United Nations Development Programme

National Human Development Report
Poland 2012
Local and Regional Development

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UNDP Project Office in Poland
Warsaw 2013

HUMAN CAPITAL
NATIONAL COHESION STRATEGY

MINISTRY OF REGIONAL DEVELOPMENT

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Foreword

Ladies and Gentlemen,

I am very much pleased to give to you the „National Human Development Report. Local and Regional Development" – a first publication of this kind since the year 2007, when the United Nations Development Programme (UNDP) published the report entitled "Education For Labour. Human Development Report Poland 2007".

The present publication shows the results of an innovative and world-scale unique study of human development on a local level by using the Local Human Development Index (LHDI). The LHDI was constructed basing on the established and internationally acclaimed Human Development Index (HDI) methodology which measures social and economic development on a national level. An HDI study is performed annually for all countries of the world with the use of data provided by the UN system. The HDI study is presented each year in the annual UNDP Human Development Reports (HDR).

Developing and implementing the HDI as an instrument of policy evaluation on a local level (LHDI) was a project innovative on an international scale. It has also gained its place amongst the global trends in new methods of measuring development, such as the initiatives of the European Commission, the OECD and the UK National Statistics Office. Adjusting the HDI to local-level measurements was an ambitious step, not only because of the availability of data, but also because of the practical implementation of the index in policy evaluation. The social development level has been evaluated for all voivodeships and counties.

Research conducted with the LHDI will serve for a better linking of the goals of voivodeship- and local development strategies with country-wide targets while maintaining an adequate hierarchy. What is more, thanks to a faithful geographical depiction of the diversity in local development, we have created an instrument for effective planning, monitoring and evaluation of actions undertaken by central and local authorities.

The LHDI methodology used in Poland will be passed on to other countries interested in measuring human development on a regional level and evaluating the influence of particular policies on development. The annual LHDI study will be published as part of the National Human Development Report for which the LHDI methodology shall serve as the basis for the analysis of progressive trends, developing recommendations and will become an important instrument of public policy evaluation – especially of policies focused on the development of human and social capital, regional balanced growth and raising the quality of life.

I wish to thank the entire Team for their hard work which led to achieving ambitious goals connected to this publication and conducting the research necessary. First of all, I would like to acknowledge the author of the LHDI concept, Andrey Ivanov, PhD, with his team and Ben Slay, PhD – the manager of the regional poverty reduction practice for Europe and Central Asia in the UNDP Regional Office in Bratislava and UNDP's main economist for Europe and the Commonwealth of Independent States throughout 2008-2011. My big thanks for the great amounts of work and innovation in perceiving social development go to Jakub Rok, Adam Płoszaj, PhD, and Kamil Rakocy, who were the main authors of this report. I would also like to thank prof. E. Kotowska, Agnieszka Chłoń-Domińczak, PhD and prof. Tomasz Pank for their invaluable support. My special thanks go to Mr. Konrad Niklewicz, the former Undersecretary of State in the Ministry of Regional Development.

Without his unwavering stance and dedication, this report would never have been completed. I also thank Mr. Jerzy Kwieciński, the former Undersecretary of State in the Ministry of Regional Development and Waldemar Sługocki, PhD, former Undersecretary of State in the Ministry of Regional Development and currently Member of Parliament. I would like to express my thanks to the Central Statistical Office team and the Ministry of Regional Development team for their support and kindness. Special thanks go out to the President of the Central Statistical Office, Mr. Janusz Witkowski, for his great faith in the project, outstanding support and willingness to cooperate. I am very grateful to all representatives of local authorities involved in the project and especially to the pro-active representatives of the Offices of the Marshall of the following Voivodeships: Pomeranian, Lublin, Mazovian and Lower Silesian. I would like to thank prof. Franciszek Kubiczek, President of the Statistics Council for his support, precious comments and providing the opportunity to consult the report and methodology applied with great experts – members of the Statistics Council. You have contributed to creating this high-quality and innovative analysis. Last, but not least I would like to thank Piotr Arak, the Project Manager and coordinator of the project under which this report was written.

I wish you a pleasant read.

Kamil Wyszkowski,
Director of the UNDP Project Office Poland

Introduction

Since the publication of the first Human Development Index in 1990, a passionate debate on issues concerning human development has been going on globally. The Human Development Reports published annually by the United Nations Development Programme (UNDP) have had a major impact on the debate concerning social inequalities, sustainable development, prosperity, welfare and quantifying human development through indicators beyond merely economic ones. The last Polish "Report on Human Development. Education for Labour" from 2007 outlined the key dimensions of the problems encountered by graduates entering the labour market. Today, these problems still seem to be valid and are reflected in the present document as well as in the approach that underpins it.

The Human Development Index (HDI) is an important advocacy tool for increasing awareness of the problems which governments must address and for mobilizing the support for particular projects or initiatives. However, the practical application of the index beyond advocacy is often questioned. Generally speaking, its critique may be summarized in one question: "What does the comparison of the index ranks of particular countries tell us?" Despite the critique, the results of the HDI-based research may encourage governments not only to include non-economic goals in their policies, but also to support the debate on regional disparities.

Over time many prominent experts have contributed their ideas to the Human Development Reports and helped develop the HDI methodology. It seems the time has come to create a new measurement of local and regional human development that should be replicable in other countries and will be closely linked to public policy. For quite some time attempts to disaggregate the HDI at the regional level have been undertaken, but the methodology and data quality was not sufficient for such attempts to turn into policy relevant analyses. No attempt has been made to match and compare the human development relevant "expenditures" under particular policies with their "effects" or human development outcomes.

In 2009, the Polish government presented the growth of their citizens' quality of life[1] as its main objective for the coming years in the strategic report "Poland 2030. Development Challenges". The same objective was set in the Long-term Development Strategy for 2030. The index by which progress in achieving this objective is measured, on the one hand by the growth of GDP per capita, and on the other hand, the increase of social cohesion and the decrease of territorial disparities in social development as well as the magnitude civilizational leap of the society compared to other countries. The HDI is also one of the key indices for the medium-term development strategy 2020 and the Human Capital Development Strategy.

The UNDP Project Office together with the Ministry of Regional Development and the Warsaw School of Economics have launched a project on developing and implementing a new tool for measuring human development at the local level based on the HDI methodology.

The tool captures regional disparities. The traditional national-level HDI "does not see" the specifics of regions and the inequalities between them. Human development is not equally spread

1 In the present project, the division of social indices into human development and the quality of life reflects the division into an objective description of the human condition (human development) and its psychological meaning defined by an individual's subjective evaluation (quality of life). The latter category shall not be the subject of the present analysis.

across the country in all counties – in some places people live longer, while in others they are better-educated.

For the HDI to become a public policy relevant tool, it must contain more substantive information than just a ranking. Thus, a comparability of data at a county-level is necessary. The national-level HDI shows the position of a given country in comparison to other countries – something interesting as a matter of curiosity but with no practical application for the state, regional and local policies beyond advocacy. When applied to the regional and local levels, the HDI approach may outline how one administrative unit differs from another and may reveal individual regions' strengths and weaknesses. It could also present how their results were achieved, what are the targets of the long-term development policy and, finally, what conclusions the country's administration should draw from them, both centrally and locally.

This analysis shows that the territorial disaggregation of the HDI does not boil down to a simple recalculation of the same data at a lower territorial unit in order to receive a territorial unit ranking; instead, this approach takes into consideration the human development trade-offs. It might, for example, be the case that good economic results have been gained at the expense of health, or that educational opportunities might compensate for lags in other domains.

A potential effect of using this measurement may be that regional policy will be based even more strongly on the documented knowledge of analysed phenomena (so-called evidence-based policy) and that its results will be subject to SMART evaluation. It is important especially in the context of Polish EU-membership and the Union's support through the Structural Funds - aimed at supporting member states in reducing the disparities between regions (and within them). **As part of the strategic system of supervising development goals in order to increase economic and social cohesion, the Local Human Development Index may become the basic instrument for a better planning, allocation, supervision and control of how the funds are spent and implemented through the year 2020.**

In the present report, we propose a "three-dimensional" LHDI, which reflects the philosophy of the global HDI. The LHDI differs from the HDI in the particular sub-indices used and in the different measurements available in public statistics or administrative sources. We also propose a group of context indicators (not included in the LHDI) which reflect other important dimensions of Human Development (HD).

We also tried to conduct a retrospective LHDI analysis. However, the timeframe had to be shortened due to limited data availability; only the years 2007-2010[2] were covered. We hope that the next issue of this report will include a reconstruction of the synthetic indices using new sources of data and will better adjust their structure for measuring human development at the local level.

The basic unit of the human development analysis is the county, and is based on its proximity to public health services, the labour market and secondary and higher education. A municipality-level analysis may seem more valuable. However, it would entail major problems such as the availability of relevant data for some indicators at this level and in cases where data are available, the small frequencies would inhibit statistical power.

2 Data on the expected lifespan is available from 2007 onwards. More details to be found in later sections of the reports.

The approach adopted in the present report allows comparing changes over time and relating human development to current public policies, decision-making, changes in the economic environment, etc. A great advantage of this approach is the possibility of comparing changes in spending of EU funds over fiscal years 2007 – 2010. This approach may be treated as an ex-post evaluation – an assessment of the efficiency, adequacy and the results of public policies over a period of time. The aim is to identify the factors of success and failure. Identifying them will help in evaluating the results in terms of sustainability and would also help draw conclusions which may impact the implementation of other projects and programmes by the Ministry of Regional Development or other entities active in the regional policy of the State.

The availability and quality of data remains the greatest challenge. Building and monitoring a dynamic index requires up-to-date data, comparable over different periods and, most importantly, reflecting both human development related expenditures and outcomes. The authors could not do much about the lack of high-quality local-level data and the long periods necessary to obtain them. One of the first objectives of this project was to systematise the existing sources of data and evaluate the feasibility of such a comparative analysis.

Based on the data available in public statistics and administrative registries, certain expenditures on public policies impact the level of human development on the respective administrative unit. The fourth chapter describes the correlation between expenditures and the policy outcomes, with human development being the dependent variable and different costs of public policies such as infrastructure, capital, etc. viewed in the three dimensions of the LHDI as the independent variables.

We also had to strike a compromise that is typical for any attempt at creating a new measure. Our aim was to achieve balance between the complexity of the index, its legibility and transparency for the end-user. The present report is addressed, on the one hand, to practitioners – local government politicians or central administration clerks, and, on the other hand, to the wider audience who may use the diagnostic value of the index to exert pressure on local and central authorities in order to influence the political agenda to bring them closer to a human development paradigm. We hope that this approach will be used and will be further developed in the future. It may also serve as an in-depth quantitative analysis to fully examine the factors that determine human development level in a particular region.

The "National Human Development Report Poland 2012.
Local and Regional Development" Authors Team,
Poland 2012

Summary

This report presents the results of a HDI-mapping at the local level, conducted for the first time in Poland. Data making possible the estimation of the human development level were aggregated to the county level, thus creating a detailed map of Poland's human development. This report, conducted by the UNDP and commissioned by the Ministry of Regional Development, is the first of its kind in Europe and is unprecedented in a number of ways.

The Human Development Index was created in 1990 as a UNDP initiative to raise the awareness of the challenges which countries at different stages of development were facing and to mobilise public support for policies aimed at developing the quality of life at both the national and international levels. The HDI tells a lot about the development potential of a country and points out key issues which should be supported by the state: living conditions, level of education and the citizens' health.

In this report the HDI has been adapted to the county level. Thus, the LHDI (Local Human Development Index) has been calculated, showing how (and why) particular administrative units position themselves vis-à-vis the other, what their strengths and weaknesses are and which path of development they have chosen. The purpose of adapting the HDI to the county and voivodeship (regional) level is not to create a ranking of "better" and "worse" territorial units, but to show the factors that make certain counties better in regards to their LHDI values. The report shows what these factors actually are good economic performance, people's health or a high degree of education with achievements in individual domains often compensating for gaps in the other two. Additionally, changes over time of growth rates or index values for the period 2007-2010 (the feasible timeframe of data availability) can be calculated for all territorial units. Such an approach allows the decision-makers to take appropriate pre-emptive steps or, if need be, to maintain the current status quo. Taking into account Poland's EU membership and support from structural funds, which aim at diminishing the regional disparities, the conducted research may also outline what impact the EU funds have had on human development in Poland.

Public authorities are closer to the standards of good governance when their decision making is based on established knowledge and critical data analysis (evidence-based policy).

In order to reflect the relationship between development inputs and development outcomes, the Local Human Development Index was structured accordingly, with indices for both categories (inputs and outcomes). For assessing the policy Inputs, a Local Human Development Inputs Index or $LHDI_{PI}$ was formulated. It follows the three traditional human development dimensions (health, knowledge and citizen welfare) and measures the expenditures of public policies relevant for the progress in each area and dimension of the LHDI. At the next stage the inputs for individual dimensions were compared to the human development outcomes at local level.

The research conducted by the UNDP was based on 2010 data from public statistics and administrative sources (i.e. the Ministry of Finance). For comparative reasons data from 2007 is also included in the report to capture any possible changes in the trends.

Main conclusions of the report

The conducted research made possible the conclusions below. Some of them are in line with the conclusions from other analyses and surveys, while some may be surprising and may defy stereotypical views, often cited in the public debate.

1. In Poland, the highest level of human development is found in metropolises, big cities and the surrounding areas.

2. The lowest level of human development is found in rural counties. Most of the areas with the lowest LHDI are part of the former Russian annexation which might be related to long-lasting effects (up to hundreds of years) of the spatial disparities.

3. The level of human development does not solely depend on the welfare and income of the county's inhabitants. The human capital level, which depends mostly on education, is of great importance. The state of health in Poland defines a sharp regional divide – its' highest level can be found in Southeast Poland, while the lowest is in the central parts of the country. The situation is at its worst in the rural and farming counties inhabited by aging populations. Parts of such areas are changing due to suburbanisation, the influx of new inhabitants who commute to the city nearby, which seems to result in improvements to the health indicators. Both the relatively higher welfare of these people and the better access to health services they have in the city where they work contribute to this. In wealthier areas, mostly in major cities, the factors determining the state of health are changing. Factors like the level of social cohesion, quality of the environment and the level of stress are gaining in significance.

4. Digital inclusion is not strictly related to the level of human development in a given region. It means that the poorer parts of Poland also actively use the Internet and that a part of society has the skills to properly use it. Previous studies in this area confirm that access to the Internet may enhance development opportunities at a national and international level for a given region and its citizens.

5. Differences in the social and economic development of regions are inevitable and rooted in long-lasting processes. The time-frame feasible in the analysis (2007-2010) does not allow us to say whether structural policy expenditures by themselves are able to secure a balanced growth at the regional level.

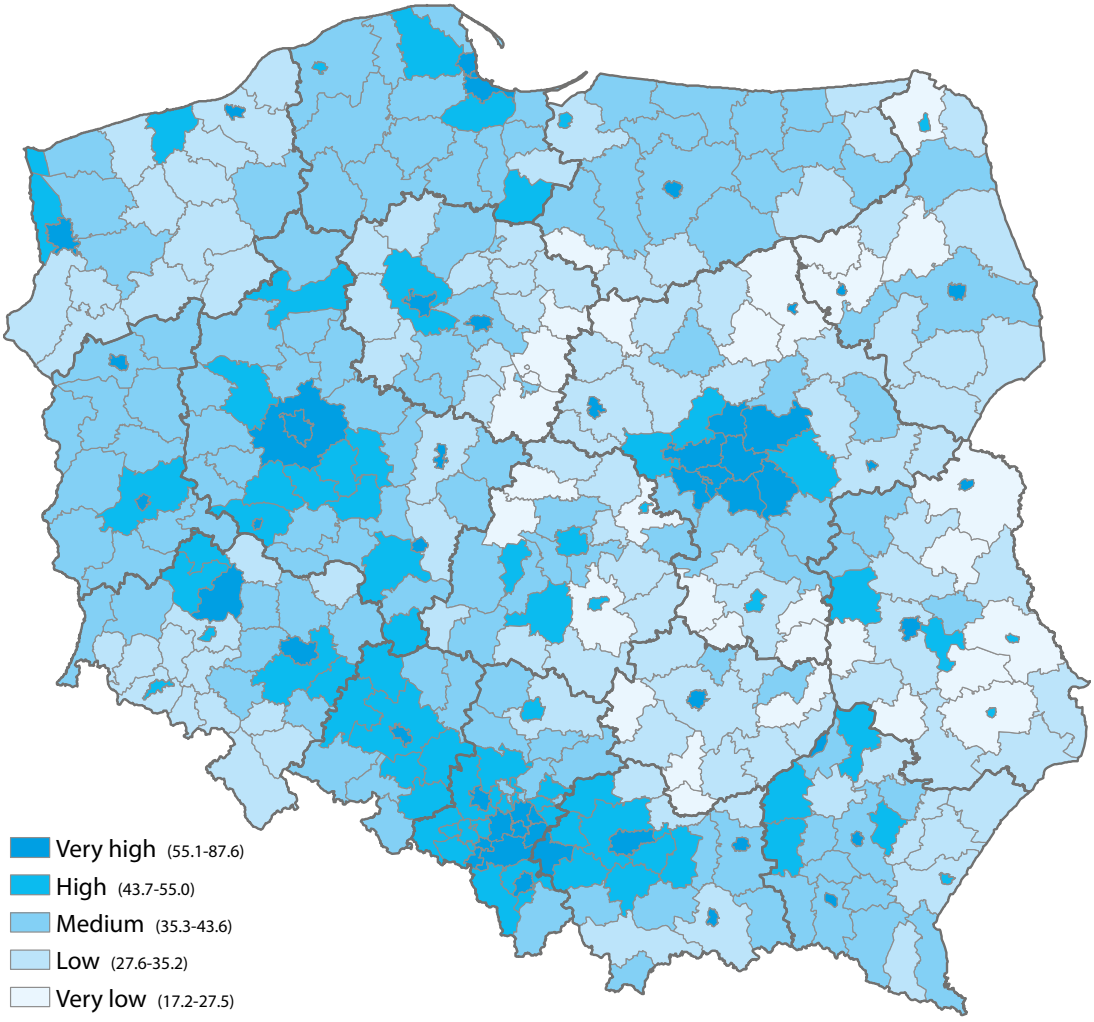
6. The study has confirmed the existence of a strong link between human development and the amount of expenditures in the Human Capital Operational Programme. Investing in education and skills are among the core factors contributing to the increase in incomes and health improvement of the people in a given community.

7. Examples of negative demographic changes are visible in connection with the aging of society taking place in some urban areas, first of all in parts of Eastern Poland. The example of the city of Łódź calls for our attention as the city ages at an incomparably fast pace. In the period analysed, the average age of the population has risen significantly, due to people at the productive age leaving the city. The economic potential of Łódź, as a large city was so large that its position compared with the rest of the country in the LHDI ranking has increased the most. However population ageing also increases some categories of expenditure met from public finances, what could lead to bankruptcy of some self-governments.

8. Another conclusion from the analysis is the need for Polish public institutions to develop rules of collecting and processing local level data. Data are far too often unstructured and databases, even within one institution, are not always coherent.

9. Data gathered during the research, allows us to develop and deepen knowledge about social development in Poland. The analysis reveals a picture of regions and counties which is not apparent and is often surprising, especially for the chosen non-economic development criteria. Part of the territorial units with very low or high rankings requires additional analyses (i.e Łódź, Suwałki or Pińczów county). It must be investigated in detail why some counties or regions had a low or high dynamics of human development, because not all of the factors may influence them directly (such as particular investments i.e. a specialist hospital or new traffic connection).

Based on the gathered data and its analysis, a county-level map of human development in Poland was prepared[3]:



Source: Own study.

The LHDI on a county level assumes values from 1 to 100.

3 Classes on the map are shown using the natural break method.

Data gathered and analysed at the county level allowed us to prepare an HDI ranking on a regional level. The ranking is shown in the following table:

Table 1. Voivodeships ranking according to LHDI value in 2010 and change of voivodeship rank in comparison to 2007[4]

Voivodeship	LHDI ranking	Change of rank in comparison to 2007	LHDI	HI	EI	WI
Mazovian	1	0	60.21	58.18	61.68	60.84
Lesser Poland	2	0	51.93	69.10	57.65	35.15
Pomeranian	3	0	51.14	71.28	47.16	39.79
Greater Poland	4	0	50.22	63.32	50.19	39.86
Silesian	5	0	49.54	48.39	53.92	46.59
Opole	6	0	46.95	59.76	55.94	30.96
Lower Silesian	7	0	46.34	47.61	48.79	42.84
Podlasie	8	1	44.40	66.08	51.60	25.67
Lubusz	9	2	44.36	54.72	47.21	33.79
Podkarpacie	10	0	43.77	72.28	48.15	24.09
West Pomeranian	11	-3	42.89	52.31	42.51	35.48
Warmian-Masurian	12	0	42.33	58.61	41.85	30.93
Kuyavian-Pomeranian	13	0	41.22	49.17	42.31	33.67
Lublin	14	1	39.55	48.61	46.46	27.40
Łódź	15	1	39.28	31.48	52.25	36.85
Świętokrzyskie	16	-2	36.78	45.95	39.18	27.62

Source: Own study.

Legend:
LHDI – Local Human Development Index
HI – Health Index
EI – Education Index
WI – Welfare Index

The research has confirmed that Warsaw enjoys the highest level of human development (calculated with the LHDI methodology) in the country. But the ranking of 30 counties with the highest LHDI values prepared in the framework of the analysis was quite surprising. It can be seen in the table below:

4 Indices assume values from 1 to 100.

Table 2. Ranking of 30 counties with the highest LHDI value in 2010 and their change of rank in comparison to 2007

County	Ranking as per LHDI 2010	Change in rank in comparison to 2007	LHDI	HI	EI	WI
Warsaw	**1**	0	87.63	68.97	97.75	99.83
Piaseczno	**2**	0	80.75	68.01	83.74	92.44
Pruszków	**3**	0	72.92	59.95	78.93	81.96
Warsaw West	**4**	1	72.48	67.39	70.88	79.72
Cracow	**5**	-1	72.05	69.00	88.47	61.27
Poznań	**6**	0	71.52	62.35	85.83	68.37
Rzeszów	**7**	0	71.22	85.90	83.24	50.52
Sopot	**8**	10	69.78	52.86	88.38	72.74
Gdynia	**9**	2	69.55	75.60	77.53	57.40
Legionowo	**10**	3	69.09	66.35	73.76	67.37
Opole	**11**	-3	68.82	69.63	83.02	56.38
Olsztyn	**12**	-3	68.62	74.23	79.57	54.69
Białystok	**13**	-1	68.10	86.84	84.02	43.29
Wrocław	**14**	-4	66.53	56.94	82.43	62.74
Gdańsk	**15**	0	65.92	75.64	64.14	59.05
Siedlce	**16**	1	64.76	68.57	77.84	50.87
Lublin	**17**	-1	64.57	62.77	86.10	49.80
Kielce	**18**	-4	64.08	68.50	75.29	51.02
Zielona Góra	**19**	2	63.43	60.32	76.68	55.17
Krosno	**20**	0	63.37	77.63	83.30	39.34
Poznań	**21**	6	62.67	75.34	54.67	59.75
Grodzisk	**22**	0	62.38	54.25	63.63	70.32
Nowy Sącz	**23**	10	62.30	79.43	74.34	40.94
Tarnobrzeg	**24**	7	61.58	84.55	78.30	35.27
Otwock	**25**	10	61.54	55.17	73.89	57.17
Tychy	**26**	-3	61.52	60.79	61.98	61.80
Lubin	**27**	10	61.45	63.13	55.15	66.64
Katowice	**28**	-9	61.03	50.58	67.54	66.54
Bielsko-Biała	**29**	-5	60.71	56.97	71.77	54.72
Leszno	**30**	-5	60.11	62.92	66.09	52.23

Source: Own study.

Legend:
LHDI – Local Human Development Index
HI – Health Index
EI – Education Index
WI – Welfare Index

As part of the survey, a ranking of 30 counties with the lowest LHDI values in 2010 (and their rank change in comparison to 2007) was also put together. It can be seen in Table 3:

Table 3. The ranking of 30 counties with the lowest LHDI value in 2010 and their change of rank in comparison to 2007

County	LHDI ranking	Change of rank in comparison to 2007	LHDI	HI	EI	WI
Poddębice	**350**	21	27.51	37.40	29.12	19.11
Włocławek	**351**	8	27.14	34.30	29.42	19.80
Białka	**352**	15	27.11	35.24	32.00	17.66
Parczew	**353**	-3	26.71	32.38	27.67	21.26
Rypin	**354**	3	26.62	36.48	26.46	19.53
Zwoleń	**355**	14	26.48	42.82	27.98	15.49
Krasnostaw	**356**	-12	26.39	21.72	35.82	23.63
Włoszczowa	**357**	-100	26.23	29.97	33.29	18.09
Nowe Miasto	**358**	-27	26.15	50.91	20.54	17.10
Maków	**359**	-27	26.12	39.78	24.84	18.04
Piotrkowski	**360**	-5	25.97	26.50	29.80	22.17
Ostrołęka	**361**	1	25.28	51.31	23.55	13.36
Żuromin	**362**	6	25.26	38.42	31.35	13.38
Lipsk	**363**	1	24.86	20.06	39.09	19.60
Zamość	**364**	8	24.45	40.28	22.56	16.09
Łęczyca	**365**	10	24.07	19.56	33.53	21.25
Lipno	**366**	0	24.02	40.02	21.72	15.95
Szydłowiec	**367**	-6	23.73	38.58	21.55	16.08
Opole	**368**	-8	23.46	33.42	27.92	13.85
Moniec	**369**	5	23.31	53.11	33.64	7.09
Skierniewice	**370**	-18	23.24	13.07	37.20	25.80
Janów	**371**	-6	22.78	30.51	30.77	12.60
Opatów	**372**	-19	22.67	21.39	26.66	20.43
Przysucha	**373**	-3	21.30	23.11	28.52	14.66
Kolno	**374**	4	20.47	66.39	25.00	5.16
Chełm	**375**	2	20.46	29.67	17.13	16.86
Łomża	**376**	3	18.69	57.26	16.82	6.78
Pińczów	**377**	-79	18.11	9.67	29.07	21.13
Kazimierz	**378**	-5	17.91	17.18	29.29	11.41
Suwałki	**379**	-3	17.24	54.53	6.89	13.65

Source: Own study.

Legend:
LHDI – Local Human Development Index
HI – Health Index
EI – Education Index
WI – Welfare Index

A few words on the methodology of the research

The basic assumption behind the HDI research methodology is the understanding of human development as a highly complex phenomenon that is impossible to present by the means of an income ranking only. Of course, the HDI methodology is not capable of reflecting such a complex phenomenon in its entirety. It does, however, include important factors which influence the quality of life and the feeling of happiness, and which are not easily convertible into material categories.

The original HDI methodology (used in creating the HDI at a national level) suggests that measuring human development should cover three important aspects of human life: health (reflected in life expectancy), knowledge and education and a decent standard of living (reflected in the level of income – welfare). The LHDI takes on a similar approach and uses the following indicators for the respective areas:

- Health: the estimated life expectancy of a newborn child, aggregated death ratio caused by cancer and heart disease,
- Education: percentage of children in pre-school education (3 to 4 years of age); average lower secondary school exam results (only for mathematics and natural sciences),
- Welfare: average income level per capita.

Access to education, its quality and degree achieved are factors which strongly determine the life of adults and their ability to transfer to better opportunities for higher living standards (income) and better health. This relationship is clearly visible in the link between education and the two following LHDI dimensions – health and income (standard of living).

A long and healthy life is one of the foundations of human development. One of the overarching goals of the government is to provide its citizens with opportunities for achieving this kind of life and the way to do that is through the prevention of major causes of deaths caused in developed countries (in the case of Poland, circulation diseases and cancer caused 71% of all deaths in 2010).

The HDI methodology includes the material factor (income level), but treats it as one of the many indicators that need to be taken into consideration. Money is important as a means for achieving a higher standard and better quality of life. Wealth can also grant easier access to higher education, healthcare and better living conditions. The means available for inhabitants of particular counties were captured in the Welfare Indicator.

The research conducted by the UNDP was based on the analysis of the data from all available sources of information on society, which are public statistics published by the Central Statistical Office and data from administrative registers of the Ministry of Finance, Ministry of Labour and Social Policy, Ministry of Health, Ministry of Regional Development, Ministry of National Education, the National Health Fund, the Central Examination Board and the National Election Committee. Due to the variable availability of data for particular indicators, the data from the years 2007–2010 was chosen for the analysis.

1. How does the adopted approach to measuring human development differ from other approaches?

1.1 The concept of human development

The first Human Development Index, published in 1990, started from the simple assumption which later became the leading thought of all consecutive reports: "People are the true wealth of nations". By supporting this approach with a plenitude of empiric data and a new way of perceiving development and its quantification, the human development reports had had a significant impact on public policy worldwide.

As Armatya Sen argues (Sen 2002), human development may be understood as the expansion of people's freedoms and opportunities to live the life they have reasons to value. Development seen from this perspective is about expanding choices. The concepts of freedom and capabilities have a far broader meaning than the concepts of basic needs and switching from the latter to the former entails referring to the concept of agency. Approaching development from the perspective of basic needs assumes a set of predefined human needs which are treated as universal in securing people's welfare. The approach that considers capabilities, concentrates on the freedom of choice including the possibility to define one's set of aspiration, values and goals which are not necessarily in line with the commonly understood pillars of welfare. This shift means a change in perspective from a passive one ("what can be done for a given person?") to an autonomous one (adding "what a given person is able to do?") (Alkire 2006).

Many ends are necessary for a "good life," ends that can be intrinsically as well as instrumentally valuable – we may value biodiversity, for example, or natural beauty, independently of its contribution to our living standards (UNDP 2011). As Anand and Sen (1994) put it: "human beings are the real end of all activities, and development must be centered on enhancing their achievements, freedoms, and capabilities. It is the lives they lead that is of importance, not the commodities or income that they happen to possess." Quality of life is not by itself constituted by income and wealth. Income does not say whether a person is presently healthy or is she equipped with knowledge capable of changing the person's position (Sen & Anand 1994).

Amartya Sen (1993) wrote that human development has two sides: the formation of human capabilities – such as improved health, knowledge and skills – and the use people make of their acquired

capabilities – for leisure, productive purposes or being active in cultural, social and political affairs. Thus, capability should be understood as a combination of functionalities (i.e. states and activities that constitutes a personal view of a "good life") that a person is able to achieve (Sen 1993b). Stressing the ability to achieve, and not simply achieved outcomes highlights the utmost importance of the freedom of choice. This theory – known as the capabilities approach – became a dominant paradigm in the human development area, and is reflected in Human Development Reports.

Amartya Sen considers human life to be a collection of various doings and beings which he calls "functionings". Doings and beings are for example, work, pleasure gained from free time and a satisfactory social life. People have greater or lesser capabilities, that is greater or lesser chances to choose from these functionings. An approximated value of capabilities are non-monetary and monetary indicators like education, health, and income. They present the degree to which people may actually live as they desire considering their innate limits to which they are subject.

"Combinations of different sets of functioning (subsets of exit space) create capabilities sets from which an individual may choose. The variety of life of individuals, depending both on the development stage and the customs of society's in which they live, and on their individual traits of character and capability to use goods, makes various sets of goods necessary to provide these capabilities to individuals" (Panek 2007). Poverty, according to Sen, means not only insufficient income, but also the lack of capability to fulfil basic needs at a given development stage.

Operationalization of the theory of human development poses a considerable challenge. Embedded in it is a question of listing human ends that are of particular value for the quality of life. There were several attempts to create such sets. Many of these efforts were built upon the capability approach, even though Sen himself refrained from specifying a list of basic capabilities (Alkire 2002). The Human Development Index, which lies at the core of every Human Development Report since its first edition, is by far the most recognizable operationalization of Sen's theory. It supplements a traditional income measure (GNI) with capability indicators from the areas of health and education. As its author, Mahbub ul Haq recalls, there were several principles guiding the search for a new index: (1) to find a measure that goes beyond income while retaining methodological soundness, (2) to limit the number of variables to ensure simplicity and manageability, (3) to construct a composite index rather than an extensive set of indicators, and finally (4) to merge social and economic indicators (ul Haq 2003). Since 1990 the HDI has been gradually refined, but the main principles remain unchanged.

There were also other attempts to specify a list of dimensions for development – oriented towards advancing the human development concept, rather than towards creating a tool for measurement. Particularly, philosopher Martha Nussbaum has proposed a set of 10 central, universal and intrinsically valuable human capabilities. It ranges from being able to live to the end of a human life of a normal length, through being able to have attachments to other persons and things, to having political and material ability to control one's environment (Nussbaum 2000). Sabine Alkire (2008) points to five widespread, often overlapping, methods of selecting development dimensions, driven by: (1) existing data or convention, (2) assumptions, (3) public consensus, (4) deliberative participatory process, and (5) evidence regarding people's values.

Undoubtedly, happiness, social inclusion and expanding people's human development opportunities are the ultimate objectives of economic development, both at the national and local level. Specific local conditions often determine such development opportunities. These conditions include economic parameters (employment opportunities, impact of economic crises), the state

of the environment, as well as political aspects (the history of local civic participation). All these parameters can be quantified and reflected in the process of (and policies targeting) integrated local and regional development.

The basic difference between different development measurements lies in the use of objective and subjective (perception) measures. The HDI belongs to the first category as it reflects the objective conditions of people's lives, based on quantitative data availability (Diener & Suh 1997). Human development may describe the level of fulfilling needs by objective (external) evaluation, while life quality is a subjective (perception) evaluation of the degree to which the needs have been fulfilled (Panek 2012). The domains of life, subject to observation and evaluation, covered by these categories, are (or may be) identical. In the case of objective evaluations, the degree to which the needs of individuals under study (persons or households) have been fulfilled is done independently from their personal values in this area. In the subjective approach, the individuals (persons or households) themselves assess their level of fulfilment. The outcome of this evaluation is strongly influenced by the gap between the level of fulfilment of needs as perceived by the individuals under study and the real level of their fulfilment. The higher level of subjective assessment (satisfaction) in poorer countries matched by a lower degree of social stratification, are proof of this gap. The higher the person's position in the social hierarchy defined by objective evaluation compared to others, the happier the people are with the degree of fulfilment of their needs. People compare their own material situation with the material situation of others (Panek 2012). Attention must be drawn to the fact that the objective approach contains some rules of arbitrary nature, resulting from the quantification system accepted for the measurement or by comparative patterns (Borys 2001).

When measuring the level of fulfilment of needs from the descriptive side, two types of life quality are distinguished: objective life quality (similar to the concept of standard of living), measured with objective measures, and subjective life quality that is being evaluated using subjective indicators. A similar approach has been used in the living standard and quality of life studies being conducted for 10 years already by the Social Monitoring Board (Czapiński & Panek 2012).

Finally, the key issue for the human development-based approach is the question of resource distribution. Traditional economic growth related measures such as the gross income per capita, are usually indices aggregating many variables, which take the average for all dimensions including the territorial ones. This averaging results in the loss of key data. For example, the income of three individuals (7,4,10) equals, on average, the income of three other individuals (7,7,7), whereas the income distribution is entirely different. It is hard to consider these situations comparable. It still needs to be proven whether the distribution indicators could be used alongside indicators based on a simple average of the results of particular observations (see Sen & Anand 1994). Having this in mind, the LHDI calculated in this report addresses one of the most important social issues in modern Poland - inequalities in territorial development.

1.2 Review of development measures

No single measure, nor a set of them, can reflect in full the economic situation or the quality of governance of a state (Stiglitz et al. 2009). GDP's deficiencies as a measure of socio-economic development are now back in the public debate after years of absence. Accusations are almost as old as the very concept of GDP, and experts have often pointed out the limitations of the GDP as a welfare indicator. Eventually, the GDP has become an indicator of economic activity and, more precisely, of economic activity limited to capital transactions.

The issue of dethroning GDP as the main development indicator and development goal has been already discussed in the early 1970's (Szarfenberg 2011). It was a reaction to the disillusionment in the developmental level achieved in developing countries brought to them by the previous decade. Steps to complement the GDP as a measure of human development included, among others, eliminating those of its elements not contributing directly to fulfilling the commonly understood consumer needs (i.e arms reinforcement, household commuting expenditures etc.) together with the simultaneous inclusion of a row of additional elements influencing the standard of living and the quality of the equation (i.e. value of free time, value of goods and services not registered on the market). The precursors of this approach were W. Nordhaus and J. Tobin (1973), who created the Measure of Economic Welfare (*MEW*). Herman E. Daly and John B. Cobb Jr. created an interesting concept of measuring economic welfare by the Index of Sustainable Economic Welfare (*ISEW*) (Daly & Cobb Jr. 1994). As much as the *MEW* concept relies on the secondary classification of the expenditures present in the GDP, the starting point in the *ISEW* concept of calculating economic wealth is individual consumption weighed by the unequal distribution of individual income. The *ISEW*, as opposed to the *MEW*, includes income distribution in this calculation.

Studies developing the aforementioned concepts were conducted in many countries and research centres. However, the measures proposed to measure the commonly perceived human development still treated this category as one-dimensional. Rawkowski (1976) proposed an interesting measure of economic wealth in Polish conditions. He presented the concept of an aggregated values method by broadly classifying the components of social welfare and by including a set of quality differences, which were difficult to measure directly or indirectly.

Another approach was connected to indices calculated in natural units. First publications on this subject were around the same time in the USA (Bauer 1967) and in Switzerland (Drewnowski & Scott 1966), and initiated the so-called social indices movement (Panek 2012).

The assumptions of the distance method (also known as the Geneva method) of measuring standard of living and welfare based on a system of indices presented in natural units, were first presented by Drewnowski in the studies of the United Nations Research Institute for Social Development (Drewnowski 1972). The method was further adapted for Polish conditions by a research team of the Warsaw School of Economics (the former Main School of Planning and Statistics, MSoPaS) led by Andrzej Luszniewicz and Jacek Rosner (Luszniewicz 1974). After several modifications, it was applied by the research team of the Statistics and Demography Institute of the MSoPaS (Krawczak et al. 1990) as the so-called modified distance aggregate method and served in studies on Poland's populations' standard of living in the years 1988–1989.

According to Stiglitz and Fittousi (2009), after attempts undertaken in the 1970s and 1980s, the interest in an alternative approach to the GDP rising and diminishing periodically , depending on the emergence of other, more burning problems of the 1990s such as stagflation or the rapid rise in the rate of unemployment and GDP-based methods of describing them. The Nordhaus-Tobin experiment gave arguments in favour of maintaining the GDP in its place – despite its limitations, it still remains a good index showing the general direction of social-economic growth. Nonetheless, the interest in finding an alternative or supplement for the GDP was on the rise again since the 1990s.

A symbol of this new trend became the creation of the Human Development Index which combines GDP with measures of health and education. This simple index only synthesises a limited amount of information. At the same time it is more suitable for comparing developing countries than for

developed countries. Nonetheless, it remains one of the few indices monitored on a regular basis and circulated by international organisations in order to enable systematic comparisons of indices between states. It has played a major role in raising the profile of key non-economic dimensions of life quality. Reflecting this spirit, the UN summit of Rio de Janeiro in 1992 introduced the concept of sustainable development into the public debate (Agenda 21) which has positively contributed to the popularisation of sustainable development indices.

This was later followed by a number of more local or country-specific initiatives, often stemming from individual researchers. The number of synthetic indicators of social progress was equal to 2 in 1990 (the HDI and the "kids count index"), climbed to about ten in 1990 and to about thirty in 2001–2002 (Afsa et al. 2008). This growing interest may reflect a combination of objective as well as societal factors. A first one probably lies with the increasing visibility of some of the adverse consequences of economic activity on the environment i.e. climatic change.

In such a context, we present an overview of the main tools that have been proposed until now to better measure socio-economic progress or well-being. The last attempt to move towards a more subjective measure of development was made by the British Office for National Statistics (2012) and we are to see the effects of work of the "Beyond GDP" initiative of the European Commission.

1.2.1 Examples of different types of development measures

The initiatives described in this part of the report vary in their range and goal. Only in the case of four initiatives, a synthetic index was developed (the Human Development Index of UNDP, the Index of Sustainable Economic Welfare developed by the World Bank, the Multidimensional Poverty Index, the Living Planet Index and the Happy Planet Index). In some other cases we refer to one-time initiatives related to broader development or wealth measurement programs (the initiatives of the OECD and the Office for National Statistics in Great Britain) or running projects, yet without final results yet, such as the European Commissions' "Beyond GDP".

The Genuine Progress Indicator (GPI) is a variant of the Index of Sustainable Economic Welfare (ISEW) first proposed by Daly and Cobb in 1989. Both the GPI and ISEW use the same personal consumption data as GDP but make deductions to account for income inequality and costs of crime, environmental degradation, and loss of leisure and additions to account for the services from consumer durables and public infrastructure as well as the benefits of volunteering and housework. By differentiating between economic activity that diminishes both natural and social capital and activity that enhances such capital, the GPI and its variants are designed to measure sustainable economic welfare rather than economic activity alone (Talberth et al. 2006).

Adjusted net saving, (also known as genuine saving), is a sustainability indicator built on the concept of green national accounts. Adjusted net savings measure the true rate of savings in an economy after taking into account investments in human capital, depletion of natural resources and damage caused by pollution (World Bank 2012a).

The ecological footprint is a measure of human demand on the Earth's ecosystems. It is a standardized measure of demand for natural capital that may be contrasted with the planet's ecological capacity to regenerate. It represents the amount of biologically productive land and sea area necessary to supply the resources a human population consumes, and to assimilate associated waste. Using this assessment, it is possible to estimate how much of the Earth (or how many planet

Earths) it would take to support humanity if everybody followed a given lifestyle. The ecological footprint concept and calculation method was developed by Mathis Wackernagel, under William Rees' supervision at the University of British Columbia in 1992. Since 2006, a first set of ecological footprint standards existed that detailed both communication and calculation procedures. They were developed in a public process led by the Global Footprint Network (2012).

The Subjective Well-Being Index and other measures of happiness or life satisfaction etc. are characterised by subjective self-evaluation. This methodology is based on people evaluating their own lives in general and in some of its aspects in detail. Questions may be relatively direct. One of the most often asked questions is: "Generally speaking, would you say that you are: very happy, happy, unhappy, very unhappy?" Other more elaborated measures use additional elements to specify the detailed subjective wellbeing components and in consequence to obtain more reliable individual estimates (Helliwell et al. 2012; van Hoorn 2007; Office for National Statistics 2012).

The Gross National Happiness (GNH) was created as an attempt to measure life quality and human development in a more holistic way by putting more weight on the psychological aspects of well-being than on the economic one. The Bhutan Happiness Index is a multidimensional measure created on the basis of data obtained from periodical surveys representative by region, sex, age, rural/urban populations etc. The GNH index is a good overview of the outcomes in nine domains that comprise the index (psychological wellbeing, time use, local community vitality, cultural diversity and resilience, ecological diversity and resilience, living standards, health, education and good governance). The ratio is aggregated from 33 clustered indicators. The concept of gross national happiness was created by his Majesty the Fourth King of Bhutan, Jigme Singye Wangchuck (Alkire et al. 2012).

The Happy Planet Index (HPI) was created in 2006 by the New Economics Foundation to show human wealth and the state of the environment. This index is an efficiency measure. It ranks countries on how many long and happy lives they produce per unit of environmental costs input. The HPI value for every country is a function of the average subjective life satisfaction, estimated lifespan and ecological footprint per capita. A ranking based on this index was published for the third time and included 151 countries (New Economics Foundation 2012).

The Living Planet Index (LPI) is an indicator of the state of global biodiversity, based on trends in vertebrates populations of species from around the world. The LPI gives information on the number trends of vertebrate species inhabiting the planet and shows in which habitats and ecosystems the number of species decreases at the fastest pace. The Living Planet Index was initially prepared by the World Wide Fund for Nature (WWF) in cooperation with the World Conservation Monitoring Centre, a branch of the United Nations Environment Programme, which monitors the state of biodiversity and leads a policy of preserving it. The LPI is calculated based on a database made by the Zoological Society of London (ZSL), encompassing more than 10,000 population trends for more than 2,500 species of fish, amphibians reptiles, birds and mammals (Word Wide Fund et al. 2012).

The Multidimensional Poverty Index (MPI) was developed in 2010 by the Oxford Poverty & Human Development Initiative (OPHI) and the UNDP. It is a deprivation measure that uses different factors to determine poverty of excluded persons beyond income-based lists. MPI replaced the previously used Human Poverty Index . The MPI is based on the same three dimensions as the Human Development Index: health, education and standard of living. They are measured by ten indices (UNDP 2010).

The OECD Better Life Index is an attempt to bring together internationally comparable measures of well-being. It's comprised of 11 domains which make up life quality: society, education, environment, civic society, engagement, health, housing, income, labour, life satisfaction, security, work-life balance. An important element of OECD's "better life" initiative is Your Better Life Index – an interactive tool available on the OECD website. It allows people to compare countries' performances according to their own preferences in terms of what makes for a better life in 34 OECD-member states and key partners such as Brazil and Russia. The index includes a general description of life quality in every country resulting from the 24 particular measures (OECD 2012b).

The Inequality of Opportunity Index is a method of measuring economic opportunities by defining the list of inequalities which may be explained by factors that people cannot influence such as race, sex, birthplace, education or parents' employment. The lower the fraction attributable to those factors in a given country, the higher its equality of opportunities. Francisco Ferreira of the World Bank was a pioneer in this method of calculating the Inequality of Opportunity Index. Today, the index is calculated for 40 countries. On the one end of the scale is Norway, where a slight inequality (2%) may be explained by birth reasons such as the origins of the parents. The extreme on the other end is Brazil, where one-third of the cases of deep inequality in income results from origin and family capital resources. On this scale, the situation of the USA is more similar to that of Brazil than of Norway (for more information visit the website of the World Bank).

The Quality of Life Index is an index created in 2005 by "The Economist Intelligence Unit" to link the results of subjective life-satisfaction surveys to the objective determinants of quality of life across countries in a way more adequate than by the use of traditional methods (the GDP growth index or the GDP per capita index). Life quality parameters used to build this index were the following: material situation, health, political stability and security, family life, community life, climate and geography, security of employment, political freedom and equality of sexes (The Economist Intelligence Unit 2005).

Most of the proposed development measures are formulated as initiatives of academic groups or non-government organisations. The most popular come from government institutions which have taken up several initiatives regarding this subject in the last years. Some of them are beginning to play a major role in formulating the development agenda and are becoming points of reference for many governments.

Apart from the abovementioned measures, various approaches to development exist in the literature i.e. the approach of Ian Morris (2010) and many others such as the Social Indicators of the European Union, the Sustainable Development Indicators of the European Foundation for the Improvement of Living or the Indicators of Living and Working Conditions. Many other theoretical approaches were described by the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al. 2009).

1.2.2 Measures of progress on the local level

Apart from initiatives on a national level, many alternative indices function at a regional and local level. Initiatives to measure balanced growth, life quality or human development on a local level have been created. Various approaches have been described in detail in the report entitled "Local Human Development Index. Conceptual foundations, methodology of measurement and policy

application" (UNDP PO in Poland 2012). For those wishing to gain more knowledge on the subject of measuring balanced growth in the regional dimension, other reports are also recommended (see Borys 2005; Borys & Rogala 2008; Singh et al 2009; Tanguaya et al. 2010; 2012).

HDI indices disaggregated to the regional level differ from the original HDI in the applied methodological approach. One group of approaches applies the traditional HDI method directly and it is suitable for big countries such as China or Russia, where territorial units are large enough to avoid problems connected with low population or an unequal distribution of economic potential (Ivanov & Peleah 2011). For example, the HDI Report for Russia in 2006/2007 provides information on the HDI for 79 regions, based on the life expectancy, enrolment rates for 7 to 24 year-olds and GDP per capita (in purchase power parity terms). Both in Russia and China, the education dimension of the HDI reflects school enrolment in all three educational levels, which is made possible by the presence of higher education institutions in regional centres. The second group of approaches uses indices at the regional level referring to the basic HDI methodology but applies different indicators within the same three dimensions. This is done in order to avoid problems related to small populations, data (un)availability at lower administrative levels and in order to adjust the measure to the specific needs at the local level. The third approach goes beyond the original methodology and changes the HDI structure usually increasing the number of dimensions of the index.

The first attempt to calculate a disaggregated HDI in Poland was made in 1993 (Akder 1994). Based on the methodology of the Human Development Index available at that time and on data from 1990, the HDI was calculated for 49 voivodeships. Threshold values were replaced by minimal and maximal "observed" values, which helped differentiate individual regions. As a result, the agglomerations of Warsaw and Cracow had the best results, while the situation was the worst in the voivodeships in the north-eastern part of Mazovia (Ostrołęka, Siedlce, Ciechanów).

The first Human Development Report published for Poland in 1995 addressed a number of issues related to the sub-indices of the HDI, their validity and the data availability. The report used data from 1992 and it also presented HD indices on a regional (voivodeships) level. The new methodology of calculating the HDI for Poland was used in the 1996 report, to present data from the year 1993. The school enrolment index was then introduced into the HDI calculations (for three schooling levels: primary, secondary and higher). For the second time, the regional approach to human development was applied in the 1998 country report on education. The report featured data from 1995, presenting in-depth analysis of the educational achievements and the national income level in voivodeships for the first time. Due to the limited availability of primary data, much of it had to be extrapolated. The authors had to use a set of assumptions necessary for performing the basic calculations i.e. to calculate the purchase power parity coefficients (PPP USD) or gross enrolment rates for particular voivodeships as per the territorial division from 1995. Further changes followed in 1999 NHDR like the introduction of new synthetic measures of poverty – like the Human Poverty Index (HPI). The calculation results were presented in the 1999 report based on 1996 and previous years' data. The national human development report prepared in 2000 focused on the development of rural areas. The report included the national-level HDI for 1997, calculated for the entire country as well as for rural and urban areas according to a modified methodology. In 2004, Lucyna Nowak calculated the HDI for urban and rural areas in the HDI report (UNDP Poland 2004). The population density index was used as the criterion, as recommended by the OECD (150 persons per 1 square kilometre) for determining "rural areas". Areas where population density was lower than 150 persons per 1 square km were classified as rural. Additionally, other indices of sex inequality and poverty used by the UNDP at that time were analysed.

To sum up, human development is measured not only by economic growth indicators, but also by the level of social indicators. The wealthier the state, the more assets it allocates to finance the social sphere and to develop social infrastructure and other investments with effects visible only after a certain amount of time. Similarly, the degree of human development in a given year is the outcome of the right investments in human capital undertaken in previous years.

1.3 Public policy support – combining expenditures and results

The LHDI, as described in this report, is considered an instrument for the policy of the state and the institutions which have an impact on the quality of life. It is supposed to be an evidence and knowledge-based instrument for managing the development process and it uses objective data and a detailed analysis covering a given country's needs. Every society functions according to a set of economic and political rules adopted and executed together by the state and its citizens (Acemoglu & Robinson 2012). Political institutions include codified law, but are not limited to it. They embrace the power and capabilities of the state to regulate and govern society (good governance).

Evidence-based policy (EBP) is a manner of conducting public policy based on objective information about phenomena. The source of this concept is the idea of medicine based on established facts[5], which may also be applied in all key public policy areas (Arak 2012b; Cartwright & Hardie 2012). An important aspect of evidence-based policy is applying a highly rigorous research such as pilotage, randomised testing and using key data which may assist the policy of the state. Not all areas of knowledge may be subject to quantitative analysis, most of them, however, are. It is necessary to discuss the methods and instruments suitable for measuring appropriate evidence. Data of adequate quality, analytical and political skills (Head 2009) are some of the key challenges in this field today. One should also focus on the very meaning of public policy for a better understanding of the EBP concept. The Polish language lacks good equivalents of the English division between *politics* and *policy*. *Politics* means a process of decision-making for a given society in which the subjects of this process carve ideas into postulates, agreements and decisions. The process comes to life by a series of conflicts and compromises, negotiations and struggling for solutions. One of its dimensions is to maintain power by formulating law in order to make and execute decisions. *Policy*, on the contrary, is the content of accepted solutions, taking the shape of normative acts, strategies and concrete actions of regulatory or assets-allocating character, which point out the goals, measures, resources and deadlines.

To differentiate this applied aspect of politics, the Polish language often uses the term "public policy" or "public policies". The term *public policy* is often used in English-language literature (Howlet et el. 2003; Dunn 2009), but one must avoid translating it as "social policy", which implies a narrower understanding excluding i.e. economics. "Public policy is all, what governments decide to do or not to do" (Dye 1976).

5 The definition was first used in 1991 by Gordon Guyatt, a medicine and clinical epidemiology professor at the McMaster University in Hamilton in Canada. Fact-based and evidence-based medicine (EBM) is a clinical procedure which is based on the best available scientific proof of efficacy and security. Such proof is also provided by plausible experiment results and observations (Wulff & Gotzsche 2005).

The key to define evidence-based policy is the concept of evidence or, put in other words, documented facts. It is a very wide category which includes both expert knowledge (especially that of think-tanks and international organisations), scientific publications, statistical reports, evaluation reports, social consultancy results, economic analyses, social experiments, modelling and econometric analyses. Knowledge contained in data is not made available by simple exploration based on reports, but demands a deepened analysis as in the case of the LHDI. It is often the case that data gathered even in advanced IT systems is used only superficially and decisions are made on the basis of experience and intuition rather than up-to-date information (Start & Hovland 2004). The LHDI may be helpful in formulating arguments based on objective information on social phenomena.

Traditionally understood public policy is constituted by a sequence of interrelated elements:

1. Identifying the problem and evaluating the reasonability of public intervention to solve it.
2. Defining rules and goals of the designed public policy.
3. Pointing out the list of instruments and resources necessary to achieve the goals set and evaluating their reasonability.

Additionally, the sequence must include a separate stage for public consultation of the designed public policy together with its main stakeholders. The purpose of these consultations is to empower civic society and to provide access to local, grass-root knowledge. The LHDI, as a measure of the public policies outcomes, may be helpful in all three presented stages. It may provide appropriate information which may also serve for policy evaluation.

A lot of attention was already devoted to the role the evaluation of public bodies' performance (Olejniczak et al. 2008; Olejniczak 2010). The popularity of this process seems to be inseparably bound with the expansion of the public sphere and the growing importance of administration responsible for completing particular tasks. What is more, this may be explained by the disillusionment by the low efficiency of the administration and by the quest for new organisational forms that would make public administration perform its tasks better and more efficiently (Zalewski 2009). The increased interest in evaluation research in Poland is strongly related to the Polish accession to the European Union. The reason for it is simple and relates to the obligatory requirement to evaluate public programmes financed by the EU and to the enforcement of evidence-based policy. Evaluating public policy is also important from the human development perspective as the LHDI may become an instrument for public policy, as discussed in this report. This approach is represented in the way the index is constructed and in the fact that, if necessary, it may be used as a tool for ex-post public policy analysis[6] based on available data that exists already. Many sources of data are not available to the public and require processing before they can be used.

The essence of strategic planning at the local and regional level is to formulate goals and layout paths to achieve them. The starting point in the process of constructing goals is to confront the facts and the most likely changes (coming from the diagnosis, projections and analyzes) with the aspirations of authorities and expectations of the community. The result of this confrontation is the vision of the desired state both for the people and for the politicians (Strahl 2006).

The aim of this report is to investigate how the public policy investments relate to their results at the local level in Poland. By using indices for all of the LHDI dimensions, the investments (public

6 Ex-post evaluation is an evaluative research conducted after the end of a public intervention (programme, project etc.) (For more details see: European Commission 1999).

policy related expenditures) were analysed statistically with components of public policy assets included in the $LHDI_{PI}$. A detailed analysis is presented in Chapter 4.

Taking into consideration the nature of the LHDI dimensions of health and education, one may describe it a "high momentum" index, the changes of which reflect the process of change in a longer timeframe. Today's investments in health and education may show their effects in 5 years or even later. One must be careful when using the LHDI to evaluate the impact of public policy on the changes in the LHDI value from year to year. A long-term analysis is recommended, which relates to strategic goals and an evaluation of public policy in the long run. For that purpose, the changes in the index value can yield sufficient information on the policy's effectiveness.

2. What is the Local Human Development Index?

In every country significant disparities exist along various criteria – between regions, sexes, rural and urban areas. For the Human Development Index to become operational, an analysis of the HDI distribution for particular countries on the regional and local level is necessary. The HDI may be a useful tool for understanding the roots of current and future social problems at a local level. It may also help in observing the effects of policies and their influence throughout several years. Attempts to disaggregate and calculate the HDI were taken in many countries (Akder 1994; Ivanov & Peleah 2011), but the proposed method of calculating the LHDI differs from the standard "disaggregated HDI" because it is focused on measuring the effects of public policies.

The HDI calculated at the regional level may show the way in which different administrative units (counties and voivodeships) develop vis-à-vis the others, what the source of these differences are, what the strengths and weaknesses of these units are and what the priorities of local governments and central authorities responsible for the development at the central level should be. From this perspective, the LHDI is not about constructing a ranking of counties and voivodeships – rather the index shows how regions achieve a given LHDI value through proper asset allocation or human capital investments which enhance people's capabilities.

2.1 Voivodeships and counties from the perspective of the development processes

A region can be defined as a separate and relatively unified area, which differs from the neighbouring areas due to natural or historically-acquired features. A review of the category's definitions shows that the term 'region' is used to define both areas of large territory as well as small ones, homogenous or diversified. The great diversity of territorial units existing in Europe and in the world, together with their different degree of centralization of government in different countries make it difficult to coin a universal definition for this category. The term 'region' includes historically- and culturally-defined territories, areas identified by their administrative and political organisation or, quite often, by a set of economic features (Grotowska-Leder 2011). It is often the highest unit of territorial organisation in a country, regardless of its legal status. It is defined by a relatively large area and population and is economically, socially and culturally homogeneous. In these areas regional institutions implement economic, social and cultural policies reflecting the specific needs.

In Poland, voivodeships are defined as regions, although some of them can hardly be considered as economically or socially consistent entities (Gorzelak & Smętkowski 2005).

Regional development has an important place in the European Union's policy. One of its priorities is reducing regional disparities and inequalities. The EU defines regions as legally and administratively separated territories (areas), with individual (regional) public government institutions chosen in democratic elections and holding legal and financial instruments (budgets) and leading intra- and interregional policies. A unified territorial division system was created in order to map and observe the situation in the EU-regions in the early 1970s. The system leads to a unified regional policy within the EU (Dolnicki 2012). It encompasses the levels of NUTS (Nomenclature of Territorial Units for Statistics) and LAU (Local Administrative Units) and its functions in EU-member states. The established common classification aims at collecting, processing and sharing comparable data for regular monitoring of regional development at the EU level.

The LHDI as a measure of human development at the regional level may provide the central authorities reference points for their strategic goal posting in the future (Ivanov & Pelah 2011, UNDP Poland 2006). A major problem, however, exists in regards to data availability and their quality at lower the territorial levels. This issue was discussed in detail in the methodological report "Local Human Development Index. Conceptual foundations, methodology of measurement and policy application" (UNDP PO in Poland 2012). In general, the bigger the territorial unit, the easier it is to generate and access reliable data (Table 2.1). Key data concerning health-related expenditures constitute a major challenge. One possible option is retaining data for the sub-regional level (below the level of voivodeships) from the National Health Fund. Similar challenges apply to health status indicators, morbidity and mortality rates, which cannot be disaggregated and compared by territorial units in their current form. At lower levels data on pre-tax income may serve as a substitute for disposable income. At the same time, most data on education is available at least at the voivodeship and county level.

Table 2.1 Poland's territorial divide and the scope of LHDI data required for measurements

Level	Number of units	General description	Scope of LHDI data required for measurements
NUTS 2 – Voivodeships	16	Large units of territorial division with a high number of inhabitants, local territorial government units.	Data available on: Disposable income (BBGD)[7] Education Health
LAU 1 – Counties and cities with county status	314+65	Smaller territorial units, highly diversified in terms of population (number of inhabitants) ranging from small counties to big cities such as a Warsaw, local territorial government units.	Data on disposable income is unavailable, however, fiscal data on tax-payers' income is possible. Data on education is available. Limited availability of health data.

Source: Own study based on UNDP PO in Poland (2012).

Due to the limited availability of proper data, we propose that the county serves as the basic unit of this analysis aiming at constructing a robust and up-to-date LHDI. The choice is further motivated by public tasks exercised on the county level including education at the secondary level and the healthcare system (UNDP PO in Poland 2012).

7 Household Budget Research is conducted by the Central Statistical Office. Its results are prepared for the regional and country level and are an element of calculating national accounts (Plicha 2008).

The research reveals a huge variation between regions with regard to their specific characteristics, level of social-economic development and the related barriers and opportunities they provide. According to the basic type of economic activity, regions can be divided into the following types: industrial, rural, industrial-rural, rural-industrial and tourist-recreational. Apart from regions characterised by a high development potential, also known as "locomotive regions" characterized by high share of innovation and learning activities, a number of under-developed and depressed regions exist. The commonly used criterion for defining high/medium/low developed regions is the GDP per capita. Expenditures for research and development in innovative regions are the most important element of their development programmes (Florida 1995).

In Poland, as elsewhere in Europe and the world, development is spatially diverse (see Gorzelak 2007; Smętkowski et al. 2011). Apart from traditional axes of economic growth and living standards variability, which run between cities and rural areas and the East and West of the country, new dimensions of inequality are becoming more significant. Metropolises are dynamically gaining advantage over peripheral areas (Smętkowski et al. 2009). Differences in the quality of life within big cities are also becoming more visible.

Spatial development disparities have many faces. One must remember that traditional divisions (East-West, urban-rural), though still visible on the development diversity variety and quality of life maps, are transforming. One example is the rising diversity of rural areas, which can be divided into those with diversified functions and income sources of inhabitants and those of a high degree of people employed in low-ware farming. Territories remote from urban centres, dominated by small farms subsistence production, have developmental challenges different from those of territories falling in the scope of influence of large urban areas. Even territories located relatively centrally from a geographical point of view but outside of the sphere of the positive influence of large urban areas (this due to the lack of functional connections with big cities) may experience the problems typical for a periphery area (see Miszczuk 2010).

The publication entitled "Poland 2030. Development challenges" (Bochniarz et al. 2009) lists the following factors as the main sources of developmental diversity on a territorial level: peripheral location, lower level of human capital, limited access to transport infrastructure, information technology and public services and dependency on only one employment sector (non-functional cities and villages). The factors, particularly augmented by demographic and migration processes, may cause further increases in inequality. Migration itself is a subject of future analysis. Depopulation in some regions and settling in metropolitan areas of big cities may have a major impact on human development in the future. It is also worth focusing on how the development of urban areas influences the variability of development patterns. A weak network of cities (regional and sub-regional centres) often determines the development opportunities of other areas (small cities and rural areas).

A challenge for development policy is creating conditions for equal chances in education, developing access to public services, increasing the transport availability for the entire country, fighting digital exclusion and supporting "poles of growth" – metropolises and regional centres (Ministerstwo Administracji i Cyfryzacji 2012).

An important factor which influences regional development are the skills and professional qualifications of a region's inhabitants, their material and financial capabilities, political awareness, social and spatial mobility. That is why, regional development strategies should be focused on improving the quality of life and the human development levels of the people living in such regions.

This report uses the county as the basic unit of spatial analysis. The county has a long tradition as territorial unit. The shape of current units was based on the old territorial diversities which date back to tribal times and resulted from division of the land plots between individual descendants – successors of an owner who passed away. (Tucholska 2007). The older governance system was two-tier with centrally governed provinces and locally governed "lesser lands" and locally appointed *starosta*. In the 14th century in "Lesser Poland" city governors existed who would govern the economically better developed city and its vicinity. This divide applies largely today in the form of land and urban counties. In the 1970s of the 20th century, regions took over many competencies formerly held by counties. The number of voivodeships was raised, while counties were liquidated. Only in 1998, after 23 years of the counties inexistence, was this administrative unit brought back to life and the county government was created. A new institutional and competency framework was created for the local county governments, while at the same time the number and borders of counties were restored almost without change. A fully new solution is the local governing character of these authorities (Tucholska 2007).

The modern county is an interesting field of research from the perspective of processes ongoing within its area and the interaction of the local scene's main actors. The 1998 legal changes however are far more important from the perspective of the county as an entity than of the local self-government. The subject was analysed by Anna Tucholska (2007) and seen from a historical perspective, the current legal form and of competencies do not directly refer to previous solutions implemented in Poland and thus may be an important subject for research. The LHDI as a tool that positions the counties and seeks those characteristic traits of the local community.

The number of counties in Poland today and within the timeframe of the research (2007–2010) was 379: 314 land counties and 65 urban counties. This division is of key meaning, as cities with a county status strongly differ from land counties. The status of an urban county, after the introduction of tri-level territorial division, was given to: (1) cities with more than 100,000 inhabitants; (2) former voivodeship capitals (excluding Ciechanów, Piła and Sieradz; the local authorities of these cities resigned from the possibility to function as urban counties); (3) some cities in large urban agglomerations: Jastrzębie-Zdrój, Jaworzno, Mysłowice, Piekary Śląskie, Siemianowice Śląskie, Sopot, Świętochłowice, Świnoujście and Żory. Warsaw has gained the urban county status as of October 27th, 2002. In the years 1992–2002, the Warsaw county and the capital city of Warsaw existed simultaneously (a communal association of municipalities, created on the basis of the Warsaw Act).

2.2 Local Human Development Index – structure

Social indicators are the basic instruments of diagnosing the level and quality of life. The GDP[8] and HDI are amongst the most important indicators applied. The latter, popularised by the UNDP, will be applied to measure regional and local development disparities in Poland. The basic principles guiding the traditional HDI-driven studies will be maintained and the indices will reflect the original dimensions of the HDI.

An established definition of an indicator is not set out by subject literature. Instead, the concept of an indicator is used interchangeably with the concept of a measure (Borys 2005). Social policy differentiates between these two terms. The measure is a quantitative estimate which describes

8 The GDP is an economic index but also applied as a social index. The GDP evaluates the value of services and final goods produced by subtracting the total value of goods and services used for their production from total production (Plicha 2008).

and measures economic and social processes and phenomena. The indicator is an observable and calculable feature of a subject or phenomenon, the existence of which implies the existence of other phenomena for us to measure (Szarfenberg 2008). For example, in the area of health, the average life span is a measure of health, while the population's health level shall serve as an indicator.

Social indicators applied to measure the level and quality of life should:

- be substantively correct – a clear substantive link between the indicator and the phenomenon described should exist,
- be formally correct – the indicators' construction should follow some general principles of constructing indicators,
- have high capacity – capable of reflecting through quantitative estimation a scope of needs that are directly reflected in the indicator,
- be normative in nature – meaning that changes in the index are perceived positively or negatively from the perspective of society,
- be systematic in nature – meaning that the indicator falls within a broader system (i.e. within the system of monitoring the realisation of development goals) (Panek 2012).

Barbara Szatur-Jaworska (2008) underlines the fact that the correct choice of social indicators is not only a matter of theory, but also practice as they are applied to formulate goals of various social programmes and to monitor their implementation, which plays a key role in the case of the LHDI.

The GDP, created in the 1930's, has served as the dominating synthetic measure of not only economic activity but also as an estimate of human development (the level of the satisfaction of needs). Its components form a system of indicators on their own. This approach could have been considered as relatively correct, when the core objective of socio-economic development was meeting the basic needs and securing survival of the society. With economic progress, the scope of needs considered as "basic" was expanding and greater attention was paid on the quality aspects of that growth. The real results of economic growth – the level of satisfaction of people's needs – were becoming increasingly important and societies were increasingly preoccupied by this ultimate outcome of growth and not just by its production aspects (measuring expenditures on satisfying needs). It was also pointed out that the GDP reflects only one dimension of economic growth – and by that matter, of human development – as it does not capture differentiation in income distribution between social and professional groups, thus blurring the existing disparities between them in regards to meeting basic needs . These flaws make the GDP unsuitable as a public policy monitoring indicator, because it does not yield the information necessary for addressing structural problems or for decision-making on resource allocation.

The conclusion that continuous and rapid economic growth does not necessarily lead to a continuous and rapid human progress precipitated the elaboration of measures capable of capturing and evaluating human development. Important work in that regard was done in the 1960s in the framework of the so-called social indicators movement (Panek 2012).

Regional-level data of appropriate quality are insufficient to make the link between human development and public policy. From a development policy[9] perspective it is more important to point

9 According to the Ministry of Regional Development, "development policy" is defined as a "set of mutually connected actions undertaken and realised in order to provide a lasting and balanced development of the country, social-economic and regional-spatial cohesion, raising economic competitiveness and creating new jobs on a national, regional or local scale" (Ministerstwo Rozwoju Regionalnego 2012b).

out at which stage of the decision-making process a particular indicator should be applied as a source of information. Following the logic presented by Ivanov and Peleah (2011) and adjusting it to specific Polish conditions (UNDP PO in Poland 2012), in particular taking into consideration the availability of data on the voivodeship- and county level, two stages should be defined:

1. **Defining the indicators of human development related inputs** – estimating indicators of a quantitative and of a qualitative nature, divided according to type of expenditure (financial, infrastructural and other public policy expenditures).
2. **Defining the indicators of the human development related outcomes** – estimating indicators of quantitative character, evaluating results in the field of public intervention (i.e. lower mortality, higher degree of citizens' knowledge, higher income).

