Olaf Foss and Dag Juvkam

DEPOPULATION IN EUROPE

-some preliminary results

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Author: Olaf Foss and Dag Juvkam

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Abstract: Depopulation is a special course of development in the process of population change. We look into depopulation at a regional level in Europe, using direct and indirect indicators to develop a typology of depopulation for "Europe 29". The typology should be considered to be preliminary.

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Publisher: Norwegian Institute for Urban and Regional Research
Gaustadalléen 21, Box 44, Blindern
N-0313 OSLO

Telephone (+47) 22 95 88 00
Telefax (+47) 22 60 77 74
E-mail: nibr@nibr.no
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Preface

This working paper gives some preliminary results from work package 4, “Fertility, migration and depopulation” within ESPON project 1.1.4: “The Spatial Effects of Demographic Trends and Migration”. The principle objectives of the work package is to detect the areas within the boundaries of the EU, the ten candidate countries, Bulgaria, Romania, Switzerland and Norway, which are facing the prospect of demographic ‘depopulation’ and to contribute to the description and understanding of the phenomenon and the processes involved.

This working paper does not necessarily represent the view of the ESPON monitoring committee or ITPS.

Oslo, December 2003

Ove Langeland

Research Director

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The concept of 'depopulation'

The concept of 'depopulation' is sometimes used almost synonymously to population decline, but usually it is associated with population decline of a certain enduring nature, or even more narrowly to processes that carry ominous signs of socio-economic impacts.

Depopulation may be regarded as a special course of development in the process of population change, often indicated by certain probable demographic implications or impacts *with a problem potential* (ageing of the population and the labour force, increasing dependency ratios, labour shortage, decreasing natural growth potential etc.), and associated with long-term demographic process (notably the "modern" fertility decline and sometimes – and even combined with – enduring territorial patterns of selective migration). To be able to indicate the presence of processes with a depopulation potential, we need a relevant territorial scale and a reasonable temporal perspective.

Analysis of demographic depopulation at the European level will have to focus on the territorial scales that are functional in an operational sense, which are not always the scientifically adequate scales. This may be compensated to some degree by looking closer into a few carefully selected geographical areas, chosen with reference to the outcome of prior typological and analytical efforts.

In this project we take an open and pragmatic view of the concept and phenomenon of depopulation. However, based on aspects discussed in this project and the more immediate background of the current interest in depopulation as a spatial phenomenon at the European level, we may keep in mind that depopulation may be associated with certain:

- Levels or degrees of demographic change
- Durations of demographic change
- Dynamics (or relative components) of demographic change
- Population-structure aspects of demographic change
- Implications/potential implications of demographic change
- Territorial contexts of demographic change/implications of demographic change

A reasonable point of departure seems to be to regard depopulation as population decrease

i) of a certain enduring, and potentially territorially comprehensive nature,

ii) which is related to long-term fertility decline, and where

iii) the structural demographic implications of which are inadequately counteracted, and sometimes even reinforced, by lasting patterns of net migration. In its turn the inherent demographic dynamics imply

iv) particular age-pyramid effects, which entail

v) a problem potential depending on qualities of the regional context.

However, in order to determine whether observable (negative) demographic trends imply depopulation or potential depopulation in this sense of the term, a comprehensive empirical analysis far beyond the frames of this project is necessary.

Indicators – a preliminary approach

We make a distinction between indicators for direct measurement of depopulation and indicators for indirect measurement of depopulation.

Indicators for direct measurement of depopulation

In principle the different types of regional population change may be described like this:

Population *decline* due to:

- negative natural change *and* negative net migration
- negative natural change alone
- negative net migration alone

Population *growth* due to:

- positive net migration alone
- positive natural change alone
- positive natural change *and* positive net migration

The potential for depopulation processes may be expected to be found among the regions where processes of long-term weakening of the natural growth potential are at work, indicated in a direct but insufficient way by the "negative natural change" indicator. However, certain regions may be able to permanently compensate – and possibly in the long run even remedy – the loss of natural growth potential by attracting migrants, at the cost of other regions which are becoming increasingly sensitive to negative migration balances.

For work package 4, our proposed indicators (realistic temporal scope and territorial scale. Ideal temporal scope in parenthesis) are:

Indicator	Temporal scope	Territorial scale
1. Crude rate of total population change	(1980-2000) 1990-2000 (latest); intervals to be decided	NUTS 3 and NUTS 2
2. Crude rate of natural population change (excess of births)	(1980-2000) 1990-2000 (latest); intervals to be decided	NUTS 3 and NUTS 2
3. Crude birth rate (ideally TFR at regional level)	(1980-2000) 1990-2000 (latest); primo, medio, ultimo period	NUTS 3 and NUTS 2
4. Crude rate of change in strategic age groups (0-14, 20-64, 64+, women 20-34)	(1980-2000) 1990-2000 (latest); whole period	NUTS 2
5. Periods of occurrence of	(1980-1990) 1990-2000 (latest)	NUTS 3 and NUTS 2

negative rates (1, 2)		

Indicators for indirect measurement of depopulation

The long-term tendencies towards stable and declining populations and their inherent demographic dynamics affect population structures in characteristic ways. *These structural changes are frequently the main focus of concern rather than the drop in total population numbers* (cf. above on the concept of depopulation). An indirect way to indicate *relative degree of "depopulation" or "depopulation problems"* is to employ some common indicators on demographic structure. As well as these structural indicators, we include contextual indicators and information on recent population change. Our proposed indicators (realistic temporal scope and territorial scale. ? = to be considered) are:

Indicator	Temporal scope	Territorial scale
Structural indicators:		
1. Share of children: 0-14/Tot.pop	1990?, 2000	NUTS 2
2. Ageing Population: 65+/Tot.pop	1990?, 2000	NUTS 2
3. Ageing "Labour Force": 55-64/20-64	1990?, 2000	NUTS 2
4. "Labour Force" Replacement Ratio: 10-19/55-64	1990?, 2000	NUTS 2
5. Post-Active Dependency Ratio: 65+/20-64	1990?, 2000	NUTS 2
6. Aged People vs. Youth: 65+/15-24	1990?, 2000	NUTS 2
Average score on indirect "ageing"/ "depopulating" indicators	1990?, 2000	NUTS 2
Structural growth potential:		
7. Changes in Natural Growth Potential: 20-29 years in 2020 (born 1991-2000)/20-29 years in 2000 (born 1971-1980)	1990?, 2000	NUTS 2
Contextual indicators:		
8. Population density (inhabitants/square kilometres)	1999/2000	NUTS 3, NUTS 2
9. National Total Fertility Rates. 3 Groups	1999/2000 (latest)	NUTS 3, NUTS 2 (demographic context)
Recent population change, pop. and area affected:		
10. Percent recent population change	Cf. direct indicators, 1995-1999	NUTS 2
11. Share of NUTS 2 average population living in NUTS 3 regions with population decline	Cf. direct indicators, 1995-1999, 1999	NUTS 2/NUTS 3
12. Share of NUTS 2 area comprising NUTS 3 regions with population decline	Cf. direct indicators, 1995-1999	NUTS 2/NUTS 3

1 Background and principle aims

1.1 The ESPON 2006 Programme

The ESPON 2006 Programme was launched after the preparation of the European Spatial Development Perspective (ESDP), adopted by the Ministers responsible for Spatial Planning of the EU in May 1999 in Potsdam (Germany) calling for a better balance and polycentric development of the European territory.

The programme is implemented in the framework of the Community Initiative INTERREG III. Under the overall control of Luxembourg, the EU Member States have elaborated a joint application with the title "The ESPON 2006 Programme – Research on the Spatial Development of an Enlarging European Union". The European Commission adopted the programme on 3 June 2002.

Research and studies on spatial development and planning seen from the national, regional and local points of view, is partly already existing and available, although only covering smaller parts of the European territory. With the ESPON 2006 Programme and by addressing an enlarged EU territory and larger territorial entities the Commission and the Member States expect to have at their disposal:

- a diagnosis of the principal territorial trends at EU scale as well as the difficulties and potentialities within the European territory as a whole;
- a cartographic picture of the major territorial disparities and of their respective intensity;
- a number of territorial indicators and typologies assisting a setting of European priorities for a balanced and polycentric enlarged European territory;
- some integrated tools and appropriate instruments (databases, indicators, methodologies for territorial impact analysis and systematic spatial analyses) to improve the spatial co-ordination of sector policies.

The projects launched under the ESPON programme follow an integrated approach and have a clear territorial dimension. Seen together, they cover a wide range of issues and are (therefore) of different nature, streching from scientific methods and data bases via strategic projects to institutional and instrumental questions. The programme covers the following fields of research:

- Thematic studies (projects under Priority 1) on the territorial effects of major spatial developments on the background of typologies of regions, and the situation of cities on the base of broad empirical data.
- Policy impact studies (projects under Priority 2) on the spatial impact of Community sector policies, Member States' spatial development policy on types of regions with a

focus on the institutional inter-linkages between the governmental levels and instrumental dimension of policies on the base of broad empirical data.

- Horizontal and coordinating cross-theme studies (projects under Priority 3) as a key component. Evaluation of the results of the other studies towards integrated results such as indicator systems and data, typologies of territories, spatial development scenarios and conclusions for the territorial development.
- Scientific briefing and networking (projects under Priority 4) in order to explore the synergies between the national and EU sources for research and research capacities.

The ESPON project 1.1.4: "The Spatial Effects of Demographic Trends and Migration" is one of 8 thematic projects. The project started up in spring 2002. This working paper gives some preliminary results for its work package 4, "Fertility, Migration and Depopulation".

1.2 Principal aims and tasks

The principle objectives of WP4 "Fertility, migration and depopulation" is to

1. detect the areas within the boundaries of "Europe 29" which are facing the reality or prospect of demographic 'depopulation', and
2. contribute to the description and understanding of the phenomenon and the processes involved.

To be able to fulfil these objectives the Work Package will have to deal with

a) alternative conceptualizations of an empirical phenomenon of "depopulation",
b) establishment of a satisfactory set of relevant demographical data for the description and analysis of "depopulation",
c) establishment of an overview of the main features and geographical patterns of population decline and possible "depopulation" within the territory of "Europe 29", and
d) identification of main demographic dynamics and determinant factors related to "depopulation" (analysis).

The empirical approach will be twofold, namely i) a statistical description and analysis at the territorial scales corresponding to NUTS 2, and in some cases NUTS 3, covering the entire "Europe 29" territory, and ii) some statistical analysis at finer territorial scales – including more detailed descriptions of demographic components of change and a longer time period – in very few (2-3) carefully selected example regions ("cases").

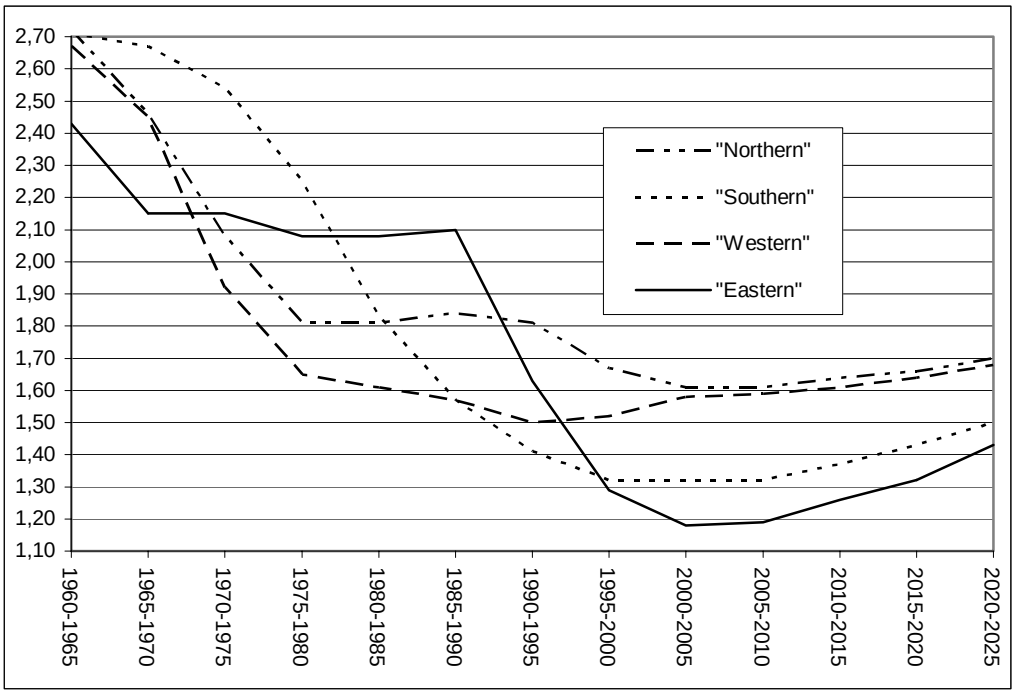
Important descriptive and analytical tools (and "products") involved in the approach is a set of indicators and typologies on certain aspects – and corresponding thematic maps – to be developed in the relevant stages of the work programme. Typological approaches refer to processes as well as areas of depopulation.

1.3 Recent demographic background

The general background of the "renewed" interest in population decline and depopulation is the recent fertility decline which in most countries took place from the middle of the

1960s to the middle of the 1970s (with some earlier as well as some later starters among the countries of the "different Europe's"). After a major fall in fertility rates, fertility tended to remain stable or to decline more slowly. There are no European examples of enduring upward shifts (cf. figure 1.1).

Figure 1.1 *Total fertility rates (TFR) for groups of European countries 1960-2025. Five years average. Historical numbers and medium variant projections. Source: World Population Prospects, the 2002 Revision. UN's Population Division, Population Database.*



The recent events may be linked to long-term demographic development, dating back at least a couple of centuries. This period includes what is known as «the demographic transition»; a major and lasting shift from high to low mortality and fertility that was most pronounced in the nations of Europe, North America, Japan, Australia and New Zealand. Increments in human longevity culminated in an unparalleled rise in life expectancy during the first sixty years of the twentieth century. Fertility declined dramatically in the countries of transition; on the order of 50 percent between 1870 and 1940.

The former century as a whole by and large saw a continuation of this tendency, although significant fluctuations occurred with the world economic crises in the 1930s and World War II. The development since the middle of the 1960s in many countries brought an end to almost two decades of post-war «baby-boom» and took fertility levels back to the long-term downward trend.

