OECD Regions and Cities at a Glance 2020



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Foreword

The COVID-19 pandemic that hit the entire world at the beginning of 2020 has been affecting people and places in both economic and social terms. The indicators presented in this edition of *OECD Regions and Cities at a Glance* allow a comprehensive assessment of the factors that contribute to making regions and cities prepared and resilient not only to the current crises but also to other megatrends that have an impact on the economy, society and the environment. Overall, this edition presents more than 100 statistical indicators for individual regions and cities, shedding light on disparities and their evolution since the start of the new millennium. For most of the topics analysed, this report covers all OECD member countries and, for a subset of indicators, especially on urbanisation, the scope of the report extends for the first time to the entire world.

There are many new areas of subnational data in the 2020 edition of *OECD Regions and Cities at a Glance.* New subnational health-related indicators enrich the first chapter of the report, covering aspects that range from excess mortality to the availability of health infrastructure and morbidity rates. The assessment of the economic resilience of regions (Chapter 2) presents new estimates of remote working potential, access to digital infrastructure as well as new evidence on the regional openness to trade. In addition, new data on expenditure and investment by regional and municipal governments (Chapter 5) provide novel insights into the financial resilience of regions and cities. Taken together, all these factors will contribute to shaping how regional economic disparities – observed from different perspectives and at different scales – might change in the future.

The report also provides new region- and city-level indicators to monitor the transition to a climate-neutral economy and sustainable development (Chapter 3). In this respect, the new indicators presented in the report are consistent, to the extent possible, with those in the United Nations (UN) Sustainable Development Goal (SDG) framework. Those indicators cover a wide range of topics, including trends in land consumption and tree cover loss, biodiversity and ecosystem protection, household energy consumption, as well as the production of electricity by energy source and related carbon emissions.

Another new aspect of this edition is the analysis of population growth, sub-urbanisation and densification of all cities and metropolitan areas in the world over the last four decades (Chapter 4). The analysis relies on concepts and definitions developed by six international organisations (European Commission, Food and Agriculture Organization, International Labour Organization, OECD, UN-Habitat and the World Bank) and endorsed earlier this year by the UN Statistical Commission.

The analyses presented in *OECD Regions and Cities at a Glance 2020* draw on a range of maps, charts and figures designed to present differences between regions and cities within and across countries. Country profiles providing key facts related to regional development complement the report and are available on the publication website.

Acknowledgements

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The report and country pages benefitted from comments by the delegates of the Working Party on Territorial Indicators and OECD colleagues, in particular Andres Fuentes Hutfilter, Enrique Garcilazo, Gareth Hitchings, Alexander Lembcke, Joaquim Oliveira Martins, Carlo Menon, Ana Moreno-Monroy, Atsuhito Oshima, Tetsuji Sugayoshi. Comments by Professor Philip McCann (University of Sheffield) are also kindly acknowledged. Pilar Philip prepared the report for publication.

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Reader's guide

Regions and Cities at a Glance 2020 provides a comprehensive assessment of how regions and cities across the OECD are progressing in their efforts to build stronger, more sustainable and more resilient economies and societies. The publication provides a unique comparative picture in a number of aspects connected to economic development, health, well-being and net zero-carbon transition across regions and cities in OECD and selected non-OECD-member countries. In the light of the health crisis caused by the COVID-19 pandemic, the report analyses outcomes and drivers of social, economic and environmental resilience for regions and cities. More specifically, Chapter 1 reports differences in factors and outcomes to assess how regions are advancing towards resilient societies. The subnational indicators considered in the chapter include excess mortality, hospital beds per capita and air quality, among others.

Chapter 2 provides an assessment of regional economic disparities and the capacity of regions and cities to build resilient economies and thriving businesses. More specifically, this chapter starts by documenting regional differences in the share of jobs amenable to remote working and the availability of digital infrastructure. The chapter also analyses long-term economic disparities by looking at regional differences in gross domestic product (GDP) per capita, productivity and entrepreneurship. The contribution of metropolitan areas in the national economies is also assessed in this chapter.

Chapter 3 analyses how regions and cities are contributing to the transition to a zero-carbon economy and sustainable development. The indicators presented in the chapter cover a wide range of topics, including trends in land consumption and tree cover loss, biodiversity and ecosystem protection, household energy consumption, as well as the sources for electricity production and related carbon emissions.

Chapter 4 documents how demographic change, ageing and urbanisation are affecting regions and cities in OECD countries and beyond. The chapter also includes population projections for cities of different sizes, as well as an analysis of recent trends in urban expansion, densification and suburbanisation of metropolitan areas.

Finally, Chapter 5 provides an update on subnational government spending and investment. In addition, the chapter provides new disaggregated figures on expenditure and investment of regional governments for EU and OECD countries, as well as on municipal governments in 26 European and OECD countries.

Throughout the publication, regional disparities in different domains are looked at through two lenses: the distribution of resources and the persistence of disparities across regions and cities over space and time. More precisely:

- Distribution of resources over space is assessed by looking at the proportion of a certain national variable concentrated in a limited number of regions, corresponding to 20% of the national population and the extent to which specific regions contribute to the national change of that variable. For example, regional convergence in GDP per worker, measured by the annual growth rates in the bottom and top 20% of regions, only occurred in 15 out of 33 OECD countries between 2008 and 2018. Metropolitan areas of at least half a million inhabitants have contributed on average to 52% of total GDP growth between 2000 and 2018.

- The report proposes several approaches to measure regional disparities. A first, simple approach is the difference between the maximum and minimum regional values in a country (regional range). A second approach consists of ranking regions by the value of an indicator and taking the ratio (or the difference) between the highest value representing 20% (or 10%) of the population and the lowest value of the regions representing 20% (or 10%) of the population. This approach is less sensitive to possible outliers and cross-country differences in the size of regions. A third approach consists of using standard composite indexes, such as the Theil general entropy index,[1] or the Gini index, which reflect inequality among all regions.

Geographic areas utilised

This publication features statistical indicators at three different scales, which are administrative regions, functional urban areas (FUAs) composed of local units, and areas defined from grid cells of regular size.

The table below summarises the different geographic areas for which the publication reports indicators. Each type of geographic areas is associated with an icon reported in the charts and maps of the publication in order to facilitate the interpretation of the indicators.

Category	Icon	Description
Administrative subnational regions	TL2	Large region (Territorial Level 2)
	TL3	Small region (Territorial Level 3)
Functional aggregations of local units	FUA	FUA (based on local units, OECD coverage)
Grid-cell areas	eFUA	Grid-based FUAs (world coverage)
	Cities	Cities (world coverage)

Administrative regions

Traditionally, regional policy analysis has used data collected for administrative regions, that is, the regional boundaries within a country as organised by governments. Data on administrative regions has also the advantage of referring to areas that are often under the responsibility of a certain subnational government or to the scale targeted by a specific policy implemented at the national or subnational level. Regions are classified into two scales: large regions (Territorial Level 2, TL2) and small regions (Territorial Level 3, TL3), which ensure comparability across countries.

Functional urban areas (FUAs) composed of local administrative units

The places where people live, work and socialise may have little formal relation to the administrative units around them. For example, a person may inhabit one city or region but work in another and, on the weekends, practice a sport in a third. A broad set of linkages, such as job mobility, production systems or collaboration among firms, determines the interactions occurring between regions. Such interactions often cross local administrative boundaries.

In order to capture the above-mentioned interactions, the report uses the FUA definition, which was developed by the European Commission (EC) and the OECD[2] (see the section below). Boundaries of FUAs are available in practically all OECD countries. Being composed of a city and its commuting zone, FUAs encompass the economic and functional extent of cities, based on people's daily

movements. Especially in the case of cities, the notion of FUA can better guide the way national and city governments plan infrastructure, transportation, housing, schools and space for culture and recreation. In summary, FUAs can trigger a change in the way policies are designed and implemented, better integrating and adapting them to local needs.

Areas defined from grid cells of regular size

Some sections of the publications, including urbanisation, air pollution, built-up areas and population density, cover the entire world. In these cases, the geographic areas utilised to report indicators are delineated from gridded data available at regularly sized cells rather than at local administrative units.

More specifically, grid cells of one km^2 are used to estimate the boundaries of cities and FUAs across the entire world. Cities are defined – according to the degree of urbanisation[3] – as clusters of contiguous cells with at least 1 500 inhabitants per km^2 and at least 50 000 inhabitants overall. Grid-based FUAs are composed of cities plus surrounding cells that are estimated to be in their commuting zones, based on a probabilistic model.[4] While this method is less direct than the use of commuting flow data to determine the areas of influence of cities, it can be consistently applied to the entire world while maximising international comparability.

Definition of metropolitan areas

The EU-OECD definition of FUAs consists of cities (local units where at least half of the population lives in clusters of densely populated grid cells with at least 50 000 inhabitants) and adjacent local units with high levels of commuting (travel-to-work flows) towards the cities. This definition overcomes previous limitations for international comparability of city and metropolitan statistics linked to administrative boundaries. A minimum threshold for the population size of the FUAs is set at 50 000. The definition is applied to 34 OECD countries and it identifies approximately 1 200 FUAs of different sizes. It should be noted that, due to the lack of commuting data, FUAs are not identified in Israel, New Zealand or Turkey.