The impact of public policy can be monitored. Such attempts are often being made in the evaluation of external outcomes and their sustainability. However, the outcomes may be "the second tier" results and are often side-effects (externalities). The externalities may be related to the interventions, however, a plausible interpretation of the relationship is not possible due to the complex cause-result chain with many factors involved. Taking into consideration the number of elements that contribute to the human development outcomes, it seems almost impossible to answer questions such as "whose was the success?"; "whose was the failure?" or more broadly "the result of whose action is this outcome?" This is why, qualitative approaches are usually used to evaluate the external effects as they provide more information on the context of particular interventions. "Sustainability" relates to the "longevity of the outcome" of an intervention, that is whether its results disappear once the intervention is over or they last further on (Ivanov & Peleah 2011).

In order to quantify particular stages of the human development process, (its "inputs" and "outcomes"), different types of data are necessary. Using input indicators as proxies of outcomes is a common mistake, which leads to false conclusions regarding the effect of the public policy. The traditional HDI is a mix of input and outcome indicators. From a human development perspective, the GDP is definitively an input. Only the ability to read and write as well as life expectancy may be considered as outcomes. This combination of components of various types is a major problem and gives ground for questioning the relevance of HDI as a robust development measure (Ivanov & Peleah 2011).

Finding the appropriate measures which make possible the calculation of "outcome" indicators at a local level is the key issue in the territorial evaluation of public policy results. Developing the quality of life is the long-term goal of every government. For Poland, the following programmes reflect this approach: "Long-term Development Strategy. Poland 2030. The Third Wave of Modernisation" (Ministerstwo Administracji i Cyfryzacji 2012); the Human Capital Development Strategy (Ministerstwo Administracji i Cyfryzacji 2012) and the key strategy for medium-term programming – Development Strategy 2020 (Ministerstwo Rozwoju Regionalnego 2012b).

2.3 Dimensions of the Local Human Development Index

Human development is the process of enhancing people's capabilities and choices. Their choices may, in fact, be infinite and may change over time. However, of all dimensions of development, three remain key: for the people – men and women – to lead a long and healthy life; to gain knowledge and to have access to resources necessary for a decent living. Still, human development is not limited to those three only. In addition to those three, others are not less important for

many people, like opportunities for make free choices, to embrace political, economic, and social freedom as well as the capability to lead creative and productive life, incl. to use the opportunities provided by digital technology (see: UNDP 1990).

According to the idea of human development, income is only one of the many benefits people strive for and it is not the essence of people's lives. Thus, development is about something more than just the growth of income and wealth (see Główny Urząd Statystyczny 2012a). People constitute the essence of development.

Many approaches to measuring and monitoring human development exist. A perfect one would include many variables in order to provide the most comprehensive view possible. What is lacking, however, is appropriate comparable data. Thus multidimensionality and comprehensiveness are not the only features of this ideal – it should also be feasible and should not be potentially misleading. Too many indicators might create a confusing picture which would lead decision-makers into misinterpretations of the main trends and misguided decisions. The key issue, therefore, is to keep the new measure internally consistent and focused on the outcomes and evaluation of public policy.

According to the original HDI methodology, measuring human development should be focused on the three most important dimensions of human life: health and longevity (reflected in the life expectancy), knowledge and education (reflected in mean years of schooling for adults aged 25 years and expected years of schooling for children of school entering age) and a decent living standard (reflected in the level of income – material welfare).

Table 2.2 Dimensions of Human Development and the LHDI dimensional indicators

<table>
<tr><th>Dimension</th><th>Health</th><th>Education</th><th>Welfare</th></tr>
<tr><td rowspan="2">LHDI dimensional indicators</td><td>Average life expectancy at birth indicator
(Estimated life expectancy at birth)</td><td>Pre-school education indicator
(Enrolment rate of children in pre-school education: 3 to 4 years of age)</td><td rowspan="2">Welfare indicator
(Average person welfare level)</td></tr>
<tr><td>Aggregated mortality index
(Aggregate mortality rate due to cancer and cardiovascular diseases)</td><td>Lower secondary school exam results index
(Average results from the lower secondary schools exam – mathematics and natural sciences only)</td></tr>
<tr><td>LHDI dimensional indices</td><td>Health Index</td><td>Education Index</td><td>Welfare Index</td></tr>
<tr><td colspan="4">Local Human Development Index (LHDI) – at county and voivodeship levels</td></tr>
<tr><td colspan="4">Human development on a local and regional level</td></tr>
</table>

Source: Own study.

Due to different dimensional indicators used in the LHDI compared to the standard HDI, we used a calculation method from the Human Development Report 2010 (UNDP 2010). Two major changes were introduced back then in the calculation of the dimensional indices: the choice and the calculation of the individual indicators and the aggregation method of the dimensional indices. The arithmetic mean (the earlier approach) was replaced by the geometrical mean in order to reflect

the limited substitution of the individual dimensions and thus take into account differences in achievement across dimensions. It reflects inequality in distribution better than the arithmetic mean because dimensional indicators with the lowest values receive higher weights (Zambrano 2011). Secondly, education measures were changed. Instead of literacy (the ability to read and write) and the average enrolment rate, the mean of years of schooling for adults aged 25 years and expected years of schooling for children of school entering age were used.

To further improve the LHDI in the direction of a policy-relevant measure, the methodology made possible estimating the human development related "inputs" and "outcomes" in a broader timeframe. The present analysis is based on the available data, thus the timeframe covered were the years 2007–2010[10] with the county and voivodeship as the basic units of territorial analysis (UNDP PO in Poland 2012).

The LHDI's construction on the county level is fairly simple. By using the method of aggregation outlined above (the geometrical mean), the final formula for the LHDI is as follows:

$$LHDI_i = \sqrt[3]{HI_i \times EI_i \times WI_i} \qquad i = 1, 2, ...n;$$

where
$LHDI_i$ is the local human development value for a country or voivodeship i,
HI_i – is the Health Index in the county i,
EI_i – is the Education Index in the country i,
WI_i – is the Welfare Index in the county i.

By using the data available and based on county-level indices, two territorial levels may be analysed: (1) the county and (2) the voivodeship. The calculation of the average values of the indicators at the voivodeship level and the averages of county-level dimensional indices in a given voivodeship were used.

The original HDI calculation methodology had to be adjusted in order to calculate the LHDI with the geometrical average, due to the fact that the value of some dimensional indices in some counties was zero. In order to aggregate the dimensional indices in such cases, unlike the traditional HDI which has values from 0 to 1, the LHDI has them from 1 to 100. When the observed value of the dimensional index was "0", the value of the dimensional index was attributed as "1" and afterwards they are multiplied by 99. Thanks to this step, the LHDI value range is from 1 to 100.

The LHDI value depends on the threshold values, that is on administrative units with best and worst county results for each of the variables. Threshold values are the minimal and maximal values observed between 2007 to 2010 for a given variable. What should be considered in the future is replacing the empirically observed threshold values for the respective dimensional index with values defined as strategic or political goals. For example, the minimum and maximum value of a newborn's estimated life expectancy in Poland. This solution would enable a better tracking of progress in the implementation of particular strategic goals.

10 The subject of the analysis is the timeframe of 2007-2010 in relation to data availability at the time of preparing the report (November-December 2012). Most of the LHDI partial indices applied has a timeframe starting in 2005, while data on the lifespan on the NUTS-3 level start from 2007. Income data from tax statements were also available only until 2010.

2.3.1 Health

Similar to the first Human Development Report, **the LHDI dimension of health** is measured using **the life expectancy at birth (LE)**, that is the number of years a newborn child is expected to live, if the mortality pattern for individual age groups remains unchanged throughout their entire life (UNDP 2007). This outcome measure may be used both on a local and regional level, however its calculation demands solving a number of problems. First of all, the smaller the territorial units are, the greater the impact of random factors (Ivanov & Peleah 2011). Data availability is also a problem in Poland, as the LE is calculated on a sub-regional level only since 2007. LE calculations are based on the structure of age and mortality tables for particular age groups and are available only for counties. Theoretically, one could perform their own LE calculations on a local level, but the robustness of the results may be questioned. There is a number of possible solutions to this problem which rely on aggregation of mortality data from a given timeframe, replacing the LE index with correlated variables available for the local level or estimating the LE value on the basis of data from a higher aggregation level (UNDP 2007; Ivanov & Peleah 2012; 2012).

Considering the aforementioned restrictions, the authors have decided to calculate the LE index independently on the basis of data from the Central Statistical Office for the sub-regional level (NUTS-3)[11]. To estimate values for counties, LE data calculated for urban and rural areas within the respective sub-region were used. Secondly, NUTS-3 urbanisation data was compared with the urbanisation level of a given county in a given sub-region. LE indices for women and men were aggregated by using the proportion of sexes for newborns in Poland.

The second health indicator used was **the aggregate mortality rate due to cancer and the index of cardiovascular disease (cases of death by type of disease per 100,000 people)**. These diseases account for the highest rate of premature mortality in Poland calculated for the population of a given county. Data on mortality is available in the Central Statistical Office for the county level. The proposed index indirectly reflects both the availability and quality of specialist health care as well as the impact of the environment and lifestyle on public health. Still, the data is crude and nonstandardised for the age of the local population. When preparing the index, only data until 2009 was available. That resulted in narrowing the timeframe of the analysis. This kind of data is usually published with delay; it is possible, however, that once published in the future, the nonstandardised index might be replaced (Wojtyniak et al. 2012).

The authors measure the outcomes for the "health" dimension by integrating the life expectancy at birth with the aggregate mortality rate due to the index of cancer and the index of cardiovascular disease. In the case of Poland, these two indicators are not highly correlated which allows for aggregating them in one index to provide a more complex view of the level of health.

The Health Index is the geometrical mean of two dimensional indices: the LEI (Life-Expectancy Index) and the CDRI (Crude Death Rate Index). It is calculated according to the following formula:

$$HI_i = \sqrt[2]{LEI_i \times CDRI_i} \qquad i = 1, 2, \ldots n;$$

11 It is a regional-level unit. There are 66 such units in Poland. Every voivodeship is grouped into a number of sub-regions; the sub-regions are then grouped into a number of sub-units – the counties.

We calculate the LEI_i value for counties and voivodeships according to the following distance formula:

$$LEI_i = 1 + 99 \times \frac{LE_{ei} - LE_{min}}{LE_{max} - LE_{min}} \qquad i = 1, 2, ...n;$$

where:
LE_{ei} – is the value of a newborn's life-expectancy in the county *i*,
LE_{min}, LE_{max} – is, respectively, the minimum and maximum values observed in counties analysed from 2007 to 2010; values for the life expectancy at birth, where the following minimum and maximum values were used in the calculation: min = 72 observed in Łódź 2007, total obs: 8152; max = 78 observed in Rzeszów 2010, total obs: 5178.

The $CDRI_i$ applies a distance formula, based on the maximum values of the mortality index:

$$CDRI_i = 1 + 99 \times \frac{CDR_{max} - CDR_{ei}}{CDR_{max} - CDR_{min}} \qquad i = 1, 2, ...n;$$

where:
CDR_{ei} – is the value of Crude Death Rate Index in the county *i*,
CDR_{min}, CDR_{max} – is respectively, the minimum and maximum values observed in the analysed counties from 2007 to 2010; of the Crude Death Rate Index with the following minimum and maximum values used in the calculation: min: 411, observed in Żory 2007, total obs 7607, max= 1040, observed in Miechów county 2009, total obs 5550.

2.3.2 Education

Until 2011, the education component of HDI consisted of the Adult Literacy Index (ALI) and the Gross Enrolment Index (GEI). From 2011, a new methodology has been applied. The ALI and GEI have been replaced by the Expected Years of Schooling Index (EYSI) and the Mean Years of Schooling Index (MYSI). The EYSI shows the number of years a 5-year-old is expected to spend on learning in their entire life, while the MYSI shows the number of years a person of above 25 years of age has spent in the schooling system (UNDP 2010). Unfortunately, a direct use of these indicators at a local level is impossible for an index published annually.

All four aforementioned indicators are difficult to apply at a local level in Poland for two reasons. First of all, data availability at a county-level is limited. Measuring the MYSI and the EYSI on a local level is possible only on the basis of data from the census, which takes place once in a decade. This means, that the indicators may be calculated only for selected years and not on a year-to-year basis. What's more, the census includes a question on the educational degree held by a citizen and not on the number of years spent in schooling. The number of those years may be estimated on the basis of the degree held, however. Data availability is a greater problem in the case of the ALI, as no such data on a local level in Poland exists. Secondly, the data available is not clear enough. This is the case for the GEI as well. In Poland education is obligatory for all, which results in high schooling attendance and does not differentiate between local units. The same would apply for literacy amongst adults, if such data were available.

Higher education is a key element of human development as it is a significant factor of professional success and, as a consequence, of a high income (Strawiński 2007; OECD 2010a). Simultaneously, on a more general level, it creates the country's human capital (Herbst 2012) and expands individual capabilities. Due to the fact that data on higher education is available only for the census years we were unable to apply them in the timeframe analysis of this report, despite their importance to the LHDI.

As James Heckmann (2002) argues, investments in human capital of the youngest people are the ones with the highest return – they are most profitable not only for children, but also for the society. The curve of learning shows that investments in early education brings a high rate of education return and high long-term profits (see Strategic Experts Team of the Prime Minister 2008; Bochniarz et al. 2009; OECD 2012a). On the basis of the PISA (Programme for International Student Assessment) research conducted by the OECD (OECD 2010b) it can be said that pre-school education is a dimensional indicator of education which is related to success in later life. Early education gives children the chance to be better prepared for further education, which is conditioned as well by the quality of learning.

Because of the aforementioned reasons, the approaches to constructing the indicators of the LHDI should be different from those used for measuring human development at a national level.
In search for possible local-level education indicators for Poland, the following options should be considered:

- the share of children in pre-school education,
- the average result of the lower secondary school exam in the mathematics-natural sciences section.

The share of children in pre-school education shows the percentage of children aged 3 to 4 going to kindergarten. Pre-school education is perceived as a significant factor of success in later life as well as a good instrument of economic policy (see Rolnick & Grunewald 2007). Thus, the indicator may constitute an important part of the local HDI. It is calculated as the total number of children aged 3 to 4 attending pre-school divided by the total number of the children aged 3 to 4. Data can be obtained through the Central Statistical Office.

The average result of the lower secondary school exam (mathematics-natural sciences section only) in relation to the national mean in a given year may be interpreted as a measure of the quality of education. The data is highly plausible and comparable on the national level (all exams are standardised). In order to acquire comparable data we propose applying the results of the mathematics-natural sciences part of the exam only, as in a long-term perspective this is a key element to building a knowledge-based society (Bartnik et al. 2011; Ministerstwo Administracji i Cyfryzacji 2012). The changes over time are measured using the national mean for each year and looking at the change of individual counties' rank in relation to the national mean. The index is calculated as the deviation from the mean of the average results of the lower secondary school exam (mathematics-natural sciences section only) for a given county. Data can be obtained through the Central Assessment Commission.

The final Education Index (EI) consists of the geometrical mean of the two dimensional indices: the Pre-school Education Index (PEI) and the Performance in Lower Secondary School Education Index (PLSSEI). It is calculated according to the following formula:

$$EI_i = \sqrt[2]{PEI_i \times PLSSEI_i} \qquad i = 1, 2, ...n;$$

We calculate the PEI_i index value for counties and voivodeships according to the following distance formula:

$$PEI_i = 1 + 99 \times \frac{PEI_{ei}}{PEI_{max}} \qquad i = 1, 2, ...n;$$

where:
PEI_{ei} – is the percentage of children in pre-school education in the county *i*,
PEI_{max} – are the maximum values (observed in the counties analysed from 2007 to 2010 of the percentage of children aged 3 to 4 in pre-school education): max=93.9978 (Warsaw 2010). Only the maximum value was used in the calculations as the minimal value within the timeframe was "0".

The $PLSSEI_i$ has a different distance formula:

$$PLSSEI_i = 1 + 99 \times \frac{PLSSEI_{ei} - PLSSEI_{min}}{PLSSEI_{max} - PLSSEI_{max}} \qquad i = 1, 2, ...n;$$

where:
$PLSSEI_{ei}$ – is the variance from the mean of the lower secondary school exams (from the mathematical-biological part only) in the county *i*,
$PLSSEI_{min}$, $PLSSEI_{max}$ – are respectively the minimum and maximum values observed in the analysed counties from 2007 to 2010; of the variance from the mean of the lower secondary school exams (from the mathematical-biological part only) assume at the level: min: 0.8206 (Złotoryja county 2009), max = 1.2063 (Warsaw 2008).

2.3.3 Welfare

Although the pioneers of measuring production and national income underlined the significance of social issues, economic growth became the highest priority for states after the end of the World War II. The growth of share capital was perceived as a means of achieving development and the GDP per capita growth rate became the basic measure of development. The GDP was created by Arthur Pigou as way of measuring wealth. Pigou defined economic welfare as a measurable aspect of human welfare. Later on, due to the lack of other measures, economic welfare started being used as a proxy of development for the social sphere as well. For the LHDI, however, the use of more detailed data on welfare is recommended.

Simon Kuznets, the creator of the GDP, warned that "the welfare of a nation cannot be counted on the basis of income" (Kuznets 1962). Income is a useful and comfortable substitute, but the comfort comes at the price of the simplicity of the indicator. Income is a means to an end, and not the end itself. The welfare of a society depends on how income is being used – i.e. on the quality and scale of governmental redistribution and not on the very level of income. Nowadays, the income of a given person or of a county may indicate future development perspectives. If local governments have already invested in human capital then the income potential may be much higher than the current level of income would indicate. In practice it can be shown that a high level of income does not guarantee human development on its own.

The truth is that there is no direct link between the growth of income (gross national income - the living standard measure in the HDI on a national level) and human development. As Mahbub ul Haq puts it: "every measure, which evaluates arms as a couple of hundred times more expensive than a bottle of milk, raises great doubt to its significance for humanity's progress" (ul Haq 2003). The above statement seems to relate to the value paradox, formulated already by Aristotle as the paradox of water and diamonds. The paradox is as follows: why does water, which is necessary to survive, cost so little, while diamonds cost so much, even though one can survive without them? The paradox was solved by the introduction of the law of marginality. Mark Skousen defines it in simple words: "if a big amount of water is available everywhere, an additional glass of water will be relatively cheap. On the other hand, if a society lives on the Arab Desert, where water is rare, it will value every additional unit of water. The same rule applies to diamonds. If there is a plenitude of diamonds, their price falls. When diamonds are rare, their price rises" (2009). This also explains

the difference between the price and use values. At first glance, ul Haq's statement seems to be in conflict with the value paradox. However, it is not so. This statement simply says that economic value is not always relevant for measuring human development.

A lot of evidence exists which confirms the theory that beyond a certain level of GDP per capita, no link between the growth of GDP per capita and the growth of people's welfare takes place. Only in the last few years has the assumption that income directly translates into people's wellbeing been questioned in broad public debate. That is why going *beyond* GDP is a matter of great importance. An attempt worth noticing is the report prepared for the president of France by the Commission for Measuring Economic Growth and Social Progress (Stiglitz et al. 2009), which has prepared a broad set of recommendations for changes in measuring wealth and the quality of life.

The key element of human development – control over resources necessary for a worthy living – is probably the hardest one to measure. The HDI uses gross national income per capita which gives some idea on the relative capability of purchasing goods and control over resources necessary for a worthy life. Unfortunately, calculating it on the county level leads to many difficulties. Dis-aggregating the GNI would be unwise because of the local diversity of counties and their economies. It seems that the best measure of the living standard would then be the level of disposable income.

The concept of income is strictly related to household income. Disposable income in the context of household income is defined as the total income subtracted by lasting expenditures. It is the best measure of economic income, often measured on the level of household budget surveys conducted by the Central Statistical Office (Główny Urząd Statystyczny 2011a). The Central Statistical Office lists the following elements as components of the disposable income: wage labour incomes, income from self-employment outside of individual agricultural households, income from freelance profession, property income, income from leasing real estate, income from social securities, other securities and other income (incl. gifts and aliments). Disposable income is also an element of the analysis of Polish system of national accounts (Plicha 2008). Unfortunately, the results of the analysis are incomparable at the county-level as the size of the sample is insufficient.

In the UNDP methodical report (UNDP PO in Poland 2012), the subject of finding a substitute closest to disposable income was raised. Particular indicators which could form its components were also described. These include, **the Welfare Index as the total taxpayers' income** prior to taxation (tax declaration: PIT-36, PIT-36L and PIT-37) plus **income from agriculture** on the basis of comparative fiscal hectare (community income from the agricultural tax divided by the tax value of one comparative fiscal hectare times the mean income from one comparative fiscal hectare from the activity of individual agricultural households, which are the basis of the agricultural land tax)[12] and the **total of social security expenditures together with other public policy tasks: the sum of social securities and expenditures on family policy in the budgets of local governments (communities and counties)** excluding securities paid due to natural disasters divided by the number of the county's population. **In other words, it is the mean level of the people's welfare.**

Gross income[13] understood in this way is, according to the authors, closest to disposable income and proves very useful in the analysis of the territorial distribution of welfare. Converted into

12 The value of one comparative fiscal hectare is set on land area, type and class of agricultural land based on the property registers and also on subventions to the county tax.

13 Income is calculated prior to taxation, as the totals consist of numbers subject to different types of income tax. Despite this flaw, the index depicts territorial differentiation well.

months, it gives the approximated hypothetical monthly income per capita (mean wealth) in a given administrative unit.

The Welfare Index includes income declared in tax declarations by:

- Persons performing non-agricultural economic activity and special agricultural production sectors, taxed by 19%,
- Persons who acquired income from sources within the territory of the Republic of Poland are subject to taxation on general terms based on the tax scale and in particular from:
  - salaries and wages from work relationships, work relationships (incl. cooperative work relationships) and imposed work,
  - retirements and national pensions (incl. structural and social pensions),
  - pre-retirement provisions and pre-retirement securities,
  - charges from membership in agricultural production cooperatives or other cooperatives active in agricultural production,
  - securities from social insurance,
  - scholarships,
  - income from individually performed activities (incl. agreements, manager contracts, membership in management boards, duty performance, sport activities),
  - income from copyrights and other estate rights,
  - provisions paid from the Labour Fund of the Employee Guaranteed Provisions Fund,
  - charges from employment of arrested and convicted persons,
  - charges from activation agreements,
  - non-agricultural economic activity.

Income is calculated as the total of all income gained in employment, which underlines the character of a citizen's activity, and retirement. Additionally, all individual social monetary provisions from social aid and family policy per one county inhabitant are added. These two parts are understood as two different financial streams. The activity, its derivatives social aid, and family policy provision, in order to avoid additional interpretation problems, are calculated together. Social aid in this perspective is the income stimulant provided by the state as a means of diminishing income inequality. Were social aid to be treated as an independent factor, it would be defined as a de-stimulant, because transfers which depend mostly on income thresholds may not be treated as stimulants. Income from labour can be exchanged for access to benefits paid by the state, which substitute for wages, and by access to services provided directly by the state, which would otherwise have to be purchased by individuals. As a result, the calculation of the total is more methodically coherent.

The Welfare Index does not consist of dimensional indices due to the monetary nature of all of its components, which can be summed.

The value of the WIi index for the counties and voivodeships analysed was calculated according to the following distance formula:

$$WI_i = 1 + 99 \times \frac{WI_{ei} - WI_{min}}{WI_{max} - WI_{min}} \qquad i = 1, 2, \ldots n;$$

where:

WI_{ei} – is the mean level of the people's welfare in the county *i*,
WI_{min}, WI_{max} – are respectively the minimum and maximum values observed in the counties analysed from 2007 to 2010; people's welfare values: min = 663.5436 (Kolno county 2007), max = 2687.3660 (Warsaw 2008).

2.4 Public policy inputs in human development

The element differentiating the approach of the present report from others is the attempt to construct a Human Development Index that would also take into consideration the various public policy expenditures devoted to improving human development (or human-development related inputs). The purpose is to use this index for evaluating the long-term effects of public policy in Poland. In a democratic country, good governance is characterised by public authorities building institutions and implementing projects which reflect the true needs of the citizens as well as rooting these decisions in established knowledge and critical data analysis. In order to evaluate the public policies (their efficiency and effectiveness), the human development outcomes need to be analysed against the human development related inputs. For that reason and following the logic of the three dimensions of the human development index, the Local Human Development Policy Inputs index ($LHDI_{PI}$) is designed. The index shall depict public policy inputs (resources devoted to the dimensions included in the LHDI).

Table 2.3 Dimensions of public policy inputs included in the Local Human Development Index ($LHDI_{PI}$)

Dimension	Health	Education	Welfare
$LHDI_{PI}$ **dimensional indicators**	**Local Dental- and Healthcare Index** (*Number of doctors and dentists according to employment location per 100,000 people*)	**Education Expenditures Index** (*Education expenditures per student in general: pre-schools, primary schools, lower secondary schools and high schools*)	**Local Expenditures Indices** (*Total of expenditures from municipality and county budgets, within given counties excluding EU expenditures and budgets points financed from EU measures in local territory governments divided by the number of inhabitants*)
	Nurse- and Obstretic Care Index (*Number of nurses and midwifes according to employment location per 100,000 people*)	**Students per Teacher Index** (*Number of students per teacher: primary and lower secondary schools*)	
$LHDI_{PI}$ **dimensional indices**	**Health Index – Policy Input**	**Education Index – Policy Input**	**Local Expenditures Index – Policy Input (a proxy for Economic Welfare Inputs)**
Local Human Development Index – Policy Input ($LHDI_{PI}$) – county and voivodeship			
Public policy human development relevant inputs on a local and regional level			

Source: Own study.

The formula for the public policy input on the LHDI dimensions is as follows:

$$LHDI_{PIi} = \sqrt[3]{HI_{PIi} \times EI_{PIi} \times LEI_{PIi}} \qquad i = 1, 2, ...n;$$

where:
$LHDI_{PIi}$ – is the public input in local human development dimensions for the voivodeship and county *i*,
HI_{PIi} – is the Health Index – Policy Input for the county *i*,
EI_{PIi} – is the Education Index - Policy Input for the county *i*,
LEI_{PIi} – is the Local Expenditures Index - Policy Input for the county *i*.

2.4.1 Health

One of the three Local Human Development Index dimensions is a long and healthy life. The capability to lead a long and healthy life is a foundation of the human development approach (Sen & Anand 1994). It is both a goal of public policy and a value in itself. Taking into account the construction logic of the LHDI dimensional indices, a measure connected to financing public healthcare in Poland should be applied for the $LHDI_{PI}$. Financial measures for financing healthcare in Poland are distributed by the National Health Fund (NHF). Local government expenditures form about 1% of all healthcare expenditures. According to the knowledge available, the NHF does not use the information from its registers for local-level analysis. Using this kind of data will be most probably possible after the completion of changes in the NHF's IT system.

The estimated life expectancy, crude death rate index and morbidity measures are all outcome indicators of the health dimension. The quality and access to healthcare and medical infrastructure are more important to the patient than the volume of financial designated resources. Data availability in this field is also limited, although the National Health Fund and the Ministry of Health are currently changing their statistical structure so that public health data will be of better quality.

Health indicators are usually referred to as variables in relation to the population (i.e. the number of primary healthcare doctors for 1,000 persons).

In the case of diagnostics and special care, access to cardiologists, oncologists, internists (internal diseases specialists), geriatrists or paediatricians becomes a significant factor. Apart from indicators relating to specialist doctors, indicators relating to other medical staff (i.e. the number of nurses per 100,000 persons) should be used. Thus, in calculating the measure of input on the dimension of health, the authors shall use the following indicators:

- **Medical and Dental Care Index according to the primary location of employment per 100,000 people** (data available for counties on the basis of Central Statistical Office, starting from 2006),
- **Nursing and Maternity Care Index according to the primary location of employment per 100,000 people** (data available for counties on the basis of Central Statistical Office, starting from 2006).

The two indices reflect the level of human resources involved in healthcare provision. While the number of general healthcare doctors shows the overall access to healthcare, the number of nurses is key in reflecting the quality of healthcare provided in a given region. The Health Index – Policy Input – HI_{PI} is calculated using the following formula:

$$HI_{PIi} = \sqrt[2]{MDCI_i \times NMCI_i} \qquad i = 1, 2, ...n;$$

where:
$MDCI_i$ – the *Medical and Dental Care Index* is calculated on the basis of doctors employed according to the primary location of employment per 100,000 people in county *i*,
$NMCI_i$ – the *Nursing and Maternity Care Index* is calculated on the basis of the number of nurses and midwifes employed according to the primary location of employment per 100,000 people in county *i*.

The value of the $MDCI_i$ for the counties and voivodeships analysed is calculated on the basis of the following distance formula:

$$MDCI_i = 1 + 99 \times \frac{MDCI_{ei} - MDCI_{min}}{MDCI_{max} - MDCI_{max}} \qquad i = 1, 2, ...n;$$

where:
$MDCI_{ei}$ – is the number of doctors and dentists in the county *i*,
$MDCI_{min}$, $MDCI_{max}$ – are respectively the minimum and maximum values observed in the counties analysed from 2007 to 2010; for the numbers of general healthcare doctors and dentists per 100,000 people the min = 9.7935 (Łomża county 2007), max = 788.4043 (Lublin 2009).

The value of $NMCI_i$ is calculated as follows:

$$NMCI_i = 1 + 99 \times \frac{NMCI_{ei} - NMCI_{min}}{NMCI_{max} - NMCI_{max}} \qquad i = 1, 2, ...n;$$

where:
$NMCI_{ei}$ – is the number of nurses and midwifes employed full-time per 1,000 persons in the county *i*,
$NMCI_{min}$, $NMCI_{max}$ – are respectively the minimum and maximum values observed in the counties analysed from 2007 to 2010; the numbers of nurses and midwifes dentists per 100,000 people on the level of: min = 5.9008 (Radom 2009), max = 1674.7066 (Krosno 2010).

2.4.2 Education

Another dimension of the $LHDI_{PI}$ is education. The evolution of education in economically-developed countries takes place under the influence of demographical, technological, political and economic processes. Amongst the causative demographic agents is the change in the age structure of theses societies, the decreasing number of young people, to whom society provide formal primary and secondary education. Technological causes of education's evolution include the constant development of information technology which enhances school curricula (i.e. coursera.org, edX.com, ted.com), alters the content and ways of teaching. Amongst political causes is the growing popularity of the thesis that the wealth of nations stems from its citizens' high qualification and competencies. The progressive role of democracy resulting in better supervision and control of spending public funds is also an important element. By placing all children under obligatory education at the beginning of the 20th century, the state has changed the face of society. Education is the field where the influence of national policy on shaping the capabilities of its citizens and the future of the entire society is greater than in any other area. Education is vital for development and the educational part of the $LHDI_{PI}$ is calculated from the perspective of national actions in this field.

Key indicators in the field of education were chosen as dimensional indices of the LHDI as a result of a discussion which accompanied the writing of the methodical report (UNDP PO in Poland 2012).

Education Expenditures per student (pre-schools, primary schools, lower secondary schools, high schools) may be perceived as the main index for input in the area of education. This index is the total of expenditures of a community and county local government on the territory of a given county. Data was provided by the Central Statistical Office on the basis of data from the Ministry of Finance.

The Student-Teacher Ratio Index (primary schools and lower secondary schools) is an alternative measure of the education input. A lower number of students per teacher may be interpreted as a sign of better teaching quality. In the context of the $LHDI_{PI}$ the student-teacher ratio is calculated for primary schools and lower secondary schools. Data was provided by the Ministry of National Education.

The *Education Index – Policy Input* – EI_{PI} assumes the following formula:

$$EI_{PIi} = \sqrt[2]{EEI_i \times STRI_i} \qquad i = 1, 2, ...n;$$

where:
EEI_i – the *Education Expenditures Index* is calculated on the basis of the total of local government expenditures on education (communities and counties) divided by the number of students (kindergartens, primary schools, lower secondary schools and high schools) in county *i*,
$STRI_i$ – the *Student-Teacher Ratio Index* is calculated on the basis of primary schools and high schools divided by the total number of teachers in those schools in county *i*.

The value of the EEI_i for the analysed counties and voivodeships is calculated according to the following distance formula:

$$EEI_i = 1 + 99 \times \frac{EEI_{ei} - EEI_{min}}{EEI_{max} - EEI_{max}} \qquad i = 1, 2, ...n;$$

where:
EEI_{ei} – are the local government expenditures per student in county *i*,
EEI_{min}, EEI_{max} – are respectively the minimum and maximum values observed in the counties analysed from 2007 to 2010; local government expenditures on education per student: min = 54736.0116 (Łomża 2007), max = 11167.7276 (Sopot 2010).

The value of the $STRI_i$ is calculated similarly:

$$STRI_i = 1 + 99 \times \frac{STRI_{ei} - STRI_{min}}{STRI_{max} - STRI_{max}} \qquad i = 1, 2, ...n;$$

where:
$STRI_{ei}$ – is the total number of students in primary schools and secondary schools divided by the total number of teachers in those schools in county *i*,
$STRI_{min}$, $STRI_{max}$ – are respectively the minimum and maximum values observed in the counties analysed from 2007 to 2010; total numbers of primary and secondary school students divided the total numbers of teachers in those schools at the level of: min=8.9393 (Sejny county 2010), max=15.3895 (Łomża 2007).

2.4.3 Welfare

In the case of the HDI, the basic dimensional index describing the welfare of citizens, meaning what can be bought and used by creating a part of our "material" capabilities, is the Gross National Income (GNI). The GNI per citizen is both an instrument and a measure. On the national level, it serves as a measure of economic capabilities and the potential capabilities of a country, it also serves as a measure for developing the population's quality of life. On a regional level its meaning becomes totally different. The disaggregated GNI provides us with information about the value added produced in a given territory. Due to the redistribution function of the government, it has little in common with measures designated (or available) for development goals on a regional level. The country taxes citizens and economic entities and then redistributes the resources gathered. Problems with interpreting this allocation consist of the fact that county and voivodeship budgets receive subventions from the national budget for their own actions. The asymmetry of relations is even more important: as an act of social solidarity, persons better-situated (both private and legal entities) have a greater financial (but not only) input in development, compared to how much they receive from public services (Ivanov & Peleah 2011).

Value added produced in one field is transferred to poorer regions according to the state's redistribution policy; poorer regions also receive EU resources. The aim of the state's regional development

strategy is to diminish inequalities in development levels and enhance the economic, social and political coherence of the state. Without such redistribution functions crises or other serious consequences could take place i.e. given regions could become totally depopulated. What is important from the human development perspective is that as a result of redistribution, internal state inequalities fall and convergence takes place for various territorial units (units draw toward the national mean). Of course some forms of redistribution rely on transfers from the state budget directly to particular individual and to local governments.

The use of the disaggregated NGI to calculate the $LHDI_{PI}$ may prove inadequate, unless the disaggregation level is high enough and the county large enough. Polish counties analysed in this part of the publication, however, do not fulfil the latter condition as there are 379 of them. We would receive a pre-redistribution image, which would be even more distant from the reality of human development than the image gained solely on the basis of GDP. In order to calculate the LHDI, one needs to estimate the disposable income or a similar measure for administrative levels such as the county and voivodeship (Ivanov & Peleah 2011).

Data relating to income (or expenditures) of households give an image of the average welfare of the members of their families including the role of the "shadow economy" but excludes resource distribution within households. In case of the LHDI the closest counterpart, disposable income, was used. It has, however, one major flaw: data on household or per capita income does not reflect consumption of "public services" (direct consumption of social services such as education and health or developing living standards through regional development and infrastructure projects financed by central funds in order to improve the situation in underdeveloped parts of the country). For public policy, household income is compared with a measurable public policy input i.e. local government budgets or allocation of EU-funds in a region. However, for that data to be comparable for many territorial units it has to be converted into per capita values.

To maintain the clarity and symmetry of the $LHDI_{PI}$, balance between different financial and structural measures of input within the Local Input Index should be kept. Dimensional indices of education include two measures: one relating to the educational infrastructure and the second to financial input. In case of health, all measures relate only to medical infrastructure. The measure of living standards include only financial measures, relating to financial input held at the disposition of a local government. We are aware of this drawback of the index, however decided to apply it anyway due to limits of potential alternative measures.

The input measure of the economic dimension of living standards from the perspective of public policy inputs is thus:

- **Total expenditures of county and voivodeship budgets within a given county and budget items financed from EU-funds in territorial governments budgets divided by the number of inhabitants.** Source: Central Statistical Office and Ministry of Finance.

This is the total of all public input in a given county divided by the number of citizens in that county. While writing the methodological report (UNDP PO in Poland 2012), it seemed that the EU-funds in local government budgets could be calculated separately. Unfortunately, the years 2007–2009 were a time of winning and signing agreements and starting projects from EU-funds. During this time, some of the local governments had no expenditures under these positions due to the shift of investments' timing. Only the years 2009 and 2010 saw a higher rate of spending from European funded measures and together with the period of 2011–2012 (when a similar situation occurred by

the end of the current financial framework and there were still many resources left unsent). The amount of European resources secured by the local government is also an indicator of its financial standing reflected in its capability to allocate financial measures for the "own contribution" to the EU funds. The problem of combining European input and policies still remains hard to evaluate. The report will later describe recommendations as to what could be changed. Part of the data on European resources may be for description and analysis. To sum up, it is important to differentiate between the different financial streams of which it consists.

During the analysis of public policy input, we should bear in mind that its character is not universal. Some regional interventions and financial input is only allocated in particular parts of the country i.e. in Eastern Poland and on particular counties and communities. Comparing territorial units which received support greater than others would prove unsuitable in the evaluation of the effectiveness of different types of public policies. One should bear in mind the problems related to diminishing the effects of burdens coming from the central government and various types of interaction on a macro-scale. It seems the attempt is worth taking, so that the $LHDI_{PI}$ may be used for defining causal relationships between human development and public policies.

The *Local Expeditures Index – Policy Input* – LEI_{PI} would take the form of the aforementioned total of local government financial input per capita. The starting point to calculate the index value for counties and voivodeships analysed is the following distance formula:

$$LEI_{PIi} = 1 + 99 \times \frac{LEI_{PI\,ei} - LEI_{PI\,min}}{LEI_{PI\,max} - LEI_{PI\,max}} \qquad i = 1, 2, \ldots n;$$

where:
$LEI_{PI\,e\,i}$ – is local governments' expenditures per capita in county *i*,
$LEI_{PI\,min}$, $LEI_{PI\,max}$ – are respectively the minimum and maximum values observed in the counties analysed from 2007 to 2010; local government expenditures converted into per capita values: min=2049.7501 (Piekary Śląskie 2007), max=9454.3677 (Sopot 2007).

2.5 LHDI contextual measures

Placing the LHDI in the context of missing dimensions of human development is necessary for the needs of a local level analysis. Since its creation, the HDI has become a useful analytic instrument for governments, media and civil society, allowing them to compare progress in human development in different countries over time. There are two possible approaches to using the HDI – as an independent, statistical and scientifically relevant measure or as a pragmatic policy relevant framework for a broader and deeper development action. The second approach is a key goal of this research and it requires more complex and subtle indicators complementing the new HDI.

Fukuda-Parr (2003) and Pineda (2012) argue that, since the creation of the HDI, it has been clearly stated that the concept of human development is far broader than what the human development index can measure. This poses a certain challenge in conducting public policy as situations may occur when improvement of the value of the human development index may camouflage regression in other key aspects not reflected in the index. For example, civic activity may decrease, the environment may become more polluted, the society may become more unequal or digital engagement may fall, while the value of the HDI will rise at the same time. This means that the UNDP has to regularly update its methodology and indices in order to be able to better capture various aspects of human development (Pineda 2012). In the case of Poland, the authors have

decided to include additional context indicators, which may contribute to the development of the HDI.

In order to create a useful tool for monitoring public policy, we have to go beyond traditional HDI dimensions, which do not fully focus on mobilizing public opinion and generating the impulse necessary for change. Building a substantial evidence based background for policy-makers requires a more complex approach, although the rules of transparency and communicative message have to be maintained. Based on the analysis of development processes in Poland and globally, we propose including information about five development aspects which are not yet – but could potentially be – part of the LHDI. We refer to the analysis of areas such as human capital, environmental protection, poverty, the labour market, civic activity, digital engagement and women's empowerment.

Table 2.4 Dimensions and contextual indices of human development[14]

Dimension	Human Capital	Labour market	Poverty	Civic activity	Digital engagement	Women's empowerment	Environmental protection
Index	Average number of years necessary to gain the level of education by persons above 15 years of age (census 2002)	Registered unemployment rate	Percentage of people receiving social security in a household compared to the total number of inhabitants	Local government elections attendance (Community Council)	Percentage of tax declarations submitted via Internet	Number of local government mandates held by women	Mixed municipal waste from households per capita
Local Human Development Index Context							
Human Development in the county and voivodeship level							

Source: Own study.

Among the main challenges the regions have to address using a long-term development perspective are social inequalities, climate changes and their effects, environmental degradation, biodiversity loss and unsustainable use of natural resources. Inequality has a negative influence not only on the situation of individuals, but also on entire societies. Highly unequal societies have a tendency for a slower economic growth than countries with lower income inequalities. Maintaining growth for a longer period of time poses a challenge for them. They also recover slower to previous economic levels after periods of depression (System Task Team on the Post-2015 UN Development Agenda 2012; as cited in Chaudhuri & Ravallion 2006; Berg & Ostry 2011). Providing a broader perspective in approaching human development is very significant at this moment due to two major reasons. On the one hand, a global discussion is being held on defining the Sustainable Development Goals as an initiative to follow the Millennium Development Goals. On the other hand, broadening the perspective on human development seems even more important in the year of the Rio+20[15] conference, which brought together world leaders and thousands of participants from governments, the private sector, NGOs and other groups to mutually discuss strategies of diminishing poverty, securing social justice and protecting the natural environment.

14 The following indices may potentially be included in the LHDI as complementary dimensions in the future.

15 *The United Nations Conference on Sustainable Development* (UNCSD) was organised accordingly to the 64/23 Resolution (A/RES/64/236) of the United Nations Assembly in Brazil which was held from July 20th to July 22nd 2012 to commemorate the 20th anniversary of the 1992 UNCED in Rio de Janeiro.

The indicators for the presented contextual dimensions of the LHDI are:

- The average number of years necessary to gain the level of education for persons above 25 years of age. Calculation on the basis of the census from 2002. Data from the Central Statistical Office.
- The number of unemployed registered compared to the total number of civilians active professionally (excluding military service, employees of budget units active in national security and public security). The unemployment rate is calculated including the number of people employed in private agricultural households (being part of professionally active civilians), estimated on the basis of the common census results. Unemployed persons are registered based on their place of current registry, while the employed are registered based on the address of their workplace. Source: Ministry of Labour and Social Policy.
- The number of people receiving social assistance in households divided by the total number of inhabitants. Source: Central Statistical Office.
- The number of votes cast during the last Community Council elections (in a county) divided by the number of all eligible voters on the county level. Source: National Election Committee.
- The number of all tax declarations (PIT-36, PIT-37, PIT-37L) submitted via Internet divided by the number of all tax declarations (PIT-36, PIT-37, PIT-37L) submitted in a given county. Source: Ministry of Finance.
- The amount of communal waste collected from households converted per capita in a given county. Source: Central Statistical Office.
- The percentage of mandates held by women in Community and County Councils. Source: National Election Commission.

3. Human development in Poland

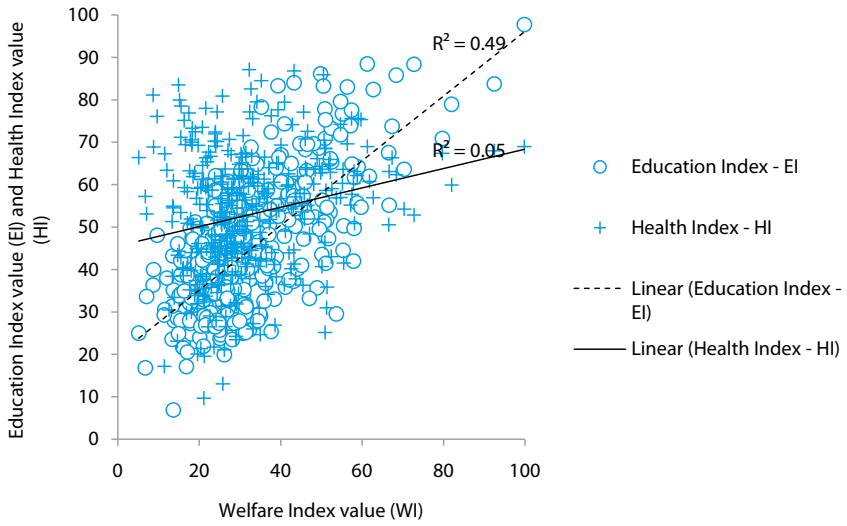
3.1 LHDI value ranking of counties and voivodeships

The Local Human Development Index was developed to measure the local and regional level of human development. It consists of three group indices:

- the Welfare Index (WI),
- the Health Index (HI),
- the Education Index (EI).

A detailed description of how the indices were developed and aggregated can be found in Chapter 2. Graph 3.1 below illustrates the relation between particular group indices which illustrate the dimensions of human development.

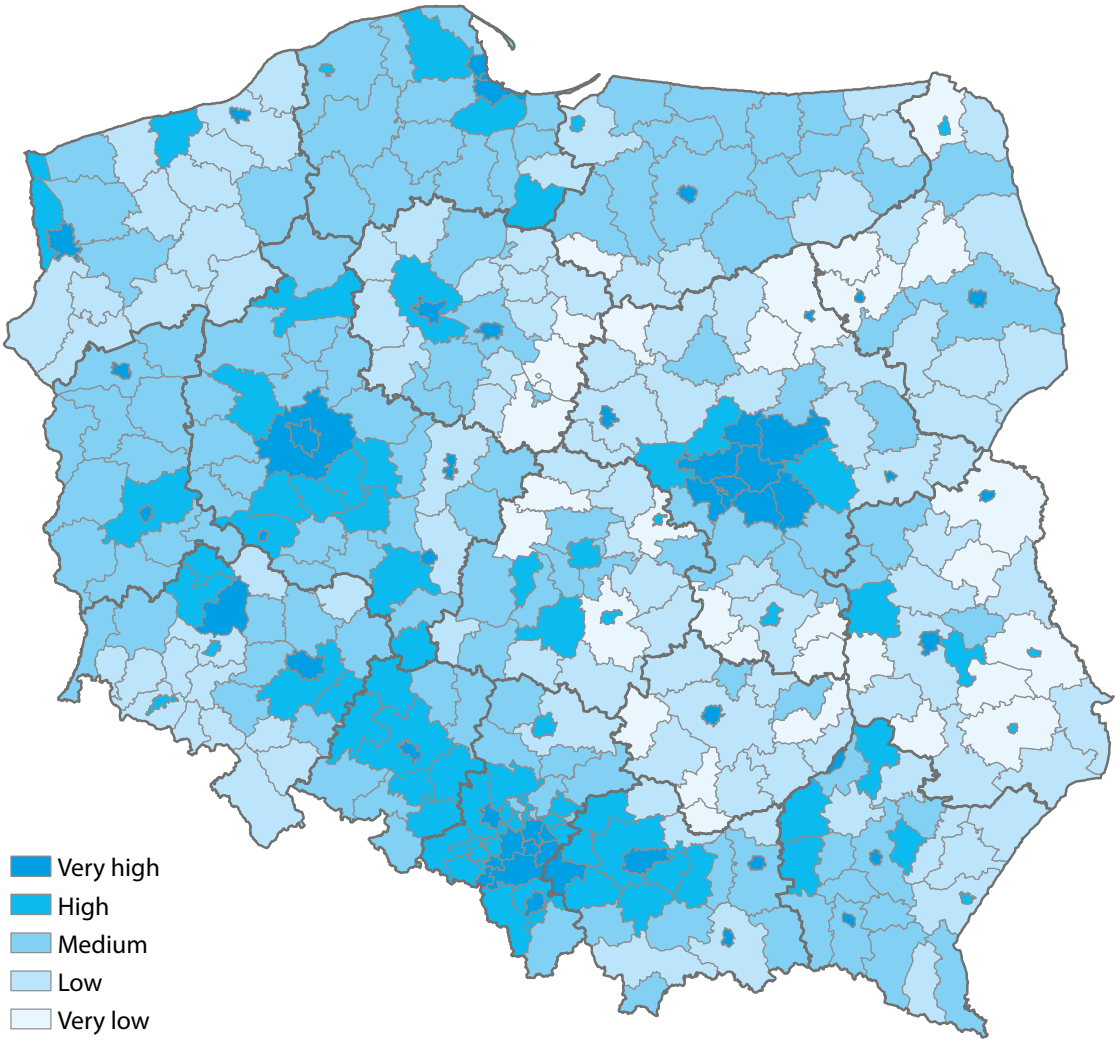
Graph 3.1 Relation between the Welfare Index (WI), and the Education and Health Index (EI and HI) in 2010 by county



Source: Own study.

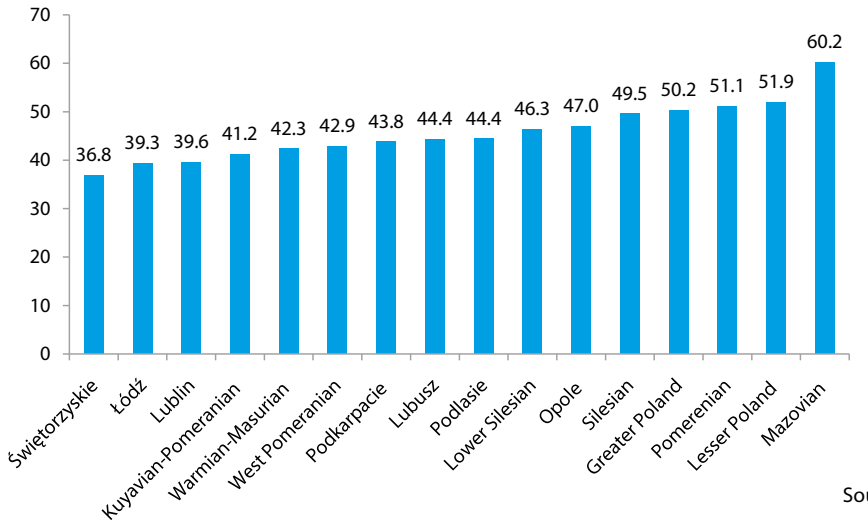
Each time relations are analysed, the pattern of the graph is chosen to reflect the specific data. In this particular case, we are looking for linear relations to illustrate the distribution of features seen in Graph 3.1. The collinear relationship ratio of the Welfare Index and Health Index is 0.219 (Pearson correlation ratio) and thus, relatively weak. The collinear relationship ratio of the Welfare Index and the Education Index is 0.701 which is quite strong. Relations between the Education Index and the Health Index are moderate, 0.392. Generally speaking, the three dimensions of the LHDI are relatively correlated, although education seems to be linked more strongly to welfare than to health. A visualisation of the Local Human Development Index can be seen in Graph 3.2 (voivodeships) and Map 3.1. (counties).

Map 3.1 The Local Human Development Index (LHDI) in counties in 2010 (the index assumes values from 1 to 100)



Source: Own study.

Graph 3.2 Local Human Development Index (LHDI) in voivodeships in 2010 (the index assumes values from 1 to 100)



Source: Own study.

The picture of local human development in Poland in 2010 can be seen in Map 3.1. Counties have been classified into 5 groups from very high, high, medium, low to very low level of human development on according to the natural breaks classification method.

The LHDI allows us to create a ranking on the level of voivodeships and counties. The results for the year 2010 are as follows:

Table 3.1 Voivodeship ranking according the value of LHDI in 2010 and the change of rank in voivodeships compared to 2007

Voivodeship	Rank according to LHDI 2010	Change of rank according to 2007	LHDI	HI	EI	WI
Mazovian	1	0	60.21	58.18	61.68	60.84
Lesser Poland	2	0	51.93	69.10	57.65	35.15
Pomeranian	3	0	51.14	71.28	47.16	39.79
Greater Poland	4	0	50.22	63.32	50.19	39.86
Silesian	5	0	49.54	48.39	53.92	46.59
Opole	6	0	46.95	59.76	55.94	30.96
Lower Silesian	7	0	46.34	47.61	48.79	42.84
Podlasie	8	1	44.40	66.08	51.60	25.67
Lubusz	9	2	44.36	54.72	47.21	33.79
Podkarpacie	10	0	43.77	72.28	48.15	24.09
West Pomeranian	11	-3	42.89	52.31	42.51	35.48
Warmian-Masurian	12	0	42.33	58.61	41.85	30.93
Kuyavian-Pomeranian	13	0	41.22	49.17	42.31	33.67
Lublin	14	1	39.55	48.61	46.46	27.40
Łódź	15	1	39.28	31.48	52.25	36.85
Świętokrzyskie	16	-2	36.78	45.95	39.18	27.62

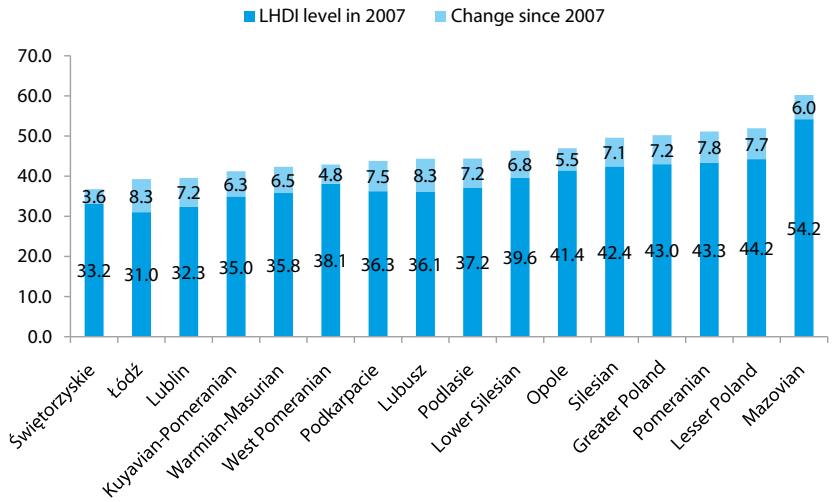
Source: Own study.

Legend: LHDI – Local Human Development Index, HI – Health Index, EI – Education Index, WI – Welfare Index

The level of human development measured by this index assumes values from 1 to 100. It must be said, that human development is an incredibly complex phenomenon and that neither the index proposed by us, nor any other synthetic measure, can fully illustrate its complexity. The changes over time presented in the above table are of a general character and due to its rather limited scale, definitive conclusions should not be drawn. An income ranking does not always reflect the distribution of human development. In other words, income does not determine the level of human development of a given voivodeship or county. We have to remember that the value of the synthetic index is a result of the values of group indices and that the value for each territorial unit should be evaluated on that basis. For example, the Lesser Poland voivodeship is second in the LHDI ranking, while the value of its income index is below the average for all voivodeships. The list of voivodeships with the worst human development results are not obvious – the Świętokrzyskie voivodeship has the lowest education results, a higher mortality rate (cardiovascular diseases and cancer deaths) and one of the lowest income level amongst the regions analysed. What's more, the result has fallen in comparison to 2007 by 2 ranks, mostly due to lower education results and the growing mortality rate. The same negative effects touch upon the West Pomerania voivodeship.

It is also worth noticing the phenomenon of the "Warsaw Island" – the Mazovian voivodeship, which has the highest human development index level in the country, embraces many counties with low index values. The Warsaw urban region significantly influences the high index values for the entire voivodeship. We must remember that cities are not heterogeneous. Some of Warsaw's city districts have lower index values in education and the lifespan varies greatly between the districts of Praga-Północ and Wilanów. This result refers to the social or developmental coherence which is not the direct subject of the analysis, but could become more so as the data available would make it possible. For example, despite the fact that the Mazovian voivodeship has reached the highest LHDI value amongst voivodeships, it may as well be in last place when looking at developmental coherence. This remains a subject for further intraregional analyses.

Graph 3.3 The absolute change of the Local Human Development Index (LHDI) from 2007 to 2010 by voivodeships



Source: Own study.

This above difference becomes even more visible for counties. A ranking structured this way does not enable us to state that life in Warsaw is twice as good as life in the city of Grudziądz; but the value of the LHDI and its partial indices do indicate a major difference between the two locations under the current definition of human development.

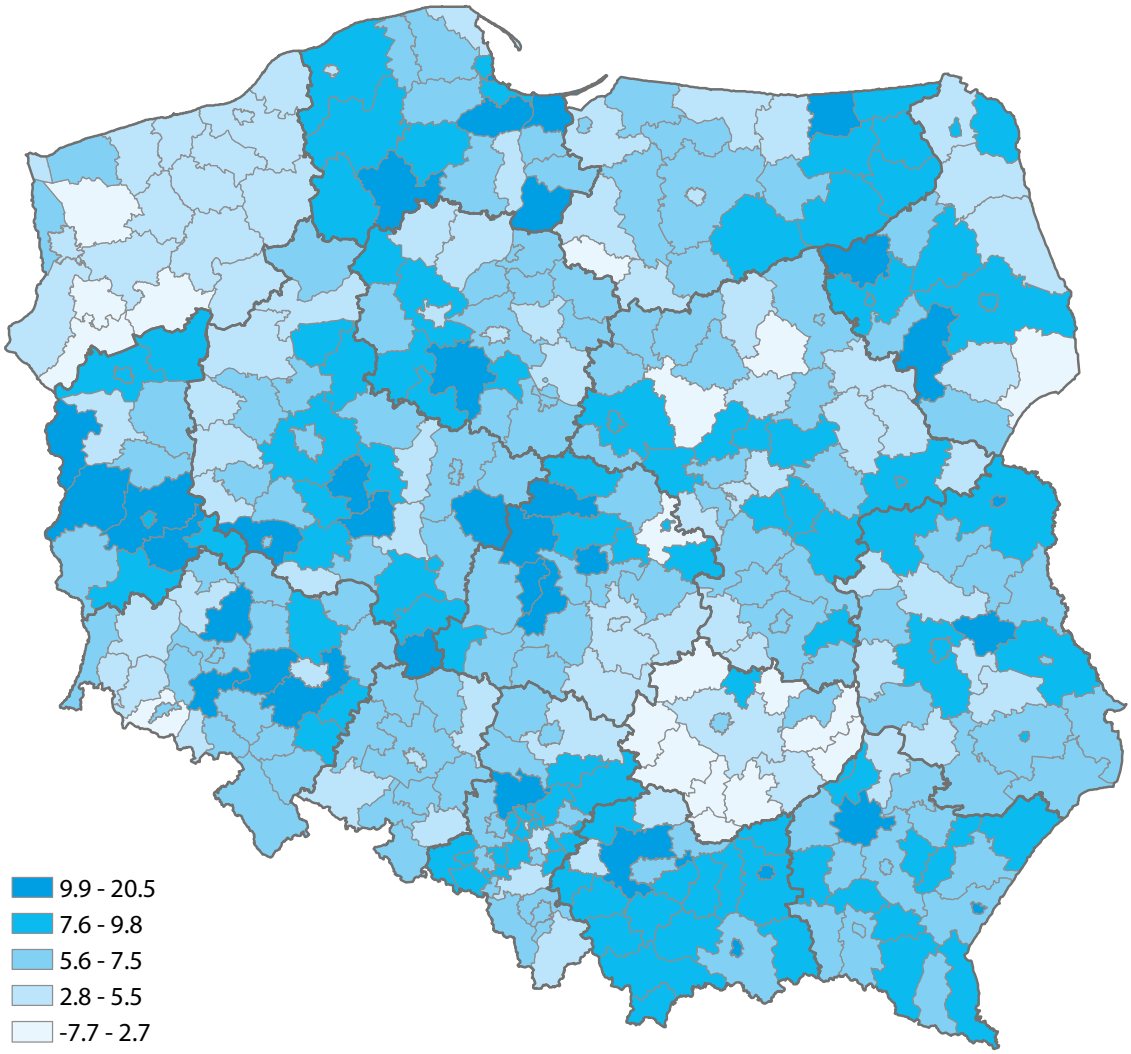
Table 3.2 Ranking of 30 counties with the highest LHDI values in 2010 and the change of rank compared to 2007

Powiat	LHDI rank in 2010	Change of rank compared to 2007	LHDI	HI	EI	WI
Warsaw	**1**	0	87.63	68.97	97.75	99.83
Piaseczno	**2**	0	80.75	68.01	83.74	92.44
Pruszków	**3**	0	72.92	59.95	78.93	81.96
Warsaw – West	**4**	1	72.48	67.39	70.88	79.72
Cracow	**5**	-1	72.05	69.00	88.47	61.27
Poznań	**6**	0	71.52	62.35	85.83	68.37
Rzeszów	**7**	0	71.22	85.90	83.24	50.52
Sopot	**8**	10	69.78	52.86	88.38	72.74
Gdynia	**9**	2	69.55	75.60	77.53	57.40
Legionowo	**10**	3	69.09	66.35	73.76	67.37
Opole	**11**	-3	68.82	69.63	83.02	56.38
Olsztyn	**12**	-3	68.62	74.23	79.57	54.69
Białystok	**13**	-1	68.10	86.84	84.02	43.29
Wrocław	**14**	-4	66.53	56.94	82.43	62.74
Gdańsk	**15**	0	65.92	75.64	64.14	59.05
Siedlce	**16**	1	64.76	68.57	77.84	50.87
Lublin	**17**	-1	64.57	62.77	86.10	49.80
Kielce	**18**	-4	64.08	68.50	75.29	51.02
Zielona Góra	**19**	2	63.43	60.32	76.68	55.17
Krosno	**20**	0	63.37	77.63	83.30	39.34
Poznań	**21**	6	62.67	75.34	54.67	59.75
Grodzisk	**22**	0	62.38	54.25	63.63	70.32
Nowy Sącz	**23**	10	62.30	79.43	74.34	40.94
Tarnobrzeg	**24**	7	61.58	84.55	78.30	35.27
Otwock	**25**	10	61.54	55.17	73.89	57.17
Tychy	**26**	-3	61.52	60.79	61.98	61.80
Lubin	**27**	10	61.45	63.13	55.15	66.64
Katowice	**28**	-9	61.03	50.58	67.54	66.54
Bielsko-Biała	**29**	-5	60.71	56.97	71.77	54.72
Leszno	**30**	-5	60.11	62.92	66.09	52.23

Source: Own study.

LHDI – Local Human Development Index
HI – Health Index
EI – Education Index
WI – Welfare Index

Map 3.2 The absolute change of the Local Human Development Index (LHDI) from 2007 to 2010 in counties



Source: Own study.

The highest increase of the LHDI values was reported in the Lubusz and Łódź voivodeships. In contrast to the increase in GDP (Główny Urząd Statystyczny 2012a) over the previous years, the Mazovian voivodeship has lost its great dynamics, as it had reached a high level of human development already in 2007 with other regions converging to similar values today. A relative increase in the income level and large increase in the average lifespan over the last several years have played a key role in the increase in LHDI for the Lubusz and Łódź voivodeships. More details can be seen on the map which presents the dynamics of human development in counties with the fastest changes taking place: Nowa Sól, Jawór, Kolbuszowa, Łaskie, Kępno, Cracow and in the city of Łódź (although the changes result from the lengthening of the average life span due to young people in productive age leaving the city), Sopot and Biała Podlaska. The smallest changes were reported in the following counties: Goleniów, Starachowice, Opatów, Sandomeirz, Busko, Pyrzyce, Myślibórz, Choszcze, Jelenia Góra, Włoszczowa and Pińczów. In the two latter counties a fall in the LHDI value was reported, mainly due to the high negative natural growth, the rise in the number or deaths and, most importantly, lower education results in the Pińczów county.

3.2 The group indices of the aggregated Local Human Development Index

3.2.1 Welfare

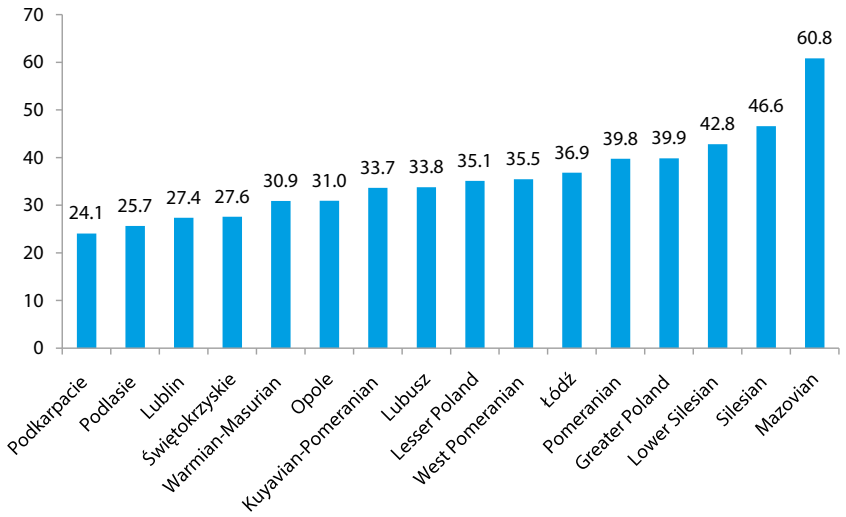
Welfare may improve access to high-quality education, health care and better housing. What seems key here are the resources at our disposal on which our goals and targets depend. This has been captured by the Welfare Index (WI). The national HDI is calculated based on the national income per capita. For the level of voivodeship and county another measure, which better reflects the average level of disposable income, had to be identified. The Welfare Index is calculated as the **total of taxpayers' pre-taxation income** (tax declarations: PIT-36, PIT-36L, PIT-37)[16] plus income from agriculture based on comparative fiscal hectare and **income on social security and other public policy duties** – social securities and family policy expenditures in the budgets of local governments (community and county, excluding security due to natural disasters) divided by the total number of the county's inhabitants. To ensure comparability of income achieved in the following years of the analysed timeframe, we have calculated the values based on 2007 prices.

Generally speaking, there are two financial streams – labour related income and social transfers. The first is comprised of income from labour activity, pensions, retirements and agriculture. The second stream is the income from social security and family policy which are related to low income thresholds, but increase the total financial resources per capita at the same time. The best way to estimate the disposable income would be by applying the corrected net income after taxation, which represents the average total disposable income per household. This method however could not be combined with other income. The proposed Welfare Index is based on all available administrative and public sources of data on individual income. It includes all sources of income: from contracts, full-time employment to economic activity, income from agriculture, pensions and retirements as well as income from social security and family policy. The Welfare Index is the closest substitute to disposable income, standardised and showing regional differentiation of individual income. Its drawback is that it does not include income from "shadow economy". It is not calculated into the results as a clear definition on how to include the additional income in a territorial perspective does not exist. We must remember that in a number of regions and counties "shadow economy" may play an important role, however estimating their scale on the territorial level would require a separate analysis.

The observed LHDI dynamics seems to have remained generally the same since the year 2007, despite the fact that the analysis covers the period of economic depression in Poland. All regions in Poland are performing better year by year in regards citizens' income. Income inequalities between the richest and the poorest regions of the country are very slowly diminishing. In the poorest regions, the growth of income is supported by the low staring level and is fuelled by the generally low level of wages. Despite low base effect in poorer regions t the income growth dynamics is higher amongst the richest regions (Mazovia, Silesia, Lower Silesia).

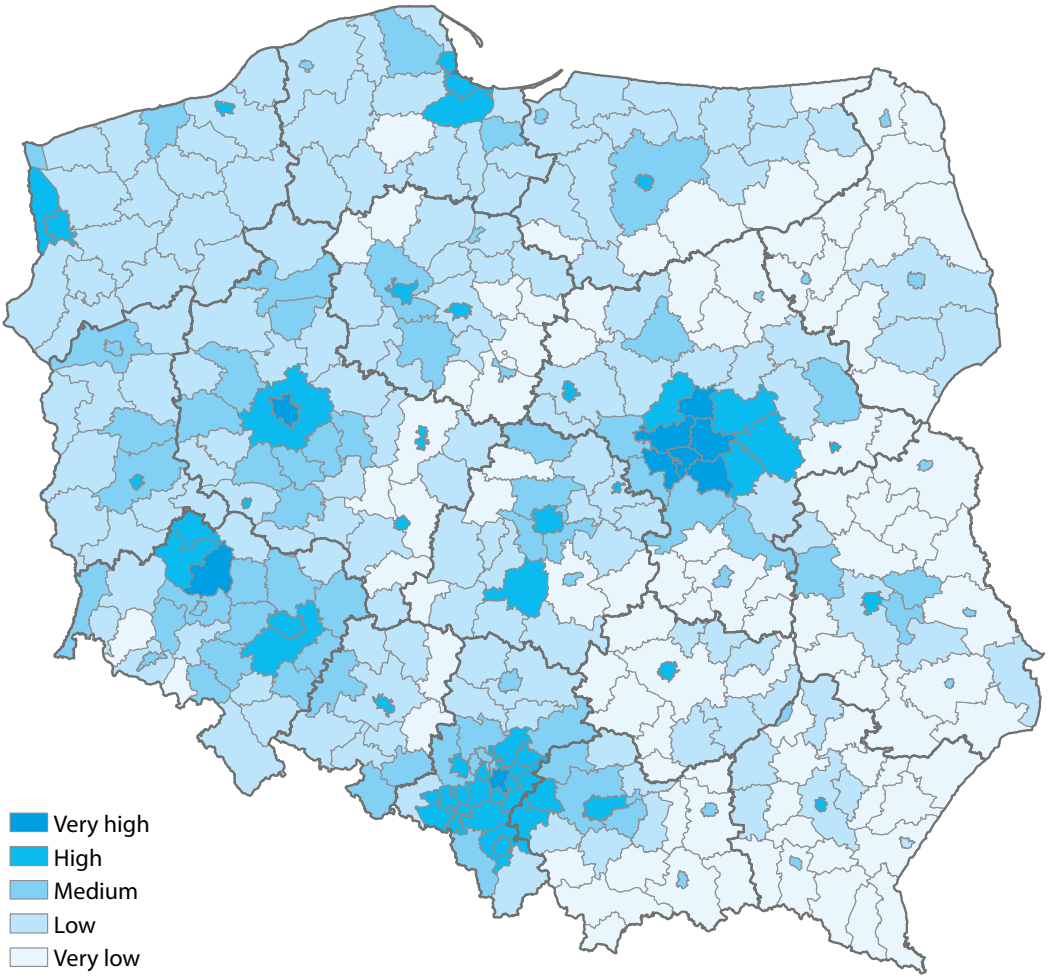
16 Municipality income from the agricultural tax is divided by the tax value from one comparative fiscal hectare times the average income from one comparative fiscal hectare of individual agricultural household activity, which is the basis of the agricultural tax for agricultural land.

