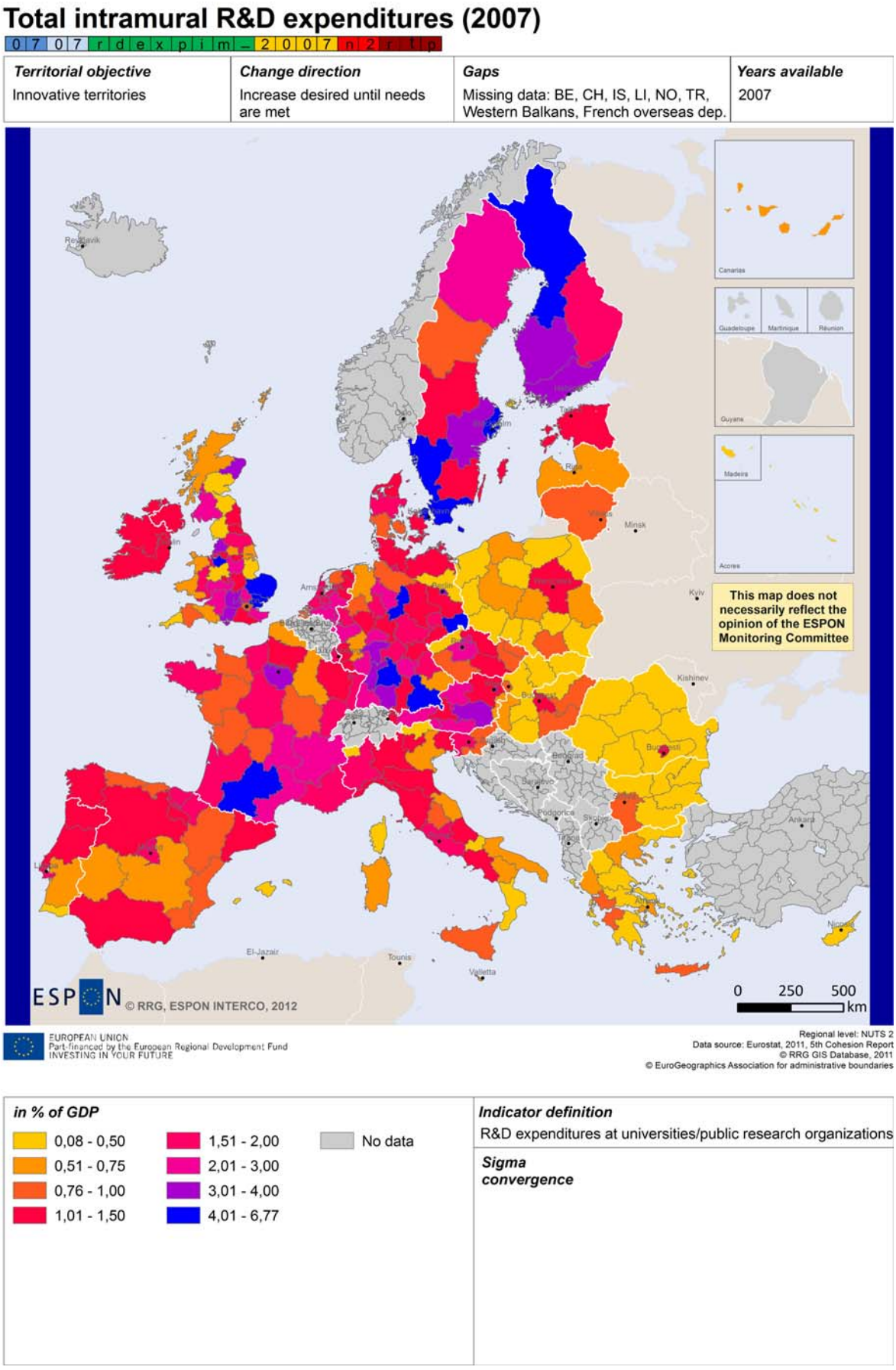


Figure 24. Indicator – Intramural R&D expenditures.

Employment rate

Theme:

0702 ECONOMY, LABOUR FORCE. Employment, Unemployment

Policy relevance:

This indicator measures the actual participation of working age population in economic regional activities and in producing net added value. High employment rates reflect a vital quality of the labour markets which constitutes a favourable context for innovative territories.

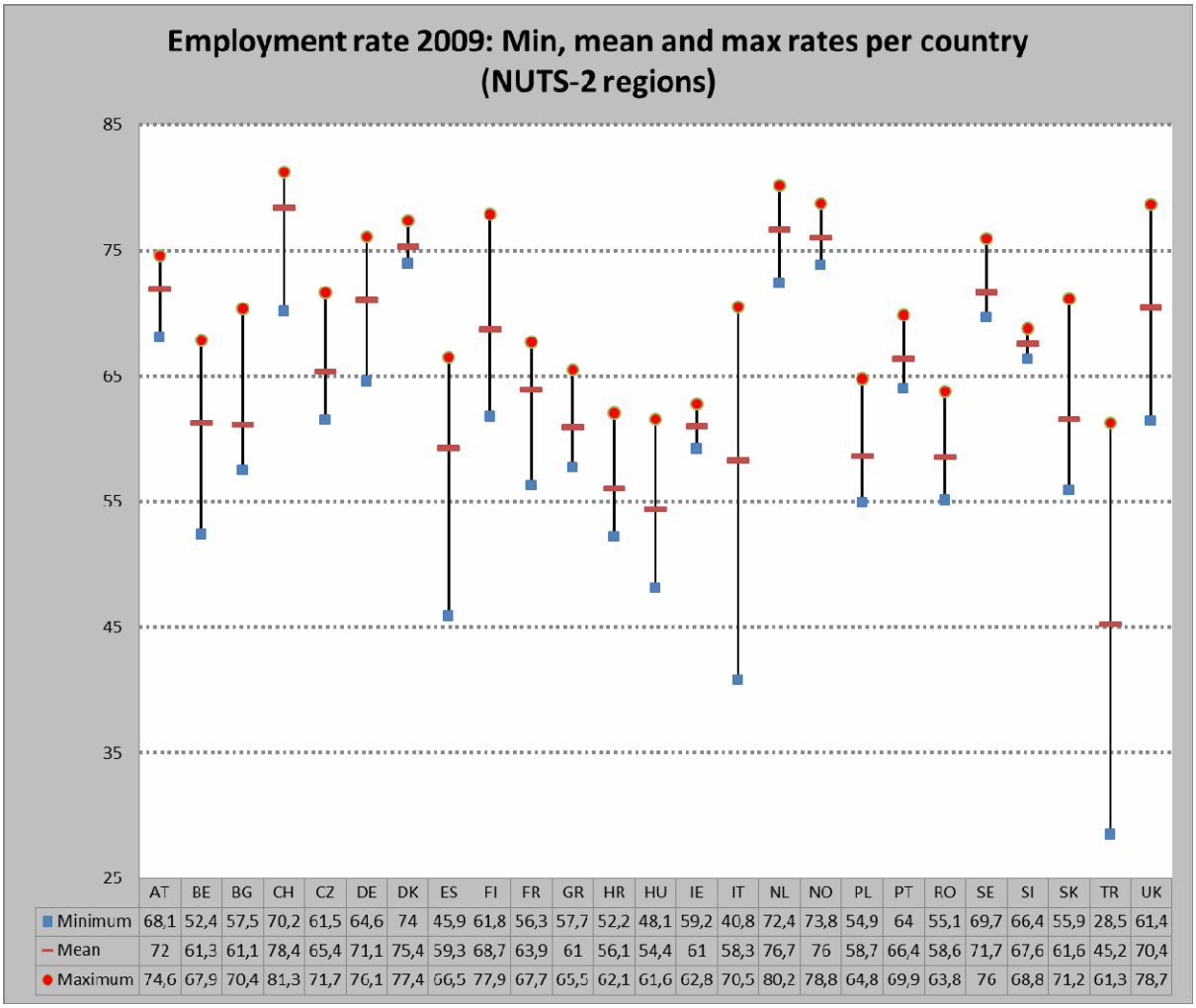
Desired direction of change:

Basically a full employment of population should be achieved (100% employment rate). Regions with lower employment rates should catch up faster than the other regions.

Description:

Employment rates significantly differ across Europe. As tendencies the rates are lower the farther south and the farther east a region is located, i.e. resulting in lowest employment rates in southern Spain, southern Italy and Turkey. In contrast, highest employment rates are found in Scandinavia, Benelux, UK, Germany and Switzerland. The map and the chart also suggest that there are great disparities within individual countries itself (for instance, Italy, Turkey, Spain) (Figure 25).

Since 2007, these disparities even increase over all European NUTS 2 regions (Figure 26), caused by two combined effects: first, regions with already high employment rates even managed to increase these rates even more. Second, many regions with low or intermediate employment rates experiences a drop in these rates (negative developments of employment). Taking these two trends together, regional disparities in Europe widened for employment in the period 2007-2010.



	AT	BE	BG	CH	CZ	DE	DK	ES	FI	FR	GR	HR	HU	IE	IT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	68,1	52,4	57,5	70,2	61,5	64,6	74	45,9	61,8	56,3	57,7	52,2	48,1	59,2	40,8	72,4	73,8	54,9	64	55,1	69,7	66,4	55,9	28,5	61,4
Mean	72	61,3	61,1	78,4	65,4	71,1	75,4	59,3	68,7	63,9	61	56,1	54,4	61	58,3	76,7	76	58,7	66,4	58,6	71,7	67,6	61,6	45,2	70,4
Maximum	74,6	67,9	70,4	81,3	71,7	76,1	77,4	66,5	77,9	67,7	65,5	62,1	61,6	62,8	70,5	80,2	78,8	64,8	69,9	63,8	76	68,8	71,2	61,3	78,7

Figure 25. Employment rate 2009 – minima, mean and maximum by country

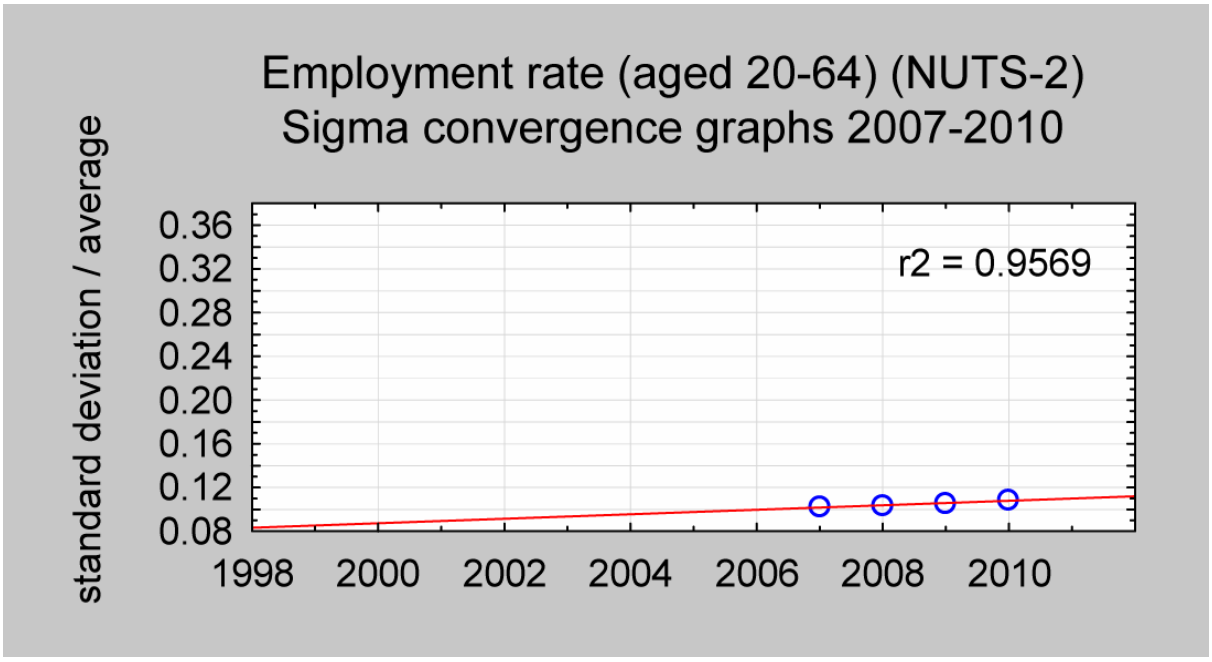


Figure 26. Employment rate – development of disparities 2007-2010

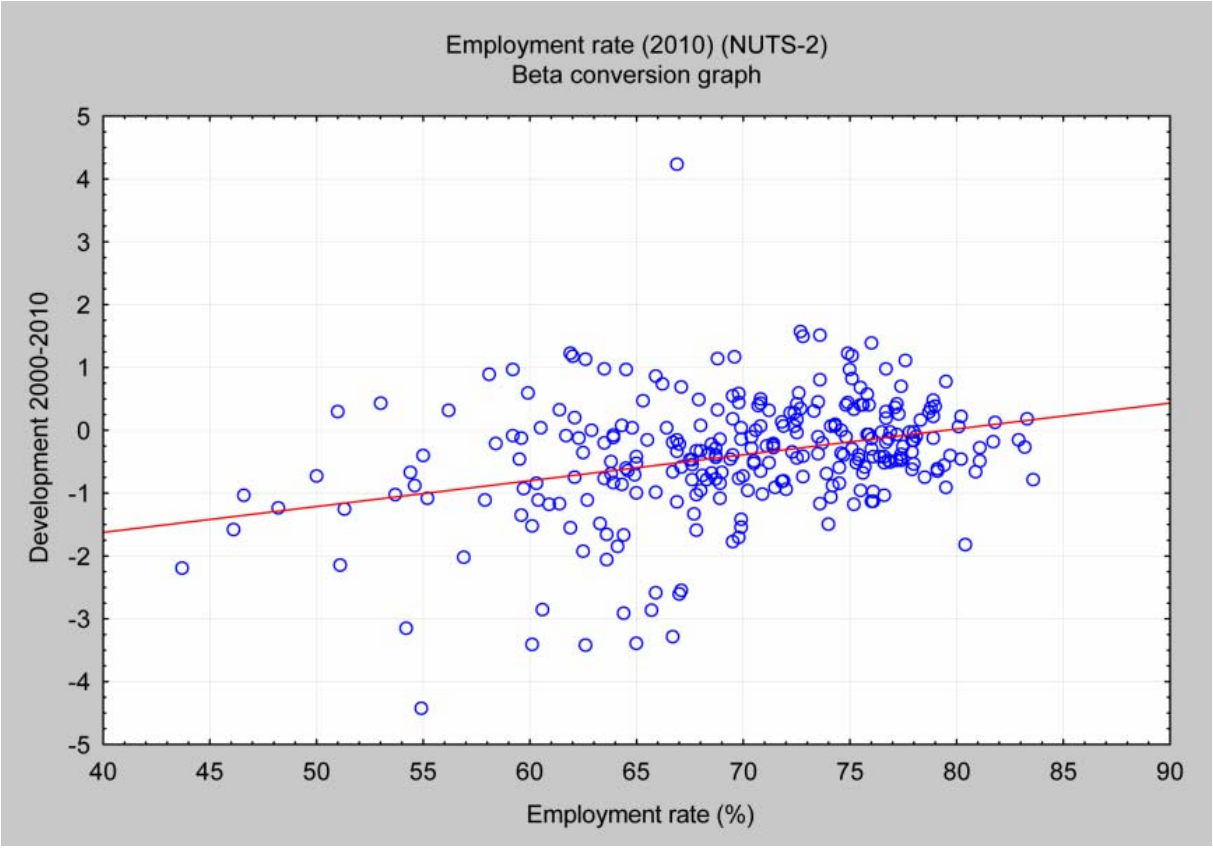


Figure 27. Employment rate – beta convergence

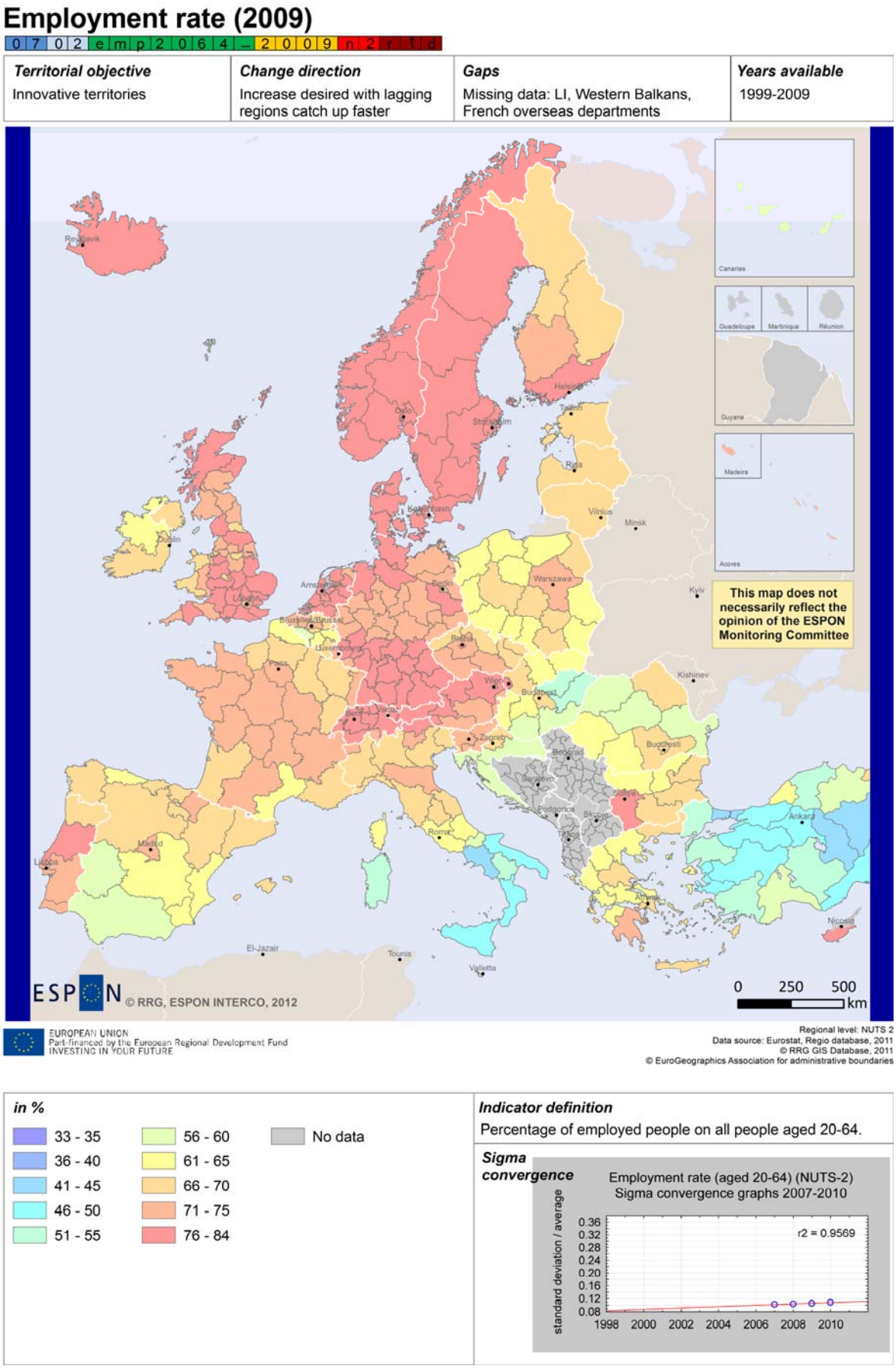


Figure 28. Indicator – Employment rate 20-64 years

Summary

What are the territorial disparities of the indicators selected for the territorial objective of innovative territories? And how have these indicators developed over the last decade?

Concerning ***tertiary education***, convergence trends towards cohesion at regional level could be observed since lagging regions developed stronger than already good performing regions; differences within countries are rather small compared to difference between countries, revealing fundamental differences in the national education systems.

Due to poor data availability, no time series analysis was possible for ***intramural R&D expenditures***. Great disparities exist even within high-tech regions and rural regions within countries, but there are obvious big gaps still existing between the old and the new EU Member States.

Gaps in ***employment*** widened since 2007, because good performing regions improved their employment rates on the expense of lagging regions, which even experienced a further fall in employment, making existing disparities permanent between the East European and south European countries on the one hand, and the remaining parts of Europe on the other hand.

Overall results for the territorial objective on innovative territories show that there is no automatism of improving levels of tertiary education and employment rates. Quite the opposite, trends of convergence for one indicator does not necessarily imply same development trends for the other indicator. For entire Europe, this led to a convergence in tertiary education, but to widened gaps in employment rates.

Territorial objective 3. Fair access to services, market and jobs

"*Fair and affordable accessibility to services of general interest, information, knowledge and mobility are essential for territorial cohesion. Providing services and minimising infrastructure barriers can improve competitiveness and the sustainable and harmonious territorial development of the EU*". With this statement, TA 2020 gives a central role to service provision and accessibility in a broader sense, since they are considered as essential for territorial connectivity and integration. The objective is to make sure that every territory benefit from well-being standards and from equal development potentials, especially for remote, isolated or sparsely populated areas.

Seven indicators are proposed as territorial cohesion indicators under this objective:

- Access to compulsory schools
- Access to hospitals
- Access to grocery services
- Access to universities
- Accessibility potential by road
- Accessibility potential by rail
- Accessibility potential by air

These indicators are dedicated to measure fair access to basic (public) services (compulsory schools, hospitals, grocery services, universities), and represent context indicators for accessibility and market potential and locational advantages by different modes of transport (accessibility potential by road, rail and air).

Unfortunately, data on the first four indicators (access to …) are so far not available at regional level for entire ESPON space; from SILC survey such data are available, however, the regional subdivision by countries is not coherent. While for all countries SILC data are subdivided by degree of urbanisation (three categories, i.e. densely populated areas, intermediate areas and thinly populted areas), a regional differentiation into NUTS regions is unfortunately inconsistent. Some of the SILC countries are subdivided into NUTS 1 entities (e.g. Ireland, Baltic States, Denmark, Belgium, Poland, Slovakia, Austria, Italy, Greece and Spain), for other countries a NUTS 2 subdivsion is implemented (Czech Republic, Finland, France, Spain) while for a third group of countries no subdivision into NUTS regions is available (like Germany, Sweden, UK). Given these data restrictions an analysis based on NUTS entities and on time-series cannot be presented.

The ESPON TRACC project is currently being calculating such “access to …” indicators, but only for selected case study regions. Results of ESPON TRACC are not yet available.

The other three potential accessibility indicators are available at NUTS 3 level for entire ESPON space, but so far only for two points in time, i.e. 2001 and 2006, taken

from earlier ESPON projects. The ESPON TRACC project is currently working to update these indicators for 2011, but results of these calculations are not yet available at the time of writing up INTERCO Final Report. In any case, even though only two points in time are available so far, time series analysis (sigma convergence) was performed to retrieve at least basic development trends of the accessibility indicators.

Access to compulsory schools

Theme:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures fair access to basic education as one of the key public services. Good access to basic education facilities helps to benefit equally from well-being standards as it is essential for territorial cohesion.

Desired direction of change:

Generally the higher the access to such facilities is the better it is for kids, families and the public as a whole; however, a minimum level should be maintained avoiding extreme long trip lengths for school kids, even in remote and peripheral areas.

Description:

Even though the majority of interviewees reported easy or very easy access to compulsory schools, Figure 29 nonetheless shows remarkable differences in the access to compulsory schools, both by country and by type of region. At country level, roughly there are three groups of countries with low proportion of concerned population (less than 10% of population facing difficulties, i.e. Cyprus, Finland, Sweden, Netherlands, France, UK), medium proportion (10% up to 20%, i.e. Belgium, Denmark, Ireland, Luxembourg, Greece, Czech Republic, Hungary, Slovenia, Estonia, Lithuania, Austria and Malta), and high proportion of population facing severe difficulties in access to compulsory schools (20% up to 30 %, remaining countries).

Second, there are also distinct differences by type of region. For most countries, access is least difficult in densely populated areas, followed by intermediate areas and is most difficult in sparsely populated rural areas. Exceptions from this rule are Malta and the UK, where access in urbanised areas is most problematic, as well as Belgium, Hungary and Portugal where interestingly access to schools in intermediate regions is most difficult. Figure 29 furthermore shows that the differences by type of region are significant, reaching up to 15 percentage points (Germany, Poland, Bulgaria).

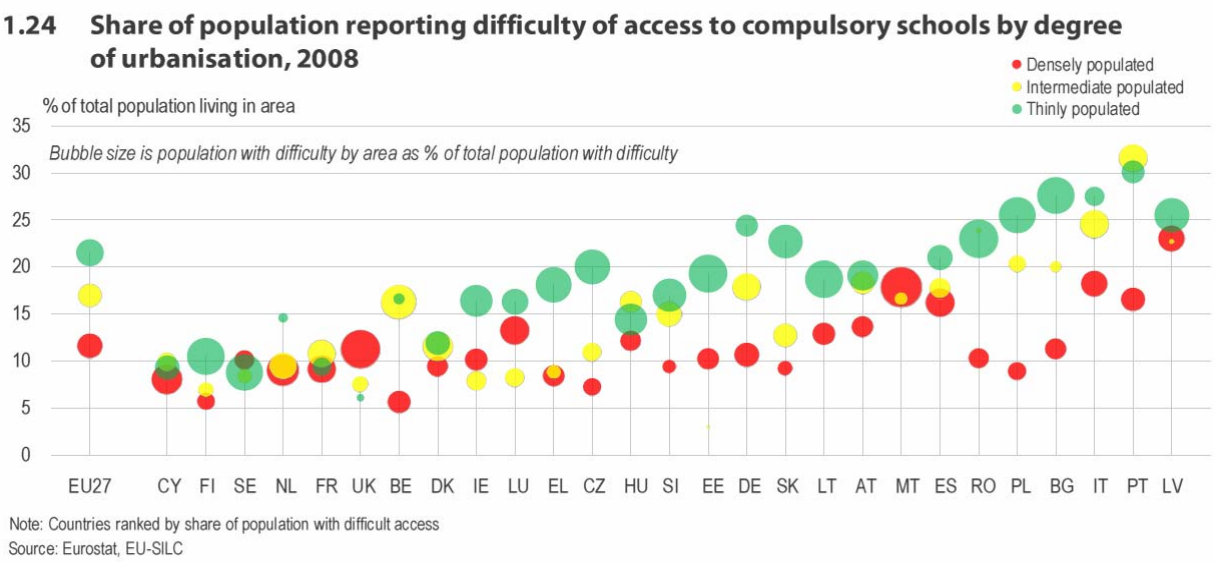


Figure 29. Access to compulsory schools in 2008 – proportion of population reporting access difficulties (5th Cohesion Report, 97)

Access to hospitals

Themes: 0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility
Policy relevance: This indicator measures fair access to health care facilities representing one of the basic public services. Fair access for all population groups helps to benefit equally from well-being standards as it is essential for territorial cohesion.
Desired direction of change: Generally the higher the access to such facilities is the better it is for the public with the view to care best about health; however, a minimum level should be maintained, even in remote or peripheral areas.
Description: As Figure 30 illustrates, differences in access to primary health care services in Europe are differing significantly. In countries like France, UK, Netherlands, Luxembourg, Belgium or Germany, only a small proportion of up to 10 percent of the population face difficulties, with only small differences by type of region. In other countries such as Sweden, Hungary, Finland or Cyprus, the differences between the type of regions are also small, but the proportion of population facing difficulties is generally higher with up to 20 percent. For the other countries, 30 percent of the proportion or even up to 40 percent of population (Romania, Italy, Latvia) face severe problems in access to primary health care services, mainly in sparsely populated rural areas.

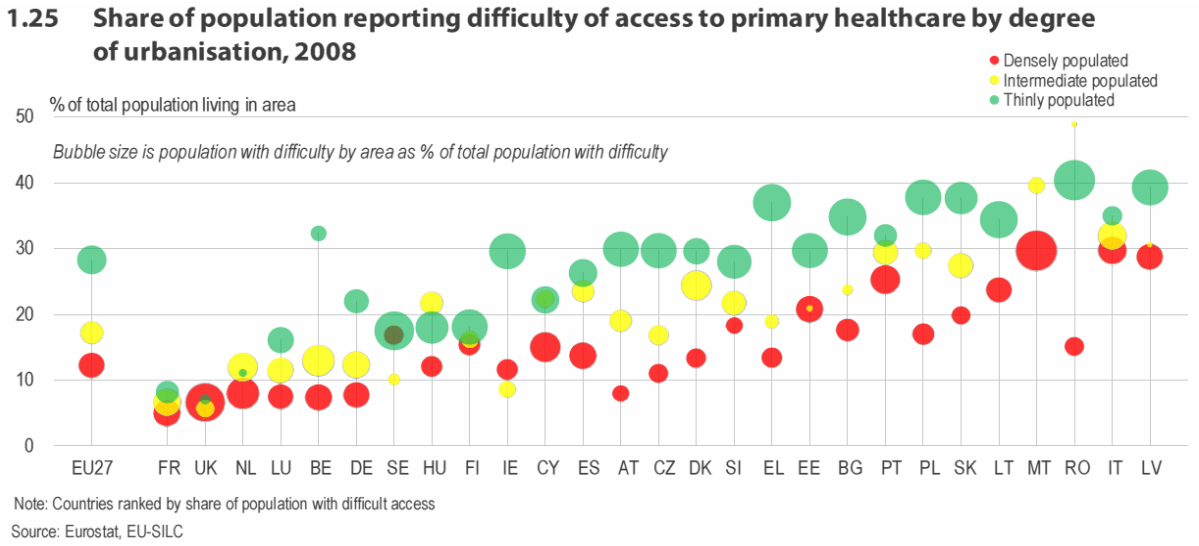


Figure 30. Access to primary health care services in 2008 – proportion of population reporting access difficulties (5th Cohesion Report, 97)

Access to grocery services

Themes:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures fair access to grocery services representing one of the basic public services. Fair access for all population groups helps to benefit equally from well-being standards as it is essential for territorial cohesion.

Desired direction of change:

Generally the higher the access to such facilities is the better it is for the public with the view of short distance trips to stores; however, a minimum level should be maintained, even in remote or peripheral areas.

Description:

Figure 31 show great differences in difficulty of access to grocery services. Generally, as expected, access in densely populated areas is easiest, followed by intermediate areas and thinly populated areas experiencing biggest problems in access to such stores. While this is a general pattern in all countries, regional disparities within the countries are significant. In many countries such as Latvia, Lithuania, Ireland or Belgium access in urban areas is reported much easier compared to its rural counterparts. Rural areas in Belgium seem to have the biggest access problems. Fair access to grocery stores for all types of regions offer Finland, Slovakia, Hungary, and to some degree, also Denmark, Czech Repbulic and Poland. In countries like Spain, Belgium or Austria also intermediate regions suffer from poor access to a certain extent.

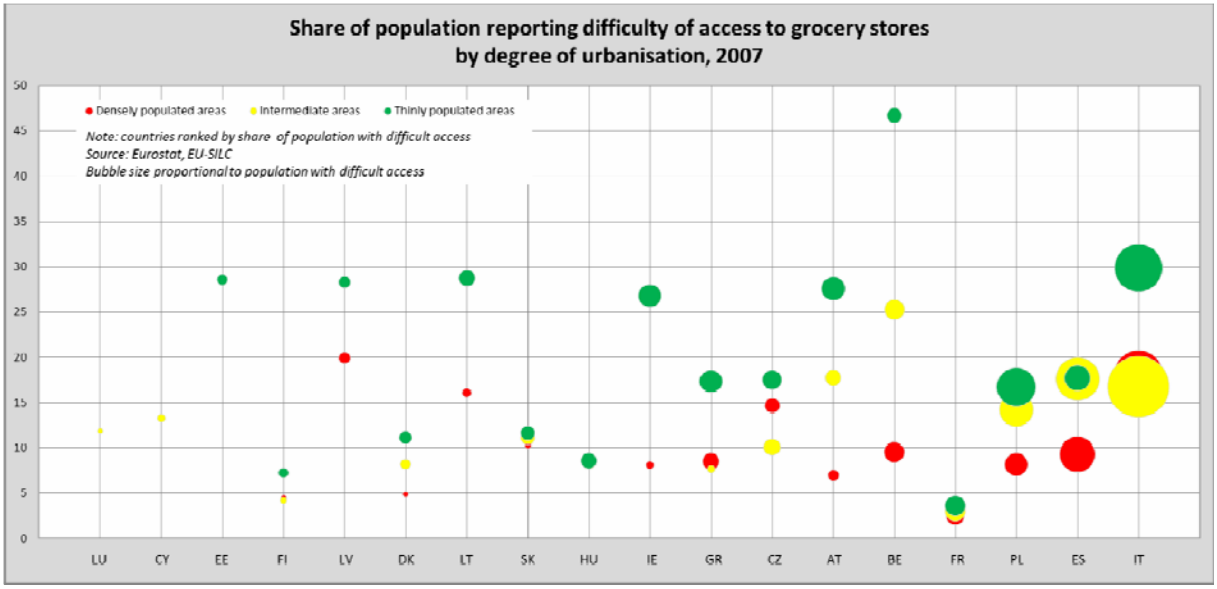


Figure 31. Access to grocery services in 2007 – proportion of population reporting access difficulties (EU-SILC survey).

