Chapter 2

How to measure regional and local well-being

This chapter provides a set of indicators to assess well-being in OECD regions. Indicators cover nine dimensions of well-being and were identified on the basis of the framework outlined in Chapter 1. Based on these indicators, evidence on well-being is provided for OECD regions, underlying the extent of regional disparities. When possible, well-being outcomes are also presented for OECD metropolitan areas. The chapter also presents data on income distribution within regions and evidence on how inequality has been associated to regional economic growth during the last decade. In addition, this chapter provides possible measures to account for the complementarities between dimensions of well-being. Finally, it discusses the main steps to be implemented in order to improve the measurement of well-being of regions and cities in the future.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Introduction

Citizens' common aspiration is to enjoy a good level of well-being where they live. Both citizens and policy makers need to be able to assess the quality of life and material conditions of the places they live and to compare them with regions and cities in the same country or across the world. In order to carry out such an assessment, it is necessary to build a set of measures at the sub-national scale. This set of indicators, built according to the framework presented in Chapter 1, can serve as a common reference for regions that aim to develop their own metrics of well-being.

This chapter provides a set of indicators for OECD regions and, when possible, metropolitan areas, offering an international comparison of well-being outcomes. The chapter first offers a set of selected regional indicators that allows OECD regions to be compared in terms of the nine different well-being dimensions presented in Chapter 1. At the sub-national scale, many well-being dimensions are strongly associated with one another, and understanding these interdependencies can be of help for policy makers. Possible measures to account for the interactions among well-being dimensions are therefore discussed. Second, the chapter presents evidence on well-being outcomes in OECD regions, assessing regional disparities in quality of life and material conditions and highlighting their policy relevance. Third, the chapter presents measures of income inequalities within regions. Finally, it discusses future work to be done to improve the measurement of well-being in cities and regions. In doing so, it identifies the major statistical gaps and discusses the priorities for overcoming them in the future.

A common set of well-being indicators for regions

A set of indicators to measure the dimensions of well-being described in Chapter 1 has been developed for the 362 OECD large regions. These indicators are comparable across OECD countries, are gathered from official sources and, in most cases, are available over different years. They are also publicly available in the *OECD Regional Well-Being Database*. At present, regional measures are available for OECD countries in eight dimensions of well-being included in the OECD Better Life Initiative at national level: income, jobs, housing, education, health, environment, personal security and civic engagement. In addition, access to services was added to the regional framework. On the other hand, regional measures, comparable across countries, are not available on three other well-being dimensions: social connections, work-life balance and subjective assessment of life circumstances. When data are available in a suitable format, the regional well-being metrics uses similar indicators as the Better Life Initiative at national level. This is the case, for example, of life expectancy (health), murder rate (safety) or employment rate (jobs) (Table 2.1).

A limited set of headline indicators chosen among those of Table 2.1 covering the nine regional well-being dimensions is available through the OECD Regional Well-Being web tool (Box 2.1).

Table 2.1. **Well-being dimensions and regional indicators**

	Dimensions	Regional indicators	Country indicators in OECD How's Life? initiative
Material conditions	Income (levels and distribution)	– Household disposable income (mean and median) – Income distribution in a region: – Gini Index for household disposable and market income – Quintile share ratio (S80/S20) for household disposable and market income – Regional relative poverty (headcount ratios for disposable and market income, with poverty line set at 40%, 50% and 60% of the national median income)	– Household net adjusted disposable income – Household net financial wealth
	Jobs	– Employment rate – Long-term unemployment rate – Unemployment rate – Women's participation rate	– Employment rate – Long-term unemployment rate – Average annual earnings per employee – Job tenure
	Housing	– Number of rooms per person	– Number of rooms per person – Housing cost overburden rate – Dwellings without basic facilities
Quality of life	Health status	– Life expectancy at birth – Age adjusted mortality rate	– Life expectancy at birth – Self-reported health status
	Education and skills	– Educational attainment – Students' cognitive skills (PISA) (available for a limited number of countries)	– Educational attainment – Students' cognitive skills (PISA) – Educational expectancy – Competences in the adult population (PIIAC)
	Environmental quality	– Air quality ($PM_{2.5}$) – Loss of forest and vegetation – Municipal waste recycled (available for a limited number of countries) – Access to green space	– Air quality – Satisfaction with water quality
	Personal security	– Homicide rate – Car theft rate – Mortality due to transport accidents	– Homicide rate – Self-reported victimisation (Gallup)
	Civic engagement and governance	– Voter turnout	– Voter turnout – Consultation on rule making
	Accessibility of services	– Broadband connection – Average distance to the closest hospital (available for a limited number of countries) – Share of population with access to public transport (available for a limited set of cities) – Unmet medical need (available for a limited number of countries)	
	Work-life balance		– Employees working very long hours – Time not worked
	Social connections		– Social network support (Gallup)
	Subjective well-being		– Life satisfaction

The next section provides an overview of the geography of well-being in OECD regions based on the dimensions and indicators introduced above. The section after that discusses interactions among well-being dimensions. The chapter concludes with a critical assessment of the dimensions for which additional improvements in measurement at the sub-national level are needed for different geographic scales.

Box 2.1. **The OECD regional well-being interactive tool**

The OECD regional well-being tool (www.oecdregionalwellbeing.org) allows the measurement and comparison of well-being outcomes in the 362 OECD regions. It features eleven indicators to measure nine well-being dimensions: income, jobs, housing, education, health, environment, safety, civic engagement and access to services. This tool responds to the need of citizens to have information on various topics affecting their life and of policy makers to have an accurate picture of societal progress.

The data visualization aims at reaching a large non-technical audience. For this reason, the values of the regional well-being indicators have been transformed in scores from 0 to 10, making it possible to obtain a relative ranking among all OECD regions in each dimension. A higher score in a topic indicates better well-being outcomes.

The visualisation enables a user to see how a region is faring in the nine well-being topics. For example, Prague (Czech Republic) scores 10 in education, 9 in jobs and less than 2 in environment. The Capital Region in Korea scores 8.7 in education, ranking first among Korean regions and in the top 28% among OECD regions. The scores of each region can be compared to those of regions in the same country and across the OECD area, thus identifying regions with similar well-being outcomes.

The interactive website also shows whether the region is making progress in a topic relative to the other OECD regions, by showing whether its relative ranking on the topic has increased or decreased since 2000. For example, for health, Prague scores 5.6, higher than any other region in the Czech Republic, but in the bottom 40% of OECD regions. This ranking has improved since 2000.

Finally, the interactive tool also displays regional disparities within countries, measuring the difference between the top and bottom 20% regional values in a topic, as compared to the difference between the top and bottom 20% for OECD countries as a whole.

The geography of well-being in OECD regions and cities

Income levels vary widely between and within regions

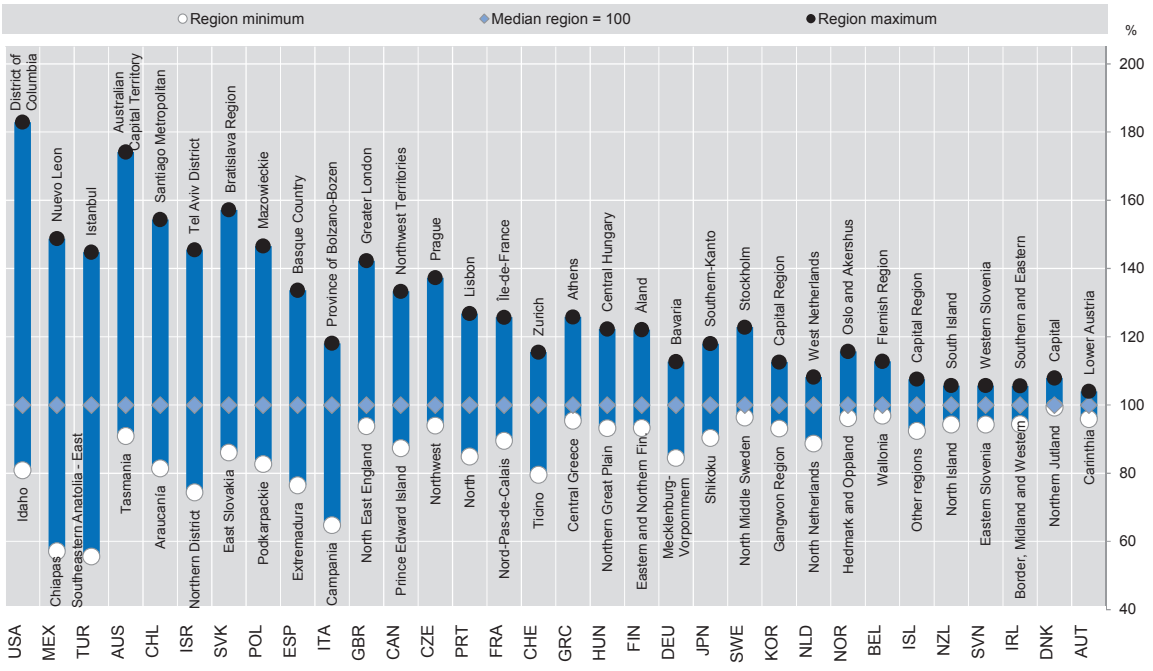
Income and employment are widely accepted as key drivers of individual well-being, not only because of their relevance to living standards but because they are associated with life satisfaction, perceived status and social connections. When considering regional disparities, the most widely used measure of living standards is variability in regional gross domestic product (GDP) (OECD, 2013a). However, GDP is best understood as a measure of the economic production of each region, rather than of the income of its residents. In addition, differences between production and household income in a given region are likely to be particularly large when a significant number of residents of one

region work in another, or when they transfer a part of their income to family members living elsewhere. Differences between GDP and income can be substantial in regions that depend on natural resources, examples of which have been extensively analysed by the OECD (OECD, 2013b). In terms of GDP per capita, regional differences within countries are often larger than those across countries. Inter-regional disparities have increased in a number of OECD countries since 1995, especially in Eastern Europe. Regional disparities are also particularly high in emerging market economies, with Indonesia displaying the highest level (OECD, 2013a).

Inter-regional disparities in household income are large in many OECD countries. In Australia, Chile, Israel, Mexico, Poland, the Slovak Republic, Spain, Turkey and the United States, people in the top income region were more than 30% richer than the median citizen in 2011 (Figure 2.1). High income gaps are also observed between urban and rural areas. In Europe in 2011, for example, households living in densely populated areas had incomes about 10% higher than all other households (Eurostat, 2013). These gaps have narrowed in most OECD countries, but remain a major concern in emerging economies and developing countries.

Figure 2.1. **Regional range of household income, 2011**

As a % of income in the country's median region



StatLink http://dx.doi.org/10.1787/888933120955

Note: The figure refers to the household disposable income of the OECD TL2 regions. Countries are ranked by decreasing regional differences. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2014), Regional Well-Being (database), http://dx.doi.org/10.1787/region-data-en.

Income inequalities within regions are larger than between regions

Recent OECD data show that differences in household income distribution are large not only across regions but also within regions. In general, income inequalities within regions in OECD countries tend to be larger than inequalities between regions (Piacentini, 2014; Rodríguez-Pose and Tselios, 2009). Evidence at the country level also shows that the lower the territorial level analysed, the higher the magnitude of regional income disparities, and income inequality appears to be higher within urban areas than elsewhere. For example, in 2010, nearly all of the most populous counties in US metropolitan areas had estimated Gini coefficients above the US national average (US Census Bureau, 2010). In the Aix-Marseille metropolitan region, the median household income of the top 10% is 8.4 times higher than the poorest 10%, making the region one of the most unequal in France (OECD, 2013a).

The availability of information on household income distribution and poverty at regional level helps national and regional policy makers to focus on inclusive growth and to enhance the effectiveness of social policies at a time of tight resources. Regional data on the distribution of household income come with various caveats. Household surveys are rarely designed to be representative at the regional level. In addition, comparing regions in different countries can be difficult, because their size varies and the fact that the cost of living is usually lower in rural areas than in cities is usually ignored, though it may have an effect on the assessment of inequality. However, this new set of indicators of regional income inequality and poverty, produced for 28 OECD countries, extends the OECD *Income Distribution Database* (IDD) to TL2 OECD regions for the year 2010. It also offers measures of the statistical reliability of these data, making international comparisons possible.[1]

These data show that regional differences in the distribution of household disposable income are high in all large OECD countries, as well as in some small countries with a dominant urban centre (e.g. Belgium). For example, the range between the Gini coefficients of the states of Chiapas and Tlaxcala in Mexico (around 0.15) is of the same magnitude as the difference in Gini coefficient between Mexico and the OECD average (Figure 2.2 panel B). Data on market income show a much larger inter-regional variability than those on disposable household income, suggesting that taxes and social transfers cushion much of the income inequalities both between and within regions.[2] The effect of taxes and public transfers in reducing regional differences in income inequality is particularly large in Belgium, Finland, Germany, Italy, Japan and the United Kingdom (compare country distribution of regional Gini Indexes in panels A and B of Figure 2.2).