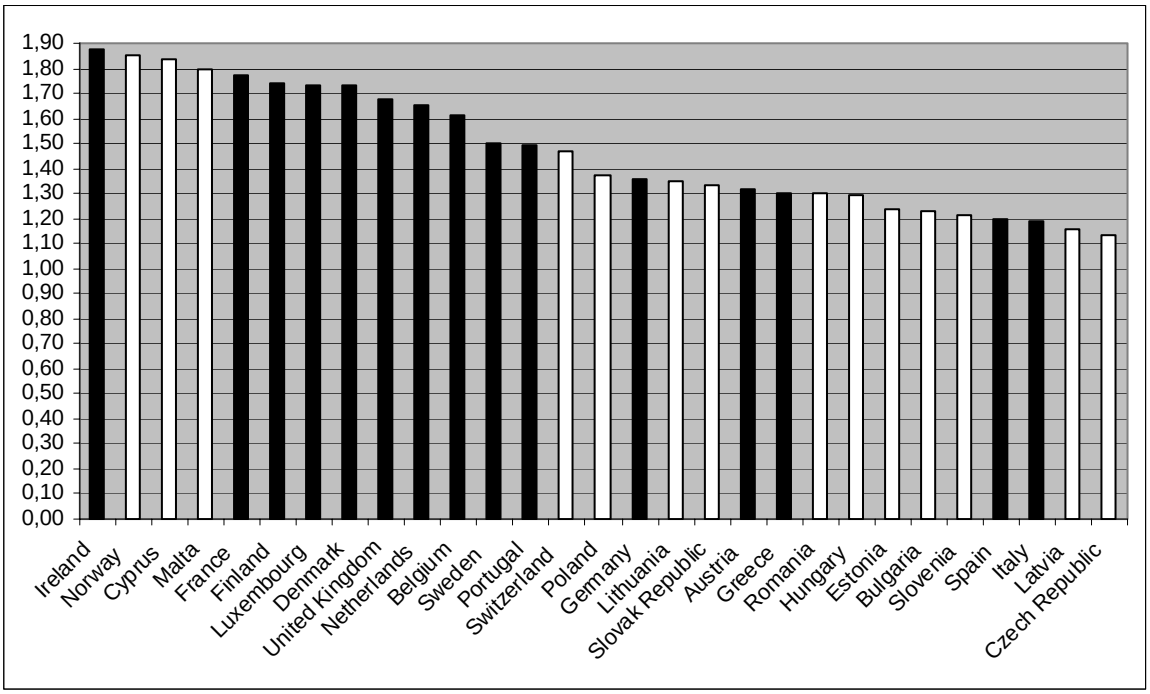
Even if many common national demographic trends among the European countries are well documented, we should remember that the extent to which the various countries experienced these trends is not always the same, and that the outcomes may differ in important ways. During the period from the late 1960s to the early 1980s fertility fell well below replacement level (ca. 2.1) in most European countries. However, the courses of

decline differed and the fertility levels varied substantially among the countries in the decades following the steepest decline, pointing towards very differentiated demographic prospects in the years to come (cf. figure 1.2).

The patterns are even more heterogeneous when we move to sub-national territorial entities. Studies in several countries have documented that the timing, pace and courses of development in fertility change varied substantially between different types of local communities and regions, for instance according to dimensions commonly associated with rural-urban, centre-periphery etc. At sub-national levels the mechanisms of regional-demographic change – especially the phenomenon and role of migration – in many places were strongly influenced by the emergence of a regional-demographic zero-sum, or even minus-sum, game.

Eurostat compiled regional population scenarios (projections) at the NUTS 2 level in 1997, covering the period 1995-2025. According to the so-called base-line scenario, described as a continuation of current trends, the EU-15 population as a whole will continue to grow at a very low rate, and start declining around 2020. While around thirty NUTS 2 regions faced a declining population in the latter half of the 1990s, mostly concentrated to the former eastern Germany and southern Europe, the number of regions with a negative rate of population change is expected to have tripled by the year 2025. Regions experiencing population decline will be widely spread across the EU territory, comprising around half of the EU population. The scenario clearly illustrates the implications of uneven regional-demographic processes and the growing sensitivity to migration balances.

Figure 1.2 *Total fertility rate (TFR) 1999 in the countries of "Europe 29". Black = EU-members. Source: Recent Demographic Developments in Europe 2000. Council of Europe.*



In the entire Europe – the Europe stretching from Lisbon to Vladivostok – the recent rapid drop in the rate of population growth is remarkable. In the period 1950-1975 the

average annual rate of growth was 8.3 per 1000 population. In the most recent quarter-century this index had fallen to 2.9 per 1000. Around the turn of the century negative natural population growth rates appeared in 17 European countries (the number of deaths exceeded the number of births). These countries were Byelorussia, Bulgaria, Croatia, the Czech Republic, Estonia, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Moldova, Romania, Russia, Slovenia, Sweden and Ukraine. In addition the following countries had close to zero natural growth: Austria, Poland, Slovakia and Spain[1].

Among the 29 ESPON-countries as many as 17 countries were within the span of Total Fertility Rates by the end of the former century, that – according to the short-hand description by the French demographer Jean-Claude Chesnais – may have the following implications: "Heavy and structural contradiction, which digs a deep hole at the basis of the age pyramid and consequently compromises the future of the society at large. Limited chance to get a return to equilibrium; evaporation of population number"[2].

[1] This paragraph is based on Demeny, Paul (2003): Population Policy Dilemmas in Europe at the Dawn of the Twenty-First Century. In *Population and Development Review* 29 (1):1 – 28 (March 2003).

[2] Chesnais, Jean-Claude (2000): The inversion of the age pyramid and the future population decline in France: Implications and policy responses. UN/POP/PRA/2003/3. 15. August 2000.

2 Concepts and definitions

2.1 The concept and phenomenon

The concept of ‘depopulation’ is far from clear. Most often the word is used almost synonymously to population decline, but sometimes it is reserved for population decline of a certain enduring nature, or even more narrowly confined to processes that carry ominous signs of socio-economic impacts. These kinds of concern may relate to socio-economic implications of distortions of the age-pyramid, or of demographical “thinning-out” of already sparsely populated (and often remotely located) areas, or even – as was the case in parts of the Nordic countries from the 1960s on – complete depopulation in the sense that entire local communities literally die out and are emptied of population.

In one or more of these senses of the concept, ‘depopulation’ has been discussed from time to time during most of the former century – in national and European terms as well as with reference to sub-national uneven territorial development.

Depopulation may be regarded as a special course of development in the process of population change, often indicated by certain probable demographic implications or impacts *with a problem potential* (ageing of the population and the labour force, increasing dependency ratios, labour shortage, decreasing natural growth potential etc.), and associated with long-term demographic process (notably the “modern” fertility decline and sometimes – and even combined with – enduring territorial patterns of selective migration). To be able to indicate the presence of processes with a depopulation potential, we need a relevant territorial scale and a reasonable temporal perspective.

In this project we take an open and pragmatic view of the concept and phenomenon of depopulation and will come back to a further conceptual elaboration based on the empirical analysis that the state of European regional data allows us to perform within the frame of available time resources. However, based on the aspects mentioned here and the more immediate background of the current interest in depopulation as a spatial phenomenon at the European level (cf. above), we may keep in mind that depopulation may be associated with certain:

- Levels or degrees of demographic change
- Durations of demographic change
- Dynamics (or relative components) of demographic change
- Population-structure aspects of demographic change
- Implications/potential implications of demographic change
- Territorial contexts of demographic change/implications of demographic change

A reasonable point of departure seems to be to regard depopulation as population decrease i) of a certain enduring – and potentially territorially comprehensive – nature, ii) which is related to long-term fertility decline, and where iii) the structural demographic implications of which are inadequately counteracted, and sometimes even reinforced, by lasting patterns of net migration. In its turn the inherent demographic dynamics imply iv) particular age-pyramid effects, which entail v) a problem potential depending on qualities of the regional context. However, in order to determine whether observable (negative) demographic trends imply depopulation or potential depopulation in this sense of the term, a comprehensive empirical analysis far beyond the frames of this project is necessary.

2.2 Territorial scale

The picture of the geography of "depopulating" Europe is of course highly sensitive to territorial scale. The NUTS 2 level is far from appropriate for the task of identifying and explaining depopulation processes. A Norwegian example is illustrated in figure 3. Norway is among the countries that came out with the highest fertility levels "at the end of" the recent phase of fertility decline, but every year since the late 1980s around half of the Norwegian municipalities ("NUTS 5"-level) experienced population decline. In more than one third of the municipalities the population declined in more than ten of the fifteen years covered; in two thirds the population declined in more than five years of the period.

At the NUTS 3 compatible level in Norway (counties) only two regions would display a declining population during the 1980s as a total, and only one region during the 1990s. At a NUTS 2 compatible level the statistics show no sign of population decline in Norway.

Analysis of demographic depopulation at the European level will have to focus on the territorial scales that are functional in an operational sense, which are not always the scientifically adequate scales. This may be compensated to some degree by looking closer into a few carefully selected geographical areas, chosen with reference to the outcome of prior typological and analytical effort (cf. above).

Figure 2.1 *Norway: Municipalities (435 NUTS 5 regions) with declining population numbers from one year to the next 1980-1996. Their percentage of all municipalities (——) and their share of the national population (- - - -).*

Historical occurrences of population decline with a possible depopulation potential have probably been a typical small area phenomena in Europe (cf. for instance the example of Norway above), although some of the implications as well as some causes may be related to larger regions and even entire nations. The Eurostat scenarios seem to indicate that ever larger contiguous territories will be affected, but a hypothesis of increasing disparities in demographic development *within* the larger regions may still be plausible.

The arguments pro and con different choices of territorial scale for focussing on demographic depopulation in a European perspective is not easy to evaluate. However, practical questions on data availability, stability of territorial grids over time, comparability across national borders etc. may anyway be the most determinate factors.

2.3 Indicators – Preliminary approach

2.3.1 Indicators for direct measurement of depopulation

We take as an obvious point of departure that regional population change in a particular period is the sum of the regions' natural population change (excess of births) and net migration in that period. The long term general trend in Europe is that the natural change component turns from being a positive to being a negative contributor to regional population change as a consequence of fertility decline and population ageing (cf. above), altering the "rules" of regional-demographic distributive games – especially the role of migration. The Eurostat baseline scenario mentioned above, projects that this trend will continue and leave the EU with a negative average contribution from the natural change

component as early as 2010. Below we have displayed some preliminary results (very preliminary typological approach and two maps with a combination of NUTS 2 and NUTS 3 for the purpose of comparability) based on data on main components of regional population change, established in WP3.

A special illustration is given in a selection of figures exemplifying regional demographic change dynamics using French and Spanish NUTS 3 regions, the two countries representing the "high" and "low" end of the range of national fertility levels following the period of the most pronounced fertility decline. These figures are based on the OECD Territorial Data Base.

In principle the different types of regional population change may be described like this:

Population *decline* (Tneg) due to:

- negative natural change *and* negative net migration (NnegMneg)
- negative natural change alone (NnegMpos)
- negative net migration alone (NposMneg)

Population *growth* (Tpos) due to:

- positive net migration alone (NnegMpos)
- positive natural change alone (NposMneg)
- positive natural change *and* positive net migration (NposMpos)

The potential for depopulation processes may be expected to be found among the regions where processes of long-term weakening of the natural growth potential are at work, indicated in a direct but insufficient way by the "negative natural change" indicator. However, certain regions may be able to permanently compensate – and possibly in the long run even remedy – the loss of natural growth potential by attracting migrants, at the cost of other regions which are becoming increasingly sensitive to negative migration balances.

Below our suggestions of a selection of direct indicators of depopulation at a territorial level are briefly summarized. Coordination with other Work Packages is necessary (particularly WP 1 and 2, but also WP 3 and 5). The proposed indicators are mainly based on the statement on data availability in the *Eurostat Regional Statistics Reference Guide (2003)*, and a limited effort of possible supplements. Indicators may be established as soon as data become available for the project. According to licence agreement between ESPON and Eurostat – signed by all Lead Partners and even Main Partners – the ESPON projects are granted the right to use the complete GISCO and REGIO data bases, and were to receive the data immediately upon signing. CD-versions of the data bases should have been sent to ITPS/Activity 1.1.4 by April 14.2003, for use by all Main Partners. By July 25.2003 ITPS and its partners had still not received the data bases. Cf. the section on data below.

Figure 2.2 *Proposed indicators (realistic temporal scope and territorial scale. Ideal temporal scope in parenthesis)*

Indicator	Temporal scope	Territorial scale
1. Crude rate of total population change	(1980-2000) 1990-2000 (latest); intervals to be decided	NUTS 3 and NUTS 2
2. Crude rate of natural population change (excess of births)	(1980-2000) 1990-2000 (latest); intervals to be decided	NUTS 3 and NUTS 2
3. Crude birth rate (ideally TFR at regional level)	(1980-2000) 1990-2000 (latest); primo, medio, ultimo period	NUTS 3 and NUTS 2
4. Crude rate of change in strategic age groups (0-14, 20-64, 64+, women 20-34)	(1980-2000) 1990-2000 (latest); whole period	NUTS 2
5. Periods of occurrence of negative rates (1, 2)	(1980-1990) 1990-2000 (latest)	NUTS 3 and NUTS 2

2.3.2 Indicators for indirect measurement of depopulation

The long-term tendencies towards stable and declining populations – and their inherent demographic dynamics – affect population structures in characteristic ways, *and these structural changes are frequently the main focus of concern rather than the drop in total population numbers* (cf. above on the concept of depopulation). An indirect way to indicate *relative degree of "depopulation" or "depopulation problems"* is to employ some common indicators on demographic structure, like the "dependency ratio".

The most obvious consequence of the general shift from high to low mortality and the fall of fertility rates, are changes in the age structure of populations, and particularly the rather recent phenomenon of *ageing.* The main cause of ageing is the change in fertility. While improved mortality generally operates at all ages, fertility changes initially affect the size of one age group only, the very young. Depopulation and ageing are interconnected by definition.

By the time the decline in fertility rates started to level off in most countries (usually around mid-1980s) the most aged populations were found in Northern and Western Europe. In some countries, like Sweden and France, rapid ageing actually started as early as the mid-nineteenth century. The remaining countries did not display such patterns until the twentieth century, however. Demographers often speak of «young», «mature» and «aged» populations by whether the share of persons aged 65 or over is less than 4 per cent, 4-7 per cent, or over 7 percent, respectively. By this measure all "Europe 29" countries and all but two NUTS 2 regions in these countries are rather "aged". In most of the regions the share of elderly people is more than the double of this "aged" threshold.

Ageing is not a uniform trend within ageing national populations. This is due to territorial differences in fertility levels and timing of fertility trends, modified in different ways by age-selective rural-urban migration patterns. The phenomena and territorial patterns of ageing and related changes in age structures associated with population decline, concern i.a. the regions' reproduction potential and the mechanisms of territorial population re-distribution, and the labour supply and composition of the labour force.

Below our suggestions of indirect indicators of "stage of depopulation" at a territorial level are briefly summarized. Coordination with other Work Packages is necessary

(particularly WP 1 and 2, but also WP 3 and 5). *The indicators are all measured against the "Europe 29" average in order to express the relative state-of-affairs of the different regions, rather than their absolute state of depopulation* (indexes: "Europe 29" = 100). *They are also grouped into four categories by degree of "negative" deviation from the "Europe 29" average* (half standard deviations are used).

The indicators have a relevant interpretation even when measured at only one point in time, but may also be used to indicate the process. The individual indicator as well as the fruitfulness of the exact definition of each indicator may vary among countries and between different purposes, and are of course subject to discussion. *The indicator values at NUTS 2 level (mostly year 2000) in all "Europe 29" countries are displayed in a series of maps in the results section (cf. below).*

The indirect indicators even include information on recent population change at the NUTS 2 level and on the share of population and area of the NUTS 2 regions which are affected by recent population decline at the lower regional level (NUTS 3)[3]. Additionally, two contextual indicators are suggested; population density and the national Total Fertility Rate, to be supplemented by indicators developed in other ESPON Activities (cf. section on data below).