Accessibility potential by road

Themes:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures market potential and locational advantages of a region. To benefit equally from these development potential is essential for territorial cohesion (context indicator).

Desired direction of change:

A minimum level of potential accessibility is desired. Regions with less than 50% of European average should catch up faster.

Description:

The regions in Belgium, the Netherlands and in the western parts of Germany have the highest accessibility values in Europe leading partly to a level more than twice the European average. But also regions in northern and eastern parts of France, in the south-east of England, in Switzerland, the western parts of Austria and the northern parts of Italy have very good accessibility by road. In all these regions the combination of good road infrastructure in form of dense motorways and high concentration of population leads to these favorite positions. Accessibility by road decreases towards regions located outside the core. Lowest accessibility by road is found in the northern regions of the Nordic countries. Also most regions of the Baltic States, Bulgaria, Romania and Greece have very low potential accessibility.

The disparities within countries are remarkable (Figure 32), and are highest in France, Germany, Italy and the UK. Even for those countries with generally high accessibility, there are regions with below-average (Austria, Czech Republic, Germany, Italy, Slovakia, and the UK).

In the period 2001-2006, disparities in potential accessibility by road slightly decreased for entire Europe (Figure 33); however, when differentiating by type of regions, the situation as not that clear: first, remote regions (intermediate regions and predominantly rural regions) have by far higher disparities compared to urban regions or regions located close to a city. Moreover, while disparities for urban regions stagnated between 2001 and 2006, disparities even increased for remote rural regions, i.e. these regions gained real losses in the relative accessibility potential.

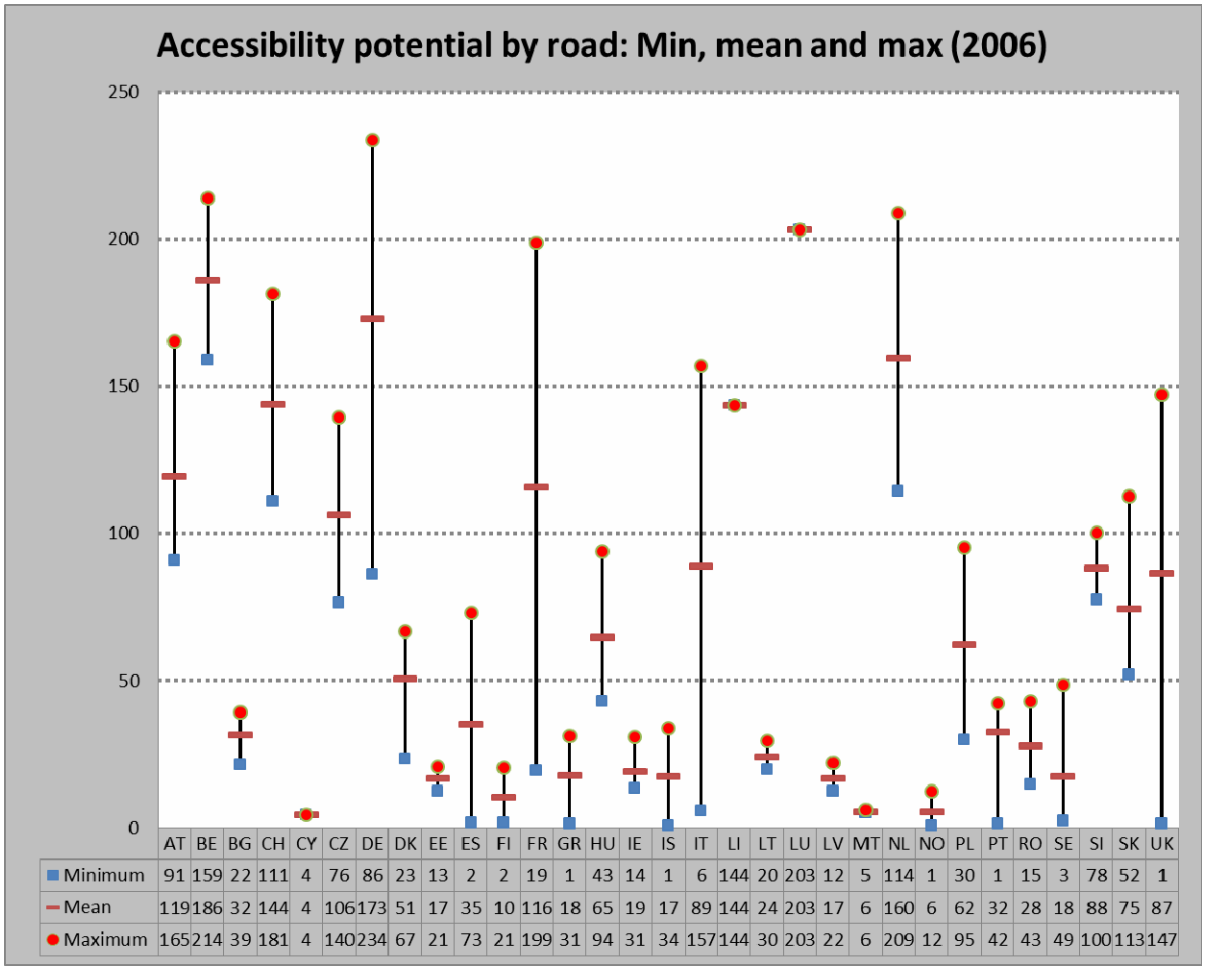


Figure 32. Accessibility potential by road – Min, mean and max

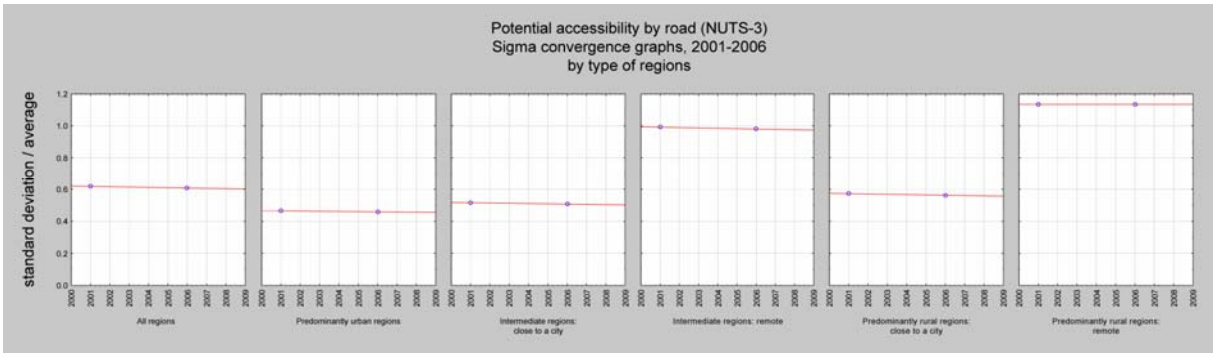


Figure 33. Accessibility potential by road – development of disparities 2001-2006

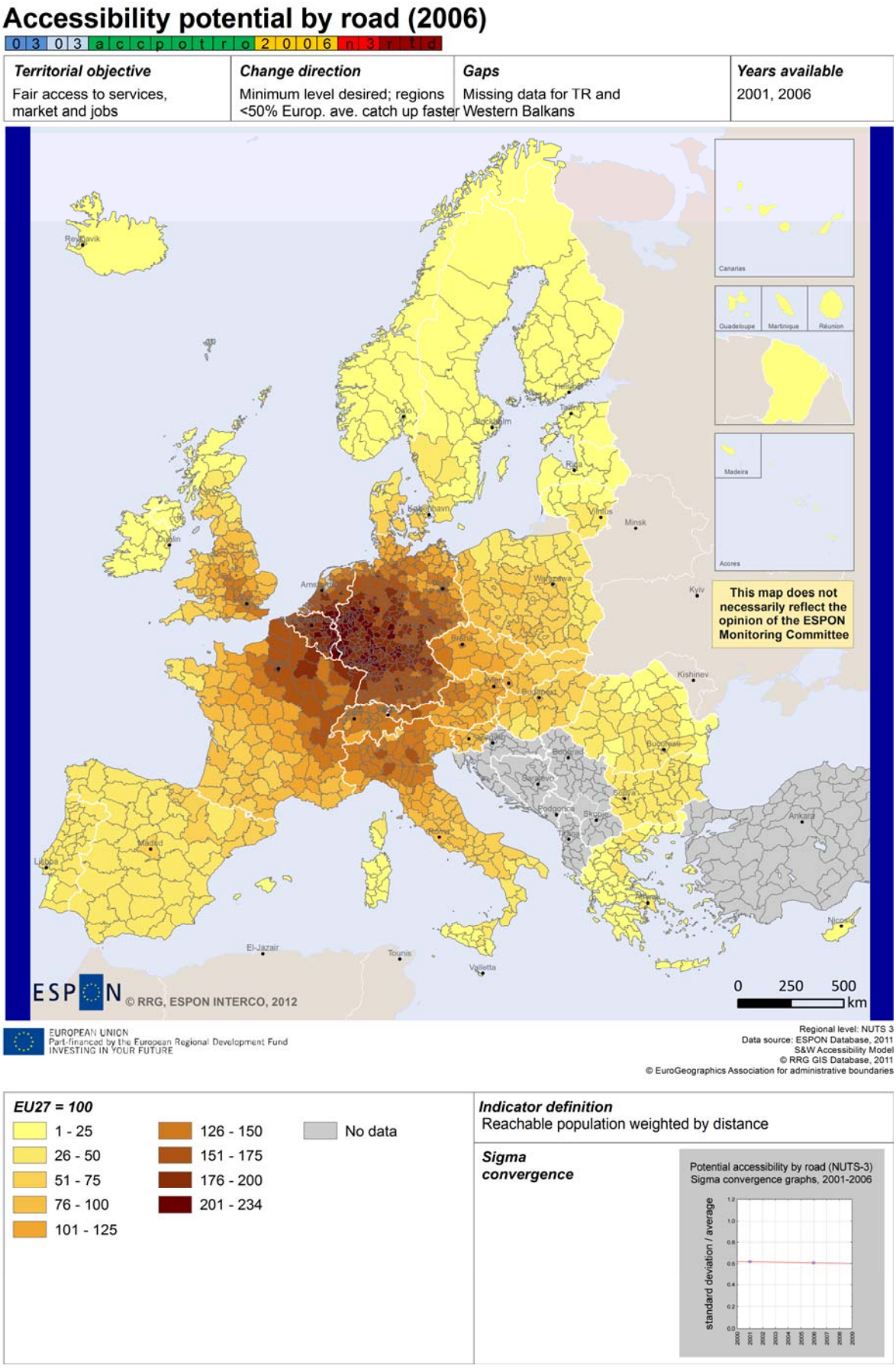


Figure 34. Indicator – Accessibility potential by road

Accessibility potential by rail

Theme:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures market potential and locational advantages of a region. To benefit equally from these development potential is essential for territorial cohesion (context indicator).

Desired direction of change:

A minimum accessibility level is desired. Regions with less than 50% of European average should catch up faster.

Description:

Regions in the European core have the highest values. However, instead of forming a plateau of high accessibility like for roads, regions with top accessibility for rail are forming corridors along high-speed rail links. High-speed rail also brings very high accessibility to regions outside the European core, for instance in France to Tours and Lyon and Marseille or in Germany to Berlin. Below average accessibility by rail can be found in Ireland, Spain, Portugal, southern Italy and most regions of the new Member States. Lowest accessibility by rail is located in the northern parts of the Nordic countries, the Baltic States and most regions of Romania, Bulgaria and Greece.

Again there are significant disparities within countries (Figure 35), in particular for those countries which have high-speed train services (Germany, France, Belgium, and Italy). For many countries even the regions with highest accessibility are clearly below the European average, often even clearly below 50% of the European average (Bulgaria, Baltic States, Norway, Portugal, Greece, or Finland).

For all regions in Europe, disparities remained stable between 2001 and 2006 (Figure 36). An analysis by type of region, however, revealed interesting details: while disparities for urban regions and for predominantly rural regions close to a city increased, there was a clear trend towards convergence for intermediate remote regions and for predominantly rural remote regions, but of course disparities for remote regions remained highest compared to the other types of regions. Increases in disparities for urban regions may be counter-intuitive at a first glance; however, recalling that not all urban regions were connected to the high-speed rail networks at the same time, the accessibility of urban regions without high-speed services falls behind those urban regions with high-speed services.

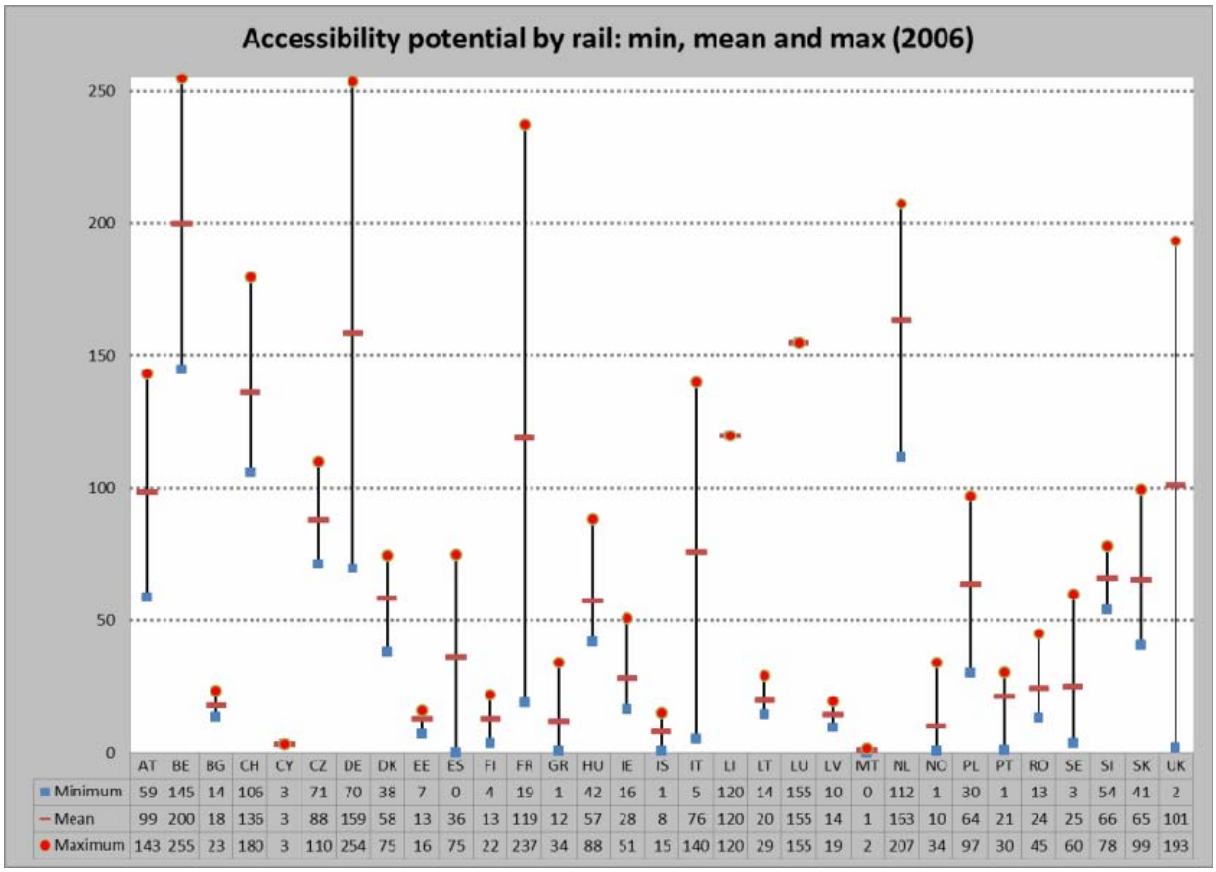


Figure 35. Accessibility potential by rail – min, mean and max

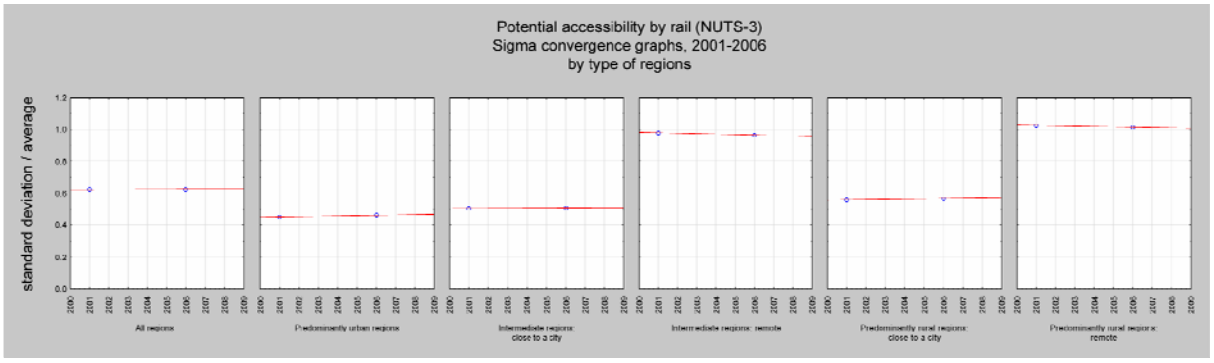


Figure 36. Accessibility potential by rail – development of disparities 2001-2006

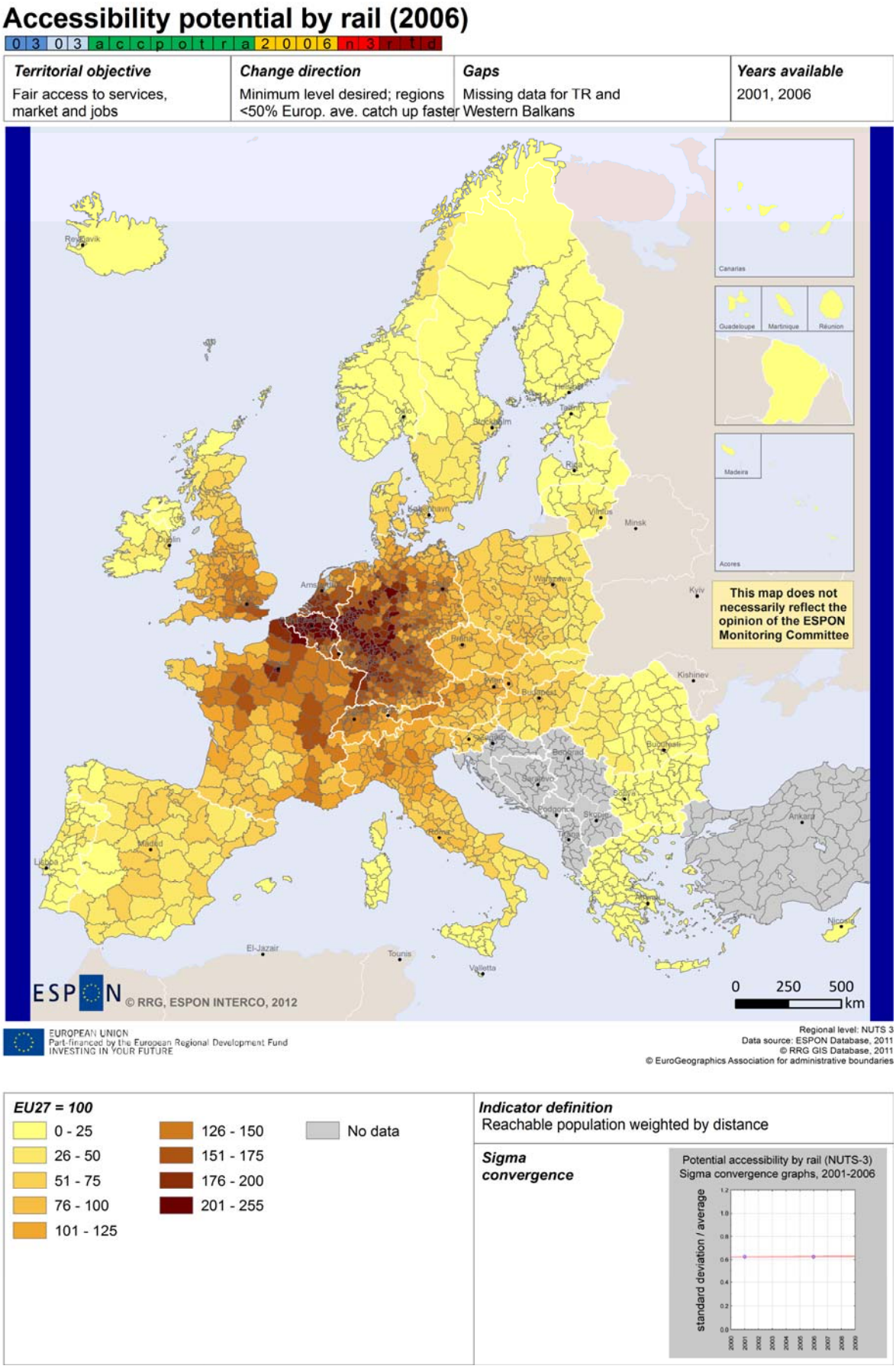


Figure 37. Indicator – Accessibility potential by rail

Accessibility potential by air

Theme:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures the market potential and locational advantages of a region. To benefit equally from these development potential is essential for territorial cohesion.

Desired direction of change:

A minimum accessibility level is desired. Regions with less than 50% of European average should catch up faster.

Description:

Regions with major airport hubs and their surroundings clearly appear as those regions with highest accessibilities. In most cases these are the capital city regions, plus selected other agglomerations. The fall in accessibility towards the other regions is remarkable in all countries, so that the biggest visible divide is between agglomerations and rural areas (Figure 39).

Consequently the variations within all countries are rather high (Figure 38), with regions clearly above EU27 average and also regions clearly below. The disparities between the countries are in any case smaller than those within the countries.

Between 2001 and 2006, disparities for all types of regions in Europe decreased for potential accessibility by air (Figure 39). While for urban regions disparities were already lowest, they dropped even more, but also for intermediate and rural regions, both close to a city and remotely, disparities decreased significantly.

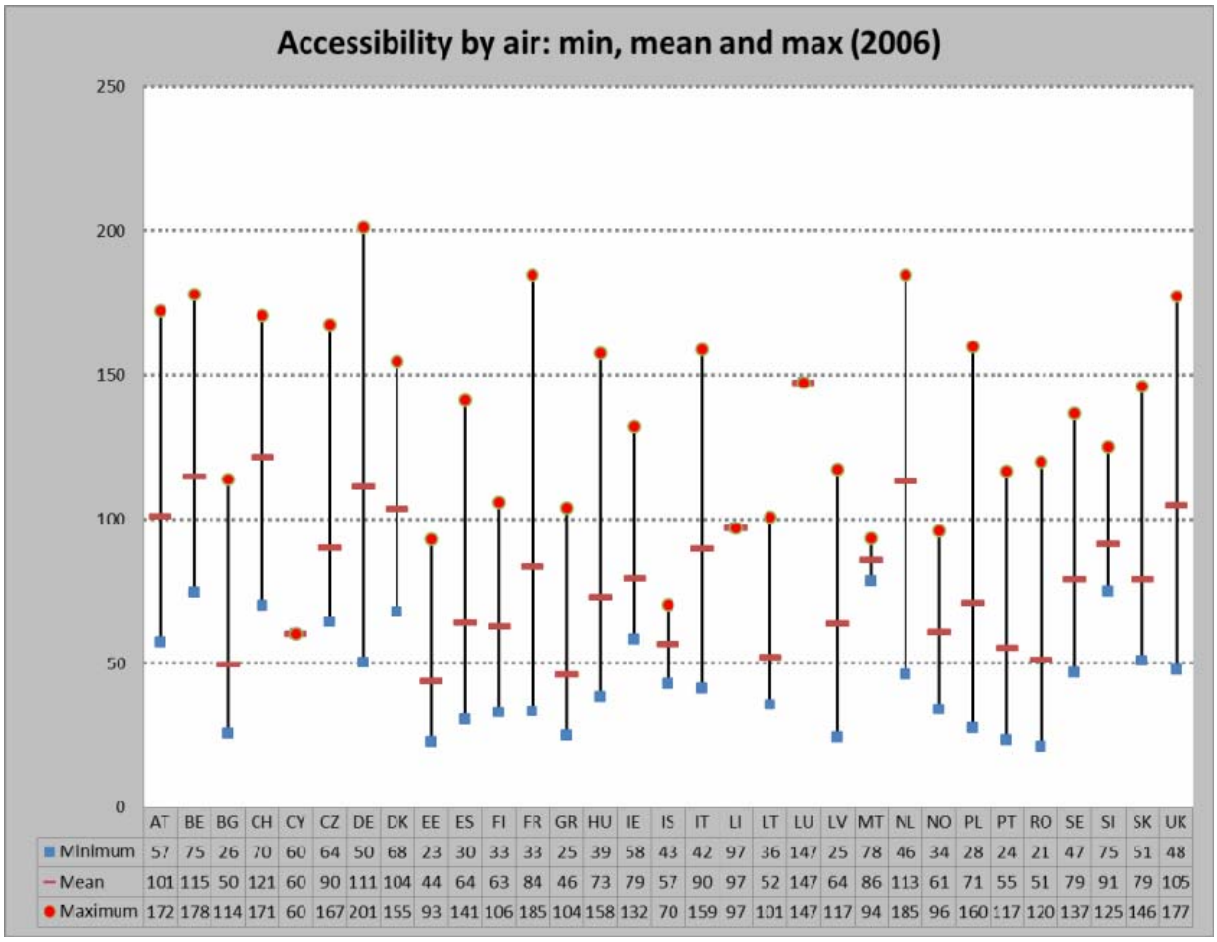


Figure 38. Accessibility by air – min, mean and max

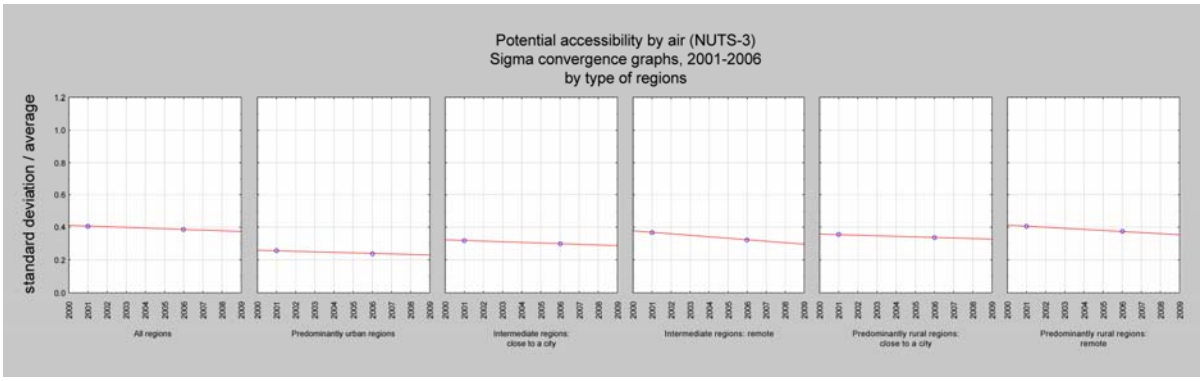


Figure 39. Accessibility by air – development of disparities 2001-2006

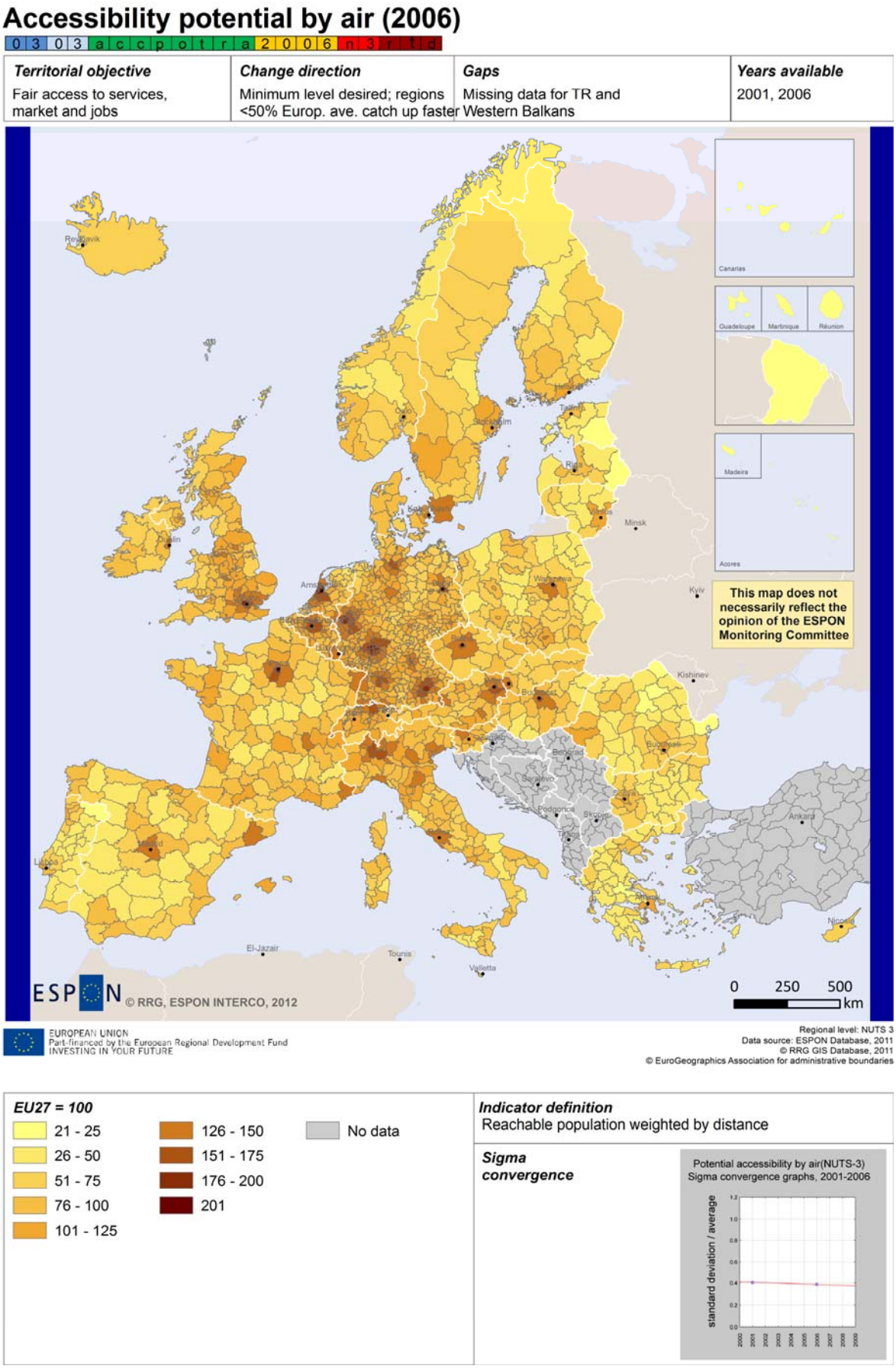


Figure 40. Indicator – Accessibility potential by air.

Summary

What are the territorial disparities of the indicators selected for the territorial objective of fair access to services, market and jobs?

Access to services has become a clear challenge during the last decade. Given the current demographic and economic trends, ensuring minimum access to services such as compulsory schools, primary health care, hospitals, grocery services, universities, etc. becomes a real challenge in rural and sparsely populated areas and in areas with other physical handicaps (mountains, islands, etc.). Partly up to 40% of the population is facing severe access problems to such services, as the 5th Cohesion Report revealed. There are not only big disparities between countries, but also within countries between urbanised, intermediate and rural regions.

Large disparities of ***accessibility potential*** by road, rail and air exist, and continue to exist in the European Union (Spiekermann and Schürmann, 2007). New transport infrastructures built between 2001 and 2006 were not able to change the overall European spatial patterns with good, moderate and low accessibility (Spiekermann and Schürmann, 2007, 25), even though in the process of EU enlargement many new EU Member States significantly improved their road networks, and thus improved their relative position. When looking at rail, the improvements of road accessibility in the new Member States were counteracted by the implementation of high-speed rail networks, linking city centres with each other.

Insofar regional deficits in competitiveness based location still remain; in different types of regions, regional disparities even increased due to the construction of high-level transport infrastructures such as high-speed rail lines or motorways, connecting urban centres with each other and bypassing rural or remote areas. The design of the trans-European transport networks (TEN-Ts) outline plans obviously has a bias towards improving the competitiveness of European agglomerations on the expense of increasing disparities between rural and remote regions and highly-accessible urban centres.