Graph 3.4 The LHDI Welfare Index (WI) in voivodeships in 2010 (the index assumes values from 1 to 100)



Source: Own study.

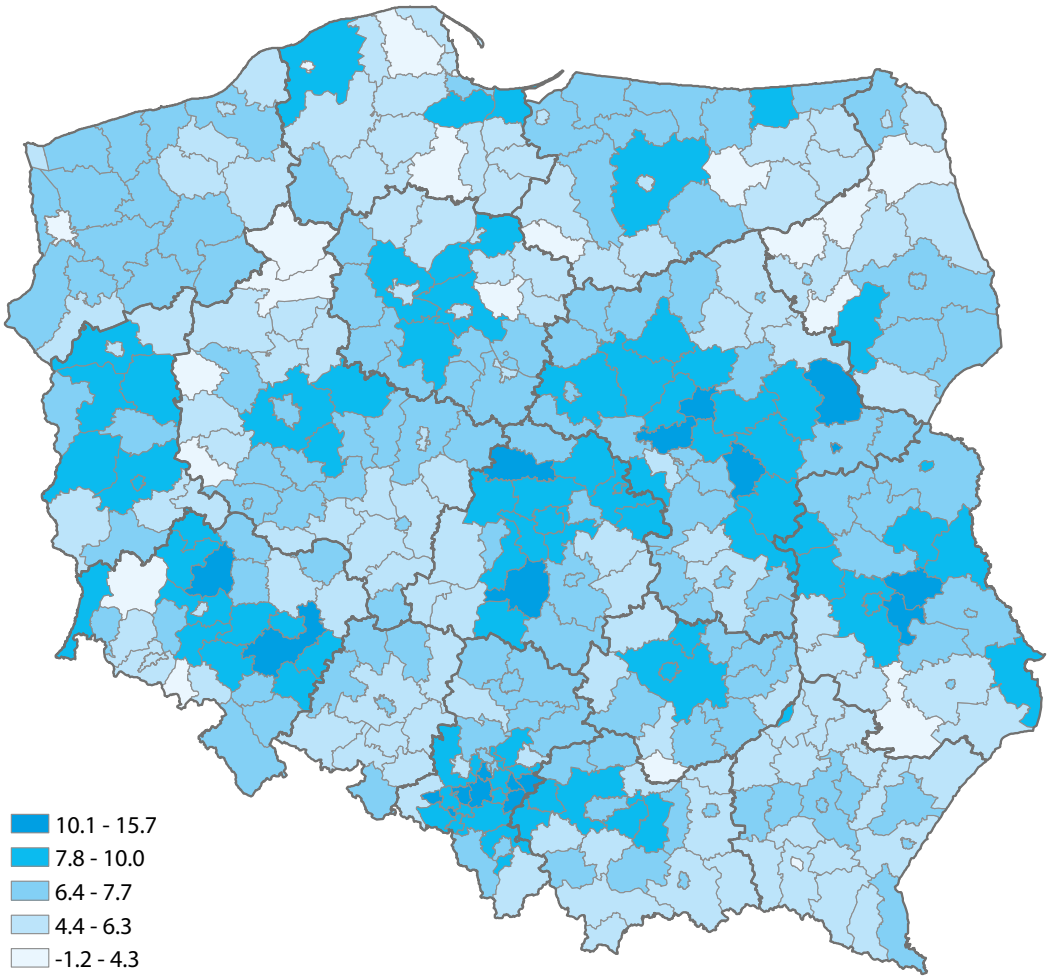
Map 3.3 The LHDI Welfare Index (WI) in counties in 2010 (the index assumes values from 1 to 100)



Source: Own study.

Map 3.3 illustrates the income difference in five categories of the LHDI Welfare Index. The web of highest incomes is identical with the biggest cities in Poland: Warsaw, Cracow, the Silesian conurbation and counties functionally linked to them, which is especially visible for Warsaw.

Map 3.4 The absolute change of the LHDI Welfare Index (WI) from 2007 to 2010 in counties

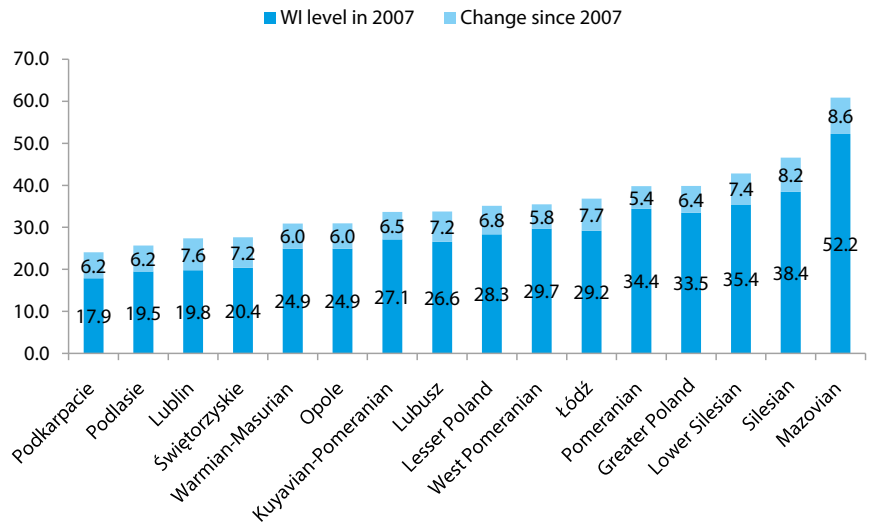


Source: Own study.

Changes in the Welfare Index are especially visible in the following counties (above 10 units within 4 years): Bieruń-Lędzin, Mysłowice, Rybnik, Lubin, Świdnica, Bełchatów, Wrocław, Otwock, Legionowo, Łęczyca, Mikołów, Warsaw – West, Łęczyca, Jaworzno, Sokołów, Siedlce and Ruda Śląska. It can be seen that a large part of the most dynamic counties are adjacent to large agglomerations. Change in income, thus, may be related to city inhabitants moving out to the suburbs, where they start paying taxes.

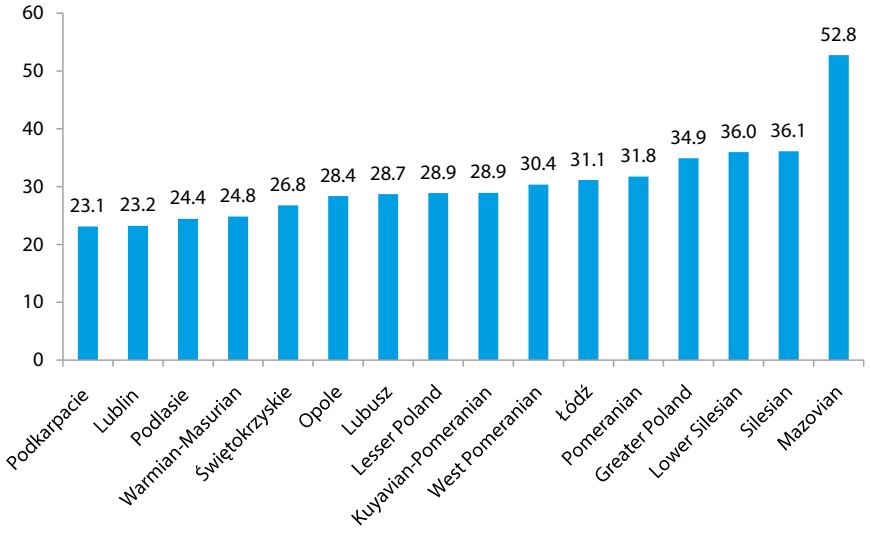
The regional Welfare Index ranking is generally similar to other regional monetary indices i.e. the GDP per capita. However, if we take a look at the order of voivodeships according to this second measure, we will see that there are some differences. Firstly, related to the flaws in the GDP, the Welfare Index estimates certain sources of income and production that the GDP per capita does not. The GDP per capita grows according to production, but real individual income increases from social transfers, which in some regions may be bigger than what changes in GDP show. The Kuyavian-Pomeranian or Warmian-Masurian voivodeships may serve as examples of the above.

Graph 3.5 The absolute change in the LHDI Welfare Index (WI) from 2007 to 2010 in voivodeships



Source: Own study.

Graph 3.6 GDP per capita (in PLN) in voivodeships in 2008



Source: Own study on the basis of the Central Statistical Office data.

The Welfare Index is the closest estimate of the disposable income because of its components that go beyond GDP – it's the amount of money that households have available for spending and saving before income taxes have been accounted for. If we compare our data used for calculating the LHDI income, to the previously described Household Budget Survey conducted by the Central Statistical Office, we shall see that they are very close in their territorial distribution.

Table 3.3 Information on income (in PLN) in voivodeships in 2010 based on UNDP and Central Statistical Office calculations

Voivodeship	Taxed income calculated by the UNDP		Disposable income (CSO)		Total income (CSO)		Total average monthly gross salary (CSO)*	
Lower Silesian	1518.814	3	1235.35	3	1282.93	3	3310	3
Kuyavian-Pomeranian	1331.438	10	1073.11	12	1108.94	12	2697	12
Lublin	1203.138	14	979.43	15	1025.80	15	2791	10
Lubusz	1333.919	9	1148.74	7	1189.89	8	2580	15
Łódź	1396.44	6	1148.54	8	1203.19	7	2898	7
Lesser Poland	1361.569	8	1124.62	9	1156.79	10	2997	5
Mazovian	1886.859	1	1569.11	1	1622.96	1	4218	1
Opole	1276.103	11	1123.99	10	1181.90	9	2882	8
Podkarpacie	1135.546	16	901.38	16	937.85	16	2647	14
Podlasie	1167.89	15	1188.46	5	1224.92	5	2682	13
Pomeranian	1456.582	5	1241.89	2	1286.94	2	3223	4
Silesian	1595.547	2	1166.44	6	1215.44	6	3502	2
Świętokrzyskie	1207.824	13	1031.24	14	1062.78	14	2753	11
Warmian-Masurian	1275.357	12	1063.00	13	1096.87	13	2448	16
Greater Poland	1457.961	4	1102.85	11	1135.02	11	2973	6
West Pomeranian	1368.359	7	1192.35	4	1231.10	4	2849	9

Source: Own study on the basis of CSO and UNDP calculations.

* The ratio of the total gross individual salaries, wages paid to given groups of employees resulting from their employment agreements, income from profit share or balance bonus in co-operatives and additional annual salaries for budget unit employees to the mean number of persons employed in a given period; after having excluded persons performing outwork and employed abroad.

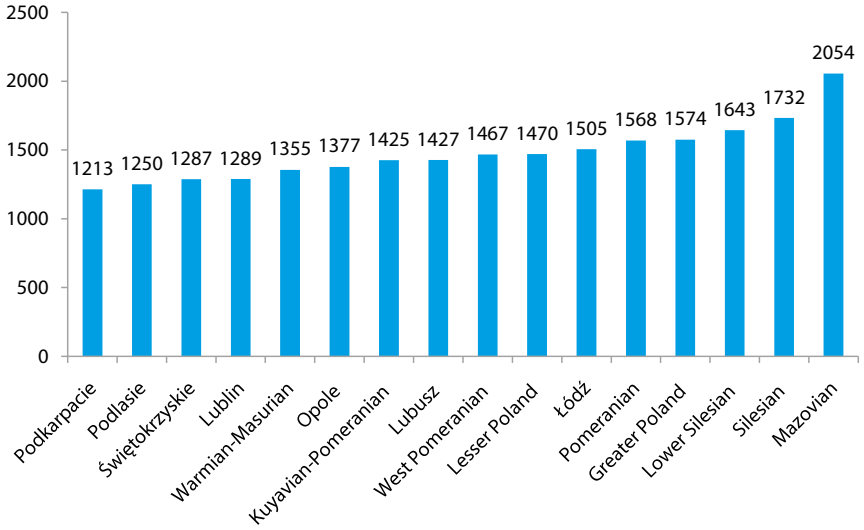
The Central Statistics Office calculations based on the Household Budget Survey (columns: income disposable and total income) show only a slightly different distribution. The Kuyavian-Pomeranian voivodeship has a minimally better rank in the UNDP source data ranking. UNDP income data also show a much greater direct income amount for inhabitants of Silesia, Lower Silesia and Greater Poland. The CSO disposable income strongly helps the West Pomeranian and Pomeranian voivodeships in the ranking. The differences are not substantial and are probably related to methodological issues – the Household Budget Survey is based on questionnaires to households, while the UNDP based its research on administration data. The differences visible may also be related to data on average monthly salaries provided by business entities with more than 9 employees, which resulted in not capturing a large part of employers from the Small and Medium Business (SMB) sector. The SMB seems to play a major role in the service market in Northern Poland and in the Lubusz voivodeship which can be seen in a different distribution of voivodeships compared to UNDP-calculated data (see: Table 3.3).

Moving on to the direct analysis of source data of which the LHDI Wealth Index is constructed, it is worth focusing closely on the two financial streams: income and social security resources.

3.2.1.1 Taxable income

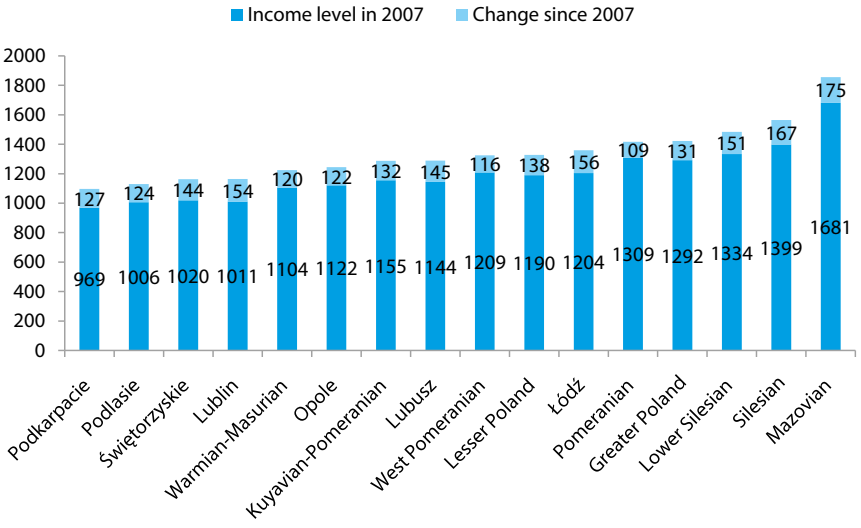
In order to be able to analyse the dynamics of changes on the level of inhabitants' welfare in particular regions, the best solution is to use source (unprocessed) data. The first important element of the economic part of the LHDI is the taxable income. Its dynamics in voivodeships between 2007 and 2010 is presented in Graph 3.8.

Graph 3.7 Taxable income (in PLN) in voivodeships in 2010



Source: Own study on the basis of the Central Statistical Office and the Ministry of Finance data.

Graph 3.8 The change in taxable income from 2007 to 2010 in voivodeships (in PLN constant prices 2007)



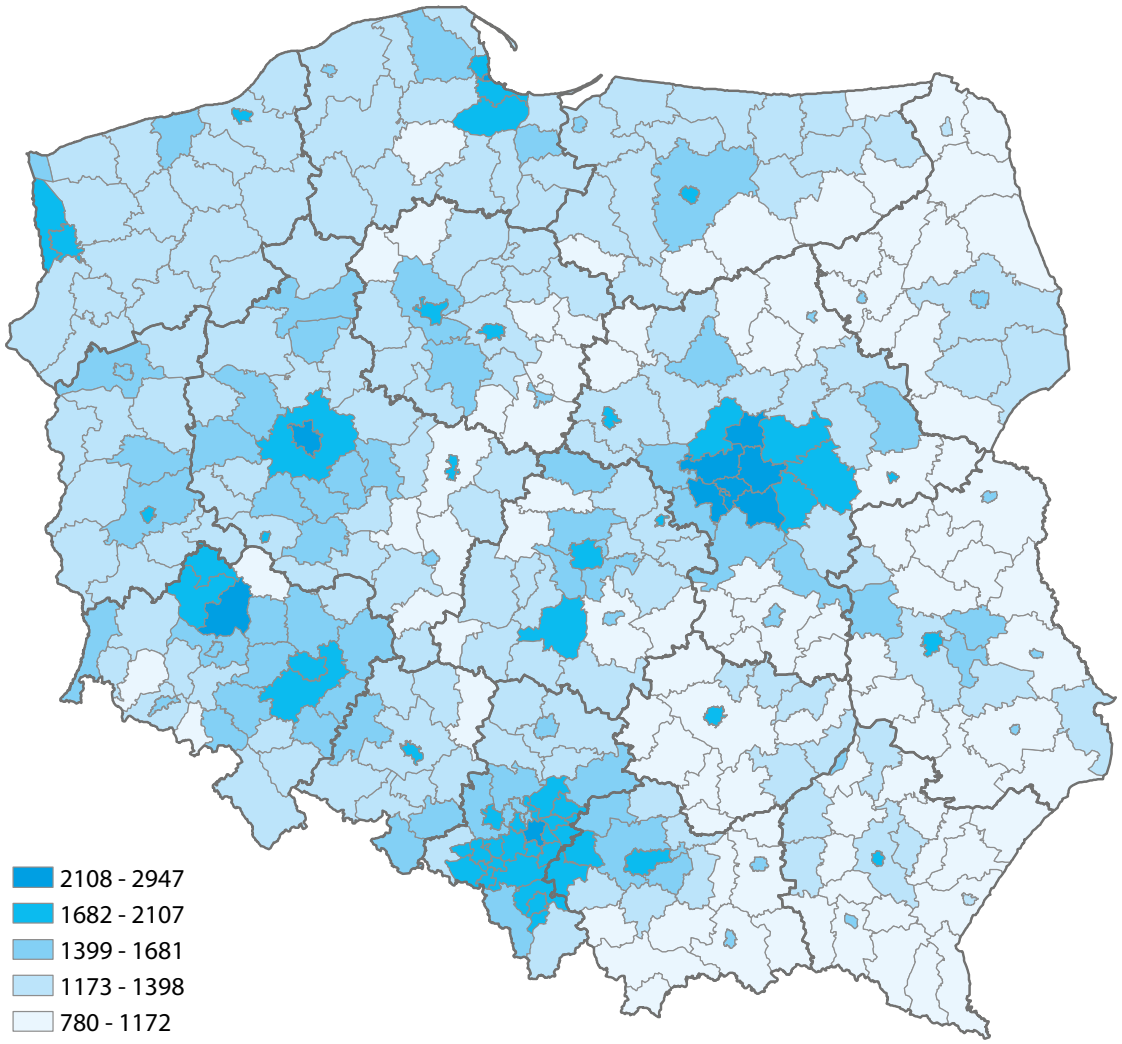
Source: Own study on the basis of the Central Statistical Office and the Ministry of Finance data.

Between the years 2007 and 2010 income increased the fastest in the Lublin, Łódź, Podkarpacie, Świętokrzyskie and Lubusz voivodeships. The slowest growth took place in the Kuyavian-Pomeranian,

West Pomeranian and Pomeranian voivodeships. Income rose at the fastest pace in regions with low income (the base effect[17]), which points to a relative convergence of some areas.

The difference according to the average county income (excluding social security) is presented in the map below.

Map 3.5 Total monthly income (in PLN) calculated on the basis of tax declarations and comparative fiscal hectares per county inhabitant in 2010



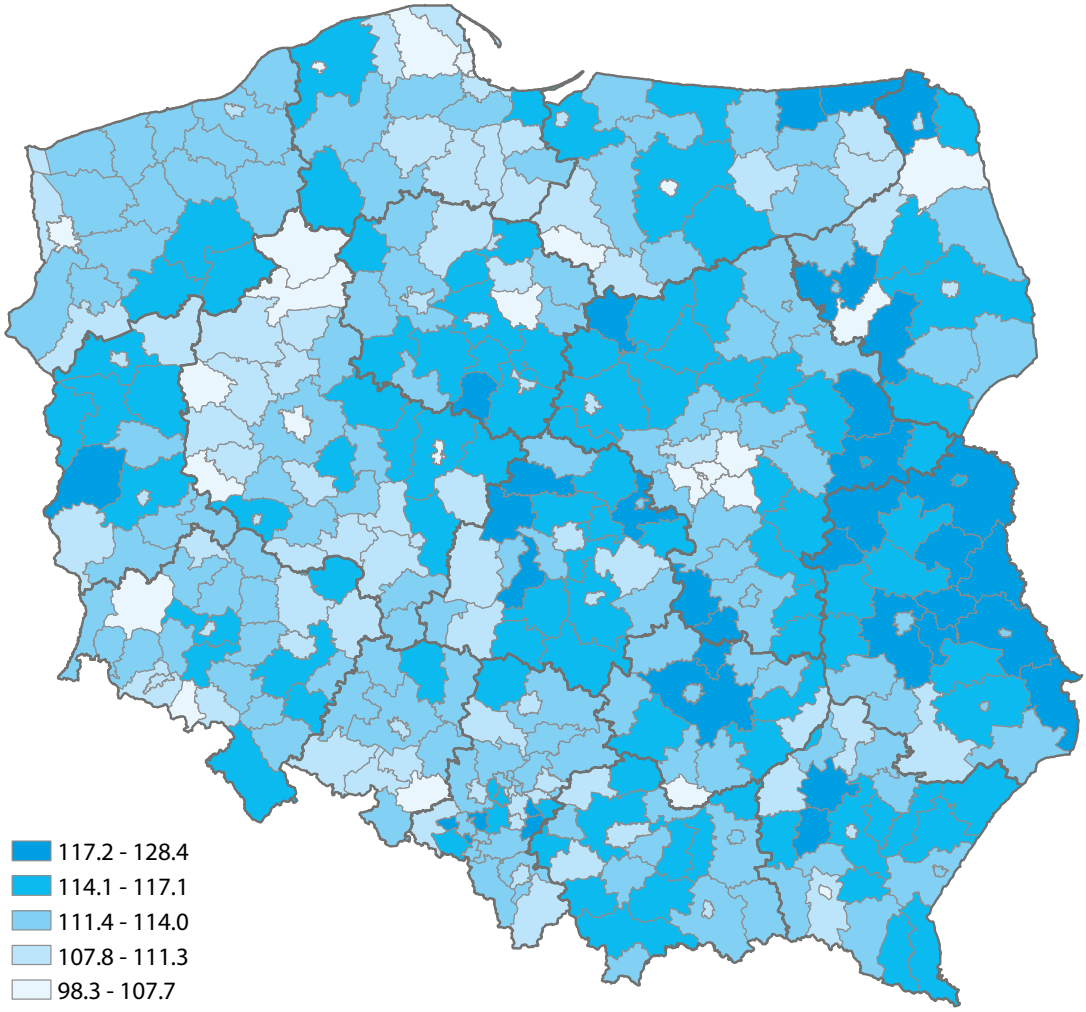
Source: Own study on the basis of the Central Statistical Office and the Ministry of Finance data.

The highest income can be observed in Warsaw, the Piaseczno county, the Pruszków county, Warsaw – West county, Sopot, the Grodzisk county, Poznań, the Legionowo county, the Lubin county, in Katowice, Wrocław, Cracow and counties surrounding them.

17 Low base effect in business and economics is the tendency of a small absolute change from a low initial amount to be translated into a large percentage change.

Income in large agglomerations is significantly higher, which can be seen in Map 3.5. The lowest income was reported in the following counties: Ostrołęka, Suwałki, Janów, Grajewo, Niż, Kazimierz, Kolbuszowa, Nowy Targ, Dąbrowa, Monów, Łomża and Kolno. Spatial distribution of the index shows a clear axis of inequality between Northwestern Poland and the country's Eastern regions. The division between the so-called "A-Poland" and "B-Poland", so often described in the literature, is clearly visible in this dimension.

Map 3.6 Change of total monthly income calculated on the basis of tax declarations and comparative fiscal hectares per county inhabitant in 2010 (in %)



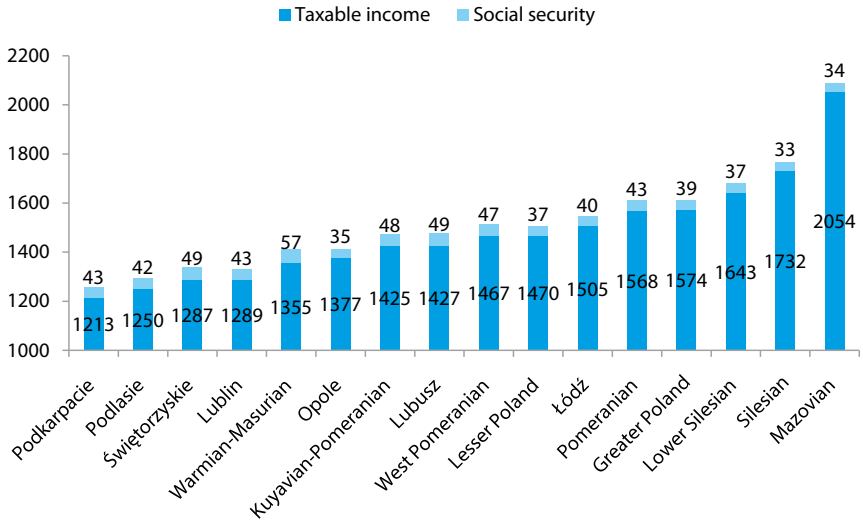
Source: Own study on the basis of the Central Statistical Office and the Ministry of Finance data.

Income grows fastest in the counties with an initially low income level, which is a result of the base effect. All of the following counties: Łęczyca, Poddębica, Bieruń-Lędzin, Łęczyn, Świdnik, Węgorzewo, Sokołów, Wysokomazowiecki and Suwałki, have low LHDI values and the high dynamics of income growth is can be explained by the the relative underdevelopment of these regions , which is clearly the case of the Podkarpackie voivodeship. Income grows slowest in cities and cities with the status of a county: Słupsk, the Złotów county, Sopot, Szczecin, the Wolsztyn county, Krosno, the Golub-Dobrzyń county, the Zambrów county and the Augustów county.

3.2.1.2 Social security and family aid income

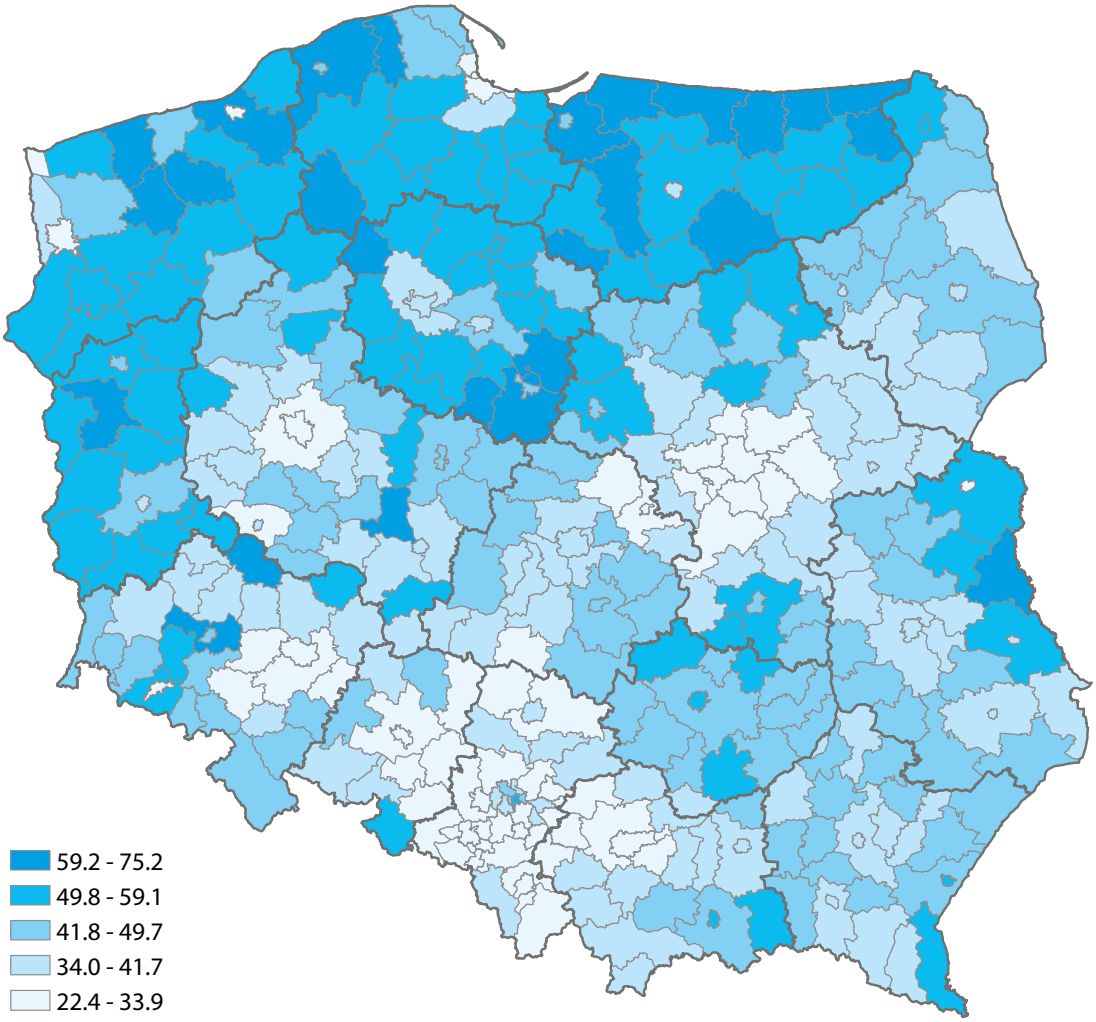
When drawing conclusions from the results below, one must remember that they are primarily from territorial and regional differences and not necessarily on the inequalities in the level of income within particular regions. Local government expenditures on social security and family aid, excluding security from natural disasters, were divide by the total number of inhabitants of a county or voivodeship. The higher total of transfers per citizen means that the range of social security was higher within a given region.

Graph 3.9 Taxable monthly income and income from social security and family policy (in PLN) per voivodeship inhabitant in 2010



Source: Own study on the basis of the Central Statistical Office data.

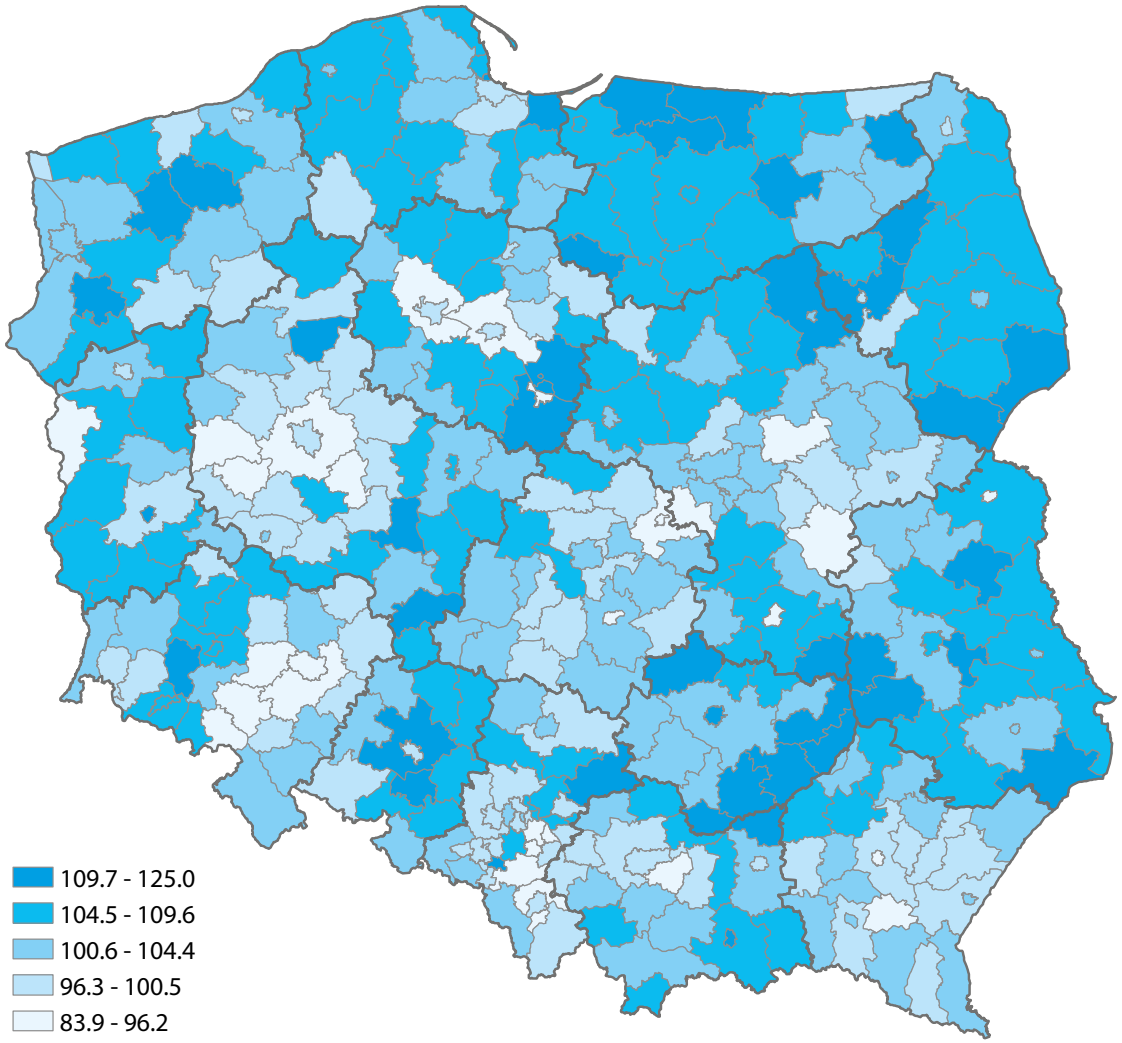
Map 3.7 Monthly income from social security and family policy (in PLN) per county inhabitant in 2010



Source: Own study on the basis of the Central Statistical Office data.

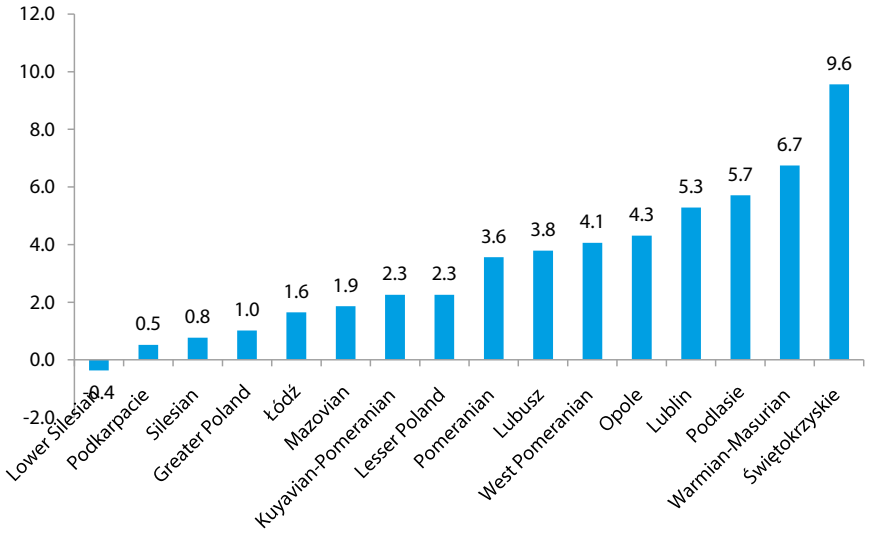
Looking at the above map showing transfers from social security, it is easy to notice that an entirely different distribution than in the case of income is presented. The counties with highest income receive the least from social security. This reveals the redistribution and selective character of social security. The highest amount of resources for social security per capita can be observed in the following voivodeships: West Pomeranian, Warmian-Masurian, Lubusz, Świętokrzyskie and Kuyavian-Pomeranian. Inhabitants of the Silesian, Mazovian, Opole and the Lesser Poland voivodeships receive the least in social security benefits. At the county level, the following counties have the highest social security expenditures: Człuchów, Elbląg, Bartoszyce, Braniewo, Gryfice, Świdwin, Lipno, Radziejów, Nowe Miasto. The lowest level of transfers take place in the following counties: Pozań, Pszczyna, Warsaw-West, Wrocław, Tychy, Skierniewice, Pruszków, Warszawa, Wrocław, Bieruń-Lędzin. High urbanisation indicators and a low unemployment rate play a major role. The data visualised on the map shows that social security is a supplement to income in almost all post-agricultural areas in the North of the country. In the "poorer" Eastern part of the country it is less supplementary as agriculture is the primary source of income for most inhabitants.

Map 3.8 Change of monthly social security and family income per county inhabitant from 2007 to 2010 (in %).



Source: Own study on the basis of the Central Statistical Office data.

Graph: 3.10 Change of monthly social security and family income per voivodeship inhabitant from 2007 to 2010 (in %).



Source: Own study on the basis of the Central Statistical Office data.

The poorest voivodeships are characterised by the highest dynamics, which seems to be an obvious effect of public policy. Our attention is drawn to Lower Silesia and Podkarpacie, where the share of income from social security falls most rapidly. In the case of Podkarpacie, this fall might be the effect of a large initial base of people receiving social security. Income thresholds for receiving social security have not been raised since 2006, which has successfully reduced receipts over time for many people.

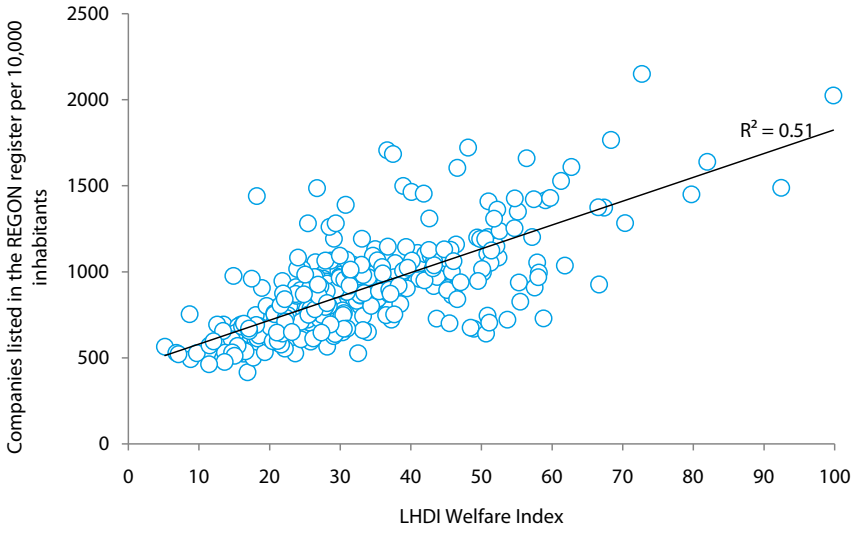
The minimum existence value in the year 2012[18] for all types of households is greater than the income criterion for a self-governing individual, which amounts to PLN 477 a month. It is also greater than the income criterion per family member which is PLN 351 per family member, while the minimum existence value for a member of a 3-persons-family amounts to PLN 404.12. The value for a 2-persons-family amounts to PLN 425.74 (Kurowski 2012). The first discrepancies between the values of income criterions and minimum values for certain family models could be observed already as of 2008. The discrepancies would further deepen in the following years due to the cessation of those funds. Counties with a rising poverty level, that is where inhabitants receive continuously more social security resources are as follows: Busko, Ostrołęka, Włocławek, Lipno, Dąbrowa, Kielce, Łobsko, Stachów, Ostrzeszów and Świdwin. An opposite dynamic can be observed in most big cities. The greatest changes took place in the following counties: Mysłowice, Rzeszów, Skierniewice, Bia la Podlaska, Garwolin, Pszczyna, Średzko, Tychy, Poznań, Włocławek and Wrocław.

3.2.1.3 The Welfare Index in the context of other economic indices

Major factors influencing the income of citizens are: the population's demographic structure and economic activity as well as the unemployment rate, the activity of new business, the structure of the local economy and, what seems increasingly important, the population's digital activity.

18 The Institute of Labour and Social Studies defines this level of income per capita or per family member as a level which satisfies the needs necessary to survive and the consumption of which may not be delayed i.e. expenditures on food and household maintenance.

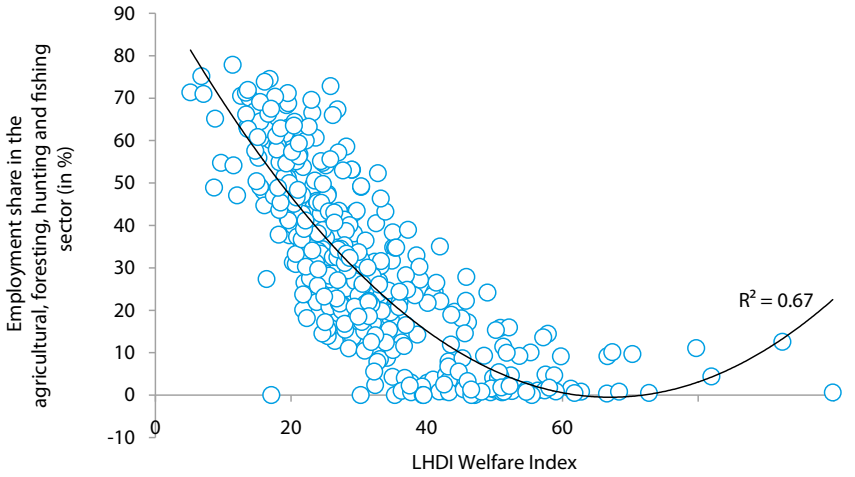
Graph 3.11 Companies listed in the REGON register per 10,000 inhabitants in 2010 and the Welfare Index value in 2010 according to counties



Source: Own study on the basis of the Central Statistical Office data.

The linear correlation ratio between newly-opened companies and the LHDI Welfare Index is 0.717 which shows a very strong relationship. Two counties with a large number of companies opened as well as a high income are Warsaw and Sopot. This shows that counties with greater income are the places where companies are opened more often, which is empirical proof of the fact that the LHDI values in the income part of the index are linked to the economic condition of a given region. Similar conclusions can be drawn from a structural analysis of the relation between local labour market employment and the Welfare Index.

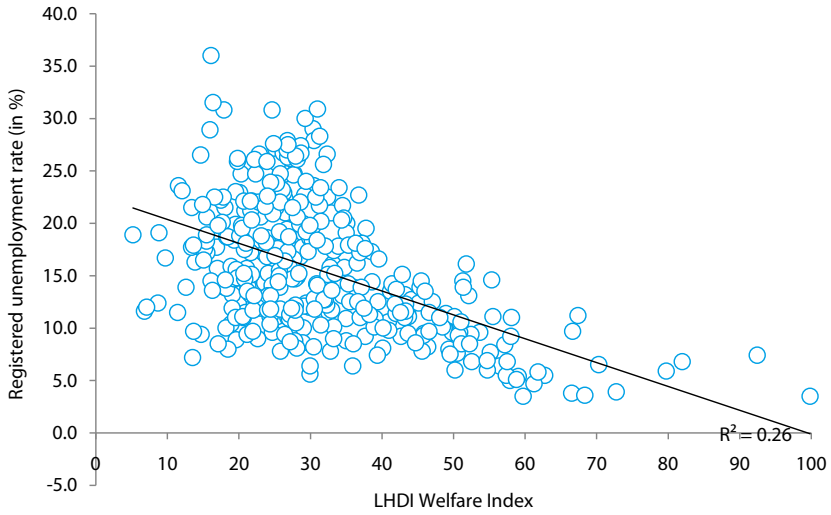
Graph: 3.12 Employment share in the agricultural, foresting, hunting and fishing sector and Welfare Index value according to counties in 2010



Source: Own study on the basis of the Central Statistical Office data.

Employment in agriculture has the strongest and most negative correlation with income. This means that higher the employment share in agriculture is, the lower the average welfare per citizen. Spearman's correlation ratio is very strong and assumes the value of -0.819 (the dependency can be observed on the graph as a generally downward sloping line). Counties in which income is closest to the maximum values analysed by the LHDI Welfare Index and in which the percentages of employees in agriculture remain relatively high are located within the suburbs of the Warsaw agglomeration. Employment in the industrial and service sector does not provide all explanations for higher income because of the distribution of specialisations across regional labour markets. Some regions are more industrialised, while in others services are of greater importance. Spearman's correlation ratio for income and employment in counties is 0.587 for industry and 0.678 for services (data does not include employees of budget units active in national security and public security; they are also employed in the headquarters but only in entities employing not more than 9 people). In other words people tend to be financially better of when working in services and in the industry. The authors believe that the aforementioned data is the best data available which indicates the important link between poverty and agriculture. The level of poverty among farmer families is clearly correlated to, among other variables, the agricultural land area. In 2011, almost 13.5% of people in agricultural households found themselves below the statutory poverty threshold and slightly above 13% lived below the minimum level of existence. People living in agricultural households with agricultural land areas smaller than 2 hectares were in the most difficult situation – the value of statutory and extreme poverty indicators were twice as high for them than for the majority of people in all agricultural households (Główny Urząd Statystyczny 2012b). Agriculture remains the largest reserve of employment resources. Only about 50,000 people are officially unemployed in this sector. However, according to the calculations of the Institute of Agricultural and Food Economics it is about 600,000 people (Dziennik Gazeta Prawna 2012). The major obstacle for further and more dynamic transformations in rural areas seems to be the overall trend toward a higher skilled labour market, which combined with relatively low qualifications of the agricultural population, hinders employment beyond agriculture (M. Bukowski 2005). It is also worth mentioning policies aimed at diversifying employment and production in rural areas with a special focus on developing services which may open the door for absorbing rural employment resources beyond agriculture without the pressure to migrate to cities at the same time.

Graph: 3.13 Unemployment rate (in %) and the Welfare Index according to counties in 2010

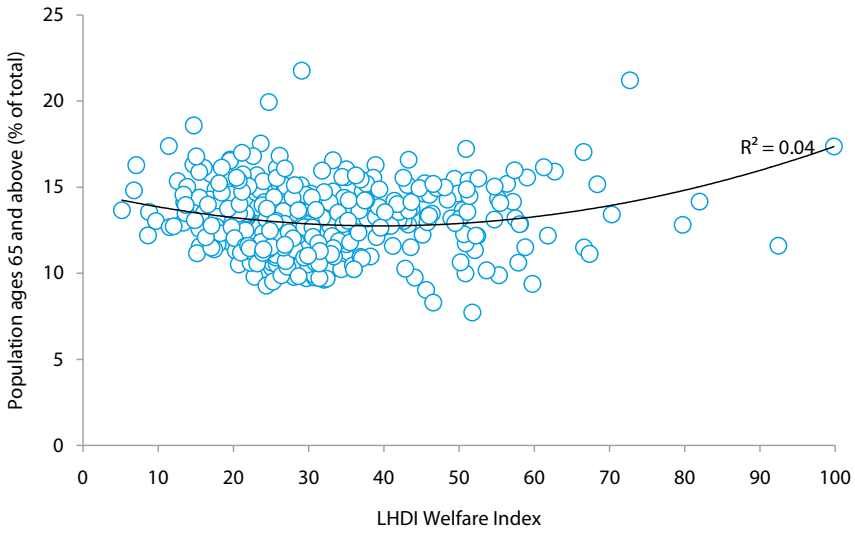


Source: Own study on the basis of the Central Statistical Office data.

The negative linear dependency between income and the unemployment rate is moderate (the linear correlation ratio is -0.514). Low income levels and labour market difficulties in counties are the results of the general economic condition. The unemployment growth and income decrease is visible, but rather weak during the years 2007–2010. A clustering of counties with high unemployment values of the Welfare Index (between 40 and 60) can be observed. These counties form a large part of counties not functionally linked to major cities. The latter ones, as closer to the «OX» axis, do not experience such high unemployment.

What draws ones attention, is the fact that the demographic structure (the demographic "age" of a county) is not linked to income, but rather that the percentage of elderly people with lower income is proportional for all counties – Spearman's correlation ratio equals -0.62 and is higher than the linear correlation ratio. The non-linear character of this relationship means that more elderly people live in the richest and poorest counties.

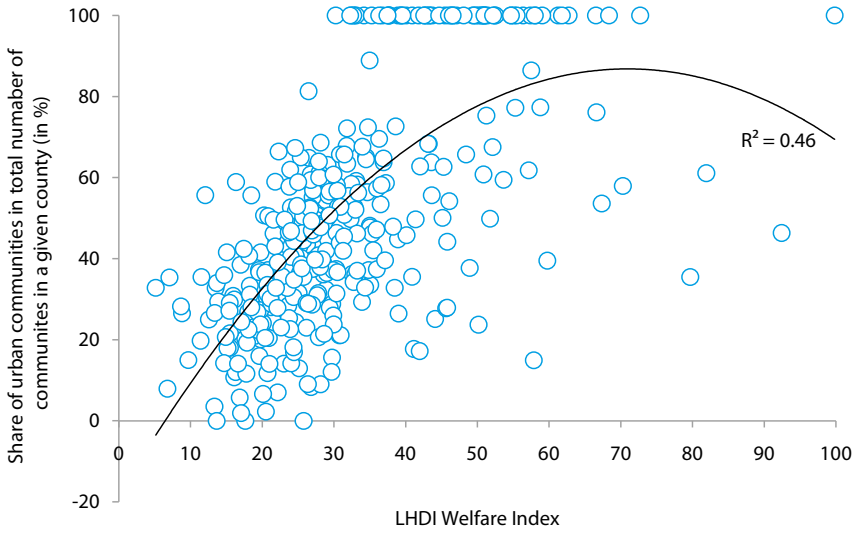
Graph: 3.14 Population share of citizens aged 65+ (in %) and the value of the Welfare Index in 2010 according to counties



Source: Own study on the basis of the Central Statistical Office data.

The strong relationship between urbanisation and income is clearly non-linear – the rank correlation ratio is 0.677. If communities could be divided functionally and not administratively, the relationship would be even stronger. It can be observed especially in counties surrounding Warsaw. Their high income translates into a stronger curvilinear dependency.

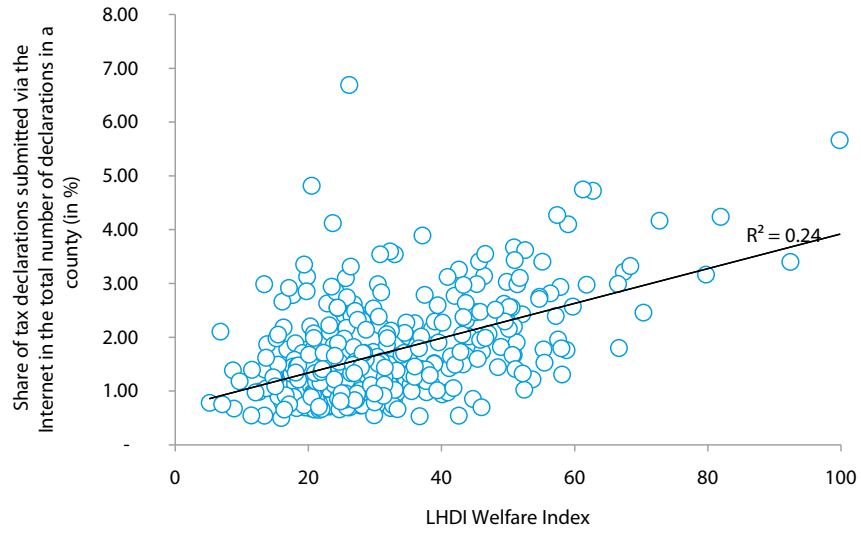
Graph: 3.15 The urbanisation index and the Welfare Index in 2010 according to counties



Source: Own study on the basis of the Central Statistical Office data.

A new index presented in this report is the Digital Engagement Index. The correlation coefficient between income and the use of ICT in a given county is moderately strong – the linear correlation ratio is 0.495.

Graph: 3.16 The Digital Engagement Index and the Welfare Index in 2010 according to counties



Source: Own study on the basis of the Ministry of Finance data.

To summarize, the discussion on income from a territorial perspective confirms the claims of incomes in cities and agglomerations being the highest and the existence of problems in other areas which are related, among others, to the traditional structure of the local economy and the high level of employment in agriculture. Of course, the measurement of welfare in rural areas is an approximation due to the way agricultural tax is calculated. However, there is no better way

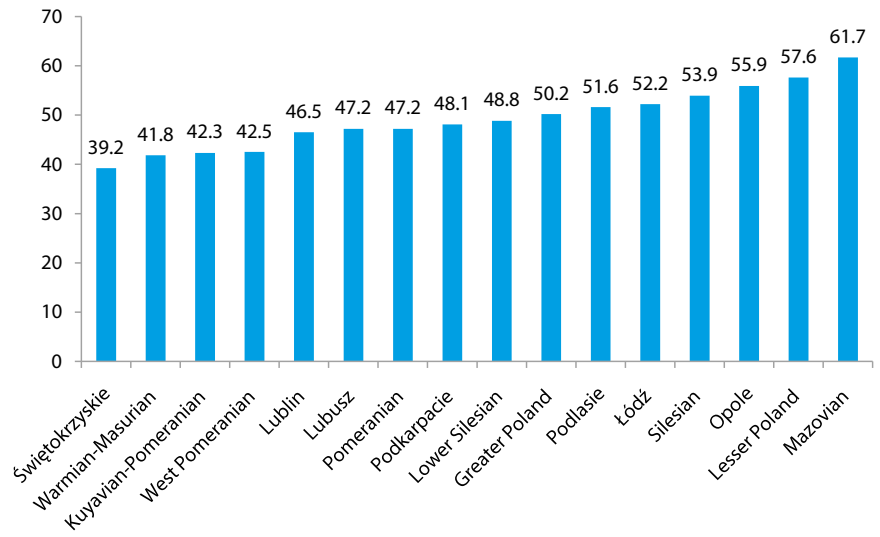
to estimate the income of this part of the population based on data available for the county level. This reveals a territorial incoherence linked to long-lasting processes and that incoherence would be difficult to address using through public interventions.

3.2.2 Education

Access to education, its quality and the education level achieved by an individual is determined mostly by their adult life and translates into both their standard of living (income) as well as their health condition. This can be observed by the link between education and two other LHDI dimensions – health and income (living standard). To illustrate the educational dimension of the LHDI for Poland two partial indices have been included – net pre-school schooling for children aged 3 to 4 and the results from the mathematical – natural science section of the lower secondary school exam. Both indices form the Education Index (calculated as the geometric mean of the partial indices which is a synthetic measure of access to education and of educational achievements, and thus indirectly related to the quality of education).

The highest Education Index value in the year 2010 was recorded by the Mazovian voivodeship, which has significantly outperformed the Lesser Poland voivodeship, ranked 2nd. The 3rd place was held by the Opole voivodeship and then by: Silesian, Łódź and Podlasie. At the other end of the scale, a group of four voivodeships was formed, which clearly stood out from the rest: Świętokrzyskie, Warmian-Mazurian, Kuyavian-Pomeranian and West Pomeranian (see Graph 3.17).

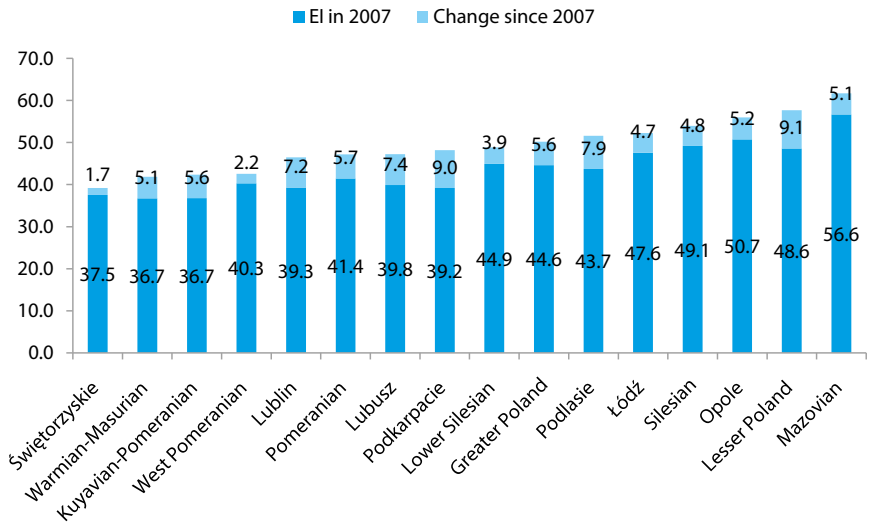
Graph: 3.17 Value of the Education Index (EI) by voivodeships in 2010



Source: Own study on the basis of the Central Statistical Office and the Central Examination Board data.

The change of the index analysed during the years 2007 – 2010 is very interesting and even though growth[19] can be observed in all regions, its size takes on various values (see Graph 3.18). The Świętokrzyskie and Warmian-Masurian voivodeship are characterised by a low index level and a small change. On the other hand, the Lesser Poland voivodeship has both a high index level and a very high change in this index. The Mazovian voivodeship which is the country's leader in terms of ranking, is characterised by medium dynamics when compared to other voivodeships. The voivodeship which is rising fastest in the ranking is the Podkarpacie voivodeship. In 2007, it was ranked 13th, continuously developing throughout the years in comparison to other voivodeship, only to be ranked 9th in 2010.

Graph: 3.18 Change in the absolute value of the Education Index (EI) voivodeships from 2007 to 2010

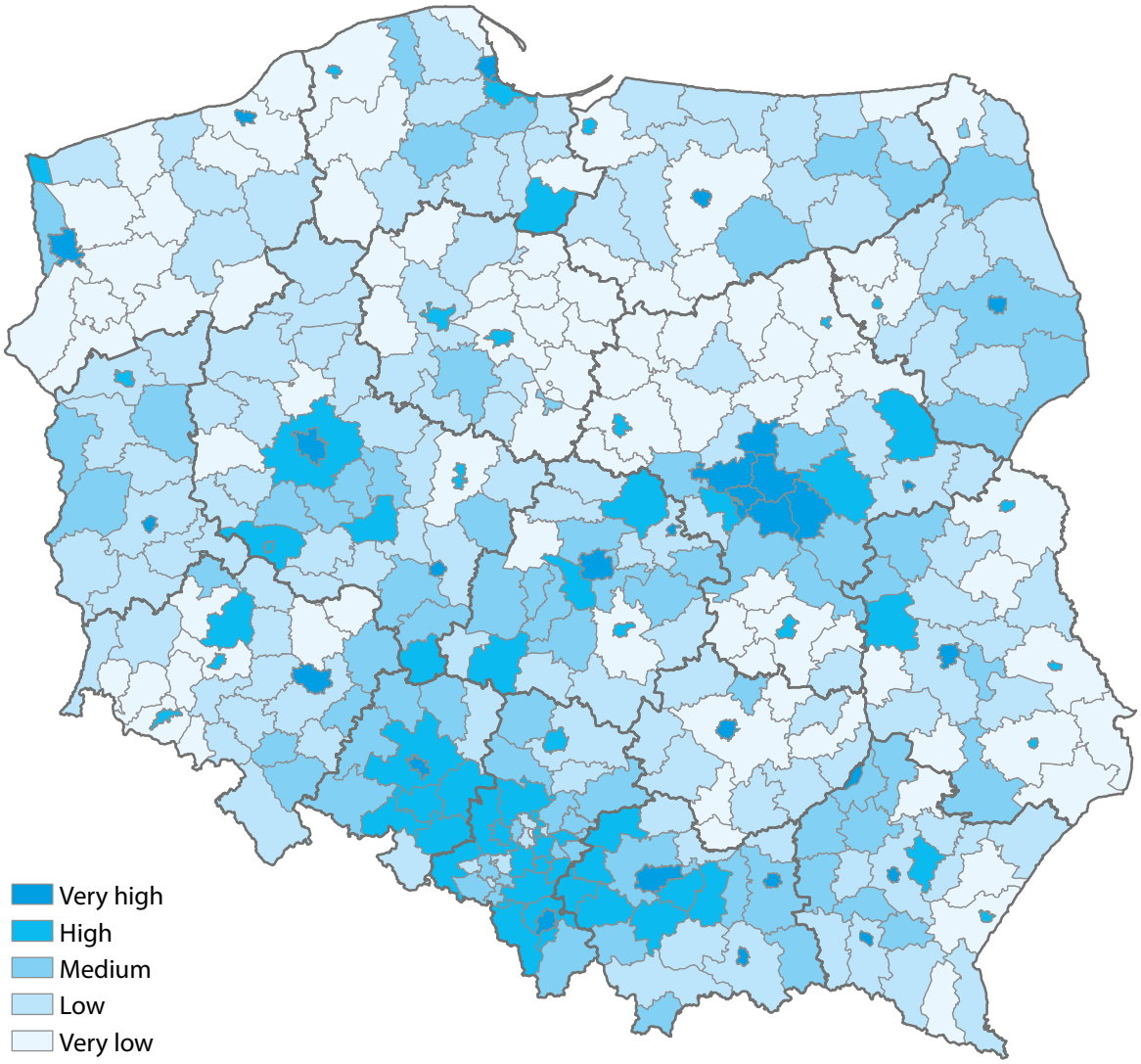


Source: Own study on the basis of the Central Statistical Office and the Central Examination Board data.

Polish voivodeships are complex spatial units with a fairly high level of internal differentiation. That is why it is worth looking at sub-regional spatial units. The county Education Index Map shows spatial differentiation in a both interesting and obvious manner. It is clearly visible that cities (urban counties) and large metropolises (mostly voivodeship capitals) reach a very high level of the index. It can also be seen that the ranking of metropolitan areas of the largest cities is relatively good i.e. Warsaw, Poznan, Cracow, Łódź and Opole. The situation, however, is not so one-sided as , for example, the suburbs of Wrocław had a low ranking. The differences between urban counties and their surrounding are even most striking. For example, the city of Kielce has a very high index level, while its surrounding is characterised by a very low level. The situation is similar in Koszalin, Olsztyn and, to an extent, in Szczecin as well as in Toruń, Płock, Słupsk and other cities (see Map 3.9).

19 In case of this index, the change in its value in particular years may be interpreted only to a certain extent as progress or regress. This is a result of the fact that the mathematical-natural science part of the lower secondary school exam are calculated in relation to the annual national mean and should be considered a change in this difference rather than in progress. The second component of the index is the net pre-school schooling which is a measure of progress. In relation to this, the Education Index shows progress only in the extent to which it is the effect of the growth in pre-school schooling (for further details see the methodological section of this report).

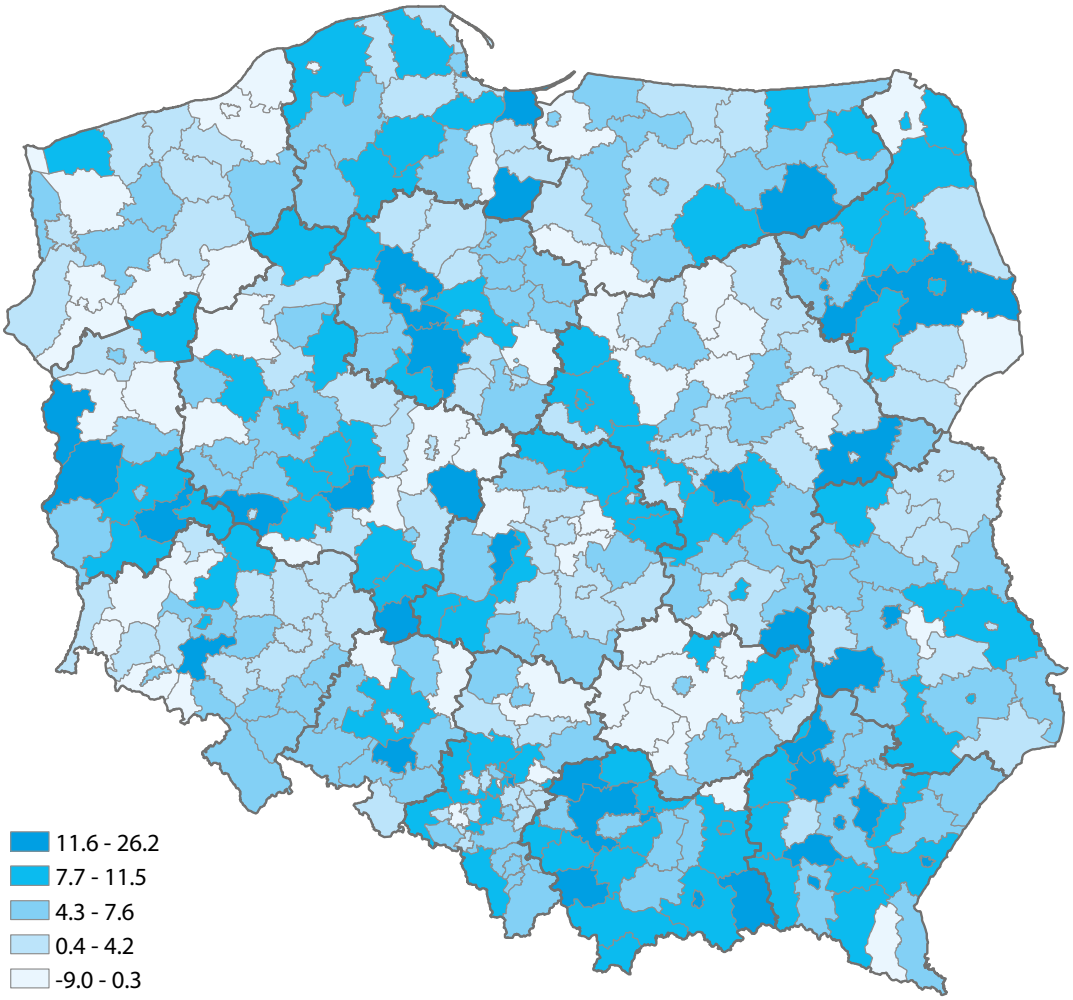
Map 3.9 Education Index (EI) in counties in 2010



Source: Own study on the basis of the Central Statistical Office and the Central Examination Board data.

Although changes in the value of the Education Index in voivodeships between 2007 and 2010 headed in the same direction and all regions experienced a very high growth in the index level despite major differences in its intensity, the situation of counties is far more complex. First of all, a group a counties where the index decreased can be distinguished. A decrease in the EI took place in 45 counties, with the greatest decrease in the following counties: Sulęcin (-9), Włoszczowa (-8.8), Jelenia Góra (-7.4), Goleniów (-5.5), Płońsk (-4.4), Pińczów (-4.4), Starachowice (-4.,0), Lubań (-3.9). Counties experiencing a decrease or stagnation of the index value (range from -9 to 0.3) are densely concentrated in the middle and Western part of the Świętokrzyskie voivodeship. The highest growth dynamics can be observed for land counties located in the vicinity of large urban areas (i.e. Bydgoszcz, Białystok, Siedlce, Cracow).

Map 3.10 The absolute change of the Education Index (EI) from 2007 to 2010



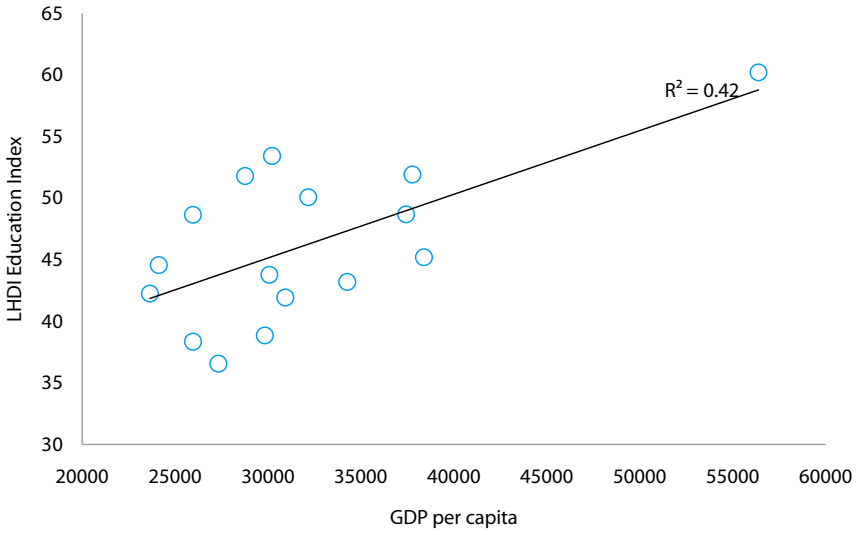
Source: Own study on the basis of the Central Statistical Office and the Central Examination Board data.