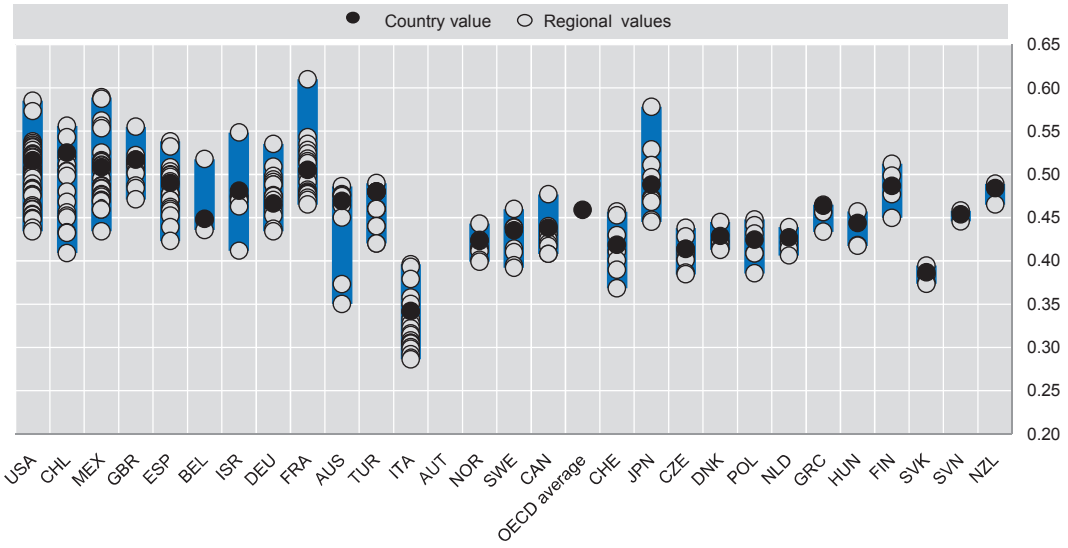
While the Gini Index provides a synthetic measure of the level of inequalities in a region, the income distribution by quintile (that is to say, the income accrued by each fifth of the regional population when ranked by increasing level of income), can show whether inequality in a region is mostly driven by disparities in the upper part of the income distribution (wealthier population) or in the bottom part (poorer population). In many regions in Italy, Japan, Norway, Slovenia, Spain, Sweden and the United States, the gap between the low earners and median earners is higher than the gap between top earners and median earners.

In Japan and in most of the regions in the Scandinavian countries, the income of the top 20% richest population is between two and four times higher than that of the bottom 20% poorest, while in most of the regions of Chile and Mexico, the income of the wealthiest is at least ten times larger. The gap between top and bottom earners is much higher than in the other regions of the country in Sicily and Basilicata (Italy),

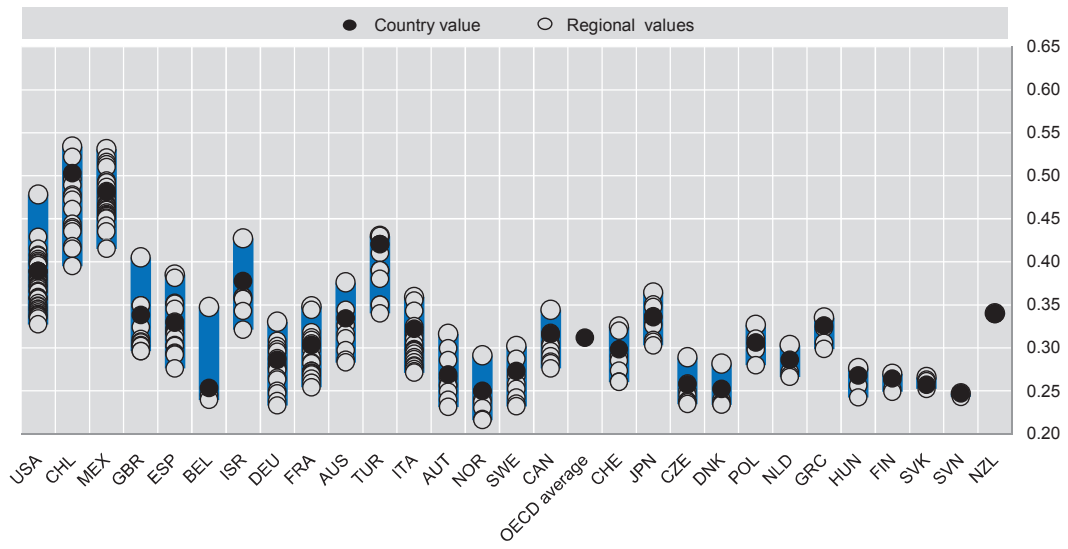
Central Poland, Ile-de-France, Andalucía (Spain), the District of Columbia and New Mexico (United States), and Jerusalem District (Israel) (Figure 2.3).

Figure 2.2. **Regional values of Gini Index in market and disposable household income, around 2010**

A. Market income



B. Disposable income



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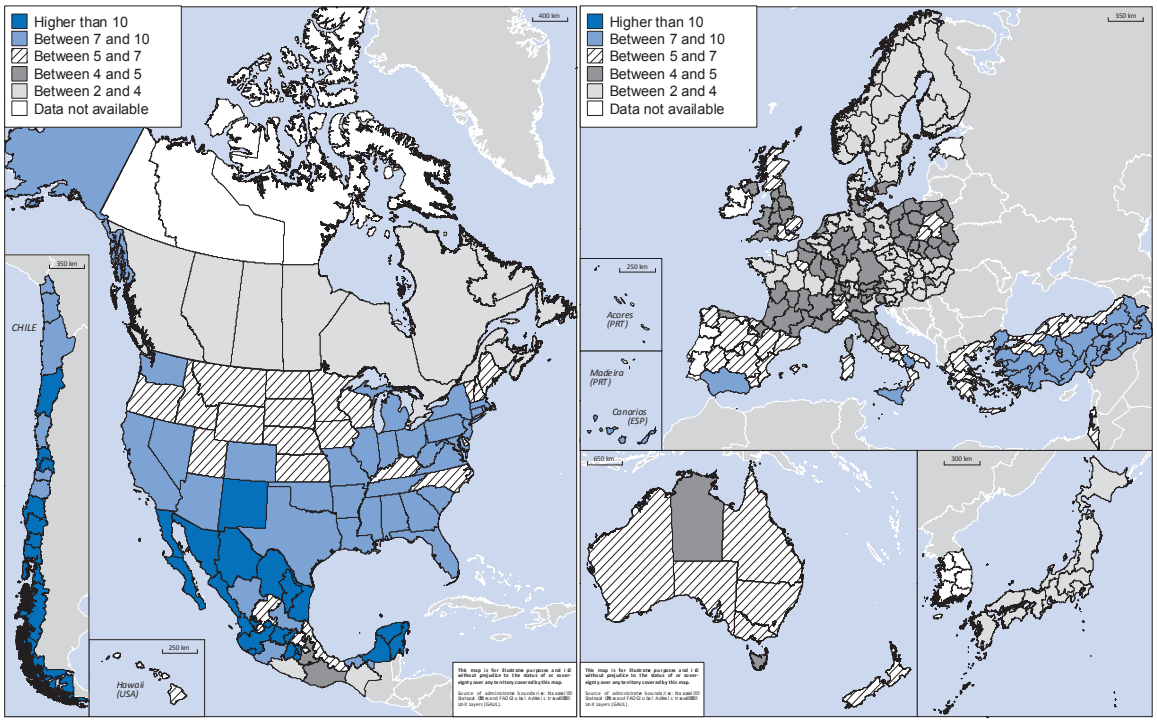
Note: Countries are ordered by the difference between maximum and minimum values of the Gini coefficient for the regional household disposable income. Each point in the panel represents a region. The Gini Index of market income in Austria is not available. The Gini Index is a measure of income concentration that ranges from 0, representing perfect equality, to 1, where all income flows to a single person. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: Authors' research based on *OECD (2014), Regional Well-Being* (database), http://dx.doi.org/10.1787/region-data-en.

Figure 2.3. **Income inequalities: How much richer were the richest 20% in each region than the poorest 20% in 2010?**



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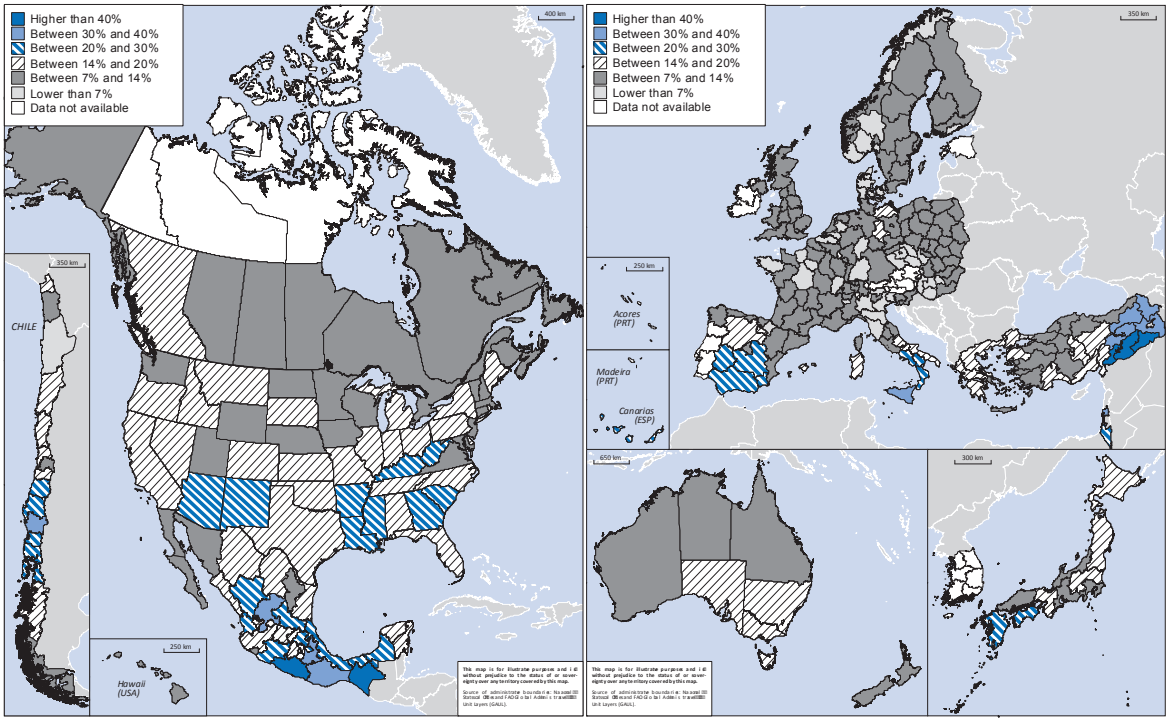
Note: The values represent the ratio between disposable household income accrued by the top 20% of population with the highest income and that of the bottom 20%. This document and any map included herein are for illustrative purposes and without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Source: Authors' research based on OECD (2014), *Regional Well-Being* (database), http://dx.doi.org/10.1787/region-data-en.

In nine countries, differences in income poverty across regions are larger than the difference among OECD countries. In Belgium, Chile, Germany, Israel, Italy, Mexico, Spain, Turkey and the United States, the inter-regional difference of the relative poverty rates is larger than the difference between the Czech Republic and Mexico, the OECD countries with the lowest and the highest relative poverty rates, respectively, when considering a poverty line defined at 50% of the national median income. In Belgium, Italy, Mexico and Turkey, the relative poverty incidence is twice as high as the country value (Figure 2.4). It should be acknowledged that poverty rates are sensitive to the absolute threshold used to identify poverty lines and to the choice of a regional or national threshold (Box 2.2).

Figure 2.4. **Regional relative poverty rates, around 2010**



StatLink http://dx.doi.org/10.1787/888933121012

Note: Poverty headcounts, with poverty line defined at 50% of the national median income. This document and any map included herein are for illustrative purposes and without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Source: Authors' research based on OECD (2014), *Regional Well-Being Database*, http://dx.doi.org/10.1787/region-data-en.

Within a country, income disparities are influenced by the distribution of wages and salaries, which account for 75% of household income among working-age adults (OECD, 2011c). On the determinants of inequalities within regions, empirical studies have analysed the characteristics of local labour markets, such as employment density (Ciccone, 2002) and the proximity to highly populated centres (Rice et al., 2006). This further translates into a premium for inhabitants of urbanised areas (Glaeser and Mare, 1994). A recent empirical analysis on OECD regions suggests a significant and positive relation of income inequalities within regions (measured by the Gini coefficient of household income in a region) with unemployment and lack of safety and a negative relation with the share of elderly population (Brezzi and Piacentini, 2014). Studying regional poverty rates, lack of safety and unemployment rates are strongly correlated with relatively low incomes. Higher levels of education and a larger share of manufacturing in total employment tend to decrease the relative poverty rates in regions (Brezzi and Piacentini, 2014).