A detailed look at the modes revealed that for the ***accessibility potential by road*** one can observe a slight trend towards cohesion across all regions between 2001 and 2006; however, the development was quite heterogeneous for different types of regions: while disparities for predominantly rural remote regions increased, and stagnated for urban regions, disparities decreased for all other types of regions. Disparities remained stable in this time period for the indicator accessibility potential by rail, again with quite distinct developments for different types of regions. While disparities for urban regions and for predominantly rural regions close to a city increased, there was a clear trend towards convergence for intermediate remote regions and for predominantly rural remote regions. Results for the ***accessibility potential by air***, in contrast, was quite clear with overall trends towards cohesion for all types of regions for entire Europe.

Territorial objective 4. Inclusion and Quality of Life

This territorial objective is certainly the most closely related to well-being. Here the issue is social but also territorial, territorial cohesion being about reducing social disparities among European territories. As mentioned in TA 2020, focus should be on underdeveloped peripheral rural and sparsely populated areas as well as on territories facing severe depopulation, where inclusive growth is a key challenge. But "*high levels of employment, a balanced distribution of benefits of economic growth and full use of labour potential"* (Europe 2020) are also important for strong areas, especially cities where wealth and disparities are concentrated. Thus, reducing poverty, promoting gender equality, facing challenge of ageing population and decreasing early leavers from education is valid for all European territories at local level.

Six indicators are proposed as territorial cohesion indicators under this objective:

- Disposable household income
- Life expectancy at birth
- Proportion of early school leavers
- Gender imbalances
- Difference in female-male unemployment rates
- Ageing index

These indicators are dedicated to measure the welfare state of a region (household income), the quality of the regional health care system and healthiness of the living environment (life expectancy at birth), the level of education (proportion of early school leavers), balanced gender relations (gender imbalances and female-male unemployment rates), and the overall age structure of a society (ageing index).

Apart from the indicator on gender imbalances and ageing index, all other indicators are currently available only at NUTS 2 or even NUTS 1 level (early school leavers). Even though NUTS level 2 or 1 already provide some territorial insights, compared to the national level, it still need to be highlighted that from a territorial perspective data availability at NUTS 3 level should be aspired.

For the first four indicators, sigma and beta convergence plots are generated to analyse the temporal development of the indicators.

Disposable household income

Theme:

0703 ECONOMY, LABOUR FORCE. Income and consumption

Policy relevance:

This indicator measures the welfare of residence population in a region and reflect the level of poverty. It is important for cohesion and inclusion that no high disparities and high levels of poverty persist.

Desired direction of change:

General increases in disposable household income are desired. Regions with less than 10,000 EUR mean disposable household income should catch up faster.

Description:

Apart from the capital cities and the big agglomerations, the disposable household income is highest in Southern Germany, Austria, England (Greater London region), France (Paris) and Northern Italy. There is furthermore a clear divide between the old and new EU Member States, with Bulgaria and Romania yielding the lowest household incomes (< 5,000 EUR). Countries with the highest disposable household income are also those countries with the highest disparities among their regions: the UK; Germany, Italy, but also Greece experience extreme divide between their richest and poorest regions (Figure 41).

Notwithstanding the high income disparities still existing in 2007, there was a clear trend towards convergence in the time period of 2000-2007 across all European regions (Figure 42). The beta convergence shows that regions with low household incomes catched up faster than those with already high income levels, since the income increases of regions with household incomes of less than 10,000 Euros was much higher compared to the other regions (Figure 43).

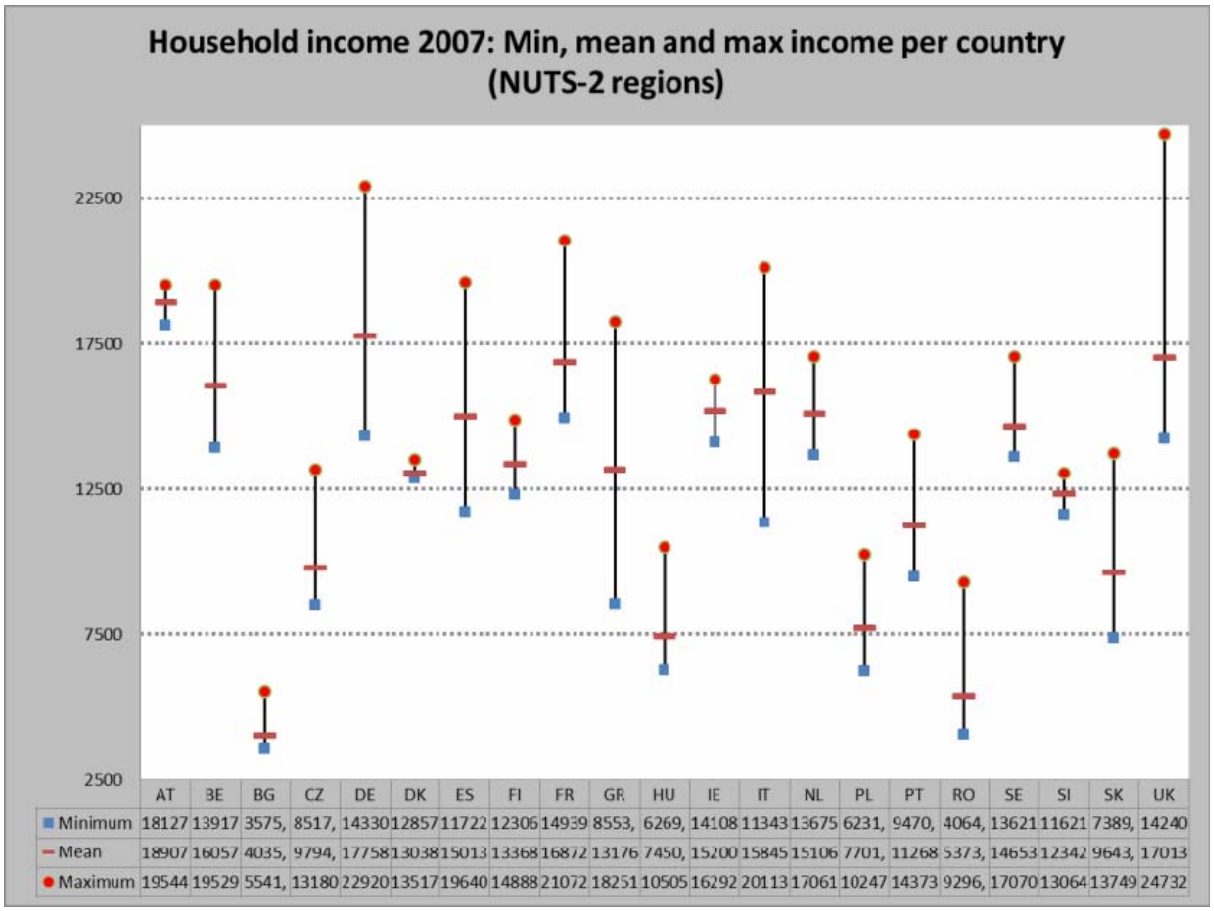


Figure 41. Disposable household income – Minima, maxima and averages

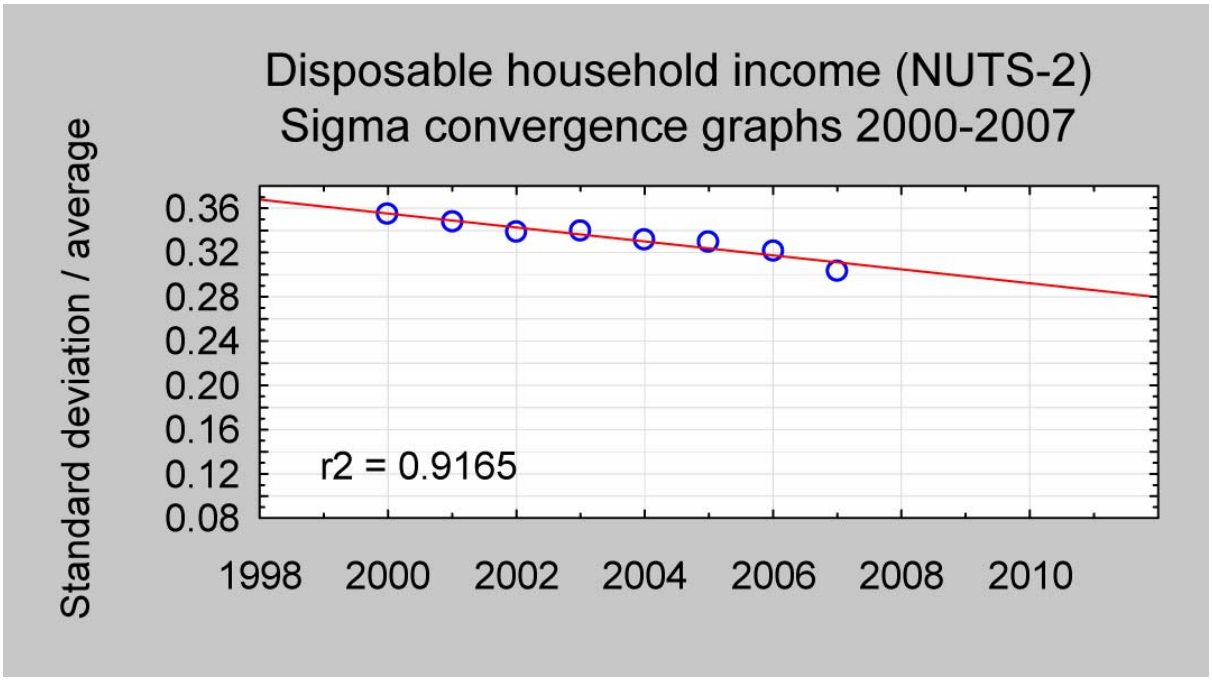


Figure 42. Disposable household income – development of disparities 2000-2007

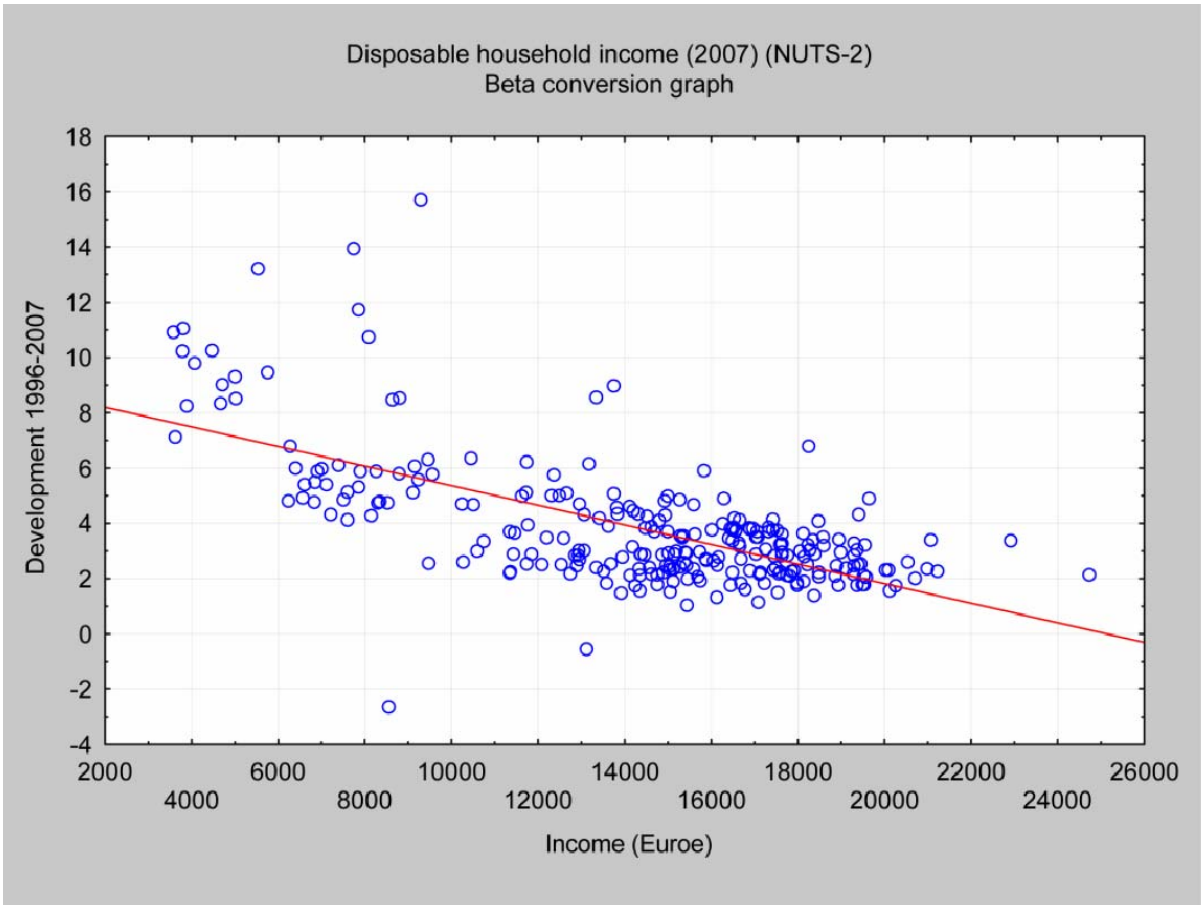


Figure 43. Disposable household income – beta convergence

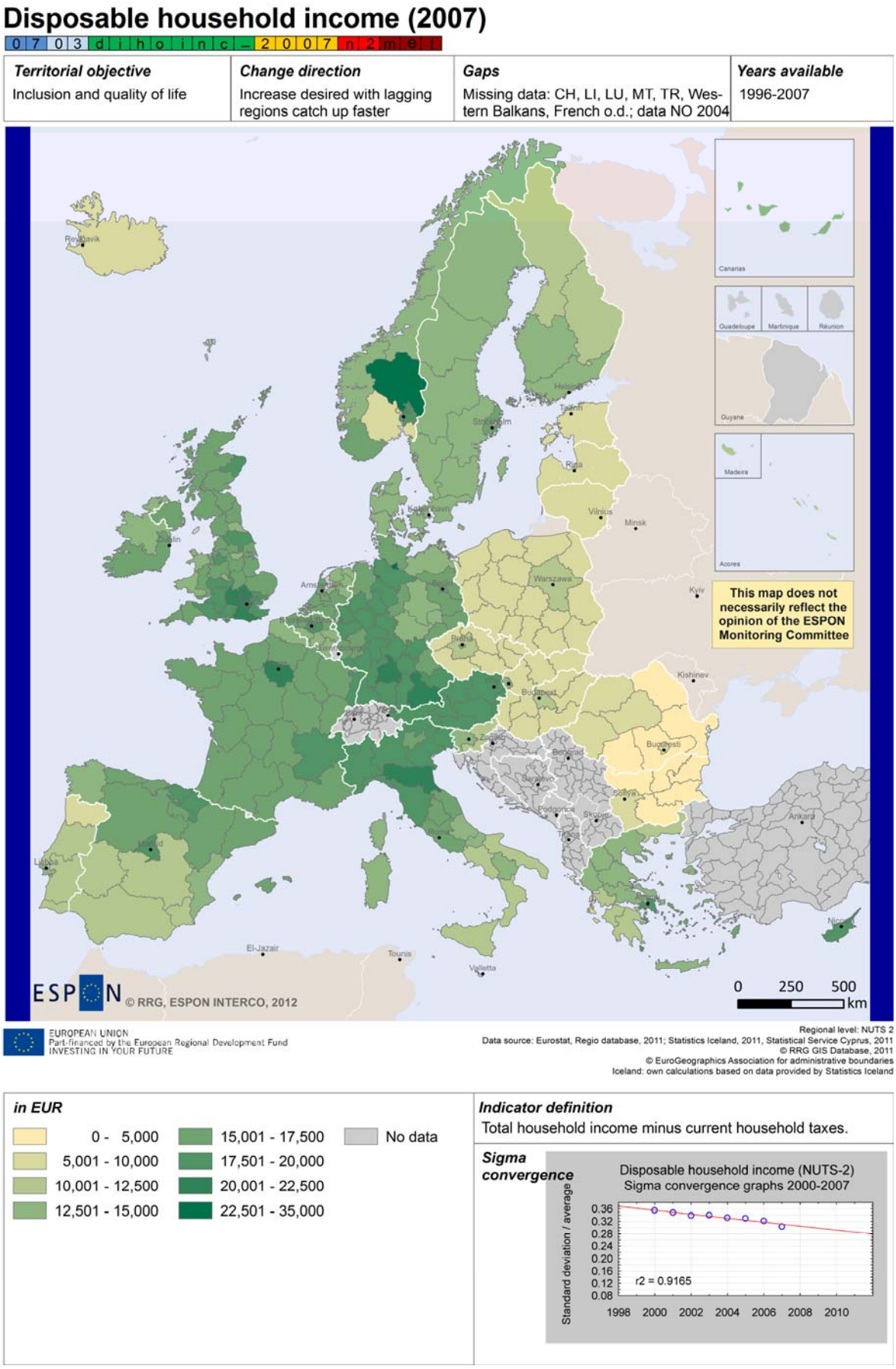


Figure 44. Indicator – disposable household income

Life expectancy at birth

Theme:

0603 SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE. Health

Policy relevance:

This indicator represents a proxy for the overall quality of the health-care system in a region. It tells us about healthiness of living environment and together with ageing index it allows to assess social policies projections and risk of exclusion.

Desired direction of change:

Life expectancy should at least be stable; decreases should be avoided, regions with expectancies of less than 75 years should catch up faster.

Description:

The map basically illustrates three findings (Figure 48): First, the general life expectancy in Europe lies between 72 and 84 years, i.e. within a time span of 12 years. Second, life expectancy is generally higher in EU15 compared to EU27, since all new EU Member States have significantly lower expectancies compared to Western Europe. Third, even in West European countries a distinction between Northern regions (lower expectancy) and southern regions (high expectancy) can be found, for instance in the UK and Germany and, to a lesser degree, in France or Greece.

Even though the general range of values between 72 and 84 years is rather small (Figure 45), the variations between the countries are completely different. There are countries with very small ranges, smaller than two or one years (Austria, Ireland, Netherlands, Norway), but there are also countries with great disparities of four or even more years (Hungary, Portugal, UK); in the latter case obviously it very much depends where people are living.

The disparities of this indicator remained almost stable in the period 2002-2008, although at a low level (Figure 46). As Figure 47 shows, the percentage development of the regions was close to zero, i.e. there was no significant development over time for almost all regions. However, the beta convergence shows that regions with already high life expectancies increased these expectancies overproportionally, even though at a very, almost neglectable level.

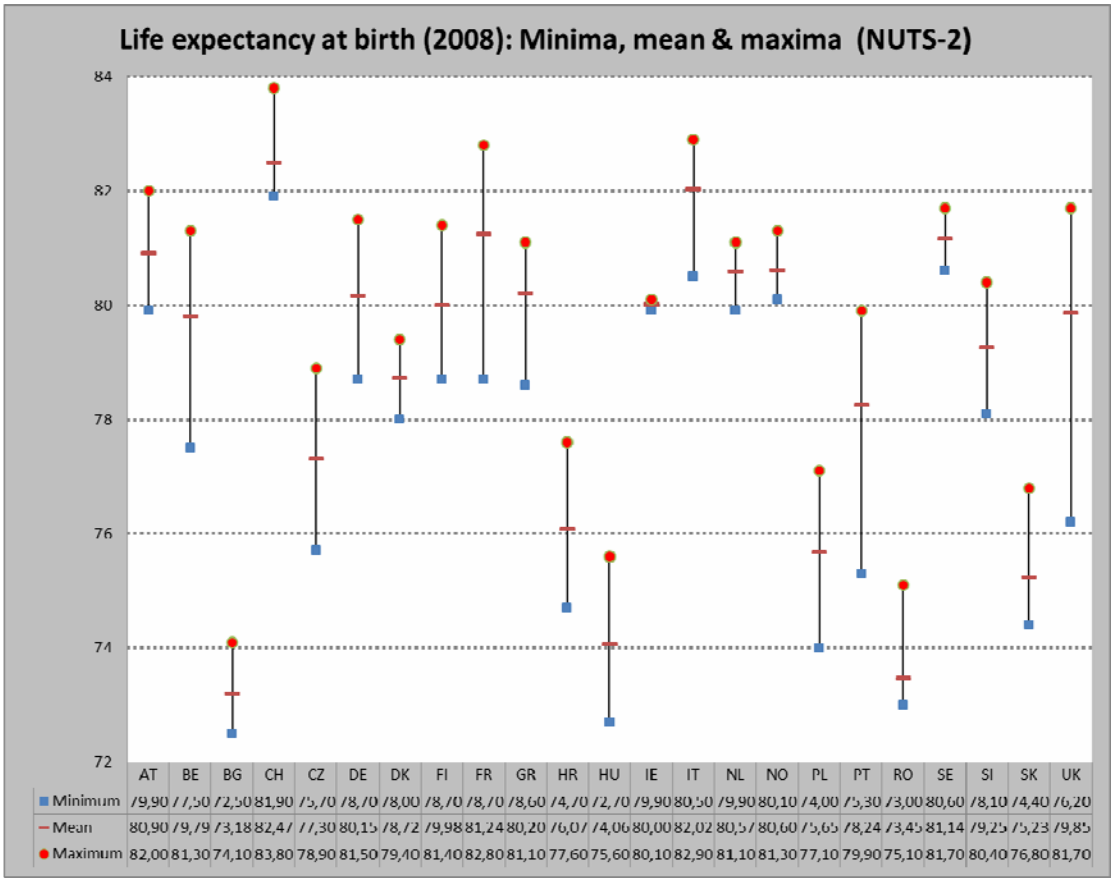


Figure 45. Life expectancy at birth by country – Minima, maxima and averages

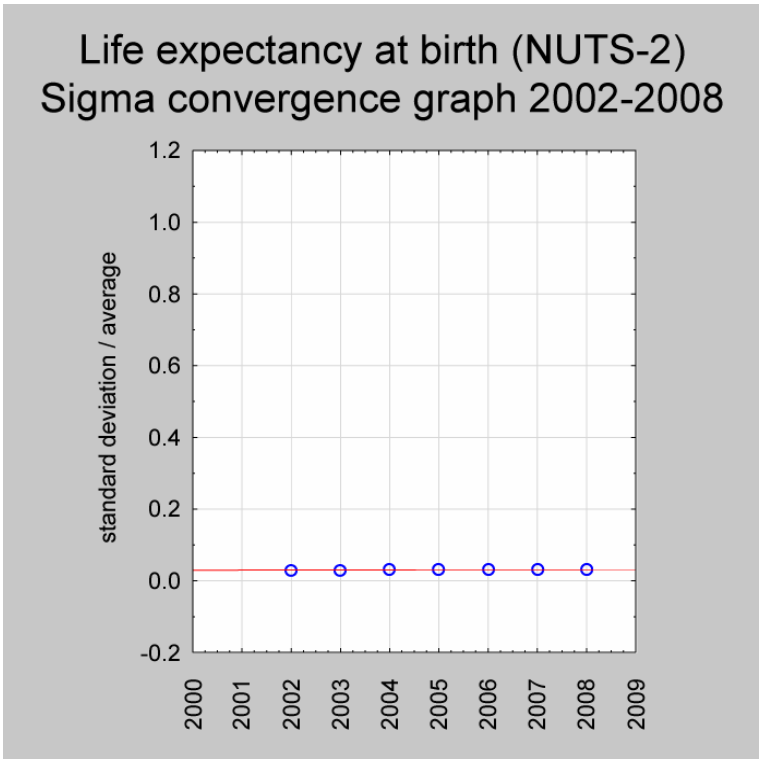


Figure 46. Life expectancy at birth – development of disparities 2002-2008

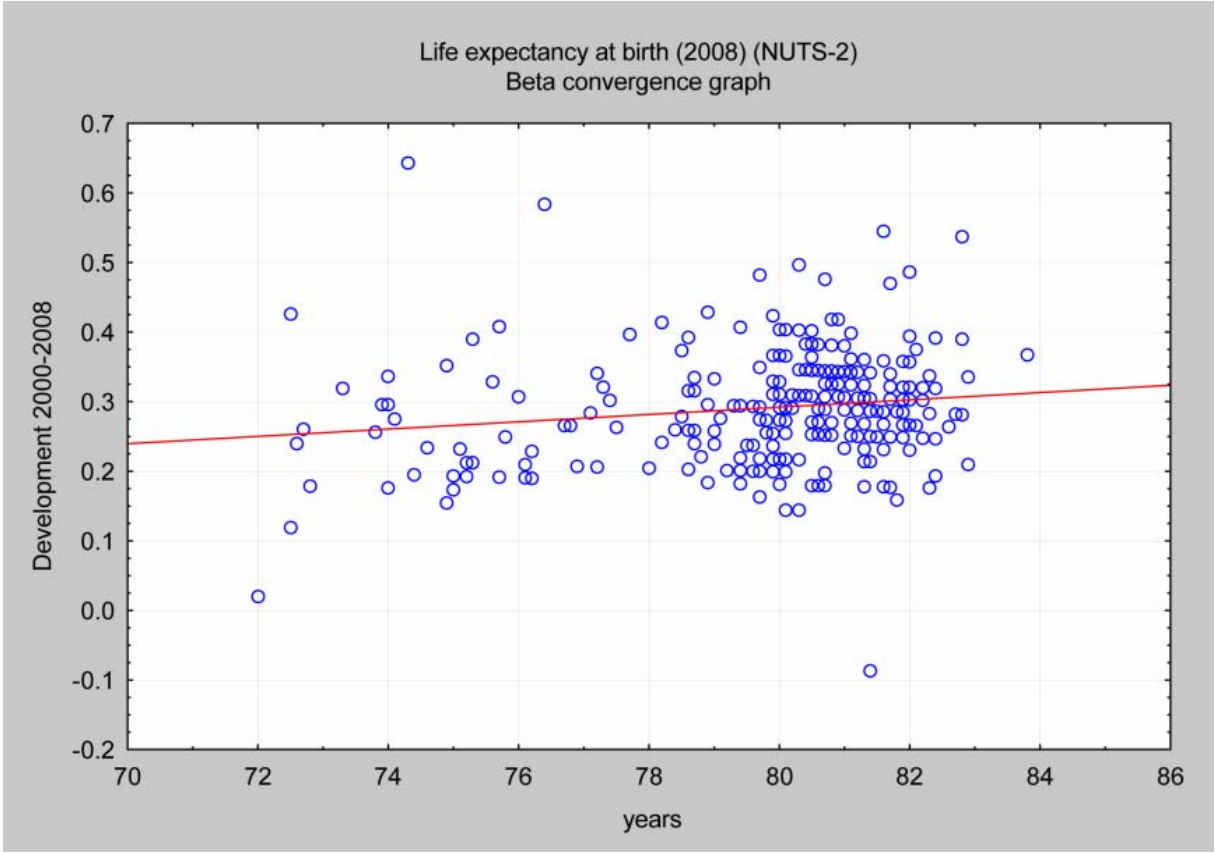


Figure 47. Life expectancy at birth – beta convergence

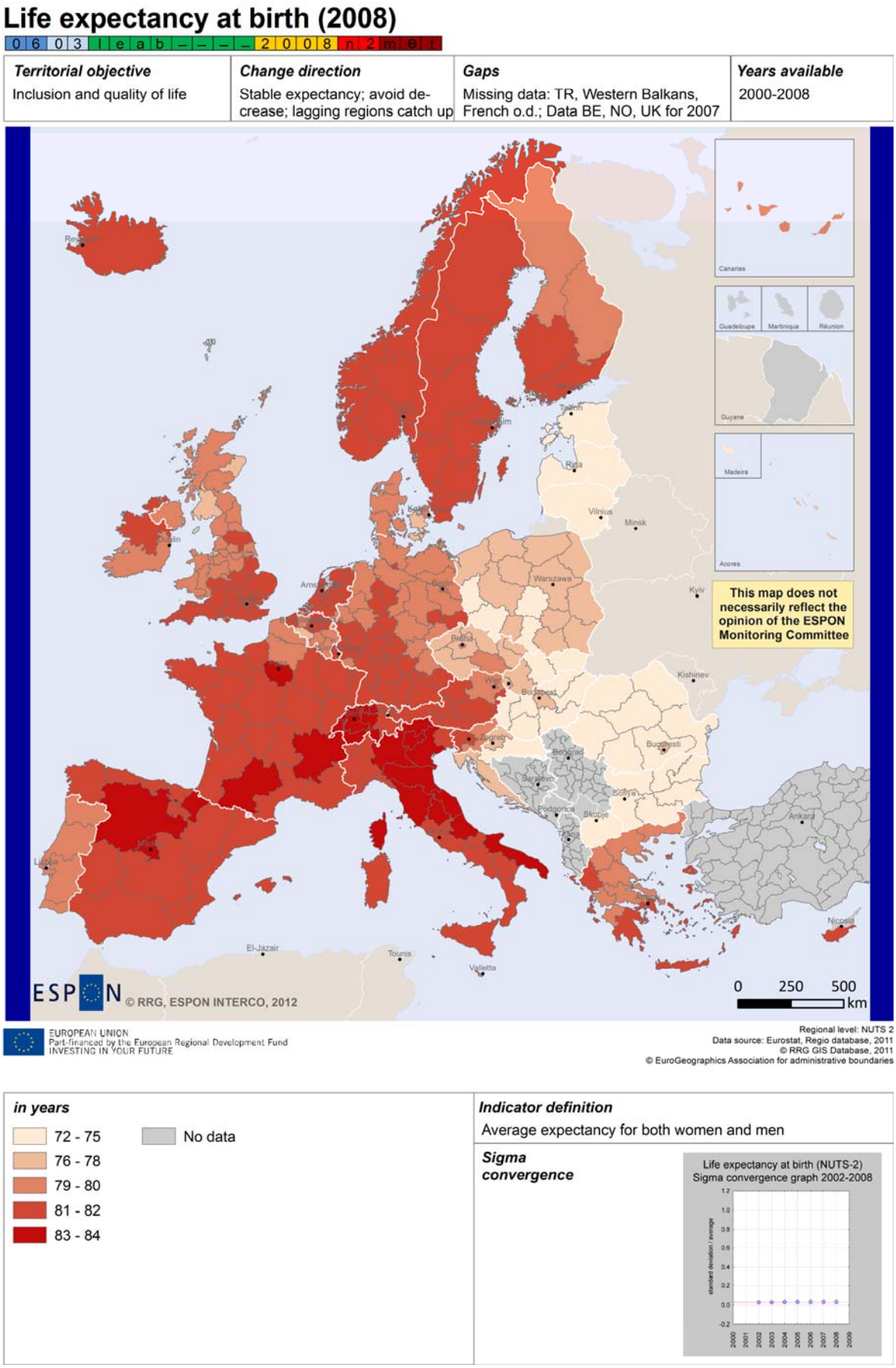


Figure 48. Indicator – Life expectancy at birth

Proportion of early school leavers

Theme:

0602 SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE. Education

Policy relevance:

This indicator measures the quality of the school system and potential inclusion in labour market. Low level of education is more likely to expose to low income and eventually to low life expectancy.

Desired direction of change:

A decrease to zero is desired, since adequate and highest level of education is needed for Europe as a whole as assets in global markets.

Description:

In most regions in Europe, the proportion of early school leavers in 2010 accounts for 11-20 percent; lower proportions can be found in Poland, Czech Republic, Slovenia and Croatia, higher proportions in Turkey, Romania, Spain, Portugal and Southern Italy (Figure 49). With the exception of Portugal, Spain and Turkey, disparities at regional level within countries are rather small; however, there are indeed variations of the general level between the countries (for instance, Swiss or Czech Republic compared to the other countries).

Notwithstanding these actual disparities, there has been a trend towards convergence since 2006 across all regions in Europe (Figure 50). This convergence trends was mainly caused by regions with high proportion of early school leavers who managed to reduce this proportion significantly (Figure 51). Regions with rather low proportion behaved differently: partly they managed to reduce this proportion even more since 2006, but for some of them the proportion increased.