The aim of this approach to FUAs is to create a methodology that can be applied across all OECD member countries, thus increasing comparability across countries, unlike definitions and methodologies created within individual countries, which have been internally focused.[5] In order to establish this cross-country methodology, common thresholds and similar geographical units across countries were defined. These units and thresholds may not correspond to the ones chosen in the national definitions. Therefore, the resulting FUAs may differ from the ones derived from national definitions and, in addition, the OECD functional urban delimitation may not capture all of the local factors and dynamics in the same way as national definitions.

This publication includes indicators on metropolitan areas, which are defined as FUAs with a population greater than 250 000. Due to data availability limitations, some indicators (i.e. GDP, employment) are reported only for FUAs of at least 500 000 inhabitants.

Classifications of regions and areas

Territorial level classification

Regions within the 37 OECD countries are classified on 2 territorial levels reflecting the administrative organisation of countries. The 427 OECD large (TL2) regions represent the first administrative tier of subnational government, for example, the Ontario Province in Canada. There are 2 290 OECD small (TL3) regions, with each TL3 being contained in a TL2 region (except for the United States). For example, the TL2 region of Aragon in Spain encompasses three TL3 regions: Huesca, Teruel and Zaragoza. TL3 regions correspond to administrative regions, with the exception of Australia, Canada, Germany and the United States.[6] All the regions are defined within national borders.

This classification – which, for European countries, is largely consistent with the Eurostat NUTS 2016 classification – facilitates greater comparability of geographic units at the same territorial level.[7] Indeed, these two levels, which are officially established and relatively stable in all member countries, are used as a framework for implementing regional policies in most countries.

Due to limited data availability, labour market indicators in Canada are presented for groups of TL3 regions. Since these groups are not part of the OECD official territorial grids, they are labelled – for the sake of simplicity – as non-official grids (NOGs) in this publication and compared with TL3 in the other countries. Germany also has a NOG category with the 96 spatial planning regions, an intermediate level between the 16 *Länder* (TL2) and the 401 *Kreise* (TL3). German NOGs allow for a level of spatial disaggregation comparable to the other countries.

For the non-OECD member countries in this report, only TL2 regions have been identified for Brazil, the People's Republic of China, Colombia, India, Peru, the Russian Federation, South Africa and Tunisia, whereas for Bulgaria and Romania, TL2 and TL3 are derived from the European nomenclature of territorial units for statistics (NUTS).

Classification of small regions by access to metropolitan areas

The OECD metropolitan/non-metropolitan typology for small regions (TL3) helps to assess differences in socio-economic trends in regions – both within and across countries – by controlling for the presence/absence of metropolitan areas and the extent to which the latter is accessible by the population living in each region. According to such typology, TL3 regions are classified as *metropolitan* if more than half of their population lives in an FUA of at least 250 000 inhabitants and as *non-metropolitan* otherwise. A metropolitan region becomes a *large metropolitan region* if the FUA accounting for more than half of the regional population has over 1.5 million inhabitants.

In turn, the typology further classifies non-metropolitan regions based on the size of the FUA that is most accessible to the regional population. More specifically, non-metropolitan TL3 regions are sub-classified into three possible types:

1. With access to a metropolitan area, if at least half of the regional population can reach an FUA of at least 250 000 inhabitants within a 60-minute car ride.
2. With access to a small/medium city, if at least half of the regional population can reach an FUA between 50 000 and 250 000 inhabitants within a 60-minute car ride.
3. Remote, if reaching the closest FUA by car takes more than 60 minutes for more than half of the regional population.

The method relies on publicly available grid-level population data and localised information on driving conditions.[8]

In this report, the five types of regions identified are sometimes aggregated to three classes only, as indicated in the table below.

Acronym	Grouping	Reduced grouping
MR-L	Large metropolitan region	Metropolitan region
MR-M	Metropolitan region	
NM-M	Region near a metropolitan area	Region near a metropolitan area
NM-S	Region with/near a small-medium city	Region far from a metropolitan area
NM-R	Remote region	

Classification of small regions by degree of urbanisation

Traditionally, the OECD has classified TL3 regions as predominantly urban (PU), intermediate (IN) or predominantly rural (PR) regions. This typology is mainly based on population density in each local unit, combined with the existence of urban centres where at least one-quarter of the regional population reside. An extended regional typology has been adopted to distinguish between rural regions that are located close to larger urban centres and those that are not, introducing a criterion of distance (driving time) to cities.[9] According to such an extended typology, a predominantly rural region is classified as predominantly rural remote (PRR) if at least 50% of the regional population needs more than 1 hour to reach a city; otherwise, the rural region is classified as predominantly rural close to a city (PRC). The result is a fourfold classification of TL3 regions: predominantly urban (PU), intermediate regions (IN), predominantly rural regions close to a city (PRC) and predominantly rural remote (PRR) regions. The distance from urban centres is measured by the driving time necessary for a certain share of the regional population to reach an urban centre with at least 50 000 people (see Figure A.1 in Annex A for a detailed description of the criteria and the resulting classification of TL3 regions). Due to a lack of data, the extended typology has not been applied yet to Australia, Chile or Korea. In 2014, the European Union (EU) modified the rural-urban typology, using 1-km^2 population grids as building blocks to identify rural or urban communities, with the aim of improving international comparability; for EU-OECD countries, this rural-urban typology is presented in the publication.

Sources of data for territorial statistics

OECD Regions and Cities at a Glance 2020 includes a selection of indicators from the OECD Regional Database, the OECD Metropolitan Database and the OECD Subnational Government Finance Database. In addition, some sections of the report provide, for the first time, comparable indicators on population, built-up areas, air quality and density of all cities and FUAs in the world. The latter indicators rely on the global, grid-based FUA boundaries defined by the OECD and the EC's Joint Research Centre.[10]

The report also presents new, modelled indicators on electricity production in regions and cities of OECD countries, distinguishing by types of sources. Estimates rely on the Global Power Plants Database.[11]

Most of the indicators presented in the publication refer to TL2 and TL3 regions and come from official national sources, following internationally consistent methods for cross-country comparability. At the same time, regional and local data are increasingly available from a variety of sources: surveys, geocoded data, administrative records, big data and data produced by users. While countries are making use of the various sources to produce and analyse data at different geographic levels, significant methodological constraints still exist, making it a challenge to produce sound, internationally comparable statistics linked to a location. The trade-off between sound methodological estimations and international comparability should always be considered, as the latter depends on information that is universally available.

Most of the indicators for FUAs are derived by integrating different sources of data, making use of geographic information systems (GIS) and adjusting existing regional data to non-administrative boundaries. Two types of methods to obtain estimates at the desired geographical level are applied, both requiring the use of GIS tools to disaggregate socio-economic data. The first method makes use of gridded data at different resolutions, which are always smaller than the considered regions. The statistics for one region are obtained by superimposing the source data onto regional boundaries. In these cases, the regional value is either the sum or the weighted average of the values observed in the source data within the (approximated) area delimited by the regional boundaries. For example, this method has been applied to estimated air pollution (population-weighted average of $PM_{2.5}$ levels) in metropolitan areas and TL2 regions.

The second method makes use of GIS tools to adjust or downscale data, available only at geographical levels that are similar or even larger than the geographical units of interest. In this case, the adopted method uses additional data (e.g. population) inputs that capture how the phenomenon under study is distributed across space. With this method, GDP and employment have been estimated in FUAs over half a million inhabitants, when those statistics were not already provided by official sources (see Annex C for details on the methods to estimate indicators for metropolitan areas).

Chapter 5 data refer to subnational governments, as classified according to general government data from OECD National Accounts. Subnational governments are defined as the set of states (relevant only for countries with a federal or quasi-federal system of government) and local (regional and local) governments.

Further resources

The different topics are visualised through interactive graphs and maps in the *OECD Regions and Cities Data Visualisation* platform, available at *https://regions-cities-atlas.oecd.org/*. Users can select from among all of the indicators included in the OECD Regional and Metropolitan databases and display them in different linked dynamic views such as maps, time trends and histograms. The website also provides access to the data underlying the indicators.

Another web tool (*https://www.oecd-local-sdgs.org/*) provides easy access to monitor the distance to the end values of the 17 UN Sustainable Development Goals (SDGs) for regions and cities in OECD and partner countries. The tool also compares the performance with other regions and cities in their respective country and helps identify peers in other countries.

The interactive web-based tool OECD Regional Well-Being (*www.oecdregionalwellbeing.org/*) allows users to measure well-being in each region, compare it against 402 other OECD regions and monitor progress over time. Each region is assessed in 11 areas central to quality of life: income, jobs, health, access to services, the environment, education, safety, civic engagement, housing, social support network and life satisfaction.