The Education Index level is connected to the welfare of the regions and counties. For voivodeships, the Education Index assumes higher values in places where a higher level of economic growth measured with GDP per capita can be observed (Główny Urząd Statystyczny 2012a). The correlation ratio is 0.65. The fact that only 16 units served as the basis for this calculation has to be considered. What is more, the Mazovian voivodeship can be easily distinguished from other regions – it is in a class of its own with the highest Education Index and GDP per capita values in the country (see Graph 3.19). Excluding the Mazovian voivodeship from the correlation analysis would significantly decrease the correlation index value to 0.37. Still, the link between the Education Index and welfare remains hardly questionable. This fact can be proved by conducting an analysis on the county level; comparing the index with the total monthly employment income per capita for particular counties. In this case, the correlation ratio is even higher than on the regional level, with its value of 0.71 (see Graph 3.20).

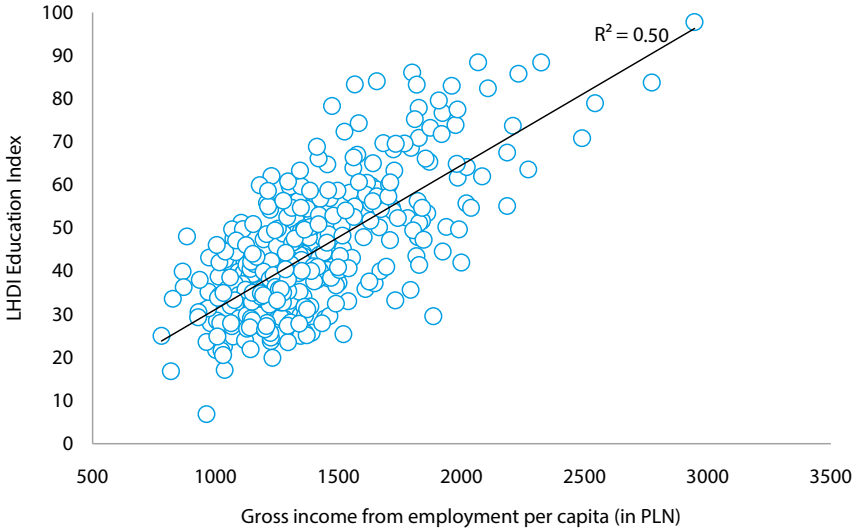
The discussed relationship does not uncover causalities (cause-and-effect relations). Based on vast research on the above subject, one may argue that there are dual relations. On the one hand, welfare translates into greater resources for education, allowing for better access and higher quality, and as a result in the effects achieved. On the other hand,

a well-functioning education system translates into a high human capital level that creates the basis for economic growth and developing welfare (see: Herbst et al. 2011; Herbst 2012).

Graph: 3.19 Relation between the Education Index and the GDP per capita in voivodeships in 2009



Graph: 3.20 Relation between the Education Index and employment income per capita in voivodeships counties in 2010



Source: Own study on the basis of data from the Central Statistical Office, the Ministry of Finance and the Central Examination Board.

3.2.2.1 Percentage of children in pre-school education

Pre-school education is an important factor in human development. Two aspects may be pointed out. First, pre-school education is of great importance for further education and adult life. Children attending kindergarten are better prepared to start their education in school, which translates into success in later stages of education, and as a result, in better future career opportunities (Heckman 2002). Apart from preparing for school education, the kindergarten is a place where children can meet their peers and helps the process of socialisation.

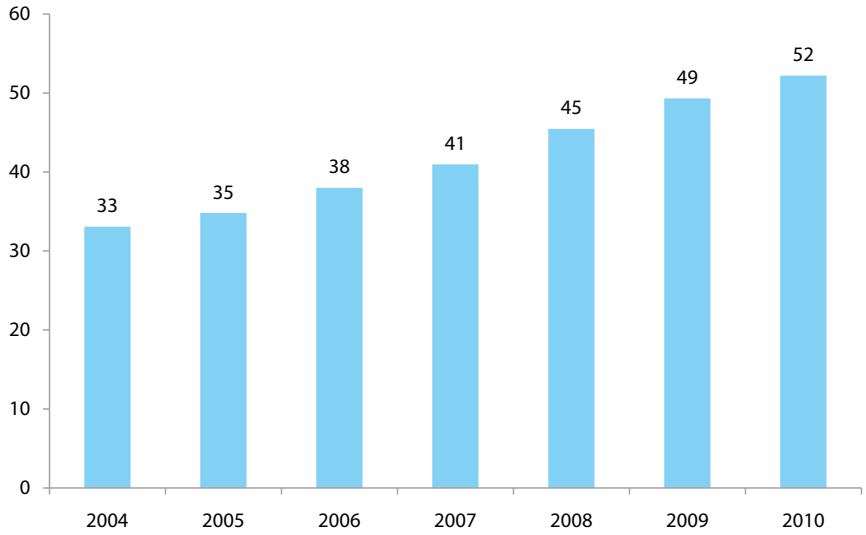
The second aspect of pre-school education's importance is its significance in parental development. Parents whose children participate in education and pre-school have a higher degree of freedom when making various decisions. This factor is especially important for the professional careers of mothers who traditionally take care of raising small children more often than fathers. This role of kindergarten will gain importance in the future due to the changing parental patterns i.e. later maternity, a general change of the family model, and the necessity to remain professionally active for longer periods in the labour market. Even more important, grandparents are becoming older and will no longer be able to take care of small children as they will be expected to retire later in their lives at which point their capacities will be less. Family help resources are becoming limited due to the decrease in the number of three-generation households and the general loosening of family ties. Providing educational-nursing services through kindergartens thus becomes an important target for the public authorities. Its effect may be not just the rise in the percentage of children in kindergartens, but also increase of female activity rate, which is important also in the context of addressing the issue of the generally low level of professional activity in Poland.

Currently in Poland, children aged 3–6 may participate in pre-school education, with children aged 3–4 attending at their parent's desire, and children aged 5–6 attending due to obligatory schooling. 6-year-olds have to attend a one-year pre-school study since September 1st, 2004 and 5-year-olds since September 1st, 2011. It should be added, that the programme to include 6-year-olds in regular school education is currently under development. Since 2012, 6-year-olds may attend pre-school or the 1st grade of primary school. In 2014, attending 1st grades will become obligatory for all 6-year-olds. Although judged differently, lowering the age threshold for pre-school and school education, seems a reasonable solution in view of child development. It will also contribute to the future development of the country (Bochniarz et al. 2009).

When analysing the percentage of children in pre-school education, one must remember the change of the age threshold for obligatory pre- and regular school education. To avoid the influence of the introduction of obligatory pre-school education for particular age groups in a future comparison, we shall look at the group of children aged 3-4 who were not and will not be covered by pre-school education in the near future.

In the years 2004–2010, a clear rise in the percentage of 3–4-year olds attending pre-school can be observed. In 2004, it was about 33% of them and in 2010 more than 52% (see Graph 3.21). The growth was partially driven by a negative demographic dynamics (a decreasing number of children per place in pre-school), which then changed in 2008 when the growth of pre-school education continued. Obviously older children (4-year olds) attend pre-school more often than their younger peers. In 2010, the pre-school education index reached the level of 46.3% and in the case of 5-year-olds it rose by 12 more percentage points, reaching the level of 58.4%.

Graph: 3.21 Percentage of children aged 3-4 in pre-school education in Poland (in %)

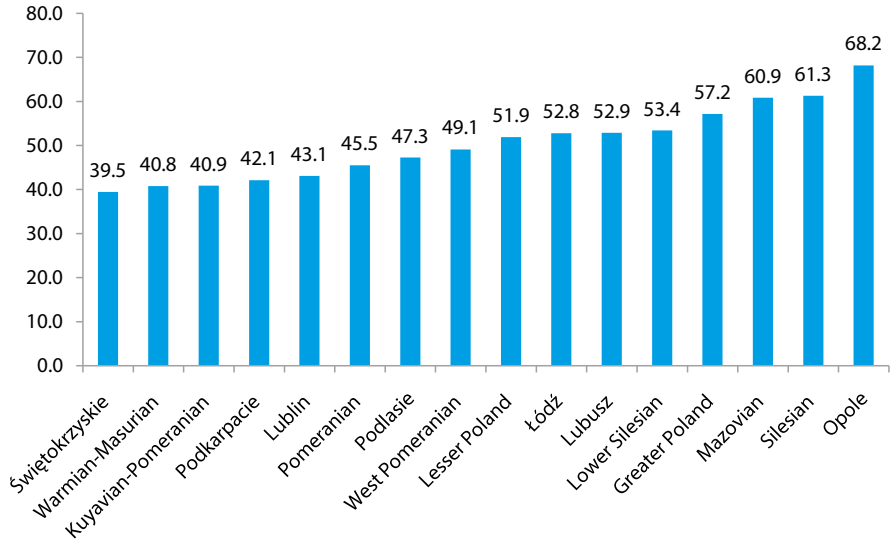


Source: Own study on the basis of the Central Statistical Office data.

The popularisation of pre-school education in Poland is a definitively positive phenomenon. Still, one must remember that other EU-member states offer better pre-school enrolment rates. For 3-year olds, an average of 78.8% of the children participated in this education in all member states (EU27) in 2010. In the "old EU" countries (EU15) the index was even higher – 83.5%. For 4-year olds the index level reached 90.8% (EU27) and 94.7% for the EU15 (EUROSTAT data). In some countries all children aged 3-4 are subject to pre-school education i.e. in France. In view of this, the range of pre-school education in Poland can be seen as negative (see Federowicz, Sitek 2011). It should be underlined that this problem has been known and diagnosed long ago and that actions aiming at improving the current status quo are being taken. The programme 9.1.1 "Diminishing inequalities in the level of popularisation of pre-school education", which is part of the Human Capital Operational Programme financed by the European Structural Funds, may serve as an example. The allocation planned for this operation reached approximately 370 million euros. As part of this initiative, opening new or developing existing pre-schools was funded, especially in areas with the lowest pre-school index levels. The observed growth in pre-school education is also a result of the aforementioned investments.

Polish regions are highly varied in terms of the popularisation of pre-school education. The leader among voivodeship is the Opole voivodeship where more than 68.2% of 3–4-year olds attend pre-school. The following voivodeships are at least a few percentage points away (see Graph 3.22): the Silesian voivodeship – 61.3%, the Mazovian voivodeship – 60.9%, and the Greater Poland voivodeship 57.2%. A general trend can be observed of voivodeships with a higher economic growth level achieving better results than voivodeships with worse results. The lowest percentage of 3–4 year olds in pre-school education was reported in the following voivodeships: the Świętokrzyskie voivodeship (39.5%), the Warmian-Masurian voivodeship (40.8%), the Kuyavian-Pomeranian voivodeship (40.9 %), the Podkarpacie voivodeship (42.1%) and the Lublin voivodeship (43.1%) which are the majority of regions in Eastern Poland (apart from the Podlasie voivodeship which has better results in this ranking and outperforms Pomerania).

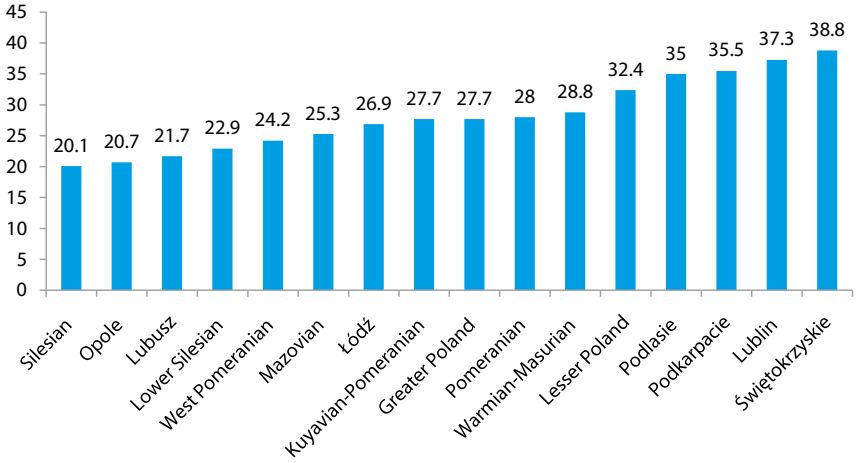
Graph: 3.22 The percentage of 3–4-year-olds in pre-school education in voivodeships in 2010 (in %)



Source: Own study on the basis of the Central Statistical Office data.

As already mentioned, pre-school education in Poland has risen significantly over the last few years. However, the growth dynamics were highly varied amongst regions. From 2007 to 2010 the growth of education varied from 20% in the Silesian voivodeship to 39% in the Świętokrzyskie voivodeship (see Graph 3.23). Differences in growth dynamics are mostly connected to the base effect – the highest dynamics were reported in regions with the lowest initial education index levels, while regions with higher education index levels did not experience such spectacular growth. This shows that the weakest regions are developing faster which results in a gradual (but slow) diminishing of inequality between voivodeships.

Graph: 3.23 Change in percentage of 3–4-year olds in pre-school education in voivodeships in 2007-2010 (in %)

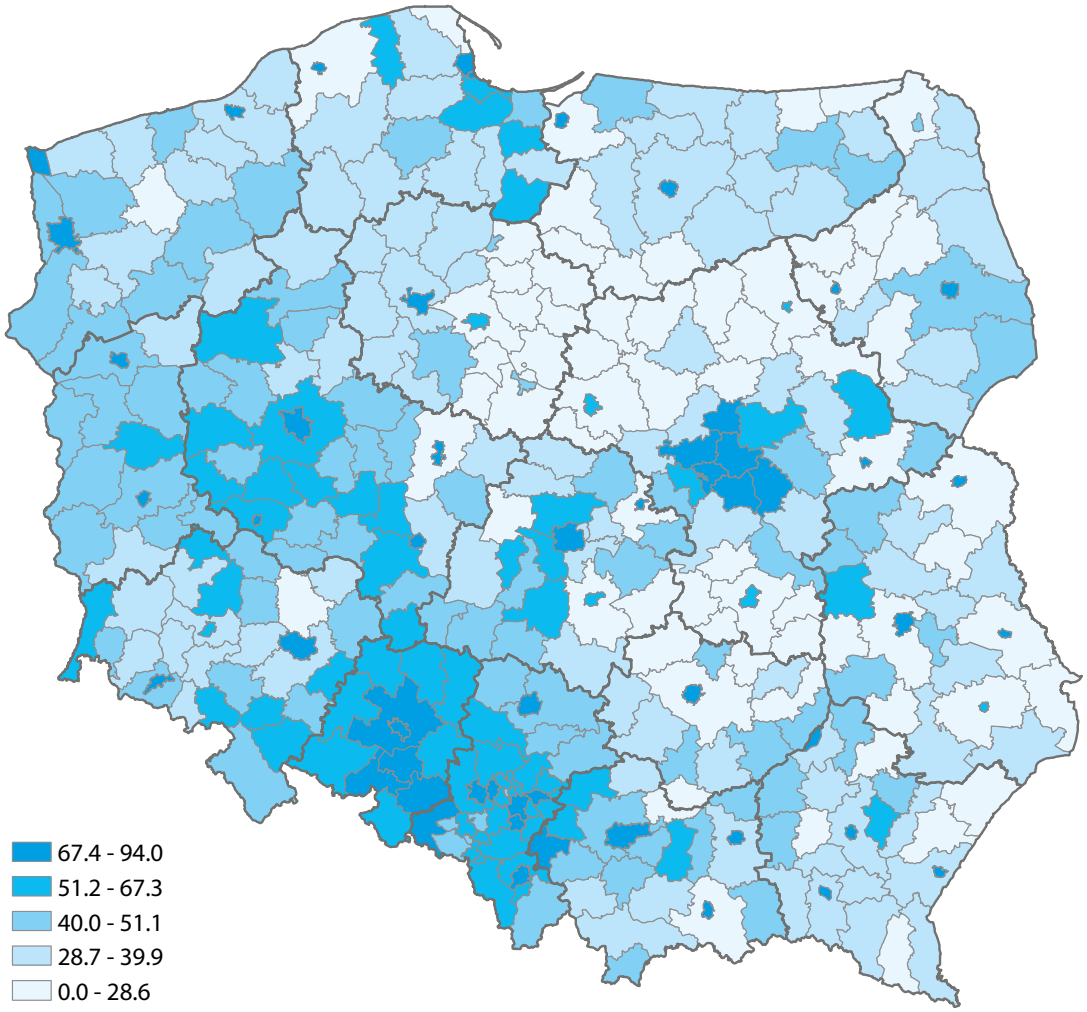


Source: Own study on the basis of the Central Statistical Office data.

On the local level (in this case the analysis focuses on counties, NUTS-4), pre-school education inequalities are even more visible. On the one hand, the Suwałki county offers no pre-schools and in different counties the education index varies from 9% to 15% (the Łomża county, the Nowe Miasto county, the Chełmno county, the Kolno county, the Zamość county, the Ostrołęka county). On the other hand, some cities – both small and large – the index reaches values very high (Rzeszów – 85.1%, Jelenia Góra – 85.4%, Białystok – 86.8%, Tarnów – 87%, Opole – 89.2%, Sopot – 90.2%, Poznań – 94%, Warsaw – 94%). The general rule may be observed that medium and large cities (urban municipalities) are characterised by a higher pre-school education index than territorial counties. It is important to note that the interpretation of the results may not be complete due to the available data describing the above phenomenon. Public statistics gathers information about children attending pre-school by the institution's location and not by the place of residence of the child. This results in an inaccurate calculation of cases in which a child attends pre-school in a municipality (county) other than the county (municipality) they live in. As pre-schools function predominantly in cities, the pre-school education index value for urban counties may be inflated and lowered for territorial counties surrounding them. Coming back to the aforementioned example, we may assume that in the Suwałki county, where according to the official statistics the pre-school education index for 3–4-year olds equals 0, part of the children may be attending pre-school in the urban county of Suwałki or in neighbouring territorial counties.

Also visible from the county perspective, is not only the regional inequality mentioned previously, but also the intraregional differences. These differences are most observable in the Mazovian voivodeship. On the one hand, there is Warsaw with its neighbouring counties (the metropolitan area) where pre-school education index values are amongst the highest in the country. On the other hand, there are the peripheral parts of the region (mostly in the northern and southern counties) where the level of the discussed index is very low (see Map 3.11).

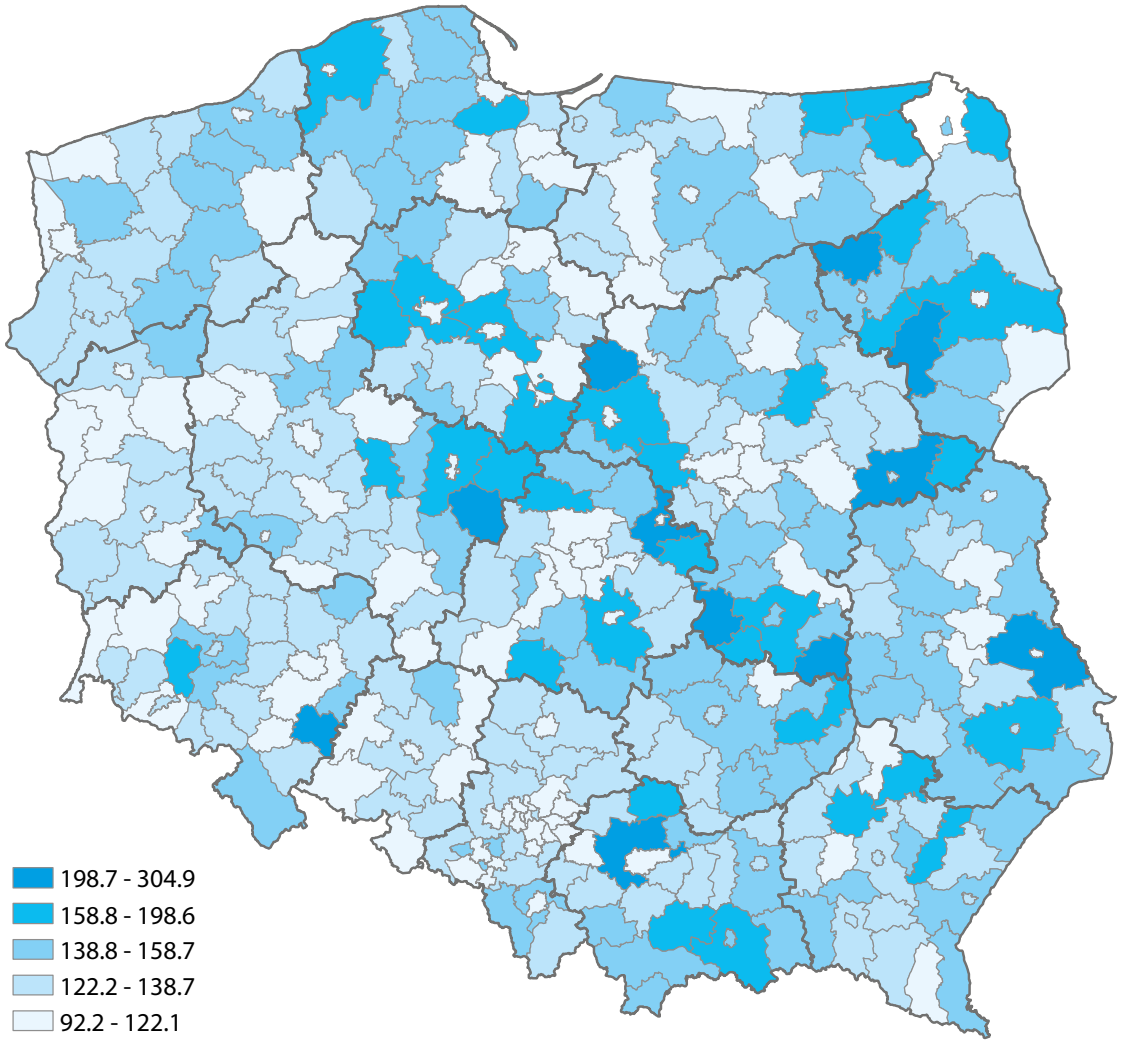
Map 3.11 The percentage of children aged 3 to 4 attending pre-school education in counties in 2010



Source: Own study on the basis of the Central Statistical Office data.

The dynamics of the net pre-school education index of children aged 3 to 4 in the years 2007–2010 was very similar to the voivodeship level. The highest growth was reported in areas with the lowest education index values. The highest dynamics can be observed in rural counties located in Eastern and Central Poland as well as in peripheral parts of voivodeships (see Map 3.12). One cannot speak of a constant dependency in this case, however. Not all counties with relatively low percentages of children aged 3 to 4 attending pre-school have noted a higher than above average increase. In one of these counties (the Świętochłowice county) a slight decreases of the index value was even reported.

Map 3.12 Change in the percentage of children aged 3 to 4 attending pre-school education in counties from 2007 to 2010 (country=100)



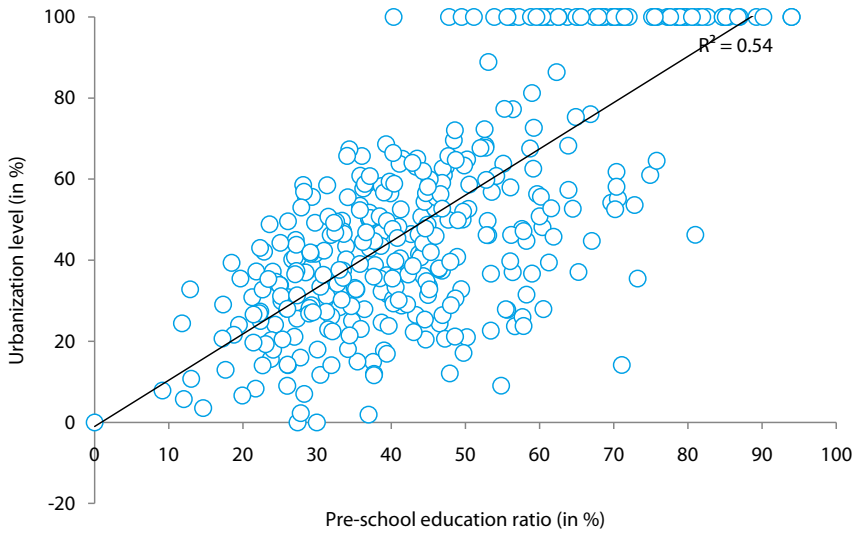
Source: Own study on the basis of the Central Statistical Office data.

The dominance of cities over rural areas in the popularisation of pre-school care of the youngest children is a good illustration of the comparison of the pre-school education index with the urbanisation index (percentage of a county's population living in cities). Here the link is very strong (the linear correlation ratio is 0.73) and can be well observed on the punctual graph see Graph 3.24. What's more, the link between the change in the pre-school education index from 2007–2010 and the urbanisation index is negative and significantly weaker (the rank correlation ratio is -0.45) and non-linear (see Graph 3.24).

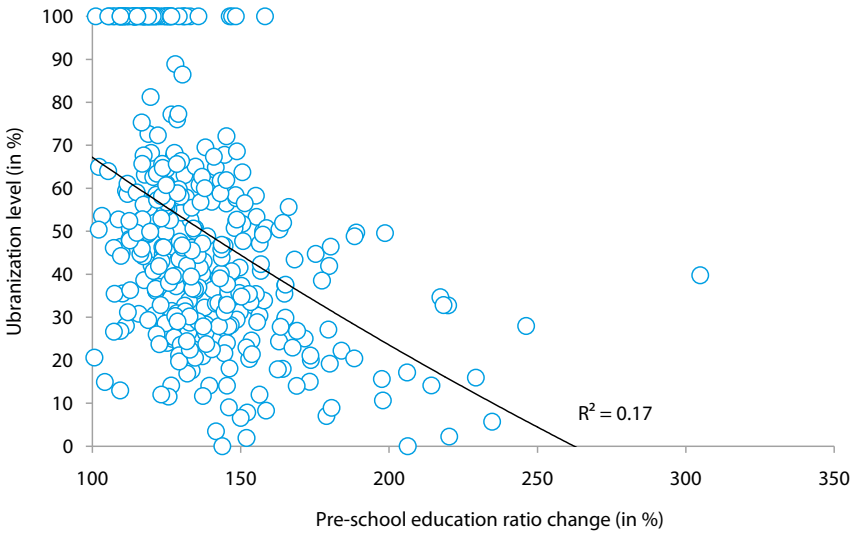
From the perspective of human development and also of the population's life capacities, a low level of access to pre-school education in rural areas is to be interpreted as a development barrier for the country and as a challenge not only for public or education policy, but also the state's development strategy. It should be said, that the low level of pre-school education of the youngest children in rural areas is only one of many negative factors by which they are characterised. Children living in rural areas attend pre-school less often than children living in cities and have less chances of attending good primary and lower secondary schools. This results in less likelihood in achieving

good secondary education and starting university studies. As a result, their career opportunities are weaker. This conclusion alone is enough to define support to pre-school education in areas less developed as a field for the state's strategic intervention.

Graph: 3.24 Dependency between the county urbanisation level and the pre-school education ratio of 3–4-year olds in 2010



Graph: 3.25 Dependency between the county urbanisation level and the change of the pre-school education ratio of 3–4-year olds in 2010



Source: Own study on the basis of the Central Statistical Office data.

3.2.2.2 Results of the mathematics-natural sciences part of the lower secondary school exam

The meaning of education for social and economic development can be analysed from two perspectives: quantitative and qualitative. The first approach focuses on access to education measured

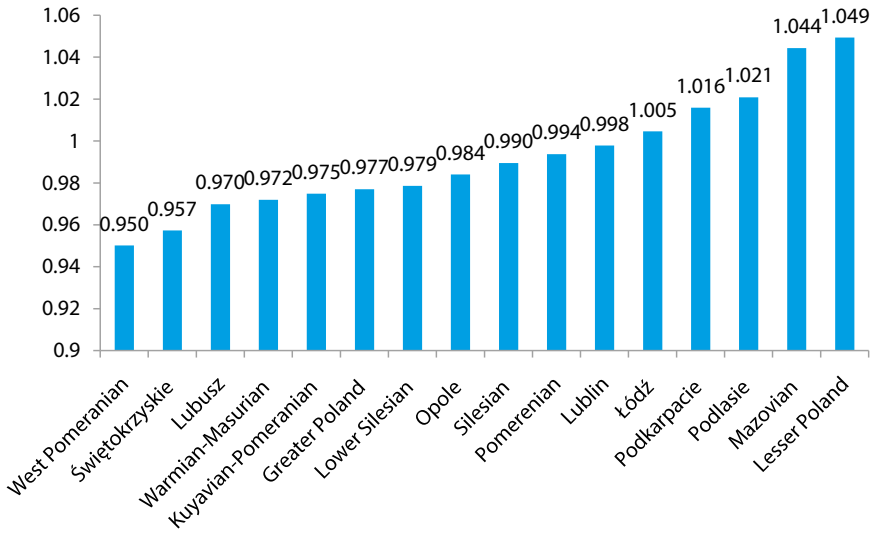
by education indicators or the length of education measured by the number of years spent in school and university. The universality of education is a target of its own as it is in line with the equal chances policy. Moreover, it has a great influence on the social-economic growth, which we have already mentioned. Such a quantitative approach, however, does not tell much about the quality of pre-schools, schools or universities. A year spent in an educational institution is treated equally, regardless of the fact that the competencies and knowledge acquired may vary greatly between institutions, classes, students etc. That is why the second approach is so important as its aim is to analyse the quality of education. The specialist literature on the subject gives proof of the correlation between education achievements and work productivity (higher income) and on a macroeconomic level with the level of economic growth (see: Bishop 1992; Barro 1992; Herbst 2004; Herbst 2012).

As part of the Local Human Development Index, the qualitative aspect is analysed on the basis of the lower secondary exam results. It is a good source for the evaluation of education achievements in regional and local comparisons because: (1) the exam is universal – all lower secondary school students have to participate; (2) the exam results are given in points and (3) the exam takes place on annual basis which allows for an analysis over time. With regard to the latter, one must be careful when comparing exam results in subsequent years as the exam content changes annually which may influence its difficulty. Thus, it is not obvious to what extent the change in the exam results within a given period of time reflects the increase or decrease in the participants' level of knowledge and competencies and to what extent the difficulty of the exam. To suit the needs of the present report, exam results were presented in such a manner to maintain a stable constant country mean for all years. County and voivodeship results have been presented as the percentage of the country mean (country mean=1) for a given year. As a result, the country mean remains the same in the following years, but it is possible for follow the change in rank for regions and counties in relation to that mean.

The lower secondary school exam has been completed in Poland since 2002. Participation is obligatory, but one cannot fail the exam. The exam sheets are checked by external examiners to ensure an even more objective assessment. Exam results are the basis for high school recruitment and are often key in the further development of education and future career opportunities. The exam consists of three parts: humanities, mathematics-natural sciences, and foreign language (introduced in the school year 2008/2009). Until 2011, exam results were given in points and from 2012 they are given in percent. The present analysis includes only the results from the mathematics-natural sciences part of the exam. The choice was made based on the illegitimacy of averaging results from all three parts of the exam. The mathematics-natural sciences part offers greater objectivity of its domain of knowledge and also their significance for the individuals' development and, in a wider perspective, for the growth of a knowledge-based economy (see Bartnik et al. 2011; Ministerstwo Administracji i Cyfryzacji 2012; P. Bukowski et al. 2012).

Regions in Poland are different in terms of educational achievements of students, which are measured by the results of the mathematics-natural sciences section of the lower secondary school exam. The unquestionable leaders are the Mazovian and Lesser Poland voivodeships which clearly outperform other regions. Worse results, but still above average, were reported in the following regions: Podlasie, Podkarpacie and Łódź voivodeships (the results of the latter were closest to the country mean). The Pomeranian and Lublin voivodeships are ranked below the average. Other regions are characterised by results significantly below the average, with the worst results in the West Pomeranian and the Świętokrzyskie voivodeships (Graph 3.26).

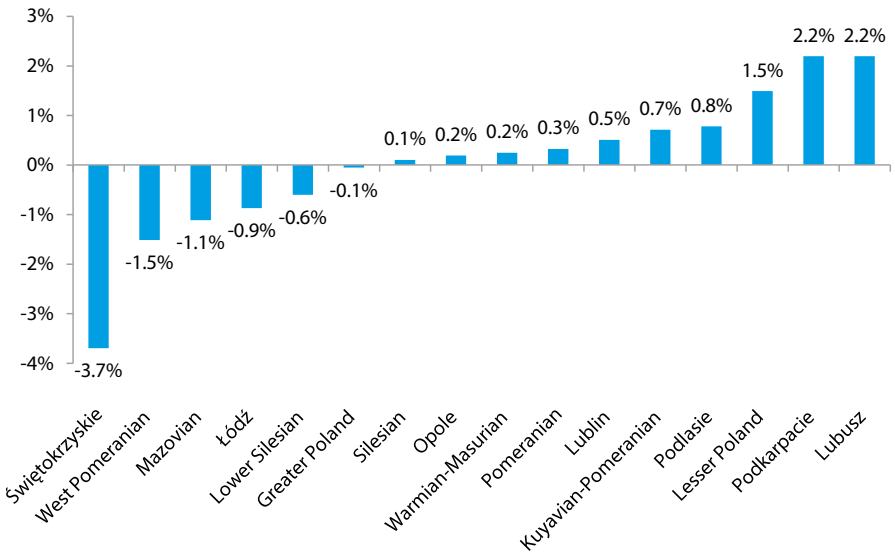
Graph: 3.26 Results of the mathematics-natural sciences section of the lower secondary school exam in voivodeships in 2010 (country mean=1)



Source: Own study on the basis of data from the Central Examination Board.

From 2007 to 2010 the average score in the mathematics-natural sciences part of the exam achieved by students from particular voivodeships underwent slight changes. In the majority of the voivodeships the change of the average score was minor (below 1%) (see Graph 3.26). Only some regions have changed their rank with regard to the national mean. The highest increase in the average score took place in the Lubusz and Podkarpacie voivodeships (2.2% for both voivodeships) and in the Podlasie voivodeship (1.5%). A significant decrease was reported in the following voivodeships: Mazovian (-1.1%), West Pomeranian (-1.5%) and Swiętokrzyskie (3.7%). The latter voivodeship is a special condition as it is the only region in Poland to experience such a high negative change in exam results. In the period analysed, the Świętokrzyskie voivodeship has systematically decreased its rank for the average results of the mathematics-natural sciences section of the lower secondary school exam – from the 5th place in 2007 to the 9th in 2008; to the 14th in 2009 and finally the 15th in 2010.

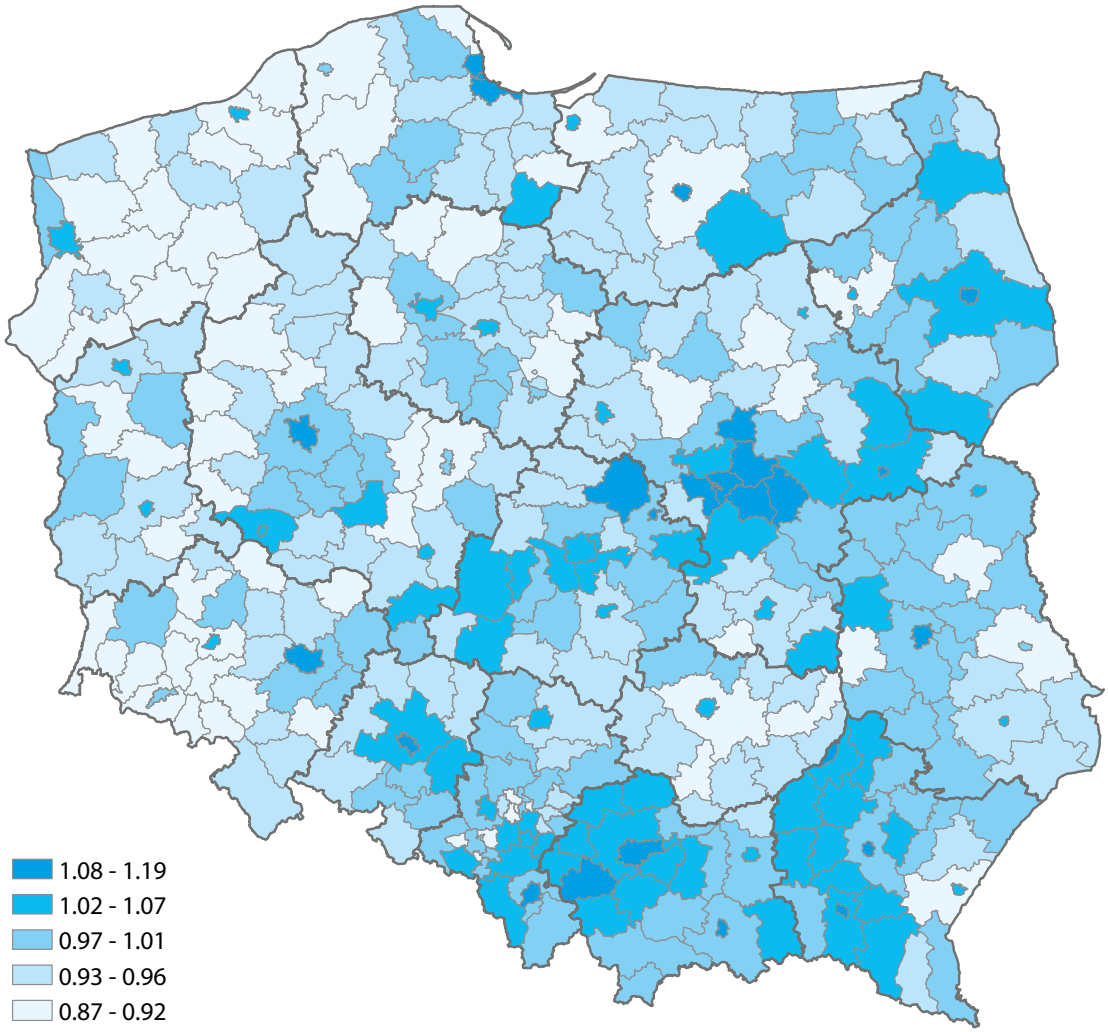
Graph: 3.27 Results of the mathematics-natural sciences section of the lower secondary school exam in voivodeships in 2010 (country mean=1)



Source: Own study on the basis of data from the Central Examination Board.

Analysing the county level results reveals new aspects of spatial differentiation. First of all, what draws ones attention is the high results achieved in urban counties, especially in major Polish cities. But, not only metropolises achieve above-average results, however, the ranking is as follows: Warsaw 1.189; Krosno 1.172; Cracow 1.171; Wrocław 1.165; Lublin 1.145; Gdynia 1.138; Sopot 1.134; Piaseczno county 1.133; Wadowice county 1.128; Pruszków county 1.120; Rzeszów 1.115; Białystok 1.114; Olsztyn 1.112; Nowy Sącz 1.106; Poznań 1.104; Otwock county 1.100; Opole 1.100. Apart from major cities, a selection of medium cities and counties within the metropolitan area of Warsaw stand out. The worst results were achieved by rural counties located predominantly in the West of the country (see Map 3.13). Eastern and Southeastern Poland (excluding the Świętokrzyskie voivodeship) have a relatively good ranking. Also in their case, an internal divide within the regions can be observed i.e. in the Mazovian voivodeship, the Lower Silesian voivodeship, the Kuyavian-Pomeranian voivodeship and the Pomeranian voivodeship. Explaining such a territorial distribution is not easy. For example, high average exam results were reported in counties of Eastern Poland which are among the least economically developed counties in the country. Contrary examples can be found in counties of Greater Poland or Lower Silesia, which are economically well-developed regions, but report low average exam results. A detailed analysis shows that trying to explain these differences with welfare, the available intellectual capital (level of population's education) or the quality of education (well-equipped schools, highly qualified teachers) is insufficient (see: Herbst 2012).

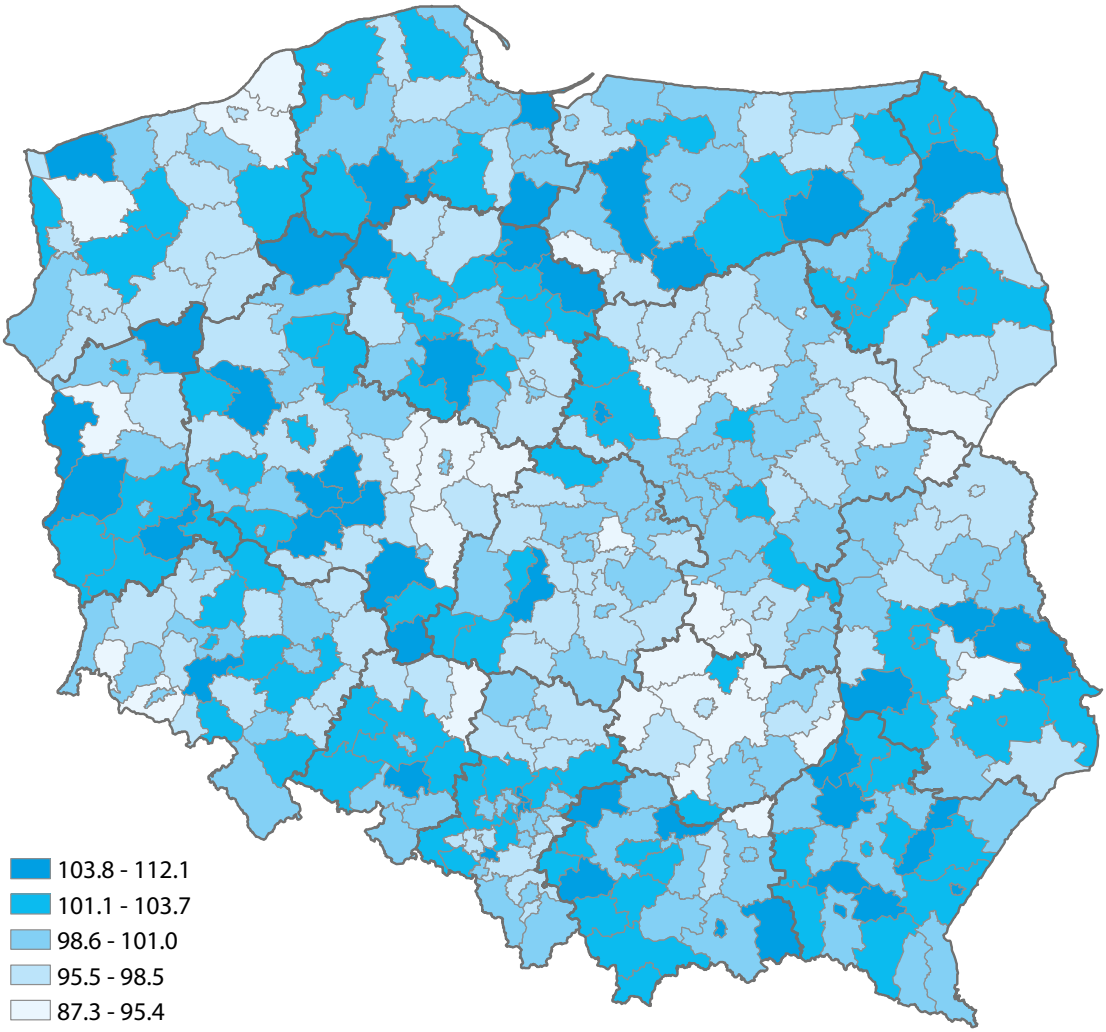
Map 3.13 Results of the mathematics-natural sciences section of the lower secondary school exam in counties in 2010 (country mean=1)



Source: Own study on the basis of data from the Central Examination Board.

The dynamics over time with regard to the country mean of the average lower secondary exam results in the mathematics-natural sciences section in counties from 2007 to 2010 is presented in Map 3.14. The condition of counties, especially urban counties, with high values of the index was relatively stable. The biggest improvement could be observed in the condition of some counties ranked relatively low in 2007, but it is hard to point at any visible trends in spatial differentiation. A decrease in the average exam results in the Świętokrzyskie voivodeship can also be observed at the county level.

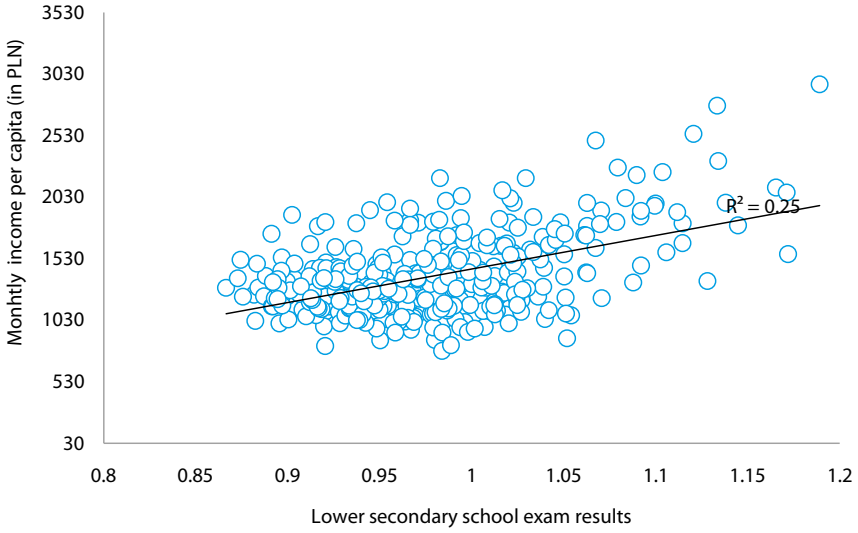
Map 3.14 Change with regard to the country mean of the average lower secondary school results in the mathematics--natural sciences section in counties from 2007 to 2010 in percent (country=100)



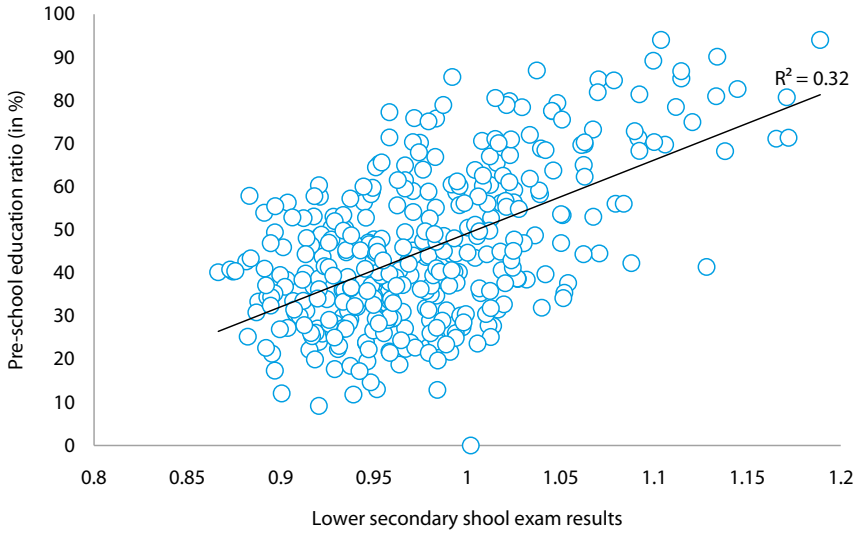
Source: Own study on the basis of data from the Central Examination Board.

As it was already mentioned, the inequalities in the lower secondary exam results cannot be easily explained. However, a large part of the spatial differentiation may be linked to welfare. A comparison of the lower secondary school exam results in the mathematics-natural sciences section with the welfare of a county's inhabitants, measured by the average monthly employment income, shows a rather strong positive relationship (see Graph 3.28) – the correlation ratio is 0.5. This may suggest that the parents' welfare does, to an extent, positively influence the education of children. This suggestion is reinforced by the fact that exam results are negatively correlated to the unemployment rate (-0.53). A slightly stronger link is visible for the pre-school education index (see Graph 3.29) (the correlation ration is 0.56) so that counties with better access to pre-school care experience better educational achievements in lower secondary schools. This is yet another argument which speaks to needed investments in pre-school care.

Graph: 3.28 Dependence between average lower secondary school exam results in the mathematics-natural sciences section and monthly income per capita in counties in 2010 by counties



Graph: 3.29 Dependence between average lower secondary school exam results in the mathematics-natural sciences section and pre-school education of 3–4-year olds on 2010 by counties*



Source: Own study on the basis of the Central Statistical Office, the Central Examination Board and the Ministry of Finance data.

* Data shown on the graph refers to the year 2010 – that is children attending pre-school and students of lower secondary schools participating in the exam that year. The graph does not show dependence at an individual level (the influence of attending pre-school by a given individual on their future educational achievements), but only the aggregate presence of phenomena analysed in spatial units.

Education is a factor and result of regional and local development. The Education Index is linked to the welfare of voivodeships and counties. The correlation with regional GDP per capita is 0.65. On the county level, the correlation between the Education Index and employment income per capita is 0.7. In this case, we may speak of cumulative circular causality. Higher-quality education and, as a result, a better educated population (social capital) positively influence progress opportunities. On the other hand, welfare influences better educational achievements. This can be observed in pre-school education which is higher in cities (or generally speaking

in more urbanised counties), which are richer than rural areas (the correlation of urbanisation and pre-school education in counties is above 0.7). A higher degree of pre-school education comes in pair with better average lower secondary school results. Better lower secondary school exam results can be observed in richer areas (i.e. higher employment income per person).

3.2.3 Health

A long and healthy life is one of the pillars of social development. Life expectancy is a universal value, recognised by all cultures, a fact that proves the vital role that it plays in individual human development. Therefore, the goal of extending lifespan and making life healthier may be reached by actively fighting against the main causes of death, which in developed countries are the so-called diseases of affluence[20]. In Poland the diseases of affluence that cause the highest number of deaths are cardiovascular diseases and cancers, which in 2010 accounted for 71% of all deaths. The fight against such diseases has its intrinsic value, but at the same time it it is also an important factor influencing the progress in the economic and educational dimensions. The challenge for the health policy is the imperative to have action across multiple sectors of society. Important partners include the education sector, the sports and leisure sector, urban planning and construction, transport, agriculture, the private sector, the food industry and the media.

The Health Index is based on two complementary components. The first one is the so-called life expectancy at birth, i.e. number of years a newborn infant could expect to live if the prevailing patterns of age-specific mortality rates at the time of birth (and in a given region) stay the same throughout the infant's life (UNDP 2007). The second element is the aggregate rate of mortality from cancers and cardiovascular diseases, that is, the total number of deaths caused by cancers and cardiovascular diseases per 100,000 habitants. Given the fact that these are the two main causes of deaths in Poland, they strongly affect general health status of Poles in each region.

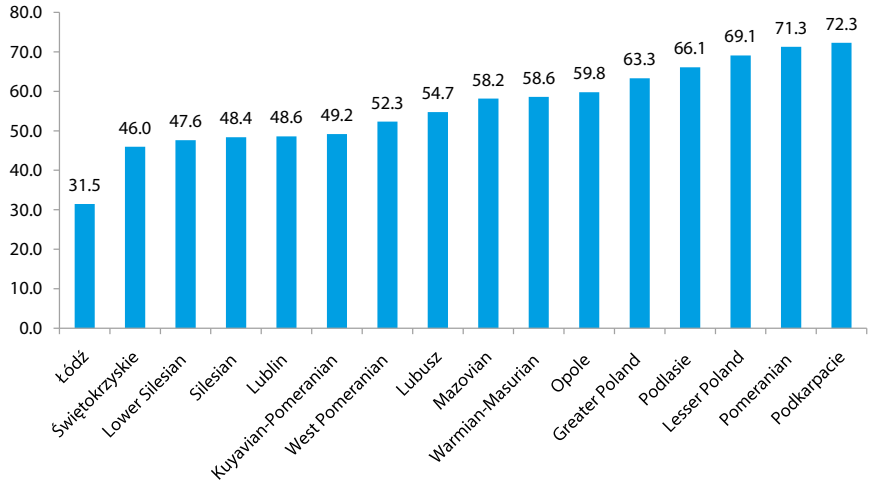
Calculation of the Index required component standardisation and segregation. The final value of the index is a geometric mean of the two indicators, normalised using the min-max method. It should be noted that both indicators – even though they describe overlapping phenomena – are significantly but moderately correlated at the level of particular counties. During the study period, the correlation coefficient ranged from 0.26 to 0.30, suggesting that these variables generally describe other aspects of health status of the Polish citizens. An in-depth analysis and interpretations of the index value and its components will be presented in the following section of the chapter.

Spatial diversification of the Health Index is visible and consistent with the results of previous studies that synthetically evaluated health status of the population at the regional level, i.e. in particular voivodeships. The best results were achieved by the Podkarpacie, Pomeranian and Lesser Poland voivodeships. The worst results were by the Łódź voivodeship with the value of the index clearly diverging from the rest of the regions (56% of the average result). Poor results were also obtained by the Świętokrzyskie, Lesser Poland, Silesian, Lublin and Kuyavian-Pomeranian voivodeships. The decrease in the Index for the Świętokrzyskie voivodeship cannot be explained by changes in the age structure of the population. From 2007 to 2010, the share of retirement age persons increased by 5% (to 18.3%), while the national average increased by 5.7% (to 16.9%). Simultaneously, during

20 Diseases of affluence are diseases associated with negative effects of living in a highly developed country. Such diseases include: hypertension, ischaemic heart disease, cerebral crisis, cancers, diabetes, osteoporosis, chronic obstructive pulmonary disease and allergic diseases.

the analysed period, the patient-per-bed ratio for general hospitals for the Świętokrzyskie voivodeship visibly deteriorated, increasing by 11.5% (the highest growth among all the voivodeships) compared to the national average – 2.3%. It can be assumed that such a decline may be associated with negative changes in healthcare infrastructure.

Graph: 3.30 The Health Index (HI) in 2010 by voivodeship

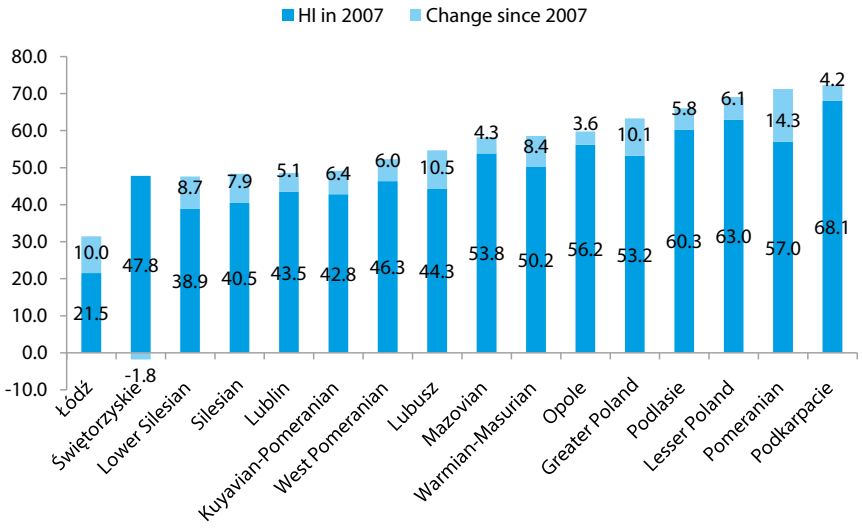


Source: Own study, based on Central Statistical Office data.

The juxtaposition of these results, provided by objective measurements, with the results of research on the subjective evaluation of health status of the habitants of particular regions (Główny Urząd Statystyczny 2007, Główny Urząd Statystyczny 2011b) conducted throughout the last decade, reveals a high degree of similarity. Apart from the West Pomeranian voivodeship, which performed much better in the aforementioned studies, the group of leading voivodeships and the underperforming ones is similar, both using the subjective and objective approach.

The analysis of Index changes in particular voivodeships gives a different picture. During the analysed period there was a visible growth trend for the entire country; the value of the Index increased each year. The undisputed leader was the Pomeranian voivodeship, which improved its score by more than 14 points, i.e. experienced a growth twice as fast as other voivodeships on average. The ranking at the bottom of the index was by the Świętokrzyskie voivodeship, which as the only one recording a decline, lost nearly two points over the four years measured.

Graph: 3.31 Absolute change of the Health Index (HI) from 2007 to 2010 by voivodeship (points)



Source: Own study, based on Central Statistical Office data.

A comparison of changes to the first five and the last five voivodeships (classified based on the Index value for 2007) indicates that the leaders improved their score at a slightly slower pace: an average of 6.8 points, compared with an increase of an average of 7.6 points for the last five voivodeships. Given the fact that the difference in the pace of changes is not very big, the positions in the ranking held by particular regions are rather stable and unlikely to vary over time. One exception is the Świętokrzyskie voivodeship, which during the last four years moved six places down the list. The Kuyavian-Pomeranian, Lubusz, Greater Poland and Pomeranian voivodeships, on the other hand, moved two places up in the ranking.

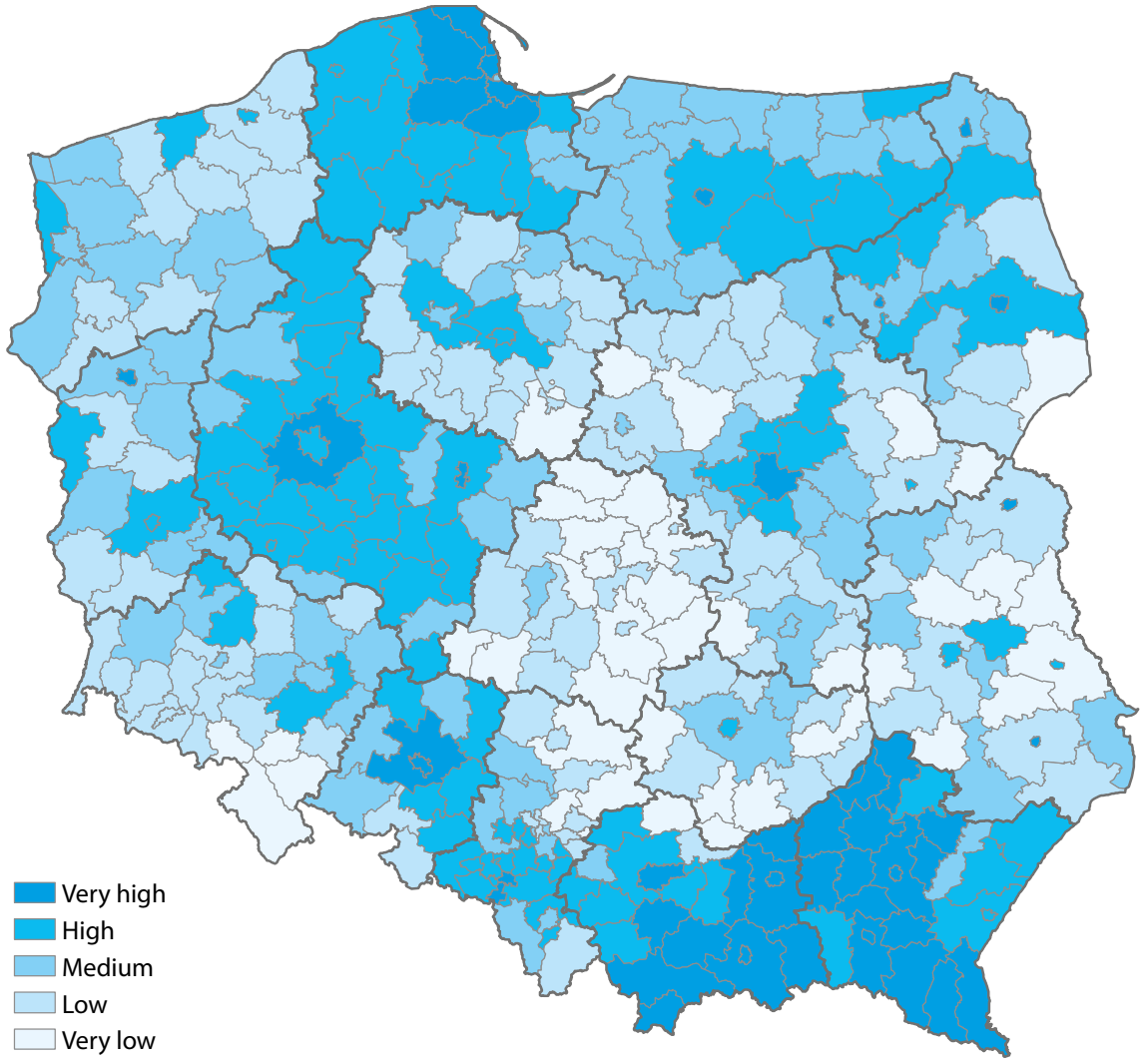
Assessing the Health Index at the county level is of an exploratory nature, mainly because the use of the life expectancy ratio. Up until now, the analysis of the health status of the inhabitants of Poland at the local scale based on this ratio has rarely been performed, mainly due to the lack of reliable data sets available in the official statistics (Wojtyniak et al. 2011).

Spatial diversification of the Health Index at the county level has a multidimensional character. The first thing that seems of importance is the strong position of counties situated in South-Eastern Poland. Within the scope of the uppermost quintile of counties (categorised based on natural divisions as well; see the Map 3.15), i.e. counties with a particularly high Index value (51 units) – as many as 18 belong to the Podkarpacie voivodeship and as many as 12 to the Lesser Poland voivodeship. A relatively good position in the ranking was achieved by municipalities, with a slight predominance of the eastern part of the country. The top group includes 21 municipalities, eight of which are located in Podlasie, Lublin and Podkarpacie voivodeships. The group includes the top performers, based on the Index value, namely Suwałki, Białystok and Rzeszów. What is also evident is a relatively high rank of suburban areas. Such is the case of Trójmiasto, but also Poznań, Warsaw and Opole.

The bottom of the ranking is dominated by the area of central Poland, especially the Łódź voivodeship (14 counties out of 42 lowest quintile areas). Very low Index values were also recorded for the areas belonging to the Świętokrzyskie, Mazovian, Kuyavian-Pomeranian and Silesian voivodeships that neighbour the Łódź voivodeship. The group includes the two counties with the lowest score,

that is Pińczów and Kazimierz counties situated in the Świętokrzyskie voivodeship. Apart from a large cluster in central Poland, counties belonging to the lowest quintile are also found in the Eastern part of the Lublin voivodeship and in the vicinity of Wałbrzych, in Lower Silesia. The only municipality that entered this category is the city of Łódź. Other areas with the lowest Index value cover a large part of Kuyavia-Pomerania, Lower Silesia, Lublin area, central Pomerania and a part of the Mazovian voivodeship, located about 50–80 km from Warsaw. A relatively high score diversification between the Pińczów region, which was the lowest rank and obtained a 9-time lower score, and the index leader, Suwałki, can be explained in two ways. The first is that the dimensions of the Health Index components overlap to a certain extent. The second is that it results from a high variation coefficient for the crude (and therefore not weighted with the population age) aggregate mortality rate.

Map 3.15 The Health Index in 2010 by county



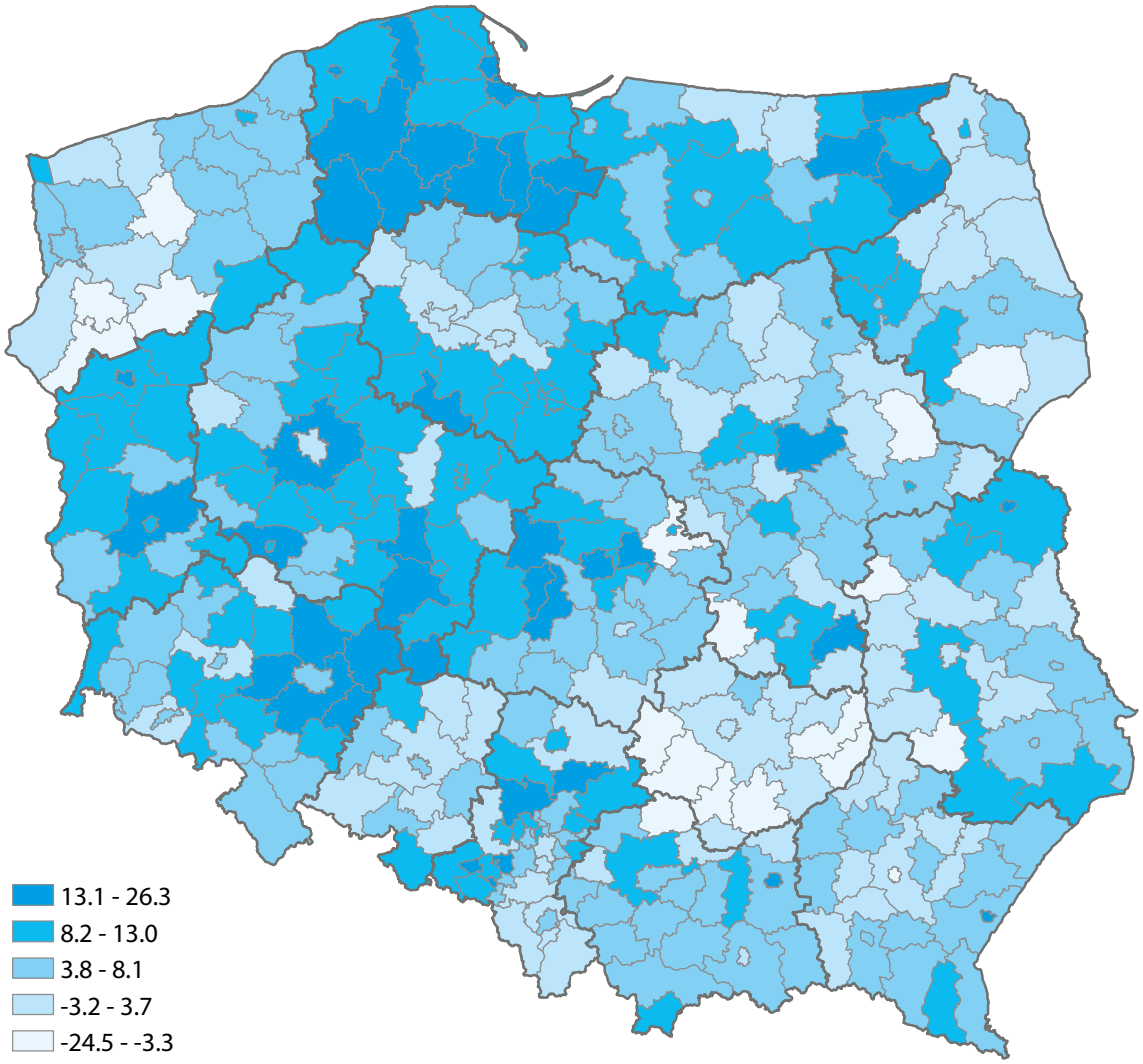
Source: Own study, based on Central Statistical Office data.

Spatial distribution of the Index changes within the period 2007–2010 has a more dispersed character. Nevertheless, several clusters in which the change is particularly visible can be distinguished. A significant increase of the index was recorded in the south-western part of the Pomeranian

voivodeship and in Trójmiasto itself. A similar index increase was observed in the vicinity of several large cities in western Poland, Wroclaw primarily, but also Poznan, Zielona Góra, Kalisz and Leszno. Moreover, an important improvement was noted in the eastern part of the Warmian-Masurian voivodeship, as well as in some counties of the Silesian and Łódź voivodeships – including the city of Łódź itself. The fastest Index value growth, however, was recorded for Biała Podlaska, in which the growth rate was almost four times faster than the average for all counties.

Despite a general upward trend, 39 counties experienced a decline in the Health Index. A decline of the index mostly affected the counties of the Świętokrzyskie voivodeship, especially the Pińczów county, which lost twice as many points as the Busko county, ranked as second. An important decline also took place in the southern part of the West Pomeranian voivodeship. Among the municipalities, the only one to record a visible decrease in the Index value was Rzeszów.

Map 3.16 The absolute change of the Health Index (HI) during the period 2007–2010 by county



Source: Own study, based on Central Statistical Office data.

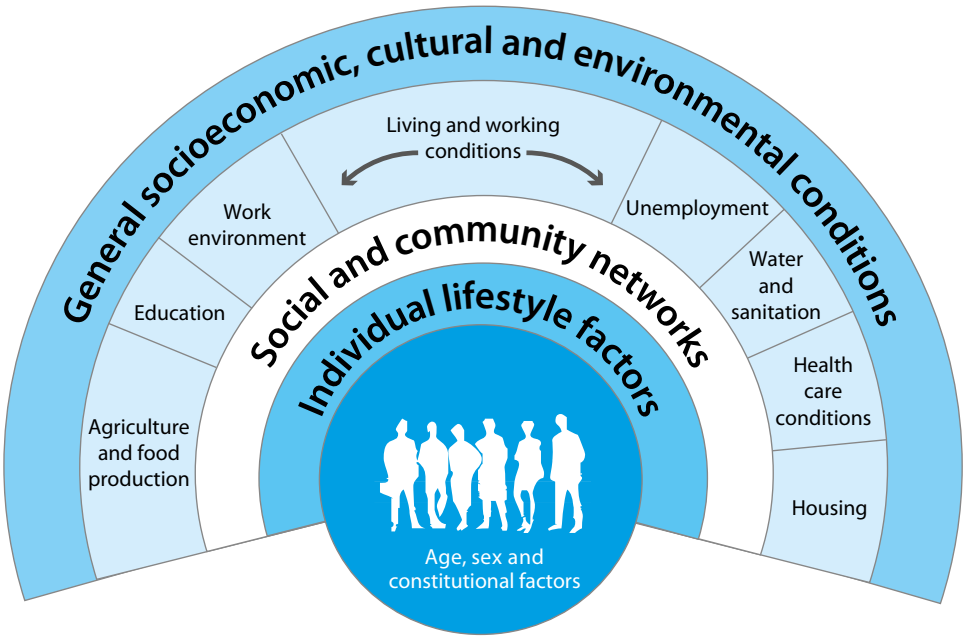
The change in the relative position of the counties that took place during the analysed period seems ambiguous. The coefficient of correlation between the base level of the index in 2007 and the change recorded between 2007 and 2010 is statistically insignificant. A comparison of the average change in the index value between the counties in the first and the tenth decile (according to the results obtained in 2007) indicates that the index value for the counties in the first decile grew one and a half times faster than for the leaders in that period, i.e. the counties in the tenth decile. A comparison between the first and the last quartile also indicates a decrease in the distance, although in this case the growth pace for the underperforming counties was faster by only 17%.