Box 2.2. Incidence of poverty within regions: National and regional poverty lines

The common practice in analysing OECD countries is to use a relative definition of poverty. Individuals or households are considered poor if their income falls below a certain proportion of the median income of the national population. The OECD uses multiple relative poverty lines, set at 40%, 50% and 60% of median national income, as a benchmark for international comparisons. Relative poverty lines do not require estimating the cost of purchasing a "market basket" of goods, as absolute poverty lines do, and thus are usually preferred for international comparisons.

In measuring poverty within a region, the choice of the reference population, whether the national or the regional median earner, is still a matter of debate. Supporters of national thresholds note that many social policies aim to provide services uniformly across a country, while others note that cost of living can be very different across regions and that people are interested in comparing their living standards with those living in the same area.

Regional poverty lines can complement poverty measures based on national poverty lines, by providing a within-region perspective to the measurement of poverty. For example, a person considered income-poor with respect to a national threshold might not be classified as poor in relation to a regional poverty line if he lives in a relatively low-income region. Preliminary estimates using a poverty line set at 60% of the regional median income show that while poverty rankings across regions are generally not much affected, poverty rates are reduced in the poorest region for most of the countries; for example, they are halved in Sicily (Italy), Chiapas (Mexico) and South-Eastern Anatolia (Turkey).

Source: Piacentini, M. (2014), "Measuring income inequality and poverty at the regional level in OECD countries", *OECD Statistics Working Papers*, No. 2014/03, OECD Publishing, http://dx.doi.org/10.1787/5jxzf5khtg9t-en.

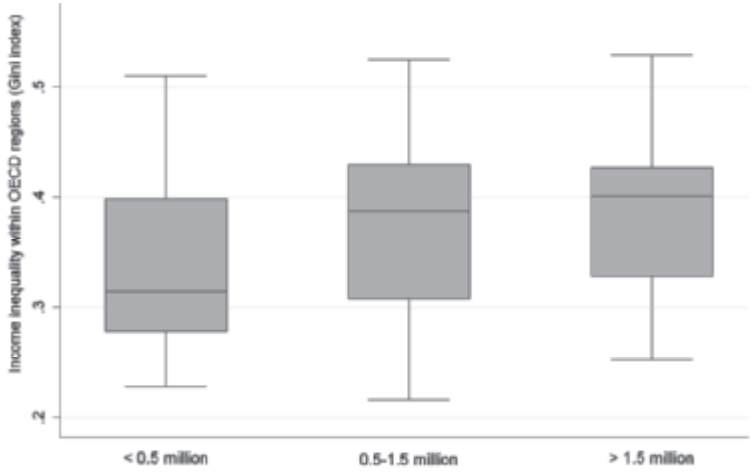
Income inequalities are on average higher in large cities

The level of income inequality within regions is different according to the urban structure of the region. First, regions with higher shares of population living in functional urban areas have an overall higher level of income inequality as measured by the Gini coefficient (Brezzi and Piacentini, 2014). In addition, a number of indicators of inequality show that there are relatively higher inequalities in regions where the largest proportion of people lives in cities of more than 1.5 million inhabitants (Royuela et al., 2014). More specifically, for the whole set of OECD regions, inequalities are lower the smaller the size of cities (Figure 2.5). Several arguments support this evidence. More talented individuals tend to move to large cities, where the returns to talent are higher and where there will be more productive firms paying higher wages (Behrens et al., 2014). Second, agglomeration economies, reflected in urban size, can be a source of additional wage premiums, and in turn increase the level of inequality. The relationship between regional levels of urbanisation and inequality is weaker in some countries, such as Chile and Mexico. One possible explanation is that the high levels of migration towards urban areas might have reduced the rural-urban earning differentials in the regions of these countries.

The fact that inequality is, on average, higher in large cities is also confirmed by previous works (Kanbur and Zhuang, 2013; Castells-Quintana and Royuela, 2014). When looking at the ratio of income of the top 20% richest people to that of the bottom 20%, income inequality in capital regions tends to be higher than the national level in all but six countries, suggesting that more urbanised areas have a skewed income distribution, particularly in the United States, Mexico and Belgium. These estimates, however, refer to the region containing the national capital, so the result depends on how closely the capital

region's boundaries correspond to those of the capital city. Internationally comparable measures of income levels and distribution based on the actual boundaries of urban areas are not yet available (Box 2.3).

Figure 2.5. **Income inequality within regions by size of cities (average 2004-12)**



Source: Royuela, V., P. Veneri and R. Ramos (2014), "Income inequality, urban size and economic growth in OECD regions", *OECD Regional Development Working Papers*, OECD Publishing, Paris, forthcoming.

Box 2.3. **Measuring income distribution in regions: Results and future developments**

Substantial research has compared levels of income inequality and poverty across OECD countries (OECD, 2011c). Because of lack of data, the inter- and intra-regional income disparities have been largely overlooked, even though the available evidence shows significant within-country differences (Rodríguez-Pose and Tselios, 2009).

Data constraints loom large in studies of income inequality, poverty and social exclusion at the sub-national level. However, through the extension of the OECD *Income Distribution Database* to sub-national values, it has been possible not only to produce regional indicators for 28 OECD countries but also to document quality issues related to these estimates. The indicators refer to the "equivalised" household disposable income, are produced either from administrative data or household surveys according to internationally agreed definitions, and refer to the year 2010. The indicators produced refer to: *i)* income levels at regional level (mean and median disposable and market income); *ii)* income distribution within a region (Gini Index for disposable and market income, quintile share ratio for disposable and market income); and *iii)* relative poverty in a region (headcounts ratio for disposable and market income), with the poverty line set at 40%, 50% and 60% of the national or of the regional median incomes. Sub-national estimates are published together with confidence intervals, to help interpret them correctly. For those countries whose estimates are drawn from nationally representative surveys, confidence intervals can highlight whether differences across regions are "real" or due to sampling errors. Future work in this field would benefit by making available regional identifiers and complete information on the sampling design in public-use survey micro-data, so as to allow better estimates of standard errors.

The results confirm the relevance of examining sub-national income distribution and of possibly repeating these estimates regularly (for example, every three years) in order to monitor changes in inequality. Another important development would be the estimation of income distribution indicators for metropolitan areas.

Source: Brezzi, M. and M. Piacentini (2014), "Understanding income inequality in OECD regions", *OECD Regional Development Working Papers*, OECD Publishing, Paris, forthcoming.

The link between income inequality and economic growth is complex at the regional level

The relationship between inequality and growth is complex, and potentially driven by different factors. On the whole, no general theory of the topic has been formulated nor stable empirical findings produced. However, several arguments have been raised to explore the mechanisms explaining how inequality might affect economic growth, some encouraging and some hindering growth. Among growth-enhancing elements of inequality are individual incentives for competition and risk taking, which are higher in societies that reward efforts and allow higher inequalities (Rebelo, 1991; Voitchovsky, 2005). Another mechanism is the accumulation of physical capital, which may be higher in more unequal societies. In this respect, it has been demonstrated that saving rates increase with wealth and that wealthier people have a higher marginal propensity to save (Barro, 2000; Dynan et al., 2004).

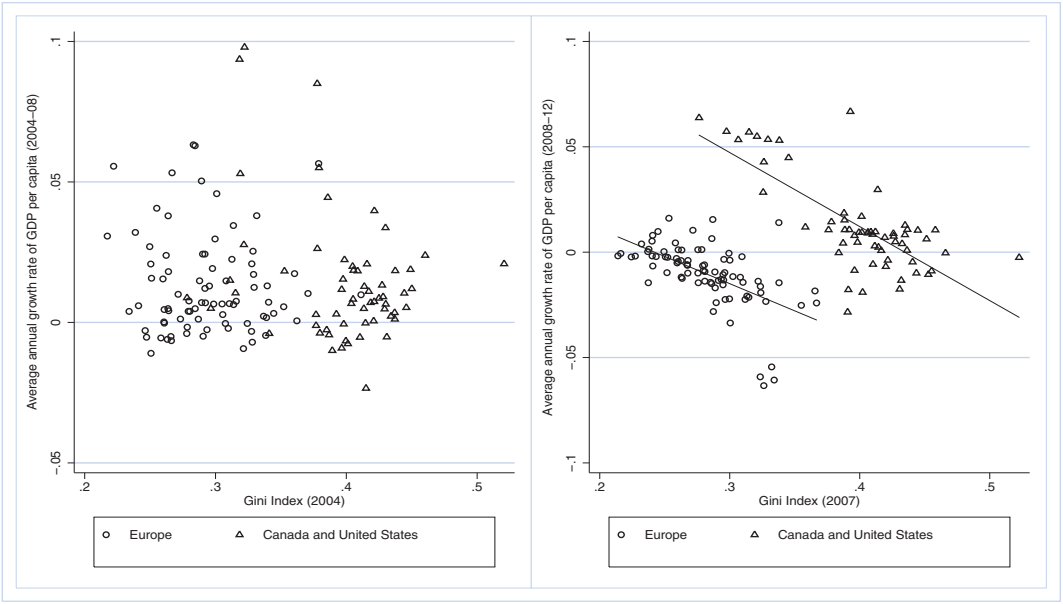
Other mechanisms could help to explain a negative relationship between inequality and growth. Political economy arguments suggest that more unequal societies are more likely to increase taxation to redistribute resources, reducing the incentives to invest (Alesina and Rodrik, 1994; Persson and Tabellini, 1994). Another argument is that higher inequality may reduce accumulation of human capital, under the argument that credit-market imperfections prevent disadvantaged individuals from investing in expensive education and training (Galor and Zeira, 1993; Easterly, 2007). More generally, the higher the level of inequality, the larger the number of individuals whose opportunities to fully develop their productive potentials are restricted. This, in turn, might affect the growth rate of the aggregate output (Ferreira, 1999). Unequal societies can also create social and political instability, resulting in uncertainty that depresses investment and economic growth (Alesina and Perotti, 1994). More recently, it has been argued that inequality might have a different impact on growth, depending on its sources or on the part of the distribution considered: only inequality of opportunity could be detrimental for growth, while inequality due to effort might be growth-enhancing (Marrero and Rodríguez, 2013; Ferreira et al. 2014). Income inequality could also potentially reduce the income growth of the poor and increase that of the rich, or vice versa (van der Weide and Milanovic, 2014). All these arguments are generally valid in the medium to long term. In a shorter time horizon, two other opposing mechanisms linked to the demand side of the economy can come into play. One is that higher inequality can have a positive effect on growth, given a higher willingness to pay on the part of the wealthiest people for new and innovative goods (dynamic price effect). On the other hand, a market-size effect suggests fewer consumers can afford to buy new goods in a more unequal society (Bertola et al., 2006).

Mainly due to a lack of reliable data, very few works have analysed the inequality-growth relationship at regional level. However, there are specific reasons why such analyses are relevant. First, how individuals behave as citizens and economic agents can be affected by local conditions rather than by national ones. Investment in human capital, for example, especially when the credit market is imperfect, can be affected by individuals' income, which can be very different across regions of a same country. Investment in human capital is also affected by life expectancy (Rodríguez-Pose and Tselios, 2010), which also can vary widely across regions and groups of people. For example, the difference between the best- and worst-performing OECD regions in terms of life expectancy is 12 years, the double that among countries (6 years). Second, a regional focus can mitigate omitted variable biases as well as issues of incomparability across countries, since regions better reflect the actual conditions where people live. In

this line of thought, the use of regional data makes it possible to better understand the role of small disparities in initial conditions for subsequent economic growth (Partridge, 2005). Finally, many of the channels of transmission between inequality and economic growth can be amplified or reduced at the regional scale: income redistributive taxes are usually imposed at the national level (political economy channel), while crime may be more important at the local level (political instability). Both aspects are consequences of inequality, which may be affecting economic performance, but they do not play a similar role at the national or regional level.

Recent OECD work has begun to address the relationship between income inequalities within regions and economic growth, in a time horizon between 2004 and 2012. The analysis considers regions in 15 OECD countries[3] where time-series estimations of regional income distribution indicators were feasible (Royuela et al., 2014). Income inequalities were measured, among other factors, by the Gini Index of income distribution within each region, while economic growth rates were measured by the relative change in levels of GDP per capita. On the whole, in OECD regions, the relationship between inequality and growth seems to have changed in the periods before and after the economic crisis. While it is hard to detect any strong relationship in the period before 2008, the following four years were characterised by different patterns. Differences across countries in regional inequalities are high and explain a large part of the variation. If we consider European and North American countries separately, the relationship between inequality and growth turns out to be negative (Figure 2.6). For both continents, less unequal regions experienced higher growth rate on average. On the whole, European regions had both lower growth rates of GDP per capita and lower inequalities with respect to their American counterparts. On the other hand, it is difficult to detect significant changes in the Gini Index in the relatively short time-span considered (2004-12).