The cut-off date for data included in this publication was August 2020. Due to the time lag of subnational statistics, the last available year is generally 2019 for demographic and labour market, 2018 for subnational finance data and 2017 for entrepreneurship, innovation statistics and social statistics in metropolitan areas. The latest point in time for the reference of the excess mortality indicators is June 2020.

Abbreviations and acronyms

	Description
Australia (TL2)	TL2 regions of Australia
Australia (TL3)	TL3 regions of Australia
COFOG	Classification of the Functions of Government
GDP	Gross domestic product
FUA	Functional urban areas
IN	Intermediate (region)
LFS	Labour force survey
NEET	Adults neither employed nor in education or training
NOG	Non-official grid
OECD#	The sum of all the OECD regions where regional data are available (# number of countries included in the sum)
OECD# average	The weighted mean of the OECD regional values (# number of countries included in the average)
OECD#UWA	The unweighted mean of the country values (# number of countries included in the average)
$PM_{2.5}$	Particulate matter 2.5 (concentration of fine particles in the air)
PPP	Purchasing power parity
PR	Predominantly rural (region)
PRC	Predominantly rural (region) close to a city
PRR	Predominantly rural remote (region)
PU	Predominantly urban (region)
R&D	Research and development
SNG	Subnational government
TL2	Territorial level 2
TL3	Territorial level 3
Total # countries	The sum of all regions where regional data are available, including OECD and non-OECD countries

OECD country ISO codes

Code	Country	Code	Country
AUS	Australia	ISR	Israel
AUT	Austria	ITA	Italy
BEL	Belgium	JPN	Japan
CAN	Canada	KOR	Korea
CHE	Switzerland	LUX	Luxembourg
CHL	Chile	LVA	Latvia
COL	Colombia	LTU	Lithuania
CZE	Czech Republic	MEX	Mexico
DEU	Germany	NLD	Netherlands
DNK	Denmark	NOR	Norway
ESP	Spain	NZL	New Zealand
EST	Estonia	POL	Poland
FIN	Finland	PRT	Portugal
FRA	France	SVK	Slovak Republic
GBR	United Kingdom	SVN	Slovenia
GRC	Greece	SWE	Sweden
HUN	Hungary	TUR	Turkey
IRL	Ireland	USA	United States
ISL	Iceland		

Other countries ISO codes

Code	Country	Code	Country
BRA	Brazil	PER	Peru
BGR	Bulgaria	ROU	Romania
CHN	China, People's Republic of	RUS	Russian Federation
CRI	Costa Rica	TUN	Tunisia
IND	India	ZAF	South Africa

Notes

1. With the α coefficient equal to 1.
2. See Dijkstra, L., H. Poelman and P. Veneri (2019), "The EU-OECD definition of a functional urban area", *OECD Regional Development Working Papers*, No. 2019/11, OECD Publishing, Paris, *https://doi.org/10.1787/d58cb34d-en*. See also the "Definition of metropolitan areas" section.
3. For more details on the degree of urbanisation, see *https://ec.europa.eu/eurostat/web/degree-of-urbanisation/background*.
4. Moreno-Monroy, A., M. Schiavina and P. Veneri (2020), "Metropolitan areas in the world. Delineation and population trends", *Journal of Urban Economics*, *http://dx.doi.org/10.1016/j.jue.2020.103242*.
5. Some OECD countries have adopted a definition for their own metropolitan areas or urban systems that looks beyond the administrative approach. For example, Australia, Canada and the United States use a functional approach, similar to the one adopted here, to identify metropolitan areas. Several independent research institutions and national statistical offices have identified metropolitan regions in Italy, Mexico, Spain and the United Kingdom based on the functional approach.
6. The United States TL3 regions are based on the U.S. Bureau of Economic Analysis economic areas. For the latest information on the methodology, please refer to: *https://apps.bea.gov/scb/pdf/2004/11November/1104Econ-Areas.pdf* .
7. For European countries, the Eurostat NUTS 2 and 3 classifications correspond to the OECD TL2 and 3, with the exception of Belgium, France, Germany and the United Kingdom where the NUTS 1 level corresponds to the OECD TL2.
8. Details on the method can be found in: Fadic, M. et al. (2019), "Classifying small (TL3) regions based on metropolitan population, low density and remoteness", *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris, *https://doi.org/10.1787/b902cc00-en*.
9. Brezzi, M., L. Dijkstra and V. Ruiz (2011), "OECD Extended Regional Typology: The Economic Performance of Remote Rural Regions", *OECD Regional Development Working Papers*, No. 2011/06, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5kg6z83tw7f4-en*.
10. Schiavina, M. et al. (2019), *GHS-FUA R2019A - GHS functional urban areas, derived from GHS-UCDB R2019A (2015) (dataset)*, European Commission, Joint Research Centre (JRC), *http://data.europa.eu/89h/347f0337-f2da-4592-87b3-e25975ec2c95*.
11. *https://datasets.wri.org/dataset/globalpowerplantdatabase*.

Editorial: Enhancing resilient places today to thrive in the future

The COVID-19 pandemic has generated huge costs in terms of human life and puts our health systems under pressure. Lockdowns and other containment measures to limit the spread of the virus have slowed down entire sectors of activity and turned the health crisis into an economic recession. According to the latest OECD estimates, the second quarter of 2020 saw a fall in GDP by somewhat above 10% in the OECD area compared with the previous quarter and a full recovery to pre-COVID levels is projected to take until 2022.

One aspect we learnt immediately from the crisis is that both the outbreak and the socio-economic consequences of the crisis are very uneven within countries. Some places have suffered more from the health costs of the pandemic than others, with some regions seeing a doubling of deaths in the first semester of 2020 compared to the same period in previous years. At the same time, some places have suffered more than others from lockdowns and the widespread scaling back of tourism and economic activities more generally.

The containment measures imposed by governments to limit the spread of the virus have triggered a massive shift towards remote working, for which not all places were equally prepared. Large cities and capitals were generally more ready to seize the opportunities of digitalisation and embrace remote working. On the other hand, many rural areas still suffer a gap of access to high-speed broadband, a lower share of jobs amenable to remote working and lower education of the workforce.

While we cannot avoid that other crises might come in the future, we can do much to be better prepared. Regions and cities need to enhance their resilience today, not only to alleviate the immediate blow of the current crisis but also to thrive in the future. The capacity of regions and cities to face pressures in the health sector, to provide (public) services effectively, including access to digital infrastructure, and the capacity to shift economic activities to remote working – also through a more skilled workforce – are all important factors of resilience amid the current crisis. However, the importance of these factors extends beyond the pandemic. They will also help to deal with other megatrends that challenge our regions and cities, such as climate change, digitalisation and demographic change.

Making regions and cities more resilient also requires to account for the need to improve living standards and the quality of the environment. With the increasingly widespread use of remote working, more people will be able to live at a greater distance from their workplace than they used to. Places offering good quality of life while maintaining access to key services might become increasingly attractive in the near future, which could change the way people and economic activities distribute across space.

Long-lasting progress towards higher well-being and capacity to adapt to external shocks also require strengthening our efforts towards the broader objective of sustainable development. It is now more than 5 years since the UN designed the 17 interlinked goals to achieve a better and more sustainable future for all. All the efforts to adapt healthcare to the emerging needs and to sustain the economy in the current crisis need to combine with many other interrelated aspects, including, among others, climate and education but also trust in institutions and gender equality, for which the role of regions and cities can be crucial. Trust in governments in some regions can be more than 30% lower than in other regions within the same country. At the same time, local governments need to progress in

gender balance, as only in 10% of regions women account for at least 30% of mayors. These regions are typically in Norway, Spain and Sweden.

To be effective, all actions to recover from the crisis and improve people's lives in all places will need to count on reliable and comparable data at the appropriate scale. This edition of *OECD Regions and Cities at a Glance* provides an important contribution in this respect, by offering a comparative picture of regions and cities across all OECD member countries and beyond. It covers many topics related to the economy, society and the environment, as well as aspects of public finance. The report presents over 100 indicators that foster a better understanding of the current state of regions and cities and help identify possible priority actions towards resilience, inclusion and sustainable development.

We are still in the middle of a profound crisis that is likely to have asymmetric long-term economic and social consequences across our regions and cities. The path to recovery will challenge all places to offer the local conditions that allow both firms and people to prosper. While different across places, the quality of life, that of the environment and available public services will likely further increase in importance, which in turn will offer new opportunities for many places. Investing today in more resilient economies and societies by taking into account the uniqueness of each place will help regions and cities to thrive in the future.

Executive summary

The COVID-19 pandemic, one of the most severe crises in a century, has been affecting economies and societies profoundly but also asymmetrically across places. The health impact has been particularly hard in some areas within countries. For example, in some regions of Colombia, Italy and Spain, the number of deaths between February and June 2020 was at least 50% higher than the average over the same period in the 2 previous years. While reminding that places can be very vulnerable to external shocks, the pandemic highlighted that regions and cities need to be prepared to face crises and other important megatrends in the future, such as ageing, climate change and digitalisation.