Indicator 4 tells us if the ten years cohort potentially entering the labour force from the bottom of the age pyramid during the next ten years is smaller or larger than the ten years cohort potentially leaving the labour force from the top of the age pyramid during the same period – assuming no deaths and migrations in the period. With the same assumptions indicator 7 tells us if the cohort constituting the 20-29 years olds in 2020 (born 1991-2000) is smaller or larger than the cohort constituting the 20-29 years olds in 2000 (born 1971-1980). In most countries this age span contains the most reproductive ages. Per 1980 this age group was constituted by one of the wider post-war baby-boom cohorts (born 1951-1960).

[3] These indicators are shown here mostly because they are used as "contextual" indicators at national and NUTS 2 level, cf. the results section below. They are actually rather direct measures.

Figure 2.3 *Proposed indicators (realistic temporal scope and territorial scale. (? = to be considered)*

Indicator	Temporal scope	Territorial scale
Structural indicators:		
1. Share of children: 0-14/Tot.pop	1990?, 2000	NUTS 2
2. Ageing Population: 65+/Tot.pop	1990?, 2000	NUTS 2
3. Ageing "Labour Force": 55-64/20-64	1990?, 2000	NUTS 2
4. "Labour Force" Replacement Ratio: 10-19/55-64	1990?, 2000	NUTS 2
5. Post-Active Dependency Ratio: 65+/20-64	1990?, 2000	NUTS 2
6. Aged People vs. Youth: 65+/15-24	1990?, 2000	NUTS 2
Average score on indirect "ageing"/ "depopulating" indicators	1990?, 2000	NUTS 2
Structural growth potential:		
7. Changes in Natural Growth Potential: 20-29 years in 2020 (born 1991-2000)/20-29 years in 2000 (born 1971-1980)	1990?, 2000	NUTS 2
Contextual indicators:		
8. Population density (inhabitants/square kilometres)	1999/2000	NUTS 3, NUTS 2
9. National Total Fertility Rates. 3 Groups	1999/2000 (latest)	NUTS 3, NUTS 2 (demographic context)
Recent population change, pop. and area affected:		
10. Percent recent population change	Cf. direct indicators, 1995-1999	NUTS 2
11. Share of NUTS 2 average population living in NUTS 3 regions with population decline	Cf. direct indicators, 1995-1999, 1999	NUTS 2/NUTS 3
12. Share of NUTS 2 area comprising NUTS 3 regions with population decline	Cf. direct indicators, 1995-1999	NUTS 2/NUTS 3

3 Data – sources and limitations

The indicators necessary to develop different modules/aspects of a typology of territorial depopulation and carry out the description and analysis as described, may to a large extent be based on two main sources of data:

1. Data which are available in the Eurostat REGIO data base with certain needs of supplements, especially with regard to the Candidate countries.
2. Data/indicators prepared and made available by other ESPON activities/the ESPON management (i.a. via the ESPON data base), especially activity 3.1 and 1.1.1./1.1.2

The latter (2) comprises indicators on settlement structure and spatial organisation, especially polycentricity, typologies of functional urban areas (FUAs), typologies of NUTS 3 regions (according to the relations between FUAs and NUTS 3), and rural-urban typology – to be taken into consideration at a later stage of the project. Moreover, the ESPON data base comprises i.a. data on economic performance (GDP), active population, employment, sectoral mix of employment, unemployment, and a small selection of *demographic* data from Eurostat databases. Data for the initial descriptive/analytical and typological tasks, that to a certain degree are unique to this project, belongs to category 1 above.

According to the *Eurostat Regional Statistics Reference Guide (2003)* the demographic data contained in the REGIO database covers among others, the following data of particular relevance to WP 4 (and other Work Packages of Activity 1.1.4, cf. above):

NUTS Level 2:

1. Population (by January 1.) by sex and five years age groups yearly from 1980 (EU-countries)
2. Population (by January 1.) by sex and single years of age yearly from 1995 (EU-countries) and 1990 (Candidate countries)
3. Average population by sex and single years of age yearly from 1990 (EU-countries)
4. Age-specific fertility rates yearly from 1990 (EU-countries only?)
5. Population scenarios (projections) in three alternatives for the period 1995-2025 (first single years, then five years) by sex and 19 age groups (EU-countries)
6. i) Excess of births/natural population change, ii) net migration, iii) crude rate of natural population change, iv) crude rate of net migration, v) crude rate of total population change, vi) pre-active dependency ratio, vii) post-active dependency ratio. Indicators i)-vii) yearly from 1990 (EU-countries, Candidate countries?)[4]

[4] These indicators (and indicator 4 above) will be available in New Cronos in 2003. We have received no information from Eurostat upon our request about the exact publication dates.

7. Crude rate of population change over 5 years periods from 1990 (EU-countries, Candidate countries?)

NUTS Level 3:

1. Average population by sex yearly from 1970 (EU-countries) and 1990 (Candidate countries)
2. i) Number of live births, ii) number of deaths, iii) crude birth rate, iv) crude death rate. Indicators i) – iv) yearly from 1977 (EU-countries) and 1990 (candidate countries)

Initial descriptive and analytical work may lead to the identification of supplementary data requirements to be evaluated and coordinated with the situation and needs across all the 1.1.4. Working Packages.

The description of New Cronos contents conceals several shortcomings with regard to period and general regional coverage. Supplementary activities are necessary to fill wholes in the data material. Data for example studies (“cases”, cf. above) are/will be collected from the national statistical sources.

In some cases supplementary analysis will be based on data from the OECD Territorial Database, covering OECD member countries among “Europe 29”, cf. the results section below.

4 Some preliminary results

4.1 The geography of recent population decline in "Europe 29"

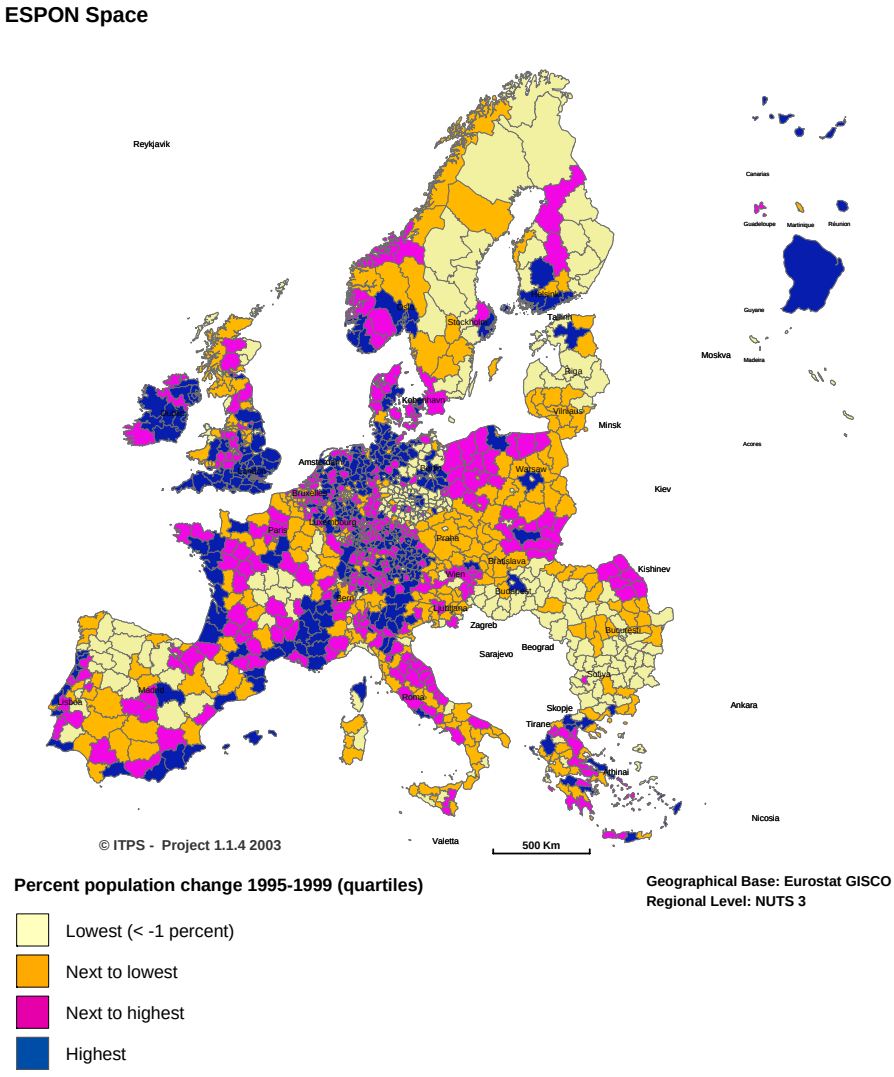
Among 1326 regions at NUTS 3 level in the 29 ESPON-countries ("Europe 29")[5] as many as 531 regions experienced a total fall in population numbers from the middle to the end of the 1990s. The median growth rate was 0,5 percent and one fourth of the regions had a total population decline of more than one percent. The growth rates varied from -13 to +31 percent among the 1326 regions (regional coefficient of variation[6] = 520).

It is important to notice that the NUTS 3 division represents very different levels of territorial detail in the different countries and a tremendous range of sizes (population and area) and other characteristics between as well as within the particular countries. In the more than 440 German NUTS 3 regions the population numbers range from around 36.000 to well above 2.000.000 inhabitants in 1999 (standard deviation 182.349 around an average of 186.229). In half of the regions the population size is higher than 135.000. Only ten percent of the regions have less than 75.000 inhabitants. The areas range from around 36 square kilometres to more than 3058 square kilometres (mean = 810, standard deviation = 596).

The first map (figure 4.1) displays the crude rates of total population change (percentage) at the NUTS 3 level 1995-1999, categorized (quartiles).

[5] Cyprus and Malta are not included due to insufficient data
[6] RCV = Standard deviation as a percentage of the mean growth rate

Figure 4.1 *Total population change 1995-1999. NUTS 3. Percent*



In the Nordic countries there is a pattern where the less central regions have the most negative development and the most central ones the strongest growth. In Germany the most marked regional differentiation is between the western part, with generally positive development, and the former GDR, where the development is mostly negative, except for in the suburban belt around the major cities. In the western part of Germany, in the Be-Ne-Lux-countries, Ireland, south England, south and western France and coastal Portugal most of the regions are within the two top quartiles. In Italy the very regions with the most negative tendencies regarding indirect depopulation (cf. below) are to a great extent the ones with the most positive population development i the latter half of the 1990s. The regional population change in Eeastern Europe is probably hampered by the lack of a properly functioning housing market, and perhaps also due to a greater share of migrations not being registered than in the rest of "Europe 29". Even so, much of Poland shows a very positive population change, not least the regions around Warsaw and Gdansk and south of Krakow.

The most negative change is found in the least densely populated regions in France, Spain and Portugal, the northern and southern parts of Eastern Europe, and in peripheral regions of Sweden and Finland.

When we rank the regions within "Europe 29" according to their population growth rates from the middle to the end of the 1990s, we find that the German NUTS 3 regions (especially the former eastern German regions) are remarkably well represented at the extremes. Many of the fastest growing and fastest declining regions in "Europe 29" are German. This may have to do with the greater level of territorial detail represented by the German NUTS 3 level compared to the other countries. Within all the three neighbouring "declining" NUTS 2 regions of Chemnitz, Dresden and Leipzig we find NUTS 3 regions that rank among the ten percent fastest *growing* as well as among the ten percent fastest *declining* regions among the total number of 1326 "Europe 29"-regions[7].

Tables 4.1 and 4.2 give a rough overview of the regional population development situation in "Europe 29" in the latter half of the 1990s. Table 4.1 indicates to what extent regional population growth rates varies among and within countries, and the share of the countries' regions, populations and areas which was affected by population decline from the middle to the end of the decade. The largest share of declining regions (50-100 percent) and affected populations (40-100 percent) are found in the ten countries Latvia, Bulgaria, Hungary, Sweden, Romania, Czech Republic, Estonia, Finland, Lithuania and the Slovak Republic (in this order).

In the Nordic countries far smaller shares of the populations than of the regions were affected. In many other countries the situation seemed to be reverse. In several countries the major part of the national area and populations were affected by population decline – measured at the territorial scale of the NUTS 3 regions.

[7] Cyprus and Malta not represented

Table 4.1 *Regions with population change below zero 1995-1999. Median change rate (percentage) and regional variation in change rates. NUTS 3 regions. "Europe29" minus Cyprus and Malta.*

Country Code	Number of NUTS 3 regions	Regions with population decline 1995-1999			Median population growth-rate	Regional coefficient of variation
		Percent of all regions	Percent of national population	Percent of national area		
AT	35	28,6	23,3	30,7	0,6	229,5
BE	43	18,6	27,0	14,4	0,8	118,4
BG	28	92,9	81,7	93,8	-3,0	159,6
CH	26	26,9	8,8	9,6	1,2	210,6
CZ	14	64,3	67,8	66,0	-0,3	242,1
DE	441	38,5	40,4	24,8	0,9	546,5
DK	15	6,7	0,8	1,4	1,0	87,2
EE	5	60,0	63,2	43,1	-0,5	1406,6
ES	52	42,3	26,2	48,7	0,2	338,3
FI	20	60,0	40,5	70,2	-0,9	906,1
FR	100	23,0	13,9	20,8	1,1	157,4
GR	51	45,1	51,9	40,6	0,4	326,2
HU	20	90,0	85,6	88,4	-2,0	219,6
IE	8	0,0	0,0	0,0	2,9	73,8
IT	103	43,7	34,1	44,5	0,2	345,7
LT	10	60,0	74,9	71,8	-0,3	220,3
LU	1	0,0	0,0	0,0	(5,5)	-
LV	5	100,0	100,0	100,0	(-3,5)	126,8
NL	40	10,0	5,4	6,0	1,8	184,2
NO	19	36,8	24,0	63,8	1,5	168,2
PL	44	31,8	36,0	21,7	0,5	405,5
PT	30	43,3	37,8	52,0	0,7	579,0
RO	42	71,4	71,8	71,7	-1,0	257,7
SE	21	76,2	43,9	86,9	-1,1	286,2
SI	12	41,7	34,5	40,3	0,0	332,0
SK	8	50,0	48,3	45,6	0,2	193,8
UK	133	36,1	26,3	30,4	0,8	255,8

Table 4.2 *NUTS 3 regions and their average population numbers in 1999 by population change category 1995-1999 (according to cutting points for four equal groups of regions among all regions within "Europe 29" (minus Cyprus and Malta)). Percent of all regions and of the average total population in the regions in 1999, respectively, in each country (cf. also map above).*