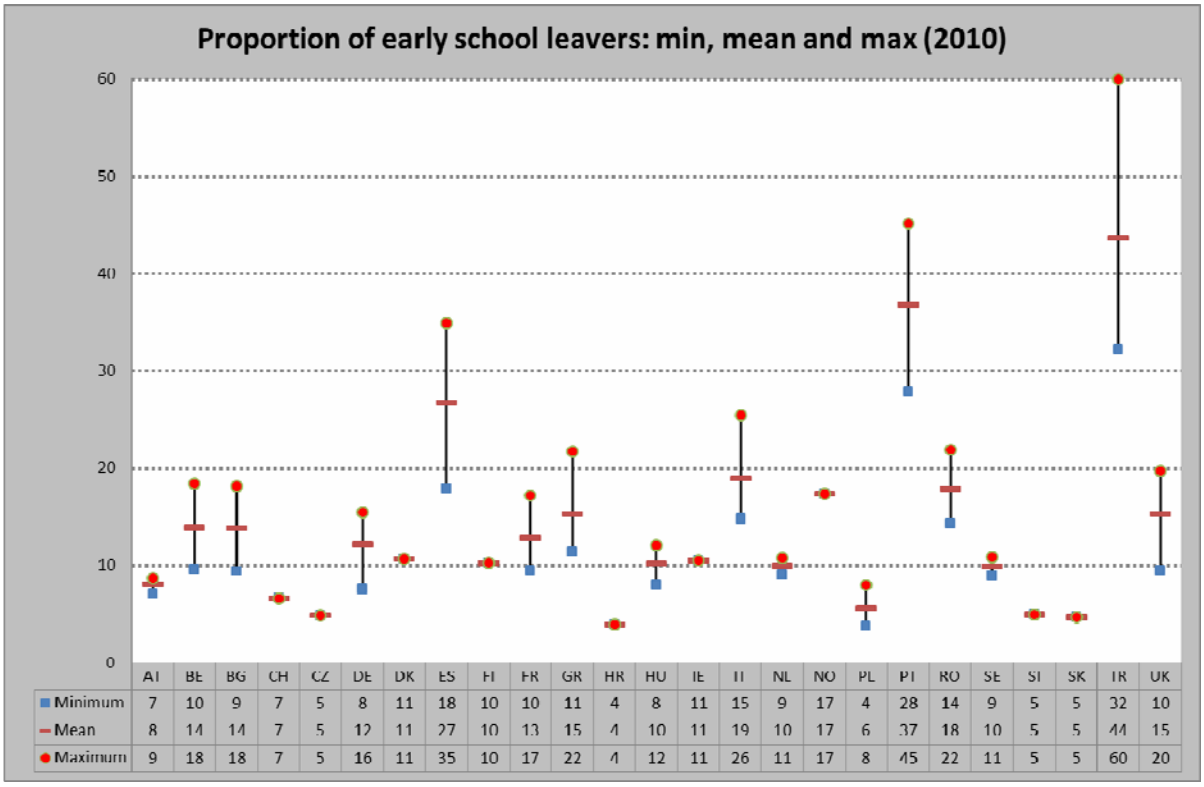


Figure 49. Early school leavers by country – minima, maxima and averages

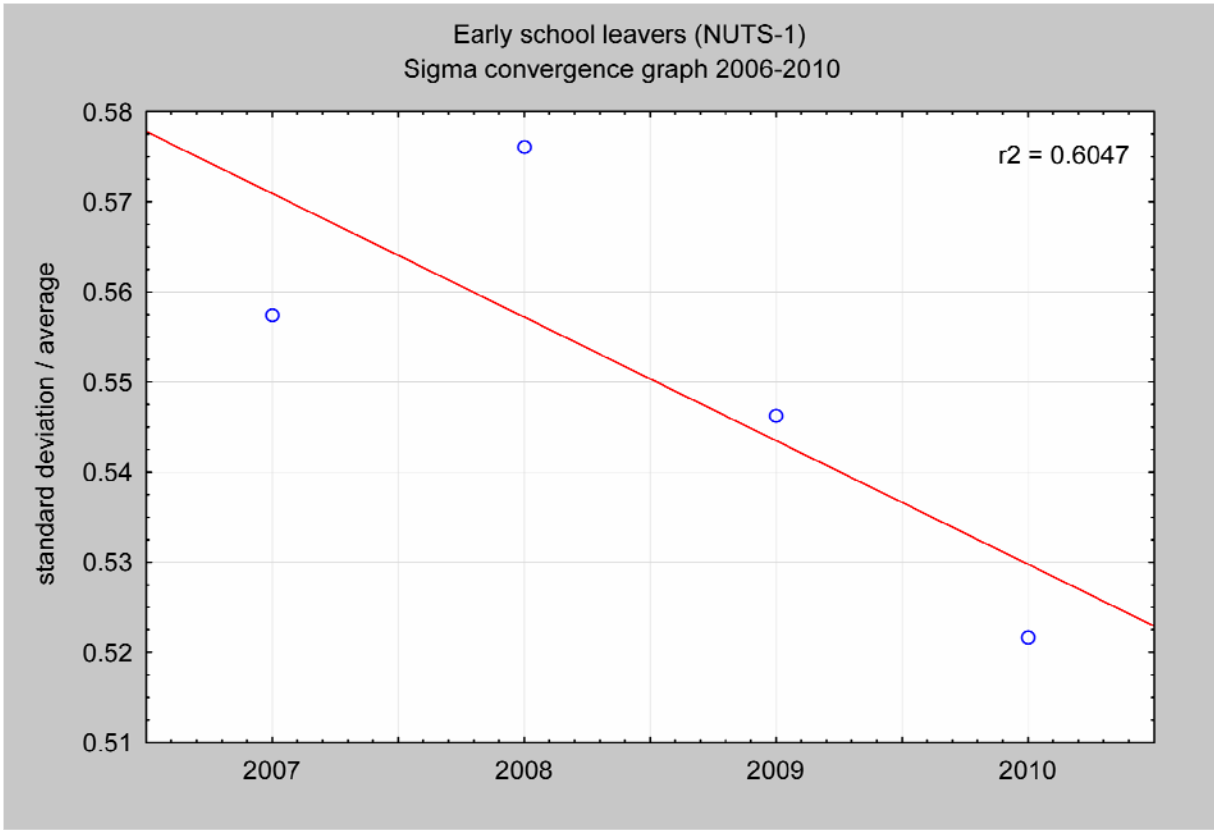


Figure 50. Early school leavers – development of disparities 2006-2010

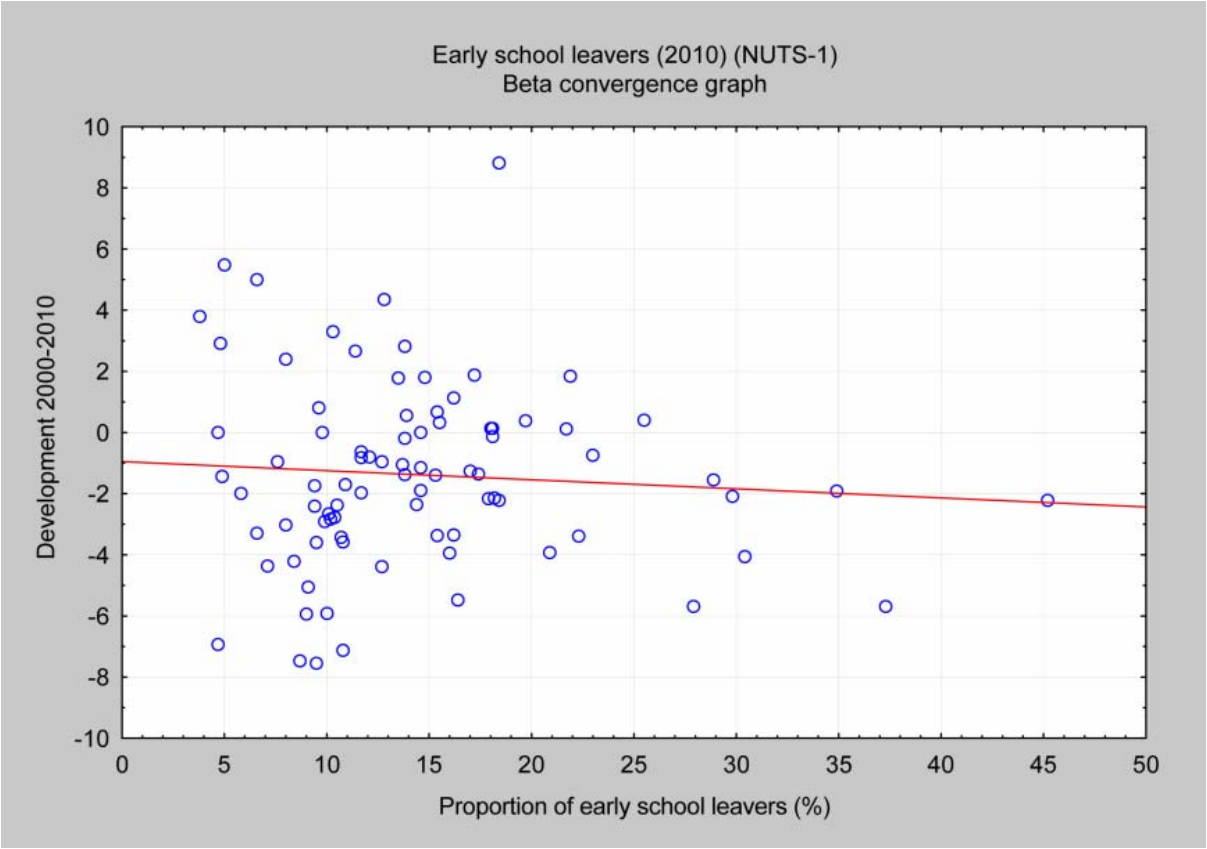


Figure 51. Early school leavers – beta convergence

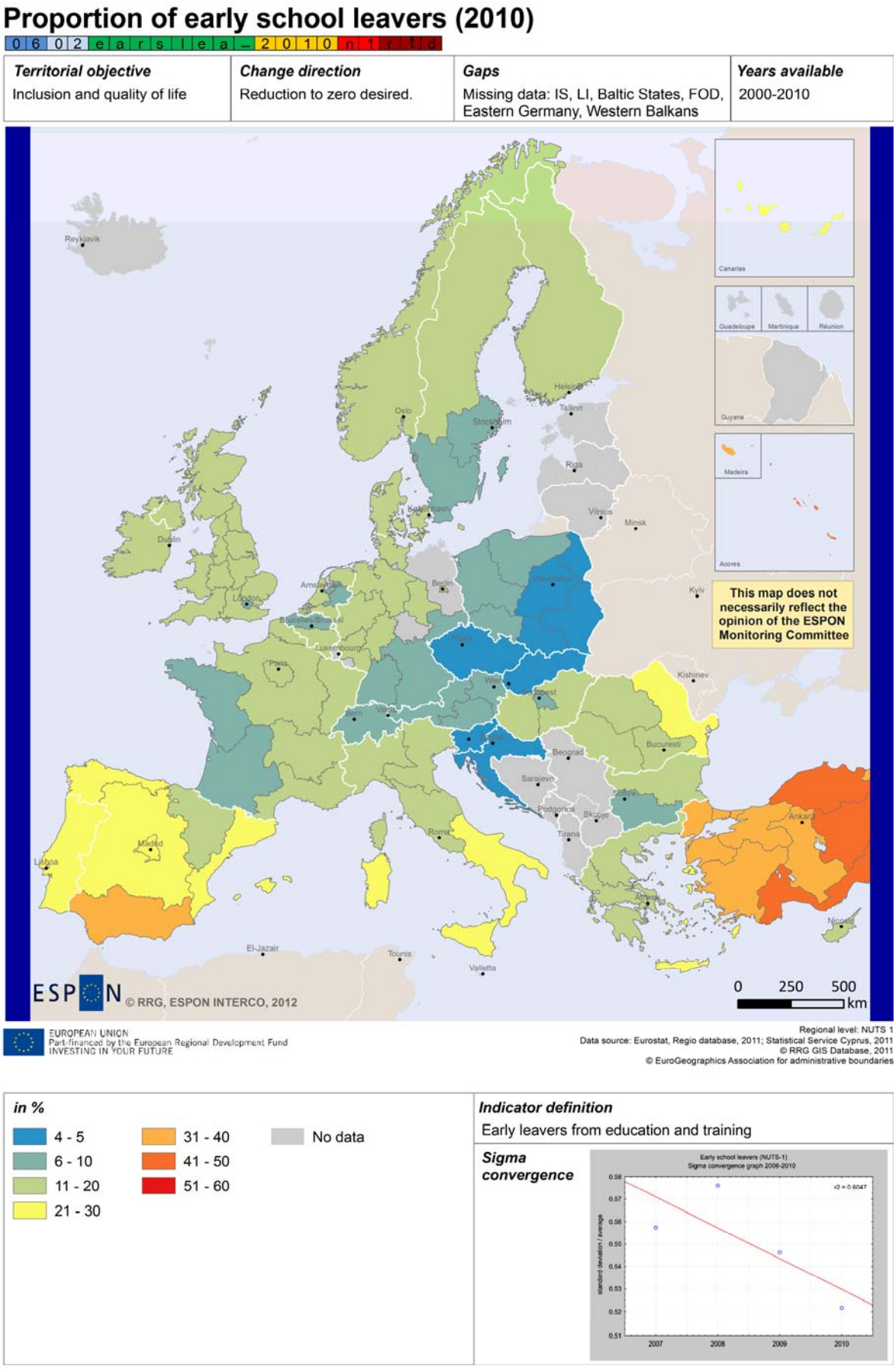


Figure 52. Indicator – early school leavers

Gender imbalances

Theme:

0201 DEMOGRAPHY. Population structure

Policy relevance:

This indicator measures differences in the gender composition of a society. A balanced participation of men and women in activities is one determinant for an inclusive society.

Desired direction of change:

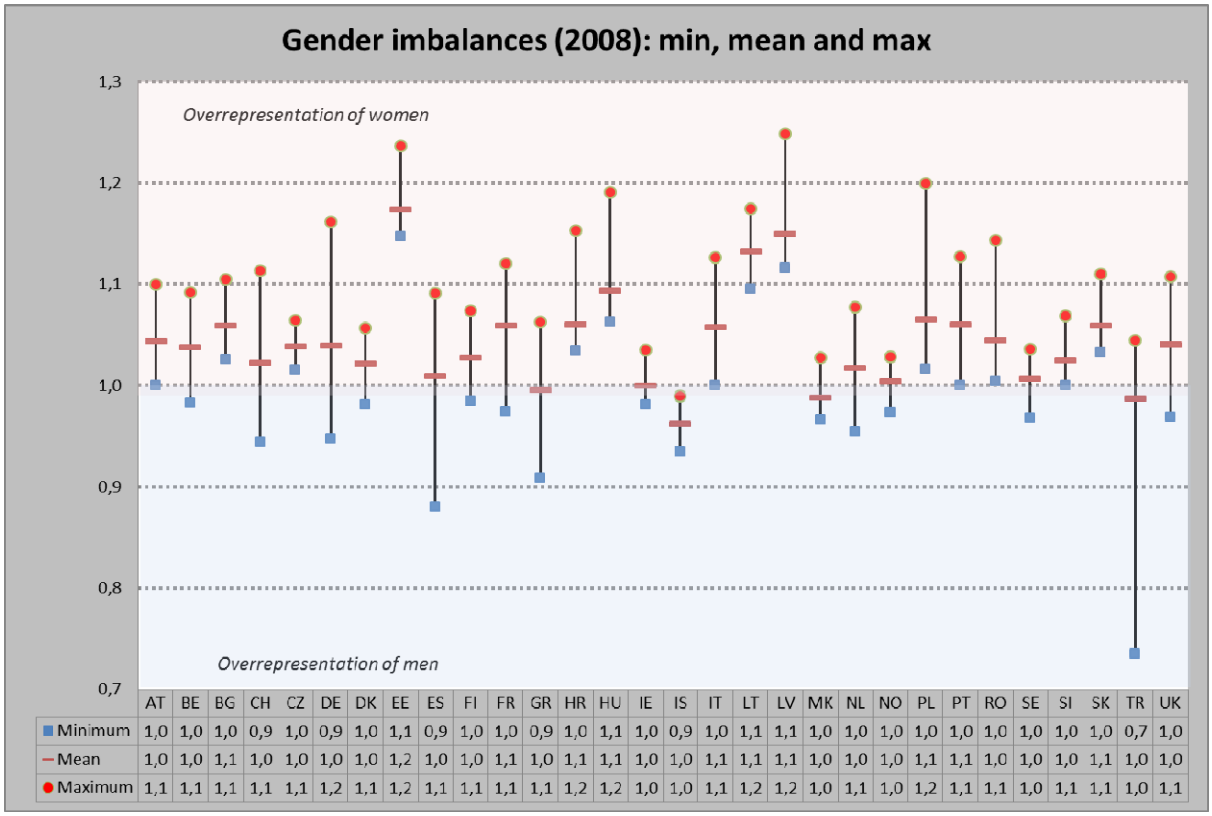
A balanced demographic structure between female and male population should be aspired.

Description:

The majority of regions in Europe experience a slight overrepresentation of women (Figure 53); only the Baltic States, as well as selected regions in Poland, Hungary, Southern France and Portugal have higher overrepresentations of women. In turn, regions in Northern Scandinavia, Ireland, East Germany, large parts of Spain, Greece and Turkey see a overrepresentation of men.

An almost balanced gender structure for the overall country can be observed for smaller countries like Cyprus, Ireland, Luxembourg, Macedonia, Malta or Norway.

This indicator experienced almost no development since 2003, neither for measuring across all regions, nor by differentiating the type of region. The sigma convergence remained stable, however, at a low level (Figure 54). As the beta convergence shows (Figure 55), the development since 2000 was for most regions in the range of +/- 0.5 percentage points only.



	AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IS	IT	LT	LV	MK	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	1,0	1,0	1,0	0,9	1,0	0,9	1,0	1,1	0,9	1,0	1,0	0,9	1,0	1,1	1,0	0,9	1,0	1,1	1,1	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	0,7	1,0
Mean	1,0	1,0	1,1	1,0	1,0	1,0	1,0	1,2	1,0	1,0	1,1	1,0	1,1	1,1	1,0	1,0	1,1	1,1	1,1	1,0	1,0	1,0	1,1	1,1	1,0	1,0	1,0	1,1	1,0	1,0
Maximum	1,1	1,1	1,1	1,1	1,1	1,2	1,1	1,2	1,1	1,1	1,1	1,1	1,2	1,2	1,0	1,0	1,1	1,2	1,2	1,0	1,1	1,0	1,2	1,1	1,1	1,0	1,1	1,1	1,0	1,1

Figure 53. Gender imbalances by country – minima, maxima and averages

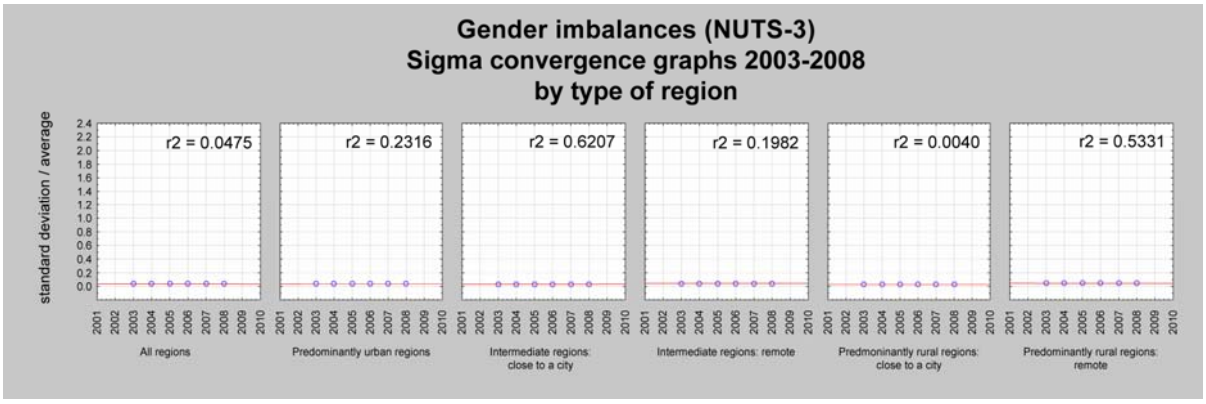


Figure 54. Gender imbalances – development of disparities 2003-2008

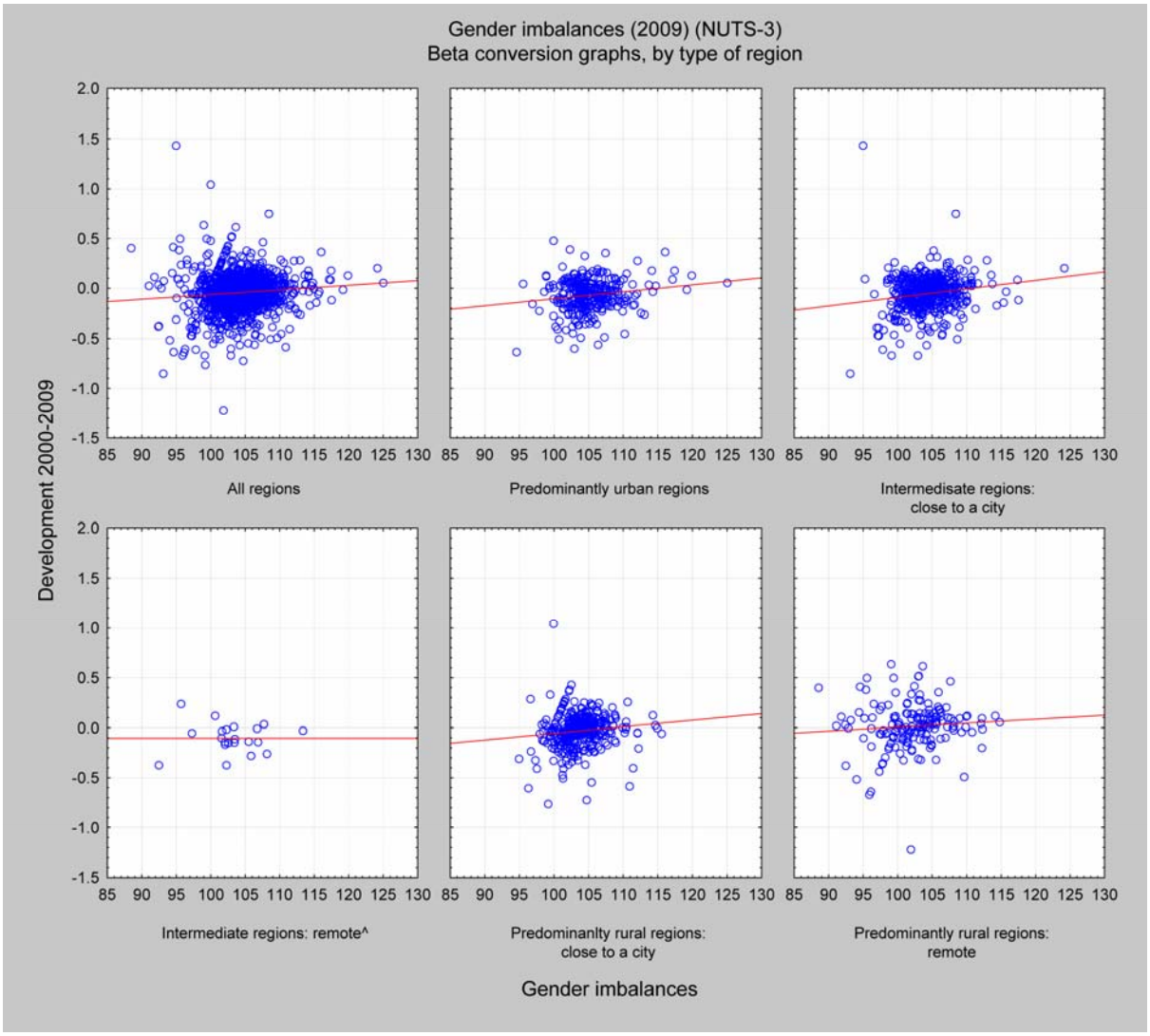


Figure 55. Gender imbalances – beta convergence.

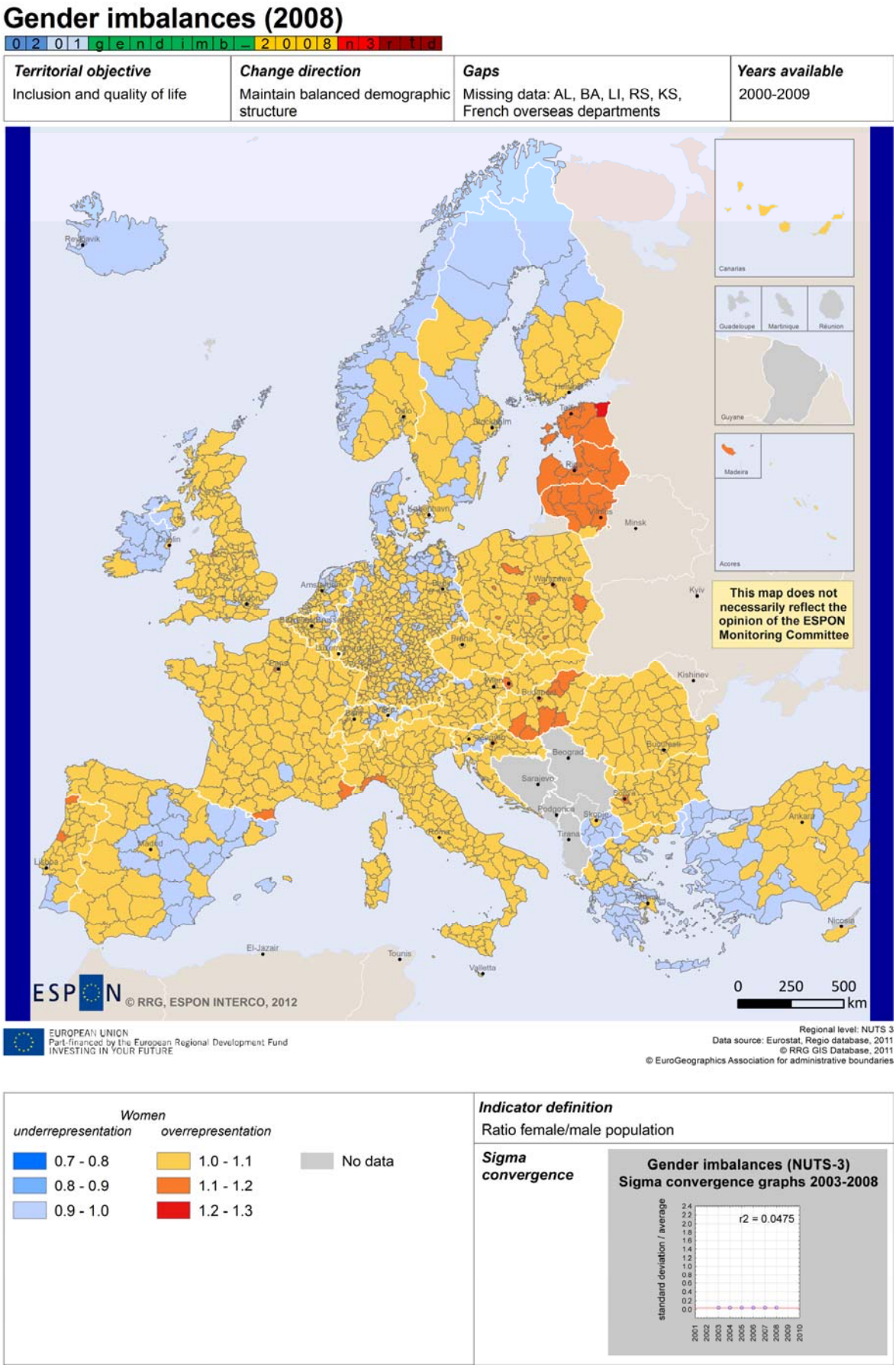


Figure 56. Indicator – Gender imbalances

Differences in female-male unemployment rates

Theme:

0702 ECONOMY, LABOUR FORCE. Employment, Unemployment

Policy relevance:

This indicator measures the female participation rate in the economy, and thus the overall quality of labour markets of an inclusive society.

Desired direction of change:

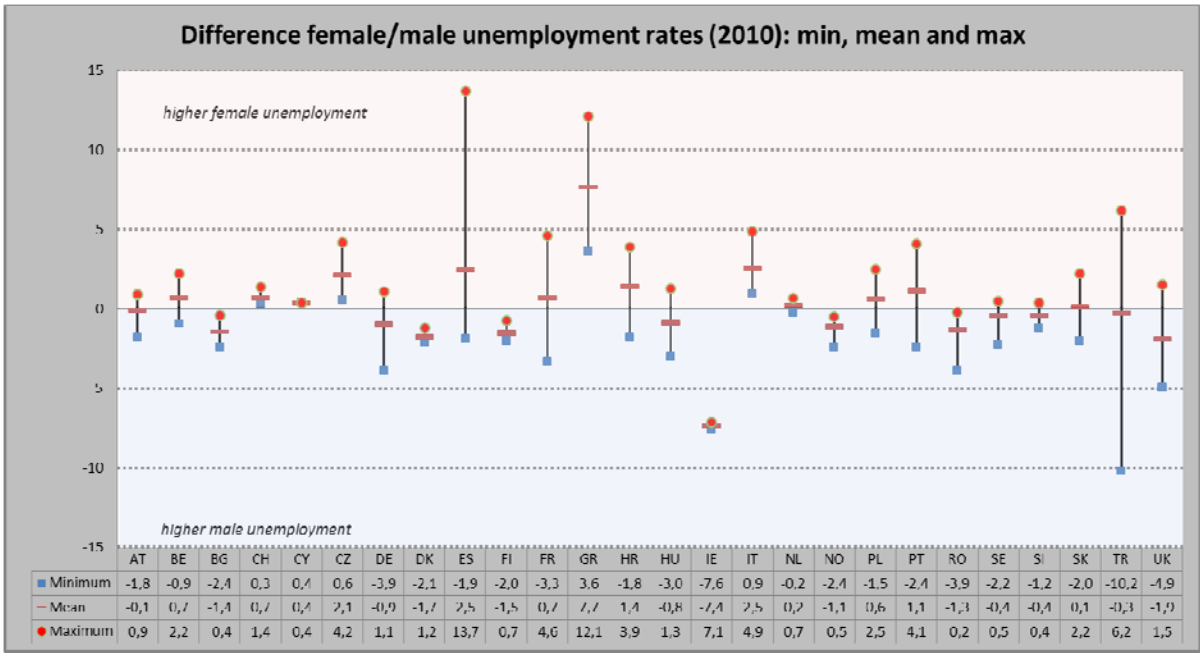
The difference between the female and male unemployment rates should decreased, i.e. there should be no significant difference in unemployment for women or men. Furthermore, a general decrease in unemployment rates should be aspired.

Description:

The spatial patterns reveal interesting pictures (Figure 58): while in Scandinavia, the Baltic States, Germany, UK, Ireland, Bulgaria and Romania higher unemployment rates for men can be observed, the opposite is true for the Mediterranean countries, France, Poland, Czech Republic and Slovakia, where higher female unemployment rates can be detected.

There are only few countries with balanced unemployment rates across sex (Figure 57), which are Switzerland, Denmark, Finland, Netherlands, Norway and Slovenia. For the other countries great disparities exist, with the highest ones in Spain, France, Greece and Turkey.

Disparities are decreasing between 2004 and 2008.