This report provides a comprehensive assessment of how regions and cities in OECD member and selected non-member countries fare in their efforts to build stronger, more sustainable and more resilient economies and societies. The 2020 edition of *OECD Regions and Cities at a Glance* provides key facts based on a large number of indicators for regions and cities related to health, well-being, economic and environmental conditions. By combining official statistics with new, modelled indicators based on less conventional data sources, the report covers trends in urbanisation, economic growth, employment and entrepreneurship, and analyses regions and cities' preparedness to face global crises and adapt to megatrends.

At the onset of the pandemic, not all regions were equally prepared to face the health emergency. Over the last decades, most regions in OECD countries have seen a significant reduction in the number of hospital beds available per inhabitant, with an average decline of 6% since 2000. This general decline – in part due to changing approaches to healthcare – coincided with a re-organisation of health services across space, with a higher concentration of hospital beds in the largest cities or in their close proximity. In this context, the availability of hospital beds fell by an average of over 20% in remote regions since 2000.

Living standards, environmental quality and morbidity are other important factors that determine the degree to which regions and cities are resilient or vulnerable to health crises. For example, the air people breathe in a given country can be clean in some areas but highly polluted in other, often densely populated areas. In fact, the most polluted city in a given OECD country has on average an 8 $\mu g/m^3$ higher concentration of particulate matter than the least polluted city, a large gap taking into account the 10 $\mu g/m^3$ total concentration that the World Health Organization recommends not to go over.

The measures implemented by countries to contain the spread of COVID-19 have affected the economy and labour market of all places profoundly. The crisis triggered a massive shift towards remote working, although that was not possible to the same extent everywhere. The potential for remote working largely depends on the proportion of jobs that are amenable to remote working, which is determined by the task content of occupations. Within OECD countries, the share of workers that can potentially work remotely differs by 15 percentage points on average, ranging from more than 50% in a number of capital regions (i.e. Ile de France, London, Stockholm) to less than 25% in some

regions of Colombia, Italy, the Slovak Republic, Spain and Turkey. These subnational differences give rise to a potentially larger economic shock in places with lower remote working capacity.

As pointed out by the current crisis, making regions and cities resilient to global crises also requires the capacity to seize the opportunities offered by digitalisation. However, the lack of high-speed Internet connection and digital take-up in some regions limits such capacity. In some regions in Italy, Portugal and Turkey, one-fourth or more of the population either does not use the Internet or does not have a computer. At the same time, the share of people with access to fast (above 30Mbit/s) Internet networks, a crucial requirement to support the increasing need for remote working, differs by 23 percentage points within OECD countries, on average, combined with a large urban-rural gap in several countries.

Whether the COVID-19 pandemic will affect regional economic disparities remains to be seen. However, long-term trends in GDP per capita differences help put the economic resilience of regions into perspective. After a period of decline in the early 2000s, gaps in GDP per capita across small regions in the OECD area taken as a whole have increased, reflecting a long-standing process of concentration of population and economic activities in metropolitan areas. The evolution of regional economic disparities remains very heterogeneous across countries. Contrary to the OECD-wide trend, one-half of OECD countries experienced an increase in the gap between their richest and poorest regions. Trends in regional productivity follow similar patterns. Since 2008, only one-third of OECD countries have experienced an increase in productivity in all regions.

While the COVID-19 crisis and the widespread shift to remote working might favour a resumption of population growth in certain low-density areas, long-term trends suggest that cities are continuing to grow. What is more, the population in cities with more than 50 000 inhabitants is projected to increase from 48% to 55% of the total world population by 2050. Cities have succeeded for decades in attracting an increasing amount of people, especially the young, from other, less accessible areas. As a result, with a 4-percentage point higher share of elderly per working-age population than other regions, on average in OECD countries, remote regions need to prepare faster and more effectively to population ageing.

As regions and cities are fighting the disruptions caused by the global pandemic, they are also advancing in the green transition and the consequent move towards a zero-carbon economy. In this respect, low-density, remote regions have made the biggest progress in the transition to clean energy production, generating 40% of the clean electricity in OECD countries and thus emitting less CO_2. On the other hand, households living in capital regions often show the lowest energy consumption and have managed, during the last two decades, to reduce their waste generation significantly.

To achieve the objective of faster recovery and higher resilience to future shocks, policy in all domains should be co-ordinated across government levels and target places according to their specific needs. As of 2019, both regional and municipal governments each account for nearly 19% of total public spending in OECD countries with comparable data. At the same time, regional governments taken alone are responsible for 22.4% of total public investment, potentially providing crucial help also for the transition to a low carbon economy. Given that health and social services are other important policy domains for subnational governments, regions and cities are at the forefront in making our societies more resilient and sustainable.





1. SOCIAL RESILIENCE FOR BETTER HEALTH AND SUSTAINED WELL-BEING

The health impact of COVID-19 in regions

Towards better health and resilient health systems in regions (SDG 3)

Breathing clean air in all the cities of the world (SDG 11)

Ensuring inclusive education in all regions (SDG 4)

Achieving gender equality in all places (SDG 5)

Safety, trust in institutions and political engagement in regions (SDG 16)

This chapter presents an overview of people's health and well-being conditions in regions and cities. The chapter also shows subnational trends on social resilience, including access to health resources, trust in institutions, gender equality and inclusive education.

The health impact of COVID-19 in regions

In most OECD countries, remote regions have experienced lower excess mortality than other regions.

The COVID-19 pandemic has hit certain parts of countries harder than others. Beyond the count of fatalities directly reported as due to the COVID-19 infection, the increase in the number of total deaths in a region relative to previous years provides a useful indication of the overall health impact of the current pandemic. More specifically, the excess mortality during the pandemic – the increase in deaths as a percentage of deaths in previous years – avoids problems of misreporting caused by low levels of testing. From February to June 2020, large regions in 31 OECD countries with available data registered on average 6% more deaths than in the same months of the previous 2 years (average of 2018-19). Interestingly, regional disparities in this indicator are strikingly high. Excess mortality in Greater London (United Kingdom), New Jersey (United States), Lombardy (Italy) and Madrid (Spain) ranged from 46% to 80% in the period from February to June 2020 – at least 22 percentage points higher than the average excess mortality in their respective country (Figure 1.1, panel A and Figure 1.3-Figure 1.4).

Differences in excess mortality during this period also reveal clear patterns between regions far from metropolitan areas and other types of regions, particularly metropolitan. In 17 out of 22 OECD countries, regions far from a metropolitan area have recorded lower excess mortality than metropolitan regions. More specifically, regions far from a metropolitan area experienced an average excess mortality of 5% compared to 9.5% in metropolitan regions. The gap is even larger between remote regions (3%) and large metropolitan regions (13%). However, there are exceptions to such a pattern, as is the case of Switzerland, where excess mortality is significantly higher in regions far from a metropolitan area than in metropolitan regions (Figure 1.1, panel B).

Another measure of the health impact of the current pandemic consists of the reported deaths due to COVID-19. In the 24 OECD countries with data available from January to 15 August 2020 (see Annex B for more details), regions registered 30 COVID-19 deaths per 100 000 people (mortality rate due to COVID-19) on average. Nevertheless, this figure masks stark differences across regions. For example, New Jersey (United States), Lombardy (Italy), Castile-La Mancha (Spain), Amazonas (Colombia), Brussels Capital (Belgium) and Stockholm (Sweden) recorded more than 100 COVID-19 deaths per 100 000 people by mid-August (Figure 1.2). In addition, large regional disparities in COVID-19 deaths are present even within countries. In the United States, Italy and Spain, those regional gaps exceeded 140 deaths per 100 000 people as regions such as Hawaii (United States), Basilicata (Italy) and Canary Islands (Spain) experienced less than 8 COVID-19 deaths per 100 000 people.

Definition

Excess mortality is defined as the percentage increase in the cumulative number of deaths (all causes) between the period of February to June 2020 with respect to the average number of deaths in the same period in 2018 and 2019.

COVID-19 deaths concern deaths where the primary cause of death can be attributed to the COVID-19 virus, independently of pre-existing conditions.

Sources

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris *http://dx.doi.org/10.1787/region-data-en*.

See country metadata in Annex B.