Country code	Growth category according to percentage change in average population 1995-1999:								Total	Number of regions
	Lowest fourth (<-1 percent)		Next to lowest fourth (-1 – 0,5 percent)		Next to highest fourth (0,5-2 percent)		Highest fourth (>2 percent)			
	Regions	Population 1999	Regions	Population 1999	Regions	Population 1999	Regions	Population 1999		
AT	6	4	37	32	46	55	11	9	100	35
BE	5	5	28	29	49	53	19	13	100	43
BG	89	73	7	12	4	15	0	0	100	28
CH	15	5	27	25	35	60	23	11	100	26
CZ	7	12	93	88	0	0	0	0	100	14
DE	32	31	13	15	21	20	35	34	100	441
DK	7	1	7	5	53	54	33	41	100	15
EE	40	50	40	39	0	0	20	11	100	5
ES	27	13	33	41	17	25	23	20	100	52
FI	50	33	15	10	10	12	25	44	100	20
FR	13	6	23	26	36	37	28	30	100	100
GR	20	6	33	51	25	17	22	26	100	51
HU	75	73	20	17	0	0	5	10	100	20
IE	0	0	0	0	25	26	75	74	100	8
IT	12	6	43	39	32	41	14	14	100	103
LT	10	5	90	95	0	0	0	0	100	10
LU	0	0	0	0	0	0	100	100	100	1
LV	100	100	0	0	0	0	0	0	100	5
NL	8	4	10	8	38	42	45	46	100	40
NO	11	7	26	17	21	17	42	59	100	19
PL	7	12	43	41	43	39	7	9	100	44
PT	30	15	17	24	23	17	30	44	100	30
RO	50	51	36	32	14	17	0	0	100	42
SE	62	36	19	24	14	19	5	20	100	21
SI	25	12	58	71	17	17	0	0	100	12
SK	0	0	63	58	38	42	0	0	100	8
UK	23	14	24	24	19	17	35	46	100	133
"Europe 29" minus Cyprus and Malta	25	18	25	29	25	27	25	25	100	1326

In table 4.2 the 1326 NUTS 3 regions are ranked by their population growth rates in the second half of the 1990s and the cutting points for dividing them into four equal groups

according to their level of growth, are established. The table shows the distribution of the regions and populations of each country in 1999 by "Europe 29" growth category. The ranks of Latvia, Bulgaria, Hungary and Sweden are confirmed. They all have very large shares of regions and populations in the category comprising the fourth of the regions with the lowest growth rates. The table even indicates that seven countries have one third or more of their regions in the category comprising the fourth of the regions with the highest growth rates, viz. Luxembourg, Ireland, Netherlands, Norway, Germany, United Kingdom and Denmark. Some of these countries also have substantial declining areas within their borders.

Among the ten percent *most declining* NUTS 3 regions in the last half of the 1990s the regions of 18 counties are represented. Of the 133 "most declining regions" as many as 64 regions are *German*, 18 regions are *Bulgarian*, 8 regions are part of *United Kingdom*, 6 regions are *Romanian* and 5 regions are *Portuguese*. The rest of the 18 countries are represented with 1-4 regions (Austria, Switzerland, Estonia, Spain, Finland, Greece, Hungary, Italy, Latvia, Netherlands, Norway, Poland and Sweden).

4.2 Recent population decline and "depopulation" – direct indicators

A series of maps may be produced – based on (a selection of) the single indicators of demographic change – in order to illustrate the geographical pattern of different aspects of relative demographic change and "depopulation potential" among "Europe 29" regions at the NUTS 3 level (direct indicators, cf. above). "Partial depopulation" (or change in strategic age groups) may for reasons of data availability be illustrated at the NUTS 2 level only (not included in this report).

A composite typology of the (potential) depopulation processes should ideally integrate indicators on the degree or level of population decline (direct indicator 1 above), the components of change (direct indicator 2 above), the timing (direct indicator 5 above) and the context (for instance indirect indicator 9 above, other – non-demographic – indicators) of change, to produce a map of degrees and types of depopulation processes in "Europe 29" at the NUTS 3 level.

At this stage of the project WP 4 we are able to display – in a highly preliminary way – two simple sketches of typologies of the "geography of depopulation" based on direct indicators and observations for a rather short period;

i) one based on the main components of change (natural population change/excess of births and migratory balance/ net migration) and

ii) one based on a combination of indicators on depopulation at three different levels of territorial scale (nation, NUTS 2, NUTS 3).

4.2.1 Typology based on the main components of population change[8]

The two maps presented her display the same phenomena in slightly different ways. The typological approach is explained in the legend. The maps are based on data on migratory balances per 1000 inhabitants, natural population change per 1000 inhabitants and total population change per 1000 inhabitants. Data covers demographic change for the period 1996-1999 (annual averages). The territorial scale is a combination of NUTS 2 and NUTS 3 levels, based on an evaluation of national territorial grids in a comparability perspective.

The first map (figure 4.2) displays all combinations of total change and the contributions (negative or positive) by the two main components of change (migratory balance and natural population change). Total population *growth* is displayed in red tones, separated in three shades according to the components of growth (natural, migration or both). Total population *decline* is represented by blue tones, and similarly differentiated into three types according to the "demographic dynamics".

The second map (figure 4.3) accentuates the *declining* regions and their combinations of components of change, while showing all *increasing* regions in a light yellow tone. This may be regarded as a first sketch or idea of a typology of depopulation areas, to be elaborated in a later stage of the project.

It is obvious from the maps that a large share of the "depopulating" regions may be characterised as relatively rural – in many cases sparsely populated and remote – regions, but even old industrial areas and relatively central towns seem to be affected by population decline. The relative contribution by the two main components of change seems to differentiate between the types of "depopulation" areas according to location, regional context and characteristics. This will have to be looked into in a later stage of the project, supported by territorial typology inputs from other ESPON-activities.

In six diagrams below (figure 4.4-4.9) we have used demographic change rates for the *NUTS 3 regions of France and Spain* to illustrate i) the distribution of regions according to rates of change in the total population and in the two main components of change (natural change and net migration), ii) the relationships between the regions' position in the pattern of distribution in two consecutive periods (1980-1990, 1990-2000), and iii) the regions' position according to the relative contributions to total population change by the two main components of change (both periods). Figure 9 shows the relative contribution of the two main components of change to population development in each of the NUTS 3 regions of *Spain* 1990-2000. The figure illustrates how net migration "operates" across the regional pattern of natural population change, exemplified by the Spanish NUTS 3 regions, displayed as a reminder for the interpretation of the relative influence and status of the two components of change in a "depopulation" perspective.

[8] The two maps presented under 4.2.1 are produced by ULB, Departement de Geographie, Bruxelles (responsible for WP3)

France and Spain are selected to represent cases at the high and low end of the range of national fertility levels following the main period of fertility decline (cf. figure 2)[9].

Only a few points indicated by the figures are to be mentioned here:

a) Figures 4.7 and 4.8 show that the two components of change were only slightly negatively correlated in the 1980s, a bit stronger in Spain than in France, however. The pattern changes from one decade to the next. In the 1990s the Spanish regions display a negative correlation, while no correlation exists for France. However, the overall pattern of regional-demographic change became far more dispersed from one decade to the next, and many more regions entered the phase of negative natural growth.
b) Figures 4.4-4.6 indicates that regional-demographic trends seem to persist from the first to the second decade. This is more pronounced among French than among Spanish regions. The regional *pattern* of natural population change was almost the same during the 1990s as during the 1980s, but – especially in Spain – many more regions entered the negative natural change phase in the course of these decades. The picture is more ambiguous with regard to net migration even if there is a visible tendency of repeating patterns, especially in France.

The French and Spanish NUTS 3 regions may be classified according to the actual results of the different types of regional-demographic dynamics during the two decades described above[10], cf. the scheme below.

A map of the results of the 1980s and 1990s regional-demographic processes according to this classification would show for instance that 11 new regions in Spain had entered the TnegNnegMneg category and one region had changed from that category to another from the first to the second decade.

In France 10 regions declined due to negative net migration alone during the 1990s (11 in the 1980s), while 8 regions (5 in the 1980s) declined due to negative natural change, and 4 (5) due to a combination of negative components of change. In Spain 13 (3) regions declined as result of a combination of negative factors and only 4 (8) due to net migration alone.

All together the number of regions with negative natural population change increased in both countries from the 1980s to the 1990s. In Spain the number of regions increased from 7 to 28 (from ca. 13 to ca 52 percent of all regions), and in France the increase was from 26 (27 percent of all regions) to 28 (29 percent).

[9] The source is the OECD Territorial Data Base (TDB), covering the OECD ”Territorial Level 3” (TL3) for European (and other) member countries. The territorial scales for TL3 are carefully chosen for each country to enhance comparability at sub-national level across the entire OECD territory. It is not always identical to NUTS 3. However, for France and Spain the NUTS 3 level is chosen as OECD TL3 (with a slight adjustment for France)

[10] Cf. section 2.3.1 ”Indicators for direct measurement of depopulation”.

Table 4.3 *Regional population processes. Spain and France.*

Regional population processes 1980-1990:	Regional population prosesses 1990-2000:						TOTAL
	Tneg Nneg Mneg	**Tneg Nneg Mpos**	**Tneg Npos Mneg**	Tpos Nneg Mpos	Tpos Npos Mneg	Tpos Npos Mpos	
SPAIN:							
TnegNnegMneg	**2**	**1**					**3**
TnegNnegMpos	**2**	**1**					**3**
TnegNposMneg	**3**	**2**	**1**	**2**			**8**
TposNnegMpos	**1**						1
TposNposMneg	**3**		**2**	4	4	11	24
TposNposMpos	**2**		**1**	4		6	13
TOTAL	**13**	**4**	**4**	10	4	17	52
FRANCE:							
TnegNnegMneg	**1**	**4**		**1**			**6**
TnegNnegMpos		**3**		**2**			**5**
TnegNposMneg	**1**		**6**		**3**	**1**	**11**
TposNnegMpos	**1**	**1**		12		1	15
TposNposMneg	**1**		**3**		15	4	23
TposNposMpos			**1**	1	7	27	36
TOTAL	**4**	**8**	**10**	16	25	33	96