Figure 2.6. **Income inequality and growth of GDP per capita, pre- and post-crisis, OECD regions**



Source: Royuela, V., P. Veneri and R. Ramos (2014), "Income inequality, urban size and economic growth in OECD regions", *OECD Regional Development Working Papers*, OECD Publishing, forthcoming.

An analysis of the relationship between income inequality and economic growth in OECD regions was carried out for the two periods 2004-07 and 2008-12. By considering the whole set of OECD regions without distinguishing the country or the continent of location, income inequality and economic growth emerged as practically not correlated or, if anything, with a weak positive correlation (Table 2.2). However, the correlation becomes strong and negative after accounting for regional income levels, degree of urbanisation, economic structure, education levels, labour market, year of reference and the continent of location (Table 2.2). This means that, taking into account the location of regions and other basic regional factors that can affect economic growth, more unequal regions have experienced lower growth rates in the last decade. These results confirm that the relationship of inequality and growth should account for differences across macro-areas, at least for Europe and the Americas. These results were also confirmed by controlling for regional dummy variables (fixed effects), which account for unobservable time-invariant characteristics of the regions (Royuela et al., 2014).

Table 2.2. **Correlations between income inequality and two-year growth rates of GDP per capita (2004-12), OECD regions**

	Gini Index	Top 20% - bottom 20% ratio	Top 10% - bottom 10% ratio	Top 10% - median ratio	Median - bottom 10% ratio	Poverty (below 40% median income)	Poverty (below 60% median income)
Raw data							
Two-year GDP per capita growth	0.0504	0.0577	0.0521	**0.0729**	0.044	0.0402	0.0233
Obs.	597	588	587	588	587	597	597
Adjusted data							
Two-year GDP per capita growth	**-0.1178**	**-0.0084**	**-0.0031**	**-0.0153**	**-0.0076**	**-0.1039**	**-0.0800**
Obs.	537	528	527	528	527	537	537

Note: Bolded coefficients are significant at 90% confidence level. Adjusted coefficients are estimated controlling for income levels, degree of urbanisation, economic structure, education levels, labour market, continent of location and time-fixed effects.

Source: Royuela, V., P. Veneri and R. Ramos (2014), "Income inequality, urban size and economic growth in OECD regions", *OECD Regional Development Working Papers*, OECD Publishing, Paris, forthcoming.

In the last decade, the negative relationship between income inequalities and economic growth was stronger in regions that included large metropolitan areas. Grouping OECD regions by the size of their cities, it emerges that the inequality-growth relationship was not of the same magnitude across groups. More specifically, the negative relationship between inequality and growth was stronger the larger the size of cities. Regions where most of the population lived in cities of more than 1.5 million inhabitants grew relatively faster when less unequal. Conversely, in regions mainly characterised by small cities or rural areas, the relationship between inequality and growth was weaker. These correlations were consistent for several indicators of income distribution within regions, as shown in Table 2.2.

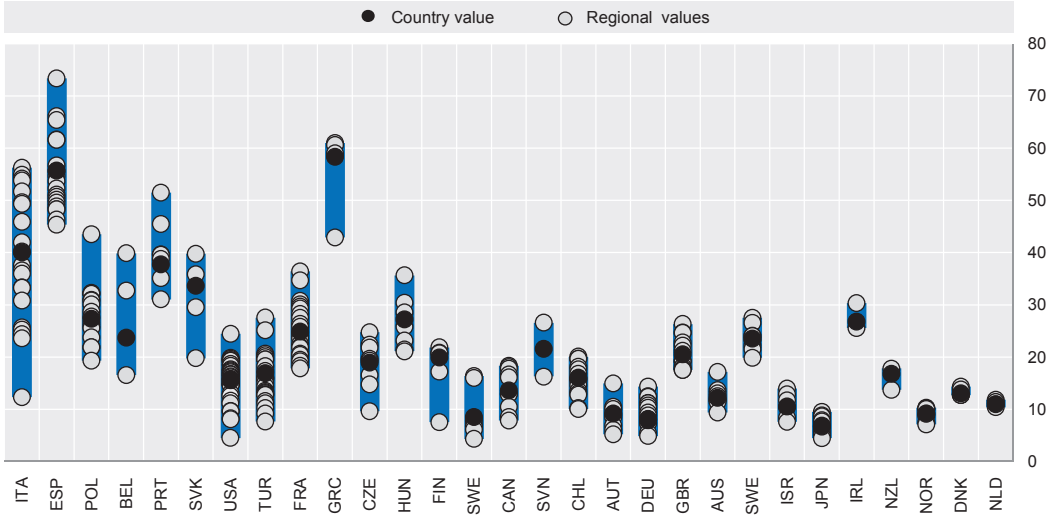
Employment outcomes in OECD countries show large regional disparities

Unequal access to employment contributes to inter-regional disparities. In the past decade, employment growth in many OECD countries was highly concentrated in

specific regions (OECD, 2013a). On average, 40% of overall employment creation in OECD economies during 1999-2012 was generated in just 10% of their regions. The industrial mix and a solid base of human capital make some regions competitive and attractive to employers. Evidence shows that the divergence in educational levels in cities in the United States is causing an equally large divergence in labour productivity and salaries for most of the workers in a city, in particular for the highly skilled, but also for the low-skilled jobs (Moretti, 2012). With the economic crisis, employment trends have become even more different across regions. In fact, in Canada, Estonia, France, Ireland, the Netherlands, New Zealand and the Slovak Republic, half or more of the employment gap could be made up if the employment rate of just one region returned to its pre-crisis level (OECD, 2013a).

In many countries, regional disparities in youth unemployment have grown wider since the crisis. Southern European countries, such as Greece, Italy and Spain, are of particular concern, because in some regions, the youth unemployment rate now exceeds 40% (Figure 2.7). These regions also have higher than average early leavers from education and training. Furthermore, while large cities drive national employment in many countries, the economic crisis has affected urban labour market conditions. The unemployment rate in metropolitan areas rose more in the 2008-12 period than it did in the previous 8 years in 26 of the 28 OECD countries. In 2012, 45% of OECD metropolitan areas had an unemployment rate above the national rate (OECD, 2013a).

Figure 2.7. **Regional variation in the youth unemployment rate, 2013**



StatLink http://dx.doi.org/10.1787/888933121031

Note: The youth unemployment rate is the ratio between unemployed persons aged 15-24 and the labour force in the same age class. Each point represents a TL2 region. Countries are ranked by decreasing regional differences in youth unemployment rate. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2014), *Regional Well-Being* (database), http://dx.doi.org/10.1787/region-data-en.

Local labour markets adjust slowly, due to the demographic and productive structure of the regions, mobility costs, market rigidity and institutional constraints. In 2011, in almost 50% of the regions considered, one out of three unemployed was long-term unemployed (i.e. out of the labour market for more than 12 months) (OECD, 2013a).

Inequalities in living standards and employment within cities are often associated with spatial segregation. Intra-urban inequality is also prominent in many cities in advanced economies, especially within metropolitan areas and post-industrial cities (OECD, 2006). Inequality does not, of course, take the same form or intensity in every city, and additional measurement is required at this spatial level (Box 2.4). The precise patterns vary from country to country and from city to city, partly depending upon national economic trajectories, labour market policies, welfare state policies, etc. People can live in cities with very different unemployment rates even within the same country. Larger differences are found in the southern European countries, such as Italy and Spain (Figure 2.8).

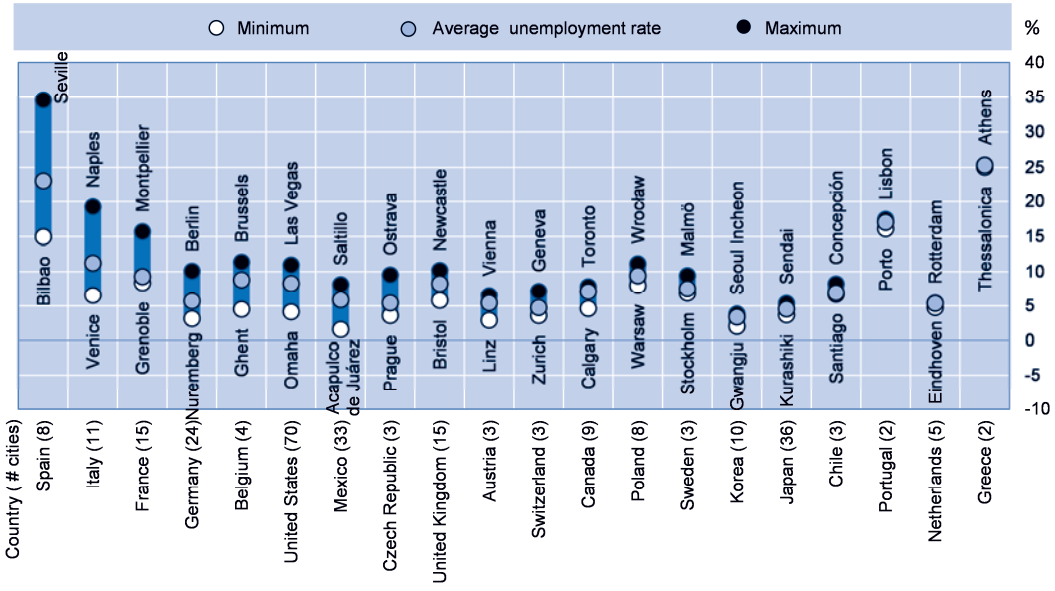
Box 2.4. **Measuring well-being and inequalities in cities**

Many socio-economic inequalities are characterised by a strong spatial dimension, in which cities play a major role. In terms of several well-being dimensions, the largest spatial inequalities are observed at city level, especially when population is grouped by race and ethnicity (Lewis and Burd-Sharps, 2013). Within cities and metropolitan areas, income inequality tends to rise with city size and with cities' per capita income levels, even after controlling for a wide range of factors, including industrial structure and skill endowments of the workforce (Baum-Snow and Pavan, 2013). At the urban scale, inequality is often reflected in spatial sorting of groups according to income, which is at the same time a driver and a consequence of interpersonal inequality. This is because neighbourhoods with lower incomes typically have poorer schools and local amenities and often suffer from poorer access to transport networks and thus to services, jobs and educational opportunities. On the whole, the residents of such places also have poorer social networks, which can be crucial to employment prospects (Olli Segendorf, 2005). These factors all tend to reinforce the inequalities that led to spatial sorting in the first place. In many instances, urban policies and planning can either reinforce or mitigate such inequalities.

Measuring well-being and inequality at city level would mean to monitor – and, in many cases, to map – the multi-dimensional outcomes in terms of income, jobs, health, education, transport, crime, social connections, etc., and the different opportunities or inequalities affecting particular groups or places. Such monitoring would be particularly appropriate at the level of functional urban areas (OECD, 2012) for two reasons: first, labour markets tend to reflect functional economies rather than municipal borders, and, secondly, administrative boundaries in fragmented metropolitan areas often reflect – and reinforce – inequalities in access to public goods and services. An analysis of the functional urban areas would also highlight whether opportunities and well-being outcomes are significantly different between the urban core and the surrounding areas.

While the *OECD Metropolitan Database* provides, for 275 cities of more than 500 000 inhabitants, information that can help assess their socio-economic conditions, data for many of the well-being dimensions presented in Table 2.1 are not yet available.

Figure 2.8. **Differences in metropolitan unemployment rates, 2012**



StatLink http://dx.doi.org/10.1787/888933121050

Note: Countries are ranked by decreasing differences in metropolitan unemployment rates.

Source: OECD (2013), *OECD Regions at a Glance 2013*, OECD Publishing, Paris, http://dx.doi.org/10.1787/reg_glance-2013-en.