Reference years and territorial level

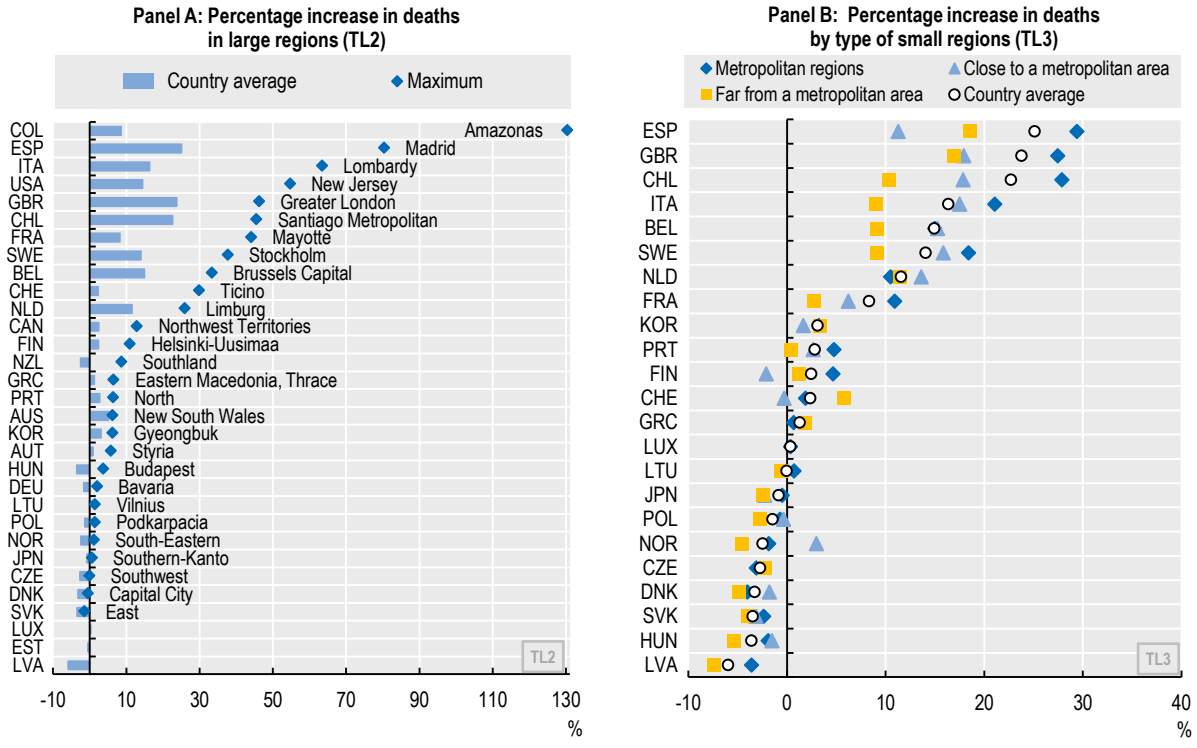
See territorial grids and regional typology in Annex A.

Figure notes

Figure 1.1, panel B: Weighted averages of small regions (TL3).

Figure 1.3-Figure 1.4: Small regions (TL3) if available, otherwise large regions (TL2) for AUS, AUT, CAN, COL, DEU, EST, NZL and USA.

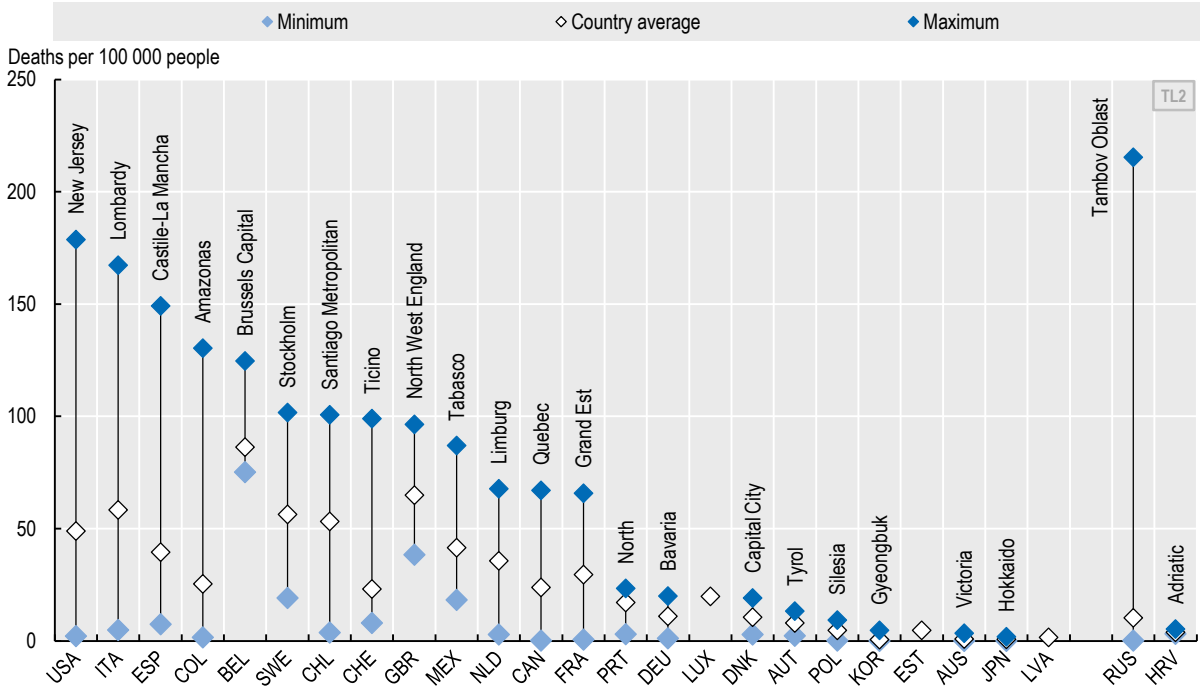
1.1. Regional disparities in excess mortality, February to June 2020 relative to 2018-19 average



StatLink https://doi.org/10.1787/888934189070

1.2. Regional disparities in COVID-19 deaths, from 24 January to 15 August, 2020

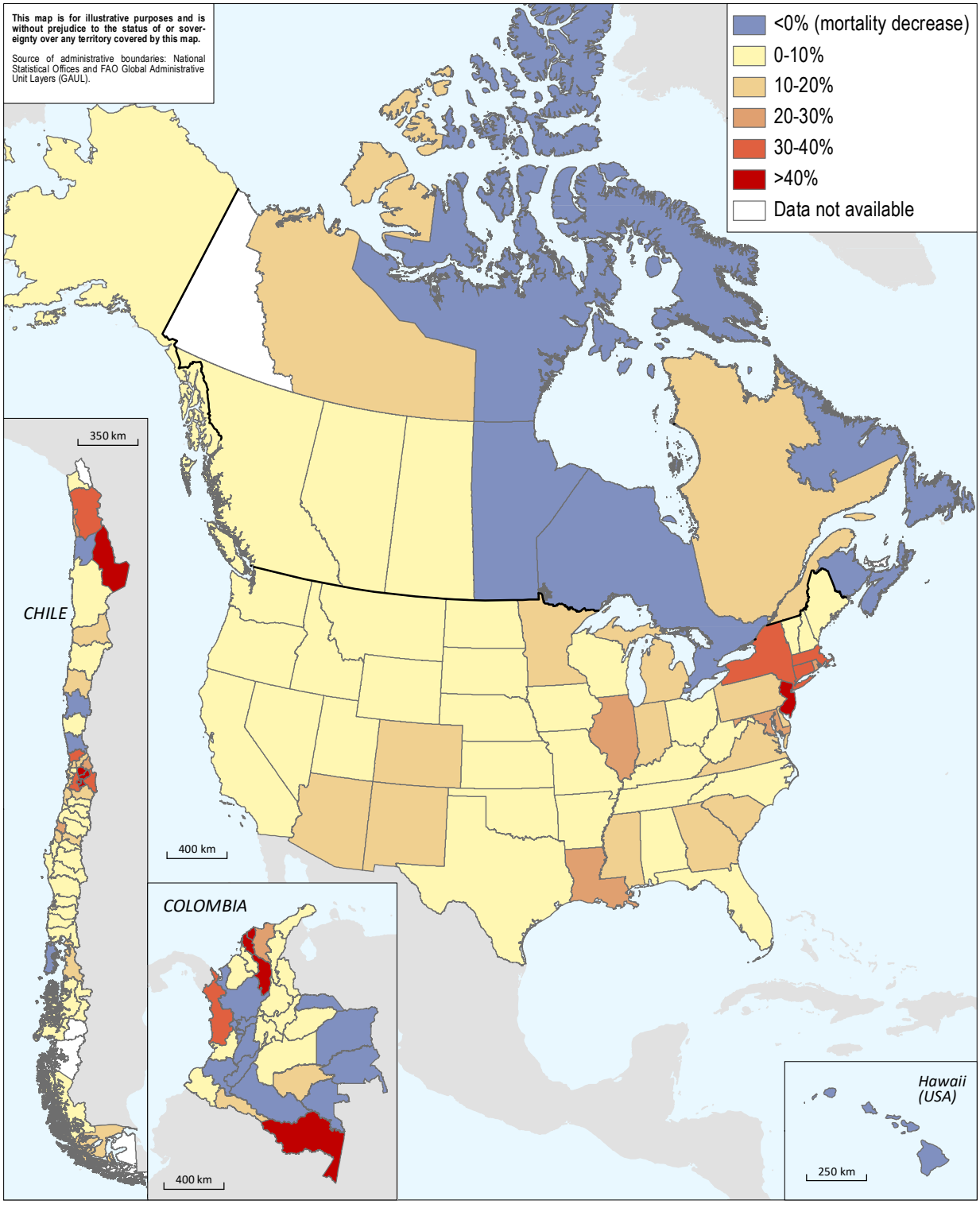
COVID-19 deaths per 100 000 people, large regions (TL2)