Being aware of the general spatial distribution of the Health Index, one should ponder on possible interpretations of this phenomenon. A conceptual basis for the search of the determinants of the spatial differentiation of general health status is provided by the Health Production Function (Or 2000). The function describes the relationship between a combination of different determinants (inputs) and resulting health outputs. The determinants that have a direct impact on health are usually classified based on:

- a particular aspect of living to which a given determinant belongs - e.g. a division including (1) natural environment, (2) lifestyle, (3) socioeconomic conditions and (4) available healthcare (Or 2000),
- determinant's susceptibility to change,
- determinant's position in the process of human health structure – a division into upstream and downstream determinants (Dahlgren & Whitehead 2007).

The following figure summarises graphically the information on health status determinants. The centre of the figure includes personal features, such as sex, age and genetic predeterminations. The determinants that may be influenced start with human behaviours, i.e. broadly taken lifestyle. The next level includes social networks and "anchoring" in a given community, followed by living and working conditions, which include, among others, housing conditions, education or access to healthcare. The final element are the most general determinants, such as socioeconomic conditions, cultural context or the natural environment condition. It is usually assumed that the strength of influence of a given group of determinants on the health status of a given population is as follows: lifestyle (50%), physical environment (both natural and man-made) and the conditions of social life, work and study (about 20%), genetic factors (about 20%), and health care-oriented actions (about 10%) (Ministerstwo Zdrowia 2007).

Graph 3.1 Main determinants of the population's health status



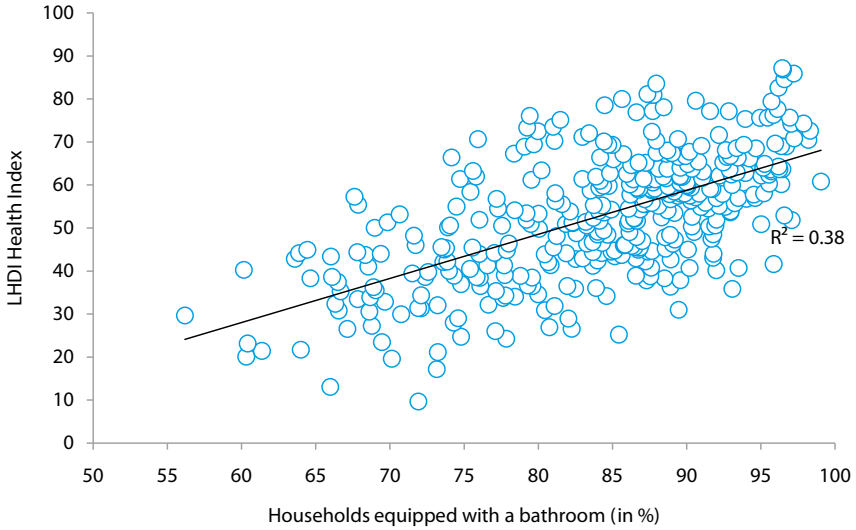
Source: Dahlgren, Whitehead 1993 as cited in Szafraniec 2011.

Studies conducted in Poland focus mainly on the socioeconomic determinants of the population's health status (Kotowska et al. 2005; Wróblewska 2010; Chłoń-Domińczak et al. 2011). Spatial diversification of the Health Index at the county level is usually explained by: living conditions, social capital (as measured by voter turnout), education level, percentage of people employed in agriculture (positive impact) and, to a lesser extent, by the rate of unemployment (negative impact) (Chłoń-Domińczak et al. 2011). An overview of international studies makes it possible to complete the list of determinants of life status with additional factors, such as:

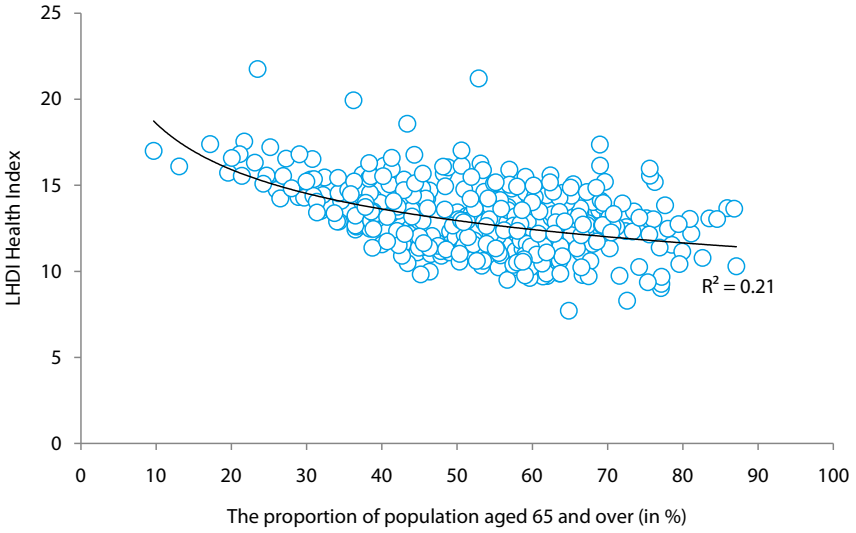
- Environmental quality (Or 2000),
- Lifestyle, diet (Svedberg et al. 2006; Dahlgren & Whitehead 2007; McFadden et al. 2008),
- Social stratification, inequalities, poverty (Marmot & Wilkinson 2006; Dahlgren & Whitehead 2007; McFadden et al. 2008; Wilkinson & Pickett 2010),
- Cultural context, including – among others – social roles associated with each gender (Lahelma et al. 2000, as cited in Wróblewska 2010),
- Organisation and functioning of the healthcare system (Dahlgren & Whitehead 2007).

The Health Index at the county level is associated primarily with the level of living conditions and the demographic structure of the population (see Diagrams 3.32 and 3.33). The relation to expenditures for healthcare (as measured by involvement of human resources), the average income level and the degree of urbanisation is positive, but the correlation is rather weak, amounting to 0.24, 0.22, and 0.21 respectively.

Graph: 3.32 The relation between the Health Indicator in 2010 and the percentage of households equipped with a bathroom in 2002 by county



Graph: 3.33 The relation between the Health Index and the proportion of the population aged 65 and over in 2010 by county



Source: Own study, based on Central Statistical Office data.

Living conditions, as measured by the percentage of households equipped with a bathroom are strongly and positively correlated with health outcomes (with a linear correlation coefficient of 0.62). Although the achieved level of development is relatively high, the provision of proper living conditions for all the inhabitants of Poland requires further efforts. The problem concerns mainly the eastern and the central part of the country. In counties such as Chełmno, Zamość, Przysucha or Lipsko county, only about 60% of households is equipped with a bathroom. In comparison, in 100 counties that are on the top of the Health Index list, the average value for this coefficient amounts to 90% while the average for all counties is 84%.

The correlation between the proportion of elderly people by county is moderately strong and negative (with a Spearman correlation coefficient of -0.43). Such a situation should not surprise, especially given the fact that mortality rates were calculated for a non-standardised population. In the coming years, the population ageing process will intensify, becoming for some regions of Poland the key development challenge. The observed dependence, however, is non-linear (see Diagram 3.33), which indicates the existence of two different types of areas with a large proportion of elderly people. The first group includes large cities, such as Sopot (more than 21% of the population are over 65 years of age), Katowice, Cracow and Warsaw. Despite ageing demographic structure, their position in the classification is relatively strong, which can be attributed to the positive impact of wealth and access to developed medical infrastructure. The second group includes poorly urbanised, predominantly agricultural counties situated in the eastern and central Poland. Another explanation may be provided by the depopulation process which affects these regions. It can be assumed that improving the situation of the elderly people that live in the non-urbanised areas is likely to translate into significant amelioration of the national health outcomes.

As shown above, factors associated with health status may influence it in various ways, depending on the particular character of a given area, e.g. its urbanisation level. The comparison of municipalities and counties in respect to the importance of social capital[21] for the Health Index also provides interesting results. In the case of municipalities, correlation results indicate a positive relationship, which can mean that there is a certain threshold (e.g. the size of population centre), starting from which social capital starts to influence health outcomes.

3.2.3.1 The average life expectancy at birth

The average life expectancy at birth is a direct and overall indicator of the effect of living conditions. The use of the life expectancy coefficient in measuring human development is common and the coefficient itself has been a component of the HDI since the publication of the first report in 1990.

The average life expectancy at birth is calculated based on data on death rates by age. Provided that, at the local level, the number of deaths among younger cohorts is relatively low, the minimisation of the influence of fortuitous events on the obtained result comes as a challenge. In order to minimise such an influence, it was decided to employ the life expectancy coefficient calculated by the Central Statistical Office for the areas of higher rank, i.e. statistical subregions. Based on the data on rural and urban regions, and for men and women at this level, the average life expectancy in particular counties was evaluated. Evaluation relied on the county's urbanisation level. Results for men and women were combined in a single value, based on the sex ratio of newborns per year in Poland and the assumption that it is similar across the country. The obtained variable is consistent with the methodology applied by the Central Statistical Office, minimises the impact of fortuitous events, the importance of which increases with the transition to the local level, and is reduced to a single value for each county, which facilitates its further use.

In Poland, the spatial distribution of the average life expectancy is stable (Wojtyniak et al. 2008). As usual, the best results are observed in south-eastern Poland, and then in the Podlasie and Pomerania voivodeships. The Łódź voivodeship stays at the bottom of the classification, visibly standing out from the other regions. A relatively low score was recorded for the Kuyavian-Pomerania, Silesian

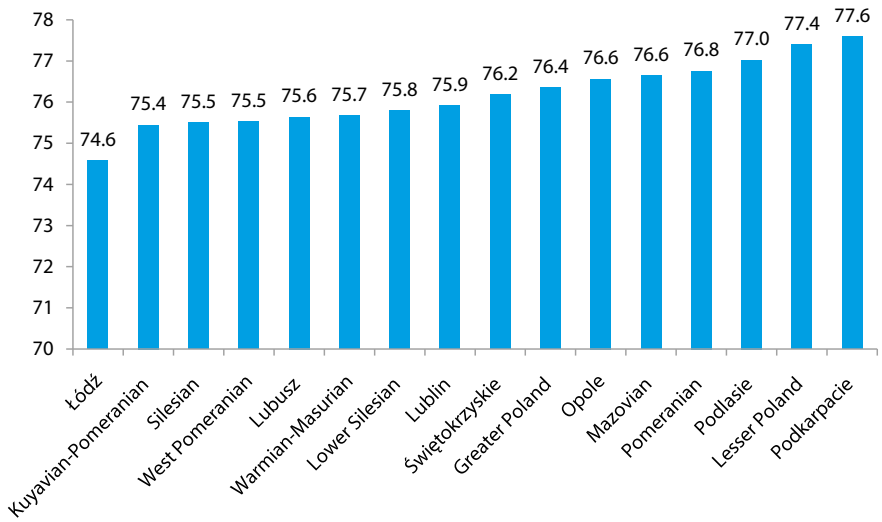
21 As measured by voter turnout in the elections to the municipal council in 2010 and the number of registered NGOs in per capita terms.

and West-Pomeranian voivodeships. The range between the leader – the Podkarpacie voivodeship – and the Łódź voivodeship amounts to over three years. Given the fact that we discuss the average life expectancy for newborns, such a difference seems alarmingly high.

The trend observed in the period from 2007 to 2010 is positive, since in all the voivodeships the average life expectancy for newborns increased. The rates were different, however, with the slowest growth recorded in the Świętokrzyskie and Opole voivodeships (0.7–0.8%). And the fastest growth was recorded in the Pomerania, Lower Silesia and Lubusz voivodeships, exceeding 1.5 %. A comparison of this set of data with the changes in the life expectancy for newborns over the period 1991–2007 does not yield unequivocal results. For example, the Opole and West Pomerania voivodeships at that time belonged to the group of change leaders, whereas in the Świętokrzyskie voivodeship the life expectancy grew rather slowly. Simultaneously, the voivodeships which during the analysed period recorded the fastest growth, from 1991 to 2007 were in the middle of the ranking (Wojtyniak et al. 2008).

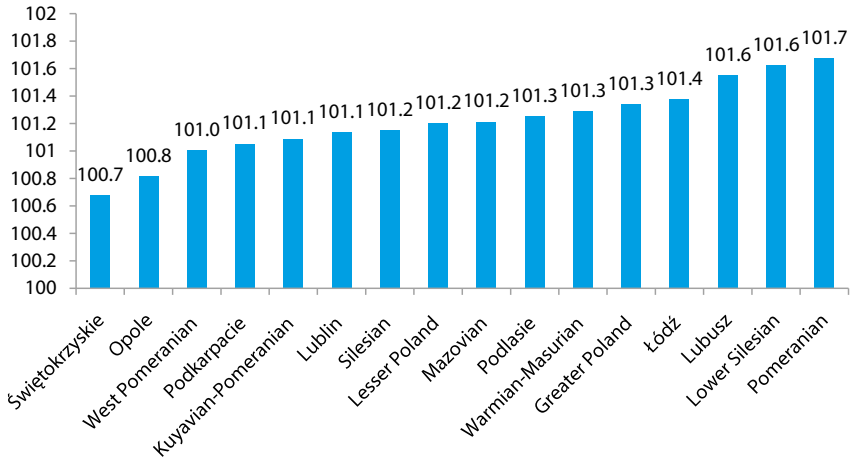
The observed changes do not allow us to clearly determine whether the differences between the regions decreased, especially when it comes to the areas found at the tail ends of the classification. An average change observed among the first five and last five voivodeships (ranked according to the average life expectancy in 2007) is slightly higher in the latter group, but it amounts to only 0.25 percentage points. A look at the relative position gives even less conclusive results. During the studied period, seven voivodeships (mainly from the top of the ranking) did not change their position in the classification, whereas the final five included both voivodeships that improved their position in the ranking (e.g. Lower Silesian and Lubusz) and the voivodeships that recorded a further decline (Silesian, Kuyavian-Pomeranian). A limited vertical mobility is associated, among others, with considerable inertia that characterises the life expectancy rate.

Graph: 3.34 Average life expectancy in 2010 by voivodeship



Source: Own study, based on Central Statistical Office data.

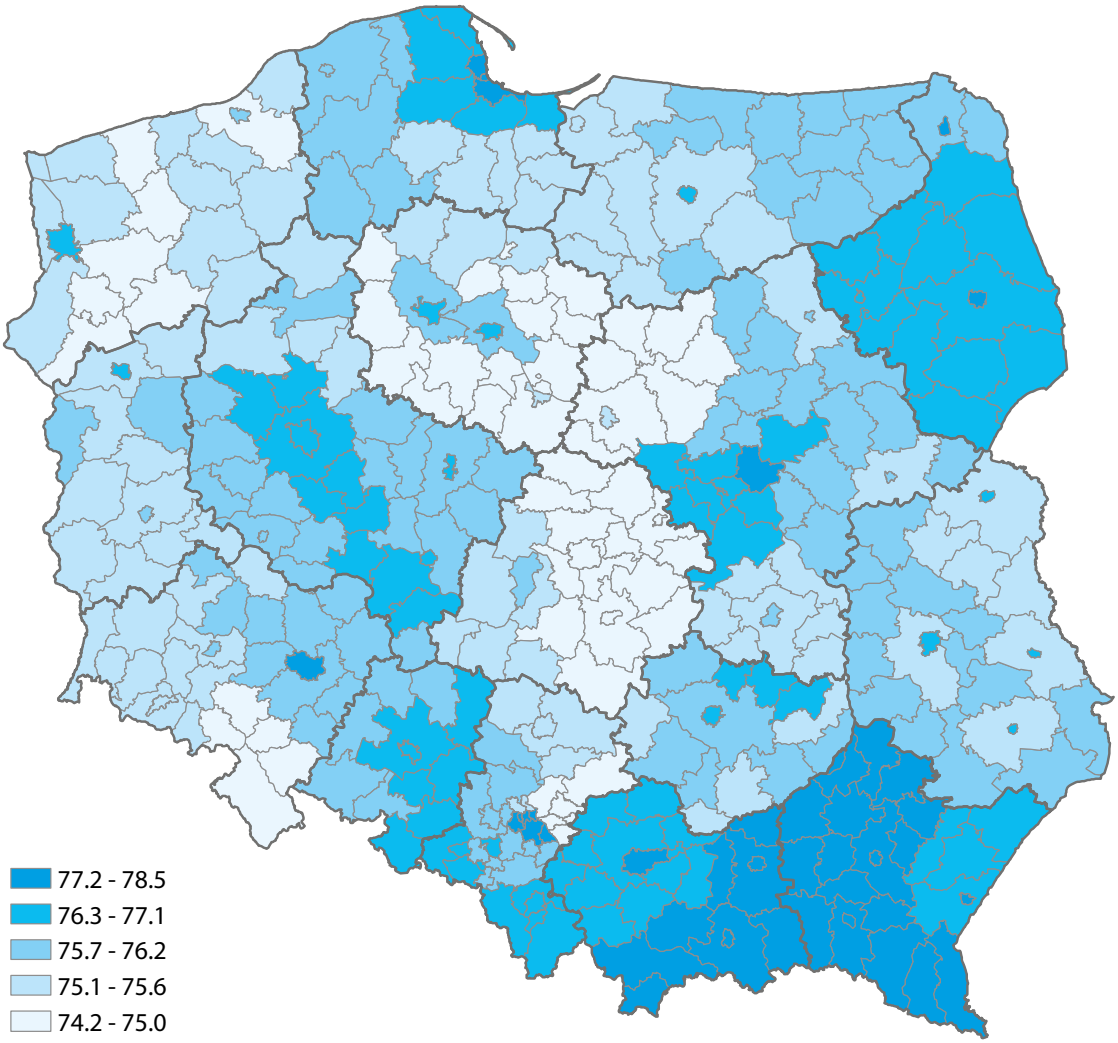
Graph: 3.35 The change in the average life expectancy in the period 2007–2010 by voivodeship (in %)



Source: Own study, based on Central Statistical Office data.

From the local perspective, the first ten positions in the ranking are occupied by municipalities – mainly from the eastern Poland, as well as Trójmiasto, Warsaw and Cracow. Rzeszów, with the score of 78.5 years, places itself at the head of the ranking. The next 19 places are occupied by counties belonging to the Podkarpacie and Lower Poland voivodeships, with predominance of the latter. High scores were also obtained by Podlasie, areas of big cities, such as Poznań, Trójmiasto and Warsaw, and the western part of the Opole voivodeship. The lowest scores were recorded for the counties situated in Łódź and the Kuyavian-Pomeranian voivodeships, as well as the north-western part of the Mazovian voivodeship, a part of West Pomeranian and Silesian voivodeships and the Wałbrzych area. The lowest rate was recorded in the Pabianice and Zgierz counties – below 74.2 years.

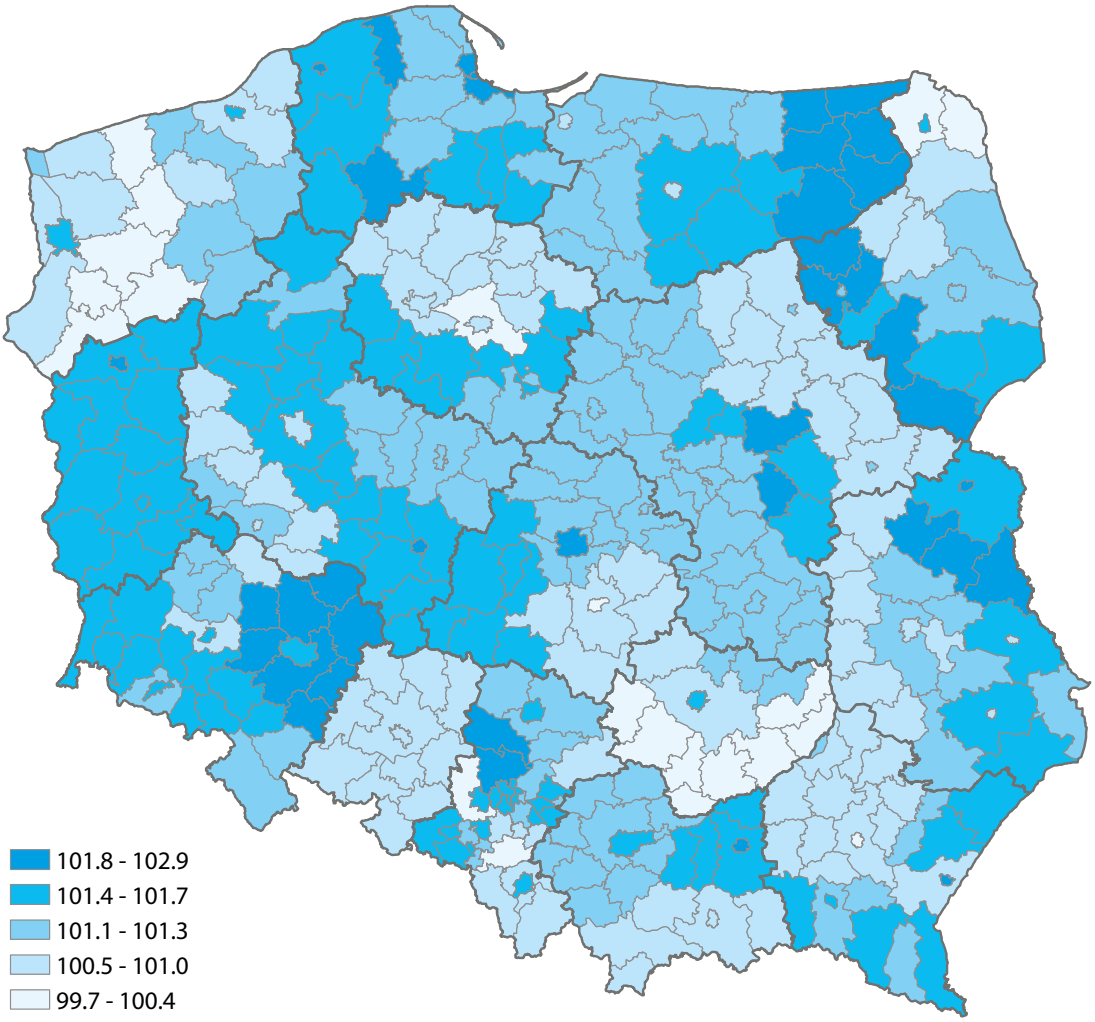
Map 3.17 Average life expectancy in 2010 by county (years)



Source: Own study, based on Central Statistical Office data.

During the analysed period, in 370 out of 379 counties the average life expectancy for a newborn increased. The average change from 2007 to 2010 amounted to 0.88 years. The highest increase, exceeding 1.5 years, was recorded primarily for counties in the Wroclaw area and municipalities situated in the Pomerania voivodeship. The undisputed leader of changes was Biała Podlaska, where the increase was as high as 2.2 years. The nine counties that recorded a decrease of the indicator value are located mainly in the West Pomerania and Świętokrzyskie voivodeships.

Map 3.18 The change of the average life expectancy in the period 2007-2010 by county (in %, 2007=100)



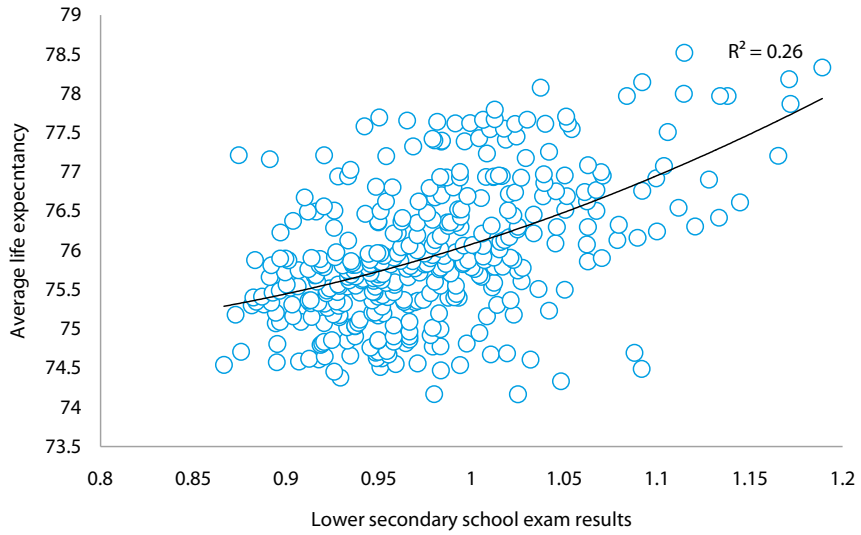
Source: Own study, based on Central Statistical Office data.

The observed change contributes to the diminishing of inequalities in the indicator distribution in particular counties, although at a moderate pace. The comparison of the first and the last decile (based on the results from 2007) indicates that the leading counties recorded an average increase of 0.81 years, while in the most underperforming counties the average change amounted to 0.94 years. The direction of change becomes even more evident when we compare the value changes for the first and the last quartile, which are 0.79 and 1.06 years respectively. The results indicate that the the counties from the bottom of the classification grow faster than the average, yet slower than for the counties with a slightly higher rank. Such a situation translates into a relative position change – the counties in the last decile rose on average by nine places, whereas the average for the last quartile was 30 positions. Stability at both ends of the distribution is assured as well by the position shifts among the counties with the highest LE values. The first decile recorded an average decrease of 2.6 positions and the first quartile – by 10.7 positions.

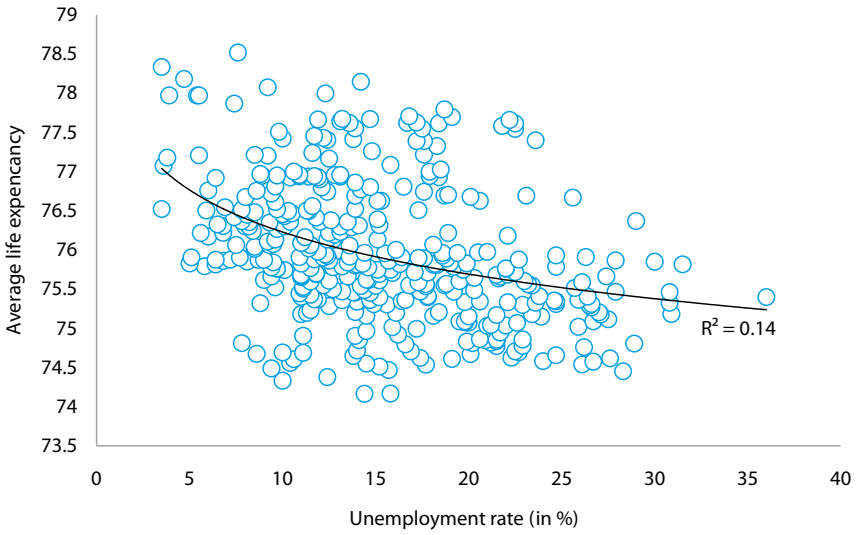
The analysis of the spatial diversification of the average life expectancy for particular counties indicates primarily a positive correlation with educational achievements and a negative one with the rate of unemployment. The correlation coefficient is 0.50 and -0.36, respectively, so the strength of

the correlation is generally lower than the correlation for the variables related to the Health Index. The diagrams representing the relationships are presented below.

Graph: 3.36 The relation between the average life expectancy and the results of the lower secondary school leaving examination in 2010 by county.



Graph: 3.37 The relation between the average life expectancy and the rate of unemployment in 2010 (%) by county



Source: Own study based on the Central Statistical Office data.

A relatively strong correlation between the average life expectancy and the results of the lower secondary school leaving examination has been confirmed as well by earlier studies (Wojtyniak et al. 2011). Such a relationship may be interpreted as a positive influence of the education quality on the awareness of the risks for health and life. It is possible, however, that the examination results reflect a wider phenomenon that draws from the cultural capital and values typical for a given area.

The relation between the average life expectancy and the rate of unemployment is negative, although the correlation is rather moderate, amounting to -0.36. Previous studies indicated that such a negative impact is significant solely in the case of men (Wojtyniak et al. 2011), which may explain the relatively low value of the correlation coefficient in a situation where the results are aggregated for both sexes. The diagram of dependencies between the average life expectancy and the rate of unemployment indicates a non-linear nature of the relationship. Violation of such linearity can be interpreted as the result of hidden unemployment in the rural areas characterised by a dispersed agricultural structure as well as a lower average life expectancy. The negative relationship between the rate of unemployment and the average life expectancy may indicate that the scale of social exclusion and poverty have a negative influence on the health status of a given population. It may be confirmed by the correlation with the variable that describes the social assistance expenditure per capita (the correlation coefficient is -0.33).

The differences between municipalities indicates that the structure of employment may also be an important determinant. In cities where more people work in services and fewer in industry, the average life expectancy is higher. A negative correlation with the degree of industry development indicates that the inhabitants of cities where the economy is based mainly on the sectors that pollute the environment and are characterised by a large number of accidents at work, live relatively shorter.

3.2.3.2 The aggregate rate of mortality from cancers and cardiovascular diseases

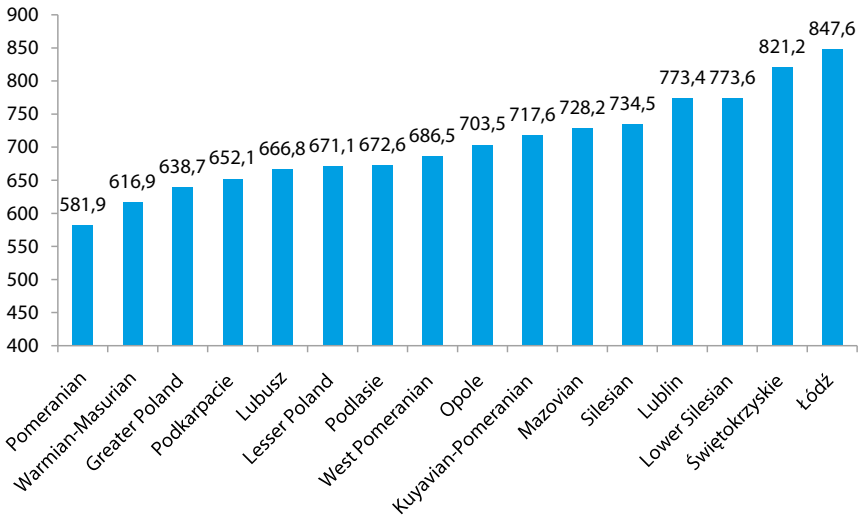
For the needs of this study, the aggregate rate of mortality from cancers and cardiovascular diseases means the number of deaths caused by cardiovascular diseases and cancers per 100,000 inhabitants. These two causes have an important impact on the assessment of the health status of the inhabitants of particular regions of Poland. This indicator reflects the number of factors affecting mortality, including the quality and universality of health care, as well as the quality of the natural environment, the dominant lifestyle or socio-economic conditions. The main advantage of this measurement is its clarity, availability of reliable data (information on the causes of death are provided by doctors and aggregated by the Central Statistical Office on the county level), significant spatial diversification of the phenomenon, a relatively large number of observations and its adequacy to the current level of development of the country. These conditions cannot be fulfilled by such indicators as infant deaths (small number of observations, small spatial diversification – useful in the case of countries with a lower rate of development), or a low birth weight rate (small number of observations, interpretation ambiguities. Thus, the mortality rate is widely used in empirical research, as a measure of health effects (Or 2000).

The aggregated rate of mortality from cancers and cardiovascular diseases is calculated based on aggregate data on the number of deaths from cardiovascular diseases and cancers per 100 000 inhabitants of a selected area. Also in this case, the minimisation of the influence of fortuitous events on the obtained result comes as a challenge. In order to fully minimise such influence, it was assumed that the result for the year x is the arithmetic average of the years x, x-1 and x-2 (for example, the result for 2010 is the average of the years 2008, 2009, 2010). Such an approach diminishes the relevance of the indicator, but in view of considerable inertia of the processes associated with the health status, the significance of the problem is small (cf. Wojtyniak et al. 2011). Another problem that needs to be determined is the inclusion of the influence of population structure on the rate of mortality from cancers and cardiovascular diseases. Undoubtedly, the number of deaths will be higher in the areas with a high proportion of elderly population. The solution to this situation would be the standardisation of the demographic structure. On the other hand, such a standardisation

could bias the image of the actual effect (number of deaths per capita) for a particular area. Moreover, the data that enable population standardisation are available with a nearly three-year delay. That is why we decided to employ non-standardised, raw mortality rates.

The lowest rate of deaths caused by cardiovascular diseases and cancers per 100,000 habitants is recorded in the Pomeranian, Warmian-Masurian and Greater Poland voivodeships. The Łódź and Świętokrzyskie voivodeships are ranked at the bottom of the classification. The difference between the regions from the two ends of the list amounts to over 250 deaths per 100,000 habitants. Nevertheless, this value should be treated with caution, for the raw mortality depends strongly on the age structure of the population. Previous studies were based mostly on standardised mortality rates, hence the possibility to compare the results here is rather limited. Nevertheless, according to the results from 2006, the highest standardised mortality rates had a similar distribution – the highest number of deaths was recorded in the Lower Silesian, Silesian and Łódź voivodeships (Wojtyniak et al. 2008). Higher discrepancies can be seen at the bottom of the classification – according to the standardised results from 2006, the voivodeships with the lower score were the Podlasie, Podkarpacie and Mazovian voivodeships.

Graph: 3.38 The aggregate rate of mortality from cancers and cardiovascular diseases in 2010 by voivodeship (number of deaths per 100 000 habitants)



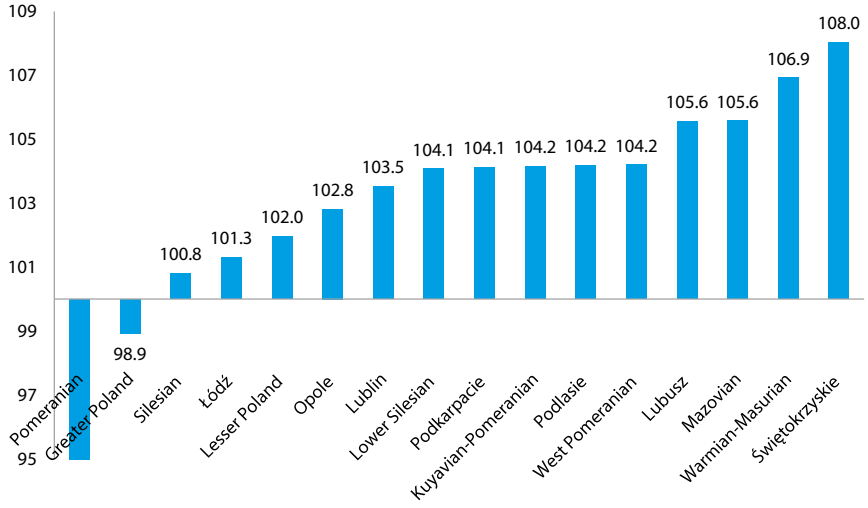
Source: Own study based on the Central Statistical Office data.

The dynamics of the phenomenon is clearly subject to spatial diversification. There is a general rising tendency – during the period 2007–2010, the rate increased by an average of 3.2%. In the Pomeranian and Greater Poland voivodeships, the number of deaths per 100,000 habitants declined. The Świętokrzyskie and Warmian-Masurian voivodeships, on the other hand, recorded an increase of 8% and 6.9%, respectively.

Despite the significant amount of the observed changes, the relative position of regions changed to a very small extent. The biggest jump in the ranking was made by the Greater Poland voivodeship, which moved from the sixth to the third position and the most important decline was recorded for the Podlasie voivodeship, which moved from the fifth to the seventh position. What is interesting is that the majority of changes took place at the top of the classification and the results of the regions

from the bottom of the list did not practically change. In absolute terms, the top five recorded an average growth rate of 3.3%, whereas in the last five regions the growth rate amounted to 3.6%. The difference is slight, but signals the increasing gap between the healthiest and least healthy regions.

Graph: 3.39 Changes in the aggregate rate of mortality from cancer and cardiovascular diseases during the period 2007–2010 by voivodeship (number of deaths per 100 000 habitants)

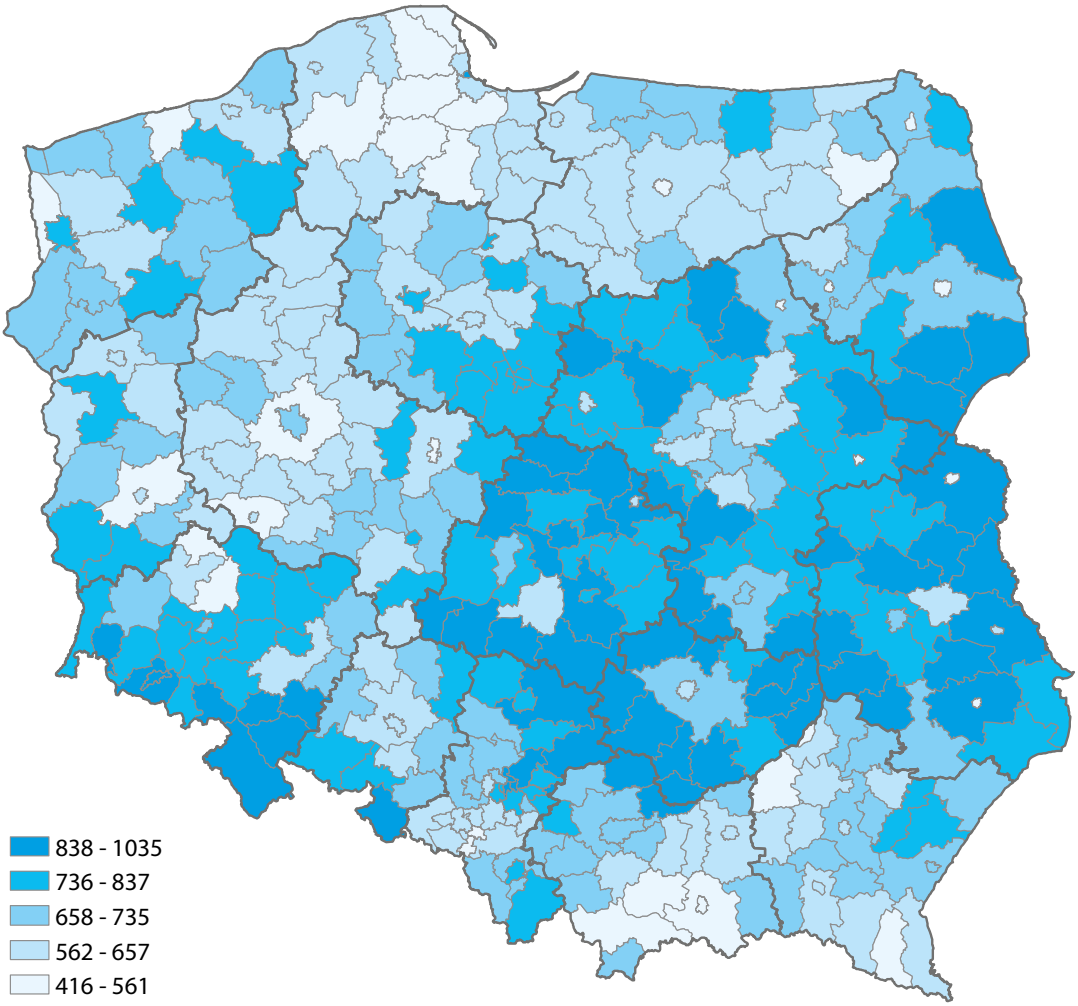


Source: Own study, based on Central Statistical Office data

The counties with the highest aggregate rate of mortality from cancers and cardiovascular diseases are located mainly within the area of the former congress Poland and the Sudeckie Foothills (although there is a vast "island" of higher scores in the Warsaw area). The counties with the lowest score are dispersed in several eastern and central voivodeships. The group of regions with the highest values of the indicator includes, among others, the 13 counties of the Łódź voivodeship, 11 of the Mazovian voivodeship, 11 of the Lublin voivodeship and 10 of the Świętokrzyskie voivodeship. The infamous leader of the classification is the Pińczów county, which surpasses the subsequent unit by as much as 19 deaths per 100,000 habitants.

The counties that recorded the lowest mortality rate are much more dispersed. The 33 areas comprised in the first class of the ranking belong to 12 voivodeships and the only voivodeships that were not included in the category are the Kuyavian-Pomeranian, Łódź, Opole and Świętokrzyskie voivodeships. The largest concentration of the counties with a very low aggregate rate of mortality from cancers and cardiovascular diseases is located in the Pomeranian voivodeship, although the classification leader remains the Police county, in which the recorded rate is lower by 26 deaths than in the next highest county: Kartuzy.

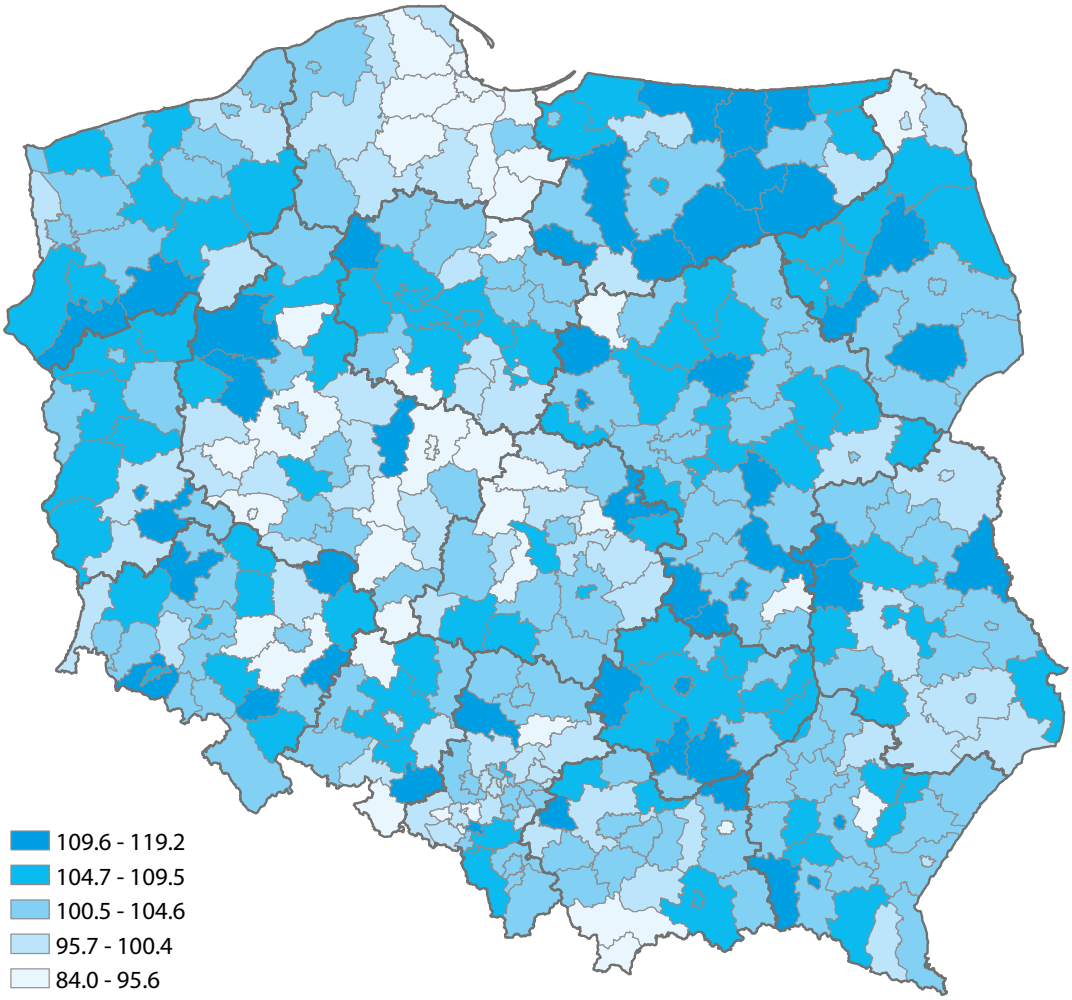
Map 3.19 The aggregate rate of mortality from cancers and cardiovascular diseases in 2010 by county (number of deaths per 100,000 habitants)



Source: Own study, based on Central Statistical Office data.

The dynamics of changes in the aggregate rate of mortality from cancers and cardiovascular diseases is subject to spatial diversification. In the first decile, i.e. among the counties that record positive changes, the majority of the areas belong to the Pomeranian and Greater Poland voivodeships. The best result was obtained by the Sztum county (a drop of 16%) and, among cities with county specifications – by Sopot (a drop of 8.7%). Spatial diversification is even stronger among the counties in the last decile, since they belong to 14 different voivodeships, except the Pomeranian and Łódź (although the Skierniewice county was classified in the category of areas that recorded the highest growth of the indicator). The largest grouping of the counties characterised by a strong negative trend is situated in the Warmian-Masurian voivodeship. Particular areas that record the largest percentage increase in the number of deaths is the Choszczeź and Pisz counties: respectively 19.2% and 19.1%.

Map 3.20 The aggregate rate of mortality from cancers and cardiovascular diseases by county: percent changes within the period 2007–2010



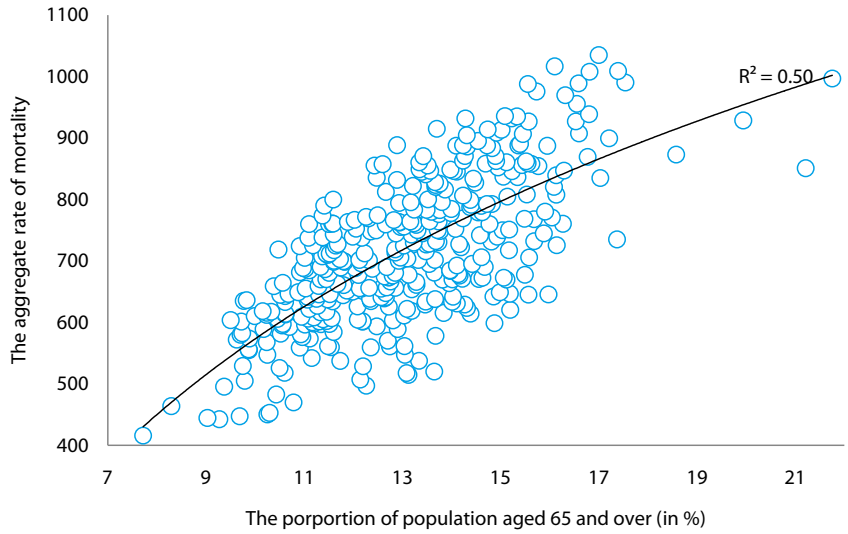
Source: Own study, based on Central Statistical Office data.

The comparison of the rate of changes for the counties from the top and from the bottom of the classification suggests that the gap between the areas with extreme indicator values is diminishing over time. An average change recorded for the counties in the first decile, i.e. with the highest rate of mortality from cancers and cardiovascular diseases (based on the data from 2007) amounted to 0.6%. Among the counties in the last decile the increase was several times higher, amounting to 3.7% compared to the average for all counties (3%). The comparison of the first and last quartile gives a similar result, although the difference is less pronounced (2.4% vs. 4.1%).

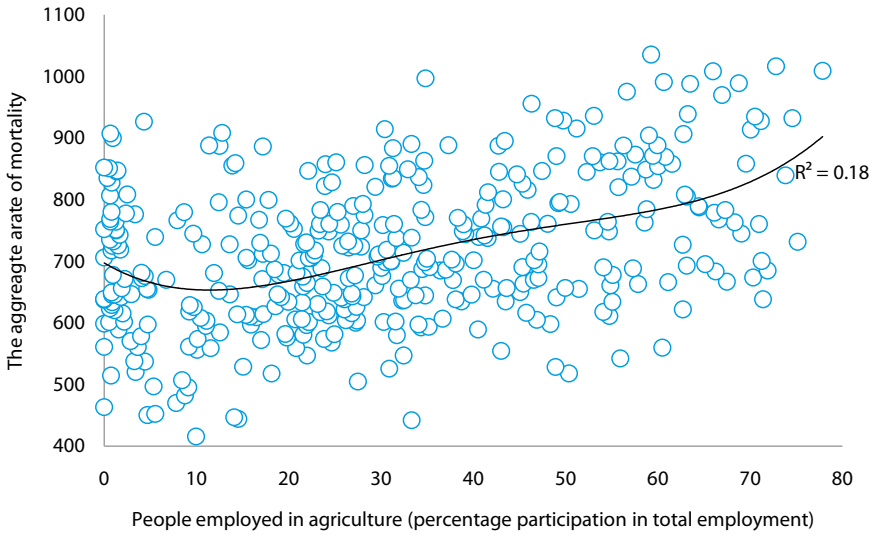
The described rate is not standardised by age, hence the focus of the correlation analysis is on the proportion of elderly population by county – the correlation associated with this variable amounts to 0.71. A similar strength, although in the opposite direction is attributed to the correlation with the percentage of households equipped with a bathroom (-0.67). Moreover, the negative relationship with the proportion of people employed in agriculture is also particularly pronounced[22] (0.39).

22 The percentage of people employed in agriculture at the level of counties is calculated based on the Central Statistical Office data on total employment and did not include the workers of business entities employing less than 10

Graph: 3.40 The relationship between the aggregate rate of mortality from cancers and cardiovascular diseases and the proportion of population aged 65 and over in 2010 by county



Graph: 3.41 The relationship between the aggregate rate of mortality from cancers and cardiovascular diseases and the proportion of people employed in agriculture (percentage participation in total employment) in 2010 by county



Source: Own study, based on Central Statistical Office data.

A pronounced relationship between the aggregate rate of mortality from cancers and cardiovascular diseases and the proportion of population aged 65 and over is to a greater extent determined by cardiovascular diseases, which are fatal especially for elderly people. Such a relationship is less pronounced in the case of cancers, although it also exists. Just as in the case of the Health Index, a slight deviation of the trend line for the counties with high participation of elderly population indicates a different scale of the effect of the ageing population in large cities and less urbanised areas.

people. Thus, the calculated rates of the indicator were overvalued.

The relationship between the proportion of people employed in agriculture and the aggregate rate of mortality from cancers and cardiovascular diseases is of a non-linear character. As shown in the diagram above, the number of deaths increases at both ends of the distribution. The slight increase among the counties with low share of agriculture in the employment structure can be explained by relatively high values of the rate of mortality from cancers and cardiovascular diseases in the area of Upper Silesian conurbation and selected cities of Eastern Poland. At the other end of the distribution, the dependency curve becomes steeper which indicates that the situation in purely agricultural counties is particularly difficult. The negative relationship with the percentage of people employed in agriculture is partially inconsistent with the results of previous studies, which indicated that agricultural areas record lower values of the standardised rate of mortality from cancers (Chłoń-Domińczak et al. 2011). There are two explanations for this phenomenon. Firstly, the indicator is the sum of deaths from cardiovascular disease (an average 459 per 100,000 inhabitants by county) and cancer (259 per 100,000). Therefore, the character of the correlation is to a great extent determined by the distribution of mortality from cardiovascular diseases (it is also strongly affected by the overrepresentation of men in rural areas). The second reason is associated with the population age structure - the counties with high employment in agriculture tend to have a higher proportion of older people, which is not reflected in the analysis of standardised coefficients.

The above analysis of the correlation allows some hypotheses about the determinants of the spatial distribution of the health status in Poland at the county level. First of all, the health situation is particularly challenging in less urbanised areas, with a large share of agriculture, inhabited by ageing populations. Large cities that also have a large proportion of elderly inhabitants are in a better situation, mainly due to easier access to health care, a higher level of wealth and better education.

It seems that a part of the problematic areas have transformed due to the suburbanisation processes, changing the social composition of the rural areas situated close to major cities. The incoming population represents a higher wealth level and mobility, which allow them to use the healthcare available in the nearby city. On the other hand, in the wealthy areas, such as large cities, the set of factors determining the health status of their inhabitants seems of a different character than in the case of poorer areas. In this case, a more important role can be played by the social capital, environmental pollution, or the scale of poverty and social exclusion (the process of favelisation[23]). Another issue is the correlation between the health-related outcomes with healthcare spending. The problem will be discussed in Chapter 4.

23 A favela is the term for a shanty town in Brazil, most often within urban areas. Most modern favelas appeared in the 1970's due to rural exodus, when many people left rural areas of Brazil and moved to cities. As the cities grow, living standards decreased and crime increased. This phenomenon affects different countries as slums develop.

4. How to measure the impact of public policies on human development?

4.1 Human development and the cycle of public policy implementation

Activities and strategies financed from public funds, including those in the 2004–2006 and 2007–2013 cycles, should be subject to specific standards of measurement, evaluation and meta-evaluation, i.e. the evaluation of both planned and conducted evaluations. These standards concern not only the description of activities and justification of public interventions (why are they being done?), but also their outcomes (what has been done and how?). It is particularly important to properly assess whether the interventions being implemented and financed from public funds are effective and useful for the local community, among other things, in terms of human development. In "Reinventing Government" (1993) Osborne and Gaebler justify the need to measure the effects of the projects, programmes and public interventions based on the following seven principles:

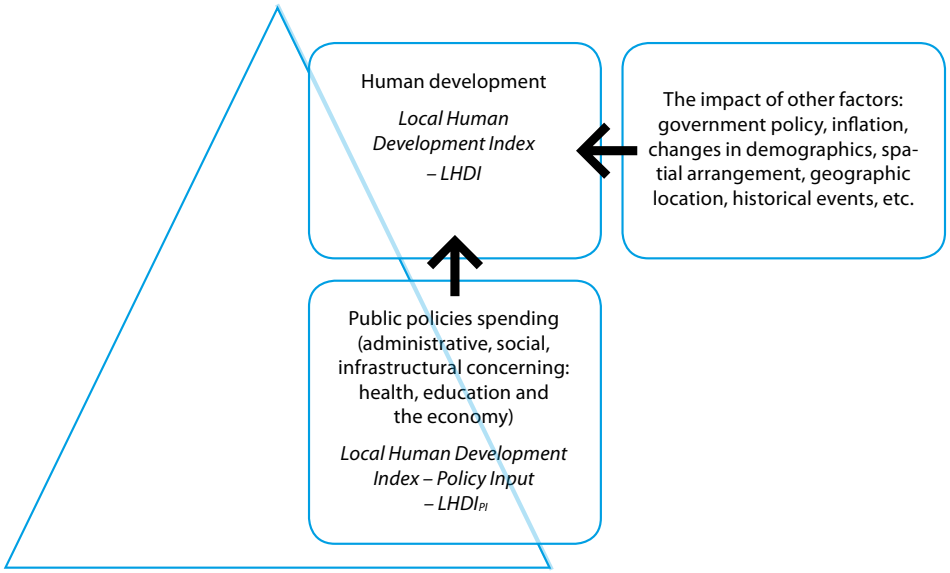
1. what can be measured, will be done;
2. if you don't measure the results, you cannot tell success from failure;
3. if you cannot see success, you cannot reward it;
4. if you cannot reward success, you will probably reward failure;
5. if you cannot see success, you cannot draw your conclusions out of it;
6. if you cannot recognise failure, you won't be able to correct it;
7. if you can demonstrate effects, you can win public support.

The above-mentioned "commandments" are based on the assumption that one shall be able to measure the effects of projects, strategies and programmes. To count the inputs (spending) is not the same as to count results. The LHDI should make it possible to measure the effects of policy, but in order to become fully functional, the relationship between the two aspects of the interventions (inputs and outcomes) needs to be measured. In other words, the relationship between state policy and the realized status of human development, represented by the $LHDI_{PI}$[24] indicator. **At this stage, it is worth distinguishing between the concept of "contribution" and "attribution"; we measure**

24 This is the first approach of its kind, aimed at analysing public policy spending via HDI as a basis for analysis. The $LHDI_{PI}$ result should, however, be interpreted with caution. In the future, it should be possible to ameliorate this ratio, inter alia, by including the Polish National Health Fund (NFZ) expenditure on public health at the local level and by analysing the progress of projects of the cohesion policy from the new 2014–2020 cycle thanks to improved records.

the former, because tracking robustly the causalities (and thus assigning attribution) for the meta-level of human development is hardly feasible.

Graph 4.1 The relationship between human development and public policy investments



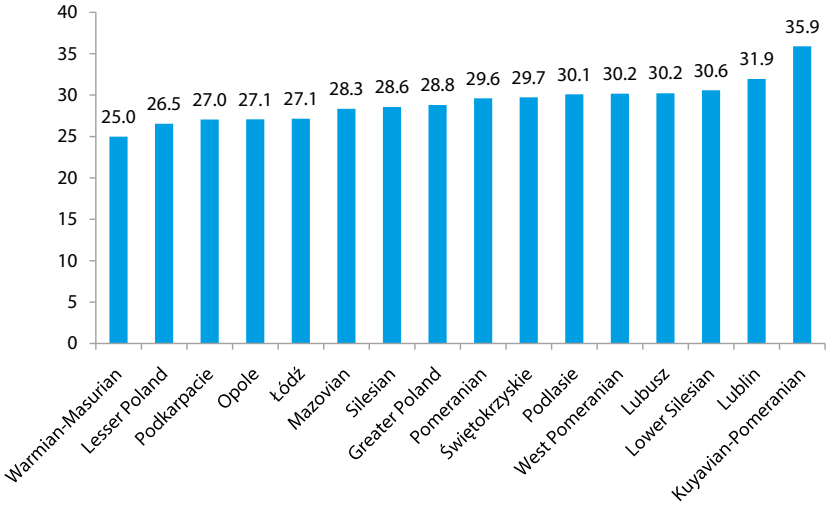
Source: Own study based on Rogala (2009).

The quality of life of citizens is considered to be the overarching objective of development at the local, regional, national, and international level. It is the ultimate result of the action taken by governing structures, including local authorities. Human development broadly described in this paper is, from the perspective of the UNDP, the long-term objective reflected in a human development quantifier, the HDI. In the case of Polish regions, this is the LHDI described in the third chapter where it was used to provide a local snapshot of the status of human development in Polish voivodeships and counties. In order to make the Local Human Development Index useful and applicable for the purposes of public policy, it needs to be operationalized so that the link between public policy inputs and outcomes can be established. The distribution of Public Policy Inputs, although crude and imperfect[25], is shown in Map 4.1. It grasps, in a synthetic way, the essential public interventions and services that affect human development in local terms.

The $LHDI_{PI}$ is a synthetic index that aggregates public spending, including European funds from the budget of local authorities, the number of doctors or nurses per capita, spending on education and the ratio of teachers to students in a given county. Graph 4.1 presents the values of this index for individual voivodeships with the largest expenditure on various public activities per capita taking place in the voivodeships of Kuyavian-Pomeranian, Lublin and Lower Silesian. At the opposite end of the ranking, with the lowest spending are the Warmian-Masurian, Lesser Poland and Podkarpacie voivodeships.

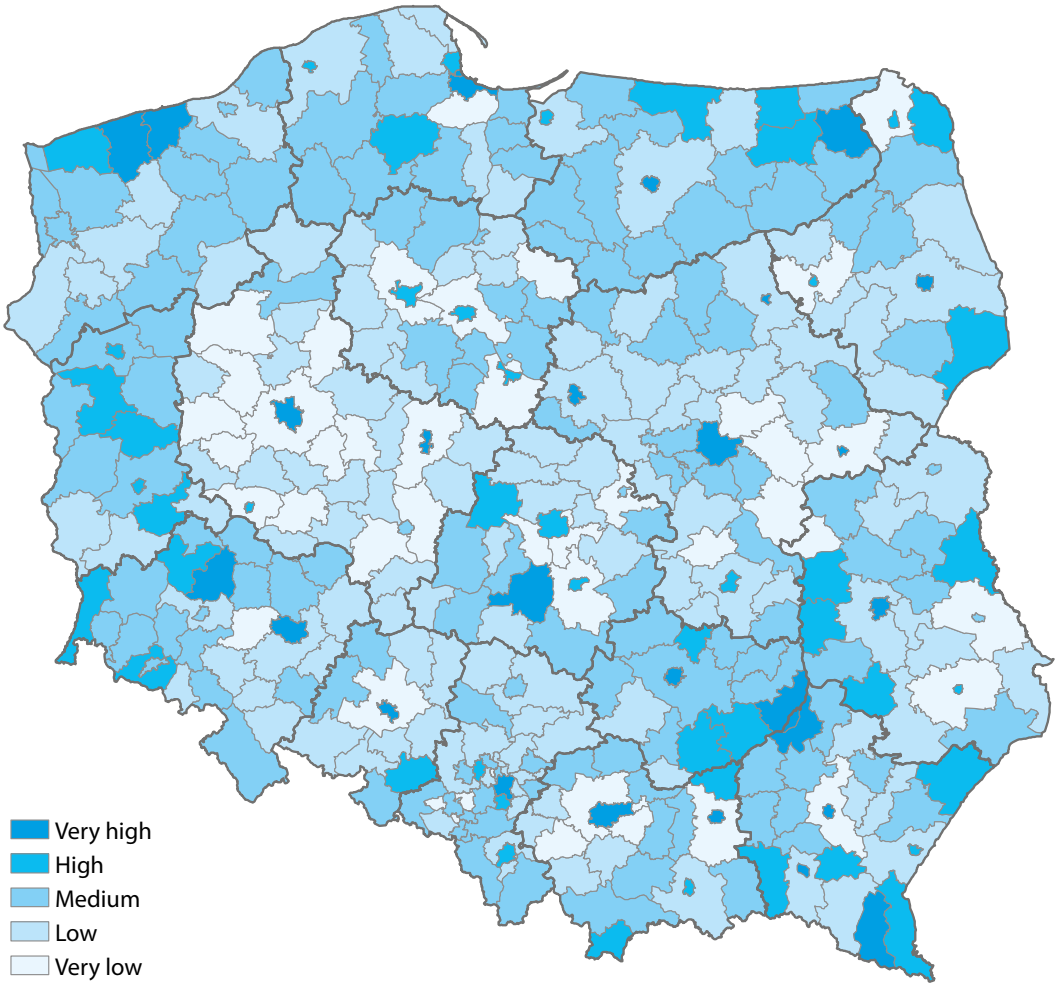
25 The Ratio of expenditure on human development will require reconstruction on the basis of new measurements appearing in the repositories of public institutions such as the Polish National Health Fund (NFZ) or the Ministry of Health.

Graph: 4.1 The Local Human Development Index – Policy Input ($LHDI_{PI}$) in 2010, by voivodeships



Source: Own study based on the Central Statistical Office data.

Map 4.1 The Local Human Development Index – Policy Input ($LHDI_{PI}$) in 2010, by counties



Source: Own study based on the Central Statistical Office data.

On the other hand, while looking at the expenditure on public policies at the county level, we can see many areas where the access to certain services facilitating human development is difficult, especially in counties surrounding urban centres such as the Tri-City (Gdańsk, Gdynia, Sopot), Bydgoszcz, Toruń, Warsaw, Łódź, Kraków, and Lublin. This phenomenon is related to the process of suburbanisation and the functional connectivity of these counties, where residents have access to public services in the urban agglomerations, and thus local governments do not have to invest too much (especially in healthcare) in the immediate vicinity of inhabitants. Most expenditure per capita occur in Sopot, Warsaw, Katowice, Płock, Sandomierz County, Kołobrzeg County, Poznań, Wrocław, Opole and Białystok. The least occur in Bydgoszcz, Łódź East County, Konin County, Skierniewice County, Kalisz County, Świętochłowice, Piotrków County, Leszno County, Rybnik County, Siedlce County and Łomża County.

Graph: 4.2 The relationship between the Local Human Development Index (LHDI) and the Local Human Development Index – Policy Input ($LHDI_{PI}$) in 2010, by counties

Source: Own study.

The relationship between LHDI and $LHDI_{PI}$ is illustrated by a linear correlation coefficient, which is 0.415 – moderate correlation. The government actions that affect the citizens cannot be easily quantified. This correlation is strong enough to conclude that in areas with high expenditures the citizens are more likely to live better, as indicated by the higher values of the human development index. Nevertheless, it should be noted that the positive impact of public policy expenditures on the quality of life does not materialise through the income of the population, but via better access to public services. In the future, with new indicators, e.g. in the area of health, it would be possible to modify the $LHDI_{PI}$ components for a more precise measurement of public policy inputs. There are also factors that are difficult to quantify, even though they have an impact on human development. Also, part of the challenge is building a time series and monitoring trends.

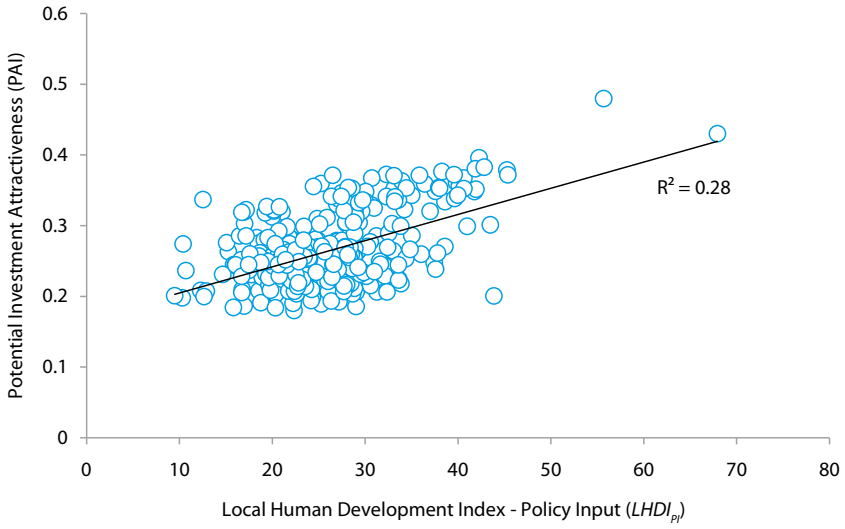
The expenditure index consists of sub-indices selected under the three pillars, which, to the authors' knowledge, reflect public policy expenditure on human development in the best way at the current moment. Of course, more such indicators exist than those included in the synthetic index. These are mainly trans-regional investments that are difficult to estimate due to a lack of territorial assignment (difficulties to track them by territorial units), including those from EU funds.

The very process of public intervention and actions of local government vary across the country. The local government is an important actor not only in human development but also in the economic sphere, both in the region and for the entire country. In recent years, a significant share of government spending was allocated to investments that were contributing to the development of the economy. Keeping this trend depends on the financial capacity of the local governments, which also depends on the optimisation of individual interventions; understood as the maximum utility the undertaken tasks yield for the local community. Expectations and social needs are increasing, while the resources available to local self-governments are limited, which in turn increases the need of efficient and effective management of public resources. Therefore, in order to achieve maximum utility and meet as completely as possible social expectations, local governments must continue to improve efficiency and make the best use of the human and financial potential they have. The individual local government entities are not always able to achieve optimal efficiency, which may give rise to discontent among residents, may lead to negative economic, social and financial phenomena across the country, as well as the need for the central government to intervene. Local authorities often justify this situation by the lack of resources, but the reasons for failure to achieve optimal results, vary. Factors that may negatively affect efficiency include: the inadequate structure and volume of policy expenditures, the lack of an adequate strategy, inefficient procedures, etc. Addressing these factors to a large extent depends on the managing unit, so-called *good governance* (Rapkiewicz 2012). Rural counties are the weakest example of local government as an investor, as they are deprived of the opportunity of generating the income enjoyed by cities or municipalities. They also have a smaller-scale redistribution of income from PIT and CIT tax revenues (respectively four to five times less than municipalities)[26] (Rapkiewicz 2012). In this relationship, voivodeship government is temporarily (until 2013) in the privileged position of administrators of grants from the EU budget in the regional operational programmes (about 1 billion euros per voivodeship), which gives it a strong position in the region and the basis to be an important investor in regional policy.

In the case of investments such as health or education, the returns in the form of an increased level of human development take longer than four years – the period covered by the study. This statement is supported by the fact that the linear correlation coefficient for the $LHDI_{PI}$ from 2007 with the values of the LHDI index from 2010 equals 0.538 and is higher than the correlation between LHDI and $LHDI_{PI}$ from 2010. This means that the expenditures from 2007 are more strongly correlated with the human development outcomes in 2010 than current expenditures. It should also be noted that 2007 was the culmination of settlements of funds from the financial framework 2004–2006, in which local governments were processing the majority of payments under the contracted investments and projects.

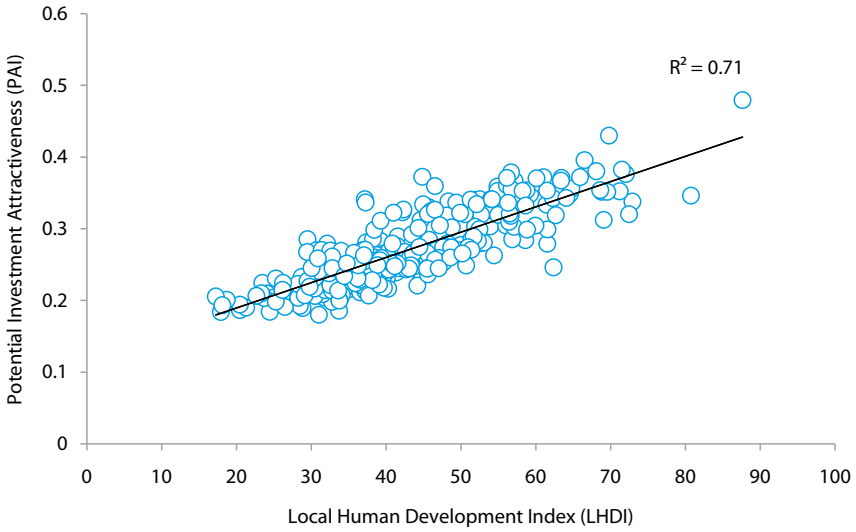
26 It should be noted that the index aggregates expenditures of municipalities and counties, thus "by-passing" this problem.