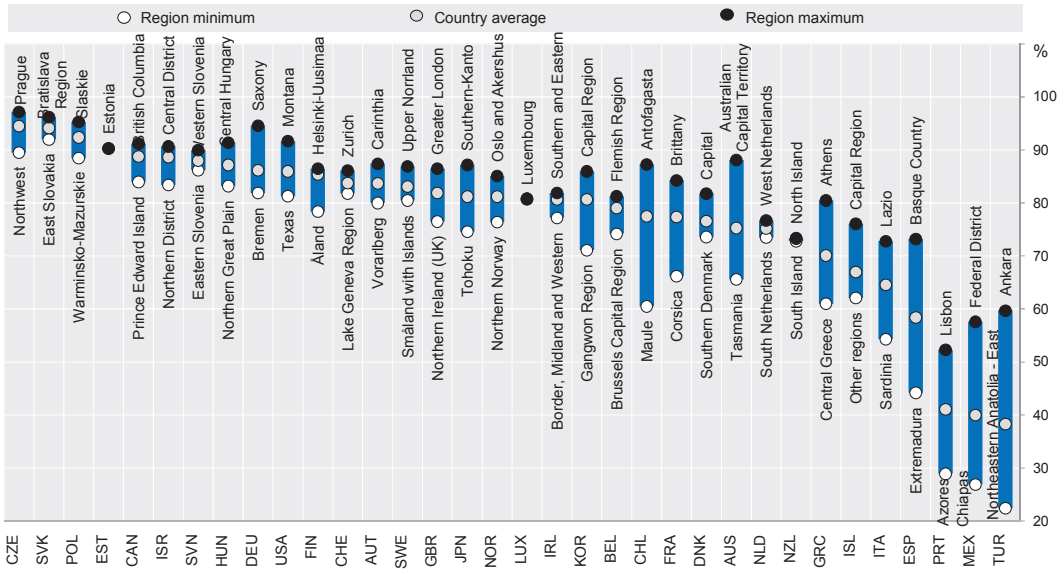
Educational outcomes can still be improved in most regions

Besides looking at income and employment outcomes, the assessment of well-being includes the measurement of several other non-material dimensions related to quality of life. One key element in terms of individual well-being is education, which, from a regional perspective, emerges as highly variable across regions. In most of the regions in Mexico, Portugal and Turkey, and in some regions in Spain, the proportion of the workforce with at least secondary education was less than 50% in 2013. These countries also show higher regional disparities in education (Figure 2.9). The share of the workforce with a secondary degree is not necessarily the best way to monitor educational outcomes; assessing the competency of students or skills of adults would be preferable. However, these data are not yet available for all countries at regional level and constitute an area for future work.

Regional factors strongly affect access to education and quality of learning. Even when the socio-economic background of students is taken into account, the location of schools matters greatly in determining the quality of education. In the OECD area, 15-year-old students in urban schools outperformed those in rural areas on the OECD Programme for International Student Assessment (PISA) survey by more than 20 points on average in 2009, or the equivalent of almost one year of education (OECD, 2010). Countries that have undertaken the OECD PISA survey at the regional level show that regional disparity in education outcomes can be large, such as in Australia, Canada, Italy, Mexico and Spain (OECD, 2013a).

Figure 2.9. **Regional disparities in education**

Regions with the lowest and highest percentage of workforce with at least a secondary education, 2013



StatLink http://dx.doi.org/10.1787/888933121069

Note: Countries ranked by average share of population with at least a secondary education. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2014), *Regional Well-Being* (database), http://dx.doi.org/10.1787/region-data-en.

Large differences in the returns to education between urban and rural areas can be a major incentive for highly educated individuals to migrate to cities. In most countries, the capital region has the highest share of the workforce with tertiary education. In the United States, Spain, the Czech Republic and Turkey, the regional variation in tertiary educational attainment is the highest (OECD, 2013a). Yet considerable disparities can be found within metropolitan regions as well. In the Chicago region, school districts record high school graduation rates that range from 57% in the city of Chicago to over 95% in suburban areas (OECD, 2013a). In Aix-Marseille, the share of the working-age population without a diploma ranges from 39% in neighbourhoods in northern Marseille to 14% in Aix-en-Provence (OECD, 2013c). The reverse is true in Puebla-Tlaxcala, Mexico's fourth-largest region, where peripheral areas exhibit lower education levels than the metropolitan core; in some census tracts, more than 65% of the population has not completed secondary education, compared to incompletion rates of less than 20% in the core.

Health, safety and housing outcomes show large differences across regions

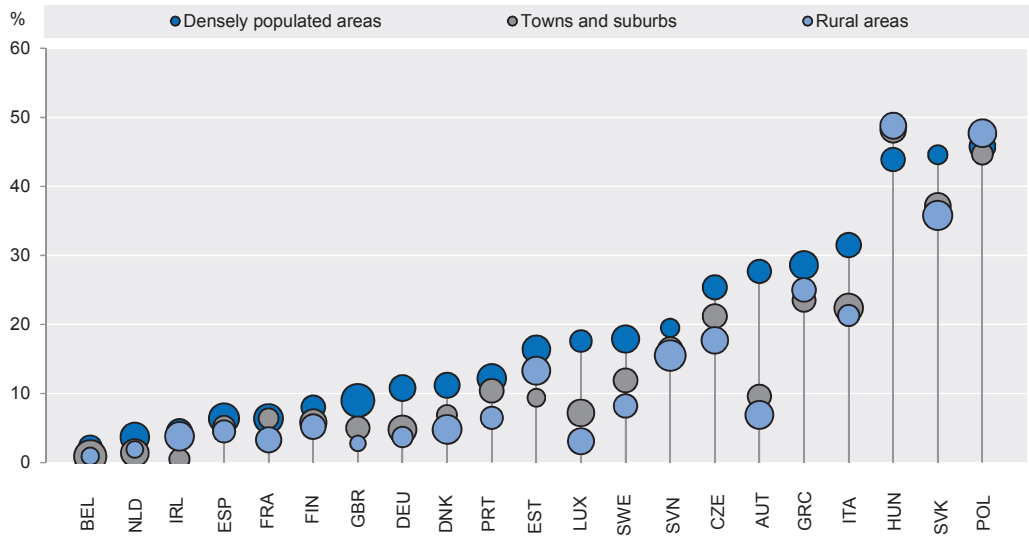
Strong regional disparities in health outcomes within countries can partly be explained by unequal access to health services. For example, people in Hawaii can expect to live on average six years longer than in Mississippi, approximately the same difference between Mexico and the United States. The age-adjusted mortality rate within countries is also subject to large differences. In most countries, the richest regions tend to have a higher number of doctors and lower age-adjusted mortality rates. Regional disparities may consequently affect the physical and financial availability of health services.

Countries with the largest regional differences in the number of doctors per resident include the Czech Republic, Greece, the Slovak Republic, Spain and the United States.

As for other dimensions of well-being, disparities in health outcomes are particularly noticeable when a small spatial scale is adopted, such as the city level. This is even more important in countries such as the United States, where TL2 regions (corresponding to states) are particularly large and their use may hide the magnitude of spatial disparities. Life expectancy in the United States varies dramatically at the level of the city-neighbourhood. For example, a 2013 study by the Robert Wood Johnston Foundation found that within the city of New Orleans, average life expectancy can vary by as much as 25 years in almost contiguous neighbourhoods.[4] A Measure of America study (Lewis and Burd-Sharps, 2013) shows the role of racial and ethnic factors on life expectancy at the city level, finding sharp differences among social groups.

Another important element that determines people's well-being in places is safety, meaning the degree of personal security where people live. Data availability across OECD regions imposes the use of objective indicators for safety, among which the murder rate is one of the most robust. As with the other outcomes of well-being, this indicator shows relatively large disparities across OECD regions, especially in North America and Chile. Perception measures of safety are increasingly being used in many countries. For European countries, for example, the EU Survey on Income and Living Conditions (EU-SILC) makes it possible to measure the perception of safety according to the type of settlement patterns (Figure 2.10). Figure 2.10 shows that, in most of countries, those who live in cities report lower levels of safety than those living in rural areas.

Figure 2.10. **Share of people who perceive crime, violence and vandalism as a problem in the area they live in, by type of area, 2012**



StatLink http://dx.doi.org/10.1787/888933121088

Note: Countries are ranked by increasing average perception of crime, violence and vandalism as a problem in the area of residence.

Source: Eurostat (2013), "European Union Statistics on Income and Living Conditions (EU-SILC)", European Commission, Brussels, http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc.

The variability of crime rates across space was strongly associated with other place characteristics in terms of well-being, such as education, access to jobs and social connections. More specifically, the empirical literature shows that increasing the level of schooling can lower crime rates (Lochner and Moretti, 2004; Machin et al., 2011) and that the latter decreases in contexts with high job accessibility (Gaigné and Zenou, 2013). The most serious crimes in cities were also found to be associated with lower social connections (Glaeser et al., 1996). Such relationships between well-being dimensions at regional level make it worthwhile to identify well-being indicators that account for more well-being dimensions at once. Such measures can help identify complementarities in different policy domains, increasing the effectiveness of policy intervention.

In measuring well-being, housing is an important dimension. Appropriate shelter is one of the most basic human needs, along with food and water. Furthermore, housing costs often represent the largest component of a household's income. Housing is also strongly connected to other well-being dimensions, such as health, income and life satisfaction (OECD, 2011). It is thus crucial to find ways to measure it. At local and regional level, the characteristics of housing are also closely linked to the territorial/spatial configuration. There are, in fact, important feedback mechanisms between the spatial structure in terms of settlement patterns, transport, and land-use and housing characteristics. For all these reasons, it would be necessary to use measures related not only to the availability of housing, but also to its quality and affordability. Especially at regional level, housing prices can vary significantly by location (e.g. urban vs. rural) and type of dwelling, which affect the extent to which housing is affordable.

While there are several ways of measuring housing conditions, no comprehensive database on the topic covering all OECD regions exists. One reason for this is the lack of availability of useful indicators at a regional level. In this context, the OECD compiled data on the number of rooms per person, which makes it possible to compare 32 OECD countries. This indicator has some limits, since it does not consider important elements such as housing prices, population density, the overall cost of life in the region or the potential benefits of trading space for location. Capital cities, for instance, have, on average, a relatively small number of rooms per person compared to the other regions in the country (with the notable exception of Mexico). At a national level, the number of rooms per person starts at 0.9 in Turkey and goes up to 2.6 in Canada. When broken down to a regional level, however, a similar difference can be found in the same country. In Canada, for example, inhabitants of Nunavut have, on average, 1.3 rooms per person, half as much as people living in the Nova Scotia region, with 2.7 rooms per person.

Environmental outcomes are to be assessed at the local scale

Regional measures of environmental outcomes also contribute to a better understanding of the location determinants of individual well-being. Many indicators of human well-being that attract attention in public policy do not account for environmental outcomes, but assessment of well-being at regional and city level demands that they be considered. The recent literature reports that individuals enjoy higher levels of well-being – both in terms of subjective life satisfaction and of health outcomes (lower mental distress) – when living in urban areas with more green space (White et al., 2013). Similar results were found in the literature regarding the negative impact of local air pollution on self-reported life satisfaction (Ferreira et al., 2013). According to the EU, exposure to fine particulate matter reduces life expectancy from between eight months to up to two years in the most polluted places (European Environment Agency, 2012), and is the main environmental cause of premature death (OECD, 2014b). Environmental issues

have also been shown to have an economic impact. Silva and Brown (2013), for instance, show that decreasing the average annual particulate matter concentrations by 1% is equivalent to increasing per capita income by 0.71%.

The cumulative benefits of individual well-being in regions and cities suggest that action should be taken both at the national and local level to preserve and improve environmental quality. A recent study estimates that OECD countries are willing to pay USD 1.7 trillion to avoid deaths caused by air pollution (OECD, 2014b). However, the capacity for action could be limited by the capacity to measure environmental outcomes. Environmental quality can be measured both by objective and subjective means. Objective measurements can include extent of energy consumption, measures of the quality of different environmental media such as soil, water or air, or different types of land use. Subjective metrics evaluate how much people report they appreciate the environment where they live.

To make up for the current lack of internationally comparable indicators of environmental outcomes, the OECD has developed a new methodology that relies on satellite-based data to measure environmental outcomes at national, regional and city levels (see Box 2.5). This has resulted in new estimates for CO_2 emissions in regions and metropolitan areas, air pollution, share of green areas in cities and forest and vegetation in regions, and changes in land use and pace of urbanisation (OECD, 2013a).

Box 2.5. **Using GIS data to measure the environmental performance of regions and cities**

In recent years, the OECD has used satellite datasets (global layers) at different resolutions, combined and co-ordinated with geographic information systems (GIS), to measure land cover and its changes, air quality and emissions for small areas of territory. Indicators obtained by integrating different sources of data using GIS include: per capita CO_2 emissions in regions and metropolitan areas (total and by sector); regional and metropolitan population exposed to fine particulate matter ($PM_{2.5}$); regional range of CO_2 sequestration and release; percentage of urban land converted from agriculture, forest and vegetation; percentage of green areas in metropolitan areas and urban sprawl index.

Despite recent progress in Earth observation, remote sensing and techniques for processing large datasets, no unique global dataset yet exists to record changes over time in land cover. By co-ordinating the available sources of data for Europe, Japan and the United States, it was possible to monitor the land taken over by urban development in these countries and to evaluate whether the expansion of land for urban uses (residential and commercial buildings, major roads and railways) threatens the quality of the landscape or biodiversity. In the past decade, for example, one-third of the OECD metropolitan areas in Europe, Japan and the United States have expanded their built-up areas at a pace that exceeds population growth.