	AT	BE	BG	CH	CY	CZ	DE	DK	ES	FI	FR	GR	HR	HU	IE	IT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	-1,8	-0,9	-2,4	0,3	0,4	0,6	-3,9	-2,1	-1,9	-2,0	-3,3	3,6	-1,8	-3,0	-7,6	0,9	-0,2	-2,4	-1,5	-2,4	-3,9	-2,2	-1,2	-2,0	-10,2	-1,9
Mean	-0,1	0,7	-1,4	0,7	0,4	2,1	-0,9	-1,7	2,5	-1,5	0,7	7,7	1,4	-0,8	-7,4	2,5	0,2	-1,1	0,6	1,1	-1,3	-0,4	-0,4	0,1	-0,3	-1,0
Maximum	0,9	2,2	0,4	1,4	0,4	4,2	1,1	1,2	13,7	0,7	4,6	12,1	3,9	1,3	7,1	4,9	0,7	0,5	2,5	4,1	0,2	0,5	0,4	2,2	6,2	1,5

Figure 57. Female/male unemployment by country – minima, maxima and averages

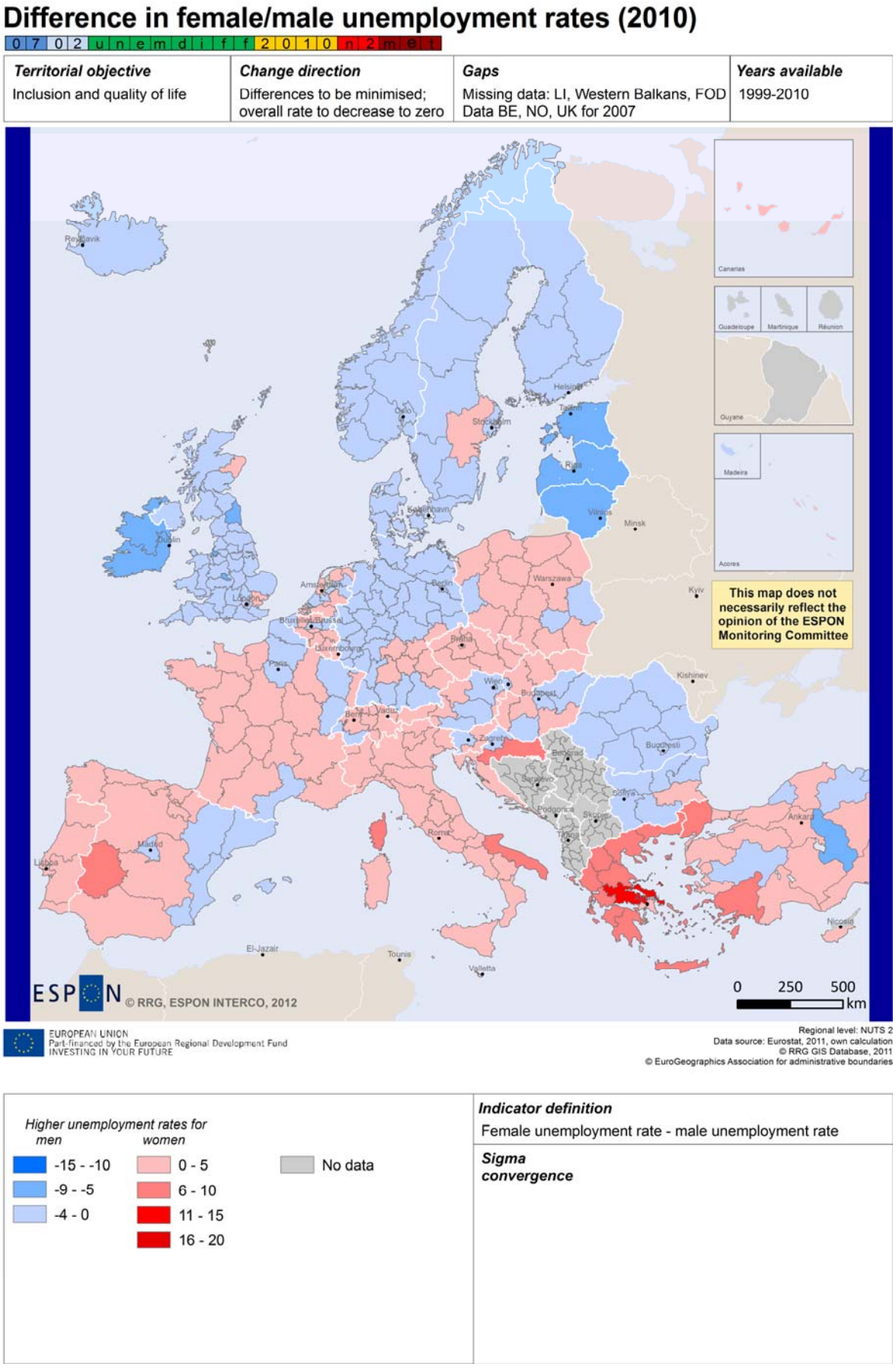


Figure 58. Indicator – Female/male unemployment rate

Ageing index

Theme: 0201 DEMOGRAPHY. Population structure
Policy relevance: This indicator measures the balance of the age structure of the society. Unbalanced age structures may lead to overaging of society and to further difficulties in maintaining adequate levels of public services and infrastructure, endangering quality of life.
Desired direction of change: To maintain a balanced age structure of the society and to avoid overaging.
Description: Figure 60 clearly differentiates regions with a surplus of children (green colors) from those with a surplus of elderly people (purple colors). Societies like Denmark, Iceland, Ireland, Norway, Poland, Romania or Turkey have higher shares of children compared to elderly people. The opposite situation is true in particular for areas in Northwest Spain, in Italy, Greece, Bulgaria, and in East Germany, with overaging societies. Due to the specific situation in East Germany, Germany is at the same time the country with the highest disparities between NUTS 3 regions, followed by Spain, Portugal and Greece and Italy (Figure 59). The remaining countries have only small disparities.

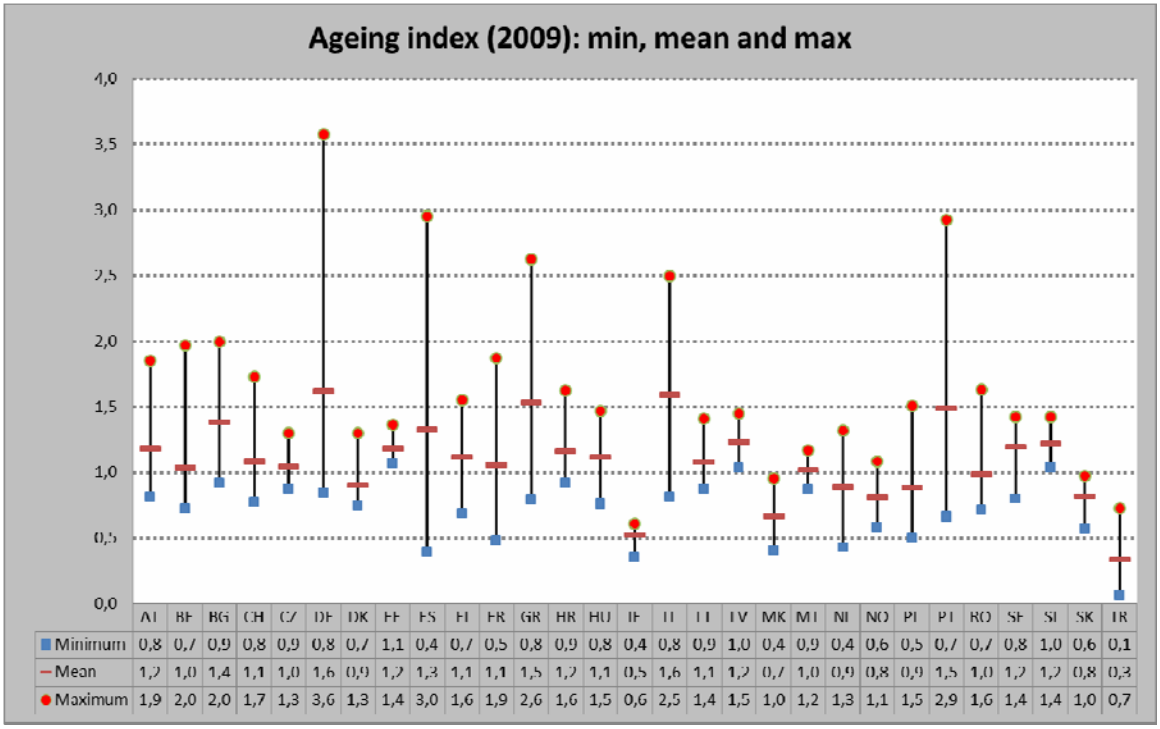


Figure 59. Ageing index by country – minima, maxima and averages.

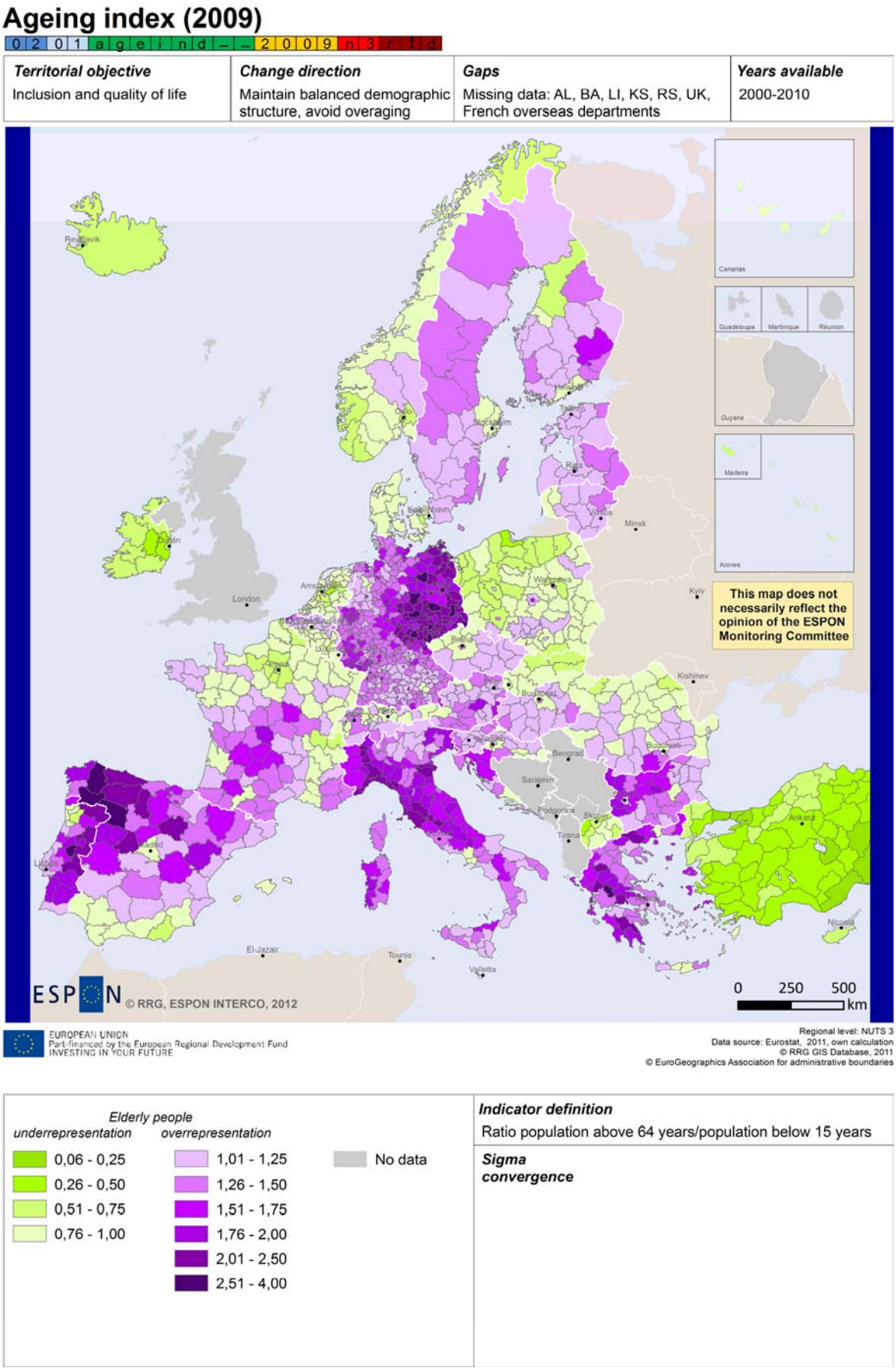


Figure 60. Indicator – Ageing index.

Summary

What are the territorial disparities of the indicators selected for the territorial objective of inclusion and quality of life? And how have these indicators developed over the last decade?

Disparities for the indicator ***life expectancy at birth*** remained almost stable, though at a low level. There has been almost no indicator development since 2002. So, differences within countries remain small, but differences between countries are quite high.

Though in 2010 some of the EU Member States still faced high rates of ***early school leavers***, a trend towards convergence could be observed since 2006 for the entire ESPON space. Many regions with high proportions of school leavers managed to reduce these rates significantly. But there were also some regions experiencing increases in the proportion of early school leavers.

There has been almost no indicator development for the ***gender imbalances*** since 2003. Gender imbalances remained stable, though generally at a low level.

Within the countries, we can observe small differences for the ***unemployment rates for women and men***, except for countries like Spain, France, Greece and Turkey. There are only few countries with balanced unemployment rates across sex. Generally, between 2004 and 2008, we can notice a decrease of disparities.

While many countries reveal only small disparities in the ***ageing index***, there are remarkable exceptions like Germany, Spain, Portugal, Greece or Italy which show great disparities between their regions for this indicator.

Despite all the existing disparities in detail as described above, Figure 61 and Figure 62 summaries that altogether disparities between European regions are rather low, and that disparities in the proportion of early school leavers decreased since 2006, furthermore resulting in a trend towards cohesion.

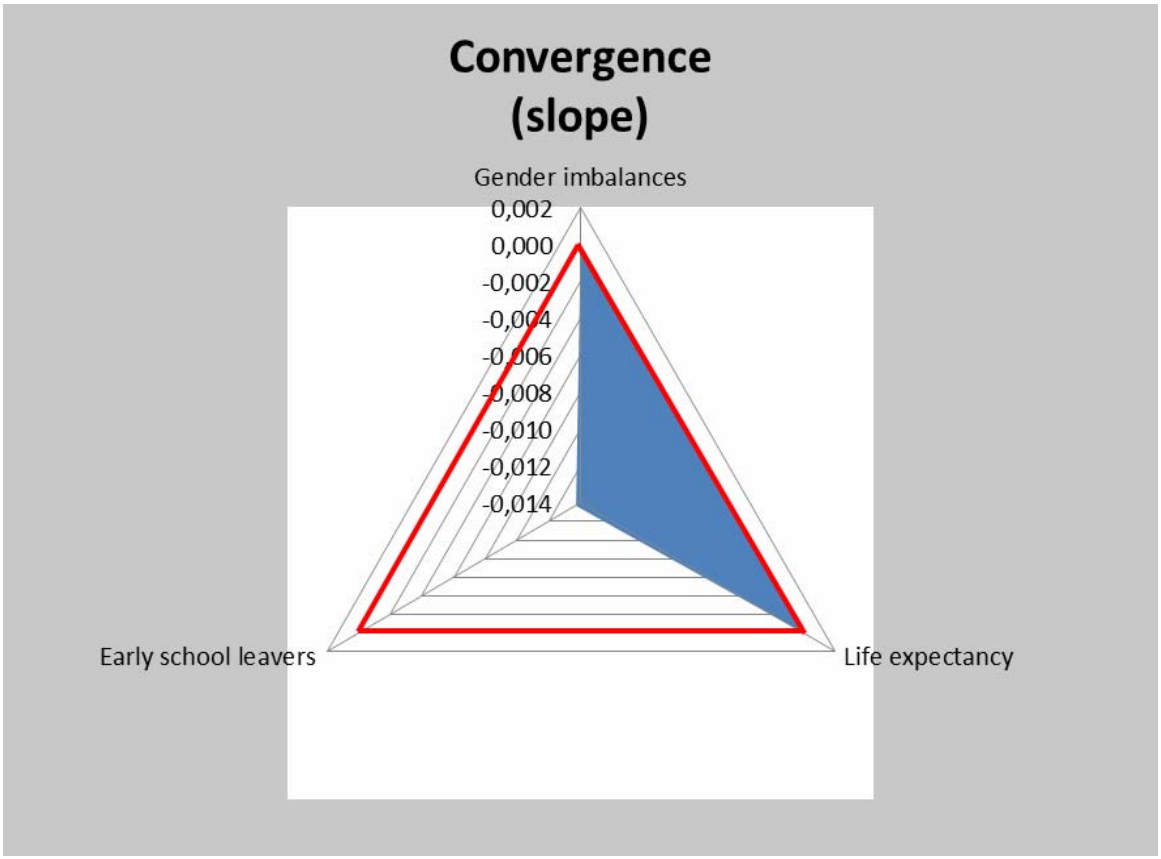


Figure 61. Degree of convergence for indicators under Territorial Objective "Inclusion and quality of life"

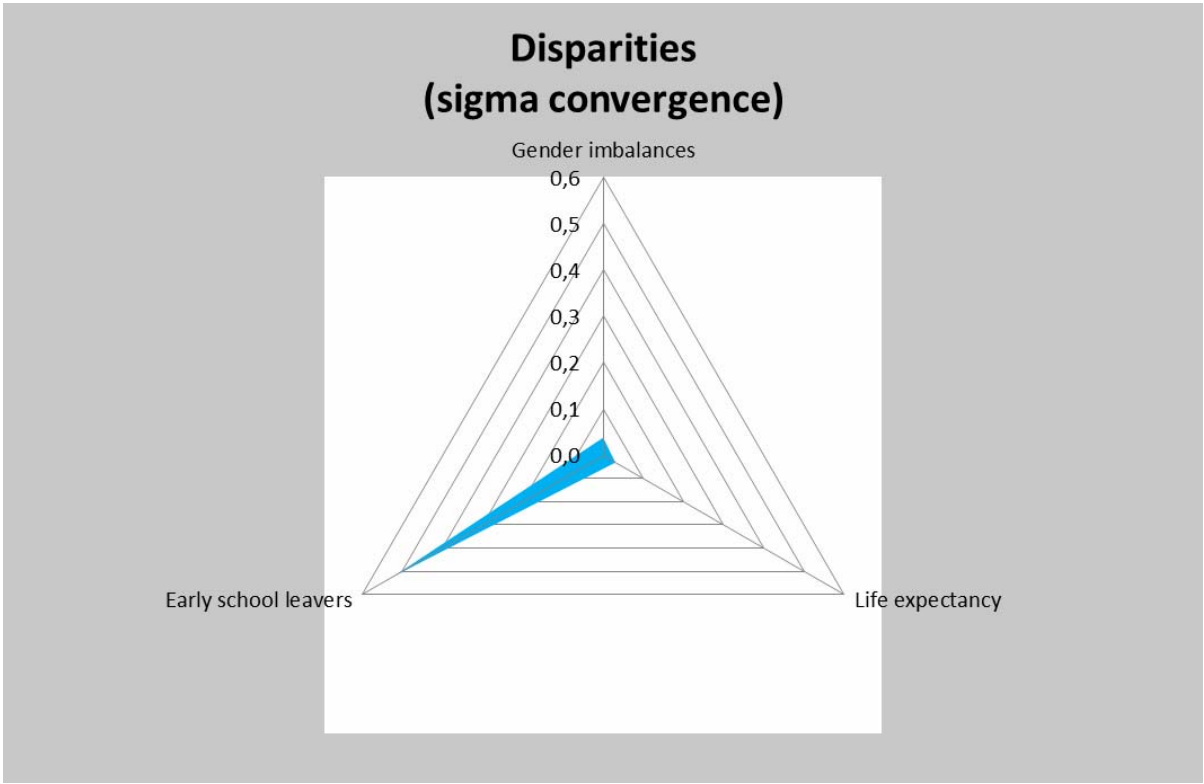


Figure 62. Degree of actual disparities for indicators under Territorial objective "Inclusion and quality of life"

Territorial objective 5. Attractive regions of high ecological values and strong territorial capital

Sustainable growth is an essential pillar of Europe 2020 Strategy. It aims at decoupling economic and demographic growth from energy consumption, for a resource efficient and sustainable economy. Renewable and low-carbon energy are also underlined in TA 2020, which puts more emphasis on joint risk management and cooperation, especially to protect natural and cultural heritage. More than only conservation of European landscapes, there is a need to put quality forward and to make the best use of natural and cultural assets. This will in turn reinforce territorial capital and attractiveness of regions, for a long-term development based on well-functioning ecological systems (TA 2020).

Four indicators are proposed as territorial cohesion indicators under this objective:

- Potential vulnerability to climate change
- Air pollution: PM10
- Air pollution: Ozone concentration
- Soil sealing per capita

These indicators are dedicated to measure the emissions and soil sealing resulting from human behaviour, as well as the general vulnerability of regions to climate change as outcome of human behaviour and adaptation capacities on the one hand, and their climatic, topographic, geological and biological conditions on the other hand. Other wishlist indicators under this territorial objective include mortality, risk and hazards, biodiversity or renewable energy potential.

Due to a lack of time series information, analyses of sigma and beta convergences could not be performed so far for this indicator set.

The indicator on potential vulnerability to climate change is a composite indicator calculated by ESPON Climate project. The potential impacts were calculated as a combination of regional exposure to climate change (difference between 1961-1990 and 2071-2100 climate projections) of eight climatic variables. Results are classified into five classes (highest negative impacts, medium negative impacts, low negative impacts, no/marginal impact, and low positive impact). Even though it is debatable whether individual impacts of climate change are to be considered a bad or a good thing, from a territorial cohesion perspective it is argued here that exposures to anticipated climate change is binding significant political, human and eventually also financial resources. Regions that will experience climate change, will thus in future be required to spend time and efforts over proportionally to adaptation strategy, compared to other regions that can spend their resources more widely.

Basic air pollution data particular matter (PM10) and ozone concentration are provided by the European Environment Agency (EEA, Copenhagen) as raster datasets. Thus, following are two types of air pollution maps: one map showing aggregated results at NUTS level, and another map, produced by EEA, at grid level.

Potential vulnerability to climate change

Theme:

0803 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARD, climate change

Policy relevance:

This indicator measures the overall vulnerability of regions in Europe to climate change, accounting for the sensitivity and adaptation capacities of regions and their regional/local government preparedness to adapt to climate change when confronted to cases of extreme climatic events.

Desired direction of change:

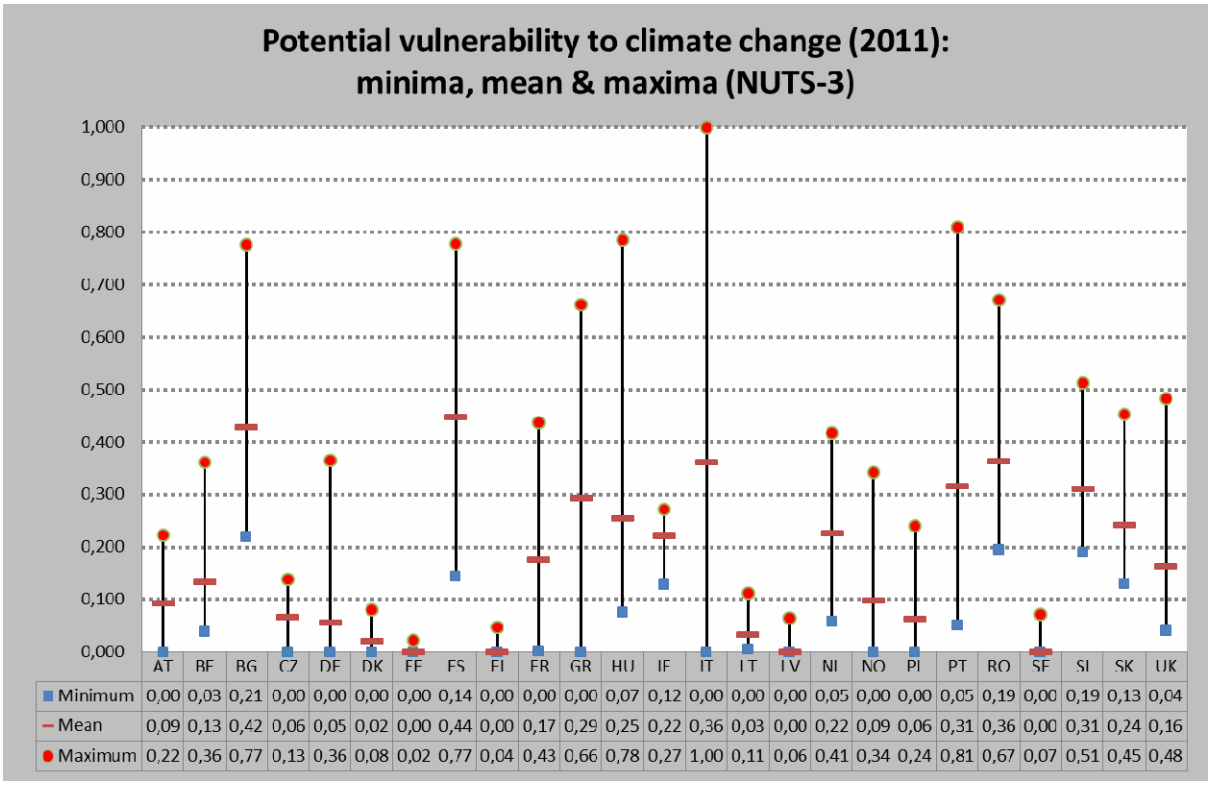
The potential vulnerability to climate change should be reduced, especially the socio-economic sensitivity to exposures to extreme climatic events. Regions with medium or high vulnerability to climate change should introduce suitable measures helping to reduce negative impacts through climate change.

Description:

Generally it is expected that regions around the Mediterranean Sea experience higher potential vulnerability to climate change, compared to regions in Central Europe and Northern Europe. All regions in Portugal, Spain, Italy, Greece, Bulgaria and Romania are likely to experience medium or even high negative impacts through climate change, so as do coastal regions in the Benelux. Regions in France, Slovakia, Western Germany and the UK and Ireland show low negative overall climate change impacts.

Apart from these general disparities in Europe, there are also significant disparities within the countries. Interestingly, countries around the Mediterranean Sea are at the same time those countries that also show the largest internal disparities, since within these countries (Greece, Italy, Portugal, and Spain) there are regions who experience no or only marginal impacts (index values close to 0), contrasted to other regions who are expected to experience severe impacts (index values close to 1). There is a tendency in most countries to experience negative impacts, for some countries in the low or medium range (Slovakia, Hungary, southern parts of Poland, UK), for other in the medium to high range (Bulgaria, Romania, Slovenia). Only few regions in selected countries such as in Austria, Czech Republic, Germany, Scandinavia, and the Baltic States are expected to experience no or only marginal impacts from climate change. Potential vulnerability of these countries is expected to be lower compared to the other countries, not only because of lower natural impacts, but also because these countries are expected to better adapt to the (political) challenges to respond to climate change processes.

Summing up, the indicator on potential vulnerability to climate change first of all highlights the big gap between Mediterranean countries, west European countries (Ireland, France, UK) and the rest of Europe, but on a second level it also illustrates significant disparities within many countries, with regions experiencing no or only marginal impacts, compared to those that are likely to experience significant impacts through climate change.



	AT	BE	BG	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LV	NL	NO	PL	PT	RO	SE	SI	SK	UK
Minimum	0,00	0,03	0,21	0,00	0,00	0,00	0,00	0,14	0,00	0,00	0,00	0,07	0,12	0,00	0,00	0,00	0,05	0,00	0,00	0,05	0,19	0,00	0,19	0,13	0,04
Mean	0,09	0,13	0,42	0,06	0,05	0,02	0,00	0,44	0,00	0,17	0,29	0,25	0,22	0,36	0,03	0,00	0,22	0,09	0,06	0,31	0,36	0,00	0,31	0,24	0,16
Maximum	0,22	0,36	0,77	0,13	0,36	0,08	0,02	0,77	0,04	0,43	0,66	0,78	0,27	1,00	0,11	0,06	0,41	0,34	0,24	0,81	0,67	0,07	0,51	0,45	0,48

Figure 63. Potential vulnerability to climate change - min. mean and max.

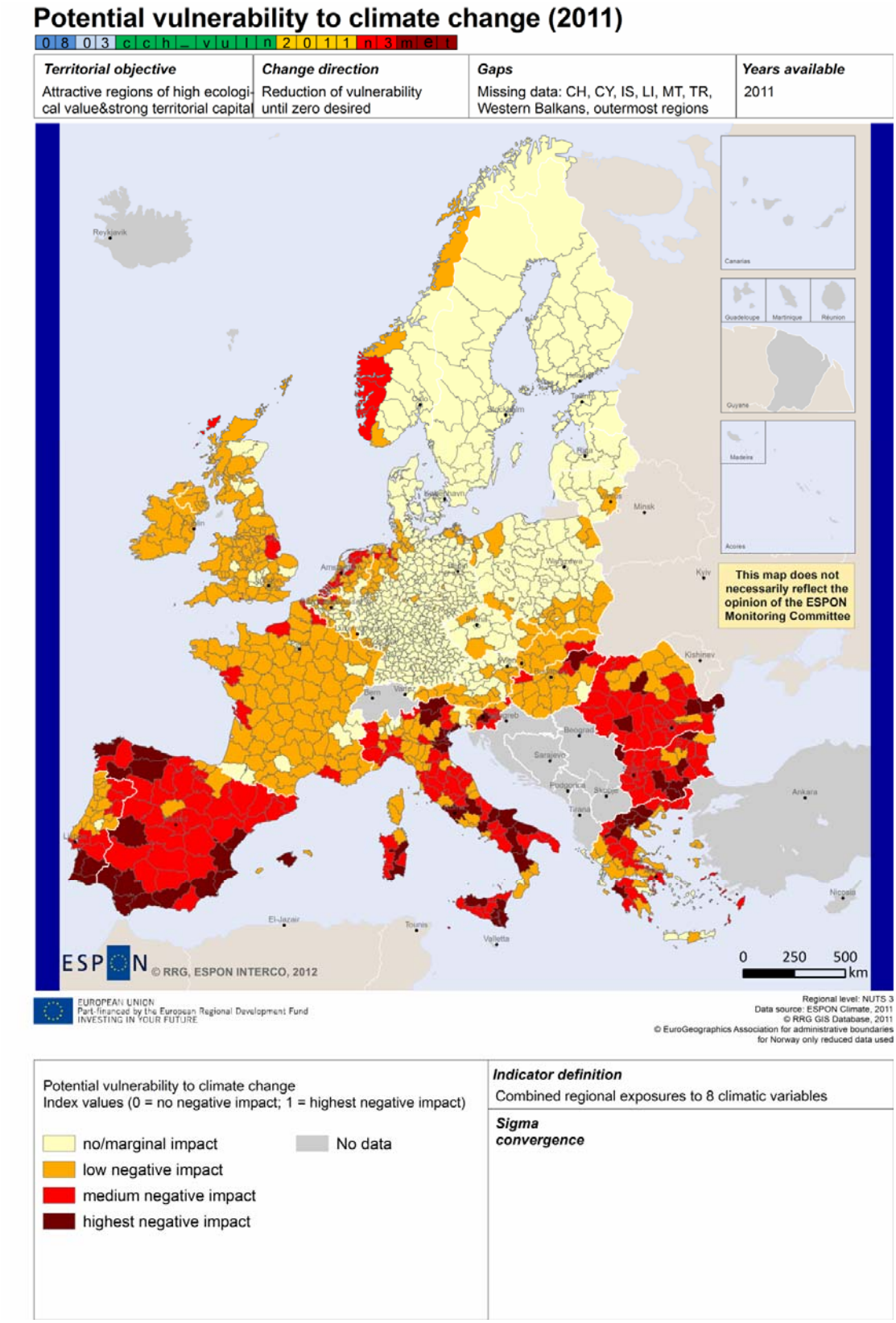


Figure 64. Indicator - potential vulnerability to climate change

Air pollution: PM10

Theme: 0801 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS. Environment quality
Policy relevance: This indicator witnesses global warming and climate change processes. A reduction of greenhouse gas emissions, ozone concentrations, etc. is a political priority. The indicator tries measuring the degree of reductions in emissions for healthier natural living environments.
Desired direction of change: Generally a reduction of the pollutions until zero is desired.
Description: Northern Scandinavia, as well as some few regions in the Alpine arc, in Southern France, Northern Spain and Scotland show very low PM10 concentrations (Figure 65, Figure 66 and Figure 67). All other regions still experience rather high concentrations, not only in the old EU Member States, but in particular also in the new ones, such as regions in Poland, Hungary or Romania (Figure 66, Figure 67). While the map at NUTS level is levelling out some outliers, the grid level map shows very distinct spatial patterns in Europe, where we can see some hot spots of air pollution in agglomerations (for instance, Athens, Madrid, Roma, Brussels) compared to their sorroundings. The highest spatial disparities can be found in Romania (Figure 65), followed by Portugal, France, Italy and Germany. Particular low disparities within countries can be observed for Czech Republic, Denmark, the Baltic states, the Netherlands, Slovenia and Slovakia.