Graph: 4.3 The relationship between the Potential Investment Attractiveness (PAI) of a county and the Local Human Development Index – Policy Input in 2010, by counties



Source: Own calculations based on "Regional Investment Attractiveness 2012" prepared by the Warsaw School of Economics in cooperation with the Polish Information and Foreign Investment Agency (PAIiIZ).

Graph: 4.4 The relationship between the Potential Investment Attractiveness (PAI) of a county and the Local Human Development Index in 2010, by counties



Source: Own calculations based on "Regional Investment Attractiveness 2012" prepared by the Warsaw School of Economics in cooperation with the Polish Information and Foreign Investment Agency (PAIiIZ).

The Potential Investment Attractiveness index (PAI)[27] is an estimate of the local advantage of voivodeships for foreign investment, as well as national investment on the county level. This meas-

27 The description of the methodology of measurement of investment attractiveness of Polish voivodeships, counties and municipalities is available on the website of the Institute of Enterprise: www.sgh.waw.pl/instytuty/ip-en and on the website of the Centre for Regional and Local Analyses which cooperates with the Institute of Enterprise: www.caril.edu.pl.

urement is compiled every year by the Warsaw School of Economics in cooperation with the Polish Information and Foreign Investment Agency (PAIiIZ) for different administrative levels, providing information on the investment attractiveness for foreign entities (Godlewska-Majkowska et al. 2012). Comparing the rate of public policy human development relevant expenditure in key areas with investment attractiveness, we can see a moderately strong correlation (Pearson's correlation coefficient is 0.526). This means that economic development, transport accessibility, presence of universities, a high level of industrial development, a high quality of human capital and special economic zones are more common in those counties where expenditures on infrastructure in the areas of education, health as well as the total public policy relevant expenditure per capita are higher. The investment attractiveness indicator is even more strongly correlated with the Human Development Index (Pearson's correlation coefficient is 0.845). In regions where human development is more pronounced, it is more profitable to invest, but also the public policy relevant investments in those regions are higher.

Public intervention, the investment made by the local government and the general climate supporting entrepreneurship are all related to human development in Poland. There is no one entity responsible for the level of regional development, because many actors are involved and the way in which a region is managed determines its human development and general development opportunities (including economic ones). Quantifying the development inputs and comparing to the outcomes may shed light on the quality of public management in a given county or voivodeship. Decisions taken by local and regional authorities have a very strong impact on people's lives.

4.2 Welfare: inputs and outcomes

The title of this section speaks of wealth, income and standard of living impacts, but as far as public policy spending in the economic sense is concerned, we are talking about local government spending. Local government entities are not autarkies, they don't lead fully independent financial policies, but still they have sufficient flexibility at the municipal level in their investments to be able to quantify and monitor their performance. Economic autonomy of local government entities means they have the right to carry out public tasks (socio-economic), choose the types of instruments, their scope and impact. The distinction between own and commissioned tasks is crucial, because local government autonomy is associated primarily with the scope of their own responsibilities (Jastrzębska 2012). Finances[28] are a key area of management by local government entities because of the wide range of public tasks performed by the local government, which require adequate financial resources. The responsibilities of the local self-governments include a number of areas critical to local communities (e.g. education, health care, social assistance), where the local authorities have to deal with the expectations of residents as to effective performance of their duties (Jastrzębska 2012). Efficiency, defined as the optimisation of the relationship between the inputs and the result, is required when the government acts as a public sector entity and performs tasks in the sphere of general consumption. It provides consumers (often free of charge) with public goods and services, but also when it acts as the sole entity responsible for the state of and prospects for economic development in the area under its governance, thus affecting human development. The synthetic indicator of economic inputs $LHDI_{PI}$ is the sum of the expenditures from the budgets of

28 Government finances for local government entities, i.e. public financial resources of municipalities, counties and voivodeships and their relationships, the operations with these resources and standards governing these operations (see Jastrzębska 2012). In the case of $LHDI_{PI}$ the indicators of cash expenditure are the finance of municipalities and counties, without *voivodeships*.

municipalities and counties in the respective territorial unit and budget items financed from EU funds in the budgets of local governments, divided by the number of inhabitants.

According to the legal entity performing the respective local government tasks, the activities can be grouped into "responsibilities of municipalities" and "responsibilities of the counties". The structure of the expenditures affects the value of the synthetic indicator of economic inputs.

Municipalities perform their tasks in particular in the areas of:

- Maintaining municipal technical infrastructure (municipal roads, streets, bridges, squares, waterworks, sewers, disposal and waste water treatment, maintenance of cleanliness, sanitary systems maintenance, landfill and municipal waste disposal, electricity and heat supplies);
- Municipal housing, local public transport, markets and market halls, municipal buildings and utilities as well as administrative facilities;
- Social infrastructure (health, welfare, education, culture, physical education);
- Order and public safety (organisation of road traffic, public order, fire protection, health safety);
- Spatial and environmental order (spatial planning, land-use planning, environmental protection).

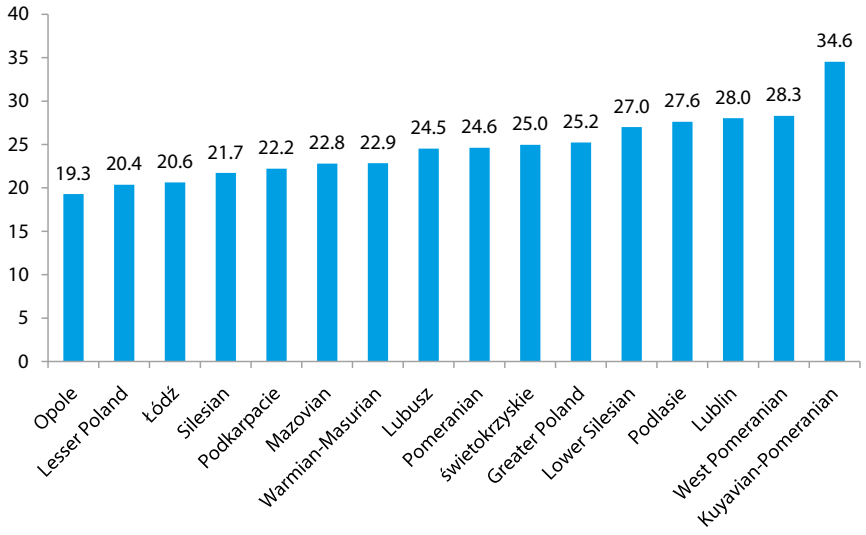
Counties perform their tasks in particular at the supra-municipal level, in the areas of:

- Technical infrastructure (transport and public roads, real estate management, maintenance of county buildings and public facilities);
- Social infrastructure (public education, promotion and protection of health, social welfare, family policy, support for disabled people, culture and protection of cultural goods, sport and tourism, fight against unemployment and local labour market activation, consumer rights protection, promotion of the county, cooperation with non-governmental organisations);
- Order and public safety (public order and security for citizens; protection from flood, fire and other extraordinary threats to human life and health; defence; performing the tasks of county services; inspection and guard services);
- Spatial and environmental order (geodesy, cartography and cadastre, spatial planning and building control, water management, agriculture, forestry and inland fisheries, environmental protection).

It must be kept in mind that even the best-managed rural peripheral municipality remains a peripheral rural municipality with a much lower budget revenues compared to an attractively located urban municipality. Certain objective conditions and barriers to development cannot be overcome even by the most creative local authorities. The development in a municipality or a county is driven by the residents and the human capital related to them (see Chapter 5) as well as widely-understood innovation and regional competitiveness. Local development depends not only on the amount of money that is spent from the budget of the county or municipality. The structure of expenditure is equally important. The larger the share of investments in the budget, the bigger the opportunities are for development.

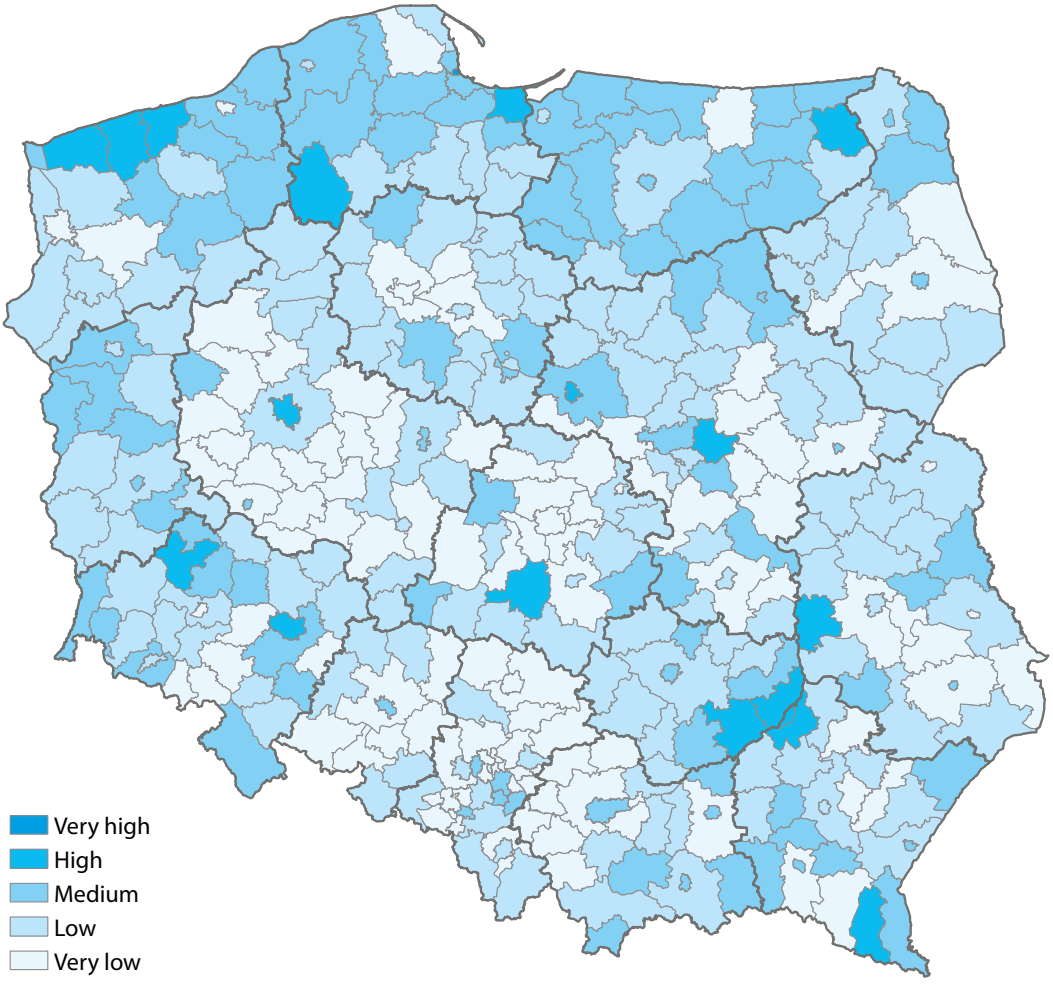
Local government expenditure per capita are visualised by the synthetic group indicator $LHDI_{PI}$:

Graph: 4.5 The Local Expenditure Index – Policy Input (LEI_{PI}) in 2010, by voivodeships



Source: Own study.

Map 4.2 Local Expenditure Index – Policy Input (LEI_{PI}) in 2010, by counties



Source: Own study based on the Central Statistical Office data.

The interpretation of the ratio of public expenditure per capita and its distribution is quite difficult for several reasons. When comparing expenditures of the Kuyavian-Pomeranian Voivodeship with other voivodeships, it ranks first. However, when we look at the distribution by counties, the observed differences are not so striking anymore[29]. The variation of expenditure over time is high. An important role is played by the period of payment settlement of the European funded projects, which vary significantly in the years 2007–2010. The average share of European funds in the budgets of municipal and county government in 2007, 2008, 2009 and 2010 were respectively 3.6%, 2.1%, 3.4% and 7.8%. The upward trend shows the moments of settlement and disbursement of formerly contracted European funds by the local budgets. The year 2007 was a time of increased spending from the previous financial framework 2004–2006, while the year 2008 was a period for contracting new services. Year 2009 and especially 2010 was a time of increased spending, and probably a similar intensity still remained in 2011 and 2012. The value of the synthetic index of public expenditure indicates that in 2010, the largest amount of money per capita was spent in Sopot and Warsaw as well as in following counties: Polkowice, Sandomierz, Tarnobrzeg, Olecko, Kołobrzeg, Staszów, Płock and Człuchów. The least was spent in the following counties: Wadowice, Pabianice, Zamość, Gliwice, Siemianowice Śląskie, Mysłowice, Kalisz, Piekary Śląskie, Sosnowiec, Rybnik and Świętochłowice.

Graph: 4.6 The relationship between the change in funding between 2007 and 2010 (in PLN 2007) and the value of the Local Human Development Index in 2010, by counties

Source: Own study based on the Central Statistical Office data.

The change in expenditures between 2007 and 2010 is more strongly linked to the value of the LHDI indicator than the sum of the funding of public entities between 2007 and 2010. The Pearson correlation coefficient is smaller than the Spearman correlation (the latter is -0.367, which implies a moderate non-linear relationship). This means that the counties with the lower value of the human development index were increasing their level of spending. In short, it appears that poorer counties "converge" to a stable expenditure level, as in urban areas. Spending per capita in cities with high levels of human development is more stable than in the poorer regions carrying out investments, including those from the EU funds.

29 The regional level is the aggregation of the local level – the expenses of voivodeship authorities are not counted.

Human development is strongly influenced by the way in which public funds are spent. Seen from the perspective of the volume of revenue and expenditure, the municipalities and cities with county rights appear as the strongest ones. Their income exceeds 77% of total local government revenue (Rapkiewicz 2012). When trends in local government finances are considered, it is important to remember that local governments are part of the public finance sector. The financial situation of the local governments cannot be assessed in isolation from the trends and the performance of the whole public finance sector. This is particularly the case when the entire public sector is in crisis, which may result in harsher financial discipline imposed by the central government on local governments. In that case the tools for improving the results of local government sector, such as the tightening of expenditure rule[30], are applied. The last year when the local government sector recorded a positive budgetary balance was in 2007 – the year before the economic crisis. Similarly, as in the case of all local government entities, the majority of local authorities in the rural counties in each year of their operation, except for 1999, benefited from loans (over 91% of them). This was the case even in 2007, when the total number of local government entities in debt declined. Each year in the decade of 1999–2009, the growth of the local governments' debt was significant, except for 2007 and 2008. The reasons, as in the case of the entire local government sector, need to be traced back to the beginning of the new financial framework. In addition, the increase of the counties' debt (between 1999–2009) was higher each year than the increase in the total debt of municipalities, counties and voivodeships (Werwińska 2011).

When calculating the LHDI input indicators, we did not take the golden rule of public finance[31] into consideration. It is especially important in the case of local government entities, in order not to punish those regions which make investments while increasing their deficit. These investments are primarily financed from European funds, so their actual impact is much higher than just the volume of the local government debt accumulated and this phenomenon cannot be assessed as only negative. However, this growing problem may result in a crisis of public finances at both the micro and macro levels. If the works were financed from budget revenues only, it would take at least between ten to twenty years longer, but at the macro level, it significantly affects the level of state debt. It is also important that in order to reach a certain level of human development, as in the case of Polish metropolitan areas, the level of investment per capita is relatively stable over time. Poorer regions have to catch up by increasing human development relevant investments, but also by disproportionately increasing their debt.

To sum up the discussion on the purely financial investment in human development, it is worth noting that the richest and the poorest regions are not always the ones spending the most per capita. The picture is more complicated and there is no clear pattern that would indicate which counties have budgets proportional to the needs of their residents. What is certainly important is the structure of these expenditures, not the general amounts of cash spent on delivering public services.

30 The issue of the financial "health" of local governments is raised from the investment and expenditure perspective, as described in this chapter. The problem with the expenditure rule is that it affects primarily the municipalities, not counties – except for municipal counties.

31 The principle of conduct in the government's fiscal policy. The golden rule proposes to use the budget deficit to finance only capital expenditure (investment), i.e. the long-term investment, such as spending on infrastructure. At the same time, the current expenditures of the state or local governments should be fully covered by the current budget revenues. State or local governments should strive to maintain a balanced budget.

4.3 Education: inputs and outcomes

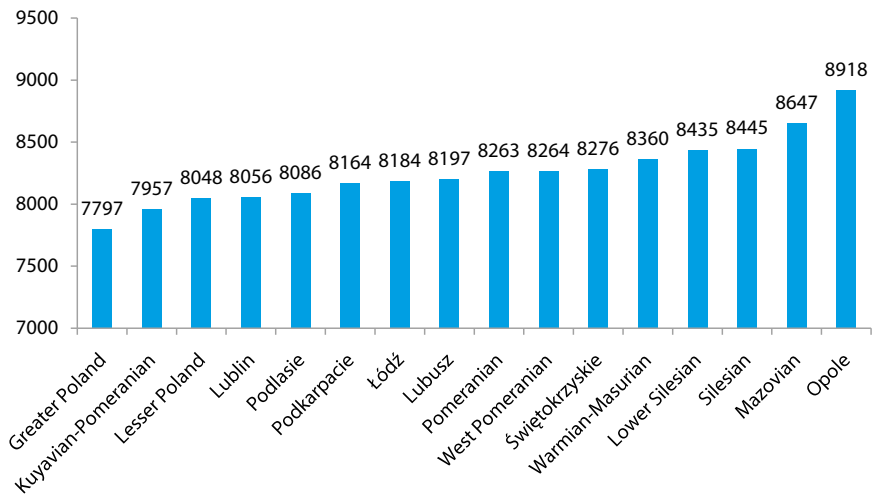
At an individual level, the relationship between the investment of time and financial resources to acquire education and the outcomes in the form of the obtained level and quality of education, and ultimately the prospects for career development and success in life, has been repeatedly tested. On this basis, and taking into account the observations of educational and economic achievements of countries, it is easy to argue that investment in public education can be an effective tool for socio-economic development. However, quantifying the relationship between expenditures on education and their effects at the local level is a complex challenge – not only because of the limited availability of data but also because the relationships in this area are complex. For example, factors such as parents' education, expenditures on education and the quality of teachers are not sufficient to explain the regional differences in educational achievements among junior high school (gymnasia) students (reflected in the final exam results). The differences in the results observed between areas formerly located within the territories of Poland's three partitions can show that hardly quantifiable historical factors can also be important (Herbst 2012).

The human development expenditure index of the LHDI is comprised of two variables: expenditure on education and the number of pupils per teacher[32]. The first indicator is calculated as the per pupil expenditure on primary, lower secondary and secondary education and preschool (kindergartens, primary schools, lower secondary and secondary schools) from budgets of municipalities and counties. Those are calculated using data on the educational subsidies to the local administrative entities and on the budgetary resources at their disposal. Thus, the expenditure index takes into account the allocation of national resources to the municipalities and counties (following the same principle for all entities) as well as the local authorities' own "effort" (which of course also depends on the resources available to individual local governments). It should be also noted that this index takes into account only the public spending on education – those included in the budgets of municipalities and counties – while household spending is completely omitted. The second indicator is the students/teacher's ratio calculated as the number of pupils in primary and lower secondary schools per teacher in those educational establishments. In the case of the expenditures, it can be assumed that the higher it is, the better the results in the form of educational achievements. As regards to the second indicator, it can be assumed that a smaller number of students per teacher reflects a lower number of students in the classroom, and results in a better quality of education and better educational achievements (bearing in mind that in this case, it is rather about achieving an optimal level of the indicator than simply its minimisation).

In 2010, the average annual expenditure per student, from the budgets of municipalities and counties to fund primary, lower secondary, secondary schools and preschools, amounted to 8,257 PLN. These expenditures vary between regions: the smallest in the Greater Poland (7,797 PLN), and the largest in Opole (8,919 PLN) (see Graph 4.7).

32 As sub-indexes for the group indices, i.e. Education Inputs Index – see Chapter 2.

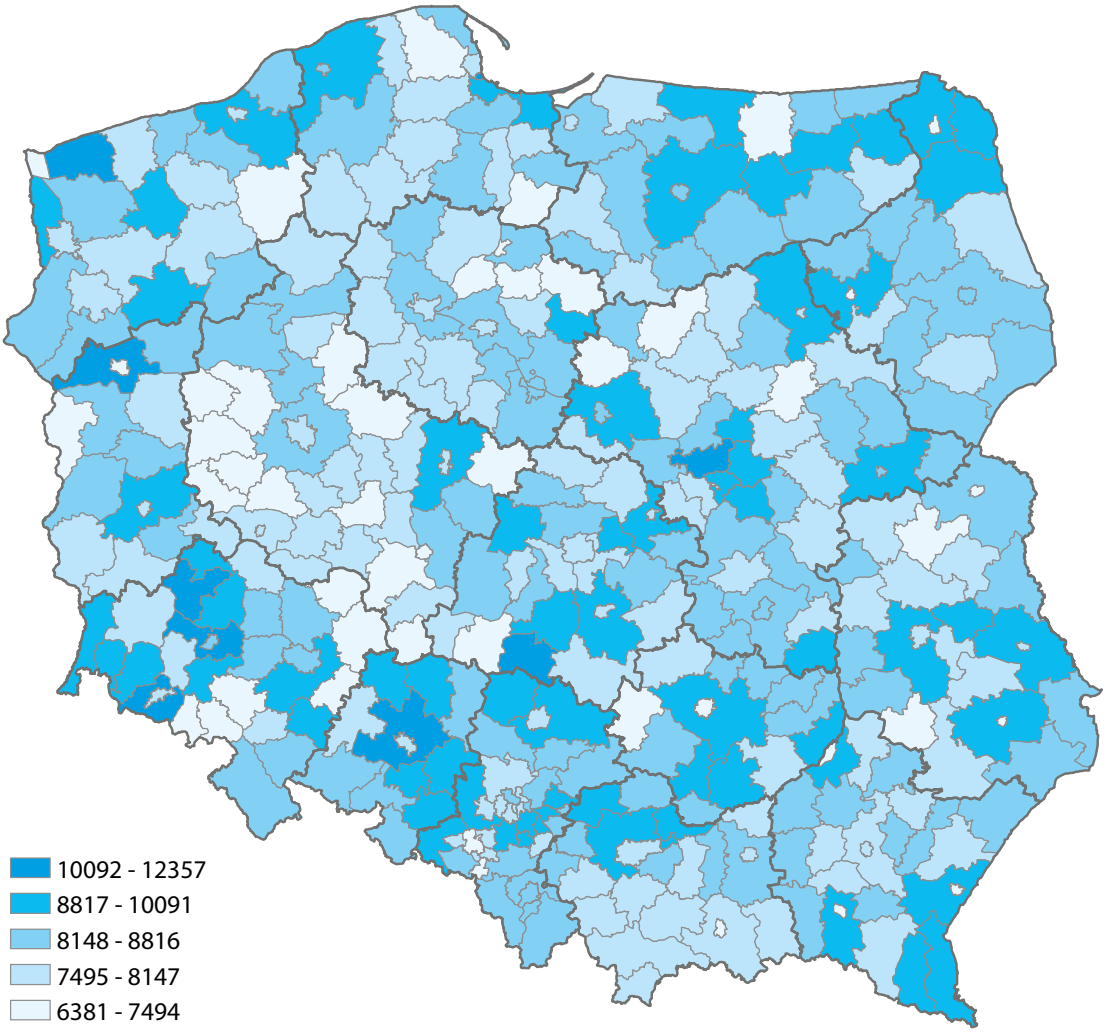
Graph: 4.7 Annual expenditure per student, from the budgets of municipalities and counties on primary, lower secondary, secondary schools and preschools, by voivodeships in 2010 (in PLN)



Source: Own study based on the Central Statistical Office data.

Even more pronounced differences exist between counties. The lowest expenditure – less than 7,000 PLN – is observed in the Jarocin (6,400 PLN), Krosno (6,400 PLN), Zamość (6,500 PLN), Łomża (6,600 PLN), Biała Podlaska (6,700 PLN), Suwałki (6,700 PLN), Kwidzyn (6,800 PLN), Przemyśl (6,900 PLN), Oława (6,900 PLN) and Kalisz (almost 7,000 PLN). These are mainly medium-sized cities, mostly from Eastern Poland territory. The highest values are noted in following counties: Strzelce (10,100 PLN), Legnica (10,400 PLN), Kamień (10,600 PLN), Pajęczno (10,700 PLN), Opole (10,900 PLN), Jelenia Góra (10,900 PLN), Polkowice (11,000 PLN), Gorzów (11,000 PLN), Warsaw West (11,500 PLN), Sopot (12,400 PLN). This picture of regional disparities may seem counterintuitive at first glance. Significant disparities exist in Poland between the urban and rural areas by most socio-economic indicators, with cities performing significantly better (the bigger, the better), while the rural areas are lagging behind. In the case of the annual expenditure per student, a different pattern emerges (Map 4.3). The expenditures on education per student from the budgets of municipalities and counties -are lower in cities and urban municipalities than in the surrounding rural counties. It is also worth noting that the highest level of expenditures do not occur in the biggest cities, and some medium and small cities are characterised by the lowest expenditures (see above).

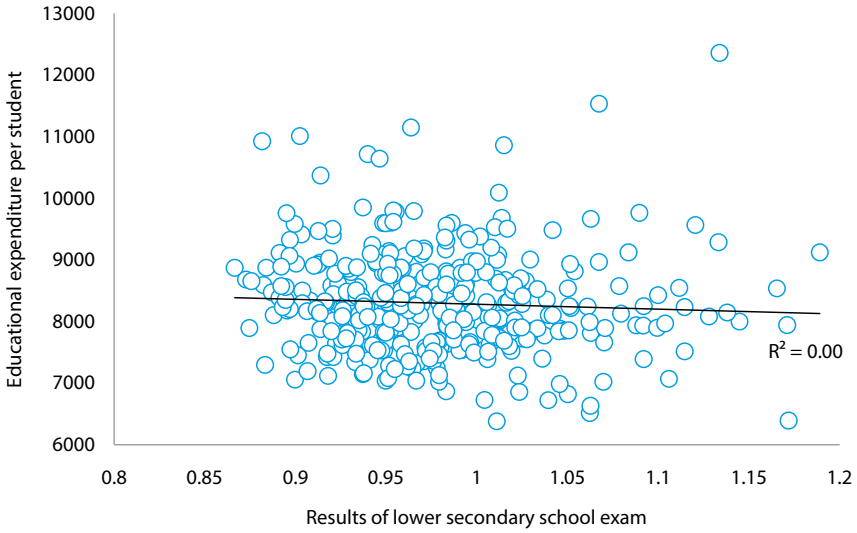
Map 4.3 Annual expenditure per student, from the budgets of municipalities and counties to fund primary, lower secondary, secondary schools, and preschools in 2010 in counties (in PLN)



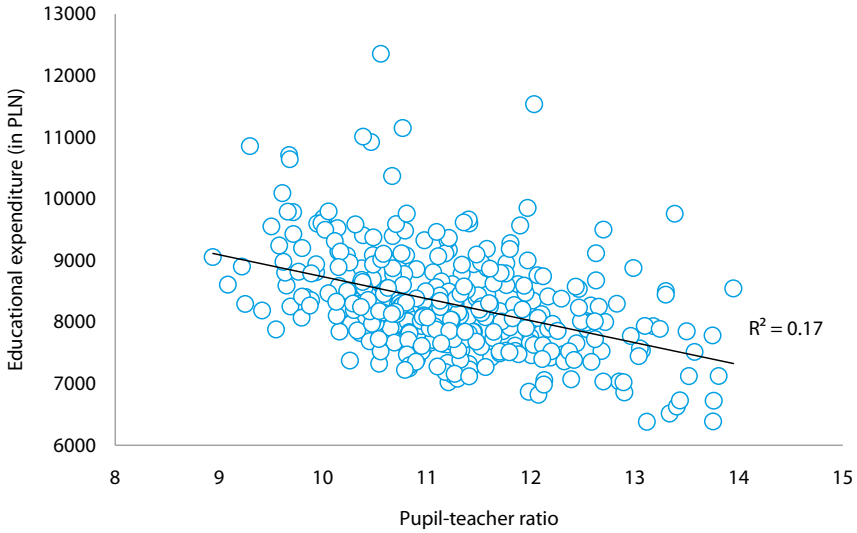
Source: Own study based on the Central Statistical Office data.

Comparing the expenditures on education with educational achievement measured by the mean scores from lower secondary school exams (mathematics and natural sciences) gives even more unexpected results. It turns out that the amount of spending on education from the budgets of municipalities and counties per student does not directly translate into good exam results. Test results may be better or worse in counties with both a high and low level of spending (Graph 4.8). Of course, it cannot be concluded that governments should cut spending on education. Instead, a closer look is necessary on the drivers determining both the diversity in spending and the educational outcomes. It turns out that the spending on education is rather strongly correlated with the number of teachers per student (primary and lower secondary schools) (the correlation coefficient is 0.42). The fewer students per teacher , the higher the costs of education (Graph 4.9). Therefore, education spending from the budgets of municipalities and counties is following (determined by) the cost of education, but it does not translate into educational results. The latter depend mainly on the children's family capital, which can be measured by the parents' educational attainment (for details, see Herbst 2012).

Graph: 4.8 The relationship between expenditure per pupil, from the budgets of municipalities and counties to fund primary, lower secondary and secondary schools and preschools, and lower secondary school exam results (mathematics and natural sciences) in 2010, by counties



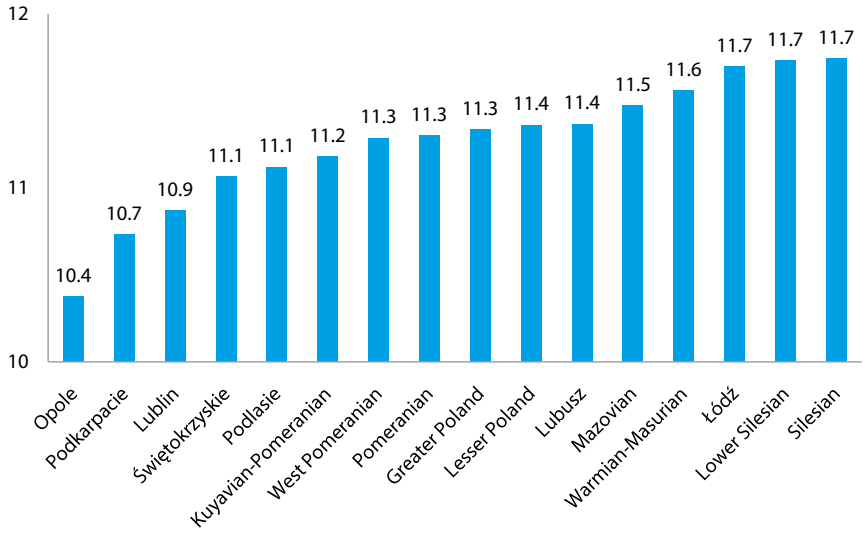
Graph: 4.9 The relationship between expenditure per pupil (from the budgets of municipalities and counties to fund primary, lower secondary and secondary schools and preschools) and the number of pupils per teacher in primary and lower secondary schools in 2010, by counties



Source: Own study based on the Central Statistical Office, Central Examination Board and Education Information System data.

Another indicator of LHDI investment in education, already quoted above, is the number of pupils in primary and lower secondary schools per teacher (in full-time equivalents) in these establishments. The national average for this index is 11.3 and the regional one ranges from 10.4 in the case of Opole County, to 11.7 in Łódź, Lower Silesia and Silesia Counties (see Graph 4.10).

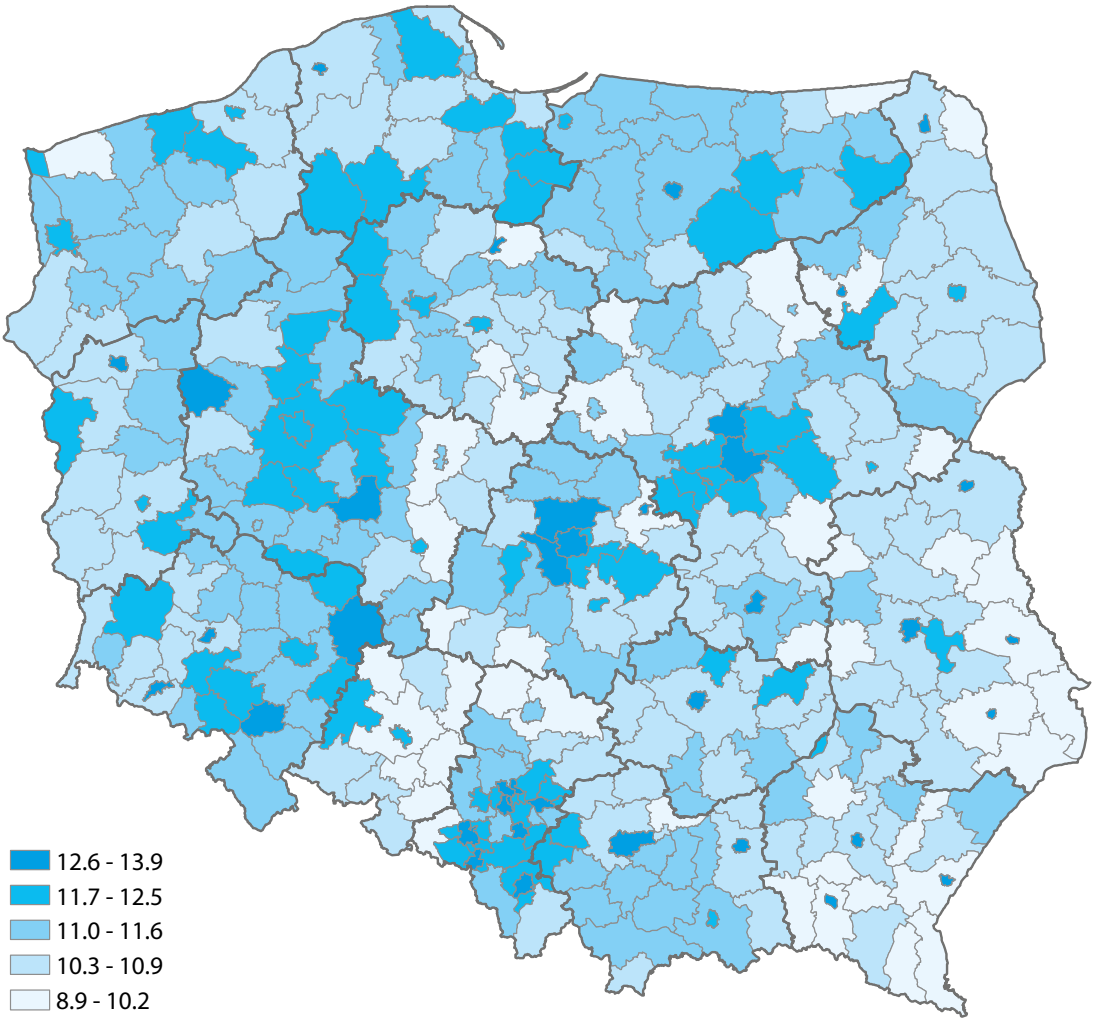
Graph: 4.10 Number of pupils per teacher in primary and lower secondary schools in voivodeships in 2010



Source: Own study based on the Education Information System (SIO) data.

At the county level, the number of pupils in primary and lower secondary schools per teacher in these establishments range from less than 9 to almost 14 (see Map 4.4). The importance of urbanisation is clear in this case - in cities and counties with a greater percentage of the urban population, the number of pupils per teacher is larger (the correlation coefficient of 0.72). This means that in larger cities, classrooms are usually bigger than in smaller cities and rural areas, but this does not prevent the former from achieving better results.

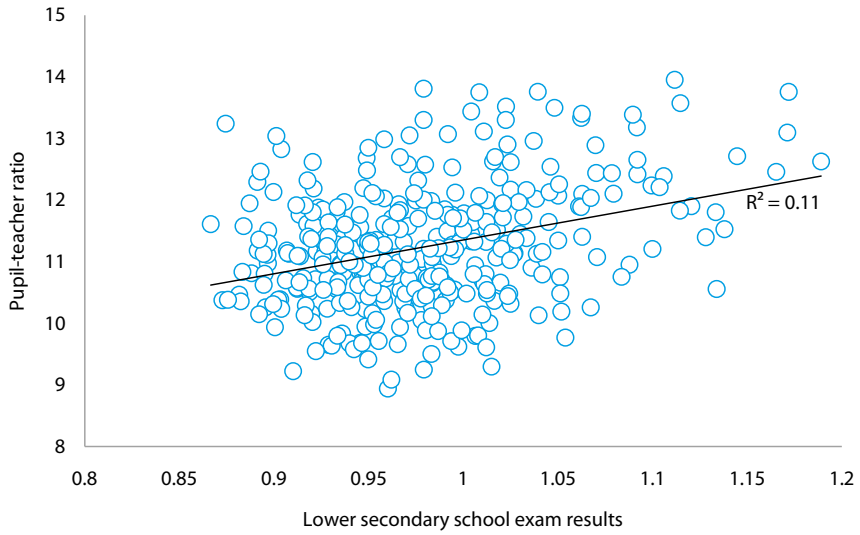
Map 4.4 Number of pupils per teacher in primary and lower secondary schools in counties in 2010



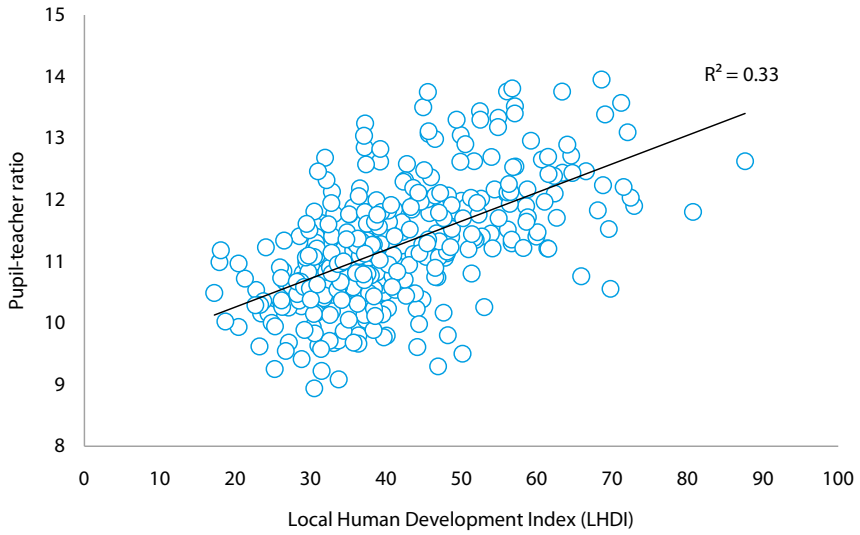
Source: Own study based on the Education Information System data.

According to intuitive expectations, fewer students per teacher should translate into better educational achievements (under the assumption that smaller classrooms foster a better quality of education). However, at the county level, we observe an inverse relationship. We can see the trend that better exam results are reached by pupils attending schools in the counties where the ratio of students per teacher is higher. The correlation coefficient in this case is 0.34 indicating a moderately weak relationship. This is confirmed by the shape of the scatter plot (Graph 4.11). Stronger relationship occurs when we compare the indicator with LHDI. In this case, the correlation coefficient is 0.57, which means that the higher the level of human development measured by LHDI, the greater the number of students per teacher in the analysed spatial units (Graph 4.12).

Graph: 4.11 The relationship between the number of pupils per teacher in primary and lower secondary schools and the results of the secondary school exam (mathematics and natural sciences) in 2010, by counties



Graph: 4.12 The relationship between the number of pupils per teacher in primary and lower secondary schools and LHDI in 2010, by counties

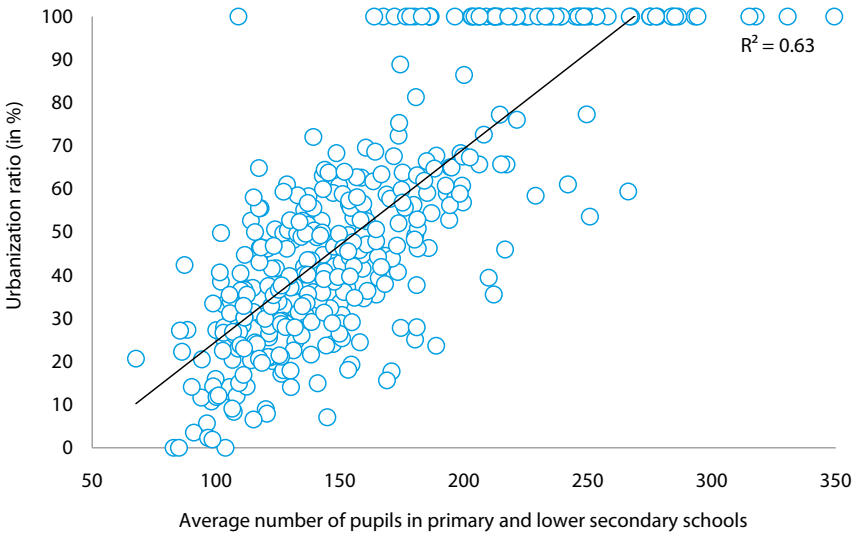


Source: Own study based on the Central Statistical Office, Central Examination Board and Education Information System data.

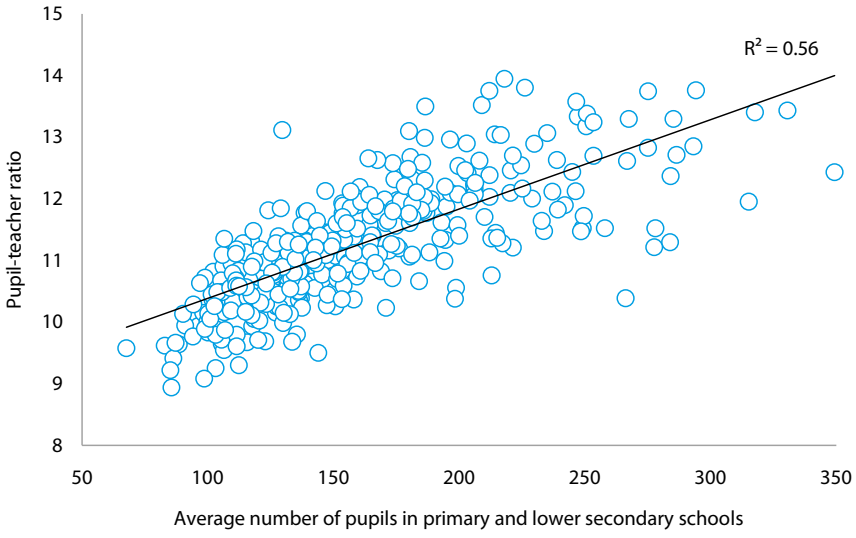
Both LHDI expenditure ratios discussed in this section (spending on education and number of students per teacher) takes on values that are counterintuitive. It turns out that neither higher costs per pupil, nor a lower ratio of students per teachers guarantee educational success and translate into a high value of LHDI. Expenditures and the number of teachers per pupils are rather determined by the structure of the school network: the number of establishments and their size in terms of number of students. The average size of an educational establishment is in turn associated with urbanisation – schools in urban areas are bigger than in rural areas (Graph 4.13). Smaller establishments are usually more expensive per unit (in this case, per pupil) compared to the larger ones (at least due to the fixed costs, i.e. the costs of maintenance of the infrastructure, administrative costs,

etc.). Larger centres can optimally fill classes and use more efficiently the work of teachers, so that the number of students per teacher is usually higher (Graph 4.14). This confirms the difficulty in the analysis of this phenomenon from a spatial perspective, mentioned in the introduction. In order to obtain a more comprehensive view of the situation, one should take into account, inter alia, the information on private expenditure on education - private schools, tutoring, etc. (according to the Public Opinion Research Center, private expenditure on education is higher in bigger cities, CBOS 2012) – but such data is not available at the level of counties or voivodeships.

Graph: 4.13 The relationship between the average number of pupils in primary and lower secondary schools in counties and the urbanisation ratio in 2010



Graph: 4.14 The relationship between the number of pupils per teacher in primary and lower secondary schools and the average number of pupils in counties in 2010



Source: Own study based on the Central Statistical Office and Education Information System data.

The level of the budgetary expenditure on education per pupil in municipalities and counties is not associated with the educational achievements measured by the average lower secondary school exam results. The expected intuitive relationship between the input and effects do not work here. Expenditures do not translate in a simple way into results, they are rather derived from a variety of educational costs. The budget expenditure on education per pupil is lower in cities than in rural counties. At the same time, the number of pupils per teacher in rural areas is lower than in cities, which is in turn derived from a smaller number of medium-sized schools – there are not less large schools in rural areas but only less medium-sized schools (it may be due to the fact that in larger schools, the work can be organised more efficiently – for example, classrooms can be bigger). The result is that the unit costs of education are higher in less urbanised areas. In turn, it appears that neither the higher expenditure on education in municipal budgets nor a better ratio of students to teachers can guarantee educational success. Perhaps a key role is played by other factors, such as human and social capital of families, private expenditure on education, and access to extracurricular classes and activities which are better in more urbanised areas.

4.4 Health related inputs and outcomes

The starting point for the analysis of costs and benefits related to health is the health production function (Or 2000). It describes the relationship between different types of factors (inputs) and the observed health outcomes. Healthcare activities are a small part of those factors - it is estimated that they account for about 10% of the total variation of the population's health (Ministerstwo Zdrowia 2007). But it is in this field that public policies aimed at improving health are focused. It is, in fact, an area which lies at the discretion of public authorities and it can be affected, among other policy tools, by increasing the availability and quality of medical care in the area. Effects of health programmes and medical technology are also influenced by savings resulting from the cost reduction of illness or adverse factors (Suchecka 2010).

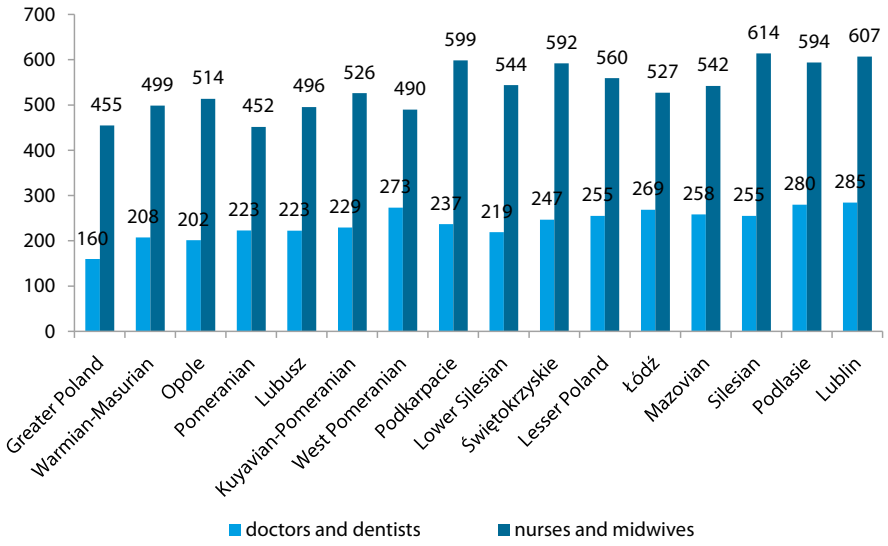
The overall measure of health-related inputs could be the financial resources allocated annually to improve health and increase longevity. In Poland, the financial resources for health care are distributed primarily by the National Health Fund (NFZ), the local government expenditures account for only about 1% of this pool. However, the National Health Fund data on the amount of health care financed at the local level is not available. Nevertheless, from the patient's point of view, quality and availability of health care and medical facilities are the most important, rather than the amount of funds allocated. Therefore, in this report concerning the Healthcare Inputs Index, we propose using the indicators of human resources involved in delivering health services. The index is composed of two sub-indicators:

- The number of doctors and dentists, according to their normal place of work, per 100,000 inhabitants,
- The number of nurses and midwives, according to their normal place of work, per 100,000 inhabitants.

Combining data on the number of doctors and nurses and midwives allows the authors to take into account both the access to general and specialised medical care as well as the quality of aid, which depends, inter alia, on the rest of the medical staff. Partial indicators are aggregated in the Healthcare Inputs Index by calculating the geometric mean of the two components.

The number of medical personnel per capita is the lowest in the Greater Poland, Pomeranian and Warmian-Masurian voivodeships. The highest values are recorded, in turn, in Lublin, Podlasie and Silesia. The graph below shows that the ratio between the number of doctors/dentists and nurses/midwives varies from region to region. On average, there are more than two nurses and midwives per doctor. The number of doctors and dentists varies from 160 per 100,000 inhabitants in the Greater Poland Voivodeship, to 285 in the Lublin Voivodeship. In the case of nurses and midwives, this number ranges from 452 per 100,000 inhabitants in the Pomeranian Voivodeship, to 614 in Silesia.

Graph: 4.15 The number of doctors/dentists and nurses/midwives per 100 thousand inhabitants in 2010, by voivodeships



Source: Own study based on the Central Statistical Office data.

The number of medical personnel per capita increased from 2007 to 2010 in most voivodeships. By far, the fastest growth in the Healthcare Inputs Index was recorded in the Warmian-Masurian Voivodeship – as much as a 14% increase in the number of physicians per capita. Five voivodeships experienced a decline in the value of the index, including the Greater Poland Voivodeship in particular, where the number of doctors per capita fell by 12%. The index describing the number of nurses and midwives was more stable – an 8% increase is reported in the Opole Voivodeship, while the Pomeranian Voivodeship was touched by a 5% drop. The Healthcare Inputs Index was slightly higher in the group of the last five voivodeships (according to the results of 2007) than among five previous leaders. However, the relative position of voivodeships has not changed much. The strongest drop was recorded in the Mazovian Voivodeship – by 4 places, the largest increase was by three places in the Świętokrzyskie Voivodeship.

The human resources involved constitute only one aspect of health care inputs. As mentioned in the introduction, a frequently used measure is the amount of funds spent on medical care. Data on the expenditure incurred by the National Health Fund (NFZ), broken down by voivodeships, are shown in the table below in relation to the Healthcare Inputs Index and the Health Outcomes Index. The differentiation in the relative position of voivodeships by the order of costs and benefits

is significant, especially in light of funding. The Podkarpacie Voivodeship is a dramatic example, with the first position in terms of effects, and the last by the National Health Fund (NFZ) expenditures per capita. This underlines the importance of other factors that determine health, discussed in detail in section 3.2.3.

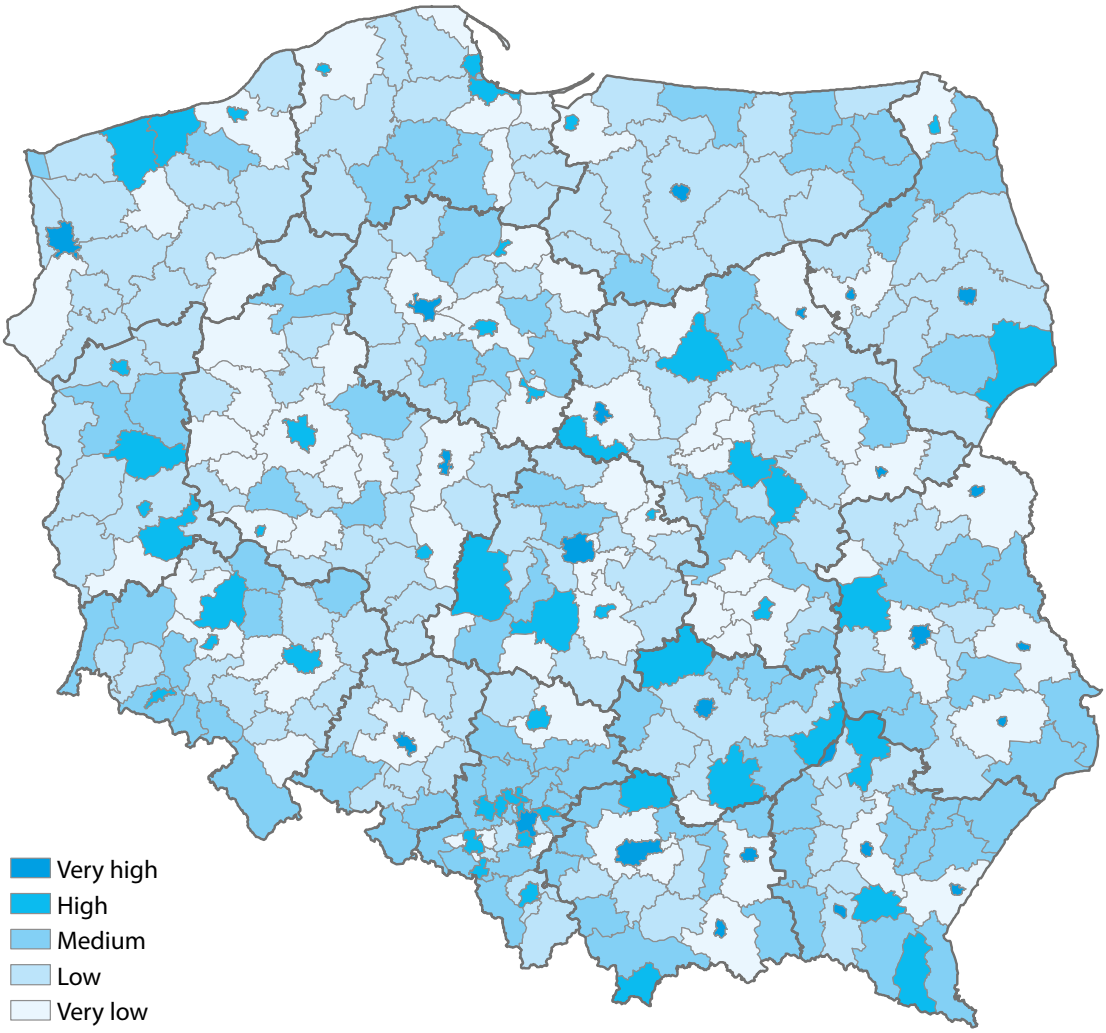
Tabela 4.1 Summary measuring health costs and benefits in 2010, by voivodeships

Voivodeship	Healthcare Inputs Index		Expenditure of the National Health Fund voivodeship branches per capita (PLN)		Health Outcomes Index	
Lower Silesian	30.18	11	1530.0	5	47.61	14
Kuyavian-Pomeranian	30.36	10	1533.7	3	49.17	11
Lublin	36.30	1	1484.5	9	48.61	12
Lubusz	29.05	12	1440.7	12	54.72	9
Łódź	32.93	6	1558.9	2	31.48	16
Lesser Poland	33.02	5	1436.2	13	69.10	3
Mazovian	32.71	8	1702.6	1	58.18	8
Opole	28.12	13	1400.2	15	59.76	6
Podkarpacie	32.87	7	1319.8	16	72.28	1
Podlasie	35.61	2	1454.0	11	66.08	4
Pomeranian	27.78	15	1513.4	6	71.28	2
Silesian	34.58	3	1532.3	4	48.39	13
Świętokrzyskie	33.40	4	1485.8	8	45.95	15
Warmian-Masurian	28.12	14	1432.8	14	58.61	7
Greater Poland	23.56	16	1464.1	10	63.32	5
West Pomeranian	32.02	9	1504.2	7	52.31	10

Source: Own study based on the National Health Fund data.

The differences in the Healthcare Inputs Index and its components is much higher at the county level than in the voivodeships. This is a sign that the health care system is not "closed" at the county level. The network of medical care is often supra-local. For example, many specialised centres are grouped in cities acting as regional hubs. This is reflected in the results of the Healthcare Inputs Index – the first 41 positions in the ranking are municipal counties. It is worth noting that among the leaders, the cities of Eastern Poland dominate, with Rzeszów and Krosno at the top of the ranking, while Toruń, Gdańsk and Gorzów Wielkopolski have the weakest record results from capitals of voivodeships. The last 20 places are occupied by the suburban counties, i.e. functionally connected to cities with county rights and situated in their immediate vicinity. The scale of variation is exemplified by the number of doctors and dentists per 100,000 inhabitants – in the Łomża County, it is less than 10, while in Rzeszów – 743. The spatial dispersion of the results is significant. Most counties falling under the lowest category on the map are in the Greater Poland and Mazovian Voivodeships, although each voivodeship is represented here by at least one county. The functional dimension – the essential use of healthcare in a part of region is crucial to the performance of individual counties rather than the regional non-functional dimension.

Map 4.5 Health Index – Policy Input in 2010, by counties



Source: Own study based on the Central Statistical Office data.

Slightly more than half of the counties reported an increase of the Healthcare Inputs Index over the period 2007-2010, although the mean change was negative and amounted for -0.6%. This discrepancy is due to, among other causes, a dramatic (ca. 10-fold) decrease in the Index value in two counties, namely Łomża and Suwałki. The most favourable change was recorded in Suwałki and the Police County, where the value of the Index increased by over 300%. A comparison of the rate of change at both ends of the distribution indicates that the counties occupying leading positions in 2007 slightly increased their scores, while among the weakest entities, a decline in the Index occurred . This trend is especially pronounced in the last decile, with a decrease of more than 5%. Given that this group is dominated by suburban counties, this phenomenon can be interpreted as a gradual move of health centres to the nearest cities, associated, among other things, with the increasing number of commuting trips from suburban areas and the increasing centralisation of public services.

The distribution of the Healthcare Inputs Index is confirmed by the correlation analysis. The variable strongly associated with the Index is the percentage of people living in cities – the correlation coefficient between the two indices is 0.72. The non-linear nature of this correlation (see Graph 4.16) shows that the strength of this relationship is defined especially by cities with county rights and the least urbanised suburban counties. In the group of counties with an average annual rate

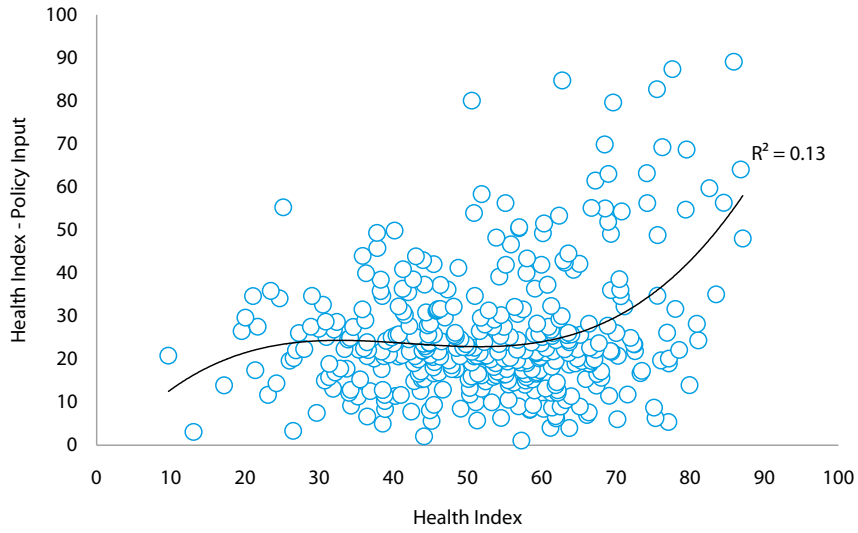
of urbanisation, the relationship is less clear. It is worth noting that the relatively better position of cities cannot be fully explained by a higher level of wealth of their inhabitants. Average income per capita is also correlated with the Healthcare Inputs Index, but the strength of this correlation is two times smaller than in the case of urbanisation and equals only 0.39.

The difference in the performance of cities with county rights is less pronounced among all counties, but is still important – the best, Rzeszów, is over four times more than the last, Świętochłowice. The relatively weak position of municipal counties in the Silesian voivodeship can be explained by their functional linkage to the Silesian conurbation and the fact that it doesn't face the need to serve a suburban area. It is more difficult to explain the relatively high ranking of the cities of Eastern Poland. This may be associated with a higher proportion of older people in the community of these areas, as well as the nature of the settlement structure in this part of the country – the majority of non-urban counties are relatively small entities.

The relationship between the Healthcare Inputs Index and the Health Outcomes Index in the counties is statistically significant but rather weak - the correlation coefficient is 0.24 (0.21 for the index of number of nurses and midwives, and 0.25 for the ratio of doctors and dentists). The strength of the correlation increases to 0.32 for the juxtaposition of Healthcare Inputs Index and average life expectancy, but it is not statistically significant (at 1%) for the aggregate rate of deaths from cancer and heart diseases.

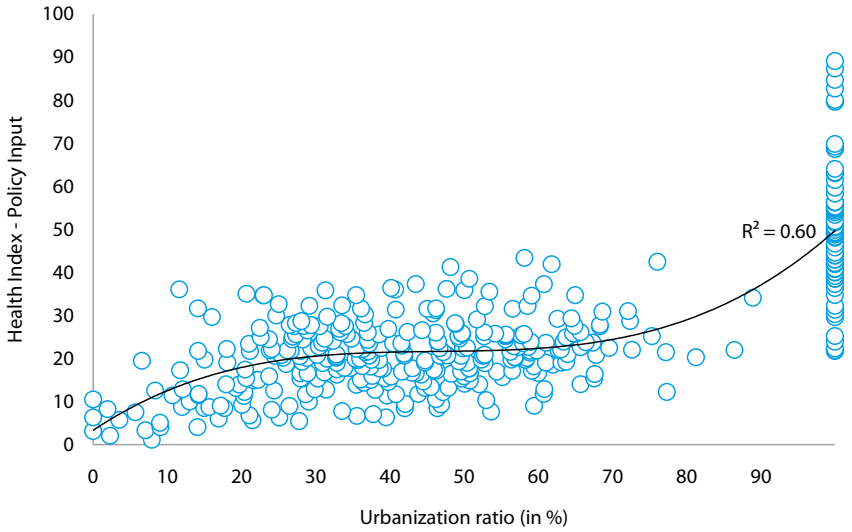
The correlation between the Healthcare Inputs Index and the Health Outcomes Index is non-linear. This relationship is more pronounced among counties with good results, mostly cities with county rights. In this group, the correlation coefficient of ranks increases from 0.24 to 0.42, while in rural counties, it is not statistically significant. This result once again draws our attention to the importance of regional centres as nodes in a supra-local network of medical care. By limiting the perspective to municipal counties, we assume that the quality of human resources involved in the health service is later reflected in the observed health effects. This relationship disappears at the level of rural counties, as input-output relationships transcend the boundaries of counties and requires consideration of, among other factors, the mobility and access to emergency assistance.

Graph: 4.16 The relationship between the Health Index – Policy Input and the Health Index in 2010, by counties



Source: Own study.

Graph: 4.17 The relationship between the Health Index – Policy Input and the Urbanisation Ratio in 2010, by counties



Source: Own study based on the Central Statistical Office data.

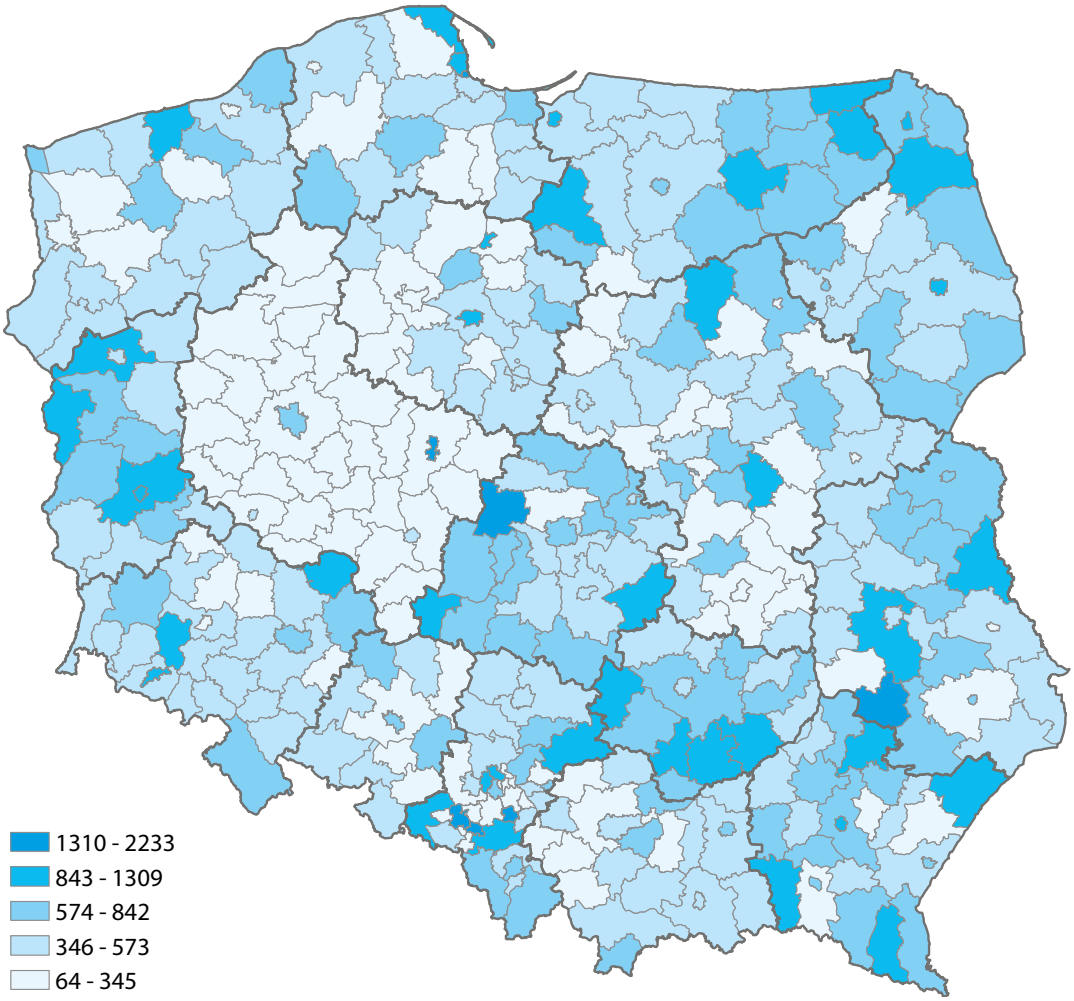
4.5 Cohesion policy and human development

Local government entities are, next to entrepreneurs, major beneficiaries of EU funds, i.e. funds from the EU budget (European Regional Development Fund, European Social Fund, Cohesion Fund). In the financial framework for 2007–2013, around 25% of EU funds allocated to Poland from structural funds will go to co-finance projects implemented by local governments under National Operational Programmes (NOPs) and Regional Operational Programmes (ROPs). Municipalities and counties (and voivodeships) can benefit from NOPs, but they are mostly the beneficiaries of ROPs to support the development of various regions and serve to increase their competitiveness. The funds also promote sustainable development through the creation of conditions for growth in investment at the regional and national level. The following types of programmes are co-financed:

- Technical assistance measures;
- Productive investment to create and safeguard sustainable jobs;
- Investments in infrastructure (such as transport, water, sewerage, telecommunications, energy and information technology);
- Development of endogenous potential by measures which support the development of local employment initiatives, small and medium-sized enterprises;
- Development of technology, innovation and entrepreneurship.

Local government entities, as beneficiaries of EU funds via ROPs, are mostly interested in investment in road construction and upgrades, water and wastewater management, waste management, solar energy, and access to broadband Internet for municipal residents (Jastrzębska 2012). The projects related to innovation, R&D and tourism are also important, as this has been associated with the organisation of the 2012 European Football Championship in Poland. It is worth looking at the types of expenses coming from European funds and see if any of them are linked to human development.

Map 4.6 The total amount of EU funds spent from the budgets of local governments of municipalities and counties from 2007-2010 in a given county per capita (in PLN 2007)

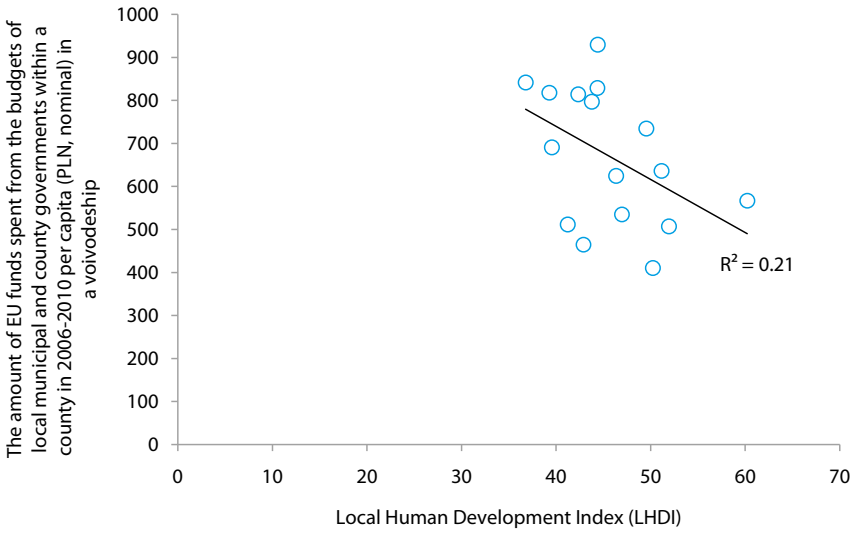


Source: Own study based on the Central Statistical Office data.