StatLink https://doi.org/10.1787/888934189089

1.3. Excess mortality, February to June: 2020 compared to 2018-19 average - Americas

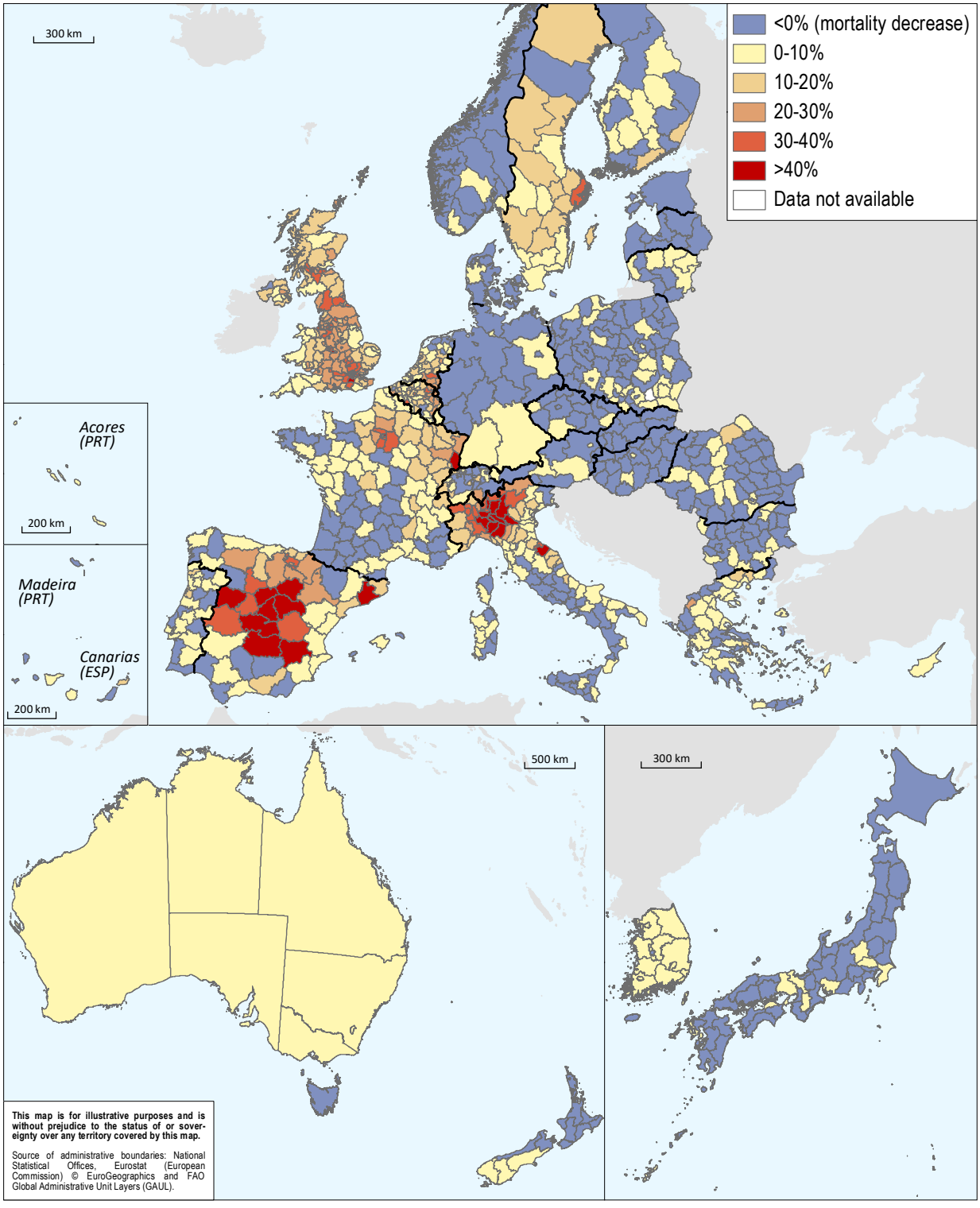
Percentage increase in 2020 deaths relative to the 2018-19 average, small regions (TL3)



StatLink https://doi.org/10.1787/888934189108

1.4. Excess mortality, February to June: 2020 compared to 2018-19 average - Europe and Asia-Pacific

Percentage increase in 2020 deaths relative to the 2018-19 average, small regions (TL3)



StatLink https://doi.org/10.1787/888934189127

Towards better health and resilient health systems in regions (SDG 3)

Metropolitan regions have 65% more hospital beds per capita than remote regions, a gap that can affect the capacity to cope with health crises.

A number of factors related to healthcare, living standards and people's behaviour can make regions unevenly prepared to face a health crisis. Stark regional inequalities in morbidity rates make some places within OECD countries more vulnerable than others. As reported by the World Health Organization (WHO), people with pre-existing medical conditions, including high blood pressure, heart and lung diseases, cancer, diabetes or obesity, are more susceptible to suffer serious consequences if infected by COVID-19 (WHO, 2020). Across OECD regions, the spatial concentration of disease-specific mortality rates reflects differing health challenges. While Western European regions face higher mortality rates due to respiratory diseases, regions in the Baltic countries and Central Europe tend to suffer more from cardiovascular diseases, whereas regions in the Americas record particularly high rates of obesity.

In some regions in Canada (New Brunswick), Chile (Aysen), Mexico (Quintana Roo) and the United States (Mississippi), close to 40% or more of the population is obese. For these regions, obesity rates are at least 8.5 percentage points higher than their national averages and are twice the OECD average (Figure 1.5). Obesity and other types of morbidity can translate into higher disease-specific mortality, such as those driven by respiratory or cardiovascular diseases. With more than 150 deaths per 100 000 inhabitants per year, some regions in Greece, Japan, Portugal and the United Kingdom are the hardest hit from respiratory diseases (Figure 1.6). In the Baltic countries and Central Europe, Estonia, North Hungary, Latvia, Central and Western Lithuania and South West Romania report an annual average of more than 600 deaths per 100 000 people due to cardiovascular diseases, the highest cardiovascular-related mortality rates among OECD countries (Figure 1.7).

Medical resources such as hospital beds and doctors per inhabitant are crucial for managing health crises but differ substantially across types of regions. Overall, metropolitan regions and regions close to metropolitan areas are better equipped with hospital beds per inhabitant than regions far from metropolitan areas, a gap that has increased significantly since 2000. In 2018, regions close to metropolitan areas had higher availability with an average of 10 beds per 1 000 inhabitants, almost twice as many as in remote regions. Since 2000, the number of beds per inhabitant has decreased in most regions (by 6% on average across all types of regions) but at a much stronger pace in remote regions (by 22%). The widespread decrease in the number of hospital beds has some exceptions. In Korea, for example, the provision of hospital beds has increased in all types of regions but at the highest pace in non-metropolitan regions (Figure 1.8).

Regional differences in healthcare infrastructure and resources are significant in most OECD countries. While some regions in Southern European and North American countries have less than 2 hospital beds per 1 000 people, other regions in the same countries have 3 times as many. On average, the best-equipped regions in OECD countries have three and a half times more beds per person than the least equipped ones. Largest regional disparities in the number of hospital beds per inhabitant are driven by particularly low availability in certain regions such as Central Greece, Chiapas (Mexico), Mayotte (France), Oregon (United States) and Vaupés (Colombia). In addition to low levels of medical equipment, some regions also face challenges of providing enough doctors. In particular, some regions in the north of Chile and the east of Turkey, together with most regions in Colombia and Mexico, have comparatively low levels of both hospital beds and doctors per inhabitant (Figure 1.9-Figure 1.10).

Definition

Obesity refers to the population aged 15 years old or more with a Body Mass Index above 30 kg/m^2.

Respiratory and cardiovascular mortality correspond to the number of deaths from diseases of categories J00 to J99 (respiratory) and I00 to I99 (cardiovascular) in the International Classification of Diseases (ICD).

Sources

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See country metadata in Annex B.

Further information

Feng Gao et al., "Obesity Is a Risk Factor for Greater COVID-19 Severity", Diabetes Care Jul 2020, 43 (7) e72-e74, *https://doi.org/10.2337/dc20-0682*.

Figure notes

Figure 1.5: CAN, DNK, ISR, ITA, ESP, SWE and CHE, 2017; CHL and EST, 2016; COL and NOR, 2015; AUT, CZE, HUN, LVA, LTU, PRT, SVK and SVN, 2014.