Figure 4.2 *Components of population change 1996-1999*

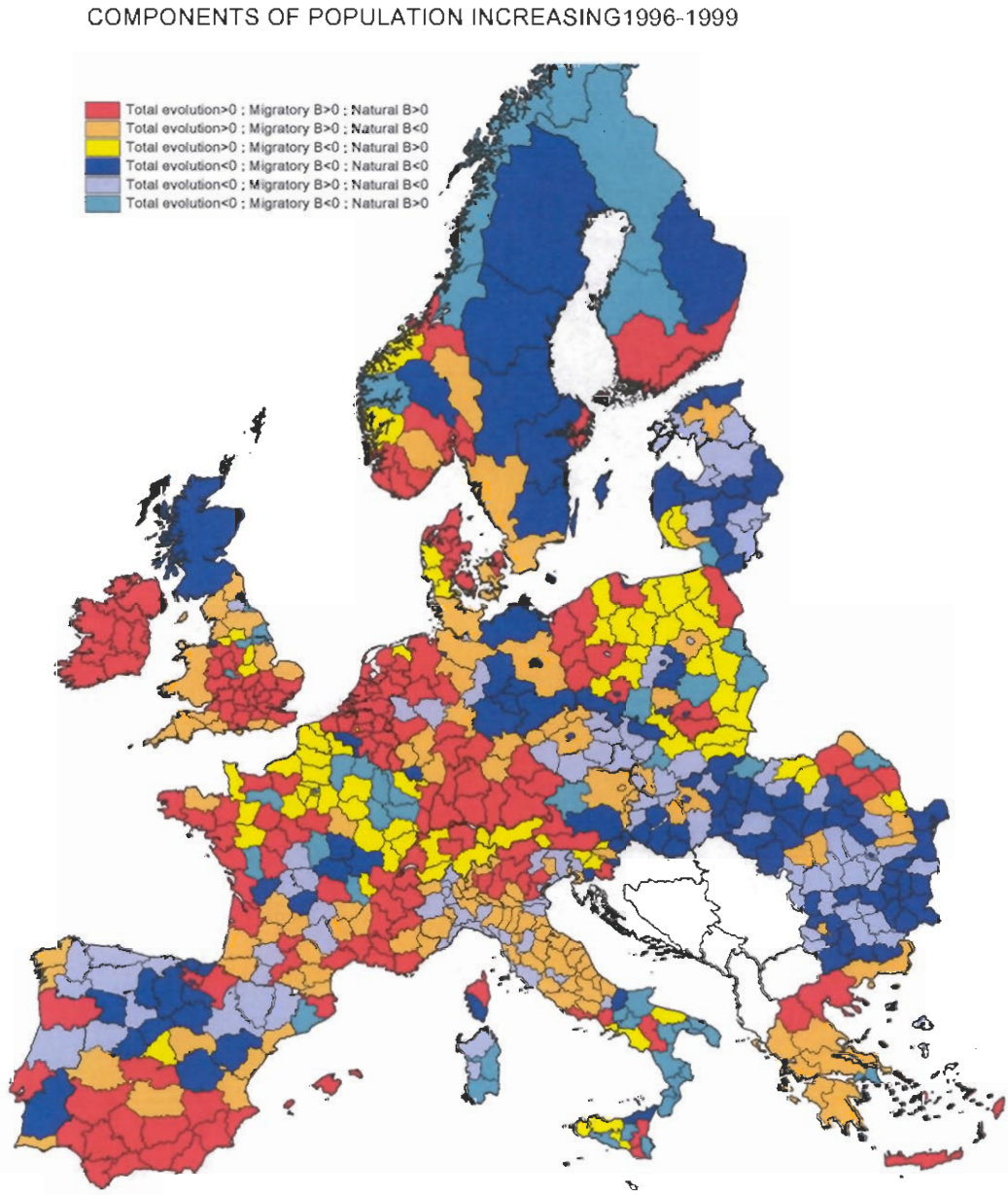


Figure 4.3 *Typology of depopulation areas 1996-1999*

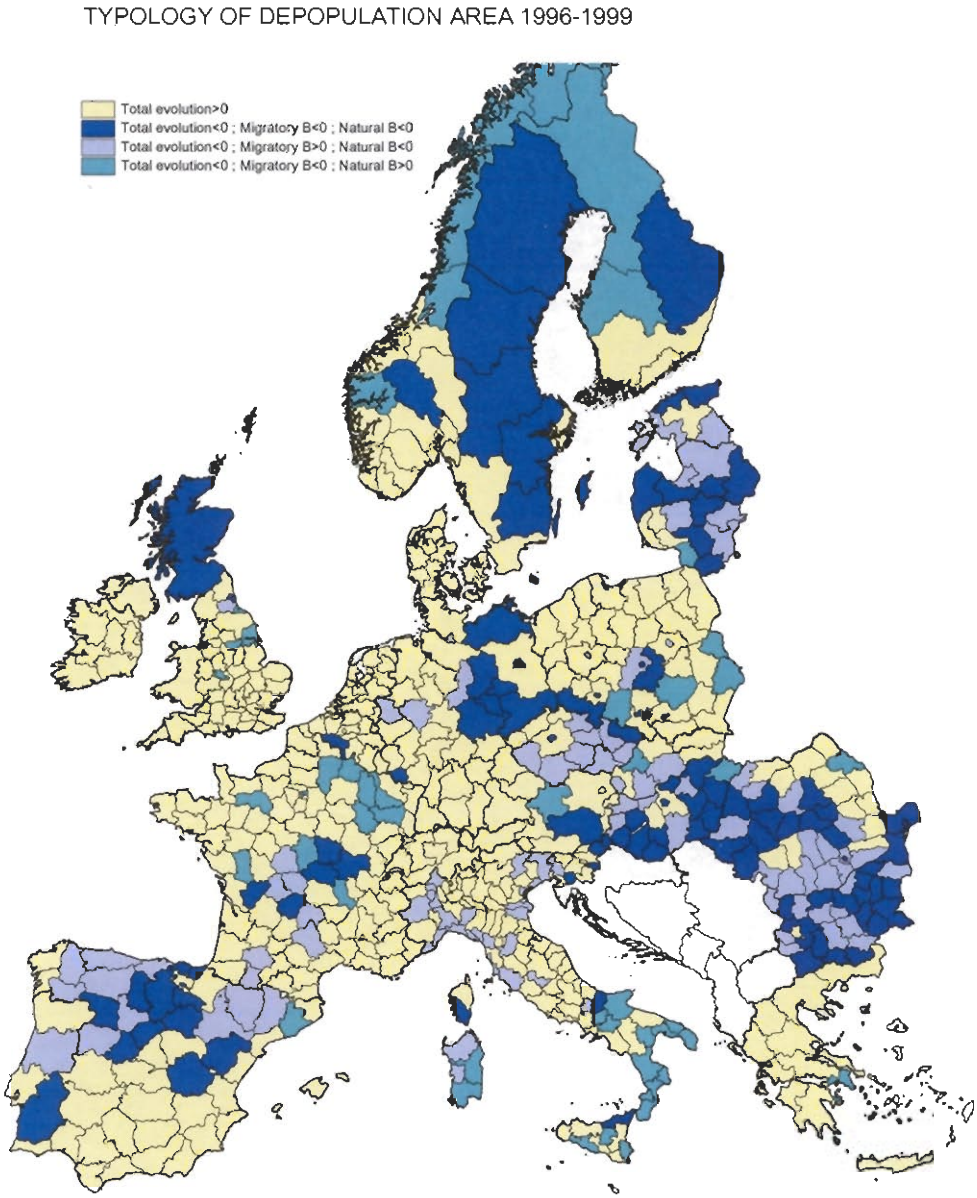


Figure 4.4 *Percent total population change 1980-1990 and 1990-2000. NUTS 3 level. France and Spain*

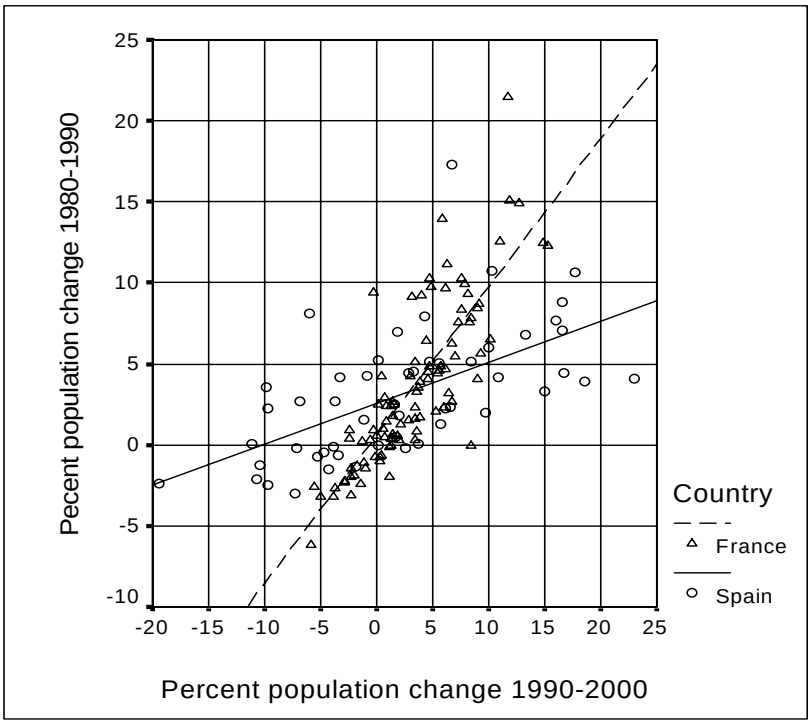


Figure 4.5 *Percent natural population change 1980-1990 and 1990-2000. NUTS 3 level. France and Spain*

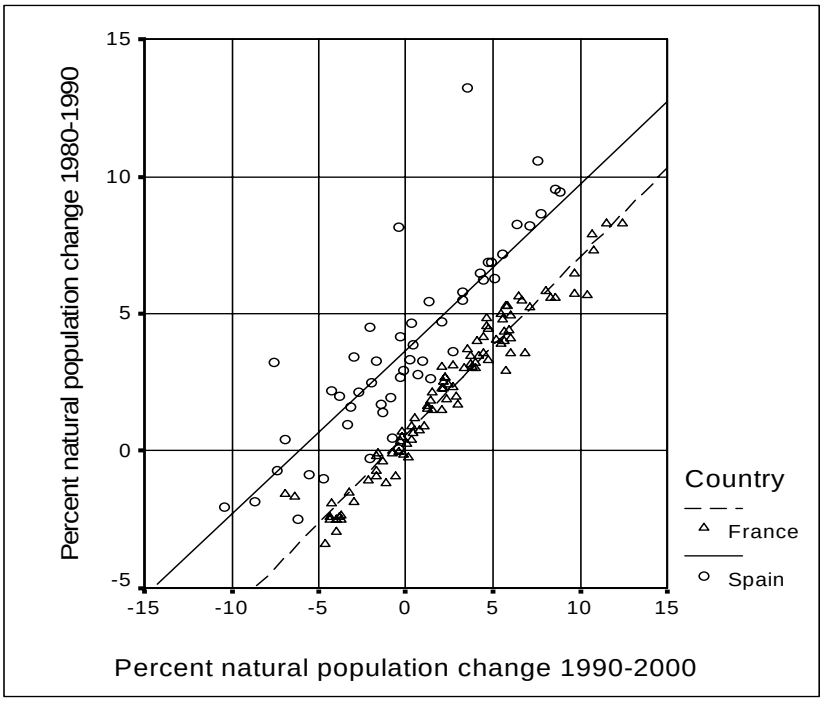


Figure 4.6 *Percent net migration 1980-1990 and 1990-2000. NUTS 3 level. France and Spain*

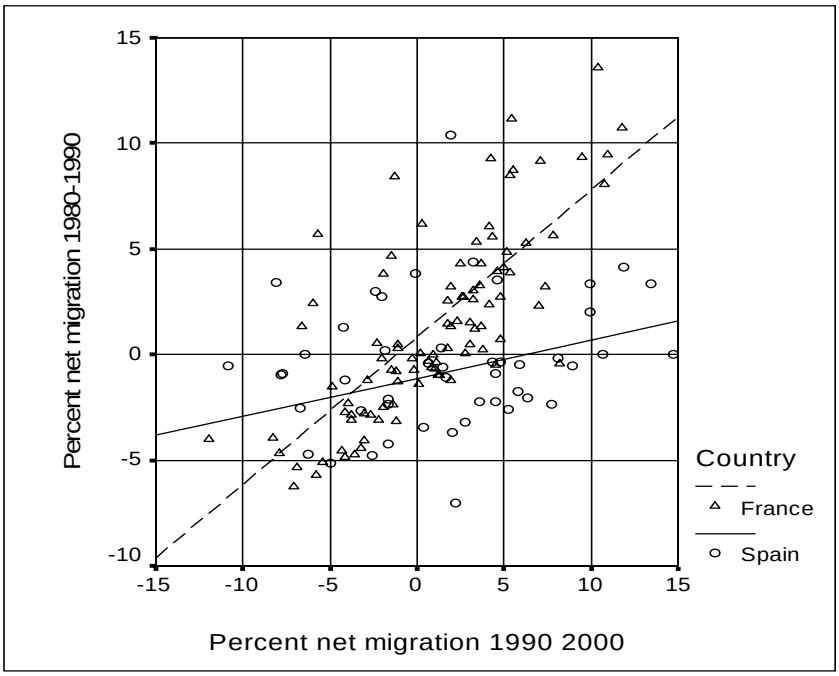


Figure 4.7 *Percent natural population change and percent net migration 1980-1990. NUTS 3 level. France and Spain*

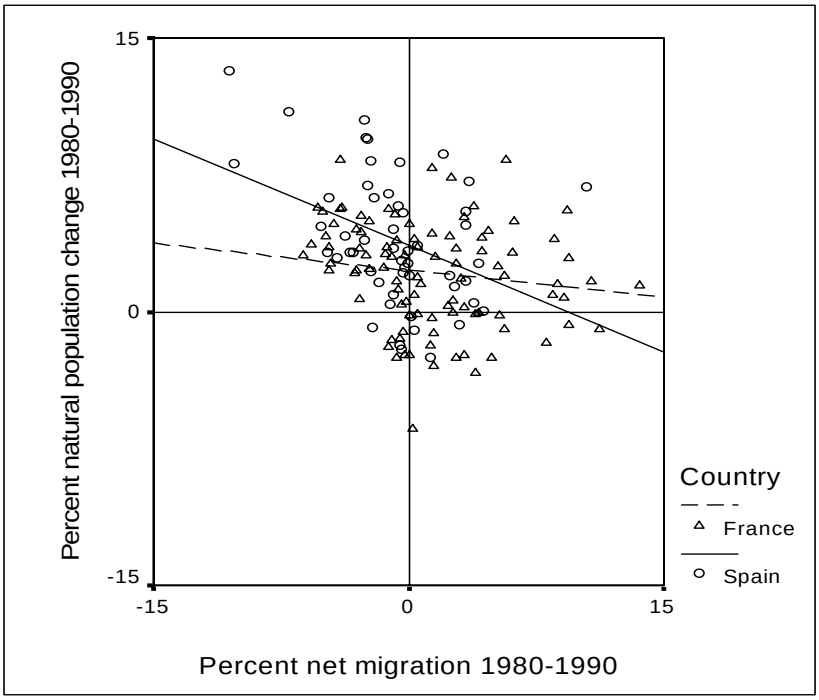


Figure 4.8 *Percent natural population change and percent net migration 1990-2000. NUTS 3 level. France and Spain*

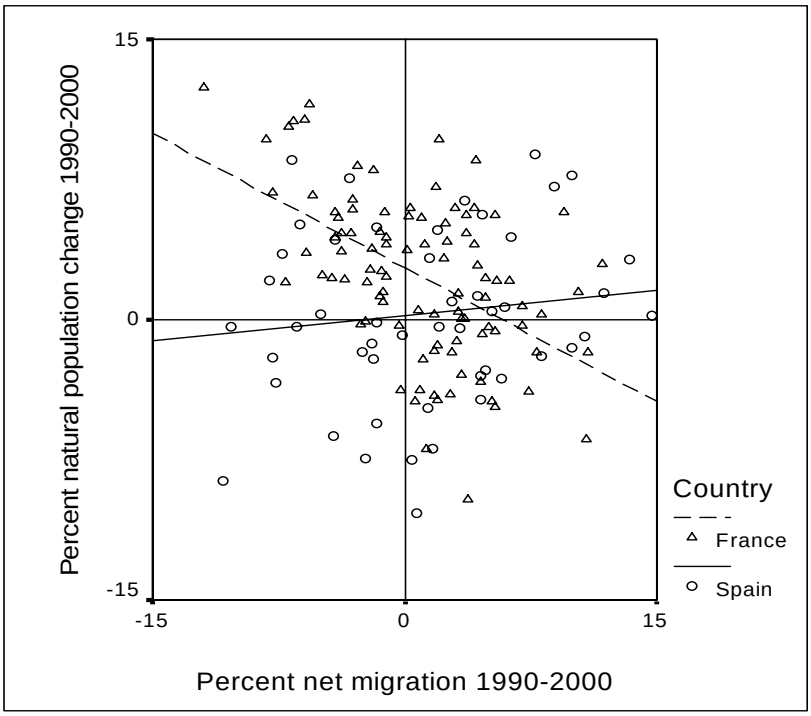
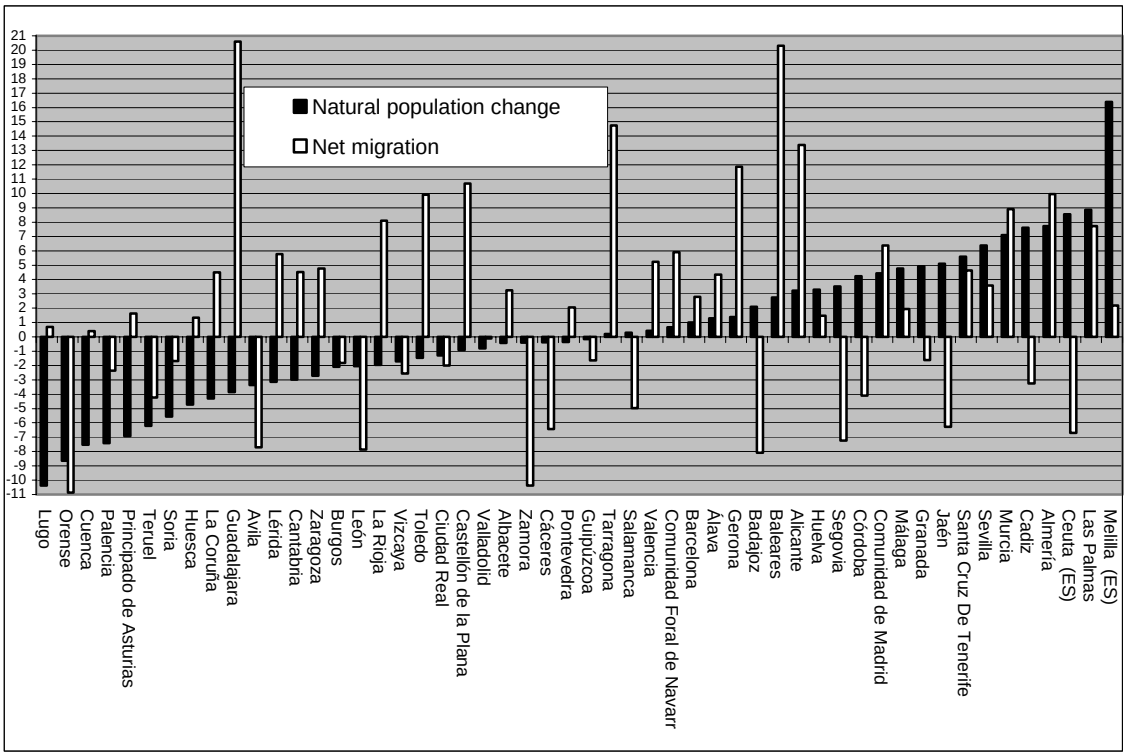


Figure 4.9 *Natural population change and net migration 1990-2000. Percent of total population 1990. NUTS 3 regions in Spain.*



4.2.2 Typology based on indicators at different territorial scales

The logic behind this typological sketch – displayed in two maps below – is that the recent (short-term: 1995-1999, total population change) demographic development of a smaller territorial unit may have different interpretations according to demographic development characteristics of the larger region of which it is a part, and even the demographic situation of the nation as a whole. In our approach the NUTS 3 level represents the smaller territorial units and the NUTS 2 level represents the larger regions. The national Total Fertility Rates (TFR) may indicate dramatically different national demographic scenarios (cf. Chesnais 2000, op.cit.) and regional-demographic dynamics, and therefore represent important frame conditions for determining prospective regional demographic change. This indicator has therefore been given some weight in the typological approach.