In the case of emission data and air quality (concentration of particulate matters), different global datasets have also been used to facilitate estimation for regions or metropolitan areas, including the *Emissions Database for Global Atmospheric Research* (EDGAR) developed by the Joint Research Centre of the European Commission, and the concentration of $PM_{2.5}$ particles developed by Van Donkelaar et al. (2014). Emissions dataset can be computed at regional or metropolitan level since the emissions are collected at national level and attributed to small gridded areas based on the location of energy and manufacturing facilities, road networks, shipping routes, human and animal population density, and agricultural land use. As a result, they can capture changes in energy use or greenhouse gas emissions due to local policies.

Box 2.5. **Using GIS data to measure the environmental performance of regions and cities** (*cont.*)

Geographic information data are a key and underexploited resource for monitoring the state of local environmental assets in regions and cities of different sizes. The results show great promise for producing internationally comparable indicators with the largest possible coverage of OECD and non-OECD countries.

One future area for development would be to integrate individual level data on satisfaction on environmental quality and environmental services with the environmental performance of regions and cities.

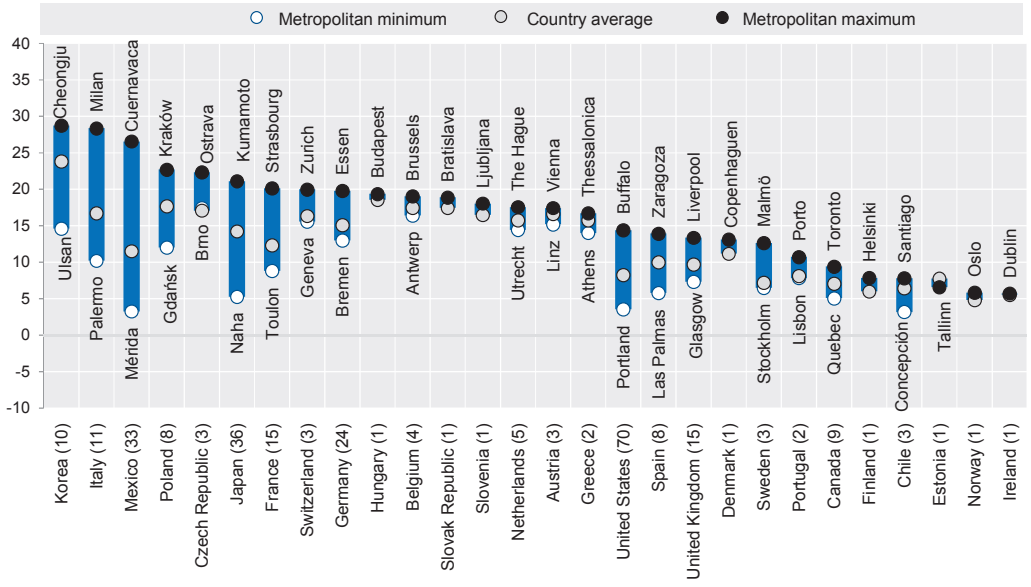
Source: OECD (2013), *OECD Regions at a Glance 2013*, OECD Publishing, Paris, http://dx.doi.org/10.1787/reg_glance-2013-en; OECD (2012), *Redefining "Urban": A New Way to Measure Metropolitan Areas*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264174108-en; Van Donkelaar, A., R.V. Martin, M. Brauer and B.L. Boys (2014), "Global fine particulate matter concentrations from satellite for long-term exposure assessment", *Environmental Health Perspectives*, forthcoming.

The headline indicator used to measure the well-being dimension in the OECD regions is the average exposure to concentrations of fine particles in the air (particulate matter, $PM_{2.5}$) of the regional population. Fine particles are considered major air pollutants, with significant negative effects on respiratory and cardiovascular systems. According to the World Health Organization (WHO) guidelines, the risk of adverse effects on health is high above an annual average concentration of 10 $\mu g/m^3$ (WHO, 2005). According to OECD estimates, in 209 out of 362 regions, people were on average exposed to levels of air pollution higher than the WHO threshold in 2012. Critically high values are found in Korea, Israel and Italy. Air pollution can be very different across cities, with some areas showing lower levels than the national averages and others much higher levels. Furthermore, while the metropolitan areas in Canada, Chile, Estonia, Finland, Ireland and Norway do not exceed the World Health Organization's recommended yearly concentration of air pollution, in the metropolitan areas of Cheongju (Korea), Milan (Italy) and Cuernavaca (Mexico), people have an annual average exposure above 25 $\mu g/m^3$ (Figure 2.11).

Concentration of activities in cities provides employment and other market services, but is also a locus of positive and negative externalities. It is reasonable to assume that city scale, urban morphology and land-use systems play a role in determining well-being. Urban sprawl, for example, has become a major public policy issue in recent years, reflecting widespread objections that urban growth is paving over the landscape and is undesirable on environmental grounds. In response, many cities and national governments have adopted policies to limit sprawl, including restrictions on development at the urban fringe, new charges imposed on builders and public purchase of open space. These measures are not, however, necessarily based on an assessment of the implications for the inhabitants' well-being. An investigation in six OECD countries explores the effect of the urban structure on life satisfaction. The preliminary econometric analysis suggests that population density in the overall urban area positively affects life satisfaction on average, but that some associated aspects of population density – such as the increasing density of roads and a greater diversification of land use – have ambiguous and sometimes negative impacts on life satisfaction (Box 2.6).

Figure 2.11. **Metropolitan disparities in population exposure to air pollution ($PM_{2.5}$), 2012**

Metropolitan areas with the lowest and highest population exposure to $PM_{2.5}$ levels, average 2010-12



StatLink http://dx.doi.org/10.1787/888933121107

Note: These estimates are made possible by the computation of satellite-based observations in Van Donkelaar et al. (2014). Countries are ranked by decreasing regional differences.

Source: OECD (2014), "Metropolitan areas", *OECD Regional Statistics* (database), http://dx.doi.org/10.1787/data-00531-en.

Box 2.6. **Exploring the effects of urban structure on individual well-being**

A recent study based on the OECD Household Survey 2011, spatial GIS data and the OECD common definition of metropolitan areas, investigated key urban structure indicators that affect life satisfaction. The analysis investigated responses from individuals living in 35 metropolitan areas (with a population of more than 500 000) from 5 OECD countries (France, Japan, the Netherlands, Spain and Sweden). The econometric analysis suggests that population density in the overall urban area positively affects life satisfaction. However, some aspects associated with population density, such as increasing congestion on roads and a greater diversification of land use, were shown to have an ambiguous and sometimes negative impact on life satisfaction. Furthermore, city compactness has both positive and negative effects on life satisfaction. Other factors being equal, households closer to the urban core generally display higher levels of life satisfaction, but life satisfaction is nevertheless negatively affected by compact characteristics, such as smaller residences or increased centralisation.

Overall, the analysis suggests the potential of integrating spatial data on urban structure and characteristics with survey data on life satisfaction and, more generally, appraisal of local environmental outcomes.

Source: Brown, Z., W. Oueslati and J. Silva (2014), "Exploring the effect of urban structure on individual well-being", *OECD Environmental Working Papers*, OECD Publishing, Paris, forthcoming.

At a regional level, access to services is a key dimension for people's well-being

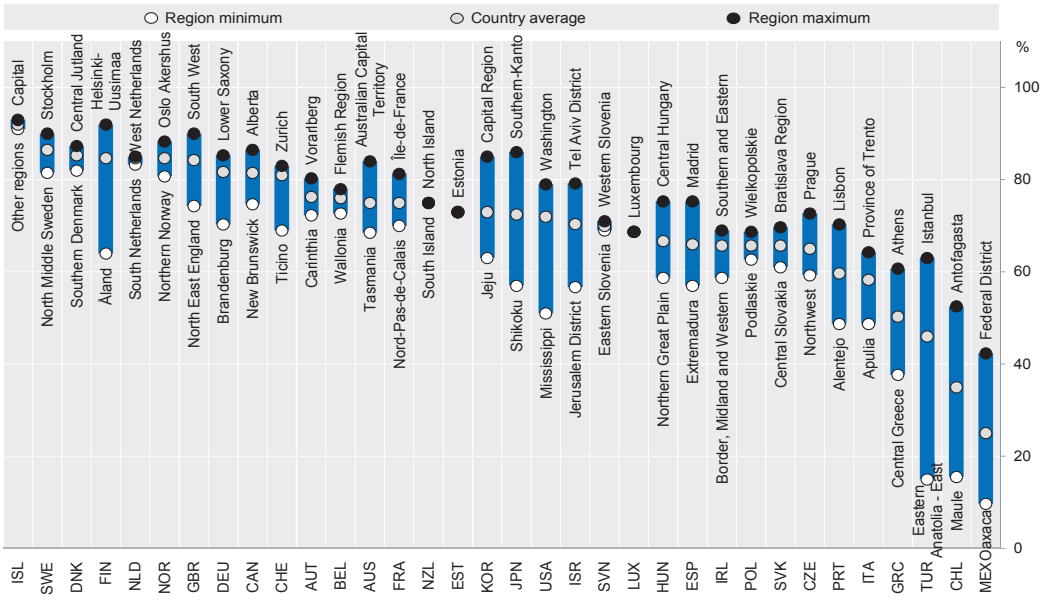
Access to services affects how people obtain what is necessary to satisfy their needs and wants. The extent to which a given service is accessible to an individual can be considered as falling under three main categories, physical, economic and institutional. Physical accessibility concerns the ability to reach the place where the service is provided. Economic accessibility refers to the affordability of a given service, including both the cost of the service and associated transaction costs (e.g. the costs of search, information and transport). Finally, institutional accessibility to a service involves constraints such as laws, norms or societal values. Knowledge and perceptions (whether people know about the existence of a service and how to use it) also play a role, because people may not be aware of the existence of a service or perceive that there are limits on its accessibility. Each of these three dimensions is strongly linked in evaluating accessibility at a regional or city level.

Measuring the access to services allows for deeper insight into disparities in well-being across different places. Significant disparities in access to basic and advanced services, such as transport, water and sanitation, education, health and ICT, persist across and within regions. Unequal access to education, for instance, may inhibit social mobility and perpetuate inequalities. Figure 2.12 shows the regional variability in the access to broadband connection, a basic component to improve economic competitiveness and social progress. Despite different average levels of broadband connectivity by country, Chile, Greece, Mexico and the United States show the highest regional disparities. These disparities are relevant for policy because they reflect the opportunities available to people to develop their potential according to their ambitions (Sen, 1993) and to satisfy different human needs, from basic physiological requirements to self-actualisation (Maslow, 1943). Analysing access to services can lead to more efficient use of resources by identifying under-serviced areas and helping to satisfy demand more equitably.

Accessibility to health services is a key element in people's well-being. A simple outcome indicator in this area is the unmet medical need, that is, the percentage of individuals who report one or more occasions on which they were in need of medical treatments or examinations but failed to receive either.[5] This indicator was computed at regional level for a set of OECD countries, based on national household surveys.[6] As in the case of other well-being dimensions, the share of people with unmet medical needs in 2011 was different between and within countries (Figure 2.13). Regional disparities in the levels of unmet medical need, under different national health systems, might reflect such inequalities as the distance from the health centre, the ability to afford care or differences in restrictions such as waiting lists. The regional divide changes from country to country and, with Mexico and Chile, the countries in South Europe display the largest gap between the best- and worst-performing regions. One limitation of this indicator is that it does not provide insight into the reasons why medical needs have not been attended to, and whether, for example, this is due to economic or institutional factors. Even where respondents are asked for this information, the data in most countries cannot be retrieved at regional level because of small sample sizes. Expanding household surveys to build a more representative regional sample could help formulate more informative indicators.

Figure 2.12. **Regional disparities in households' broadband connection**

Minimum and maximum regional values, percentage of households with broadband connection; 2013



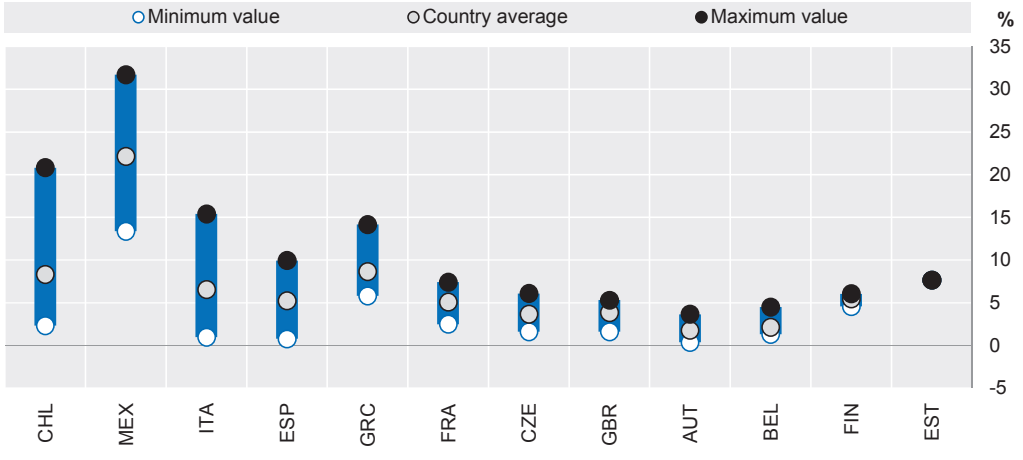
StatLink http://dx.doi.org/10.1787/888933121126

Note: Countries are ranked by decreasing average national share of households with broadband connection. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2014), *Regional Well-Being* (database), http://dx.doi.org/10.1787/region-data-en.