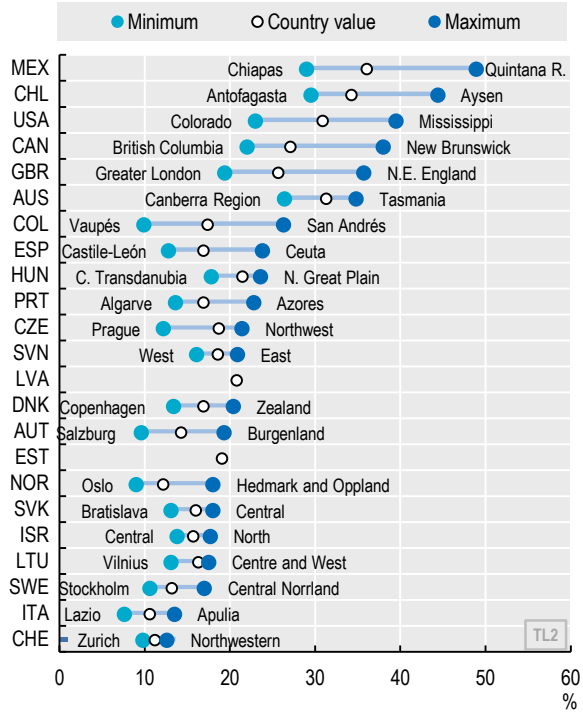
Figure 1.6-Figure 1.7: BGR, CHL, HRV, DNK, EST, FIN, DEU, GRC, IRL, ISR, ITA, LVA, LTU, LUX, NOR, POL, ROU, SWE, CHE and GBR, 2017; FRA, 2017.

Figure 1.8: Weighted averages of small regions (TL3) of AUT, CHE, CZE, ESP, EST, FRA, HUN, JPN, KOR, LTU, LVA, SVK, SVN and SWE.

Figure 1.9-Figure 1.10: See reference years for hospital beds and doctor rates in Annex B.

1.5. Obesity rates, 2018

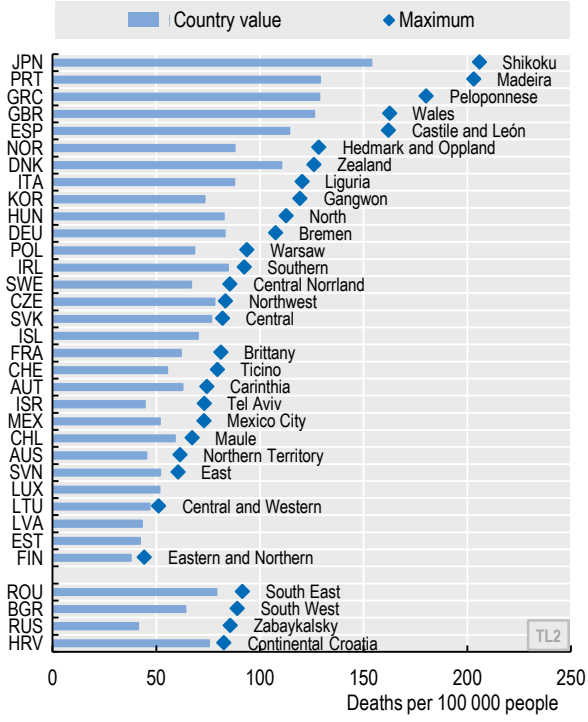
Percentage of adult population, large regions (TL2)



StatLink https://doi.org/10.1787/888934189146

1.6. Respiratory diseases mortality, 2018

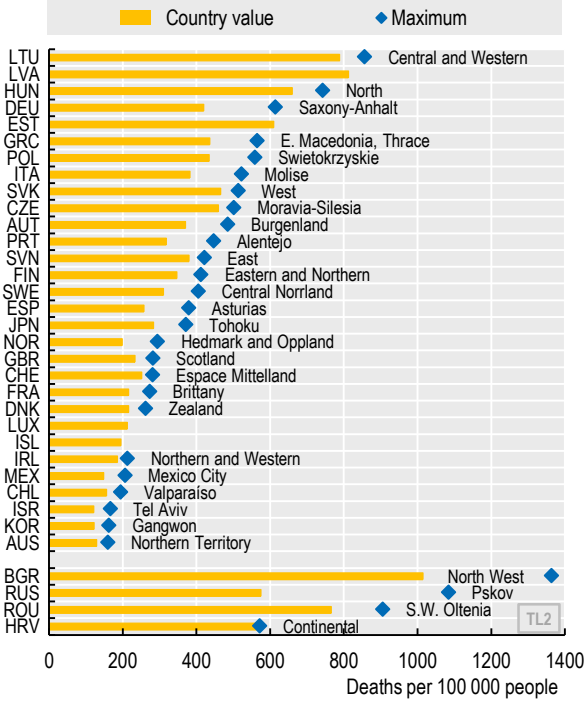
Deaths per 100 000 people, large regions (TL2)



StatLink https://doi.org/10.1787/888934189165

1.7. Circulatory diseases mortality, 2018

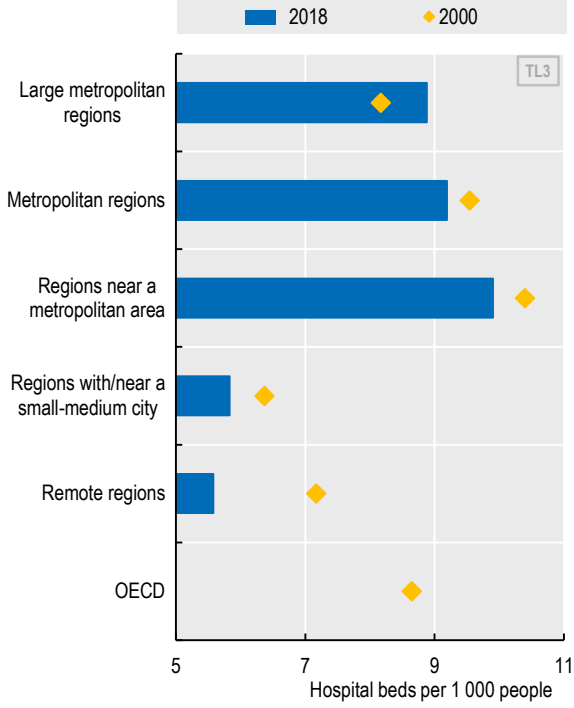
Deaths per 100 000 people, large regions (TL2)



StatLink https://doi.org/10.1787/888934189184

1.8. Hospital beds rate, 2000-18

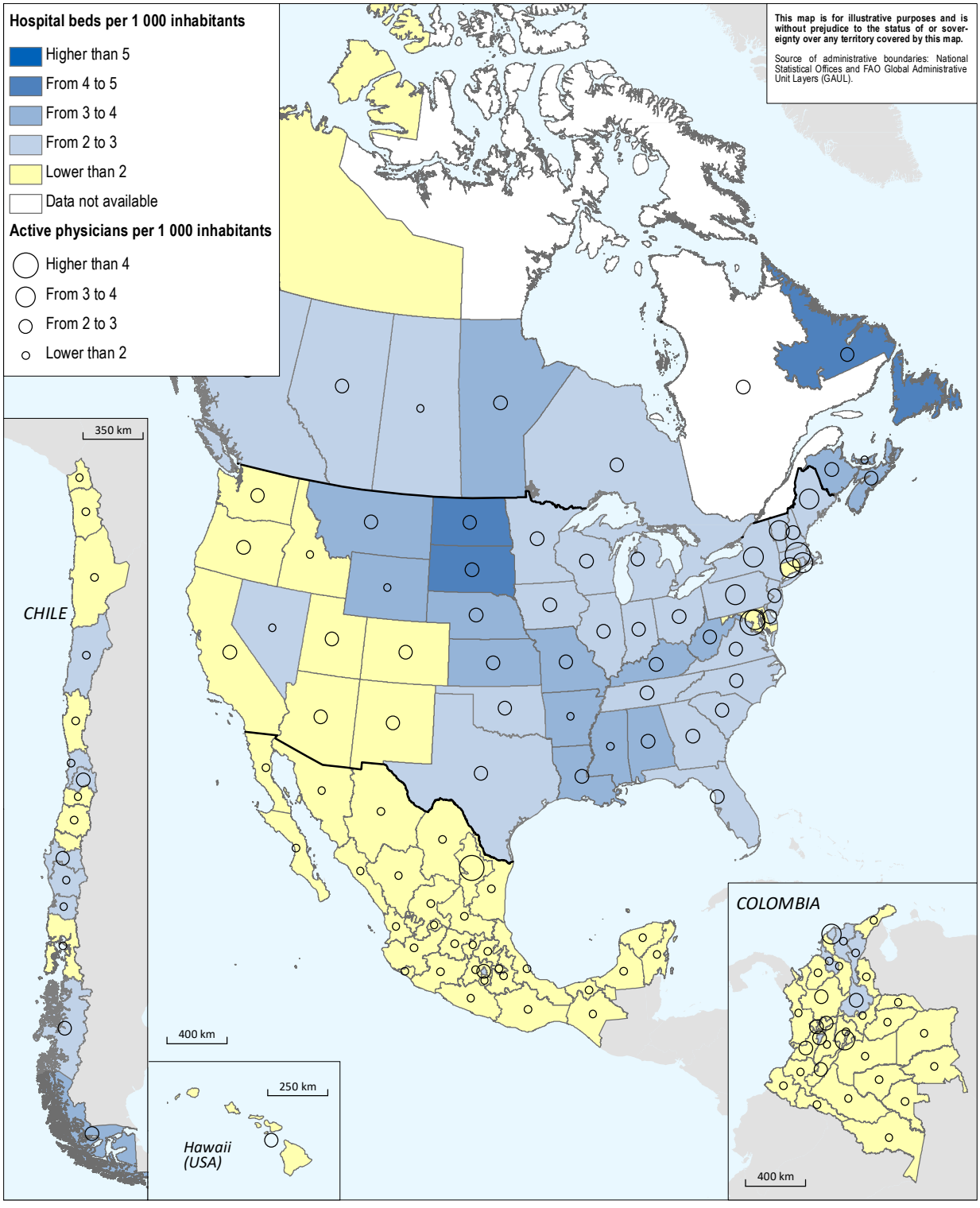
Beds per 1 000 people, by type of region, small regions (TL3)