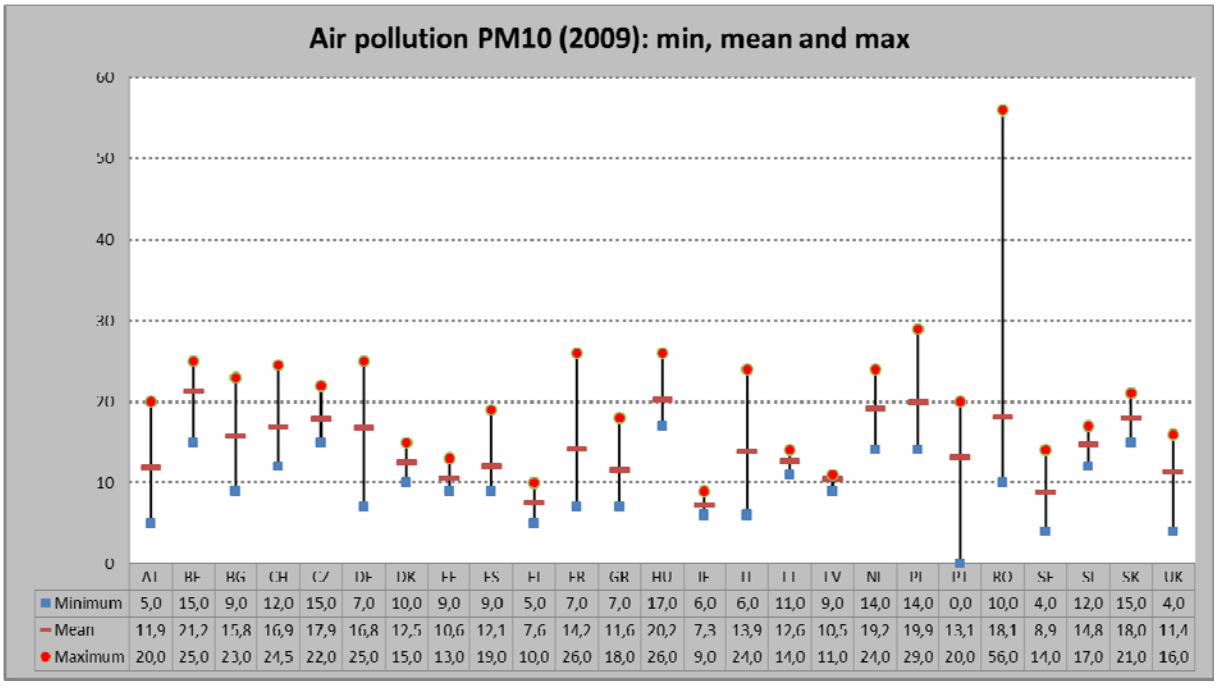


Figure 65. PM10 air pollution – minima, mean and maxima

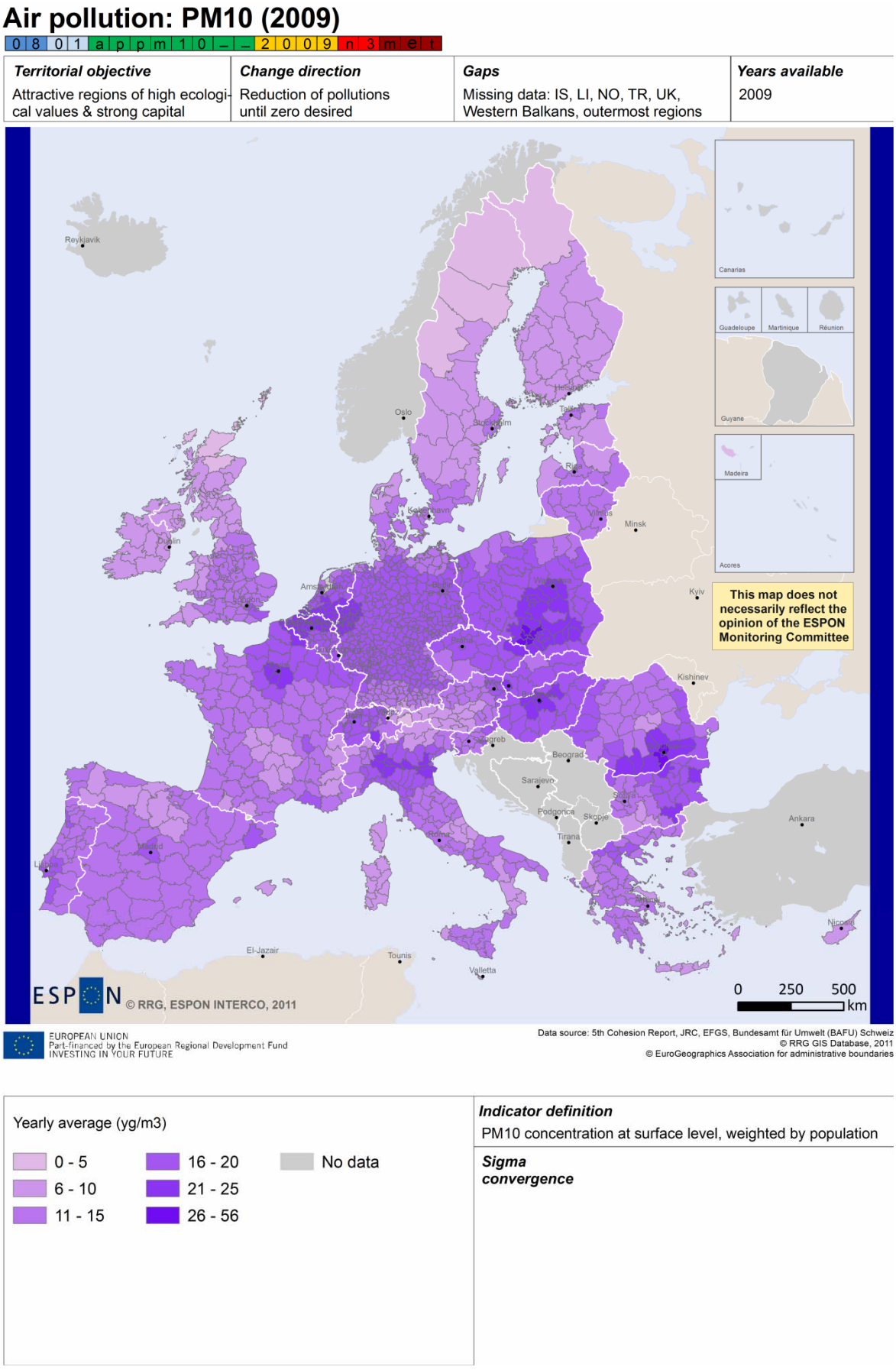


Figure 66. Indicator – PM10 air pollution.

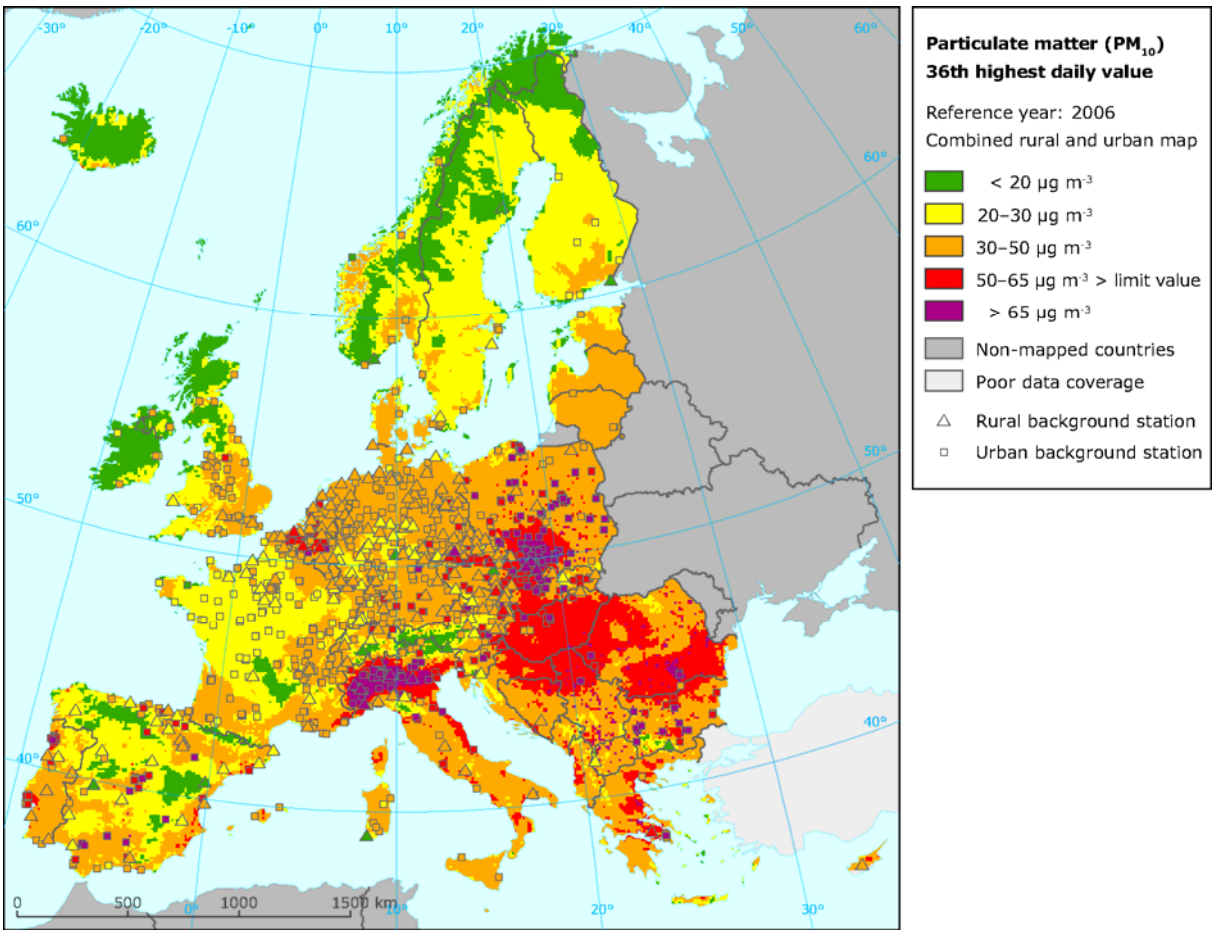


Figure 67. Indicator – PM10 air pollution at grid level (EEA, 2011)

PM10 showing the 36th highest daily values at urban background sites superimposed on rural background concentrations, 2006.

Air pollution: Ozone concentration

Theme:

0801 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS. Environment quality

Policy relevance:

This indicator witnesses global warming and climate change processes. A reduction of greenhouse gas emissions, ozone concentrations, etc. is a political priority. The indicator tries measuring the degree of reductions in emissions for healthier natural living environments.

Desired direction of change:

Generally a reduction of air pollutions until zero is desired, so that the number of days with ozone concentration exceedances decrease.

Description:

For many countries the general number of days with Ozone concentration exceedances with less or equal 5 days is rather low (Figure 68; Scandinavia, Ireland, Spain, Baltic States, Poland); however, there are remarkable exceptions, such as Italy, Bulgaria and Romania and parts of Greece, experiencing highest number of days with concentrations above threshold levels with partly more than 100 days. The latter ones are also the countries with the highest disparities of exceedances within the countries (Figure 70), i.e. there are regions with rather good air quality (such as Western parts of Greece and Romania), but there are in contrary also regions with extremely bad air quality in the same country. At grid level, the general picture at NUTS level is reproduced, but partly even more accentuated (Figure 69). Generally, the maximum daily 8-hour average is higher the farther south a region is located, i.e. regions at Mediterranean Sea suffer most from Ozone concentrations. In contrary, the farther North a region is located the better the air quality is. But there are also exceptions from this general picture: there are also rural and urban background stations indicating local hot spots of Ozone concentrations across Europe, so as there are also local stations along the Mediterranean coast with rather low concentration levels. Altogether, from the EEA grid data, Iceland, Ireland and the UK generally appear as the areas with the best air qulity.

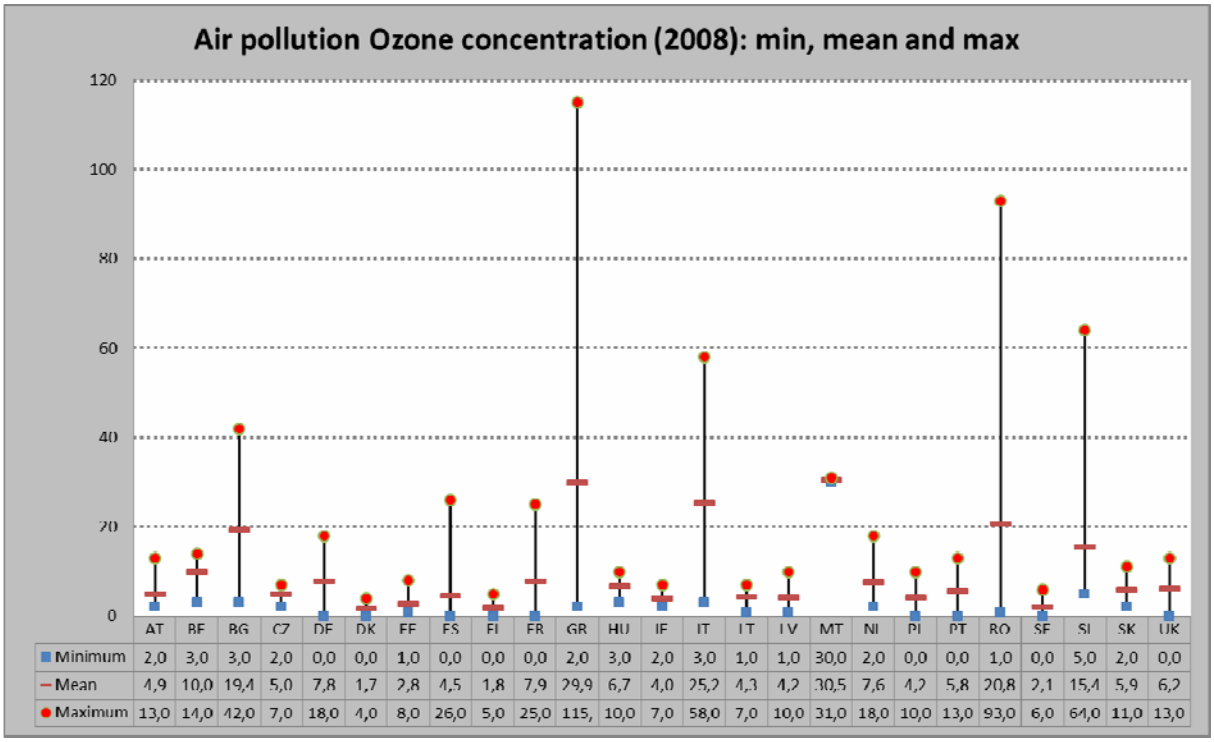


Figure 68. Air pollution: Ozone concentration exceedances – Minima, mean and maxima

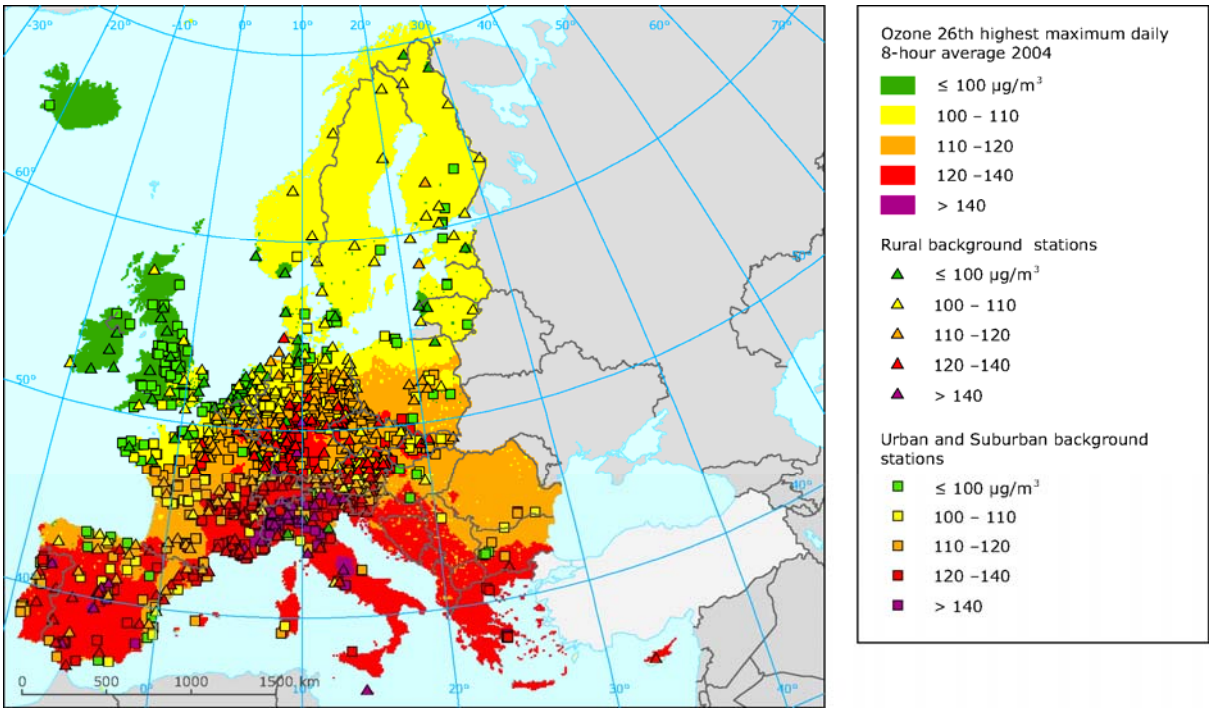


Figure 69. Indicator – Ozone concentration (EEA, 2011). Ozone 26th highest maximum daily 8-hour average 2004.

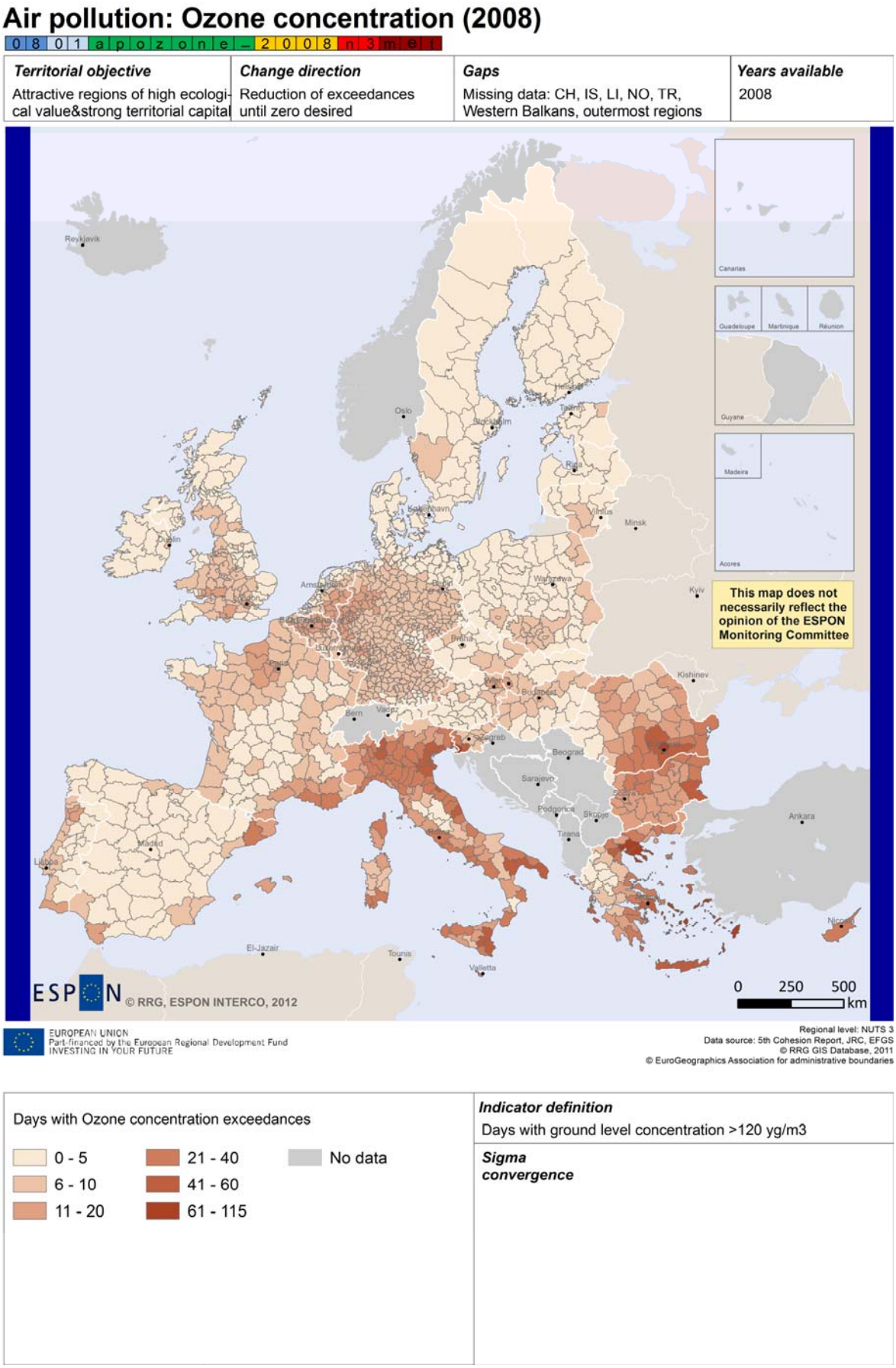


Figure 70. Indicator – Ozone concentration exceedances

Soil sealing per capita

Theme:

0803 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS. Climate change

Policy relevance:

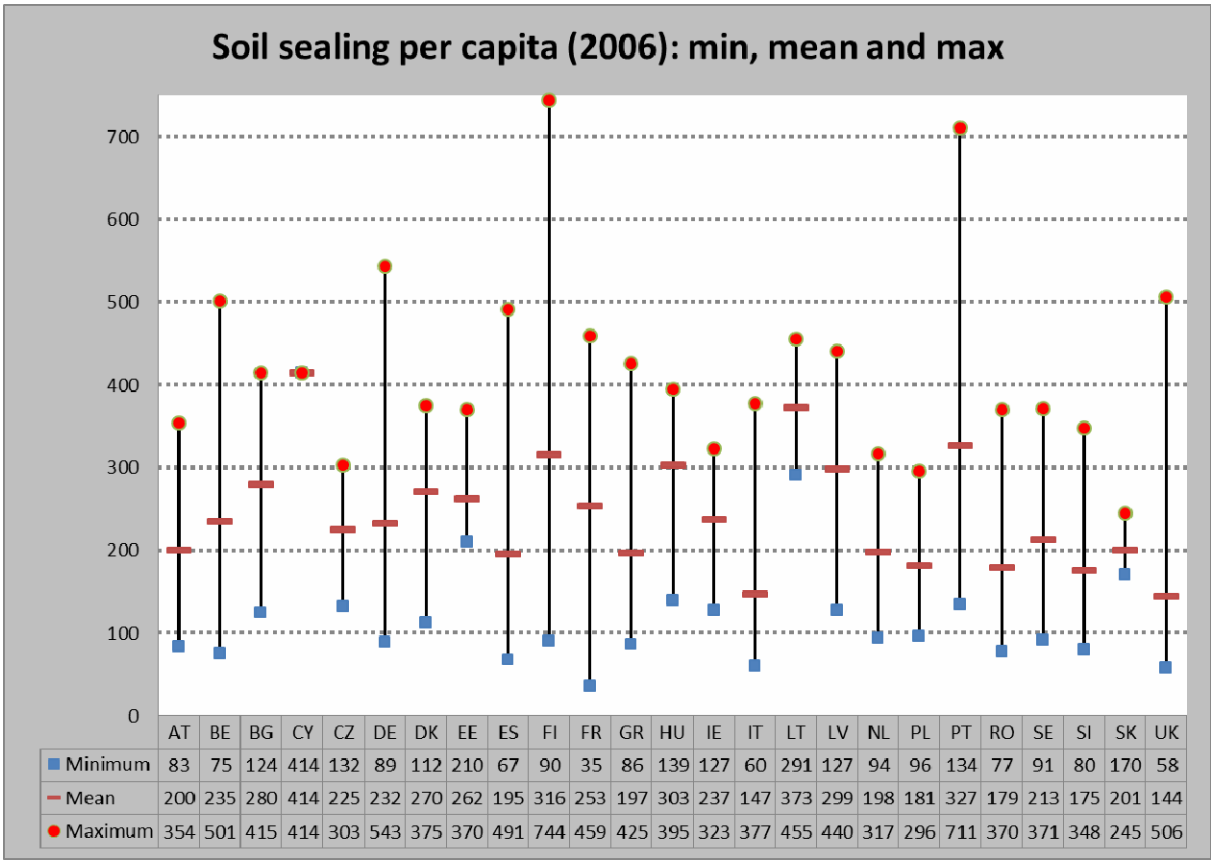
This indicator measures the degree of de-coupling of economic/demographic development and land take. Concentration of constructions (i.e. reduction of land take) prevents from natural hazards and preserve ecological functions and values.

Desired direction of change:

Generally, decrease in soil sealing per capita is desired down to the absolute minimum level.

Description:

Differences in land take per capita are quite significant for all countries leading to a very diverse spatial pattern in Europe (Figure 72). Hot spots of soil sealing per capita are East Germany, Portugal, Western parts of Finland, Cyprus, parts of the Baltic States and some regions in France. On the contrary, soil take in Italy, the UK, Romania, Poland, in large parts of Spain and in West Germany and East Finland is modest. This diverse picture leads to big value ranges between minimum and maximum for each country; while some countries like Italy or the UK are on good track on average towards a reduction of annual soil sealings, other countries like Finland, Portugal, Belgium or Germany face two problems of (i) generally decrease overall soil sealing, and (ii) reduce the big gap between regions taking most land and those taking the least land (Figure 71).



	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LV	NL	PL	PT	RO	SE	SI	SK	UK
Minimum	83	75	124	414	132	89	112	210	67	90	35	86	139	127	60	291	127	94	96	134	77	91	80	170	58
Mean	200	235	280	414	225	232	270	262	195	316	253	197	303	237	147	373	299	198	181	327	179	213	175	201	144
Maximum	354	501	415	414	303	543	375	370	491	744	459	425	395	323	377	455	440	317	296	711	370	371	348	245	506

Figure 71. Soil sealing by country – minima, mean and maximum by country

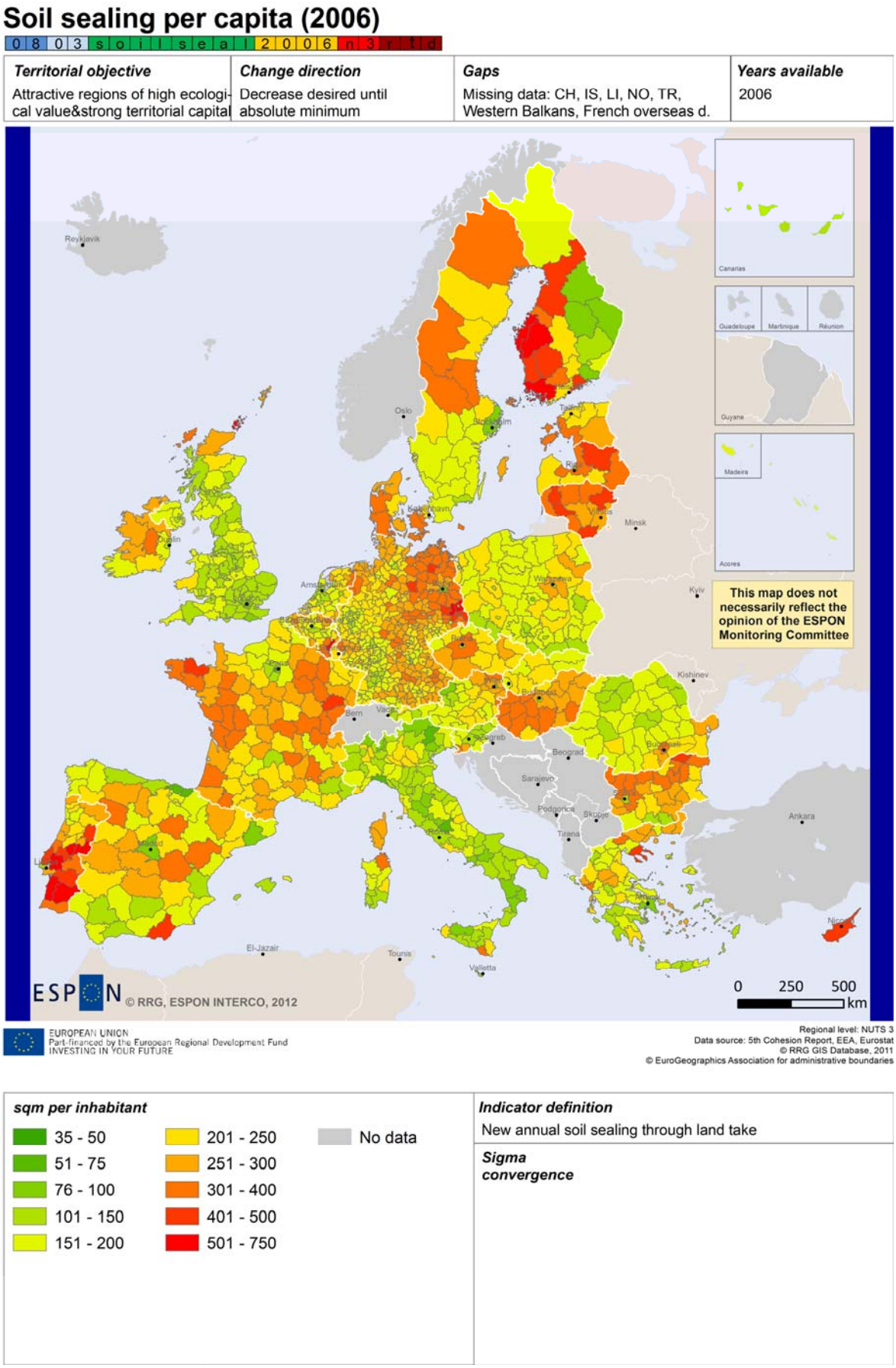


Figure 72. Indicator – Soil sealing per capita.

Summary

What are the territorial disparities of the indicators selected for the territorial objective of attractive regions of high ecological values and strong territorial capital? And how have these indicators developed over the last decade?

The desired thresholds (target values or desired direction of change) for all four indicators can only be reached for a small number of regions. Despite a big gap between Mediterranean countries, west European countries and the rest of Europe concerning the potential vulnerability to climate change, many regions are likely to experience significant impacts. As for PM10 pollution, many regions in Europe still have rather high concentrations, even though differences within a country are rather low, contrary to the previous indicator. In case of Ozone concentration the analysis reveals that the number of days with concentration exceedances is quite low for most of European regions, with some remarkable exceptions, reflecting measures implemented over the last decade for improving the air quality; however, some countries like Italy, Romania or Bulgaria still have to improve their air quality levels. Soil sealing illustrates the most heterogeneous picture in Europe, with regions experiencing extremely high land take, and other regions with very modest land take rates per capita. Territorial disparities are extremely high within the countries, as well as between them.

So from a territorial cohesion perspective, the indicator on Ozone concentration already presents the smallest spatial disparities, followed by PM10, while soil sealing still yield very high disparities.

Unfortunately, time series data are not available until today for none of the four indicators presented, so no assessment can be given on the development trends of these indicators over recent years. From an environmental point of view it would nonetheless be important to keep track of these indicators over time, so it is recommended to collect such datasets regularly over time periods allowing assessing the development trends.

Territorial objective 6. Integrated polycentric territorial development

"*Polycentric and balanced territorial development of the EU is key element of achieving territorial cohesion*". Taking up the main priority of ESDP, TA 2020 promotes a polycentric pattern at macro-regional, cross-border, national and regional level that should reduce the strong territorial polarisation. The aim is to encourage competitiveness and attractiveness outside the Pentagon area thanks to extended networks between centers of different scales. Concentration and connection are the main challenges of polycentrism, as on one hand they help achieving a critical mass and allow surrounding areas to benefit from agglomeration effects, and on the other hand they may have negative externalities, especially in larges cities. As already underlined by the Green Paper, cooperation between territories is an important factor to tackle these issues and for having a real integrated territorial development. This implies not only well connected centers of different weights but also to have coordinated strategies and to overcome divisions due to borders, moreover in transnational functional areas.

Four indicators are proposed as territorial cohesion indicators under this objective:

- Population potential within 50 km
- Net migration rate
- Cooperation intensity in INTERREG program period 2000-2006
- Cooperation degree in INTERREG program period 2000-2006

These indicators are dedicated to measure basic territorial market potentials and territorial structures (population potential within 50 km), attractiveness of a region for in-migration and to keep population (net migration rate), and the degree of collaborations with partner regions (cooperation intensity and cooperation degree).

The indicator "Population potential within 50 km" is defined as the number of people within reach of 50 km airline distance for a system of 2.5 x 2.5 km raster grid cells. For each cell the reachable population was calculated. This potential indicates the "daily life" type of service provision that requires certain minimum potential within reasonable distance or travel time, if the origin becomes a center for private or public service provision. This indicator, at grid level, furthermore illustrates territorial structures with city centres or agglomerations appearing as 'peaks' or 'plateaus', and rural or remote areas appearing as 'basins'. This indicator was first developed in the EU Parliament Cohesion Study (Dubois, 2007) at raster level. Within INTERCO, the results were aggregated to NUTS2/3 level. In order to highlight regions that are above or below the European average, the indicator has furthermore been standardised at the EU27 average.

The two indicators on cooperation intensity and cooperation degree have been developed by the ESPON TERCO project. They indicate the cooperation intensity and cooperation degree of regions in INTERREG IIIc projects for the program period

2000-2006. Due to a lack of time series data, analyses of sigma and beta convergences could not be performed so far for none of the indicators under this objective.

Population potential within 50 km

Theme:

1002 TERRITORIAL STRUCTURE. Regional/territorial structure

Policy relevance:

This indicator is a proxy for the demand for provision of (public) services, for market potential and for polycentricity. A polycentric pattern with balanced concentration is essential for territorial cohesion.

Desired direction of change:

A minimum level of potential should be secured. Regions with less than 50% of European average should catch up faster.

Description:

The indicator highlights the strong population potential that lies in the most urbanised parts of Europe (Figure 74): Benelux countries, Western Germany, Southern England and Northern Italy. But more importantly, the map also highlights that territories in the new Member States, but also in other 'peripheral' parts of the Iberian Peninsula and of Scandinavia, often enjoy high population potentials. By this the importance of regional centers in Poland, Czech Republic, Hungary, Rumania or Spain becomes apparent. On the other hand, the map also shows large areas with below-average potentials, not only in Norway, Cyprus and Greece, but also in geographically more central areas in France, Spain, Austria and other parts of Europe.

Disparities at grid level within the countries are significant, not only for usual subjects like Germany, France, Italy or UK, but also for countries like Netherlands, Spain, Belgium, or Poland (Figure 73).