The purpose of regional policy is to influence the process of social and human development. In other words, it is the realisation of explicitly targeted actions and changes, which are financed by, inter alia, the Structural Funds. The effective use of these funds is considered an important factor in the socio-economic growth in Poland, and in the context of UNDP projects – of its human development. Analysing the expenditures funded from European funds is quite problematic. The first reason is their "progressive" share in local government budgets over subsequent years. The ongoing nature of projects makes it impossible to effectively analyse investments year by year, as the variance is too significant. Map 4.6 above shows the total financial flow from 2007–2010 in real terms (in PLN 2007) per capita by county. What is evident in this case is the low level of allocation of EU resources in the Greater Poland voivodeship. There are also several voivodeships in which, due to large intraterritorial differences, the share of European funds is higher. These are primarily Mazovian, Lesser Poland and West Pomeranian voivodeships. The regions which undoubtedly benefit from European funds are also visible. These are mainly Lubusz and Eastern Poland. The largest expenditure per capita was recorded in the following counties: Żory, Poddębice County, Tychy, Sopot, Janów County, Rybnik, Konin, Suwałki, Bytom, Białystok, Wieruszów County, Elbląg, Zabrze, Opoczno County, Słubice County, Pszczyna County, Gołdap County, Jelenia Góra and

Gdynia. According to the same analysis, the counties spending the least per capita are: Ostrzeszów County, Kalisz County, Legnica, Wadowice County, Lubin County, Oława County, Krotoszyn County, Dąbrowa Górnicza, Środa Wielkopolska County, Mysłowice, Pruszków County, Oborniki County, Śrem County, Katowice, Piekary Śląskie, Czarnków-Trzcianka County, Grójec County, Świętochłowice and Gostynin County. When one analyses the total expenditure in the budgets of municipalities and counties since 2006, the date this data was provided by the Central Statistical Office (GUS), a shift can be noted, which does not however affect the general trend.

Graph: 4.18 The relationship between the amount of EU funds spent from the budgets of local municipal and county governments within a county in 2006–2010 per capita (in PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by voivodeships

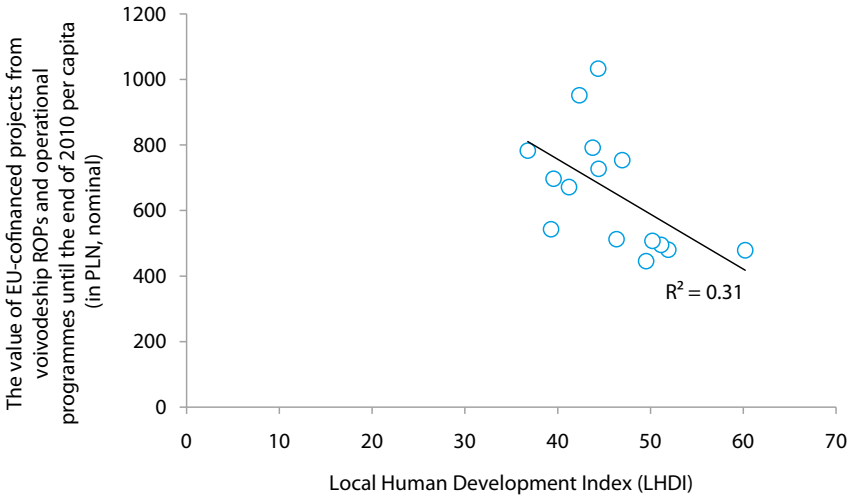


Source: Own study based on the Central Statistical Office data.

In the case of the relationship between the European funds in the budgets of local government entities (municipality, county), nominally counted as the sum of the years 2006–2010, and the value of the LHDI indicator for 2010, the correlation coefficient is -0.457 on the voivodeships' level. It is an estimated calculation which should be treated with caution. Nevertheless, it shows that the allocation of EU funds happens in the regions which have a lower level of human development. When we perform an analysis of the available data from the Ministry of Regional Development for the projects completed by 31 December 2010 under the Regional Operational Programmes and the Operational Programme Infrastructure and Environment, Innovative Economy, Human Capital, Technical Assistance, Development of Eastern Poland, the correlation coefficient is even larger and amounts to -0.541. Even with such a small sample, this may lead to the conclusion that the resources within ROPs[33] and OPs were spent in regions with lower levels of human development. The results are estimates and they only allow an overview for comparisons between cohesion policy expenditure and the development index.

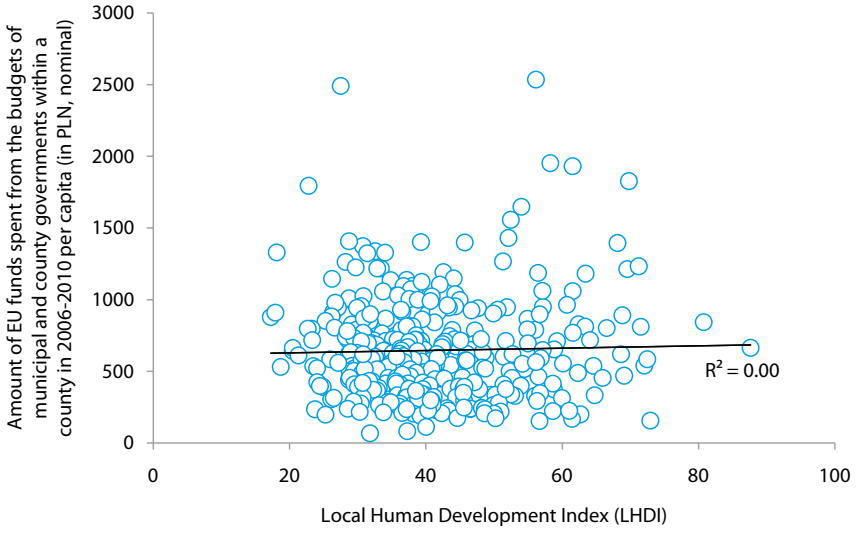
33 An analysis based solely on the ROPs data is flawed due to the fact that regional programmes account for 25% of the applications for co-funding from European funds and 30% of the applications for disbursement. Much more money is spent by the Operational Programmes, which are national and interregional in scope.

Graph: 4.19 The relationship between the amount of project co-financing from voivodeship ROPs and operational programmes until the end of 2010, per capita (PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by voivodeships



Source: Own study based on the Ministry of Regional Development data.

Graph: 4.20 The relationship between the amount of EU funds spent from the budgets of local governments (municipalities and counties) within a country from 2006–2010, per capita (PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on the Central Statistical Office data.

Graph 4.20 shows a juxtaposition of EU funding from the budgets of municipal and county governments from the period 2006–2010 with the value of the LHDI indicator in 2010. The correlation coefficient is only 0.027, indicating no correlation whatsoever. A comparison of cohesion policy spending at the voivodeship level with the one at the county level proves that the allocation of funds is difficult to assess due to the lack of data to accurately locate the intervention. On the basis of economic data available at the regional level, it seems that the resources are allotted to the

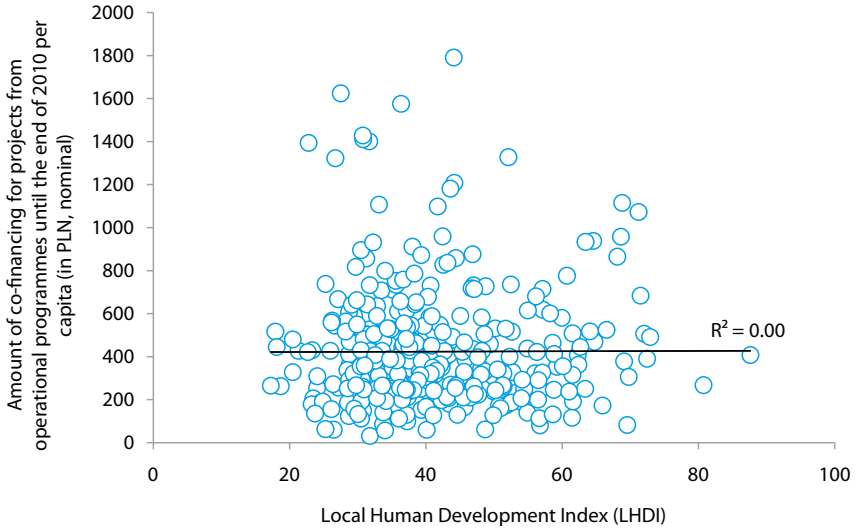
regions which need them. Such a conclusion poses, unfortunately, a number of problems. Firstly, intra-territorial diversity plays an important role - for example, in the case of Mazovian Voivodeship, this is particularly evident with the example of polarisation: between Warsaw and suburbia and the counties being the most explicit example. Secondly, we are using an indicator based on spending by local government entities from the cohesion policy measures, which accounts for only 25% of all resources. It can be assumed that NGOs and business entities have similar participation in European spending in voivodeships, but at the county level, this assumption is too crude. Therefore, finding an appropriate measure of the linkage between the EU funds and human development is still a challenge.

Graph: 4.21 The relationship between the amount of co-financing for projects from the provincial ROPs and operational programmes until the end of 2010 per capita (PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by counties

Source: Own study based on the Ministry of Regional Development data.

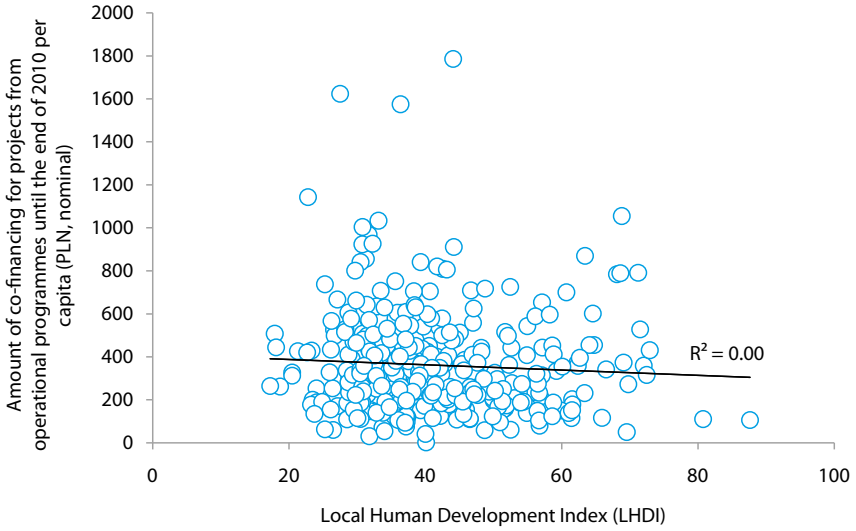
In regards to the analysis of all European spending on the county level, we can draw "safer" conclusions, because the linear correlation coefficient is -0.191. This means that the funding of various programmes was affecting counties with a lower level of human development. This relationship is weak, but it can contribute to further analysis.

Graph: 4.22 The relationship between the amount of co-financing for projects from operational programmes until the end of 2010, per capita (PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on the Ministry of Regional Development data.

Graph: 4.23 The relationship between the amount of co-financing for projects from the Regional Operational Programmes until the end of 2010, per capita (PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on the Ministry of Regional Development data.

The relationship between spending on projects funded by Operational Programmes (including the Eastern Poland Operational Programme) and the Local Human Development Index is very weak – the linear correlation coefficient is 0.04. The relationship between LHDI and activities completed in 2010 within the Regional Operational Programmes is similarly very weak – the Pearson's correlation coefficient is -0.063. While analysing subsequent chunks of data on projects, it seems that one cannot assign them to the human development indicator presented in this paper, but for the sum of all funds spent on subsidizing projects, such a relationship exists (Graph 4.22).

Graph: 4.24 The relationship between the amount of co-financing of projects from the Human Capital Operational Programme until the end of 2010, per capita (PLN, nominal) and the value of the Local Human Development Index (LHDI) in 2010, by counties

Source: Own study based on the Ministry of Regional Development data.

The analysis of the total project funding from cohesion policy programs within the National Strategic Reference Framework in conjunction with LHDI indicate a weak correlation of these two factors, but while analysing various elements of the funding, we discover a significant relationship.

The English term of human development is often translated into Polish as "social development" or, literally, "human development". Similarly, one of the most important operational programmes is called Human Capital[34]. The linear correlation coefficient for LHDI 2010 and the resources spent under the Human Capital OP by the end of 2010 is -0.581. It is by far the most significant correlation observed between human development measured by LHDI and cohesion policy spending. The program was written in order to increase human capacity, so the Human Capital Operational Programme seems to reach areas that need support the most.

The Human Capital Operational Programme corresponds to about 30% of the total money spent on all programs and priorities of the cohesion policy. Unfortunately, even the summary above is not completely reliable because of the quality of reporting of expenditure under the financial framework of 2007–2013, which gets even harder with the data from the financial framework of 2004–2006. It is not possible to generate historical data for the 2004–2006 financial framework – only one summary report is available, and it is not possible to compare the level of financial contribution at the level of counties. It is possible to use small area estimates and try to estimate the value of transfers, but it is linked with a high risk for error. In the case of the evaluation of policies

34 The Human Capital Operational Programme is one of the operational programmes that is and will be implemented from 2007–2013. The financial resources for its implementation come mainly from the European Social Fund (ESF). The entire amount which was foreseen for the implementation of Human Capital is close to 11.5 billion euros, out of which 9.7 billion (85%) constitutes the total amount of the Social Fund resources in Poland for the years 2007–2013 and the remaining part (15%) is the national contribution. The purpose of the Human Capital is to enable full use of the potential of human resources by increasing employment and adaptability of businesses and their employees, improving the health of people working, raising the level of education in the society, reducing areas of social exclusion and supporting the construction of the administrative structures of the State (more: http://www.kapitalludzki.gov.pl/).

and analysing the relationship between public intervention and development indicators errors may be too high to report anything conclusive.

Nevertheless, in the current programming period, there are five reports presenting the value of contracts signed with the beneficiaries at the end of each year: 2007, 2008, 2009, 2010, and 2011. The data presented is cumulative. The collected information on individual projects includes: the programme, contract number, project title, type of beneficiary, location and value of the project. The location of the project is the key information needed in this case, and some projects have identified several regions or counties – it seems thus important to have information about the percentage of the distribution amount for each unit of local government. Due to the different approaches to the way the data is aggregated in both frameworks, the reports for the period 2004–2006 duplicates the full value of the project in cases where projects that have been implemented in more than one municipality or more than one county/voivodeship. Therefore, it would be a mistake to sum them up, as it would lead to an overestimated total amount.

Another approach was used in the current financial framework. For the reports on the value of projects implemented in the period 2007–2010, an algorithm was used, according to which the amounts are proportionally divided, if the area of the project covers more than one administrative unit. If a project had been, for example, implemented in three counties, information on the contract would appear three times, but in each of three records just part of the total amount of the contract would appear. In addition, there were projects of nationwide coverage that were not clearly classified when it comes to the financial resources allocated and their impact.

In many cases, it is difficult to clearly determine and assign territorial scope of the project or its effects, especially when dealing with big scale investments in hard infrastructure, such as roads, sewer system, electroenergetic or telecommunication lines or systemic projects. Taking into account the above-described simplified system for the allocation of quotas among the administrative entities and the number of projects nationwide that are not taken into account in the analysis by territorial division, the data presented should be treated as estimates when it comes to their territorial scope. One can try using small-area estimates to determine the level of allocation of EU funds, but it also is not sufficiently reliable because of the differences in the patterns in which the individual project allocations; due to those differences assigning the expenditures to individual categories would be biased by the subjective judgment of the person assigning.

The most reliable indicators of the use of funds from the Operational Programmes and the Regional Operational Programmes do not say anything about the relationship between cohesion policy and human development indicators at the local level. However, a more detailed analysis outlines a link between the Human Capital Operational Programme and human development, as well as the low correlation of resources which can be linked to LHDI by territorial factors. The question remains, however, whether a more significant correlation for the expenditure on peripheral areas could be observed, in terms of human development within the NSRF 2007–2013 (National Strategic Reference Framework 2007–2013), if it were possible to calculate the Local Human Development Index for 2004, 2005 and 2006.

An overall assessment of the impact of cohesion policy on human development is difficult. From 2007–2010, we can observe a fluctuating but growing importance of EU money in the budgets of local authorities. This has a positive impact on improving the investment attractiveness of the local government entities, as well as on quality of life of the people. Big cities especially are taking action involving far more EU funds (see Smętkowski & Płoszaj 2011) and are more likely to use national

programmes alongside regional programmes, while smaller local government entities focus on projects that are important to the local community, and investments of greater importance for the region are implemented by voivodeships.

The main change from the previous period is a partial decentralisation of the implementation of the operational programmes financed from EU funds (ERDF, ESF and CF). Regional governments now manage the implementation of the ESF resources, and above all implement the priorities of their Regional Operational Programmes.

Due to the fact that many guidelines of the Ministry of Regional Development and the European Commission exist, the regional programmes do not differ significantly from each other except for the emphasis on a strategic area for a given voivodeship. Changes in the implementation of ROPs were caused by the economic downturn in 2008 when most of the voivodeships decided to shift the allocation of funds from later years to 2009 and 2010, as seen in the data presented. It is worth noting the success of local authorities in implementing operational programmes or of institutions participating in the Human Capital Operational Programme. This suggests a possible high degree of utilisation of the EU funds in the 2007–2013 financial framework – just like in the case with 2004-2006 (almost 100% of funds were utilized). However, the absorption rate of the cohesion policy resources cannot be the sole criterion for assessing the effects of state aid granted to EU member states. Unfortunately, up until now, an opposite view prevailed, focused on the level of spending rather than the outcomes of the projects. If we don't measure the effects (the outcomes), we cannot tell the success from failure (Osborne & Gaebler 1993). This is why the idea for the LHDI and its application in the "human development inputs versus human development outcomes" framework was proposed and tested. But apart from that, it is necessary to carry out the evaluation of projects at the central level by responsible institutions and at the level of the beneficiaries of these funds according to the criteria of effectiveness, efficiency, usability, relevance and sustainability of public interventions.

The EU measures are of particular importance for Poland to mitigate the effects of the economic recession, and can help (the Human Capital Operational Programme in particular) in the long run to increase the human development of poorer areas. The estimated Polish GDP growth rate with the use of European funds is higher by 0.5-0.9 percentage points (Ministerstwo Rozwoju Regionalnego 2012a) – it could be called "the European stimulus package" affecting the Polish economy (Arak 2012c).

From 2004–2006, one could observe that the "EU funds absorption rate" took over the "effectiveness of their effective use" as an assessment criterion (Jastrzębska 2012). Cohesion policy has been evaluated to an incomparably greater extent than any other public policy in Poland, with more than 700 evaluation studies for individual programmes and projects. Some of them are characterised by high academic rigor, such as counterfactual methods estimating the impact "with" and "without" intervention. The Ministry of Regional Development publishes rankings of voivodeships where the funds are spent for various programmes, and on this basis the allocation of reserves and unused funds is made. In the first funding period, Poland focused on the absorption-implementation feature of the cohesion policy and neglected its strategic function. Since 2009, efforts have been made to sort out the strategic and development management system (Ministerstwo Rozwoju Regionalnego 2012b). The experience of other countries does not allow for the assumption that it is always and everywhere that expenditure itself (especially if so much of it is spent on infrastructure, as in the case of the EU structural policy) has a positive impact on the effectiveness of management (Gorzelak 2009). Meanwhile, the money itself should support development and be spent on not

just the development needs of the regions, but also of the whole country Ministerstwo Rozwoju Regionalnego 2012b; Ministerstwo Administracji i Cyfryzacji 2012).

Strategies for the programming period 2007–2013 were prepared for the funds, and not as independent development objectives in conjunction with strategic projects. This was due in part to the fact that Poland was not sufficiently prepared for the use of European funds – due to the weak tradition of thinking in terms of long-term goals, and the relative unpreparedness of new regional institutions (only operating since 1999). The method of allocation and evaluation of resources in the period 2014–2020 will be prepared according to strategic and operational documents, much more so than for the 2007–2013 cycle.

Local self-governmentprefer investments which are smaller and simpler to implement, while infrastructure projects are not fully thought out but visible and tangible for the residents: construction of stadiums, roads, business and conference centres. Investing in infrastructure is beneficial in the short term, because it stimulates demand and generates employment, but in the long term, it generates maintenance costs for the new buildings. In the future, it will not be infrastructure expansion but rather an economy based on knowledge and creativity that will count as a factor of development (M. Bukowski et al. 2012). Therefore, undertaken projects should not be developed ad hoc, should not be too easy and fast in execution, and aimed at only immediate visible effects. The literature emphasises that the merit of spending the EU funds is not counted in their relative effortlessness to be spent but in their potential, as great as possible, to achieve a positive impact on the economy, and above all, on the quality of life of citizens. Projects of this nature are, unfortunately, the hardest to quantify and to show results in a simple way.

It should also be noted that the LHDI project with its "human development input-outcome angle" should be continued with the data from the National Census of 2011, which was not available by the Central Statistical Office (GUS) at the time of conducting this research, and using small area estimates techniques referring to the results of survey data in subsequent years. As far as the measurement of the effectiveness of cohesion policy is concerned, it should be possible to measure specific activities from the 2007–2013 financial framework but unfortunately, too few projects were completed by the end of 2010, in order to reliably measure their effect in the current analysis[35].

35 Because of the schedule of the project, its experimental (pilot) character and delays in the schedule of census data sharing, the scope of the analysis could not have been larger e.g. using more time-consuming statistical methods as small area estimation and an attempt to assign all cohesion policy funds to individual counties.

5. The LHDI in the broader context of socio-economic development

One of the emerging accusations against the HDI is its narrow perspective of social development, resulting from reducing it to three pillars only, i.e. wealth, education and health. Many attempts to put together a comprehensive list of aspects of social development have been undertaken (Nussbaum 2000; Alkire 2002), but a consensus on this issue is still far from being reached. On the other hand, integrating too many components in an index reduces its clarity and limits its potential for broader communication of development issues. Choosing between a higher level of detail and a higher clarity of message for a given indicator is a classic dilemma underpinning all attempts at developing new indicators.

An attempt at answering the above challenge is to look into relations between the Local Human Development Index and selected aspects of socio-economic development. In that way, without reducing the proven communicative capacity of the three pillars of the HDI, we want to enrich the picture presented so far with other areas of key importance for the development of the country. The selection of these dimensions is driven primarily by: (1) their importance for human development in Poland, (2) their adequacy at the local level and (3) their formalization and legitimation in official policy strategies in Poland and key international documents. We have also tried to ensure the communicativeness of our results, so we have chosen only seven areas considered by us to be the most important. The list of areas, with their justification in official documents, is provided in the table below.

The below table shows that the role of all seven aspects in the shaping of public policy has been recognised both at the national level (Ministerstwo Rozwoju Regionalnego 2012b) and internationally. Their importance for development has been repeatedly tested and confirmed, therefore they are a good reference point for the Local Human Development Index presented in this report. In the following section, we compare the indicators, describing the different aspects of socio-economic development with the LHDI, thus expanding and enriching the field of interpretation of the results.

Tabela 5.1 Justification of selected aspects of the socio-economic environment

Dimension	Justification
Human capital	The key role of human capital as a factor of development is underlined in the Mid-term Development Strategy 2020 (SSRK 2020) and the Long-term Development Strategy (DSRK) 2030. One of the nine integrated development strategies – Human Capital Development Strategy (SRKL) – is dedicated to this issue, and so is its goal: to bring out the potential of individuals, so that they can fully participate in the social, political and economic life.
Labour market	Employment growth is one of the five objectives of the Europe 2020 strategy; it aims to launch a programme for new skills and jobs. SSRK 2020 proposes an active involvement of the State in order to remove barriers to employment, similar to the DSRK and SRKL.
Poverty	Poverty reduction is one of the five objectives of the Europe 2020 strategy, which involves the mobilisation of the European Platform against Poverty. Reducing poverty in the most vulnerable groups is one of the objectives laid down in SSRK 2020, and social cohesion is a key area for SRKL and DSRK.
Active citizenship	The development of social capital is one of the key challenges for Poland, which is emphasised, among others, in SSRK 2020 and the Strategy for Regional Development. The first document contains a provision indicating that social capital is used to increase the scale and sustainability of civic engagement and cooperation. The theme of active citizenship is also dealt with by the Strategy for Social Capital Development (SRKS).
Digital engagement	One of the seven flagship initiatives set up within the framework of the Europe 2020 strategy is the European Digital Agenda. One of the objectives of SSRK 2020 is to increase the use of digital technology, while pointing out that one of the challenges is the uneven development of the digital society in Poland. In Poland, the importance of this area is highlighted by the DSRK and Efficient State strategy.
Protecting the natural environment	The need to integrate environmental concerns into development policy has been strongly emphasised in the document crowning the Earth Summit in 1992 – Agenda 21. In 2012, the Rio +20 conference confirmed the necessity of building measurement systems that would take into account the impact on the environment. Improving the environment is one of the objectives of SSRK 2020, while highlighting the fact that the factors determining the quality of the environment in Poland are mostly clean air, water, soil, and proper waste management. The protection and rational use of natural resources, is one of the strategic challenges for Poland, mentioned in the National Strategy for Regional Development. The issue of environmental protection is also dealt with by the Strategy for Energy Security and the Environment.
Empowerment of women	Promoting gender equality and empowering women is the third on the list of the UN Millennium Development Goals. Separate databases on women empowerment are run by the World Bank and a specialised UN agency: UN-WOMEN. The relatively weaker position of women in professional, social and political life is considered a cross-cutting challenge in the Human Capital Development Strategy.

Source: Own study.

5.1 Human capital

The process of rationalizing policies of employment and education is in progress. Competences acquired in formal education are equally important to those acquired informally, although the latter is difficult to capture using objective measures. Since a competence is the ability to cope with routine tasks and non-routine demands of life and work, the school is then the main determinant, in addition to the cultural capital acquired at home (DiMaggio 1982; Arak 2012). What are the most useful skills in life and work? Is it possible to extract, define and measure the skills, beyond just general intelligence, that are useful in solving a whole range of different problems that arise at work

and elsewhere, at home, in the family, and local community? In the modern world, in the face of increasingly strong global competition, human capital, highly qualified, skilled and adapted to the challenges of a changing world, is one of the indispensable conditions for rapid economic growth (Barro 1999), the development of civil society and, consequently, improvement in the quality of life. Human capital should not be viewed only through the prism of its "utility" in the development process. A sufficiently high level of human capital significantly increases the chances of employment. Subsequently, a safe and high quality job is one of the ways to avoid poverty and – consequently – social exclusion. The high quality of human capital is also relevant for choices focused on respect for the environment, as its condition translates into a higher quality of life (for present and future generations) and public health (Lan et al. 2011; Ministerstwo Pracy i Polityki Społecznej 2012).

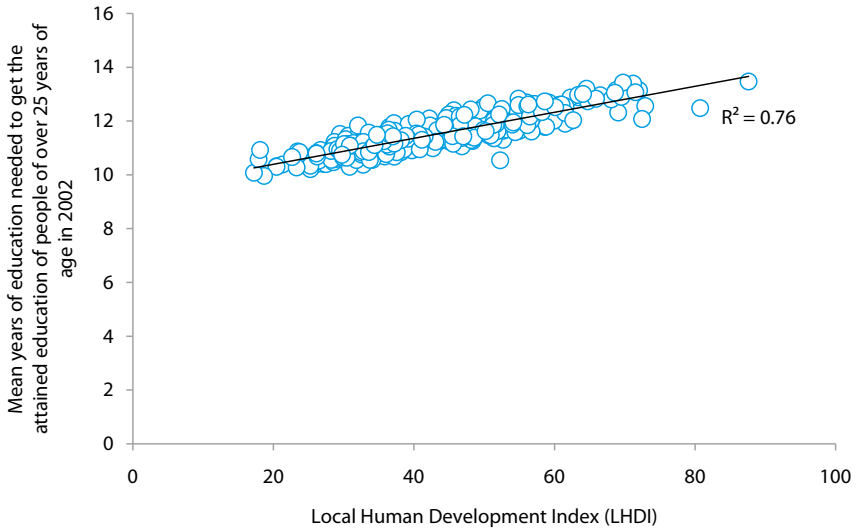
The purpose of education policy, as well as of other policies in the area of public sector services, is to increase equity in access to services, improve its quality and efficiency. Without a more precise formulation of the objectives of education (and thus determining what competencies are to be formed – what kind of human capital is needed) and without appropriate indicators to measure them, it is difficult to conduct any policy and evaluate its effectiveness. An important objective of the state is to equalise access to education and life chances that an individual enjoys after completing formal education. The whole rhetoric of the knowledge-based economy and the information society is, in fact, a call to raise the level of competences (UNDP Poland 2007). Human capital measured by the level of education of the labour force is the sum of competences of particular individuals. For a country, such as Poland, with a still limited financial capital stock possessed by its own citizens, the investment in education (and thus boosting human capital) is the key to success (Czarnik et al. 2012).

The conclusion that follows is: the level of expertise of society, i.e. the population's knowledge measured by the level of attained education, is crucial. Starting from 2010, two indicators with their respective sub-indices are being used for the educational dimension of the international HDI – the Expected Years of Schooling Index (EYSI) and the Mean Years of Schooling Index (MYSI). EYSI reflects the number of years that a 5-year-old is expected to spend in the educational system, and MYSI shows the number of years that a person over the age of 25 has spent to get their current level of education (UNDP 2010).

Both are difficult to calculate at the regional level on a yearly basis, but their significance remains undisputed (UNDP PO in Poland 2012), mainly due to the fundamental role of education for achieving a higher income in the future (Hanushek & Woessmann 2007). Based on data from the National Census 2002, one can calculate the average number of years of education needed to get to the attained education for people of over 25 years of age in the county profile in other words Mean Years of Schooling. This indicator can be estimated by multiplying the number of people over 25 years of age with a given level of education by the estimated time required to complete the school. We assume a simplified model of the path to achieve a given education level based on the average time it takes to complete a given stage (according to regulations relevant for people 25 years old in 2002). We are also assuming that for higher education, there are 8 years of primary education, four years of high school and five years of University studies. In the case of vocational post-secondary colleges we assume 2 years of college, four years of high school and eight years of primary school - a total of 14 years, for the secondary vocational education - a total of 13 years, for the basic vocational education - 12 years, primary - 8 years, and 6 years for those who did not indicate any levels of education or had not completed the primary level. Then these values were divided by the sum

of the people in the county age 25 or higher, and then summed up[36]. The end result is exactly the average number of years of education required to earn the level of education attained by persons over 25 years old in 2002[37]. It is a measure which can show the greatest regional differences in terms of level of education, but due to the fact that it can be calculated only on the basis of data from the census, it appears in this study as a contextual LHDI measure.

Graph: 5.1 The relationship between the average number of years of education needed to get the attained education of people of over 25 years of age in 2002 (in years) and the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on the National Census 2002 – Central Statistical Office data.

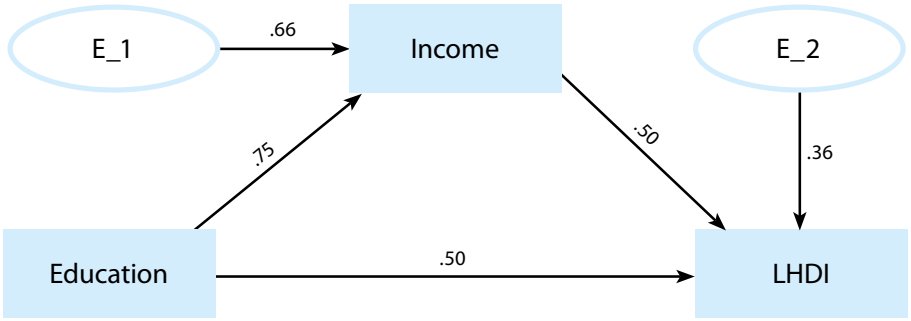
The linear correlation coefficient of the average number of years of education and the human development index is 0.873. This is one of the strongest correlations observed during the study of human development at the county level. This correlation coefficient is higher than the correlation coefficient of the average monthly taxable salary and the LHDI, which is 0.755. It is worth recalling that the LHDI measures the level of education obtained via lower secondary school test results and the percentage of children aged 3–4 years attending kindergarten – the latter is significantly associated with subsequent education, but the two measurements are completely different. The correlation coefficient indicates collinearity and, regardless of the outcome, it cannot be interpreted as a direct effect of education on human development. Detailed analyses of the regional education require more variables and more detailed models (Herbst 2012). Given that the calculations used in the current analysis were based on 10-year old census data for the population aged 25+, one might consider using the level of education of the children whose parents were exactly this age in 2002. The relationship between the status of parents and their children's accomplishments in life are the subject of numerous studies. In this case, we can only see the potential impact of acquired education on human development, as well as on the income and health.

36 $MYS = \frac{\textit{Hipotetical years spent in school } i \times \textit{Number of people with "i" level of education attained aged 25 and over } i}{\textit{All people aged over 25 in the county}} + \ldots ;$

where i = primary and no education, vocational etc.

37 All calculations are based on the data from the Central Statistical Office (GUS) concerning the National Census 2002 made available by the Local Data Bank.

Graph: 5.2 The relationship between the average number of years of education needed to get the attained education for people of over 25 years of age in 2002 (in years) and the value of average monthly base income in 2010 (PLN, face value) as well as the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on SEM, using Amos software.

Standardised coefficients in the Structural Equation Model (SEM):
Income – the average monthly base salary in 2010 in PLN nominal (see Chapter 1 – Description of indicators)[38]
Education – the average number of years of education needed to get the attained education for people of over 25 years of age in 2002 (in years)
LHDI – Local Human Development Index, the value for 2010
E_1 – variable residual, reflecting the impact of the variables on income that are not included in the analysis
E_2 – variable residual (reflects the impact of the variables on LHDI that are not included in the analysis

Graph 5.2 visualises the *Structural Equation Model* for the relationship between income in 2010, the number of years of education in 2002 and the LHDI value in 2010 for a given county by means of a path diagram[39]. Both education and income are regression weights, or so-called beta coefficients, equal to 0.50 for explaining the level of human development in a given county, but the regression weight for education is 0.75 for the strength of explaining the level of income. There are other potential factors (the importance of standardised regression coefficients) explaining income, but the strongest relationship is with the level of education in 2002. Each year spent on acquiring education before 2002 was of a high significance for the average monthly income observed in 2010, potentially increasing its level.

Education, its quality and the overall impact on human life and society is invaluable. Based on this analysis, at the beginning of the 2000s, acquired education can significantly explain the LHDI level in 2010. The above juxtaposition may cautiously suggest the robustness of the structures that determine the results, among other things, where parents' attained education coincides with the distribution of the lower secondary school results or with the percentage of children attending kindergarten. A similar analysis should be performed based on data from the 2011 Census, although due to the depreciation of the value of education and high unemployment among young people (Szafraniec 2011), it may have less of an impact than in previous years. The reasons for this may be in the "educational boom" that does not necessarily go hand in hand with increasing the quality of education, human capital and the adequacy of competences to meet the needs of the labour market. The return on education, as a process of a long duration (distributed in time), will have an impact on future earnings, and thus on the average pension received. This notion, however, could possibly be revised based on new census data and further analysis of the impact of education on development.

38 The value of income is calculated without social assistance benefits.
39 The analysis of structural equations (so-called *path analysis*, or *structural equation modelling*) is one of the best developed techniques from the family of causal interpretation methods based on statistical analysis of data (Cwalina 2000).

5.2 Labour market

The labour market consists of people (those having or looking for a job), sectors in which they work or might work and the institutions facilitating the process, generally matching the demand for and supply of labour. In general, the labour market may be approached from several angles: (1) from the perspective of human capital resources and their use (by age groups, level of education and health status), (2) the distribution of workers by economic sectors in which they are employed (number of people employed in the service sector, agriculture etc.), (3) from the perspective of the demand and supply of labour (the number and type of vacancies versus the number of people looking for a job and their qualification).

The labour market has two principal functions in the economy. It provides an opportunity to earn money for people offering their work and it is a source of basic factor of production for the companies that demand labour (Cahuc & Zylberberg 2004). Earnings received in exchange for work constitute the main source of income for the vast majority of people. Lack of work is an important problem related to human development that has to do with people's abilities to reach their envisaged goals. There is no single labour market but as many labour markets as professions and kinds of work done, as well as regions. It is very important that labour market institutions work at the county level and at this level an active labour market policy is implemented.

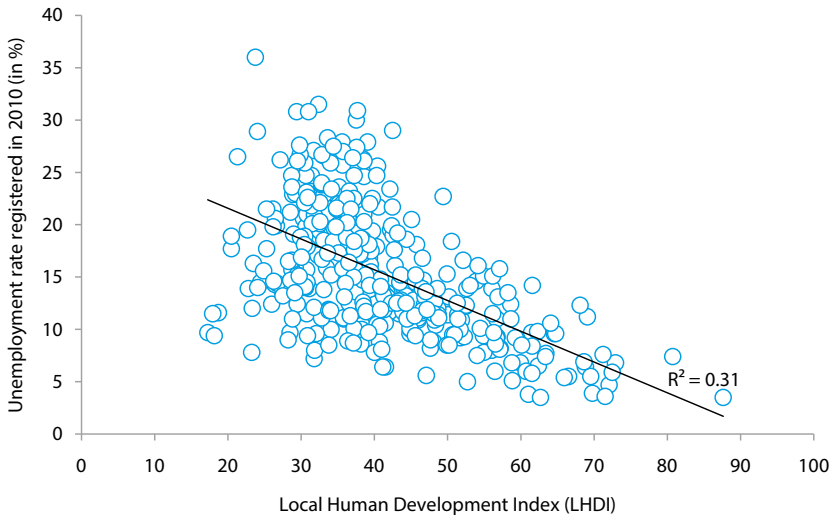
It is obvious that a country's welfare results from the work of its citizens and the quality of institutional surroundings they have to deal with. At the same time, however, only recently did this simple rule recover its primary position in actions taken by the governments of the developed countries (World Bank 2012). The ones that act in accordance with it are well aware that, given current demographic challenges, without an increase in the number of the employed, their countries will not succeed in the future. This will lead to a decrease in the quality of life in these countries and their lack of importance on the global scene. In view of the unstable economic situation all the above-mentioned factors make accessing the labour market in an effective way after studies uncertain (UNDP Poland 2004). The impact of the crisis is reflected, above all, in unemployment and related social threats, including prolonged professional inactivity among teenagers. Numerous research projects show that the challenge of entering the labour market during recession may permanently affect the younger generation (Bukowski et al. 2011). The most serious concerns are related to the possible emergence of a "lost generation" being caused by the crisis. It would consist of young, well-educated people detached from the labour market or having so-called "junk jobs" – i.e. poorly-paid, low-status and unstable. In that context the state is increasingly considered an important actor capable of initiating changes in the educational system that would adapt it to future challenges, including within the framework of the dual education system with its higher priority of practice over theory.

Within the coming years, the shrinking of the working age population will probably be accompanied by a decrease in the number of available jobs. At the same time, sectors in which jobs will be created and cut will be changing, as will the demand for certain qualifications. The biggest threats will come from the decline in the working age population, on the one hand, and, on the other, the increasingly frequent mismatch between the employees' capabilities and the modern labour market requirements. If the current priorities do not change, youth potential will be further wasted, as after their studies they will struggle to find their first satisfactory job (Szafraniec 2011).

When it comes to competences and their mismatch with demand, the unemployment structure in specific regions seems quite static, like unemployment at the county level. Differences in professional activity at the country level seem to depend on the size of the towns. The employment rate has always

been the highest in the biggest cities (with population exceeding 100,000 inhabitants), whereas it is the lowest among the inhabitants of the smallest towns, of population smaller than 10 thousand people, which are normally characterised by a small diversity of economic activity types (Bukowski 2005). It is due especially to the low labour mobility and limited importance of salary adjustment on the regional labour markets (Radziwiłł 1999), which did not change even after Poland had joined the EU[40]. Incomes (Chapter 3.2) in the regions characterised by higher unemployment are in general lower and they increase more slowly than in the regions with lower unemployment rates, but a cheaper workforce attracts investments only to a limited extent (Chapter 4.2). What makes regions more attractive for entrepreneurs are big cities and connections between them. Conditions favourable for economic development are typical of places where such activity is already well developed – the human development index is correlated with investment attractiveness. Additionally, a significant number of people who do not belong to the economically unemployed are registered as unemployed in the employment offices. They register not because they are willing to find a job, but because they need health insurance.

Graph: 5.3 The relationship between the annual average unemployment rate in 2010 (in %) and the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on the Central Statistical Office data.

The coefficient of linear correlation between the unemployment rate and the LHDI is -0.561. It is a considerably strong negative correlation and it confirms the notion that the metropolitan effect affects the labour market, because big cities are characterised by the highest levels of human development and the lowest unemployment rates. Human development is indeed correlated with urbanisation and, as a result, also with the quality of public services offered in big cities. High unemployment acts as a barrier to human development and a phenomenon typical of regions with low LHDI values (and especially rural counties).

The influence of the income measured within one of the LHDI aspects is partial; what matters is the intrinsic value of work and "being at work". The benefits of the latter go beyond financial gains, namely the salary, and seem relevant from the point of view of the social investments and

40 Whereas in the 1990's the main reason for migration was a lack of jobs, namely unemployment, nowadays a more significant factor is the structural mismatch related to employees' qualifications (Kaczmarczyk & Okólski 2008), although due to the financial crisis that started in 2009, the former factor can still be important.

the benefits they can give (Kotowska & Chłoń-Domińczak 2012). Since the metropolitan effects in Poland are more important than the salary effect and the migration effect, the market mechanism did not contribute to significantly narrowing the gap between the regions. Radziwiłł wrote in 1999 that only after migrations on a large scale would certain unemployment rate convergence be possible, but not due to increased employment in the economically weak regions, but rather because of the scale of workforce outmigration would be higher than the job cuts, which happens in Łódź, for example. This means that without an active regional labour market policy, it is nearly impossible to ensure more even regional development.

5.3 Poverty

Research on poverty has been conducted for more than a hundred years. In Poland, the first research dedicated to poverty was carried out as early as in the nineteen twenties. The related works intensified in the nineties. The problem of poverty, both in theory and in practice, received a new stimulus during Poland's time of transition from a centrally planned to a market economy. Economic reforms and changes in property ownership caused significant shifts in income distribution, which, in turn, contributed to the increase in the financial diversification of the society and worsening of living conditions for some social groups. The poverty category changes in time and depends on the place (Panek 2007). The financial situation for certain households which would be considered poor in the past would not qualify for that status a few dozen years ago. At the same time, people who are considered poor in Western Europe are in a much better financial position than, for example, an average citizen of India. In all definitions that can be found in related literature, poverty is linked with not being able to satisfy certain needs at a desired level (Drewnowski 1977; Panek 2008). Until the late sixties, the dominant approach when analysing poverty was the so-called basic needs approach, with basic needs meaning, above all, access to food, housing and clothes. Being able to meet them meant actually being able to survive. The scope of basic needs gradually expanded (Panek 2011). At the same time, the understanding poverty as a mere lack of means (financial resources) necessary to meet basic needs (the basic needs approach) was replaced by a theory based on the inability to perform bodily functions, resulting from social conditions and the individual ones, necessary to lead a valuable life (the capabilities approach).

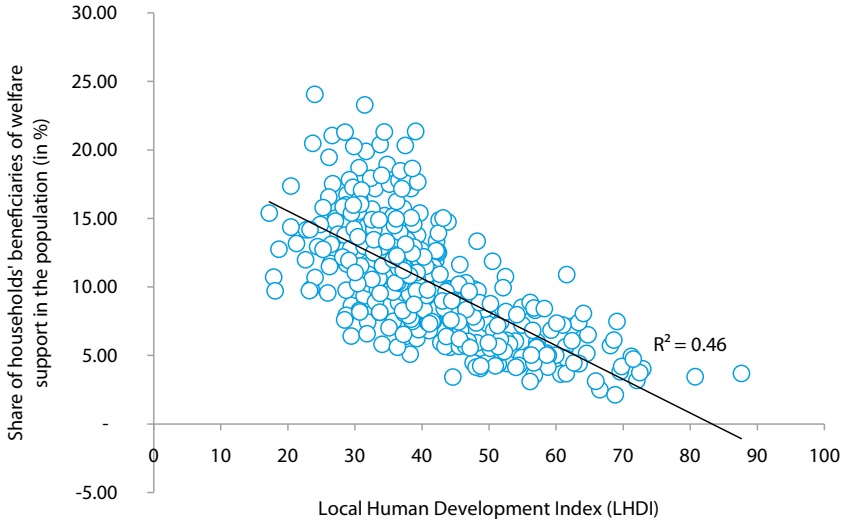
The terminology used by researchers and practitioners of social policy has been partially systematised by the agreement reached at the World Summit in Copenhagen devoted to social development, organised in 1995 (United Nations 1995). A two-level poverty measure was suggested at that time, namely absolute and overall poverty, providing an opportunity to analyse poverty in accordance with the generally accepted standards, taking into account different levels of development in different countries. Absolute poverty was defined as an inability to meet basic human needs, including food, drinking water, sanitary equipment, health, housing and information. It thus depends not only on households' income, but also on their access to basic services, which in some cases does not depend only on the available financial resources. Overall poverty is a broader category than absolute poverty. It is associated not only with the lack of access to basic goods and services, but also with the lack of possibilities to participate in decision making and in civil, social and cultural life.

In practice the use of the poverty measurement, the so-called economic definition of poverty is the one that is most frequently used. Poverty is defined as a situation in which an entity (a person, a family, or a household) does not have sufficient resources (money in the form of both current income and income from the past, as well as saved material resources) allowing to meet their needs. This approach led to creation of the so-called minimum subsistence level adopted by the resolution of the Council of Ministers of 10 August 1981 on analysing and determining the minimum subsistence

level and to creation at that time of the minimum level of existence. Both measures have been calculated for the last three decades by the Institute of Labour and Social Studies. The minimum subsistence level is a category used in social policy for assessing the living standards of the population, because it includes the basic basket of consumer goods (Rajkiewicz 2001). The minimum of existence defines the absolute basket of consumer goods that should be available for one to survive.

There is no appropriate information about income per household member at the county level, which is why it is impossible to calculate the existence minimum for each county. The poverty indicator we suggest (the Material Poverty Approximant) as a context indicator for the local human development analysis is the share of people in households benefiting from social welfare[41] in 2010 (the same for which the most recent LHDI is calculated). The thresholds entitling one to social welfare have not been increased since 2006, but the percentage of people in need of aid in some regions has remained high. In 2011, the value of the minimum of existence exceeded the threshold entitling them to social welfare, which have remained stable during previous years.

Graph: 5.4 The relationship between the share of people in households benefitting from social welfare in the population in 2010 (in %) and the value of the Local Human Development Index in 2010, by counties



Source: Own study based on the Ministry of Labour and Social Policy data.

The LHDI shows regional diversification which is related to the quality of life but also to poverty. The coefficient of correlation between poverty measured through the share of the social welfare beneficiaries in households with the Local Human Development Index is -0.678. A higher level of human development means fewer people using social welfare, although stable thresholds of entitlement may decrease the percentage of people entitled to social welfare. It seems obvious that there are more people depending on state aid in the counties with a lower value of the human development index. The question worth asking is: why isn't this correlation stronger, as there should be far fewer beneficiaries of social welfare in some regions which are characterised by a higher level of human development. This might also be a starting point for a discussion about addressing social welfare and whether it is properly distributed from a territorial perspective.

41 Social welfare is the financial and non-financial help granted to individuals who have problems with functioning in the society on their own. This kind of support includes (1) financial benefits: ongoing benefits, temporary allowance, designated benefits; (2) non-financial help: social work, social and health insurance contributions, aid in kind, nursing services, assistance in obtaining housing, help provided in nursing homes.

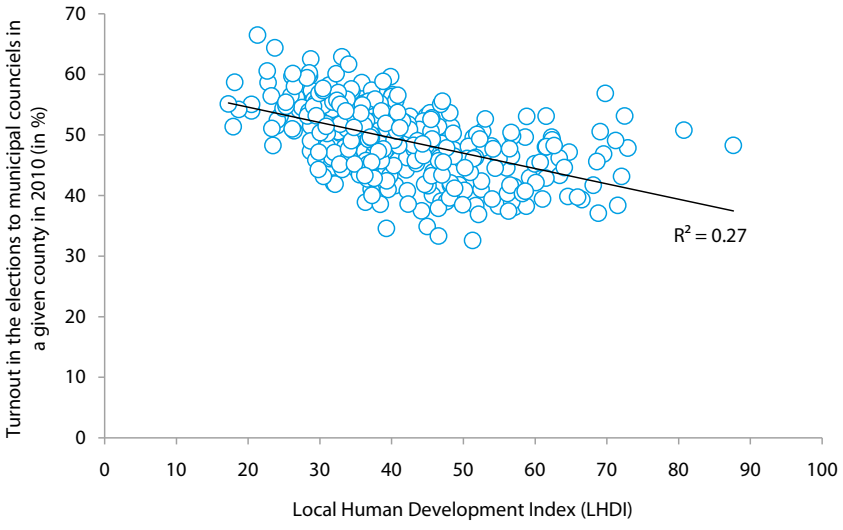
5.4 Civic activity

Civic activity is reflected in the participation in the life of local communities and non-governmental organisations and, above all, participation in elections. Using this aspect of community life, we try to look at the condition of civic activity, compared to the level of human development. At the local level, one fulfils their civic duties to the fullest by taking part in the elections of municipal authorities. Raciborski (2011) believes that the contemporary political processes are reflected, among others, in reconfiguration of civic activity and decentralisation of the countries, as well as in development of local authorities, which encourage creation of new communities of political interest, based on administrative and economic ties. Civic activity may refer to the municipality level. According to Theiss (2012), participation in a given local community goes hand in hand with the ties with certain territory. Additionally, municipalities also have significant political independence related to the local policy they implement.

Participation in lections is a procedure ingrained in democracy. This is how citizens contribute to democracy. Performing the right to vote is in large modern democratic countries essential for some of the fundamental values of democracy, like freedom and equality. Only equal participation in elections can result in equal representation, which is crucial for ensuring equal political influence of all social groups. The equal political influence should, in turn, ensure equality in other aspects of human life, as well as prevent discrimination and reduce social inequalities (Cześnik 2009). An argument commonly found in related literature states that representatives of the upper social strata participate in elections more often and that voter turnout is higher among these groups and much lower among the members of the lower unprivileged class, which contributes to the fact that their interests are underrepresented among the authorities. At the municipality level in Poland no such relation can be found.

In the case of local elections, it seems that participation in making strategic choices is much more popular (Clark et al. 2012). In other countries, local authorities are often associated with the socio-economic situation of a particular region or province, and punished or rewarded for the situation at both the macro and micro level (Jastramskis 2011). When comparing different levels of human development in the counties and the average voter turnout in municipal councils elections in a given county, it is clear that the turnout in the regions with a lower level of human development is not much higher than in more socially developed regions.

Graph: 5.5 The relationship between average voter turnout in the elections to municipal councils in a given county in 2010 (in %) and the value of the Local Human Development Index in 2010, by counties



Source: Own study based on the National Electoral Commission data.

The sense of civic activity and the necessity to participate in the election of the lowest level of government is considerable and depends on the level of human development. The regression line tilted to the right indicates that more people vote in local elections in the regions with a lower level of human development. The coefficient of the linear correlation between the voter turnout in the local elections and LHDI is -0.518. The correlation is negative and moderately strong. Involvement at the local level seems to be higher in poorer regions than in richer regions. It must be also pointed out that there is a significant difference connected with strategic choices, related to being directly familiar with the local political scene in the rural counties, especially in the rural municipalities, as opposed to urban counties. In smaller towns and in the countryside it is also more possible that a voter will personally know potential candidates and the voters may have the impression that their votes might influence more directly the authorities in direct elections. Additional factors explaining a better turnout in rural areas include: a lower level of party-dependency in the local elections, more diligent voters/being used to voting, a larger share of elderly people who generally care more about elections than the general population.

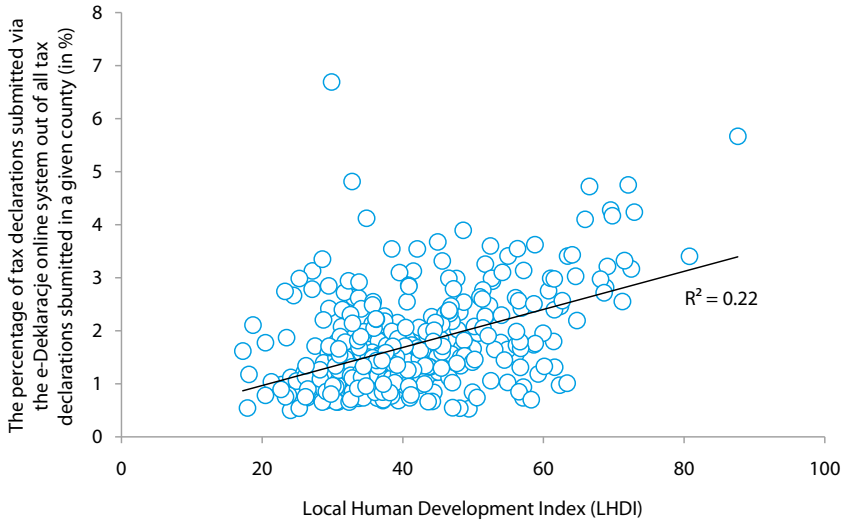
Local authorities play a key role when it comes to the redistribution of basic goods and services (Dragu & Rodden 2011). In Poland, particularly important are the tasks of municipalities, related to allocation of the means from social welfare and employment opportunities in their offices. The projects implemented by municipalities are also much more visible to an average citizen. Greater commitment to voting in counties with lower levels of human development is therefore not surprising. It can be explained by rational strategic choices and the perception of a larger impact on the local authorities of a local community.

5.5 Digital engagement

Digital transformation is now one of the key drivers of Polish modernisation. The popularisation of Internet technology has the opportunity to radically change the way business and administration operate, and to engage citizens in the democratic process (Batorski et al. 2012) as well as help in reducing the development disparities on a national level and between cities and the periphery (Zerka 2012a). One of the key factors for inadequate use of digital technology in Poland is relatively low GDP per capita, which translates into opportunities for investment in ICT (*Information and Communication Technologies*), and still a low level of digital literacy (Zerka 2012b). However, regardless of this factor and of the problems associated with the availability of infrastructure, the current level of Internet use is affected by low skills, needs and motivations (Batorski & Płoszaj 2012). It results from the absence of effective mechanisms to build a system of digital literacy in formal and informal education (Ministerstwo Administracji i Cyfryzacji 2012) and the deficit of relevant content and services tailored to the needs of existing and potential users. People from small towns and villages have problems with access to the official circulation of culture and cultural heritage because of the lack of shops and institutions in their vicinity, which is offset by access to the Internet (Filiciak et al. 2012). Many people, however, do not see any reason to use the Internet and other digital technologies - even if they have access to them. The role of the state is developing tools to stimulate the demand for digital services on the one hand, and the supply on the other hand, taking into account the practices of those already involved in the digital society (Hofmokl et al. 2011). For them, the Internet has become an everyday tool for performing duties at home or work, and a way to spend free time. They use intermediary services for purchases and non-commercial exchange on the Internet; they read the news updated around the clock on an on-going basis; they watch movies and other audio-visual content (including TV programmes) that are available to them, regardless of time, place or type of the receiver. For this part of the population connected to the Internet,

the computer is an electronic device second only to TV – and for the younger generations equally important as cell phones (Szafraniec 2011). User behaviour has an impact on the shape of services and content offered on the Internet. For example, in recent years, the so-called social networking grows dynamically, and with it, the extensive social networks, superimposed on digital networks which constitute a basis for them. Thanks to this, the digital media is becoming a tool for social mobilisation and collective civil or political action.

Graph: 5.6 The relationship between the percentage of tax declarations submitted via the e-Deklaracje online system out of all tax declarations submitted in a given county (in %) and the value of the Local Human Development Index (LHDI) in 2010, by counties



Source: Own study based on the Ministry of Finance data.

The role of the internet can be compared to the role of banking in the modern post-industrial economy. Without it, a significant part of the economy would not function. Today, the Internet is a synonym for openness, creativity, and interdependence (Świeboda & Petru 2012).

From this perspective, many important changes took place before our eyes, at least as evidenced by the involvement of many people in the protests against the introduction of ACTA in Poland. Although the indicator measuring the digital activity tested in this analysis – the incidence of submitting a tax declaration through the Internet – can be regarded as imperfect, it is the best feasible way to reflect both skills and access to technology. The correlation coefficient of the index with LHDI is 0.465 – a moderately strong relationship which shows that human development is usually associated with digital skills and access to new technologies. The biggest number of online tax declarations was submitted in Elbląg, although this is not the place with the highest level of human development. The second biggest number was submitted in Warsaw, where the level of human development is the highest. In other counties, there is a significant diversity, which makes it impossible to precisely determine which regions (with high or low level of human development) are more probable to become highly digitally active.

Nearly two million Poles benefited from the possibility of submitting the tax declarations via the Internet in 2010 (PIT-36, PIT-36L, PIT-37) and it is still not much. The Internet influences the emergence of a new type of business, both in traditional and emerging areas of the economy. A number of new

sectors of the economy is growing only because of the Internet, such as e-commerce, e-services, e-health, e-education, e-culture, e-media, etc. (Świeboda & Petru 2012). The digital economy has a significant impact on GDP growth. The size of the Internet economy in Poland is estimated at around 2.7% of GDP (Cimochowski et al. 2011), which means that it plays a similar role as European funds. The Internet can, as part of strategic planning, work to ensure the territorial cohesion of the country, inter alia, by increasing community involvement in the emerging new media, such as "technically involved citizens" affecting the local environment through new portals in the peripheral parts of the country (Danielewicz & Mazurek 2012). An important role at the local level can be played by the development of e-government. On the one hand, it allows for exploiting the potential of information and communication technology to increase the efficiency of the offices and other local institutions. On the other hand, digital media offer new possibilities of public participation in decision-making processes, also at the local level. It is enough to mention live online transmissions of municipal and city council meetings which are nowadays gaining in popularity (Płoszaj et al. 2012). It may also increase transparency by making sure important policy discussions are widely visible to the public.

5.6 Protecting the natural environment

The significance of environmental protection in development policy and in the practice of public intervention is undeniable now. The turning point was the Earth Summit of 1992 when representatives from more than 170 countries decided on the need to take into account environmental aspects in thinking about development. Agenda 21, the global action plan, which summarized 2.5 thousand recommendations for the direction to follow in order to achieve sustainable and balanced development, was elaborated back then. One of the chapters of this document was devoted to the development of indicators that take into account not only the socio-economic aspects of development, but also the environmental implications. Poland took an active role in these events, being one of the countries most affected by pollution. The collapse and restructuring of the industry during the transition period allowed Poland to improve its environmental performance, thus becoming a beneficiary of the Kyoto Protocol. Currently, the economic rent resulting from the political and economic changes in the last 20 years is running out, with decision-makers facing the challenge of developing an integrated environmental policy. The list of issues that arise in public debate ire long and includes energy efficiency, the development of renewable energy sources, noise reduction, the creation of national parks and finding solutions to waste disposal.

In its recent publication on sustainable development, the Central Statistical Office (GUS 2011) lists different categories of policy frameworks which should be integrated in order to talk about sustainable development. This means the consistent combination of various dimensions such as: social, economic, environmental, and political-institutional, based on ethical and moral frameworks. The integrity of policy frameworks is achieved through balanced combination of different kinds of capital – the natural environment, social and human capital and man-made capital. Social development is the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (Brundtland 1987). This approach is consistent with the one presented in this report.

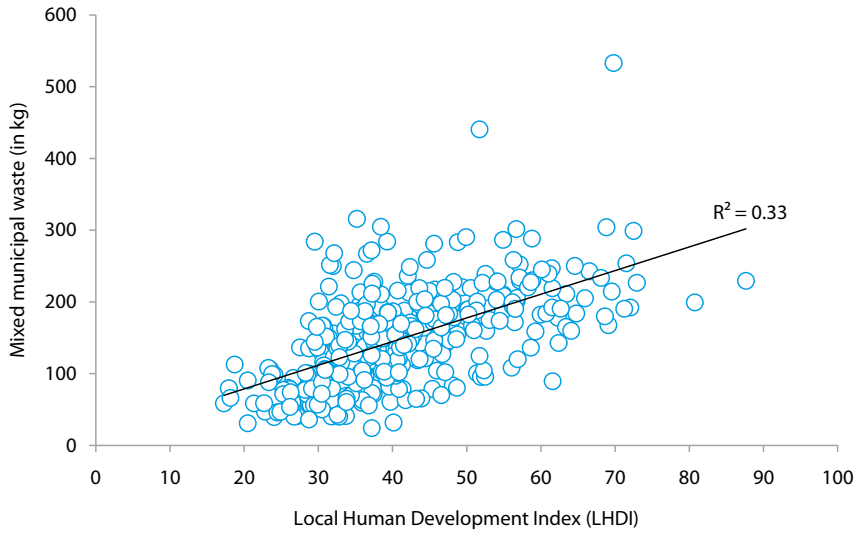
Many environmental problems are supra-local. Air pollution from local plants move freely across administrative boundaries, and global trade links move consumers away from production sites which emit fumes. However, there are issues that can be resolved locally, with an active participation of local governments and residents. An example of such activity is the management of municipal solid waste and sewage. As far as reducing the amount of untreated sewage is concerned, Poland

has made considerable progress in the last few years, still the issue of waste remains a pressing problem. Approximately 80% of the collected municipal waste goes to landfill without segregation, which equals a loss of raw materials, energy and space (Ministerstwo Środowiska & Ministerstwo Gospodarki 2011). In the medium-term National Development Strategy 2020, it is stated that the primary objective of the policy in this regard should be to prevent waste production and maximise recovery of materials contained therein and/or energy (Ministerstwo Rozwoju Regionalnego 2012b). Thus, the indicator representing the environmental aspect chosen in this study is **mixed municipal waste collected from private households, per capita** (data from the Local Data Bank of the Central Statistical Office).

The indicator used allows assessing how much waste produced by households is collected and indiscriminately disposed. In practice, the unsorted waste effectively prevents the recovery of raw materials, and the energy recovery is performed in Poland on a very small scale – in 2010, only one municipal waste incinerator was operational in the country. The vast majority of non-selectively collected waste goes to landfill. This form of disposal contributes to the pollution of air, land and water on a large territory, it is also proof of inefficient management of resources and space (Keating 1994). The percentage of reduction of landfilled municipal waste is one of the indicators proposed in the Strategy for Energy Security and Environment (Ministerstwo Środowiska & Ministerstwo Gospodarki 2011). A similar requirement is imposed by the EU directive on waste; the European Commission threatened Poland with a high financial penalty if the implementation of its provisions is too slow.

The legal changes in the area of waste management planned for 2013 are to help in the implementation of strategic objectives and requirements of the EU. The new regulations will allow municipalities to take control of waste and manage them in their area, which in practice shall contribute to reducing the amount of waste going to landfill. All the inhabitants of the municipality will pay a fee set by the municipality for waste collection, decreased if one self-sorts. The new legal Act will seek to limit illegal disposal or burning of garbage, the idea is also to allow better control over the activities of waste recycling companies and to facilitate the logistics of the operation.

Graph: 5.7 The relationship between the amount of mixed municipal waste collected from households per capita (in kg) and the Local Human Development Index in 2010, by counties



Source: Own study based on the Central Statistical Office data.

The relationship between the quantities of mixed municipal waste and the value of the Human Development Index Local is clearly positive – the correlation coefficient is 0.58 for counties. The amount of waste collected is even more closely associated with the level of urbanisation (0.70). The better position of rural areas where less waste is produced, can be associated with a relatively easy disposal of waste outside the official system, e.g. by burning it in a furnace or composting organic waste. The juxtaposition of LHDI scores with the environmental indicator suggest that the spatial distribution of the level of human development is not the same as the distribution of sustainable development. It can be assumed that a high level of human development is achieved, inter alia, at the expense of the environment, with stronger pressure on the latter.

The result points out two difficulties, of methodological and of a practical nature. The first challenge is to capture environmental issues at the local level. The problem is in the inadequacy of administrative boundaries in relation to natural phenomena and the trans-local nature of these phenomena. For example, in the ranking of counties by air pollution, the first place will be occupied by these local units where the facilities of supra-regional importance are located (e.g. power plants), while the pollution itself will significantly affect the environment within a radius of several dozen or even hundreds of kilometres. The practical difficulty concerns the challenge of finding a path of development that will combine a high standard of living (as measured by the HDI for example) with the sustainability of the environment, which is the basis of life. Therefore, at the local level, environmental footprint indicators that are derived from the level/style of life seem to be the most appropriate – local decision-makers should focus more on this area. Environmental indicators are not useful in comparing the situation of different functional areas (e.g. urban and rural), while response rates should complement pressure indicators – and not vice versa, as it is now.

5.7 Women's empowerment

Gender equality is enshrined in international human rights standards since the creation of the Universal Declaration of Human Rights. Today, the importance of balancing the status of men and women is also highlighted by theoretical and practical issues involved in development. But it has not always been the case. Suffice it to say that women were granted political rights, especially voting rights, at the beginning of the twentieth century – for example, in the U.S. in 1920, and in Poland a little earlier, in 1918. Even though gender equality can be traced to the enlightenment and humanist ideas of the French Revolution, the key role was undoubtedly played by emancipation movements, developed since the eighteenth century. The place and role of gender equality in contemporary Western societies undoubtedly affect various processes of social, political, economic and technological character – for instance, the Industrial Revolution has played an important role. It should also be noted that contemporary gender equality is treated as a factor contributing to the development, with Scandinavian countries exemplifying this correlation (Johnsen 2012). The level of gender inequality varies considerably between different countries in the world, both in terms of legislation and actual facts. This issue, however, is not the subject of this study, and those interested can find many publications on this subject, such as the UNDP website dedicated to women's empowerment (UNDP 2012).

In developed countries, despite the prevalence of the idea of equality and a number of legal guarantees for it, the reality is far from the expected ideal. This is apparent in particular on the labour market. It is still a common practice to reward women less than men, even if they perform the same tasks and occupy the same job positions as their male counterparts (this phenomenon is called the *gender wage gap*). Other phenomena associated with discrimination on the grounds of gender in the labour market are also known and widely discussed, e.g. "sticky floor" and "glass ceiling". The former relates to the

situation when a woman performs poorly paid, low prestige and basically dead-end jobs and occupations. Currently in Poland, the leading example of this phenomenon are supermarket cashiers or clerks. The phenomenon of the glass ceiling means that the promotion to high levels of occupational hierarchy is much more difficult for women possessing the necessary qualifications and experience. It is clearly visible at the highest level of business - management boards and supervisory boards of public companies in the vast majority of cases consist of men. The same applies to the highest political positions.

These phenomena are not only contrary to the ideals of equality and justice, but it can also be argued that they have adverse implications for economic and social development, as the potential of women is not fully exploited. In Poland, women are better educated than men. In addition, research conducted in the private sector shows that companies in which more women are leaders, achieve better results (Deloitte 2010). Consequently, the mainstreaming of gender equality and empowerment of women is crucial to measure human development. The issue of gender equality is one of the key horizontal issues to be considered by UNDP within the scope of pro-development activities. In the study of human development, this perspective is taken into account in the Gender Inequality Index (GII), based on the same assumptions as HDI. GII shows the differences in the distribution of achievements between men and women in the areas of health, empowerment and the labour market. The issue of de facto gender equality is in fact an integral factor to be taken into account when talking about economic development, democracy, the functioning of political systems and sustainable development. Unfortunately, the synthetic approach to this aspect within the scope of LHDI in Poland poses significant problems, of which the lack of adequate data is the cause. First of all, it should be noted that we do not have statistics on the level of municipalities and counties, describing the income of the population based on gender. Assessment of possible spatial differences in the labour income gap between the sexes is thus impossible. However, one can take a look at another very important aspect of the functioning of local communities, such as women's participation in universal elections to municipal and county councils.

The data discussed in the following section represents the percentage of seats in municipal and county councils held by women. The analysis was carried out at the level of counties, i.e. data for all councils in the county was pooled (in the case of municipal counties, of course we have to deal with only one council). Looking at the composition of councils selected in 2010, we see a very large variation between counties. The percentage of mandates accorded to women has a value from a few per cent to a maximum of 44%. We have to note that there are no counties in Poland (or municipal counties), where women would constitute more than half of the councillors. What's more, there are only 35 counties where women represent more than one third (33% or more) of councillors. At the same time, the percentage of seats for women of less than 20% was observed in 87 counties. The average for voivodeships ranges from 24% in the West Pomeranian, to 39% in the Lesser Poland. This data indicates that it is hard to talk about real gender equality in this regard.

The importance of women's empowerment for human development is unquestionable. However, based on the data we have, one cannot find a statistically significant relationship between the percentage of women in municipal and county councils and the level of human development at the local level. It must be noted that the participation of women in decision-making processes is only one of the indicators of the degree of equality in the distribution of achievements between women and men, in addition to issues such as control over resources, education, health (including reproductive health), and others. It is therefore not advisable to provide conclusions on the relationship between human development and gender equality based solely on an analysis of empowerment defined as the percentage of women in municipal and county councils, one should also take into consideration other dimensions of gender equality.

6. Conclusions and recommendations

1. In Poland, the highest level of human development occurs in large cities and in their surroundings.
1.1 Large cities are beneficial for a high level of human development. Not only do people there have the highest income, but also better access to public services, students perform better and the life expectancy is longer (e.g. Rzeszów).