The approach is "hierarchical" in the sense that population change in small territorial units is "weighted" by the population change situation of the larger region, and in its turn by the national demographic prospects (assuming no migration), indicated by the Total Fertility Rate. Total Fertility Rates at sub-national territorial levels are very hard to come by, and are also relatively unstable figures. Some effort will be made to estimate TFR or a similar indicator at the NUTS 2 level, however (cf. WP 2). The logic is illustrated in the figure 4.5.

Figure 4.5 *Total Fertility Rate and recent population decline. NUTS 2, NUTS 3.*

NATIONAL	**NUTS 2-regions**	**NUTS 3-units**	**NUMBER OF NUTS 3-units**	**Code**
Total Fertility Rate	Recent population decline	Recent population decline	1995-1999 "Europe 29" (excl. CY & MT)	
<1,3 (Extremely low)	Change rate <0 or share of pop. in declining units >25%	Change rate <0	**122**	111
		ELSE	46	112
	ELSE	Change rate <0	**6**	121
		ELSE	65	122
1,3 – 1,5 (Very low)	Change rate <0 or share of pop. in declining units >25%	Change rate <0	**213**	211
		ELSE	155	212
	ELSE	Change rate <0	**45**	221
		ELSE	295	222
>1,5 (<1,9) (Low)	Change rate <0 or share of pop. in declining units >25%	Change rate <0	**78**	311
		ELSE	61	312
	ELSE	Change rate <0	**15**	321
		ELSE	255	322

The typological exercise may take different paths depending on the relative weights assigned to the influence of the different hierarchical levels. Below, two slightly different examples are given, however both giving a certain emphasis to the national "frame" indicator. The typological sketches are schematically presented, followed by one map for each preliminary typology:

Figure 4.6 *Preliminary typology, alternative 1 (based on direct indicators of "depopulation")*

CODE, composit indicator ("typology") of "depopulation"	TERRITORIAL LEVEL/Indicator			Code, cf. scheme above
	NATION Total Fertility Rate 1999	NUTS 2 Recent population change/share of population in declining NUTS 3 units >25% of population in NUTS 2 region (1995-1999)	NUTS 3 Recent population change (1995-1999)	
1 (Very strong depopulation)	Extremely low	Decline	Decline	111
2 (Strong depopulation)	Very low	Decline	Decline	211
3 (Depopulation)	Extremely low	Decline	Not decline	112
	Extremely low	Not decline	Decline	121
	Very low	Decline	Not decline	212
	Very low	Not decline	Decline	221
4 (Possible depopulation	Low	Decline	Decline	311
	Low	Decline	Not decline	312
	Low	Not decline	Decline	321
5 (No depopulation)	Extremely low	Not decline	Not decline	122
	Very low	Not decline	Not decline	222
	Low	Not decline	Not decline	322

Figure 4.7 *Preliminary typology, alternative 2 (Based on direct indicators of "depopulation")*

CODE, composit indicator ("typo-logy")	TERRITORIAL LEVEL/Indicator			Code, cf. scheme above
	NATION Total Fertility Rate 1999	NUTS 2 Recent population change/share of population in declining NUTS 3 units > 25% of NUTS 2 population (1995-1999)	NUTS 3 Recent population change (1995-1999)	
1 (Depopulation 1)	Extremely low	Decline	Decline	111
2 (Depopulation 2)	Very low	Decline	Decline	211
3 (Depopulation 3)	Extremely low	Decline	Not decline	112
	Extremely low	Not decline	Decline	121
	Very low	Decline	Not decline	212
	Very low	Not decline	Decline	221
	Low	Decline	Decline	311
4 (No depopula-tion)	Extremely low	Not decline	Not decline	122
	Very low	Not decline	Not decline	222
	Low	Decline	Not decline	312
	Low	Not decline	Decline	321
	Low	Not decline	Not decline	322

Figure 4.8 *Direct indicator of "depopulation".*

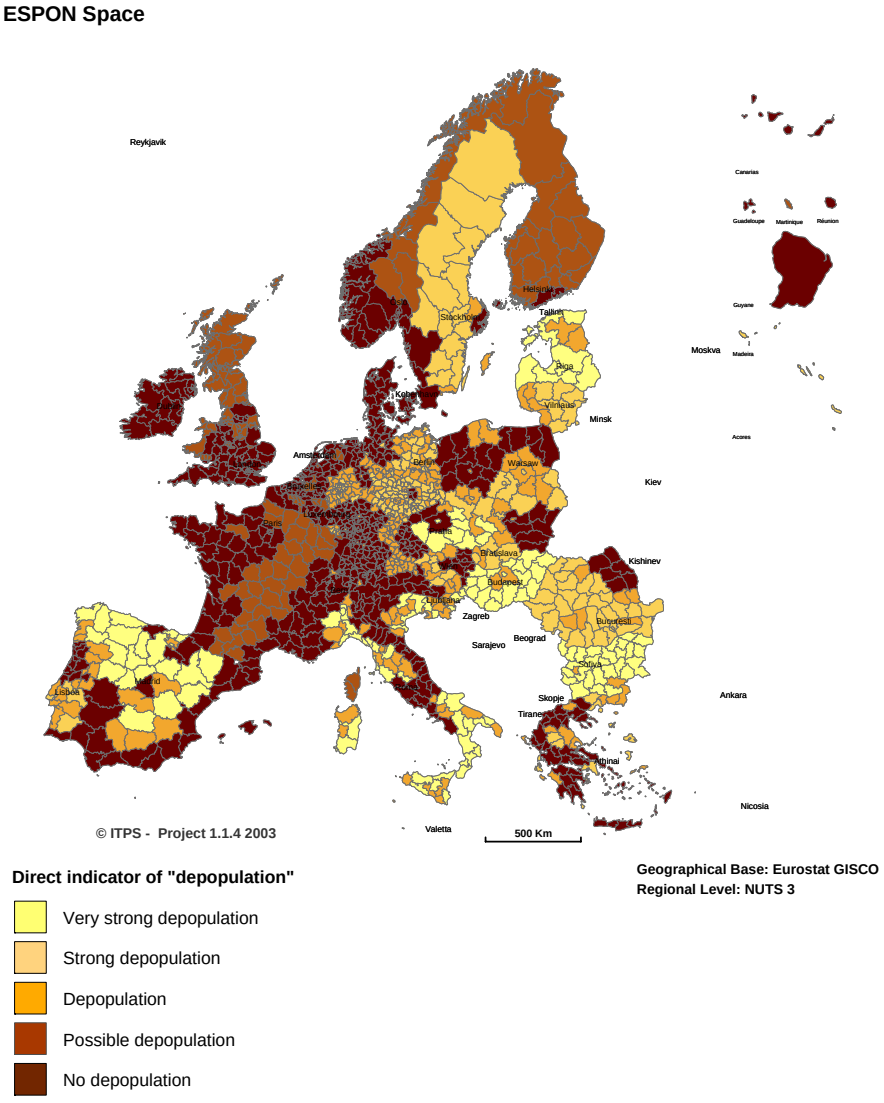
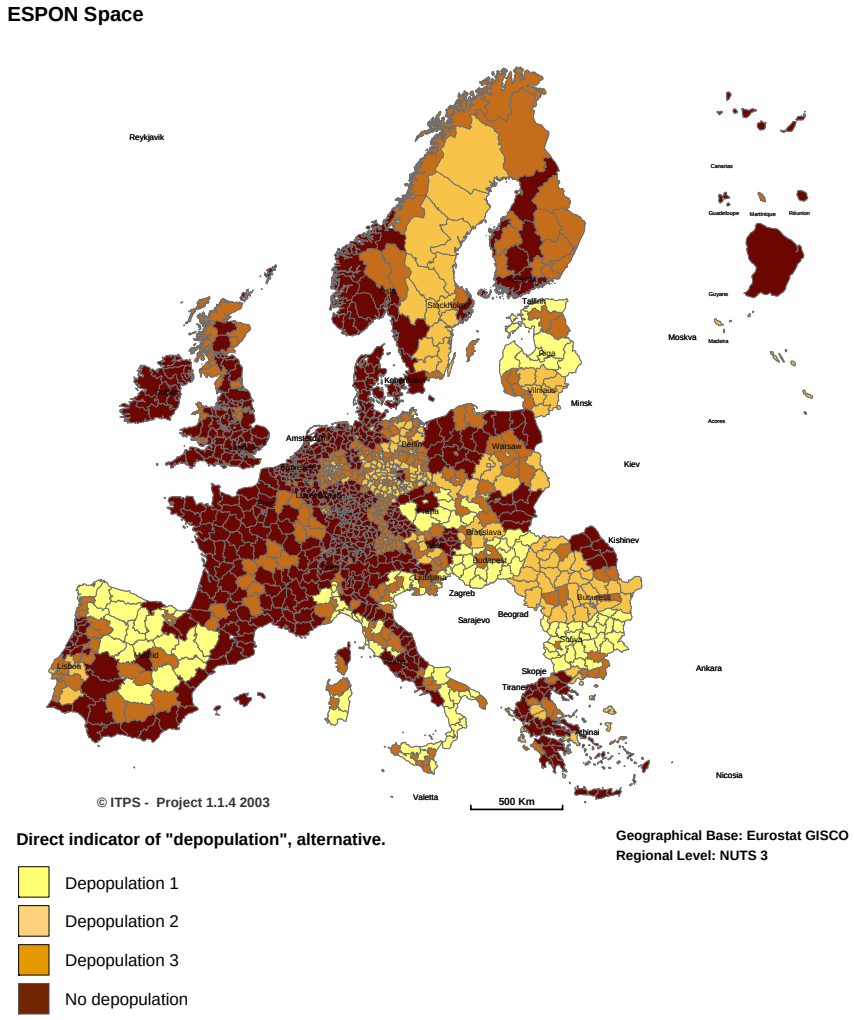


Figure 4.9 *Direct indicator of "depopulation", alternative*



Countries with “Extremely low” Total Fertility Rates in “Europe 29” (except Cyprus and Malta) comprise 239 NUTS 3 units. 708 NUTS 3 units are within countries with “Very low” fertility, and 379 units are located in “Low” fertility countries. The share of NUTS 3 units with *recent population decline* within declining larger regions, range from 51 percent among units in “Extremely Low” fertility countries, via 30 percent in “Very low” fertility countries, to 21 percent in “Low” fertility countries. Regions with *growing* units within growing regions range from 27 percent, via 48 percent, to 63 percent, respectively. The countries with “Extremely low” fertility rates are Spain, Italy, Bulgaria, Slovenia, Hungary, The Czech Republic, Estonia and Latvia. Within these countries wide “depopulation” areas exist according to our indicators, and in a few of them regional polarization seems to be the case, declining and growing areas existing side by side (for instance Spain and Italy).

In the candidate countries one cannot speak of depopulation in a strict sense, though population decline is a marked process. Actual depopulation might occur in some of the high mountain areas of Romania and Bulgaria, however.

In Hungary the distribution of population (apart from the concentration in the Capital Region) is relatively even, and so is the decrease in the number of inhabitants. Comparison of maps at the NUTS2, NUTS3, NUTS4 and NUTS5 area units reveals that the higher the level of analysis is, the more even is the process of decline. Only a most detailed map (of NUTS5 units) will show variations particularly due to the development of urban regions and the stagnation of rural regions.

In Scandinavia, Swedish territorial units are deviant. At this territorial scale most of the Swedish units will have to be characterized as “depopulation” areas, i.e. they are declining units within declining larger regions in a country with a “Very low” below-replacement fertility level.

According to the first map of “direct indicator of depopulation” no country with low total fertility rate has any region with depopulation. In Ireland and Denmark all regions are in the no depopulation category, while in France, the United Kingdom, the Be-Ne-Lux-countries, in Finland and Norway, parts of the countries are also in the possible depopulation category.

All the countries with very low fertility rate (Sweden, Germany, Switzerland, Austria, Portugal, Slovakia, Greece, Romania, Poland and Lithuania) have at least some depopulation regions, but no one (per definition) with very strong depopulation. Every region in Lithuania is in the depopulation categories. With the exception of the territories around Leipzig, the whole of the former GDR shows depopulation or strong depopulation, as does the Ruhr area, and territories close to the former GDR border from Lower Saxony to Bavaria.

Very strong depopulation is generally found in territories in the countries with extremely low total fertility rate, Spain, Italy, Slovenia, Bulgaria, Hungary, the Czech Republic, Latvia and Estonia. In the Baltic states, Hungary and Bulgaria, all regions are in one of the three depopulation categories. In Latvia, all the regions have very strong depopulation.

The second map (the alternative “direct indicator of depopulation”) show to a great extent the same pattern as the main “direct indicator of depopulation”, but especially a greater part of France, of the northern parts of the United Kingdom and of Finland falls within the no depopulation category.

Parts of northern Italy, parts of northern Spain and parts of Bulgaria are both found to have the highest level of relative depopulation (cf. the section on indirect/structural indicators below) and very strong depopulation according to the direct indicator. For most of Eastern Europe, there is a discrepancy between low degrees of relative depopulation (cf. below) and an often strong or very strong depopulation according to the direct indicator, even though we find a number of regions in Poland and in Romania that combine the lowest degree of relative depopulation and no depopulation according to the direct indicator. Parts of the UK, Germany, Northern Italy and Greece combine the highest degree of relative depopulation (cf. below) with no depopulation according to the direct indicator.

4.3 Indirect/structural indicators on degree/state of "depopulation"

Indirect indicators 1-7[11] may serve the purpose of mapping some important *structural aspects* of the type of enduring population stabilisation and decline frequently associated with depopulation. They indicate structural demographic effects of depopulation, as well as the demographic dynamics at work and probable policy relevant implications and the future demographic potential.