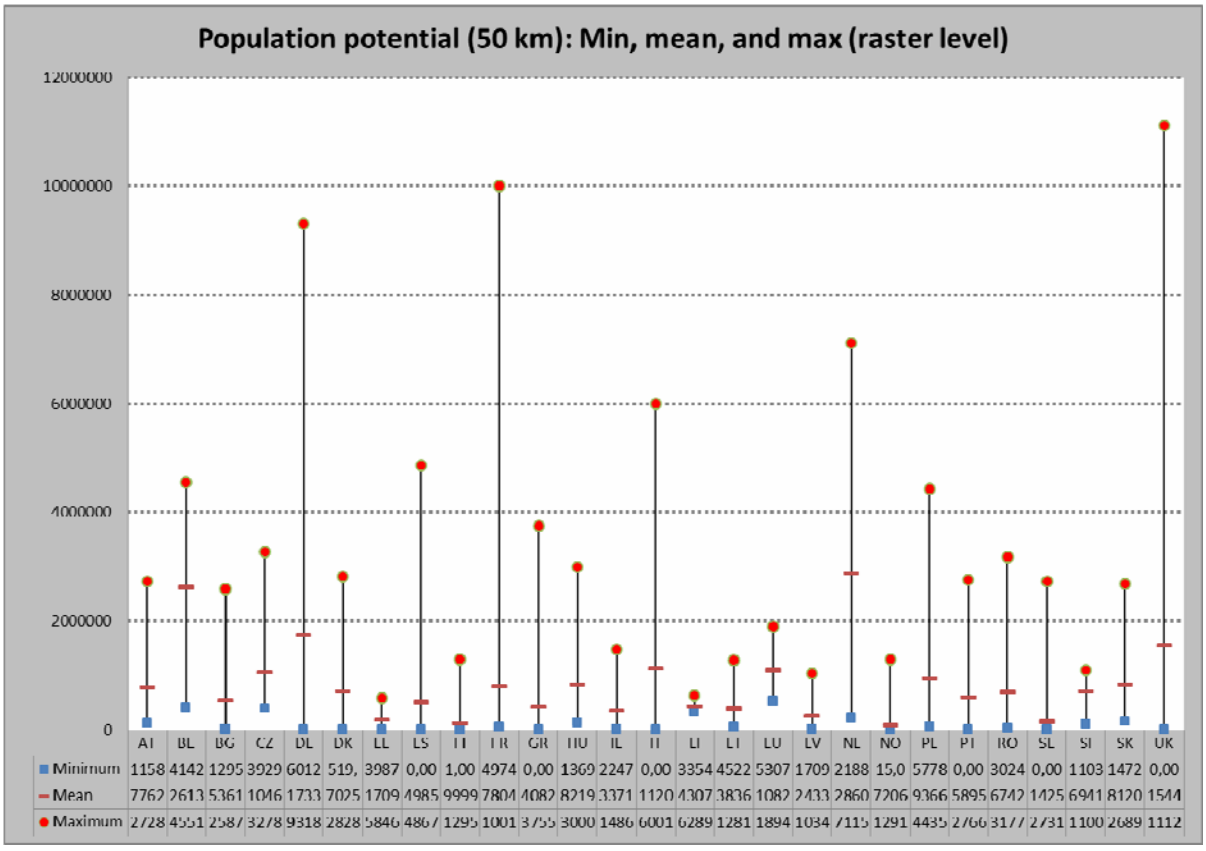


Figure 73. Population potential within 50 km – minimum, mean and maximum.

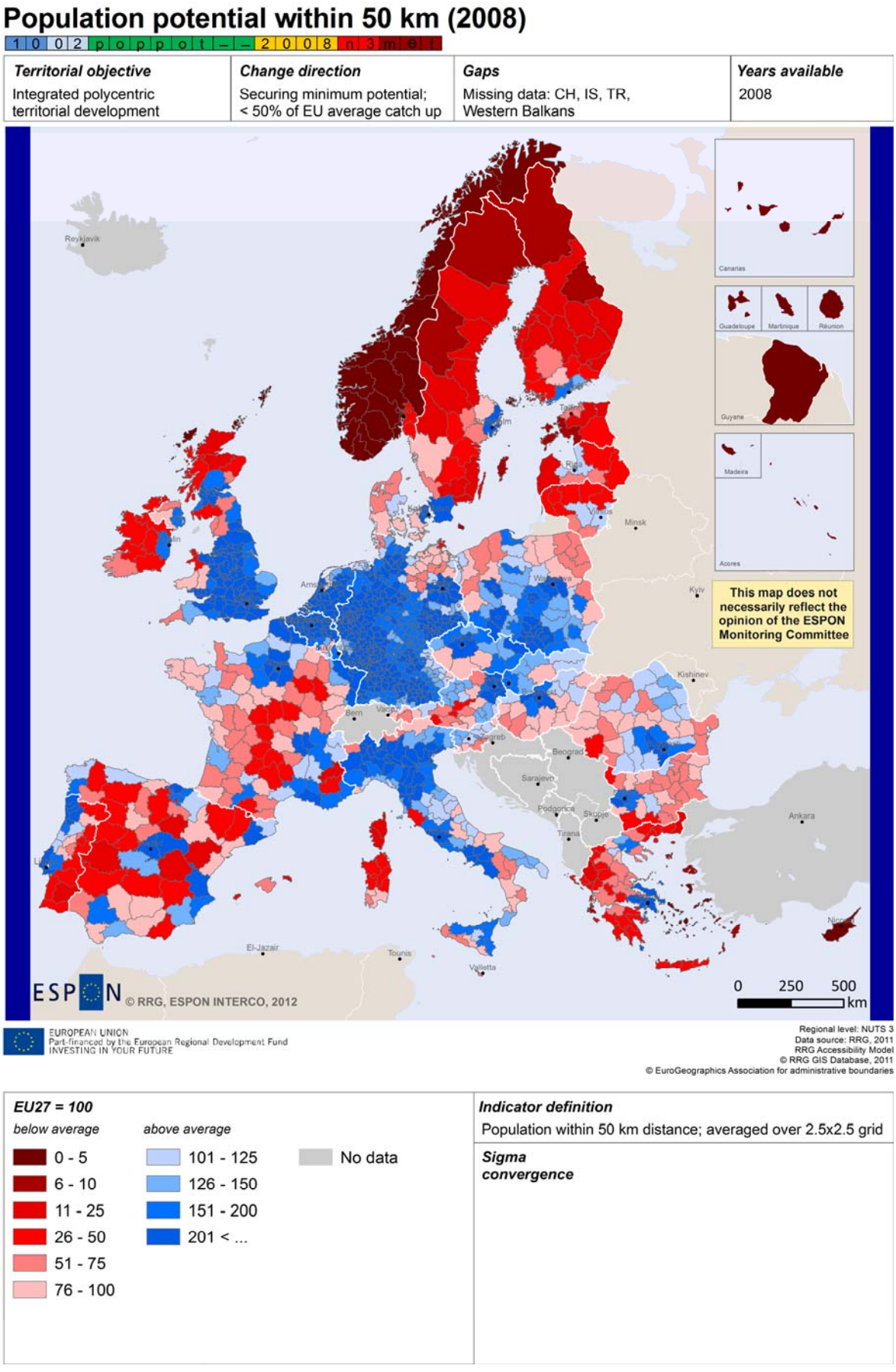


Figure 74. Indicator –Population potential within 50 km

Net migration rate

Theme: 0202 DEMOGRAPHY. Migration
Policy relevance: This indicator is considered as a proxy for the overall attractiveness of a region in terms of labour markets, education, quality of life, welfare, etc. It contributes to measure trends of concentration within European territory.
Desired direction of change: Indicator should be positive, in particular in relation with negative population development and overaging.
Description: Spatial patterns of net migration rates reveal that in the new EU Member States most regions loose population except for the capital regions and other selected agglomerations, just as Northern Scandinavia, East Germany and Northern France do in losing population; in contrary, most regions along the Mediterranean Sea attract population. Except for Belgium, there is no single country that has only positive or only negative migration rates, i.e. all countries have regions who lose population, as well as regions who gain. Greatest disparities can be found for Spain, Bulgaria, Netherlands and the UK. Otherwise disparities for most countries are in a range of 25 percentage points.

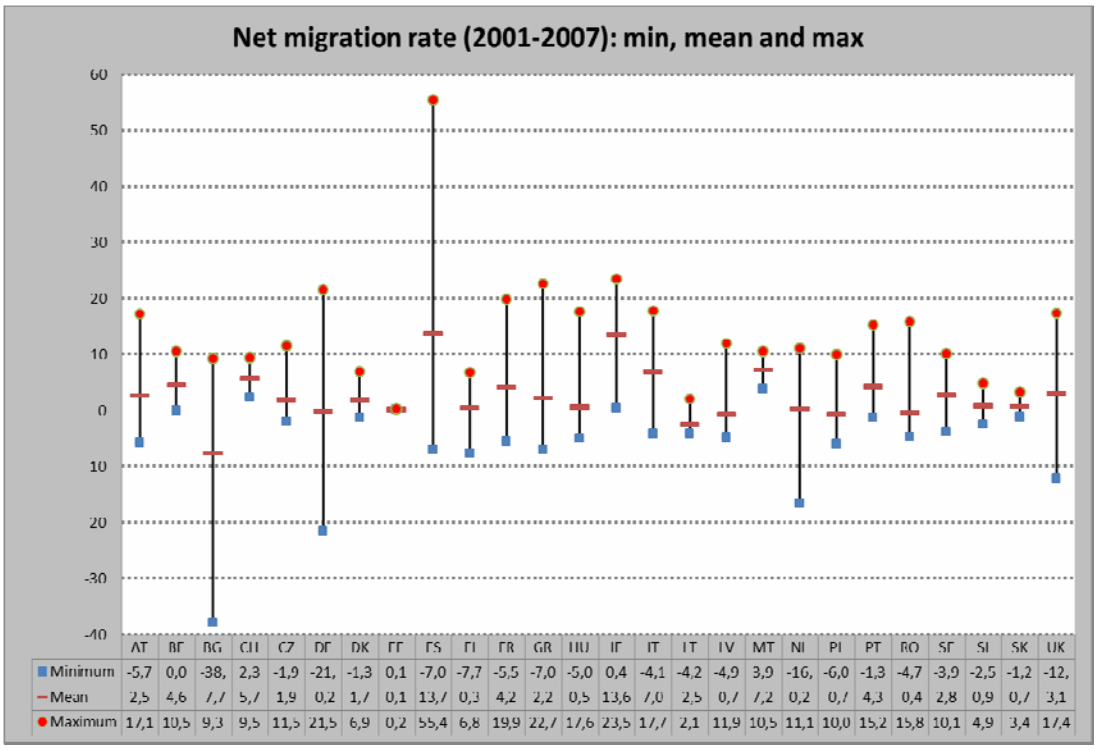


Figure 75. Net migration rates by country – minimum, mean and maximum

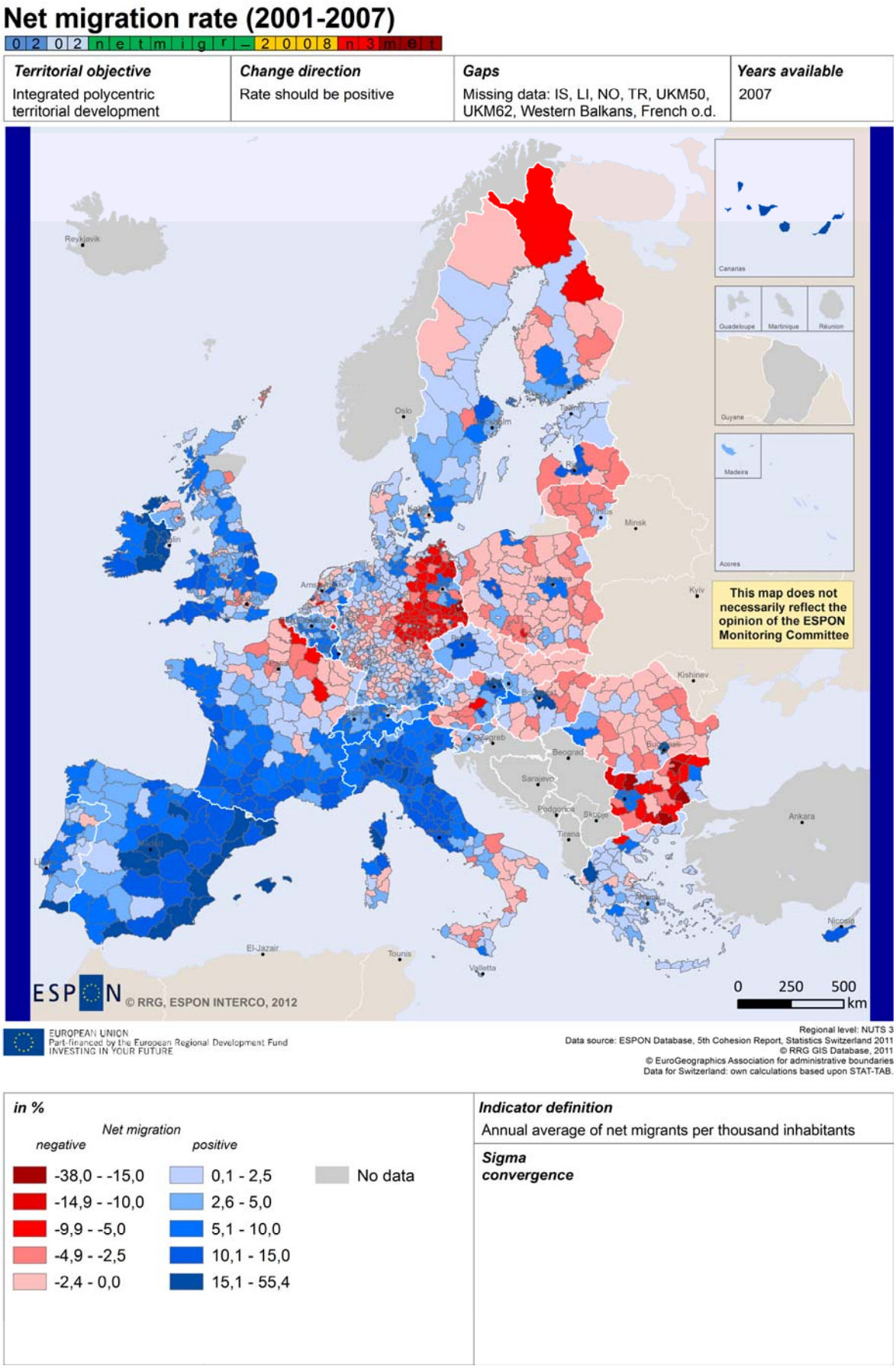


Figure 76. Indicator – Net migration rate

Cooperation intensity

Theme: 0901 GOVERNANCE. Governance
Policy relevance: This indicator measures the intensity each region is cooperating in terms of number of INTERREG IIIC projects in the program period 2000-2006. Cooperation and coordination on the basis of such projects can reinforce territorial integration.
Desired direction of change: Each region should have a minimum level of cooperation; regions with no or with extremely low cooperation intensity should increase their efforts in such projects.
Description: Generally the number of INTERREG IIIC projects per inhabitants is higher the smaller the population of a region is, i.e. regions in Sweden, Finland, the Baltic States, Austria, Slovenia, Greece, and Italy show the highest cooperation intensity, while regions in Western Germany, France, Poland, Romania or UK have only little intensities (Figure 78). In absolute terms (Figure 77), the cooperation intensity is varying to a high degree for all countries. In all countries except for Ireland and Slovenia, there are regions with almost null cooperations (one or two projects only), whereas on the other end of the spectrum there are also regions with high intensities of fourty or more projects (Belgium, Germany, Spain, finland, France, Greece, Hungary, Italy, Slovenia). So the disparities within the countries are quite remarkable, and are usually greater than the disparities between countries.

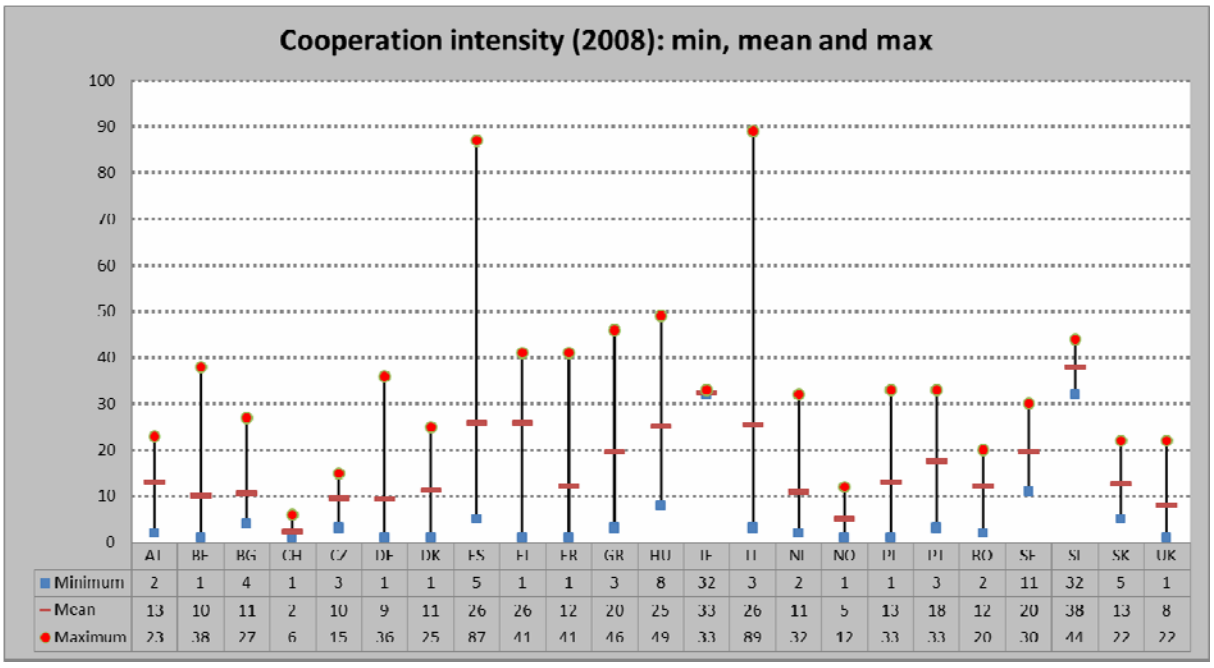


Figure 77. Cooperation intensity by country – minimum, mean and maximum

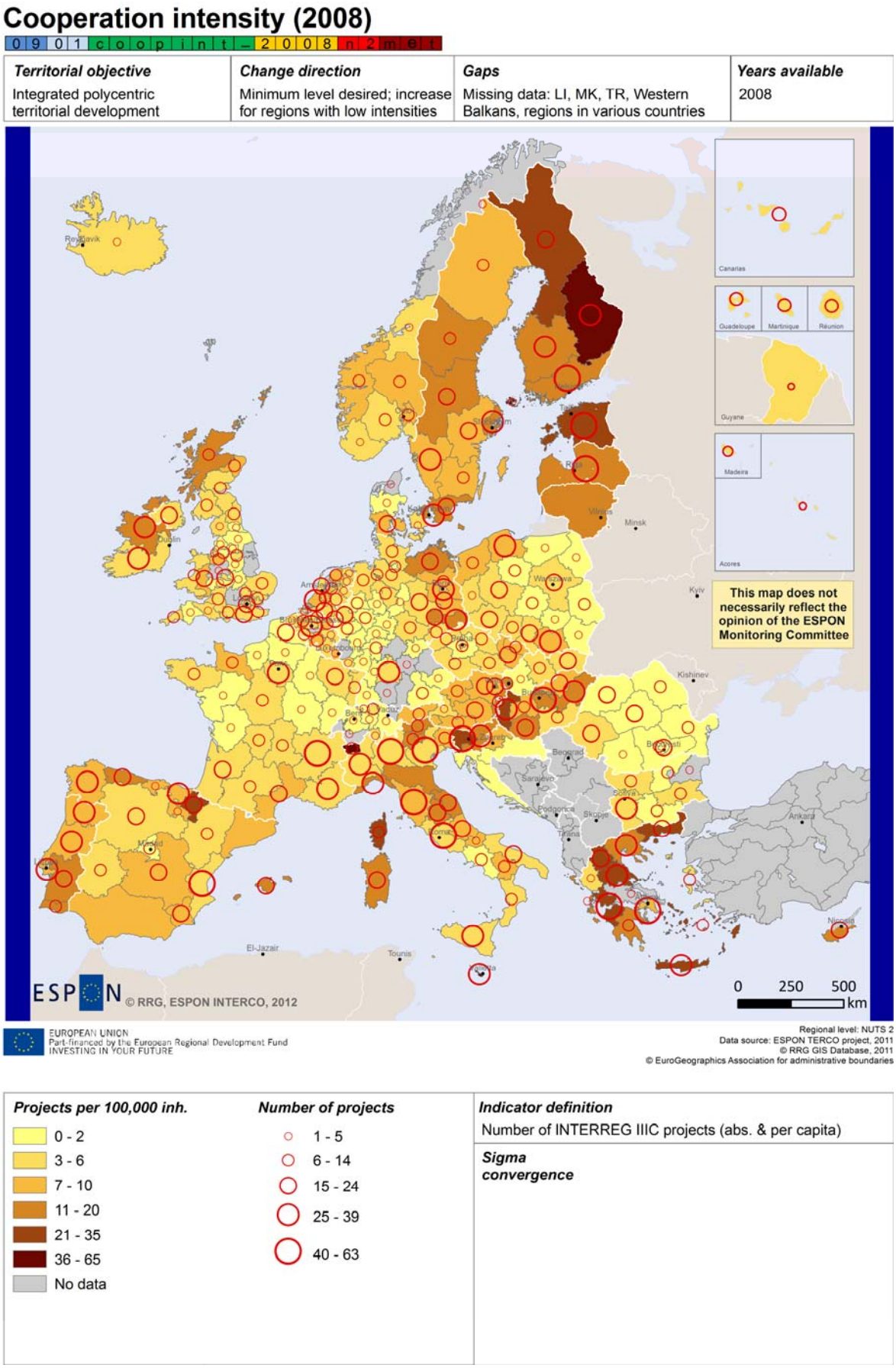


Figure 78. Indicator – Cooperation intensity (ESPON TERCO)

Cooperation degree

Theme: 0901 GOVERNANCE. Governance
Policy relevance: This indicator measures the degree of cooperation between partner regions in INTERREG IIIC projects for the program period 2000-2006. Cooperation and coordination on the basis of such INTERREG IIIC projects can reinforce territorial integration.
Desired direction of change: Each region should have a minimum level of cooperations; regions with no or with extremely low cooperation intensity should increase their efforts in such projects.
Description: The number of collaborating regions in INTERREG IIIC projects is quite different, ranging from mere 3 to 188 at maximum. While the general spatial patterns is quite heterogeneous, there is an arc of regions with highest cooperation degree ranging from Finland, the Baltic States, Poland/Slovakia/Hungary, Northern Italy, Southern France to Spain. Regions in France, Western Germany, the Benelux countries and the UK have only small numbers of collaborating regions. Interestingly, the highest number of collaborating regions yield regions in Lithuania; Italy, Spain, Latvia and Malta (Figure 79). But there are also regions in almost all countries who have less than ten collaborating regions, some of them have even no collaborating partner region. Thus, the cooperation degree varies significantly within the countries, rather than betweem them.

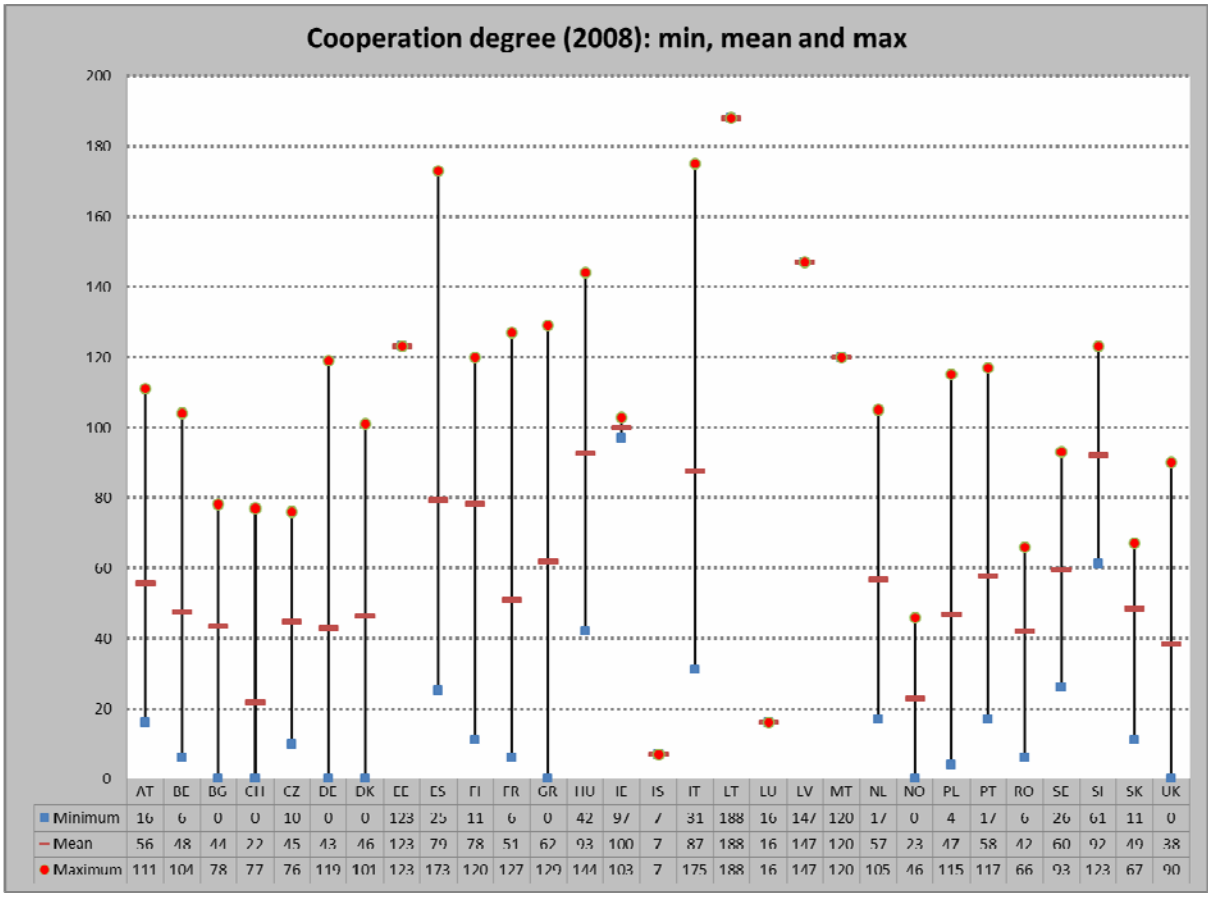


Figure 79. Cooperation degree by country – minimum, mean and maximum.

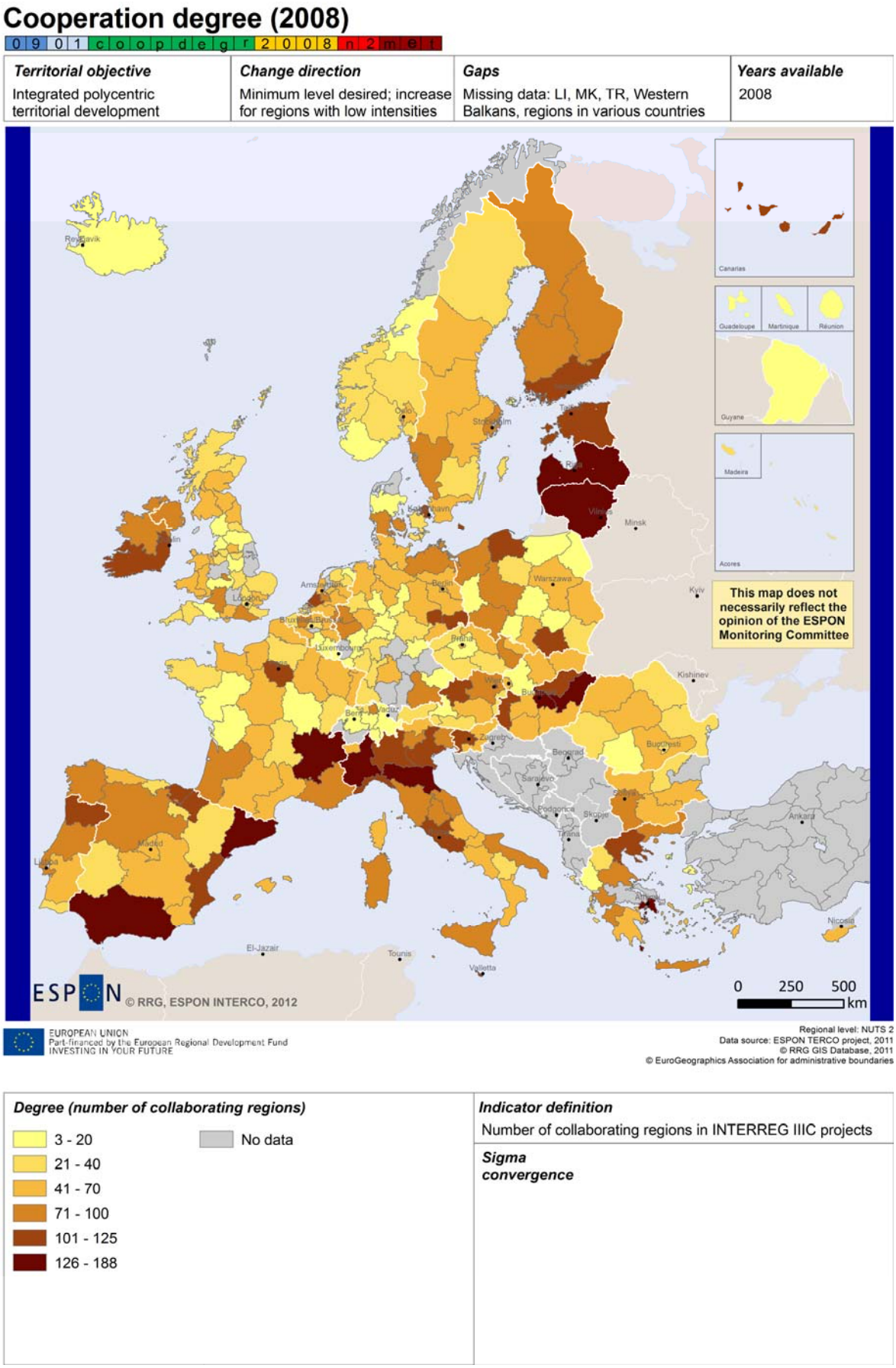


Figure 80. Indicator – Cooperation degree (ESPON TERCO)

Summary

What are the territorial disparities of the indicators selected for the territorial objective of integrated polycentric territorial development?

The indicator population potential clearly highlights the main dichotomy between the European core area (‘blue banana’) and the peripheral ones. In areas outside the European core area only selected urban regions show above-average population potentials, while the other regions perform significantly below European average. A change in these patterns is unlikely to occur in the short run, even though some of the peripheral regions, such as regions in Spain, Greece or Ireland, experienced considerable population gains through migration processes. But since the main economic centers in Europe also experiences positive net migrations, it is rather unlikely that areas outside the blue banana significantly catch up. Nevertheless, the net migration patterns again highlight the tremendous negative population trends in the new Member States, in the Nordic countries, in Eastern Germany and Northern France, which need to be paid attention by policy makers.

Smaller countries like the Baltic States, Slovakia, or Slovenia already engaged over proportionally in international cooperation projects – by that trying to gain (or at least keep) knowledge in the countries as an instrument counteracting even further negative demographic trends.

Further ideas for analyses

The INTERCO TC top indicators allow us to better approach actual weaknesses (and strengths) of European territories in relation to the TA 2020 policy priorities and Europe 2020 priorities and targets.

From this scope, we present in next some examples of potential exploitations of INTERCO top indicators which are relatively easy to understand and to be used by regional and local level stakeholders. These ideas are not included in the previous sections of the report dealing with the more usual exploitation of indicators.

The following "further ideas" attempt mainly take into account more deeply either the type of territories or the "autocorrelation" (spatial interaction) of territories.

(1) Interrelating the different aspects of TC through indicators

As it has been demonstrated previously, TC is a multidimensional concept and should be approached as such in both territorial analysis and territorial policy definition. From this scope, it is very important to study the interrelations among different issues of TC using appropriate indicators. For instance, it is very useful to see if comparatively high rates for specific regions for the tertiary educated people (TED), which are supposed to be reflecting a human potential of high quality, correspond or not to law rates of unemployment in the same regions.

We present in next this specific example. Evidently, many other interesting interrelations could be explored through appropriate indicators.