Figure 2.13. **Share of people who experienced unmet medical needs, 2012**

Highest and lowest regional values in 2012

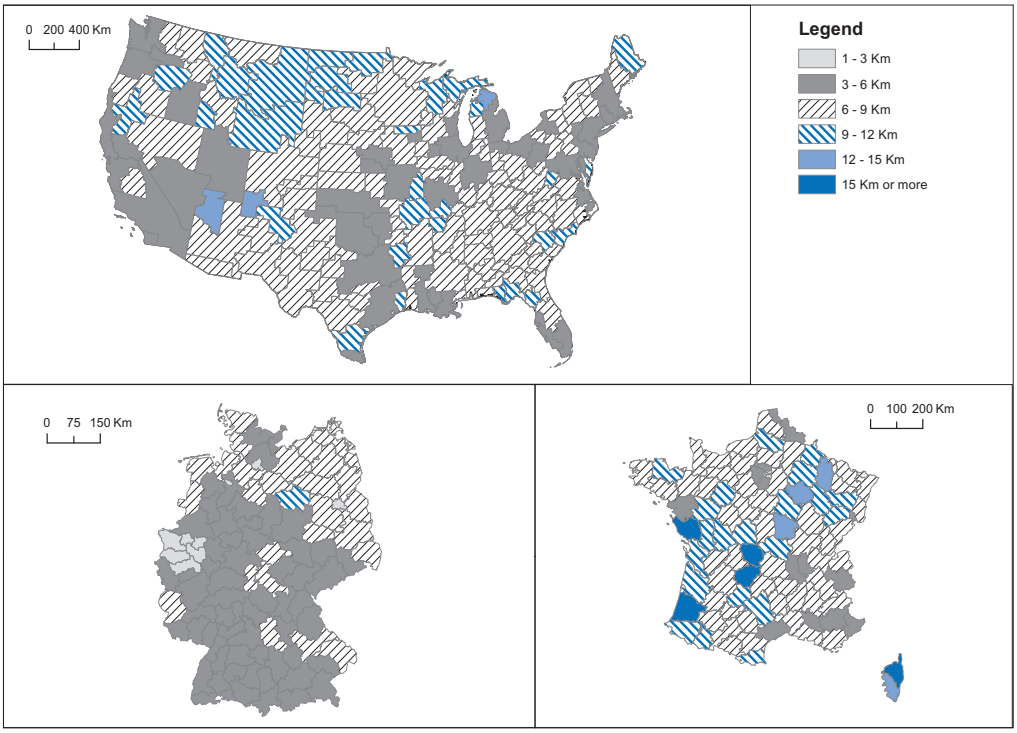


StatLink http://dx.doi.org/10.1787/888933121145

Source: Authors' research based on EU-SILC for European countries; CASEAN for Chile; ENSANUT for Mexico.

Disparities in access to services across regions can be related to issues of land-use planning. Access to services can depend heavily on the closest point of access and how it can be reached. Regional geographic features as well as the regional transport network are determining factors. Specific indicators to measure the spatial accessibility to public services (e.g. health services) can take into account the distance – in terms of driving time or road distance – to reach the point of access. Figure 2.14 shows, for the case of France, Germany and the United States, the average distance to hospital by small region (TL3), where such distance is weighted by the localisation of people in each square kilometre. On average, regions with higher population density have a higher physical access to hospitals. While in France, regions with relatively high distance values are scattered throughout the country, in the case of Germany, regions with relatively high distance values are mostly located in the north-east of the country (Ruiz and Veneri, 2014). These types of indicators are currently available only for a set of countries – including France, Germany, Italy, Mexico, Portugal and the United States – which have provided data on the location of hospitals and at least their basic characteristics.

Figure 2.14. **Average distance to the closest hospital**



StatLink http://dx.doi.org/10.1787/888933121164

Note: The distance is weighted by the population. This document and any map included herein are for illustrative purposes and without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area

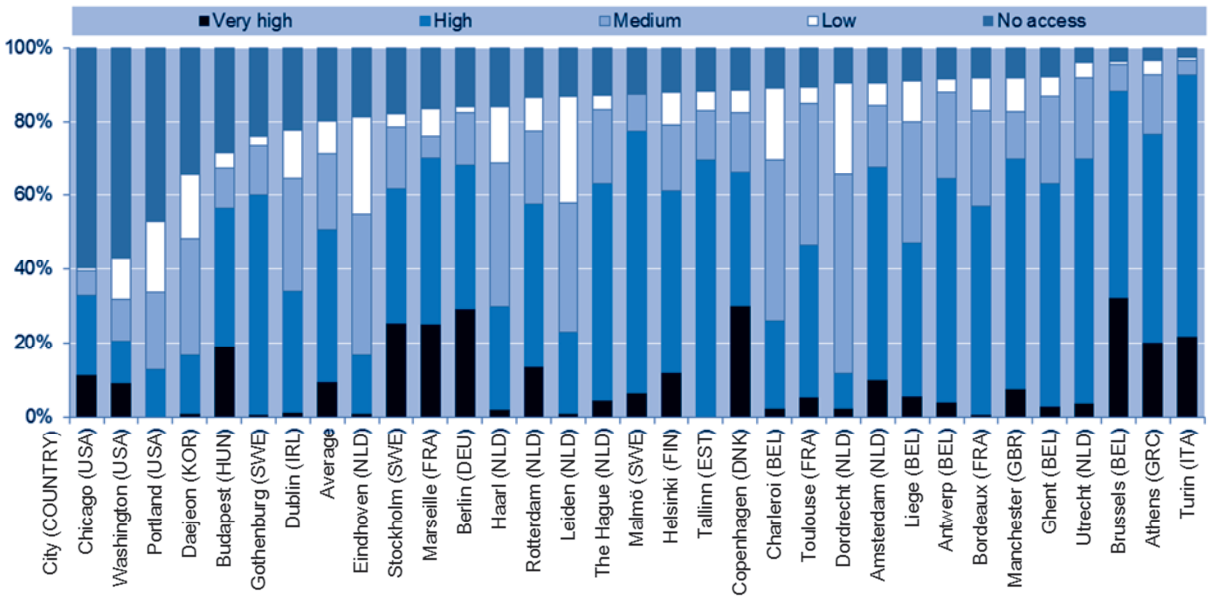
Source: Ruiz, V. and P. Veneri (2014), "Measuring the access to public services: The case of public hospitals", *OECD Regional Development Working Papers*, OECD Publishing, Paris, forthcoming.

The availability and accessibility of public transport in cities is an important dimension of quality of life. An ongoing OECD-EU project has developed a common

methodology to identify public transport catchment areas (areas within walking distances to service stops) for different typologies of transport in functional urban areas (OECD, 2014a). After combining the catchment areas with the service frequency by transport mode (bus, metro, light rail, etc.), the share of population with varying degrees of access to public transport was computed. Preliminary results for 32 OECD metropolitan areas show large differences in the access to transport in cities, although the cross-country comparability of the data needs further testing (Figure 2.15). Not surprisingly, a larger share of the population in urban core areas of European cities has access to public transport than in American cities: no less than 70% of population in the European cities have some access to public transport. Among the non-European cities, Chicago, Washington and Portland have the largest shares of population with "very high" and "high" access. Of the large European cities, more than 90% of the population has high and very high access to public transport in such cities as Turin (Italy) and Brussels (Belgium), with 70% in the medium-sized city of Malmö (Sweden) (Figure 2.15). The sample analysis for non-European cities reveals that publicly available data from public transport providers in metropolitan areas are rather limited and that further data collection is needed (Box 2.7).

Figure 2.15. **Access to public transport in a selection of cities**

Percentage of population with access to public transport



StatLink http://dx.doi.org/10.1787/888933121183

Note: For cities in the figure, the population refers to those living in the core of the respective metropolitan area (densely populated areas). The service frequency of public transport was reclassified into the categories very high, high, medium and low, according to common thresholds by continent. The "no access" category refers to areas where the estimated walking time for accessing public transport is higher than 5 minutes (for road transport) or 10 minutes (for rail transport). The results shown in the graph should be considered preliminary as the cross-country comparability of data needs further testing.

Source: OECD-EC calculations based on functional urban areas (OECD, 2014a).

Box 2.7. **Accessibility of services: The statistical agenda ahead**

Citizens and policy makers are increasingly calling for indicators of accessibility of services. For this task, spatial information on the location of services available (e.g. schools, hospitals, train stations, green spaces, etc.) is necessary. By integrating this information with administrative data (e.g. on the use of the service in question), as well as with data on population and roads, it is possible to assess at different territorial levels the extent to which services are at least potentially accessible.

While physical accessibility to services facilitates well-being outcomes, it could be argued that it is not a well-being outcome in itself. However, it directly affects the chances that residents in given locations have certain services available. This suggests that accessibility to services might be considered a well-being dimension in and of itself.

The most important constraint when building indicators on physical accessibility to public services is the lack of adequate data. Despite the increasing use of GIS for territorial planning, data on the exact position of key services like public hospitals are scarce (or at least not publicly available). Further work on the geo-localisation of public services should also take into account the characteristics of service providers. In the case of public hospitals, this could help identify the type of treatments offered in the different health facilities. Additional information could make it possible to build more robust indicators (e.g. gravity-based measures).

Standardising these measures across countries is of particular interest because it makes it possible to identify international benchmarks, carry out comparative analysis of cities and regions, and provide useful information to policy makers, people and service providers. International comparisons require data of consistent quality. For example, when computing access to health services, a consistent distinction should be made between private and public services, but institutional differences in health systems between countries should also be considered. Not all countries have the same data available, and further work on building accessibility measures should take into account indicators that portray spatial access to public services and those that allow comparison of as many OECD countries (regions) as possible.

One possible limit of the measures of access to services is that there are different methods depending on the service considered (health, education, transport, etc.) and no standard measures across services have been formulated. For this reason the regional assessment of service access is in general difficult, since a suite of different measures is needed. A solution would be to develop a composite measure of physical proximity to a bundle of services.

Accounting for interactions among well-being dimensions

Well-being dimensions can be strongly interdependent in regions. This interdependency should be considered when designing policies, to maximise their results (see Chapter 1). Regional and local initiatives to measure well-being can address the complementarities among different policy objectives. For example, more public transport choices in metropolitan areas can improve economic competitiveness by increasing access to jobs, and at the same time support environmental objectives (Box 2.8). On the measurement side, this implies building synthetic indicators that take into account more than one dimension of well-being.

The interactions across well-being dimensions can also be measured by specific indicators without using global indexes. These indicators, referred to as cross-dimensional indicators, consist in combining two well-being dimensions, where the first is measured along the distribution of the second one. For example, the share of households that spend more than 30% of their income in energy consumption can give

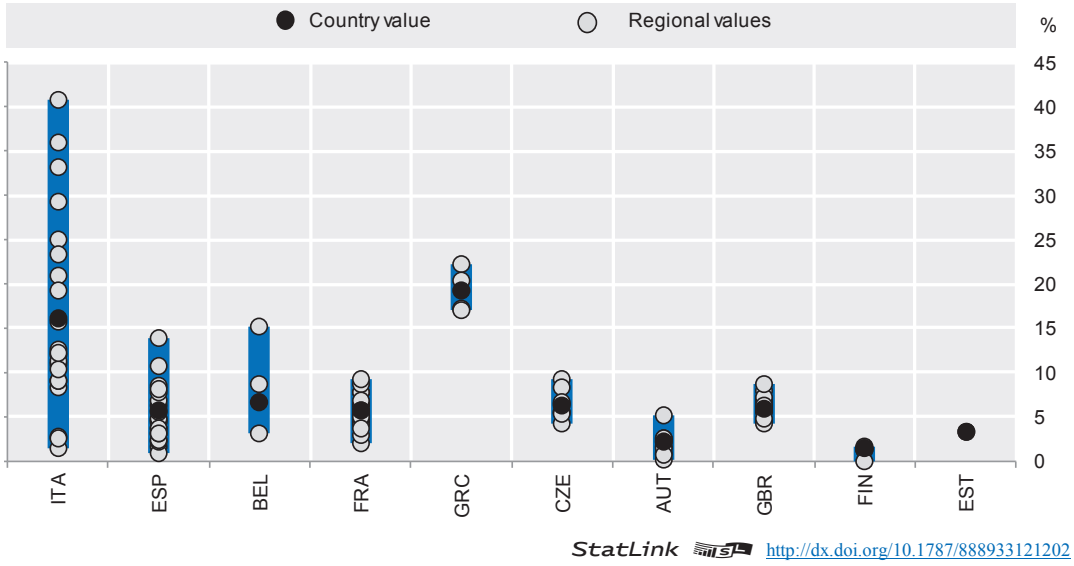
information on different well-being dimensions, such as income, environment and access to services (energy). The main advantage is that these measures can help monitor complementarities among policies and well-being dimensions, as well as monitor specific issues or groups of people. A set of possible cross-dimensional indicators to be used for international comparison is presented in Table 2.3. The purpose of this list, which is far from exhaustive, is to give an idea of how the interaction among different well-being dimensions can be accounted for when measuring well-being.