The most evident indicators of depopulation in the sense mentioned above are the (shrinking respective expanding) share of children and elderly people in the population (*cf. the first two maps below*). Similar indicators of relative depopulation – and highly policy-relevant, although controversial with regard to interpretation – are the so-called post-active dependency ratio and the ratio of young people to elderly people, and the indicator of an ageing "labour force" (cf. *the next three maps*). The maps are showing four categories, from "Europe 29" average or "better" (for instance a lower share of elderly people, a higher share of children, a lower dependency ratio etc., are characterised as "better"), to one standard deviation (STD) or more "worse" than the "Europe 29" average. *The sixth map* is based on the average score on these five (relatively highly correlated) indicators, intended as a rough general relative-state-of-depopulation indicator – and as another preliminary typological basis for a map of "the geography of depopulation" within the "Europe 29". The indicators are categorized in quartiles. *All the indicators and maps in this section are at territorial level NUTS 2.*

Eventually (*the last two maps*) two indirect indicators at NUTS 2 level (indicators 4 and 7)[12] may serve as supplementary pointers to future depopulation geography. The *first* of the last two maps indicates the potential for growth in an important demographic basis for natural population change (the age-group 20-29 years) inherent in the present regional demography (the size of the cohort that will be 20-29 years in 2020 in relation to the size of the cohort that was 20-29 years in 2000). The *second* of the last two maps indicates to what degree the potential loss of "labour power" due to retirement in the course of the next ten years, will be compensated by the entering in the labour market by the cohort leaving the educational system and reaching the economically active ages during the same period. Both indicators are blind to migration and mortality. They are related to "depopulation" as indicators on demographic-structural effects of depopulation dynamics, as well as on potential prospective depopulation process.

[11] Cf. section 2.3.2 "Indicators for indirect measurement of depopulation".
[12] Cf. section 2.3.2 "Indicators for indirect measurement of depopulation".

The first six maps – based on indirect/structural indicators (the sixth being the average score indicator) – are briefly and preliminary commented upon as follows:

1. The regions with the most negative deviations regarding *the share of children* ("Europe 29" average = 17.2 percent) are mostly located in northern and central Italy, northern Spain, east Germany and in Greece. On The British Isles and in the Nordic and the Baltic countries, all regions are on the European average or "better", as are most of Poland, Slovakia, Romania, Belgium and the Netherlands. The East German case is related to a rapid fertility decline after the reunification of Germany and migration to former West Germany. For both the Italian and Greek regions with a particularly difficult position according to this indicator we must probably seek the explanations in previous demographic occurrences, as these regions generally have a strongly positive migratory balance, which greatly influences the population distribution by age groups. To some extent, this is also true for Northern Spain.
2. The regions with highest *share of persons above 65 years of age* are Spanish and Portuguese regions with low population density, much of northern and central Italy, and some parts of Greece, the United Kingdom and Sweden. The Italian regions are generally more densely populated than the other regions, and include many of that country's most important cities. Only tree regions within the former Eastern European countries are not included among regions on the "Europe 29" average or better ("Europe 29" average = 15.6 percent). There is little reason to assume that the same explanatory processes are at work in all these regions. This pattern is basically a result of changes in fertility levels and migration levels.
3. Very much the same picture is presented by the *post-active dependency ratio* ("Europe 29" average = 0.3) as for the population ageing. This should not be taken as an indication that the distribution of children is close to being the same as for the population 20-64 years of age. It rather means that this difference is not big enough to contribute significantly to changing the regional pattern when using a rather crude ratio. This is partly a result of the one group consisting of 20 cohorts, the other of 45.

Figure 4.10 *Share of children. Deviation from "Europe 29" average. Share of persons 0-14 years.2000*

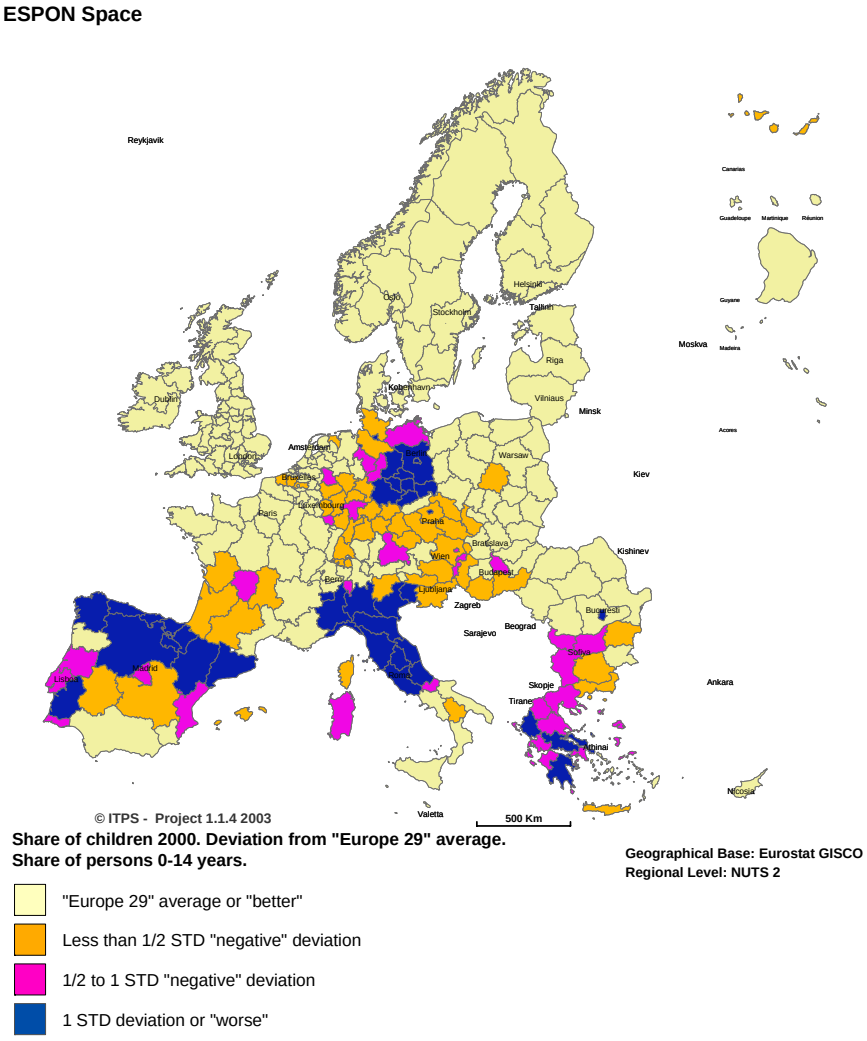


Figure 4.11 *Share of persons over 65 years of age. Deviation from "Europe 29" average.2000*

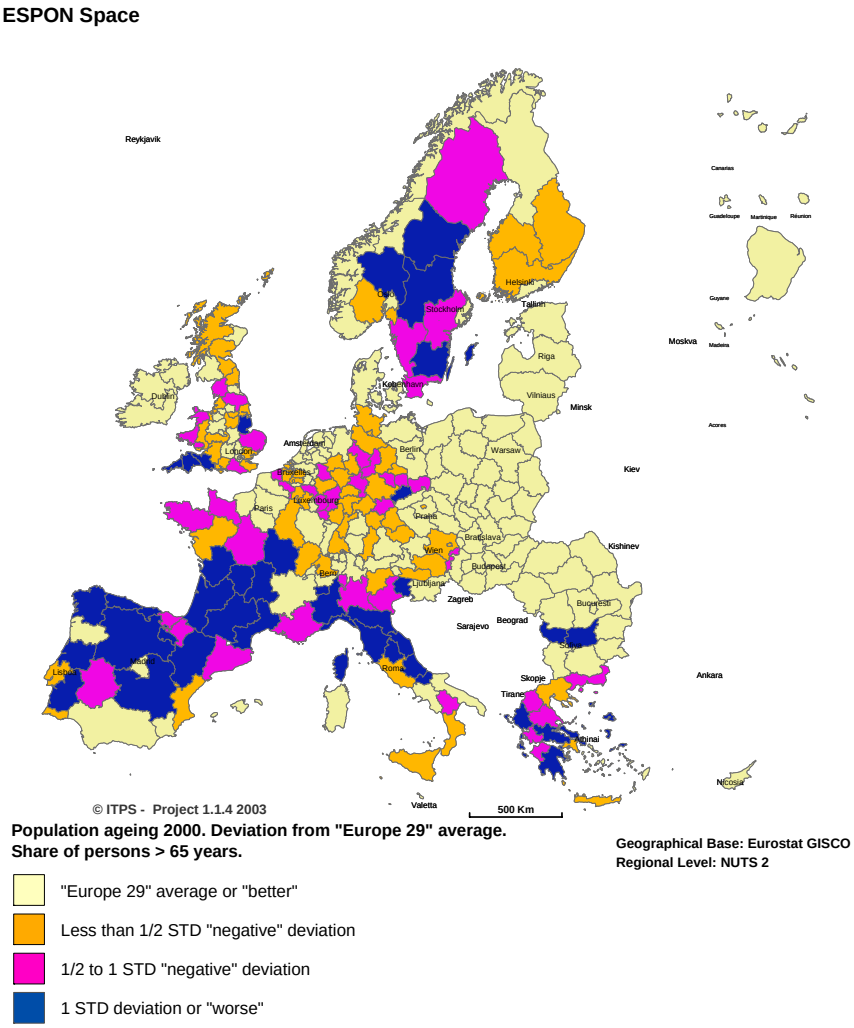


Figure 4.12 *Post-active Dependency ratio. Deviation from "Europe 29" average. 65+/20-64 years.2000*

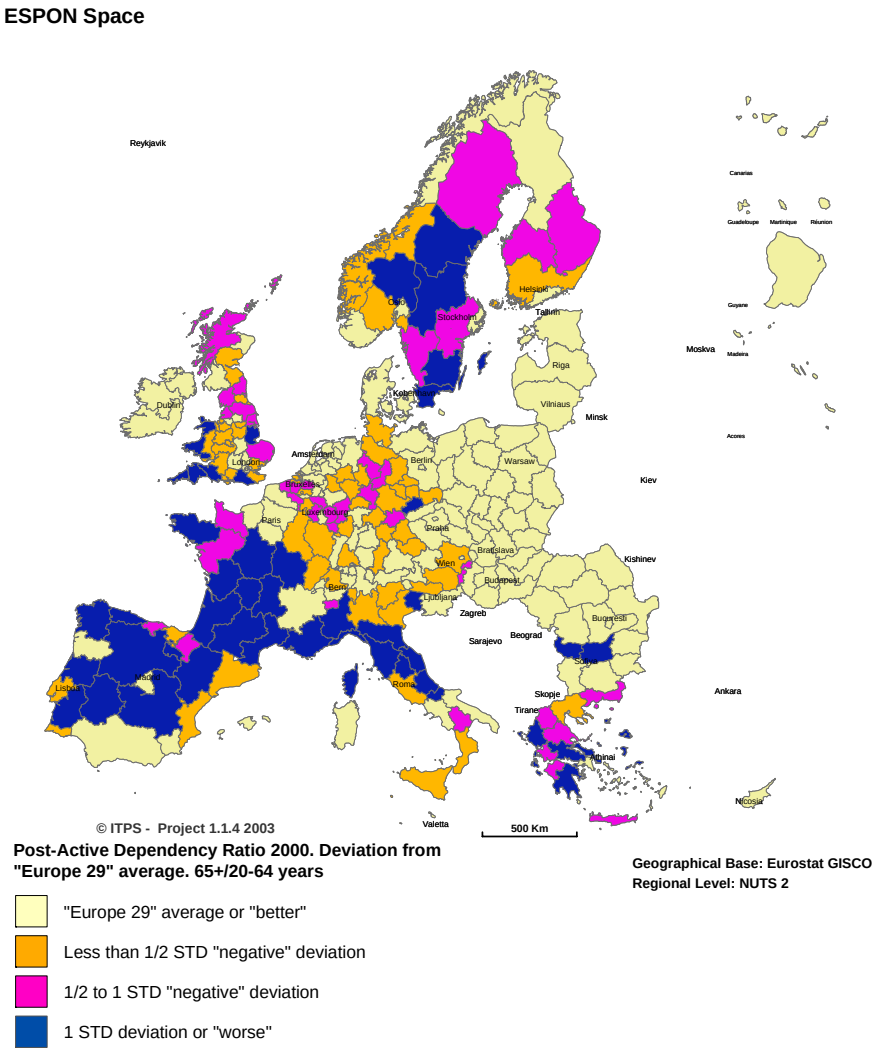


Figure 4.13 *Aged People vs. Youth. Deviation from "Europe 29" Average. 65+/15-24 years. 2000*

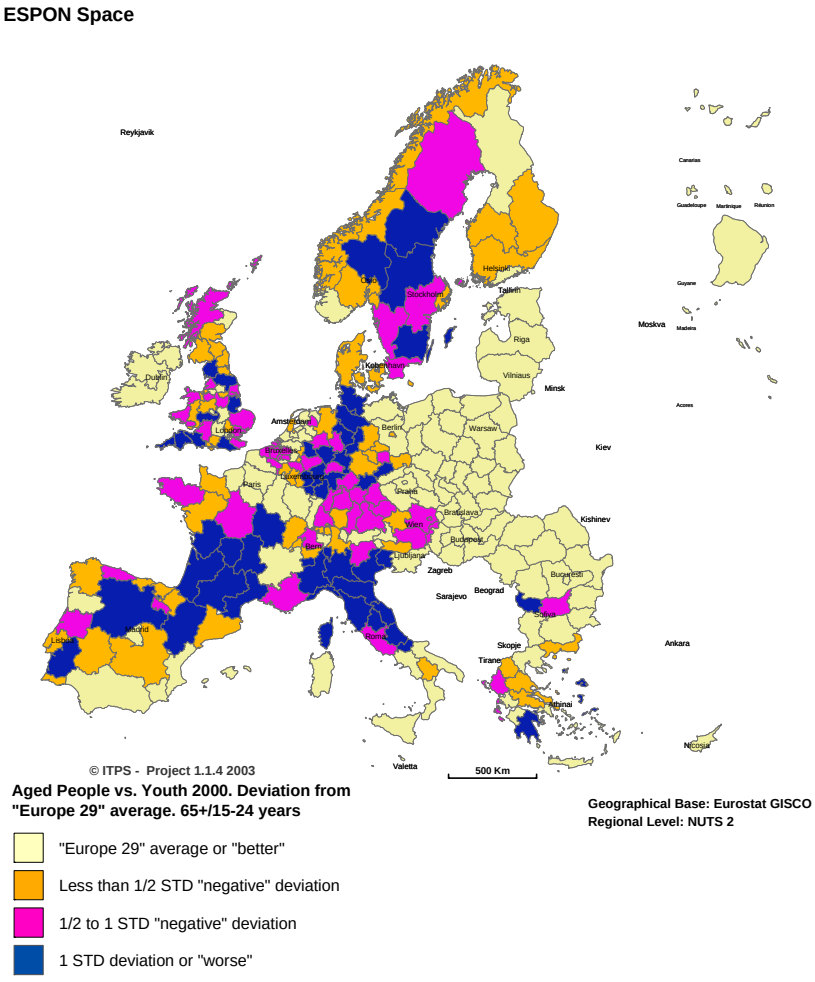


Figure 4.14 *Ageing Labour Force. Deviation from "Europe 29" average. 55-64/20-64 years. 2000*