In order to compare correctly the unemployment rates to the TED rates per region, we had to build appropriate clusters of values for the two indicators corresponding to different types of regions. We started by normalising the values of the indicators by taking into account the population of the regions and putting the values in a common scale 0 to 1. As in the case of the unemployment a low rate has a positive meaning, we have calculated the differences of the respective values from 1 (see for this kind of normalisation for the case of unemployment in: Grasland, Hamez 2005).

In a second step, we built clusters of the values of unemployment rates (same for the TED rates), using the K-means statistics. We have specifically divided the unemployment rate's normalised values in three clusters. Evidently, we could create more clusters (for instance: 5 or 6). We have proceeded in such tests. However, as one should define a compromise among the distinction degree of the analysis (number of clusters) and the clarity of the result, we have decided to present here a Figure of the analysis using 3 clusters of unemployment rates (low, medium and high) and 3 clusters of TED rates (low, medium and high).

The method to build clusters of a range of values using K-means presents some advantages in comparison with simpler classifications of values by "manually" selected breaks (i.e. 0 / 0,33 / 0,66 / 1) or by "natural" breaks. The K-means method creates, where possible and after a number of iterations, compact clusters, as it

ensures the minimization of the distance of each member of the cluster from the centroid of the cluster[1].

Next, we compared the 3 x 3 clusters and produced nine types (clusters) of regions: with high TED-low unemployment, high TED-medium unemployment, and so on (see in the Figure 81). In general lines, regions with high TED are situated in the European (ESPON space) north and west while regions with low TED are located in south and east. Evidently, there are notable exceptions, e.g. the northern Spain and the capital regions of a great number of southern and eastern countries with high TED. The territorial division of the ESPON space as for the unemployment rate has already been presented in previous sections of the Report. It differs considerably from the division regarding TED.

The synthesis of the two, which is shown in the Figure 81, enables us to compare the performance of the regions as for the TED in relation to their performance as for the unemployment. As a high TED is supposed to be related with a highly qualitative human capital and thus to low unemployment[2], it is "expected" that a region with high TED has low unemployment, whereas it is expected that a region with low TED has high unemployment and, finally, it is expected that a region with medium TED has medium unemployment. From this scope, the Figure enables us to distinguish the regions with high TED-low unemployment ("good performance" for the two indicators, the performance as for the unemployment being "expected" from the performance as for the TED) e.g. south-eastern UK, western Norway, Brussels and Amsterdam regions but also Warsaw and Sofia regions, from those of high TED-high unemployment ("bad performance" for unemployment, the performance as for the latter being "not expected" from the performance as for the TED) such as northern Spain and Eastern Finland. Many other interesting contrasts could be detected regarding for instance the regions with low TED-high unemployment ("bad performance" for the two indicators, the performance as for the unemployment being "expected" from the performance as for the TED) which are more often found in south and east regions contrasting with regions presenting low TED and low unemployment ("good performance" for unemployment, the performance as for the latter being "not expected" from the performance as for the TED), e.g. northern Italy and northern Romania.

In a final step, we have compared the three clusters of unemployment rates with the three clusters of TED rates in order to better detect which regions present an unemployment rate higher than that "expected" from their TED rate –Figure 82. This Figure is similar to the previous one because the same clusters are used; it differs from the previous one only as for the way of presenting the phenomenon studied. However, it shows more clearly the regions presenting unemployment rate much

[1] We have used, in this example, the K-means classification method of SPSS.

[2] It is usually supposed that a highly qualitative human capital contributes to the increase of GDP and it is also usually supposed that a high GDP is related to low unemployment rate. Evidently, all these are general hypotheses to be checked by the comparison of the two respective indicators per region.

higher than that expected from their TED rate. Thus, a clearer association of territories to a TC objective emerges: the human capital of these regions could be better used to decrease the high unemployment; this territorial observation could be an interesting space-based input for the implementation of the "human capital" policies at both the EU and national levels. Such regions are situated in South e.g. Spain and Southern France but also in Ireland, East Germany (EU "North"), the Baltic States and Finland –to note only some evident cases.

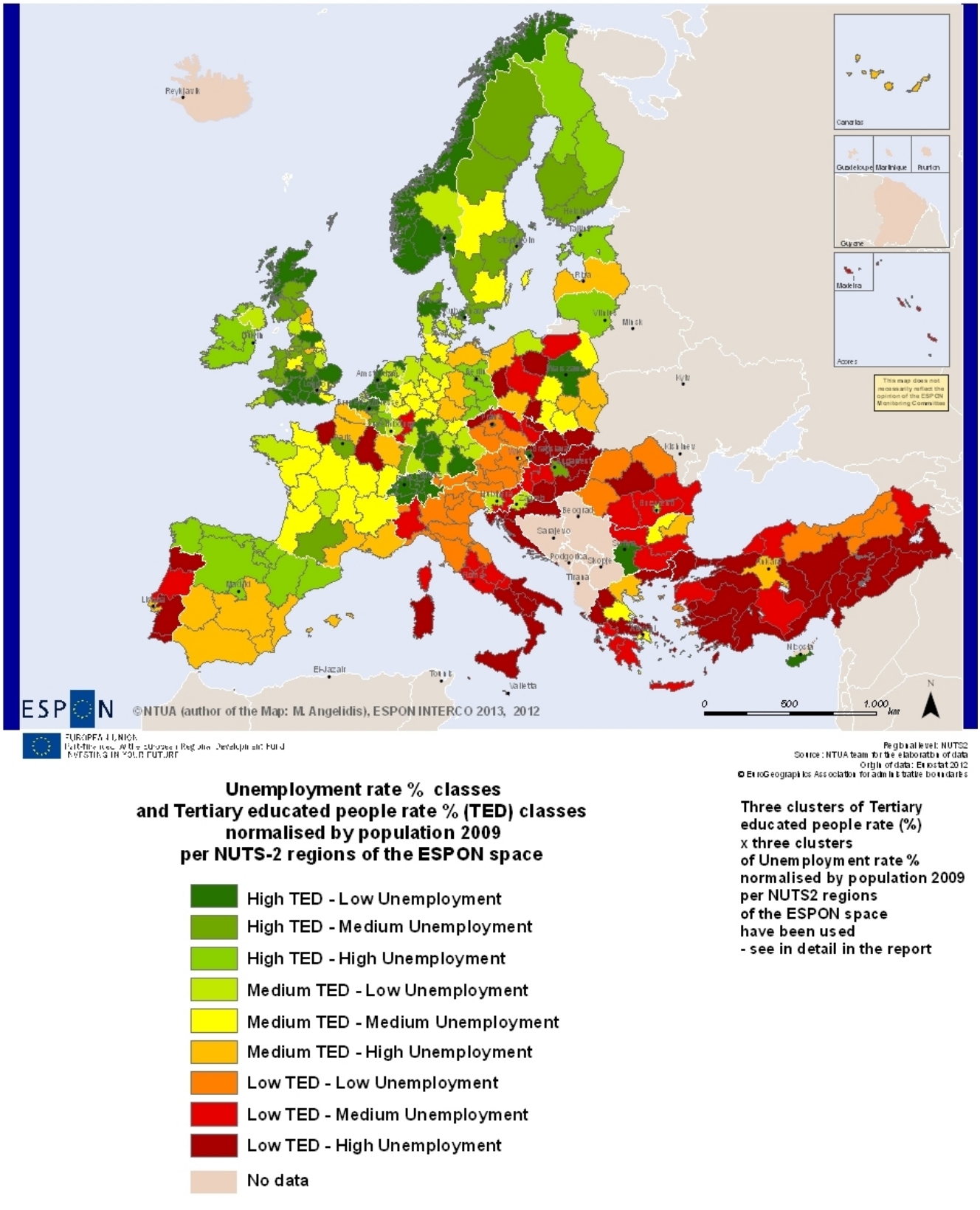


Figure 81. Typology of Unemployment and Tertiary educated people (TED) rates per NUTS 2 regions of the ESPON space 2009

Source of the data: Eurostat 2012, Elaboration of the data: NTUA team

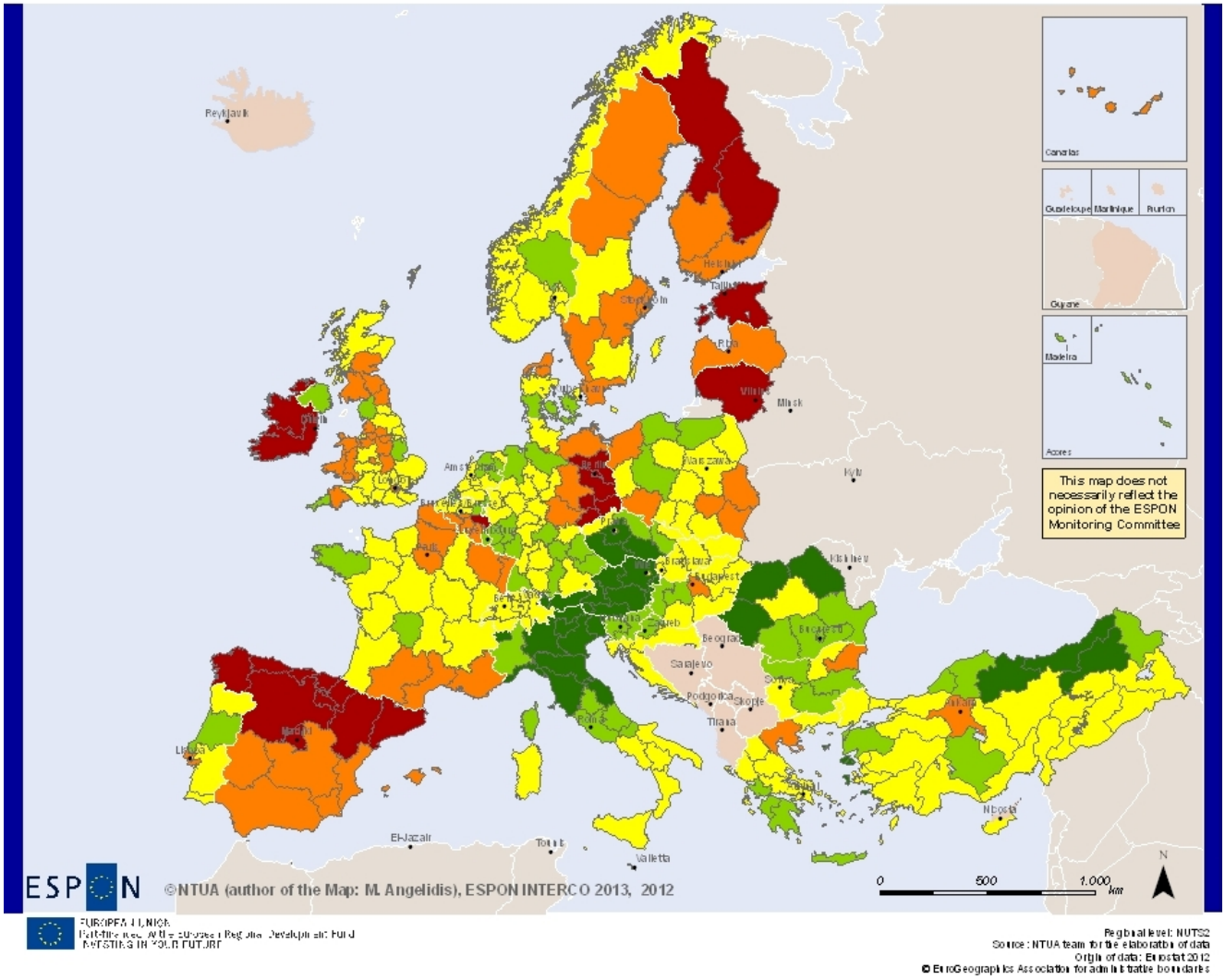


Figure 82. Difference of the Unemployment rates from that "expected" from the Tertiary educated people (TED) rates per NUTS 2 regions of the ESPON space 2009

Source of the data: Eurostat 2012, Elaboration of the data: NTUA team

(2) Going from the GDP to the well-being territorial indicators

As it is argued in INTERCO (on the basis of the most recent literature), well-being is better placed to express cohesion than GDP. Further on, well-being (and the respective indicators) is more "territorial" than GDP, as it is more embedded to the territories where the every-day life of citizens is deployed. Therefore, **GDP could be used as a kind of "wild card"** to be compared with indicators which better express well-being.

A second important reason is that GDP is very often used so far in Cohesion policy[3]. For instance, we could compare the regional distribution of GDP with that of unemployment. We can thus see which territories have higher unemployment rate than expected taking into account the spatial distribution of GDP. Therefore we could have a first configuration of the territories to which a more active policy of decrease of unemployment (creation of jobs) should be implemented.

We note that a first very interesting work on crossing GDP with unemployment has been done in Grasland, Hamez 2005. Recently (in September 2011) ESPON CU has made public in the ESPON website a similar map: "European Regions 2010: Economic Welfare and Unemployment". In the example that we present in the following we use a similar method. Our goal here is to present and comment in detail the method used and the potential use of the "crossing" for the integration of territorial cohesion objectives in EU and national/regional level policies.

Here we could first create typologies of EU regions for specific INTERCO indicators with cluster analysis and then compare the spatial distribution of each of these indicators with GDP. It is more appropriate to use for these statistical analyses data normalized by the population of the respective regions. As an example of the use of this kind of analysis we present in next the case of the indicator of unemployment rate 2007 (in %) in comparison with the GDP 2007 per NUTS 2 regions, both normalised by population. We present, specifically, an analysis using three clusters of unemployment rate: high, medium, low, in comparison with three clusters of GDP (normalised by population): high, medium, low.

The Figure 83 presents a simple crossing of the 3 unemployment classes with the 3 GDP classes. It is evident that there is an important number of NUTS 2 regions which have high unemployment rate while their GDP is high or medium. Inversely, there are numerous regions which have low unemployment rate while their GDP is low.

These differences, which are very important for the design of the territorial dimension of the Cohesion policy, are more clearly presented in the Figure 84 showing the difference between the unemployment rate observed and the unemployment rate *"expected" from the GDP rate* (of the respective regions)[4]. The above three x three clusters have been used.

It appears that a considerable number of regions belong to a much higher unemployment class than "expected" from the GDP class (of the same regions).

[3] See, among others, for this kind of reasoning in: Grasland, Hamez 2005.

[4] Both unemployment rate and GDP are normalised by population 2007 and refer to the NUTS 2 regions of the ESPON space.

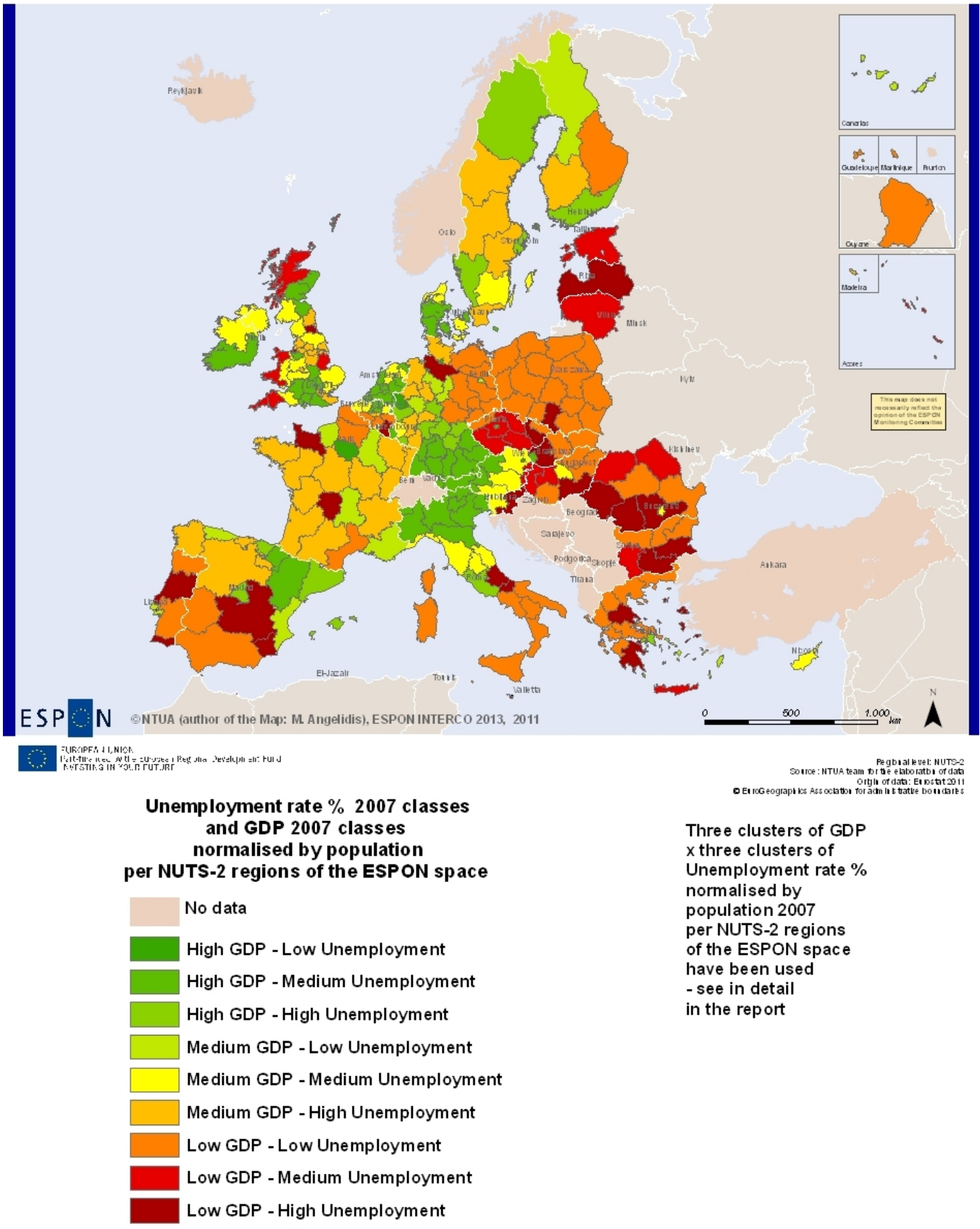
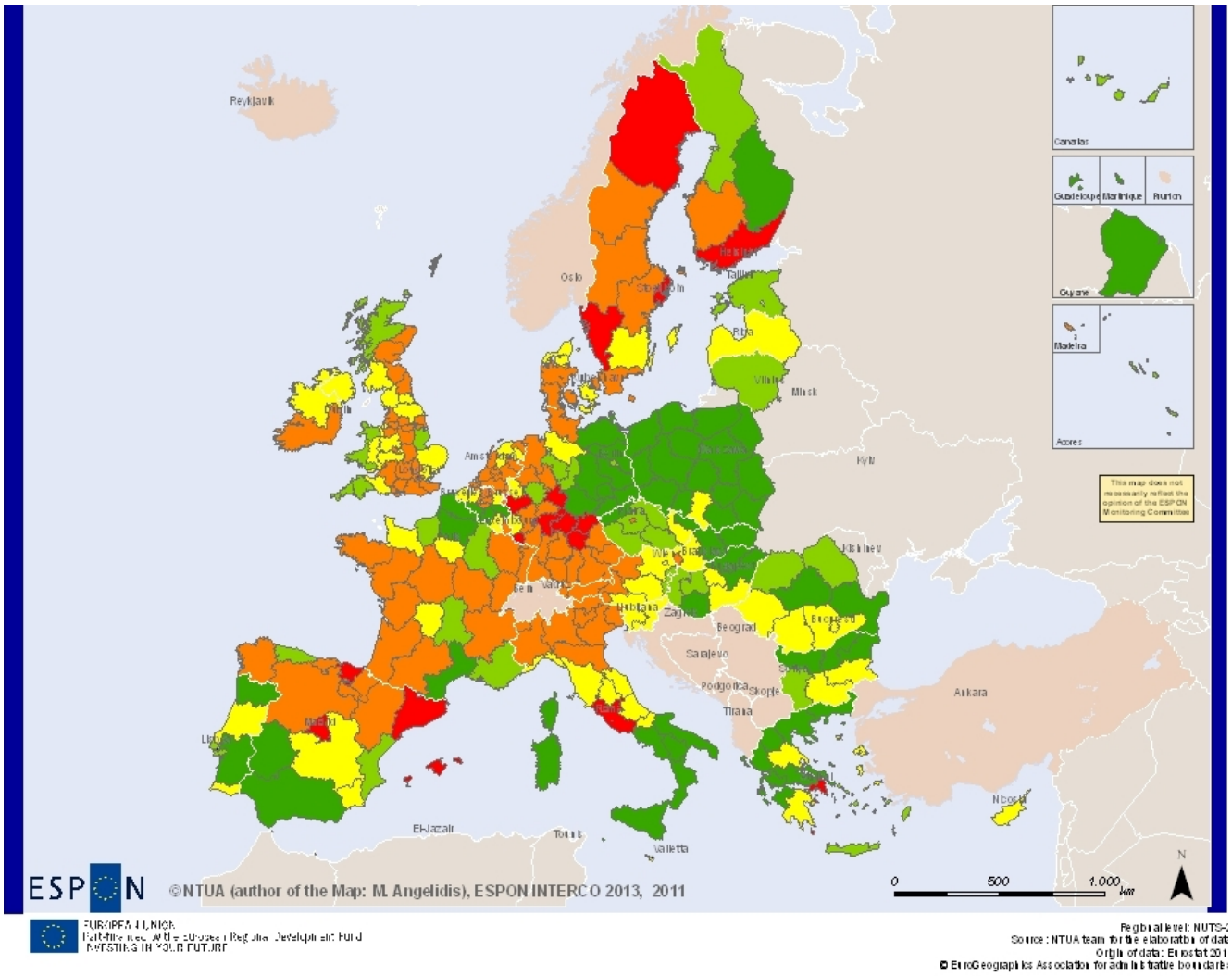


Figure 83. Unemployment rate (%) 2007 classes and GDP 2007 classes per NUTS 2 regions of the ESPON space

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team



Unemployment rate % 2007 class per NUTS-2 region of the ESPON space in realtion to the (unemp.) class "expected" from GDP class

- No data
- Much lower unemployment class than expected from GDP class
- Lower unemployment class than expected from GDP class
- Unemployment class same as the expected from GDP class
- Higher unemployment class than expected from GDP class
- Much higher unemployment class than expected from GDP class

Three clusters of GDP x three clusters of Unemployment rate % normalised by population 2007 per NUTS-2 regions of the ESPON space have been used - see in detail in the report

Figure 84. Unemployment rate (%) normalised by population 2007 per NUTS 2 regions of the ESPON space: relative difference to the unemployment rate "expected" from the GDP rate normalised by population

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

(4) Impacts of the territorial contiguity on territories' correlation (clustering) or dispersion

From this scope, the spatial autocorrelation method using the Moran's I index in association with Z-scores could be used.

Moran's I is a measure of spatial autocorrelation developed by Patrick A.P. Moran. Spatial autocorrelation is characterized by a correlation in a signal among nearby locations in space. Spatial autocorrelation is more complex than one-dimensional autocorrelation because spatial correlation is multi-dimensional (i.e. 2 or 3 dimensions of space) and multi-directional.

Moran's I is defined as :

$$I = \frac{\frac{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}}}{\sqrt{\sum_{i=1}^{n}\frac{(x_i - \bar{x})^2}{n}}\sqrt{\sum_{i=1}^{n}\frac{(x_i - \bar{x})^2}{n}}} = \frac{n}{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}} \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^{n}(x_i - \bar{x})^2}$$

where n is the number of spatial units indexed by i and j; x is the variable of interest; $\bar{x}$ is the mean of x; and c_{ij} is an element of a matrix of spatial weights.

The expected value of Moran's I under hypothesis of no spatial autocorrelation is: E (I) = -1/(n-1)

Negative (positive) values indicate negative (positive) spatial autocorrelation. Values range from −1 (indicating perfect dispersion) to +1 (perfect correlation). A zero value indicates a random spatial pattern. For statistical hypothesis testing, Moran's I values can be transformed to Z-scores in which values greater than 1.96 or smaller than −1.96 indicate spatial autocorrelation that is significant at the 5% level.

As an example of the use of this method, we present the case of the indicator of unemployment rate 2009 (%) per NUTS 2 regions[5] -see Figure 85.

Moran's I index = 0, 22 and Z-score = 12,12 standard deviations

This specific pattern is clustered (not dispersed). There is less than 1% likelihood that this clustered pattern could be the result of a random chance.

It is highly probable that in this case territorial contiguity impacts on territories' correlation (clustering) regarding unemployment rate.

In this case, it is more appropriate to use data normalized by the population of the respective regions. The result of the use of such data is presented in the Figure 86.

The degree of the impact of the territorial contiguity has not changed.

In the above two tests we have used for the parameter: "Conceptualisation of Spatial relationships"[6] the option: "Inverse distance" which takes into account for a specific NUTS 2 region the influence of other regions which are contiguous or not contiguous to this region.

We have then tested the option: "Polygons contiguity" so that the calculation takes into account only the contiguous (immediately neighbour) regions to each specific

[5] We have used the Spatial Statistics Tools of ESRI ArcGIS.

[6] In ESRI ArcGIS.

region. In this case the Moran's I index = 0,60 and Z-score = 14,61 standard deviations, which means that this kind of territorial contiguity impacts much more on territories' correlation (clustering) regarding unemployment rate.

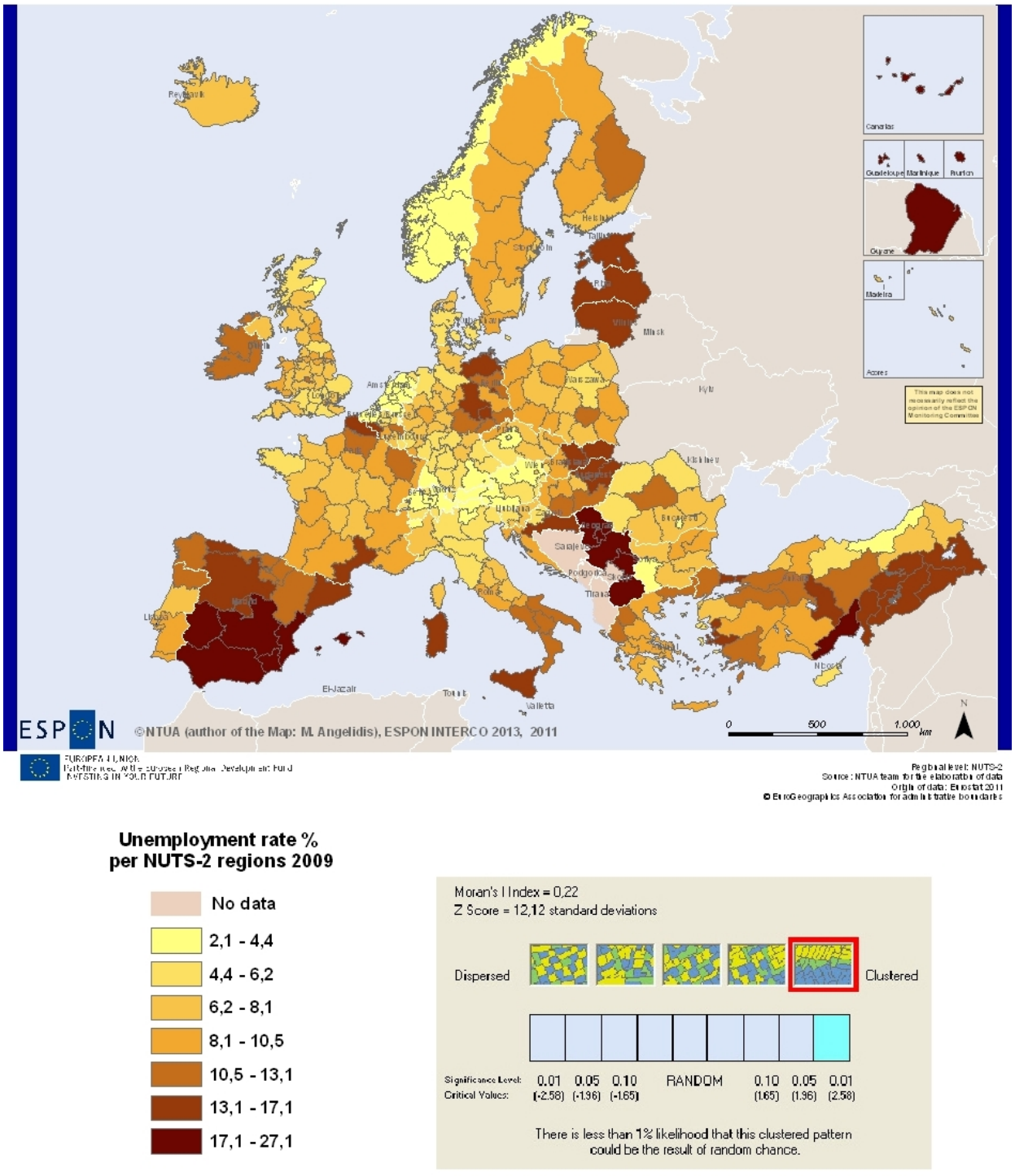


Figure 85: Unemployment rate (%) 2009 per NUTS 2 regions: Moran's I index and Z-score

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

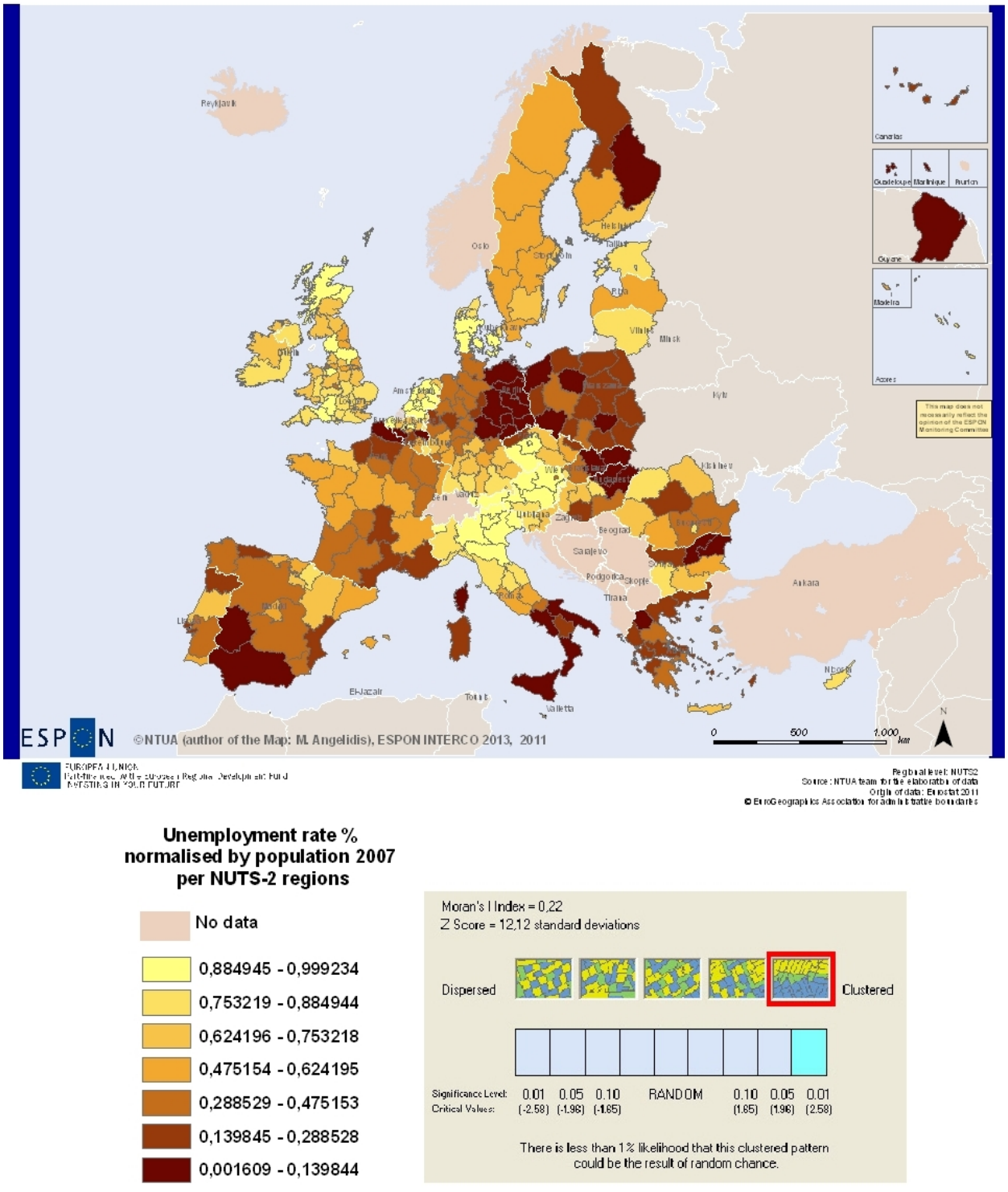


Figure 86. Unemployment rate (%) normalised by population 2007 per NUTS 2 regions: Moran's I index and Z-score

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

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The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.

ISBN 978-2-919777-10-5