Few of the cross-dimensional indicators listed in Table 2.3 can be computed at regional level, mostly because of data limitations. The surveys that collect this information do not always allow for a regional representativeness of data. Only certain indicators presented in Table 2.3 can be computed at regional level, and for a sub-sample of OECD countries only. For example, the European Survey on Income and Living Conditions (EU-SILC) collects information on the share of households that cannot afford to keep their houses sufficiently warm, and for a sub-sample of European countries, it was possible to draw reliable information at regional level. As shown in Figure 2.16, the percentage of households varies widely, with lower values in Austrian and Finnish regions and higher values for Greece and Italy. Italy also displays the largest gap between "best" and the "worst" performers. The figures presented in Figure 2.16 should be interpreted with caution, as they involve a small sub-sample of OECD countries and explore only one of the several possible cross-dimensional indicators of individual well-being. A complete and more representative picture will require improvement in the regional representativeness of household surveys.

Table 2.3. **Cross-dimensional indicators**

Indicator	Well-being dimensions considered
Share of students in primary education with no access to food	Education – Income
Share of households that devote 30% or more of their income to energy consumption	Income – Environment
Share of households with housing costs greater than 30% of income	Income – Housing
Life expectancy for low-income earners	Income – Health
Share of obese people with no more than primary education	Health – Education
Share of transport expenses by class of household income	Access to services – Income
Share of households which cannot afford to keep the house sufficiently warm	Income – Housing
Share of individuals with no more than lower secondary education whose health status limits their activities	Health – Education
Share of individuals with a low level of education who report problems related to crime in the area where they live	Crime – Education
Share of individuals who report environmental problems in the area where they live by class of household income	Environment – Income
Share of individuals who report problems related to crime in the area where they live by class of household income	Income – Crime
Health status of long-term unemployed	Health – Employment
Life expectancy of individuals with limited education levels	Health – Education
Incidence of chronic disease by class of household income	Health – Income
Unmet medical need among individuals with limited education levels	Health – Education
Share of individuals with limited education levels in long-term unemployment	Education – Employment

Figure 2.16. **Percentage of households that cannot afford to keep their houses sufficiently warm (OECD regions), 2012**



Note: Each dot represents a TL2 region. Countries are ordered by decreasing regional differences in the value of the indicator.

Source: Authors' research based on data from Eurostat (2013), "European Union Statistics on Income and Living Conditions (EU-SILC)", European Commission, Brussels, http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc.

Box 2.8. **Complementarities among well-being dimensions: Examples from OECD regional initiatives**

Morelos: The dimension most shaping the policy debate at present is concern over personal security. This focuses on the cost in human lives and family well-being of the state's high level of crime, and also the economic impact on its productivity and business. A remarkable consensus has emerged in different sectors that the root cause of the insecurity stems from a lack of educational and employment opportunities for young people. A preventative approach focusing on education, health and social cohesion has been proposed, in addition to focusing on the police and criminal justice system. One policy initiative that attempts to account for the interaction between well-being dimensions is the *beca salario*, a universal scholarship programme that directly benefits students in public schools. This can help reduce the risk that young people become involved in criminal activity.

US Partnership for Sustainable Communities: This federal initiative aims to develop more sustainable communities by integrating transport, housing and energy policies. Recognising that housing and transport costs account for almost half the average household's budget, the initiative has developed the Location Affordability Index (LAI), which provides estimates of the percentage of a family's income dedicated to the combined cost of housing and transport in a given location. Because what is "affordable" is different for everyone, users can choose among eight different family profiles, defined by household income, size and number of commuters, and see the affordability landscape for each in a neighborhood, city or region.

Source: OECD (2014), "State of Morelos, Mexico", and OECD (2014), "US Partnership for Sustainable Communities", in OECD (2014), *How's Life in Your Region?: Measuring Regional and Local Well-being for Policy Making*, OECD Publishing, Paris.

The way forward in measuring well-being in regions and cities: The statistical agenda

This report provides a framework and a set of measures to assess well-being in cities and regions. It also takes stock of the statistical challenges involved in comparing regions and cities within and across different countries. Since most of the surveys undertaken by national statistics offices to measure household conditions are designed to provide information at the national level, statistical information at a detailed geographical level is typically scanty. Different methods are needed to increase the available information, which could include: using existing micro-data from surveys and censuses; integrating geographical information systems (GIS) with administrative data; estimating well-being indicators for different units (using administrative or functional boundaries); designing specific surveys and using innovative tools (e.g. social networks, ICT tools) to collect information. The potential of using *big data* for measuring well-being dimensions and assessing social progress is being investigated in many OECD countries and could represent a direction of wrok also at sub-national level. All these methods pose challenges for ensuring the quality and comprehensiveness of the statistical information.

A common statistical agenda for advancing in the measures of well-being of regions and cities needs to cope with two major issues. First, it is important to understand the most relevant scale (e.g. city, region, neighbourhood, etc.) for the various well-being dimensions. Second, the way these dimensions interact should be analysed further at different spatial scales and time horizons. In order to compute indicators that account for interactions across well-being dimensions, a review of current data availability, including micro-data, and future strategic objectives of National Statistical Offices would be necessary.

The main statistical challenges include: *i)* improving the measurement of well-being dimensions in large regions; *ii)* measuring additional well-being dimensions that are not at present available for large regions; *iii)* improving measurements of inequality within regions; and *iv)* increasing well-being measures for other administrative units, in particular for metropolitan areas.

Improving the measurement of different well-being dimensions

One important issue is to close the gap between the well-being dimension considered and the outcome measures available. Priorities for future research include:

- Quality of services. Access to services is a key dimension of regional well-being. Several existing indicators consider different types of services, but measurements of accessibility need to be improved to account for affordability and possible institutional constraints, and not just physical access to services. New metrics are needed to assess the quality of the services provided, for example surveys assessing user satisfaction in regions or cities. Increasing the regional representativeness in national households surveys would be a way to improve information on services for some countries.
- Education outcomes. At a regional level, educational outcomes are currently measured by levels of education. At the regional level, PISA measures of student competence are now limited to a handful of countries or single regions. Given the relevance of educational outcome and its strong connection/complementarity with other dimensions of well-being, the assessment of skills is particularly important. To build indicators on education outcomes at regional and urban levels, greater

consistency in national programmes for skills assessment will be necessary, and information from surveys and other sources (e.g. administrative records) must be included.

Measuring additional well-being dimensions

Due to the limited availability of data at the sub-national scale, this report is not able to study as many dimensions for the measurement of well-being in regions and cities as the How's Life? framework does for the national level. Some of the elements that are not available for the regional framework could improve the understanding of the material conditions and quality of life in regions and cities. Priorities for future research should include refining measurement of the following elements:

- Housing. A crucial element in the assessment of material conditions, regional indicators of housing should consider the characteristics of dwellings, including their quality and affordability. Less ambitious but important and potentially more easily available indicators include homeownership rates and vacancy rates. For this task, existing geo-coded information should be explored.
- Transport. Transport, as a material component in accessibility of services, crucially affects quality of life. Important data include measures of physical access to mass transit (e.g. distance from a station or point of access); the price of transport (economic accessibility) and time spent travelling (e.g. commuting time). This information is not yet available in all OECD countries, but GIS data will be vital after countries co-ordinate to provide consistent geo-coded information on where services are located and what they consist of.
- Land use is another important spatial component underlying well-being metrics. It is strongly connected to other dimensions of well-being, such as transport, housing and environmental health. Consistent and comparable data on land use make it possible to assess access to open space, parks and other natural amenities. GIS is a crucial tool in this type of measurement, but more frequently updated and spatially detailed information is also necessary. An alternative and promising way to assess the quality of the environment is to focus on residents' subjective assessment of natural amenities. One example is the Netherlands' Hotspot Monitor initiative to identify highly valued natural sites using a survey-based method (see Box 1.7).
- Subjective well-being. Subjective measures evaluating life circumstances and satisfaction with services can also be used. One option would be to use existing surveys for European regions (European Social Survey, or EuroBarometer) to interpolate regional data and expand this to the other OECD countries. Alternatively, the feasibility of running national household surveys on an agreed set of indicators at a regional level should also be explored.

Individual-level measures of inequality in well-being

Assessing well-being in cities and regions implies, when possible, measuring the extent to which the different dimensions of well-being are available to people. Indicators of inequality can be seen as meta-measures, which are particularly helpful for regional policy makers to better target policy. These measures are relevant, since they are linked to equality of opportunity.

This report documents a first effort to build measures of household income inequalities at regional level in 28 countries. To ensure that these measures will be available in the future, it is necessary to increase the availability of survey data that are representative at the regional level, redesign the sampling structure and disseminate the information needed to evaluate sampling errors. It would also require repeating the sub-national estimates of income distribution at regular intervals (e.g. every three years). Individual-level inequality measures are also important for other aspects of material conditions, such as wealth.

New data production methods for metropolitan areas

More effective measurement of well-being at the appropriate scale will require new methods of gathering data. This is particularly true for the city level. The *OECD Metropolitan Database*, which includes indicators on the 275 OECD functional urban areas of 500 000 people or more, offers a basis for studying the implication of different policies in cities of different sizes. However, data are still lacking for many key social and income variables at the city level. Priorities for future work are:

- Income and employment. Currently, indicators of employment for functional urban areas are estimated by downscaling from regional values, based on the distribution of population throughout the region (OECD, 2013a). However, more robust employment and income indicators could be computed in other ways, for example using small area estimation techniques. These techniques can also be used to obtain estimates of income level and distribution in cities where they are currently unavailable (see, for example, the Eurostat project "ESS-Net on small area estimation", tested in ten countries).
- Access to services. To increase measures of access to services and subjective measures of service quality, different sources of data could be included. Administrative data, available at local level, could be integrated with geo-coded data and national household surveys. National statistical offices could help make more geo-coded data available about the location of infrastructure and services (hospitals, schools, cultural and recreation facilities, transport stations, public spaces, etc.). Expanding national household surveys to include a limited set of questions for subjective evaluations of the quality of services for lower geographical levels could also be discussed.

Notes

1. The indicators are produced through a new household-level data collection based on internationally harmonised income definitions that use the same definitions and methods as the *OECD Income Distribution Database* (www.oecd.org/social/income-distribution-database.htm). Results and details on the quality of the estimates can be found in Piacentini (2014).
2. Market income is household income before cash transfers from the general government, taxes and social security contributions paid by a household.

3. Selected countries are Belgium, Canada, Chile, the Czech Republic, Estonia, Finland, France, Greece, Italy, Korea, Luxembourg, Mexico, Spain, the United Kingdom and the United States.

4. Source: www.rwjf.org/en/about-rwjf/newsroom/features-and-articles/Commission/resources/city-maps.html (last accessed July 2014).

5. For European countries the same outcome indicator has already been used to measure access to medical services at both regional (Annoni et al., 2012) and national level (OECD, 2013d).

6. The indicator has so far been computed only for Chile, Mexico, New Zealand and a sub-sample of European countries (Austria, Belgium, the Czech Republic, Estonia, Finland, France, Greece, Italy, Spain and the United Kingdom). Data on Chile are taken from the *Encuesta de Caracterización Socioeconómica Nacional* (CASEAN, 2011); those on Mexico are drawn from the *Encuesta Nacional de Salud y Nutrición* (ENSENUT, 2012); and those on European countries are drawn from the European Survey on Income and Living Conditions (EU SILC, 2013).

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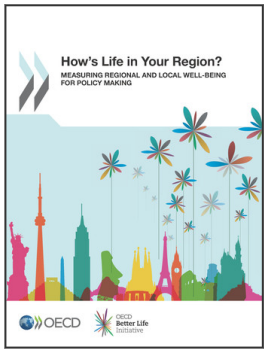

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