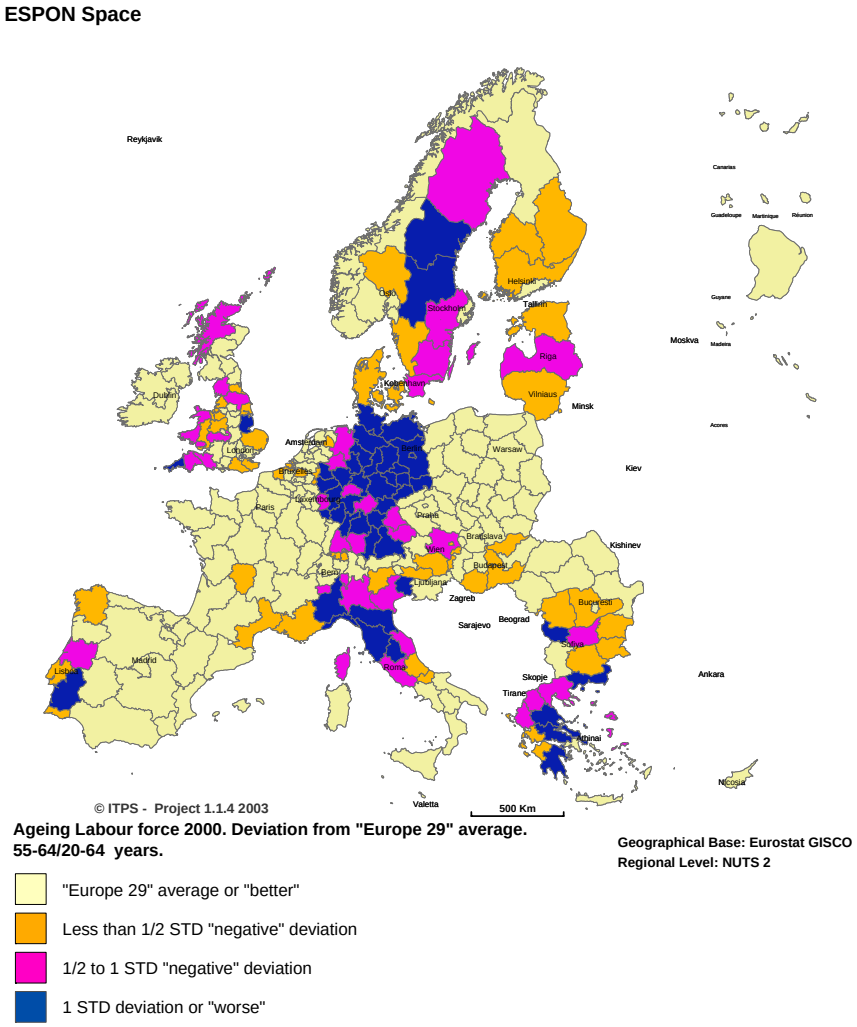


Figure 4.15 *Average score on indirect depopulation indicators. Deviation from "Europe* 29" average. Quartiles. 2000

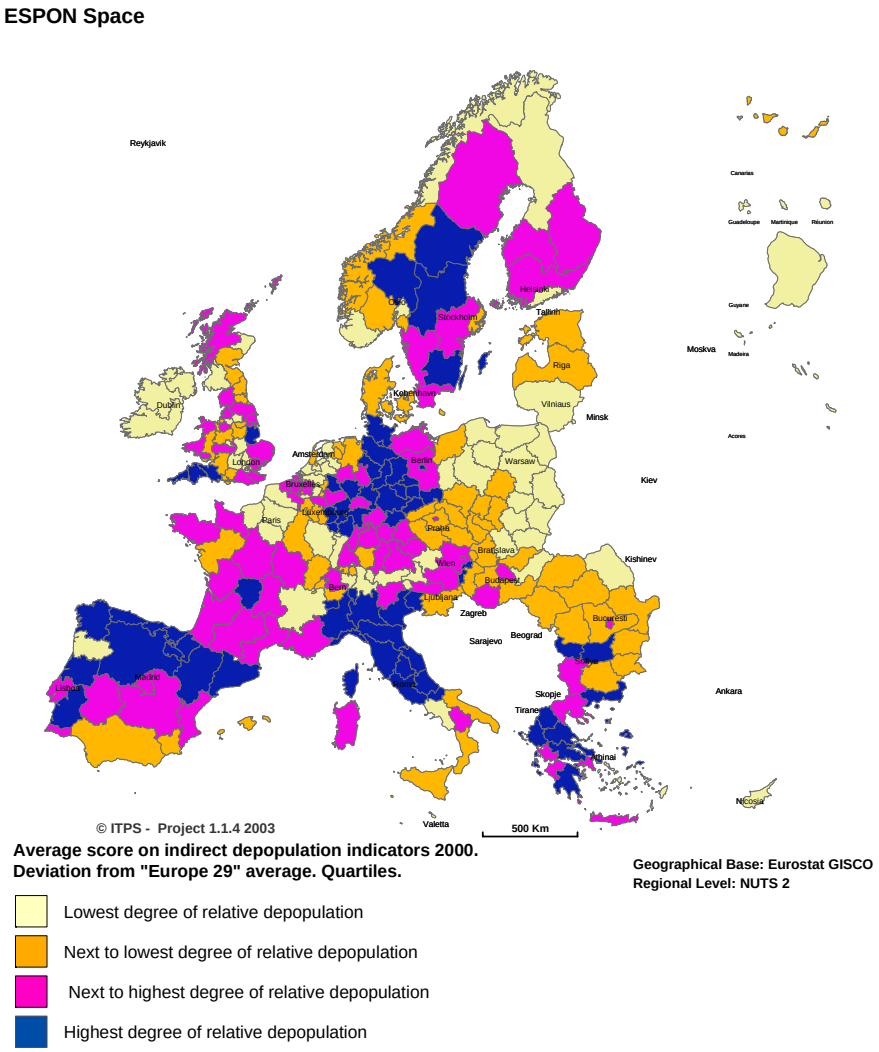


Figure 4.16 "Natural Growth Potential" 2000 (2020). Deviation from "Europe 29" average. Cohort 1991-2000/Cohort 1971-1980

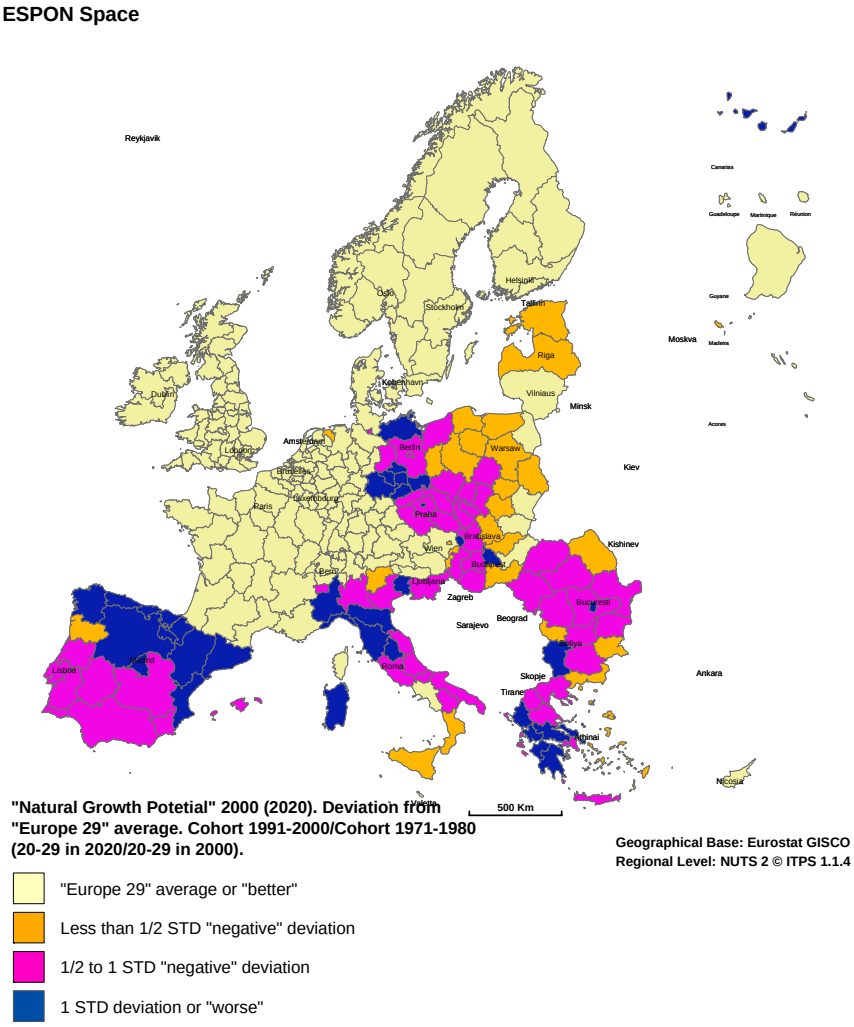
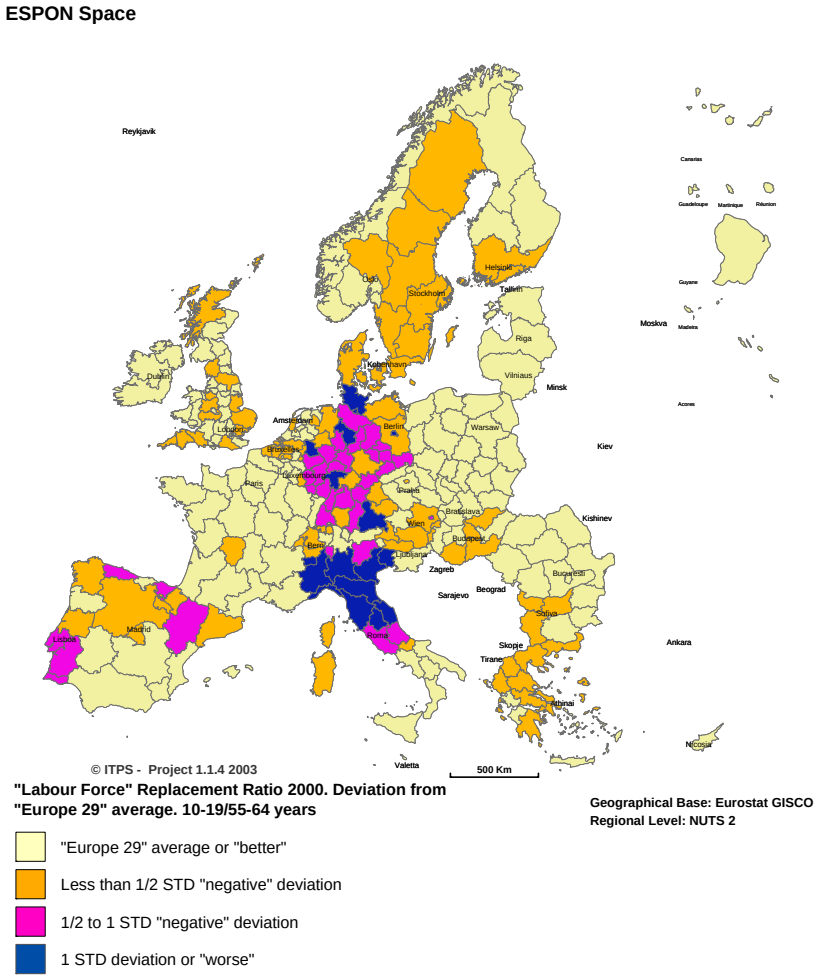


Figure 4.17 *"Labour Force" Replacement Ratio. Deviation from "Europe 29" average. 10-19/55-64 years. 2000*



4. When it comes *to the aging of the labour force* ("Europe 29" average = 17,7 percent), the northern Italian regions, most of Greece and most of Sweden are included in the two groups with at least ½ STD (standard deviation) "negative" deviations. All the German regions fall within these two groups as well. This means that the early reduction in fertility in Germany will be very marked in the age structure of the labour force by this time, opening a potential for migration from the candidate countries, where most regions have a lower share of the cohort near retirement age than the "Europe 29" average. France, with its very early reduction in fertility, has not an ageing labour force by this measure; neither has the Be-Ne-Lux countries, Spain, Ireland or Norway.

5. When looking at *average scores*, Ireland is the only country with a national subdivision that is completely within *the lowest degree of relative depopulation*. No regions in Germany, the Czech Republic, Bulgaria and Spain are within this category. When looking at the regional picture, a big discrepancy with the migratory balances of adults in the reproductive age groups is shown (cf. also WP 3). This means that for example the very same northern and central Italian regions that for decades have had a migratory surplus is in the category of *highest degree of relative depopulation*, we find no north-south dimension in the United Kingdom, and the regions of France with the most positive migratory balance are also among those with high degree of relative depopulation.

What these results demonstrate is basically that demographic scores at any given time are highly influenced by former demographic occurrences. Behind these figures are national and regional changes in fertility over almost a century, migration patterns and their changes within each country, international migration and its regional distribution in the countries, and implications of wars.

The last two maps based on indirect/structural indicator are briefly and preliminary commented upon as follows:

1. The first map demonstrates to a great extent the difference between the countries that since the 1970s have bettered their fertility rates, and those which have not. For the former Eastern European countries, it shows the reductions in fertility during the 1990s, which make the situation of Eastern Europe generally somewhat negative with regard to prospective change in the core age group of its "natural growth potential" ("Europe 29" average = 0,8). With the exception of the metropolitan regions of some of the Eastern European countries, however, the regions with the most "negative" deviation from the average are almost exclusively within the present EU, and in countries with very low or extremely low total fertility rate. As expected, much of northern Italy, the northern half of Spain and parts of Greece falls within this group, as does much of east Germany. For the northern Italian regions and for the Greek ones, these deviations will probably be modified by migration. Almost all European regions within the former west bloc north of the Alps and the Pyrenees are on the average or better.

2. There are comparatively few regions with a strong negative deviation for the "labour force" replacement ratio (10-19/55-64 years, "Europe 29" average = 1.2). More than one STD (standard deviation) "negative" deviation are only found in regions of northern Italy and scattered German regions. All regions of Germany and Sweden have a negative deviation. When most regions with a strong negative deviation on ageing labour force (cf. above) does not have a strong negative deviation for labour force replacement, this means that most of the regions with a large share of people in the 55-64 age group also have a relatively large group of 10-19 years old people.

5 Outlook – further steps

The tasks with highest priority in the next phases of the project will be (all within the realism of the time, financial and infrastructural resources available):

- To make an effort to fill as far as possible the data-gaps in order to make the typologies (and maps) somewhat closer to the ideal definition (cf. the section on data and data limitations above). Especially this concerns the temporal scope and the data on main components of demographic change.
- Investigate the possibility of moving from NUTS 2 to NUTS 3 level for some of the "indirect/structural" indicators of depopulation, and investigate to what degree this will have to compromise with the aim of regional coverage.
- General refinement/improvement of main preliminary typologies, investigate the possibility for developing better typologies.
- Integrate territorial information/typologies developed in other ESPON-Activities to search for principle explanatory factors to the observed territorial patterns of "depopulation" (cf. above).
- Select (on the basis of available information/preliminary typologies) a small number of example regions ("cases") for closer statistical analysis/analysis at finer regional scales (preferably NUTS 5 level), mainly based on data collected from national sources.
- Continuous refinement of maps/presentations