Recommendations:
1. It is necessary to adopt laws allowing the creation of functional metropolitan areas. These laws would make it easier to coordinate public transport, the development of transport infrastructure and environmental protection, and help ensure spatial coherence, effectiveness of the system of benefits and public services, environmental protection infrastructure and cultural infrastructure.
1.1 Speeding up the development of infrastructure that integrates metropolitan areas with their surrounding should contribute to raising the quality of life in metropolitan areas. It should include: public transport, water and wastewater infrastructure, telecommunications infrastructure and leisure facilities (also cultural industries, etc.). The actions should be taken as soon as possible concerning wastewater infrastructure and telecommunications; in the medium and long term, the actions concerning the development of an inclusive metropolitan public transportation system should be continued.

2. The lowest level of human development occurs in rural counties. Most of the areas with the lowest LHDI are located in the territory of the former Russian partition, which can be linked to their peripheral status (remoteness from engines of growth or vibrant metropolitan centres) – both hundreds of years ago and today. A long tradition of dominance for agriculture in the areas' local economies also contributes to their low level of human development.
2.1 The differences between rich and poor counties are growing – this can be seen via their differences in their level of human development.

Recommendations:
2. Less developed rural areas should be linked with regional and local growth centres, i.e. the medium-sized cities, which in turn should be linked to major cities and metropolitan areas. The development of networks of cities should be supported – the increase of the potential of: labour (access to labour from rural areas); educational, cultural and social institutions; and transport infrastructure, will be beneficial to peripheral areas.

2.1 The modernisation and restructuring of agriculture and its productivity is conducive to rural development. It should be obtained by:

a) an increase in the competitiveness of the agri-food sector, which can be achieved by, among others: the implementation and promotion of innovative solutions, development and improvement of the research infrastructure, development of consulting services or investment in agriculture,
b) structural change of the agricultural sector, which can be achieved by, among other policies: a mandatory accounting for taxes and insurance, improved agrarian structure in agriculture (the increase in the average size of farms and the reduction of employment in the sector), improving the organisation of agricultural producers and logistics in the agri-food chain (including the development of wholesale markets),
c) improving education in rural areas, while improving the quality of vocational and technical training, adapted to the needs of the local labour market,
d) the improvement and development of transport infrastructure,
e) technical, educational and legal support for people working remotely and commuting to work.

3. The level of human development depends not only on the income and wealth of the inhabitants of counties. The level of human capital is also very important, which depends mainly on health and knowledge.

3.1 The health level in Poland is also clearly differentiated regionally; it is higher in the south-eastern part of Poland, and worse in the central part of Poland. Rural and agricultural areas, inhabited by an aging population, are the worst in this respect. Some of these areas are transformed as a result of suburbanisation – the influx of new residents who commute to work in a nearby city, which seems to entail the improvement in health indicators. It consists of both the relative wealth of people, as well as better access to health care, located in the city in which they work. In wealthier areas, mainly in big cities, determinants of health are changing – particularly the roles of social cohesion, a clean environment and stress are increasing.

Recommendations:

3. Development policy should take into account the crucial importance of human capital (also in terms of public health) for economic and social development. It is addressed in the Human Capital Development Strategy of the government and requires concerted actions along several dimensions. Improving health status is definitely one of them. While pursuing policies aimed at improving health, determinants differentiating health levels by region should be taken into consideration. Three types of areas are particularly distinct – poorly urbanised agricultural areas, areas where the processes of urbanisation take place, and relatively affluent areas. As part of these activities, efficient spending should be adapted to the needs of regions, together with the promotion of healthy lifestyles and medical check-ups. The regionalisation of the health care system and the introduction of performance evaluation of service providers at every stage of treatment should be considered.

3.1 Health education is an important element for preventive measures. It is important to continue the pro-health projects in primary and lower secondary schools (promoting the consumption of milk, fruit, etc.) and to maintain attractive and varied physical education classes. Investing in health awareness and education from the very beginning is necessary in order for future generations to be healthy and better know how to respond to potential diseases.

3.2 Constantly building and expanding the knowledge a person has and uses in daily life is another important aspect of human capital stock accumulation. This is equally important both for children and adults. From a human capital perspective it is important to secure access to education at all ages through quality early years of education and continued involvement in gaining new knowledge through Lifelong Learning Programmes. In regards to early education, it is necessary to:

a) ensure that all children have access to good quality education, including early childhood education for kindergartens;
b) personalise the learning process, so that it is tailored to the needs of different students and allow for greater cooperation with parents;
c) provide equal opportunities to study for people with different socio-economic status through the development of scholarship programmes and loans.

In regards to adult learning, it should be seen as an important tool for "extending" the productive age of a person and as an opportunity for the inter-generational transfer of knowledge and skills. Lifelong learning should be also seen as an integral part of the future social security and pension systems reform. Ideally it should be integrated with professional qualifications and an upgrade in various forms of distance learning (*blended learning* and *e-learning*).

3.3 Active Social Policy mechanisms in Poland, understood as providing equal opportunities, and not just income from social transfers, should be used as a tool for building human capital. In this regards, priority should be given to employment as a viable form of social inclusion (from *welfare* to *workfare*) with benefits going far beyond incomes. Incentives should be introduced to make mobility between regions easier (supporting the development of the housing market, to transport infrastructure, to supporting the development of ICT – remote work) in order to be able to work in accordance with competences, regardless of the place of residence.

4. Digital engagement is not directly correlated with the level of human development in regions – even in the poorer parts of Poland, the Internet is actively used. This begs the question of whether the different populations possess the competencies to use the internet most effectively for human development or is the Internet in some areas unavailable. The part of the society that possesses competencies Part of the society possesses competencies which are not being used to their fullest potential because of human capital constraints. It means lower levels of human development have been a factor slowing down digital engagement. It also means that the potential digital engagement has for boosting human development in the regions is still untapped. Previous studies in this field confirm that an Internet connection may increase development chances at the national and international level for the area and the people living there.

Recommendations:

4. In order to increase the endogenous growth potential of regions, it is necessary to invest in telecommunications infrastructure and the development of digital competencies of both older and younger Poles.

4.1 It is necessary to expand wireless Internet access, and to made unlimited broadband available in the entire country, but particularly in less urbanised areas. Properly used technologies can be an important factor of human development change in peripheral areas.

4.2 In order to tap the potential of the digital revolution for entrepreneurship in the peripheral areas, it is necessary to align copyright and intellectual property rights with the conditions of a networked society. The key issue is to establish fair use and not to block the flow of information, including the cases of cloud storage of information and the operations performed on potentially sensitive data.

5. Socio-economic disparities between regions are an inevitable phenomenon, rooted in long-term processes, usually taking decades and not a few years. Due to the short time-frame of the analysis based on the data from the period 2007–2013, there are no firm conclusions regarding the impact of the cohesion policy funds on the level of development of regions.

5.1 Spending European funds on basic infrastructure at the national and interregional level makes it difficult to assess the impact of the intervention on human development. Based on the available data, it cannot be inferred that the funds spent within the scope of most operational programmes (except for the Human Capital Operational Programme) were associated with the level of human development within the territory.

Recommendations:

5. Funds spent from the Operational Programmes should be studied further for the directly observable effects of the intervention. It is necessary to further analyse the structure of projects and the areas and types of actions under all operational programmes. The establishment of a task force that would create and introduce conversion algorithms for national-level infrastructure investments on a lower territorial level should be implemented. It seems necessary to create a consistent system of evaluation based on the data on financial flows, the benefits in terms of employment, the discontinuation in use of social assistance and the duration of the project, with the use of administrative records from the Social Insurance Institution, Ministry of Finance, Ministry of Labour and Social Policy and the Ministry of Regional Development.

5.1 In order to fully assess the support for remote areas, the eligibility for the CAP support for the smallest farms should be reviewed. It is also necessary to evaluate support mechanisms, such as diversification and retraining support, as well as direct financial incentives for those handing over their farms, e.g. via modified structural pension schemes supporting those who want to give up agricultural activities.

5.2 It seems important to improve the accessibility of Poland's remote regions by creating a sustainable, coherent and user-friendly transport system at the local, regional, national and European level. Improved transport infrastructure and well-developed public transport can contribute to the diffusion of growth effects by facilitating access of inhabitants from remote areas to more developed labour markets and higher quality services (education, health, culture, etc.) provided at regional and sub-regional centres.

5.3 The institutional efficiency of local governments should be increased, with more involvement in the programming and management of development policies at the local level, e.g. by increasing their financial independence and by making better use of the results of the public debate on the system of local government units run by the Ministry of Administration and Digitization as a source of inspiration for local solutions to local problems. The key idea is also to create conditions for the emergence of a "smart system", i.e. one that has the ability to enhance the quality of its own operations by acquiring experience, creating best practices and sharing them within the union of government units and the Joint Commission of Government and Local Government.

6. The study confirmed a strong correlation between the level of human development and expenditure under the Human Capital Operational Programme. Investments in education and skills are one of the most important factors in increasing the income and health of people in a community.

Recommendations:

6. Continue investing actively in human capital stock by improving the education system in rural areas. This can be achieved, inter alia, by improving the quality of vocational and technical

education adapted to the needs of the local labour market. The introduction of a dual vocational training system based on the ESF resources and family businesses should be considered. Support for people working from a distance, including technical, legal and training assistance and the use of the ESF resources.
6.1 Educational policy and labour market policy should be implemented at the regional level and, above all, should complement each other. It is necessary to integrate educational systems (especially for the secondary and upper school levels) with the needs of regional labour markets. Regional Labour Market Observatories should be used for this purpose, in order to conduct regional human resources forecasts at least once every five years.
6.2 It is worth allocating more European funds to projects related to innovation and R&D, and to innovation arising in particular from cooperation between science and business.
6.3 Instead of financing investments from direct payments under the Active Labour Market Policy, it is better to invest in equity of a newly formed company open by the person being "targeted". It is necessary to determine the marginal efficiency of investment (the rate of return is computed as the rate at which the expected stream of future earnings from an investment project must be discounted to make their present value equal to the cost of the project) – such a change would result in a significant increase in efficiency in the distribution of funds.

7. There are visible examples of negative demographic changes associated with the aging population that occurs in certain urban areas, and especially in some eastern regions of Poland. This population ageing increases important categories of expenditure met by public finances, which could eventually lead to bankruptcy for some local governments. The case of Łódź is particularly noteworthy, with its population ageing disproportionately fast. In the analysed period, there has been a significant increase in the mean age of the population, given that people of working age are leaving the city. The economic potential of Łódź, as a large city has been so large that its position compared with the rest of the country in the LHDI ranking has increased the most despite the an aging population.

Recommendations:
7. The largest area of expenditure in many counties is now health care, whose cost is likely to increase dramatically as populations age. This would present the central government with hard choices between higher taxes, including a possible reweighing of tax from earnings to consumption, and a reduced government role in providing health care.
7.1 The central and local governments must act to prevent tipping social and economic balance due to the likely overlap of financial and population problems, resulting from the population aging. Profiling may be a chance to attract people to the city, including those for whom the suburban zone ceases to be attractive. Possible actions can include:

a) making urban life attractive and thus competitive in terms of living costs and other aspects for elderly people;
b) adjusting the living space to the specific needs of its potential residents from different parts of the agglomeration, including downtown (the elderly, the single persons, the temporary residents: students and temporary staff);
c) the preference for types and forms of building, which provide adequate population density (multi-family housing, low-rise built-up areas with high density).

7.2 Improving access to public services (education, health, culture and tourism) tailored to the needs of an aging population. Efforts should focus on increasing the efficiency of service delivery and sharing, and on improving quality. This can be achieved, inter alia, by outsourcing services via private entities and by the development of e-government within the new financial perspective.

8. Another conclusion, resulting from the study, is the need to improve the rules for data collection and processing by Polish public institutions. The data is often unstructured, and the databases, even within a single institution, are not always compatible with each other.
8.1 The interpretation of the notion of data protection by the Inspector General for Personal Data Protection prevents linking repositories of Syriusz (labour market policy), Empatia (social policy), Social Insurance Institution (social insurance and sickness), data on income (from tax declarations), property (real estate database conducted by the governors), health and illness (National Health Fund) and the SIMIK National Information System (projects realised with cohesion policy funds).
8.2 There are no publicly available – and with the possibility of reusing them – knowledge repositories listed in the previous section. Some governments (including the UK and the U.S.), by opening their knowledge repositories, have created completely new sectors of the economy, based on the data available.
8.3 There are no databases available to the wider public that contain the Central Statistical Office's unidentified individual data necessary for *evidence-based policy* – however, changes are planned in this area.

Recommendations:
8. The amount of public resources available online (such as information resources) in order to ensure the supply of high-quality content should be increased. For that purpose:

- Open standards for sharing public information should be developed, taking into account legal, technical and financial aspects, to ensure, among others, possibilities for automated information processing.
- Clear rules of re-use of public information, including a repository system providing public information resources (ie. official statistics) in an open and standardised manner for all entities, should be introduced.
- Existing public resources from the sphere of education, science and culture, including public media resources, should be shared, in accordance with the standards of openness. The same applies to the outcomes of the digitisation of the content of public programmes, academic institutions and R&D programmes financed from public money, and the resources of public statistical institutions and administrative registers.

8.1 Personal data protection laws should be harmonized and administered to the benefit of the end user. The continued legal uncertainty and inconsistency may discourage users from using the products and services offered on the Internet, thus limiting the economic development in Poland, as well as the use of data in public policy. It is advisable to consider the creation, at a later stage, of an independent analytical entity at the government level, in order to prepare forecasts and assess the impact of regulations, similarly to the Government Centre for Strategic Studies (which existed until 2006) using administrative knowledge repositories and statistics. Such a new analytical body should have the authority to use all the individual data from administrative records along with the ability to combine them between sources.
8.2 Clear rules should be introduced to ensure that the public resources and assets financed with public funds, which will be created in the future, will comply with the standards of transparency for public resources.
8.3 It is necessary to create a central registry of health information on public health (morbidity, mortality, hospital admissions, and the time required to perform specific diagnostic tests for various diseases, as well as the use of medications). This registry is necessary for increasing the efficiency of the health system. It is not just about limiting the opportunities for the misuse of funds and frauds, but also about limiting the opportunities for medical service price inflation and unnecessary treatment that is sub-optimal for the taxpayer.

9. Data collected during this research allows for broadening and deepening the knowledge about human development in Poland. The study reveals a picture of regions and counties, which is not obvious and often counterintuitive from purely an economic-driven perspective. A subset of territorial units whose rank was particularly low or particularly high, requires additional analyses (examples: Łódź, Suwałki County, Pińczów County). It should be explored in more detail why some counties or regions have a particularly low or high dynamics of human development, which may be a residual of a variety of unaccounted factors (like the specific type of investment, such as construction of a new specialised hospital or new communication links).

Recommendations:

9. More detailed qualitative research for areas that are "outliers" in terms of the level of human development should be conducted. The factors that cannot be observed by the quantitative data should be analysed in detail; these factors could affect the health, education and the level of wealth of the county. It should also be verified which public interventions, according to the opinion of local governments, are most closely associated with the level of human development in the area.

9.1 A subjective quality of life analysis should be performed, to be later verified with the observed results of this study on human development, in order to have a comprehensive picture of the development of Poland at the local level. Citizens' opinions are important to assess which public interventions or external factors have the greatest impact on improving their quality of life. A specific survey concerning the quality of life was carried out by the UK Office for National Statistics whose experience in this area can be used; in 2012 it published the first national well-being survey covering every county.

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Annex 1. Table of indices used

Index	Method of calculation on the county level	Data availability	Data source
Gross income per capita	The sum of total income of taxpayers before tax (tax returns: PIT-36, PIT-36L, PIT-37) plus income from agriculture based conversion hectares (income of municipalities from agricultural tax divided by the amount of tax per conversion hectare multiplied by the average income from 1 conversion hectare of individual farm operations that are the basis for agricultural land tax).	Since 2004	Ministry of Finance Central Statistical Office
Transfers of social benefits per capita	Total expenditure on social assistance and on other social policy tasks: the sum of social benefits and family policy expenditure in the budgets of local governments (municipalities and counties), excluding benefits paid due to natural disasters, divided by the number of inhabitants of the county.	Since 2004	Central Statistical Office
Percentage of children attending preschools (age range of 3–4 years)	Ratio expressed as a percentage of the number of children aged 3–4 years attending pre-schools in the county out of the total number of children aged 3–4 years in the county.	Since 2003	Central Statistical Office
Mean score for lower secondary school exam (mathematics and natural sciences)	The deviation from the national average (Poland = 100) of the results from the lower secondary school exam, mathematics and natural sciences, for a given county.	Since 2002	Central Examination Board
Life expectancy of a newborn	Average life expectancy calculated on the basis of Central Statistical Office data for the sub-regional level (NUTS-3). Based on indicators calculated by the Central Statistical Office of life expectancy divided into rural and urban areas, and for men and women, the average life expectancy in the counties was estimated. The estimates are based on the degree of urbanisation of the county. Rates for women and men were aggregated based on the sex ratio of newborns in Poland for a given year.	Since 2007 for NUTS 3	Central Statistical Office
Aggregated cardiovascular diseases and cancer mortality rates per 100,000 people	Total number of deaths from cardiovascular diseases and cancer per 100,000 inhabitants of the selected area. To minimise the impact of unexpected events, the result for the given year is the arithmetic average of the years x, x-1 and x-2.	Since 2007	Central Statistical Office
Total public expenditure for LAU level 1 per capita without EU funds	Total expenditure from the budgets of municipalities and counties, in a given county, without budget items financed from EU funds in the budgets of local governments, divided by the number of inhabitants.	Since 2006	Central Statistical Office, according to the Ministry of Finance
EU funds in the budgets of local governments per capita	The sum of budget items financed from EU funds in the budgets of local governments (municipalities within the county and county) divided by the number of residents.	Since 2006	Central Statistical Office, according to the Ministry of Finance
Pupil-teacher ratio (primary and lower secondary schools)	The cumulative number of pupils in primary and lower secondary schools, divided by the cumulative number of teachers in these schools for a given county.	Since 2007	Ministry of National Education
Education expenditure per pupil (primary, lower secondary, secondary schools and preschools)	Total local government expenditure (municipalities and counties) on education divided by the number of pupils/students (kindergarten, primary schools, low secondary schools, secondary schools) for a given county.	Since 1995	Central Statistical Office
Number of doctor and dentists, according to their normal place of work, per 100,000inhabitants	The number of doctors and dentists, according to their normal place of work in health care facilities. It does not include facilities formed by the Ministry of National Defence or the Ministry of the Interior and Administration , people working for: the National Health Fund, public administration, higher education; regardless of the type of contract under which the work is carried out (for example, a contract of employment, civil law contract, including mandate contract) and working time. According to the normal place of work – an employee for whom the reporting entity is the main place of work declared by the employee. These persons, regardless of the number of working hours, are counted once per 100,000 residents in the county.	Since 2006	Central Statistical Office

Index	Method of calculation on the county level	Data availability	Data source
Number of nurses and midwives, according to their normal place of work, per 100,000 inhabitants	The number of nurses and midwives (including those holding an MSc degree) according to their normal place of work in health care facilities. It does not include facilities formed by the Ministry of National Defence or the Ministry of the Interior and Administration , people working for: the National Health Fund, public administration, higher education; regardless of the type of contract under which the work is carried out (for example, a contract of employment, civil law contract, including mandate contract) and working time. According to the normal place of work – an employee for whom the reporting entity is the main place of work declared by the employee. These persons, regardless of the number of working hours, are counted once per 100,000 residents in the county.	Since 2006	Central Statistical Office
Mixed waste collected during one year	Mixed municipal waste collected from households is the waste collected during a year, without waste collected separately and selected from fractions of dry matter per capita in a given county. In tons.	Since 2005	Central Statistical Office
Share of people in households benefitting from community social support in the total population	Ratio expressed as a percentage of the number of persons in households benefiting from community social support out of the total population of the county.	Since 2008	Central Statistical Office
Average number of years of education required to reach the level of attained education for adults of over 25 years of age	Total number of people over 25 years old with a given level of education multiplied by the estimated time required to complete a given school, divided by the number of people aged 25 and more. A simplified projected path of reaching the given level of education: higher education – 17 years, post-secondary education – 14 years, vocational secondary education – 12 years, vocational education 12 years, primary 8 years, incomplete primary – 6 years. Years of education, based on regulations valid in 2002 for persons of 25 years and more.	Only for the year of the National Census (2002)	Central Statistical Office
Registered unemployment rate	Ratio, expressed as a percentage of the number of people registered as unemployed in the county labour offices out of the number of the civilian labour force (the sum of the unemployed and the employed workers without the employees of budgetary units operating in the field of national defence and public safety).	Since 2002	Central Statistical Office
Voter turnout in local elections	A ratio, expressed as a percentage, of the number of votes cast in the last election to municipal councils out of the total number of persons entitled to vote.	Only for the elections year – data from last local government elections was used (2010)	National Electoral Commission
Percentage of tax declarations submitted online	A ratio, expressed as a percentage, of the total number of tax declarations (PIT-36, PIT-37, PIT-37L) submitted online (via e-Deklaracje online system) out of the sum of all tax declarations (PIT-36, PIT-37, PIT-37L) submitted in a given county.	Since 2009	Ministry of Finance
Number of seats held by women in local governments	A ratio, expressed as a percentage, of the number of seats held by women in the councils of municipalities and counties out of the total number of seats in these councils.	Only for the elections year – data from last local government elections was used (2010)	National Electoral Commission

Annex 2. Values of synthetic indices

Description of the abbreviations:
LHDI – Local Human Development Index
HI – Health Index
EI – Education Index
WI – Wealth Index
$LHDI_{PI}$ – Local Human Development Index – Policy Input
HI_{PI} – Health Index – Policy Input
EI_{PI} – Education Index – Policy Input
LEI_{PI} – Local Expenditure Index – Policy Input

Table 1. Local Human Development Index and its components in voivodeships

LGU Code	Voivodeship	LHDI Rank				LHDI	HI	EI	WI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
02	Lower Silesian	7	7	7	7	46.34	47.61	48.79	42.84	30.57	30.18	35.04	27.02
04	Kuyavian-Pomeranian	13	12	13	13	41.22	49.17	42.31	33.67	27.05	30.36	29.35	22.21
06	Lublin	14	14	16	15	39.55	48.61	46.46	27.40	28.56	36.30	29.54	21.72
08	Lubusz	9	10	11	11	44.36	54.72	47.21	33.79	28.80	29.05	32.60	25.23
10	Łódź	15	16	15	16	39.28	31.48	52.25	36.85	27.14	32.93	29.42	20.63
12	Lesser Poland	2	2	2	2	51.93	69.10	57.65	35.15	28.34	33.02	30.22	22.80
14	Mazovian	1	1	1	1	60.21	58.18	61.68	60.84	35.89	32.71	40.89	34.55
16	Opole	6	6	6	6	46.95	59.76	55.94	30.96	26.53	28.12	32.60	20.37
18	Podkarpacie	10	11	10	10	43.77	72.28	48.15	24.09	29.61	32.87	32.04	24.64
20	Podlasie	8	8	8	9	44.40	66.08	51.60	25.67	30.21	35.61	31.56	24.54
22	Pomeranian	3	3	3	3	51.14	71.28	47.16	39.79	30.16	27.78	34.90	28.30
24	Silesian	5	5	5	5	49.54	48.39	53.92	46.59	27.05	34.58	29.66	19.30
26	Świętokrzyskie	16	15	14	14	36.78	45.95	39.18	27.62	31.94	33.40	34.80	28.03
28	Warmian-Masurian	12	13	12	12	42.33	58.61	41.85	30.93	30.07	28.12	35.02	27.62
30	Greater Poland	4	4	4	4	50.22	63.32	50.19	39.86	24.97	23.56	28.91	22.86
32	West Pomeranian	11	9	9	8	42.89	52.31	42.51	35.48	29.71	32.02	32.79	24.97

Table 2. Local Human Development Index and its components in counties

LGU Code	County	LHDI Rank				LHDI	HI	EI	HI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
0201	Bolesławiec	198	218	234	148	38.03	49.06	39.83	28.15	26.91	24.66	31.86	24.80
0202	Dzierżonów	294	286	285	287	31.92	26.58	46.26	26.46	22.93	20.27	26.94	22.09
0203	Głogów	58	58	57	55	53.91	63.62	44.53	55.32	27.92	21.44	37.63	26.98
0204	Góra	278	279	282	281	33.02	44.08	35.73	22.86	25.82	23.59	29.31	24.91
0205	Jawor	249	292	351	346	35.17	43.72	32.66	30.47	24.98	17.14	36.31	25.05
0206	Jelenia Góra	331	318	274	237	29.49	36.47	27.66	25.41	31.21	23.95	46.66	27.20
0207	Kamienna Góra	300	303	318	268	31.53	44.84	32.07	21.81	22.31	23.84	24.44	19.05
0208	Kłodzko	302	316	336	314	31.39	28.89	40.38	26.51	29.40	27.57	35.14	26.23
0209	Legnica	253	289	259	234	35.08	42.42	29.03	35.06	19.95	7.82	41.87	24.24
0210	Lubań	316	302	313	270	30.65	36.62	28.36	27.71	27.72	22.10	36.75	26.21
0211	Lubin	27	37	30	37	61.45	63.13	55.15	66.64	38.58	42.44	42.23	32.05
0212	Lwówek Śląski	344	356	352	329	28.70	38.44	30.31	20.29	24.69	17.72	36.87	23.04
0213	Milicz	279	297	288	285	32.86	46.94	30.12	25.09	25.41	29.68	24.40	22.66

LGU Code	County	LHDI Rank				LHDI	HI	EI	HI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
0214	Oleśnica	133	122	147	130	42.81	54.04	43.81	33.14	20.78	17.11	25.17	20.83
0215	Oława	77	93	103	90	49.99	57.13	50.20	43.57	19.16	19.22	20.52	17.82
0216	Polkowice	116	89	93	76	44.85	56.89	29.54	53.66	32.29	9.06	67.10	55.40
0217	Strzelin	207	225	264	251	37.42	41.21	33.02	38.50	28.65	20.92	40.20	27.94
0218	Środa Śląska	144	214	209	201	41.70	49.09	35.86	41.18	16.17	8.50	27.89	17.84
0219	Świdnica	227	222	260	230	36.53	36.04	37.28	36.30	21.73	22.48	24.28	18.80
0220	Trzebnica	203	211	241	227	37.63	51.65	29.59	34.87	24.78	20.73	32.48	22.59
0221	Wałbrzych	291	295	319	310	32.12	24.67	38.39	34.98	24.88	34.11	24.39	18.51
0222	Wołów	187	171	254	187	38.54	44.48	39.15	32.88	28.42	25.15	34.11	26.77
0223	Wrocław	60	66	101	77	52.71	60.26	41.98	57.87	21.04	8.49	40.73	26.90
0224	Ząbkowice Śląskie	254	272	353	254	34.94	31.88	45.88	29.17	22.67	13.14	35.47	25.01
0225	Zgorzelec	145	163	193	142	41.57	44.64	37.22	43.23	32.53	27.84	40.11	30.82
0226	Złotoryja	274	374	322	283	33.37	44.71	25.72	32.32	27.21	25.74	31.72	24.66
0261	Jelenia Góra	107	107	113	95	45.69	38.31	63.96	38.92	26.95	38.47	25.60	19.87
0262	Legnica	67	77	69	66	51.72	54.28	59.77	42.64	28.55	39.20	30.71	19.33
0264	Wrocław	14	17	12	10	66.53	56.94	82.43	62.74	42.25	50.41	41.24	36.28
0401	Aleksandrów	324	293	314	345	30.30	35.83	33.71	23.02	29.44	31.56	34.46	23.45
0402	Brodnica	273	258	256	277	33.45	45.48	32.31	25.46	16.55	9.40	23.16	20.81
0403	Bydgoszcz	90	96	96	100	47.83	61.94	40.06	44.10	15.25	6.28	30.59	18.47
0404	Chełm	250	182	243	256	35.16	48.45	31.39	28.58	19.83	17.65	22.98	19.22
0405	Golub-Dobrzyń	304	322	307	288	31.27	49.80	29.49	20.81	24.64	23.47	28.65	22.23
0406	Grudziądz	299	298	334	321	31.68	53.27	23.76	25.13	19.20	10.00	32.32	21.92
0407	Inowrocław	159	150	194	220	40.55	40.74	47.47	34.47	26.98	25.76	29.31	26.01
0408	Lipno	366	358	356	366	24.02	40.02	21.72	15.95	29.02	23.66	35.09	29.44
0409	Mogilno	241	265	287	290	35.80	44.50	38.49	26.80	23.90	22.43	28.67	21.23
0410	Nakło	275	291	273	296	33.12	43.42	31.88	26.24	20.95	16.60	27.90	19.86
0411	Radziejów	339	352	357	349	28.83	35.35	33.73	20.09	25.25	22.19	30.46	23.80
0412	Rypin	354	336	321	357	26.62	36.48	26.46	19.53	26.95	20.71	38.16	24.77
0413	Sępolno	321	341	346	338	30.49	46.12	31.07	19.77	23.29	16.92	30.98	24.08
0414	Świecie	248	228	238	199	35.53	46.50	33.34	28.92	24.98	24.13	29.65	21.80
0415	Toruń	201	208	248	218	37.70	61.40	29.35	29.74	17.08	8.76	29.12	19.51
0416	Tuchola	317	276	295	302	30.62	50.57	27.91	20.35	28.59	19.23	37.70	32.25
0417	Wąbrzeźno	312	329	290	312	30.79	43.84	25.15	26.47	20.25	15.36	25.28	21.39
0418	Włocławek	351	351	359	359	27.14	34.30	29.42	19.80	18.57	9.22	31.00	22.39
0419	Żnin	255	230	261	282	34.85	45.46	37.01	25.16	22.41	16.71	29.97	22.48
0461	Bydgoszcz	51	43	34	30	56.02	51.90	68.61	49.38	30.69	58.34	26.32	18.82
0462	Grudziądz	217	157	174	198	37.16	37.85	41.88	32.37	28.59	45.81	23.67	21.55
0463	Toruń	38	45	28	29	57.17	63.60	63.31	46.39	30.70	44.56	29.06	22.36
0464	Włocławek	140	105	120	126	42.19	44.01	45.18	37.78	34.22	43.02	34.69	26.86
0601	Biała Podlaska	352	360	366	367	27.11	35.24	32.00	17.66	21.22	11.30	33.18	25.48
0602	Biłgoraj	297	296	298	309	31.76	54.93	43.20	13.50	22.86	20.17	27.28	21.72
0603	Chełm	375	375	374	377	20.46	29.67	17.13	16.86	16.97	7.52	32.42	20.03
0604	Hrubieszów	306	345	337	325	31.02	48.23	26.76	23.13	22.33	25.61	28.01	15.53
0605	Janów Lubelski	371	370	364	365	22.78	30.51	30.77	12.60	31.25	32.67	30.37	30.75
0606	Krasnystaw	356	353	350	344	26.39	21.72	35.82	23.63	23.02	27.56	25.63	17.26

LGU Code	County	LHDI Rank				LHDI	HI	EI	HI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
0607	Kraśnik	314	330	327	333	30.73	40.44	42.18	17.01	25.19	25.60	31.03	20.13
0608	Lubartów	336	333	347	318	29.16	33.90	38.71	18.90	24.99	24.58	29.06	21.85
0609	Lublin	270	312	348	308	33.70	43.68	32.65	26.83	19.44	12.59	31.10	18.76
0610	Łęczyca	129	156	172	169	43.37	61.38	40.82	32.56	26.94	18.21	38.83	27.65
0611	Łuków	240	260	263	263	35.84	50.04	44.59	20.63	25.34	22.76	30.55	23.41
0612	Opole	368	363	368	360	23.46	33.42	27.92	13.85	32.08	22.37	41.24	35.80
0613	Parczew	353	365	369	350	26.71	32.38	27.67	21.26	26.88	28.65	29.45	23.00
0614	Puławy	105	100	86	94	45.97	48.77	56.93	35.00	30.54	41.22	30.19	22.88
0615	Radzyń Podlaski	305	327	332	328	31.08	44.00	37.83	18.05	21.94	21.90	24.07	20.02
0616	Ryki	210	198	170	167	37.33	38.89	44.08	30.34	17.97	8.43	31.60	21.78
0617	Świdnik	106	81	114	88	45.77	50.94	50.54	37.24	21.37	22.66	25.77	16.72
0618	Tomaszów Lubelski	318	340	326	316	30.59	44.97	32.20	19.76	28.64	28.25	33.47	24.84
0619	Włodawa	335	334	362	341	29.21	32.00	39.91	19.52	31.84	26.89	37.60	31.93
0620	Zamość	364	369	371	372	24.45	40.28	22.56	16.09	15.81	11.45	26.73	12.91
0661	Biała Podlaska	50	48	48	65	56.05	79.54	64.79	34.17	29.33	68.70	19.96	18.40
0662	Chełm	78	71	62	69	49.91	66.72	56.70	32.86	28.72	55.14	24.32	17.66
0663	Lublin	17	18	19	16	64.57	62.77	86.10	49.80	37.56	84.75	29.10	21.49
0664	Zamość	53	56	49	58	54.89	75.55	66.17	33.09	36.40	82.72	22.18	26.29
0801	Gorzów	142	153	196	147	42.04	55.50	40.61	32.97	28.25	15.12	49.88	29.91
0802	Krosno Odrzańskie	185	189	219	293	38.57	47.90	43.33	27.64	24.84	17.69	34.96	24.79
0803	Międzyrzecz	137	138	153	131	42.46	56.37	43.43	31.27	27.65	32.13	29.65	22.19
0804	Nowa Sól	246	179	184	363	35.64	51.00	34.99	25.36	33.24	34.69	37.02	28.60
0805	Słubice	135	200	228	184	42.55	58.01	45.64	29.10	24.28	19.06	28.40	26.42
0806	Strzelce-Drezdenko	225	263	277	262	36.57	51.65	36.35	26.05	26.39	21.47	34.49	24.82
0807	Sulęcin	230	217	198	176	36.36	45.95	37.61	27.82	31.35	31.36	36.66	26.79
0808	Świebodzin	157	148	144	146	40.68	47.31	40.62	35.03	33.02	36.18	35.66	27.90
0809	Zielona Góra	124	132	136	160	44.09	57.83	41.19	35.98	24.30	15.03	37.31	25.57
0810	Żagań	247	267	265	275	35.59	46.68	36.07	26.76	19.85	12.92	27.72	21.85
0811	Żary	224	199	229	209	36.65	42.78	41.10	28.01	23.09	19.06	29.46	21.93
0812	Wschowa	218	221	270	264	37.12	53.47	38.11	25.11	21.52	15.88	27.90	22.51
0861	Gorzów Wielkopolski	39	61	50	47	57.12	69.33	67.06	40.09	30.04	49.11	24.66	22.38
0862	Zielona Góra	19	20	16	21	63.43	60.32	76.68	55.17	35.84	51.52	31.40	28.45
1001	Bełchatów	85	87	79	80	48.34	46.35	47.93	50.85	39.62	37.24	45.37	36.82
1002	Kutno	293	331	341	330	32.03	26.01	38.01	33.24	24.08	19.66	30.64	23.17
1003	Łask	175	250	171	261	39.31	46.03	46.24	28.55	25.35	31.64	28.60	18.00
1004	Łęczyca	365	373	376	375	24.07	19.56	33.53	21.25	23.82	26.53	28.21	18.06
1005	Łowicz	264	294	280	279	34.08	24.25	56.28	28.99	19.44	14.39	26.99	18.92
1006	Łódź East	147	124	122	149	41.49	36.48	47.86	40.90	15.08	6.68	26.75	19.17
1007	Opoczno	342	332	315	322	28.72	32.86	34.22	21.07	24.61	17.84	31.70	26.37
1008	Pabianice	177	152	149	179	39.24	26.89	58.22	38.61	18.31	22.04	21.46	12.97
1009	Pajęczno	277	275	271	297	33.07	36.90	39.75	24.67	23.07	12.59	42.21	23.10
1010	Piotrków	360	339	354	355	25.97	26.50	29.80	22.17	12.28	3.36	30.46	18.08
1011	Poddębice	350	364	370	371	27.51	37.40	29.12	19.11	30.56	20.16	41.89	33.81
1012	Radomsko	332	325	294	315	29.45	28.00	37.85	24.12	25.44	22.36	30.83	23.89

LGU Code	County	LHDI Rank				LHDI	HI	EI	HI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
1013	Rawa	197	245	224	233	38.15	39.44	48.69	28.91	26.22	21.10	34.75	24.60
1014	Sieradz	226	255	225	225	36.54	44.21	47.41	23.27	27.28	37.31	29.78	18.26
1015	Skierniewice	370	361	355	352	23.24	13.07	37.20	25.80	12.89	3.12	33.12	20.71
1016	Tomaszów Mazowiecki	251	254	226	235	35.12	32.18	46.63	28.88	22.75	16.92	32.16	21.66
1017	Wieluń	242	248	212	228	35.76	34.59	54.24	24.38	25.10	27.47	26.12	22.03
1018	Wieruszów	313	344	329	339	30.75	34.04	40.84	20.91	22.12	12.21	32.08	27.62
1019	Zduńska Wola	122	146	139	157	44.30	51.29	53.29	31.80	23.97	20.79	28.79	23.02
1020	Zgierz	209	210	190	255	37.36	30.89	48.59	34.73	21.61	28.72	24.76	14.20
1021	Brzeziny	311	290	306	335	30.79	31.34	36.65	25.42	21.02	15.82	31.13	18.87
1061	Łódź	115	159	223	317	44.96	25.17	70.90	50.92	29.99	55.28	26.30	18.56
1062	Piotrków Trybunalski	104	103	78	72	46.00	37.80	58.95	43.69	30.96	49.33	27.00	22.27
1063	Skierniewice	54	54	67	61	54.89	43.04	73.28	52.42	28.56	43.90	27.34	19.42
1201	Bochńa	88	88	80	99	48.10	67.11	59.62	27.81	24.57	19.95	30.29	24.53
1202	Brzesko	148	147	142	163	41.34	72.49	51.19	19.04	24.32	23.43	29.78	20.62
1203	Chrzanów	61	52	53	54	52.62	53.61	60.01	45.29	22.18	29.20	25.48	14.66
1204	Dąbrowa	338	350	349	354	28.95	68.90	39.96	8.81	30.12	27.77	32.87	29.95
1205	Gorlice	173	186	179	204	39.35	70.06	47.60	18.27	28.87	26.06	32.41	28.50
1206	Kraków	70	73	83	91	51.38	62.56	51.69	41.95	16.48	9.01	30.01	16.54
1207	Limanowa	236	229	232	274	36.15	78.53	38.79	15.51	27.68	22.17	32.14	29.78
1208	Miechów	347	372	338	307	28.47	21.09	41.83	26.16	27.17	34.68	29.32	19.72
1209	Myślenice	113	108	112	116	45.35	70.28	55.88	23.76	23.11	20.80	28.22	21.02
1210	Nowy Sącz	259	239	245	271	34.43	79.93	33.61	15.19	21.77	13.98	29.37	25.12
1211	Nowy Targ	333	310	328	358	29.45	81.12	36.33	8.67	24.59	24.39	27.35	22.29
1212	Olkusz	59	60	58	63	53.06	59.68	60.45	41.42	24.63	25.89	31.24	18.46
1213	Oświęcim	36	40	40	42	58.62	64.00	68.28	46.08	21.76	25.77	25.77	15.53
1214	Proszowice	269	281	292	269	33.72	46.34	35.95	23.01	29.01	31.68	35.75	21.55
1215	Sucha	194	188	244	238	38.31	62.71	47.44	18.90	23.51	30.00	25.29	17.12
1216	Tarnów	208	253	240	248	37.39	75.16	42.70	16.29	16.97	8.74	29.99	18.64
1217	Tatra	195	164	185	242	38.25	69.35	44.40	18.18	35.02	36.04	34.69	34.35
1218	Wadowice	83	82	85	83	48.66	64.80	59.70	29.78	18.49	20.13	23.35	13.45
1219	Wieliczka	66	69	68	73	51.89	65.14	54.97	39.02	17.00	9.01	29.47	18.52
1261	Kraków	5	5	4	4	72.05	69.00	88.47	61.27	38.26	63.03	32.47	27.36
1262	Nowy Sącz	23	35	33	33	62.30	79.43	74.34	40.94	35.00	54.73	27.47	28.52
1263	Tarnów	32	36	45	45	59.25	76.28	72.39	37.67	41.76	69.23	33.65	31.26
1401	Białobrzegi	345	319	339	342	28.55	44.94	26.76	19.35	16.76	8.11	27.24	21.33
1402	Ciechanów	171	173	168	175	39.44	42.02	40.01	36.50	29.08	35.56	28.88	23.96
1403	Garwolin	164	158	151	178	40.11	50.15	43.75	29.41	17.75	15.37	24.50	14.85
1404	Gostynin	296	270	276	295	31.79	41.27	31.48	24.73	24.26	36.36	23.93	16.41
1405	Grodzisk Mazowiecki	22	22	23	22	62.38	54.25	63.63	70.32	25.77	23.56	31.03	23.41
1406	Grójec	165	203	157	164	40.02	45.50	42.97	32.78	24.04	25.68	29.30	18.45
1407	Kozienie	166	112	110	155	39.87	42.16	44.33	33.91	29.27	27.72	34.30	26.38
1408	Legionowo	10	10	11	13	69.09	66.35	73.76	67.37	19.96	7.66	40.48	25.65
1409	Lipsko	363	368	358	364	24.86	20.06	39.09	19.60	28.65	29.67	36.79	21.55

LGU Code	County	LHDI Rank				LHDI	HI	EI	HI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
1410	Łosice	340	347	325	313	28.80	30.77	39.77	19.53	22.08	15.02	31.12	23.04
1411	Maków	359	349	342	332	26.12	39.78	24.84	18.04	26.67	25.08	31.91	23.72
1412	Mińsk	73	68	66	67	50.70	51.88	54.80	45.84	17.38	16.24	23.31	13.86
1413	Mława	319	305	301	319	30.51	38.83	29.65	24.66	18.84	11.70	25.84	22.11
1414	Nowy Dwór Mazowiecki	98	99	98	102	46.85	55.55	41.00	45.14	22.07	14.12	33.39	22.79
1415	Ostrołęka	361	359	343	362	25.28	51.31	23.55	13.36	18.93	5.75	41.74	28.28
1416	Ostrów Mazowiecka	290	261	249	265	32.26	45.34	31.47	23.53	22.82	20.48	26.68	21.75
1417	Otwock	25	21	24	35	61.54	55.17	73.89	57.17	27.50	41.94	28.23	17.57
1418	Piaseczno	2	2	2	2	80.75	68.01	83.74	92.44	27.45	17.16	41.01	29.38
1419	Płock	288	306	312	324	32.55	38.57	31.76	28.15	18.90	5.04	44.14	30.35
1420	Płońsk	341	311	283	286	28.72	31.36	27.31	27.67	22.20	18.93	28.28	20.44
1421	Pruszków	3	7	3	3	72.92	59.95	78.93	81.96	27.16	23.67	37.27	22.70
1422	Przasnysz	329	323	317	284	29.71	39.03	30.89	21.75	28.84	24.28	33.22	29.75
1423	Przysucha	373	366	372	370	21.30	23.11	28.52	14.66	22.23	11.72	34.37	27.26
1424	Pułtusk	258	207	175	195	34.47	45.41	29.74	30.33	22.24	18.09	27.10	22.43
1425	Radom	334	337	320	334	29.37	51.92	27.28	17.89	19.63	13.14	29.56	19.47
1426	Siedlece	284	335	284	327	32.78	44.14	38.89	20.52	10.30	2.08	30.37	17.30
1427	Sierpc	346	346	335	351	28.53	33.71	31.83	21.64	20.65	17.80	24.22	20.43
1428	Sochaczew	117	116	123	119	44.84	53.80	43.06	38.92	20.70	19.07	27.59	16.86
1429	Sokołów	214	180	162	154	37.20	27.27	56.80	33.24	25.81	26.08	30.56	21.57
1430	Szydłowiec	367	354	363	361	23.73	38.58	21.55	16.08	20.38	12.85	31.55	20.89
1432	Warsaw West	4	4	5	5	72.48	67.39	70.88	79.72	29.62	13.88	54.94	34.07
1433	Węgrów	263	283	197	221	34.09	41.02	35.80	26.98	21.77	11.70	35.37	24.91
1434	Wołomin	41	47	46	51	56.86	65.94	53.48	52.12	17.17	15.37	23.46	14.02
1435	Wyszków	244	238	203	253	35.69	58.02	28.95	27.06	20.01	19.69	22.55	18.06
1436	Zwoleń	355	338	360	369	26.48	42.82	27.98	15.49	18.76	14.92	25.41	17.43
1437	Żuromin	362	367	367	368	25.26	38.42	31.35	13.38	24.31	21.79	30.61	21.54
1438	Żyrardów	151	109	124	124	41.09	43.95	37.59	42.02	22.16	22.00	25.63	19.30
1461	Ostrołęka	48	32	91	40	56.16	74.19	55.71	42.85	39.84	63.21	32.34	30.94
1462	Płock	43	39	31	44	56.71	50.87	61.67	58.12	45.26	53.97	42.88	40.05
1463	Radom	80	67	59	74	49.39	55.85	58.72	36.73	33.56	46.67	33.49	24.19
1464	Siedlce	16	14	55	17	64.76	68.57	77.84	50.87	40.13	55.00	38.19	30.77
1465	Warsaw	1	1	1	1	87.63	68.97	97.75	99.83	55.67	51.91	56.74	58.58
1601	Brzeg	114	117	128	109	45.07	56.69	46.60	34.65	24.31	19.75	30.65	23.74
1602	Głubczyce	163	155	189	143	40.28	45.82	40.34	35.35	28.23	31.24	32.14	22.41
1603	Kędzierzyn-Koźle	76	62	61	56	50.18	62.39	58.76	34.47	30.25	29.30	38.63	24.45
1604	Kluczbork	170	176	191	159	39.51	52.45	45.86	25.65	21.64	14.85	33.06	20.64
1605	Krapkowice	87	84	82	84	48.20	68.05	60.79	27.07	19.14	15.66	29.28	15.28
1606	Namysłów	120	102	129	108	44.39	59.30	49.33	29.90	24.91	21.66	35.31	20.21
1607	Nysa	167	161	165	140	39.75	48.35	48.71	26.67	22.73	26.12	26.98	16.66
1608	Olesno	232	170	192	171	36.35	59.11	41.44	19.60	22.85	21.46	29.27	18.99
1609	Opole	97	95	90	89	46.91	69.10	62.11	24.05	18.68	11.49	35.53	15.95
1610	Prudnik	190	204	251	183	38.42	42.93	55.10	23.97	23.14	20.69	31.15	19.22
1611	Strzelce	123	120	118	114	44.18	65.43	59.91	22.00	23.07	19.54	35.04	17.93

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		2010	2009	2008	2007								
1661	Opole	11	8	10	8	68.82	69.63	83.02	56.38	41.93	79.62	32.74	28.27
1801	Bieszczady	231	251	258	260	36.35	76.92	35.78	17.46	33.61	26.15	45.37	31.99
1802	Brzozów	168	178	188	205	39.70	70.61	49.77	17.81	33.85	36.08	37.92	28.35
1803	Dębica	125	126	121	127	43.87	72.40	48.62	23.98	25.88	23.52	33.08	22.29
1804	Jarosław	276	278	291	292	33.08	59.38	29.87	20.42	25.54	28.27	28.05	21.00
1805	Jasło	193	162	167	193	38.38	66.37	39.36	21.64	31.56	28.24	38.27	29.08
1806	Kolbuszowa	280	324	344	356	32.85	76.09	48.09	9.69	24.43	19.72	31.53	23.44
1807	Krosno	169	151	173	162	39.54	73.51	40.52	20.76	20.93	17.29	31.79	16.67
1808	Leżajsk	239	224	205	232	35.90	71.16	42.05	15.46	28.25	32.26	30.56	22.88
1809	Lubaczów	310	313	340	340	30.83	60.93	35.18	13.67	32.12	27.53	38.48	31.28
1810	Łańcut	100	111	143	118	46.56	71.98	58.67	23.89	23.85	24.96	28.56	19.03
1811	Mielec	96	90	95	92	46.99	80.91	49.90	25.70	27.70	28.22	32.12	23.45
1812	Nisko	343	343	331	348	28.71	67.28	30.54	11.52	23.66	22.23	31.05	19.19
1813	Przemyśl	301	315	296	323	31.48	63.24	27.93	17.66	19.80	10.50	33.73	21.90
1814	Przeworsk	261	268	272	289	34.38	56.76	37.06	19.32	24.02	24.46	29.01	19.53
1815	Ropczyce-Sędziszów	221	190	222	212	36.78	73.32	37.15	18.27	24.89	16.76	33.29	27.63
1816	Rzeszów	143	145	141	132	41.74	70.21	42.41	24.42	15.83	6.04	30.02	21.87
1817	Sanok	149	141	148	158	41.26	78.02	41.67	21.61	23.73	31.67	24.67	17.09
1818	Stalowa Wola	99	101	77	79	46.69	70.66	52.52	27.43	27.84	34.62	28.51	21.86
1819	Strzyżów	215	212	237	245	37.17	69.43	44.54	16.61	28.46	21.73	35.11	30.20
1820	Tarnobrzeg	155	169	178	181	40.82	69.27	49.72	19.75	37.43	21.91	52.38	45.69
1821	Lesko	303	274	297	300	31.39	83.52	24.84	14.91	38.56	35.05	45.26	36.16
1861	Krosno	20	19	17	20	63.37	77.63	83.30	39.34	40.63	87.38	23.53	32.61
1862	Przemyśl	74	80	87	98	50.53	67.25	63.37	30.28	36.98	61.48	26.84	30.65
1863	Rzeszów	7	11	8	7	71.22	85.90	83.24	50.52	40.63	89.08	29.08	25.89
1864	Tarnobrzeg	24	26	25	31	61.58	84.55	78.30	35.27	40.98	56.34	33.53	36.42
2001	Augustów	200	196	183	170	37.79	61.94	47.17	18.48	29.48	24.43	38.00	27.59
2002	Białystok	134	142	145	161	42.70	61.90	49.50	25.40	22.17	19.63	29.29	18.96
2003	Bielsk	292	256	236	244	32.05	36.23	36.81	24.69	25.56	29.04	27.71	20.75
2004	Grajewo	315	308	302	306	30.72	63.41	37.97	12.05	25.18	25.57	29.60	21.10
2005	Hajnówka	298	259	201	243	31.75	23.48	46.88	29.08	29.84	35.88	32.68	22.66
2006	Kolno	374	377	375	378	20.47	66.39	25.00	5.16	24.18	19.01	32.00	23.23
2007	Łomża	376	378	378	379	18.69	57.26	16.82	6.78	9.48	1.11	35.91	21.40
2008	Mońki	369	371	373	374	23.31	53.11	33.64	7.09	24.23	19.95	31.09	22.95
2009	Sejny	320	299	333	343	30.49	53.43	34.33	15.45	32.34	27.51	40.52	30.36
2010	Siemiatycze	309	342	305	320	30.87	43.37	46.07	14.72	23.61	19.96	31.26	21.10
2011	Sokółka	348	328	323	326	28.26	44.32	33.81	15.06	22.59	22.99	26.94	18.61
2012	Suwałki	379	379	377	376	17.24	54.53	6.89	13.65	16.72	6.35	35.07	21.01
2013	Wysokie Mazowieckie	295	326	345	347	31.83	50.59	34.51	18.47	23.57	21.73	29.32	20.55
2014	Zambrów	189	220	186	192	38.42	64.55	42.20	20.83	19.30	19.00	23.16	16.34
2061	Białystok	13	12	13	12	68.10	86.84	84.02	43.29	41.84	64.06	36.53	31.31
2062	Łomża	40	38	43	50	57.09	82.61	68.84	32.72	32.89	59.71	22.97	25.95
2063	Suwałki	63	70	64	70	52.46	87.11	51.37	32.27	33.81	48.04	25.94	31.03

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		2010	2009	2008	2007								
2201	Bytów	245	249	252	266	35.65	66.68	29.80	22.79	26.54	19.59	34.09	27.99
2202	Chojnice	182	223	207	258	38.76	61.41	39.88	23.78	26.94	25.40	29.91	25.74
2203	Człuchów	212	236	253	250	37.22	62.04	32.27	25.76	28.33	14.65	38.99	39.81
2204	Gdańsk	52	63	70	62	54.96	77.09	47.19	45.63	16.92	5.43	33.43	26.68
2205	Kartuzy	158	136	138	151	40.58	77.14	35.53	24.38	24.86	19.02	30.99	26.06
2206	Kościerzyna	181	201	246	213	38.82	61.29	46.08	20.71	31.64	32.36	32.58	30.05
2207	Kwidzyn	86	94	108	112	48.23	59.65	58.66	32.07	21.86	20.18	22.82	22.68
2208	Lębork	138	137	127	134	42.34	61.56	43.28	28.48	26.92	21.83	33.07	27.02
2209	Malbork	141	130	133	129	42.12	54.87	40.07	33.98	24.77	16.41	32.11	28.84
2210	Nowy Dwór Gdański	136	233	150	186	42.48	62.16	40.63	30.34	28.89	12.77	48.80	38.69
2211	Puck	188	166	158	166	38.43	71.59	25.74	30.79	21.58	11.80	34.06	25.01
2212	Słupsk	234	280	267	272	36.24	61.87	25.00	30.76	20.76	6.77	43.31	30.53
2213	Starogard	206	206	214	203	37.51	60.10	34.23	25.65	25.21	25.17	30.13	21.12
2214	Tczew	174	167	163	150	39.32	57.75	34.10	30.86	19.79	14.05	26.91	20.50
2215	Wejherowo	111	104	107	111	45.50	77.16	37.66	32.41	21.22	20.15	24.73	19.18
2216	Sztum	285	357	311	294	32.77	56.68	24.58	25.26	25.96	22.21	33.08	23.81
2261	Gdańsk	15	15	15	15	65.92	75.64	64.14	59.05	39.57	48.82	41.16	30.83
2262	Gdynia	9	9	9	11	69.55	75.60	77.53	57.40	33.09	34.74	35.09	29.72
2263	Słupsk	62	55	42	53	52.52	59.97	57.79	41.81	32.28	41.92	33.20	24.17
2264	Sopot	8	6	14	18	69.78	52.86	88.38	72.74	67.92	31.34	100.00	100.00
2401	Będzin	128	135	155	135	43.45	30.99	51.64	51.28	20.68	25.17	24.78	14.19
2402	Bielsko	64	59	52	57	52.29	57.92	53.90	45.79	19.54	16.55	28.32	15.92
2403	Cieszyn	68	64	63	64	51.71	56.76	60.67	40.15	28.85	30.50	33.24	23.69
2404	Częstochowa	252	209	220	202	35.10	34.25	42.56	29.66	20.67	12.88	35.36	19.41
2405	Gliwice	72	83	81	68	50.95	55.72	54.39	43.64	20.31	25.22	26.79	12.40
2406	Kłobuck	186	165	181	191	38.56	44.15	46.57	27.88	21.19	15.42	32.89	18.76
2407	Lubliniec	126	125	100	115	43.64	54.53	49.93	30.51	27.24	30.24	31.19	21.42
2408	Mikołów	31	31	36	36	59.94	57.74	64.86	57.51	27.90	22.01	39.53	24.96
2409	Myszków	192	175	177	224	38.39	42.92	41.12	32.06	23.49	25.22	28.37	18.12
2410	Pszczyna	46	34	39	38	56.45	63.64	56.32	50.20	24.84	24.44	31.02	20.21
2411	Racibórz	92	97	106	101	47.63	65.20	54.48	30.42	26.13	25.66	33.75	20.61
2412	Rybnik	82	72	71	86	48.70	66.13	35.69	48.95	10.39	7.06	18.59	8.54
2413	Tarnowskie Góry	69	85	75	87	51.40	54.91	57.32	43.15	23.92	27.50	26.46	18.81
2414	Bieruń-Lędziny	33	24	37	39	58.83	62.17	55.71	58.79	23.40	12.20	34.63	30.32
2415	Wodzisław	55	50	60	60	54.44	63.60	52.34	48.45	21.79	26.13	26.15	15.14
2416	Zawiercie	199	241	262	217	38.01	34.18	43.51	36.92	22.97	24.94	28.53	17.03
2417	Żywiec	153	131	131	121	40.86	46.09	47.82	30.95	25.72	21.76	32.33	24.20
2461	Bielsko-Biała	29	30	18	24	60.71	56.97	71.77	54.72	33.94	50.66	32.10	24.04
2462	Bytom	176	181	161	200	39.27	45.44	36.71	36.31	25.88	42.08	26.18	15.74
2463	Chorzów	103	110	105	113	46.52	41.31	56.28	43.29	25.24	40.90	25.12	15.66
2464	Częstochowa	89	75	74	85	48.09	40.18	65.00	42.58	28.89	49.87	27.02	17.90
2465	Dąbrowa Górnicza	118	127	109	104	44.61	40.71	43.52	50.12	29.00	32.26	36.65	20.62
2466	Gliwice	34	41	44	28	58.78	59.09	65.38	52.56	28.17	36.39	28.54	21.52
2467	Jastrzębie-Zdrój	42	51	51	41	56.75	70.47	51.21	50.65	24.43	38.60	21.75	17.36

LGU Code	County	LHDI Rank				LHDI	HI	EI	HI	$LHDI_{PI}$	HI_{PI}	EI_{PI}	LEI_{PI}
		2010	2009	2008	2007								
2468	Jaworzno	81	78	84	82	48.77	41.57	50.30	55.49	25.09	30.31	28.18	18.51
2469	Katowice	28	28	21	19	61.03	50.58	67.54	66.54	45.36	80.06	39.61	29.42
2470	Mysłowice	44	49	35	43	56.67	63.11	49.68	58.03	19.25	22.33	27.04	11.81
2471	Piekary Śląskie	110	133	119	117	45.58	36.32	57.34	45.46	20.19	39.97	19.56	10.52
2472	Ruda Śląska	79	79	76	81	49.90	58.65	41.46	51.09	20.18	23.90	23.87	14.41
2473	Rybnik	57	53	56	49	54.01	64.30	49.50	49.50	26.36	40.76	22.69	19.80
2474	Siemianowice Śląskie	139	252	227	174	42.31	48.42	33.23	47.06	19.40	25.24	23.48	12.33
2475	Sosnowiec	102	113	104	96	46.53	35.86	54.67	51.39	20.76	43.98	21.90	9.29
2476	Świętochłowice	211	168	164	165	37.26	54.13	25.37	37.67	12.53	21.74	15.08	6.00
2477	Tychy	26	29	22	23	61.52	60.79	61.98	61.80	34.42	37.30	40.40	27.07
2478	Zabrze	71	74	73	71	51.30	65.09	52.60	39.42	33.20	42.16	30.98	28.02
2479	Żory	49	44	47	48	56.15	72.59	52.35	46.58	26.50	21.88	30.76	27.66
2601	Busko	349	300	266	276	28.21	29.04	34.17	22.62	33.60	34.68	38.35	28.52
2602	Jędrzejów	337	288	269	280	29.12	35.52	32.86	21.15	22.38	15.30	32.38	22.61
2603	Kazimierza	378	376	379	373	17.91	17.18	29.29	11.41	20.33	13.92	30.33	19.88
2604	Kielce	326	301	310	303	29.89	55.40	23.95	20.14	25.65	19.49	35.93	24.09
2605	Końskie	322	285	278	259	30.47	38.29	35.68	20.70	27.99	35.83	28.66	21.37
2606	Opatów	372	362	361	353	22.67	21.39	26.66	20.43	26.03	17.44	35.33	28.62
2607	Ostrowiec	229	202	216	219	36.41	44.41	38.64	28.14	28.84	30.86	33.87	22.95
2608	Pińczów	377	355	316	298	18.11	9.67	29.07	21.13	26.33	20.82	36.38	24.11
2609	Sandomierz	267	264	211	180	33.78	38.53	38.81	25.77	43.86	34.69	51.07	47.62
2610	Skarżysko	160	187	182	189	40.41	41.32	50.21	31.81	32.41	31.03	38.12	28.79
2611	Starachowice	272	247	202	188	33.58	48.14	29.32	26.83	28.78	32.18	31.43	23.58
2612	Staszów	265	237	208	249	34.01	42.10	38.24	24.43	34.36	24.60	40.72	40.51
2613	Włoszczowa	357	321	293	257	26.23	29.97	33.29	18.09	26.69	27.08	27.84	25.23
2661	Kielce	18	16	20	14	64.08	68.50	75.29	51.02	39.97	69.87	28.67	31.87
2801	Bartoszyce	205	191	233	173	37.51	54.45	33.13	29.27	30.98	25.38	39.45	29.71
2802	Braniewo	202	227	221	208	37.68	48.98	35.25	30.99	27.69	20.69	33.10	31.00
2803	Działdowo	281	266	242	241	32.84	51.67	28.05	24.43	25.21	26.54	28.10	21.48
2804	Elbląg	327	317	304	304	29.85	51.12	19.89	26.16	21.93	9.99	35.46	29.80
2805	Ełk	162	194	213	185	40.30	67.71	43.31	22.32	26.49	23.74	31.58	24.80
2806	Giżycko	131	119	134	139	43.16	57.48	47.54	29.42	36.02	31.57	42.79	34.61
2807	Iława	223	232	187	196	36.70	55.77	32.74	27.07	26.98	20.32	33.79	28.60
2808	Kętrzyn	179	192	176	138	39.07	49.43	39.56	30.51	22.03	22.81	23.92	19.59
2809	Lidzbark	191	219	257	206	38.40	53.57	39.45	26.80	28.60	18.18	38.60	33.33
2810	Mrągowo	172	174	169	153	39.37	60.60	39.13	25.74	28.49	22.54	38.56	26.60
2811	Nidzica	286	314	300	301	32.56	55.30	28.63	21.80	26.00	17.72	35.41	28.02
2812	Now Miasto	358	348	324	331	26.15	50.91	20.54	17.10	27.71	20.62	35.34	29.20
2813	Olecko	256	273	268	291	34.83	52.27	34.13	23.69	37.58	23.97	49.47	44.77
2814	Olsztyn	184	235	199	197	38.57	59.74	27.95	34.37	23.98	17.47	34.98	22.57
2815	Ostróda	222	215	215	229	36.78	52.16	34.71	27.47	26.52	20.63	34.59	26.12
2816	Pisz	289	309	330	336	32.37	59.32	34.94	16.36	27.08	21.36	34.38	27.05
2817	Szczytno	183	262	235	223	38.58	58.69	44.06	22.20	28.26	17.65	39.49	32.40
2818	Gołdap	287	287	308	337	32.56	59.34	26.95	21.57	28.36	16.97	38.95	34.50

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		2010	2009	2008	2007								
2819	Węgorzewo	204	205	217	273	37.57	52.34	35.38	28.63	33.56	28.04	38.94	34.63
2861	Elbląg	65	57	54	59	52.11	53.89	66.41	39.55	33.17	48.24	30.65	24.68
2862	Olsztyn	12	13	7	9	68.62	74.23	79.57	54.69	37.92	56.27	35.70	27.13
3001	Chodzież	127	149	130	128	43.60	60.59	40.97	33.38	23.45	21.55	26.98	22.18
3002	Czarnków-Trzcianka	216	177	156	168	37.16	55.54	36.08	25.62	17.48	10.56	27.64	18.31
3003	Gniezno	130	114	126	123	43.32	63.72	40.03	31.86	20.63	23.90	22.77	16.13
3004	Gostyń	132	144	132	144	43.07	58.44	38.49	35.52	16.00	8.44	26.81	18.11
3005	Grodzisk Wielkopolski	152	154	135	156	40.98	59.03	41.54	28.08	17.17	12.73	22.69	17.53
3006	Jarocin	108	121	111	141	45.65	61.27	54.68	28.39	19.63	26.84	16.82	16.76
3007	Kalisz	268	269	275	278	33.76	58.40	38.57	17.08	12.64	8.25	22.71	10.79
3008	Kępno	94	115	117	125	47.08	63.73	54.75	29.91	21.10	18.70	24.94	20.13
3009	Koło	237	231	230	216	36.04	50.54	36.31	25.52	19.60	15.96	24.72	19.08
3010	Konin	323	271	281	311	30.44	61.20	21.92	21.03	14.65	4.07	34.20	22.58
3011	Kościan	91	91	88	93	47.67	61.53	52.96	33.25	21.99	26.02	23.64	17.28
3012	Krotoszyn	161	185	140	152	40.34	59.27	39.63	27.94	20.05	16.64	25.44	19.05
3013	Leszno	109	139	125	137	45.60	63.72	56.38	26.39	10.69	4.01	22.09	13.79
3014	Międzychód	219	226	204	172	37.12	57.46	32.74	27.18	23.92	17.43	29.20	26.89
3015	Nowy Tomyśl	146	123	116	110	41.52	61.30	32.51	35.91	16.63	12.20	22.35	16.87
3016	Oborniki	156	184	166	136	40.71	67.49	31.79	31.44	19.04	16.54	26.02	16.02
3017	Ostrów Wielkopolski	101	106	102	120	46.55	66.48	49.67	30.56	18.56	18.91	21.75	15.55
3018	Ostrzeszów	178	197	180	194	39.19	53.92	50.89	21.93	23.42	16.25	31.09	25.43
3019	Piłą	119	128	94	97	44.44	59.02	40.28	36.93	26.20	25.82	30.99	22.46
3020	Pleszew	238	242	218	214	35.91	59.79	34.99	22.14	23.25	20.54	27.25	22.47
3021	Poznań	21	23	27	27	62.67	75.34	54.67	59.75	16.72	6.33	33.38	22.10
3022	Rawicz	180	134	146	145	38.85	55.15	38.15	27.86	19.53	16.45	24.61	18.41
3023	Słupca	228	195	159	182	36.51	51.43	35.85	26.40	20.74	16.59	27.26	19.73
3024	Szamotuły	112	129	115	107	45.49	60.55	40.66	38.25	16.05	13.20	20.27	15.45
3025	Środa Wielkopolska	84	98	97	106	48.58	63.99	48.27	37.12	17.58	11.40	26.69	17.85
3026	Śrem	75	76	72	78	50.21	66.51	52.87	36.00	22.50	22.69	25.42	19.76
3027	Turek	154	140	137	210	40.84	56.24	44.31	27.34	23.36	14.55	34.23	25.61
3028	Wągrowiec	196	172	255	226	38.16	58.86	35.04	26.95	16.69	9.34	23.97	20.75
3029	Wolsztyn	150	143	152	122	41.14	57.96	40.11	29.96	18.75	15.83	22.44	18.56
3030	Września	95	92	89	105	47.03	61.89	50.93	32.99	17.45	13.97	23.13	16.43
3031	Złotów	235	216	195	211	36.18	58.74	34.84	23.14	22.54	15.32	29.84	25.05
3061	Kalisz	45	42	32	46	56.52	57.96	69.68	44.71	27.72	40.04	23.77	22.38
3062	Konin	37	33	29	32	58.24	70.79	60.63	46.03	38.00	54.33	33.55	30.12
3063	Leszno	30	27	26	25	60.11	62.92	66.09	52.23	33.10	42.94	30.92	27.32
3064	Poznań	6	3	6	6	71.52	62.35	85.83	68.37	42.81	53.35	38.55	38.14
3201	Białogard	307	282	286	299	31.01	44.92	26.96	24.62	29.24	23.64	35.59	29.71
3202	Choszczno	330	304	279	240	29.49	38.75	23.52	28.15	26.42	20.70	35.79	24.88
3203	Drawsko	266	240	289	252	34.00	47.84	34.38	23.90	27.83	18.56	36.32	31.97
3204	Goleniów	213	234	160	133	37.22	52.61	31.71	30.91	25.32	20.85	32.53	23.92
3205	Gryfice	283	243	250	236	32.80	42.68	28.16	29.38	37.78	38.53	36.43	38.41

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		2010	2009	2008	2007								
3206	Gryfino	262	284	239	222	34.13	50.32	25.16	31.42	21.56	13.33	33.25	22.62
3207	Kamień	243	244	206	231	35.70	47.48	35.89	26.71	34.82	19.73	54.63	39.18
3208	Kołobrzeg	121	86	99	103	44.32	58.03	40.94	36.64	43.47	43.39	45.50	41.61
3209	Koszalin	282	213	247	247	32.83	45.16	27.34	28.66	20.65	5.65	46.33	33.60
3210	Myślibórz	325	277	309	246	30.05	42.23	25.67	25.03	26.60	21.78	34.73	24.88
3211	Police	56	65	65	52	54.15	64.84	47.28	51.78	27.43	22.32	37.79	24.46
3212	Pyrzyce	271	307	299	177	33.60	40.70	29.77	31.31	22.71	20.64	28.44	19.95
3213	Sławno	308	257	303	267	30.89	46.32	26.50	24.01	28.12	20.61	37.04	29.12
3214	Stargard	233	193	200	207	36.26	48.53	31.20	31.48	22.86	22.62	26.98	19.58
3215	Szczecinek	220	183	154	190	37.03	44.99	40.43	27.91	25.63	21.01	28.41	28.20
3216	Świdwin	260	160	231	239	34.39	45.55	33.24	26.87	24.72	19.32	31.62	24.72
3217	Wałcz	257	246	210	215	34.75	50.34	27.84	29.93	21.43	11.80	34.06	24.48
3218	Łobez	328	320	365	305	29.78	38.87	27.32	24.87	22.81	10.29	40.99	28.11
3261	Koszalin	35	25	38	26	58.63	60.17	69.65	48.09	29.29	49.27	26.67	19.12
3262	Szczecin	47	46	41	34	56.30	55.13	69.53	46.56	29.72	56.25	25.94	18.00
3263	Świnoujście	93	118	92	75	47.19	51.79	54.12	37.49	28.74	29.60	29.20	27.47

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