StatLink https://doi.org/10.1787/888934189203

1.9. Hospital beds and doctors per 1 000 inhabitants: Americas

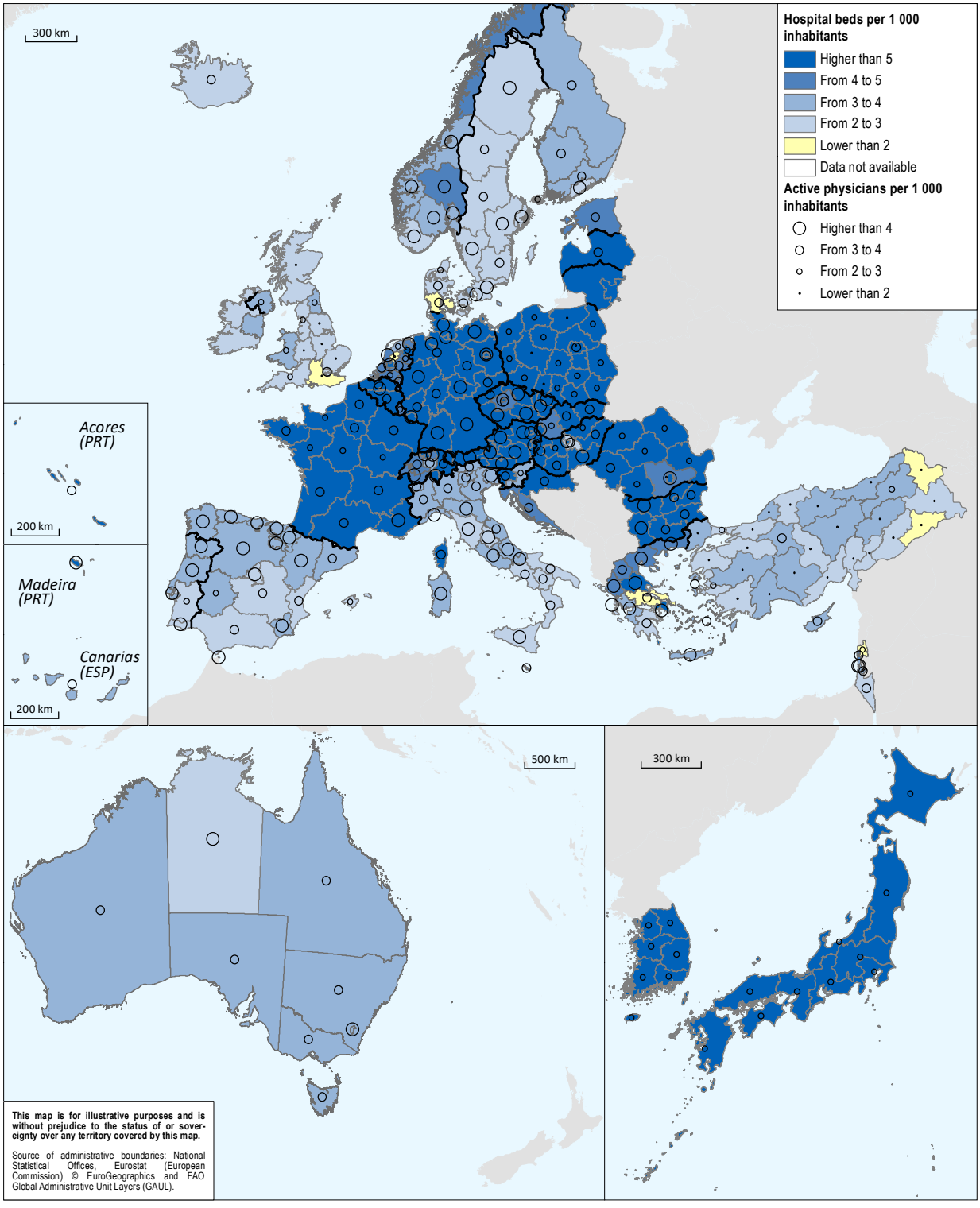
Large regions (TL2), 2018



StatLink https://doi.org/10.1787/888934189222

1.10. Hospital beds and doctors per 1 000 inhabitants: Europe and Asia-Pacific

Large regions (TL2), 2018



StatLink https://doi.org/10.1787/888934189241

Breathing clean air in all the cities of the world (SDG 11)

Despite improvements during the last decade, air pollution in cities remains high, especially in poorer countries.

Air pollution is among the greatest environmental health threats across the world. This is particularly true for cities, where the higher concentration of people and economic activity compared to less dense areas make them more exposed to air pollution (OECD, 2020a; OECD/European Commission, 2020). As suggested by the United Nations (UN) Sustainable Development Goals (UN, 2017), one the most relevant measures of air pollution is population exposure to fine particulate matter 2.5 ($PM_{2.5}$ in micrograms per cubic metre or μ/m^3). Chronic exposure to $PM_{2.5}$ significantly increases the risk of heart and respiratory diseases. In addition, the current pandemic is showing that air quality is also a source of health resilience. Recent studies have demonstrated that air pollution contributes to the airborne transmission of SARS-CoV-2 and a higher risk of mortality due to COVID-19 (Comunian et al., 2020; Cole et al., 2020).

Across the world, air pollution levels in cities tend to be higher in poorer countries. In 2019, the average $PM_{2.5}$ concentration levels across cities was highest in lower-middle-income countries (66 μ/m^3 of $PM_{2.5}$), followed by low-income (42 μ/m^3) and upper-middle-income countries (36 μ/m^3). On the other hand, cities in high-income countries recorded significantly lower air pollution (15 μ/m^3 of $PM_{2.5}$), although still above the levels recommended by the WHO of 10 μ/m^3. Air pollution levels also differ across world regions. With an average pollution level of 84 μ/m^3 of $PM_{2.5}$, South Asian cities have the lowest air quality, while cities in North America recorded the lowest average concentration of $PM_{2.5}$ (8 μ/m^3) – this is partially explained by the significantly higher population density of South Asian cities (Figure 1.11).

Globally, air pollution levels in cities have changed significantly in the last 30 years. While cities in high-income and OECD countries have been reducing people's exposure to $PM_{2.5}$ since 1990, cities in upper-middle-income countries have started to make progress only since 2010. On the other hand, air pollution has been on the rise in the last 10 years in cities from lower-middle and low-income countries (Figure 1.12). More precisely, since 2010, most world macro-regions – except for South Asia and Sub-Saharan Africa – have recorded a decrease in air pollution in cities. This reduction in $PM_{2.5}$ concentration was strongest in East Asia and the Pacific (falling by 4 points) and the Middle East and North Africa region (falling by 5 points) (Figure 1.14-Figure 1.16).

In the OECD area, differences in air pollution levels across cities remain relatively small within countries compared to between countries. Nevertheless, most cities still have exposure to $PM_{2.5}$ above the limit recommended by the WHO. Within-country differences are largest in countries such as Turkey, Chile, Spain or Poland, where pollution is high on average and where some cities experience levels of $PM_{2.5}$ around the 30 μ/m^3 or more (Figure 1.13). Although air pollution has been declining on average across OECD cities in the last 30 years, 66% of cities in the OECD (789 out of 1 187) still had their residents exposed to harmful levels of air pollution in 2019 (above 10 μ/m^3). In 30 countries (out of 37), there is at least one city with population exposure to air pollution above the suggested threshold of 10 μ/m^3.

Definition

The indicator of air pollution refers to the population-weighted average exposure to fine particulate matter that is less than 2.5 microns in diameter ($PM_{2.5}$), which are generally emitted from the combustion of liquid and solid fuels for industrial and housing energy production, vehicles and biomass burning in agriculture. The major components of particulate matter are sulphate, nitrates, ammonia, sodium chloride, black carbon, mineral dust and water. These are potentially the most harmful to health, compared to other air pollutants.

Sources

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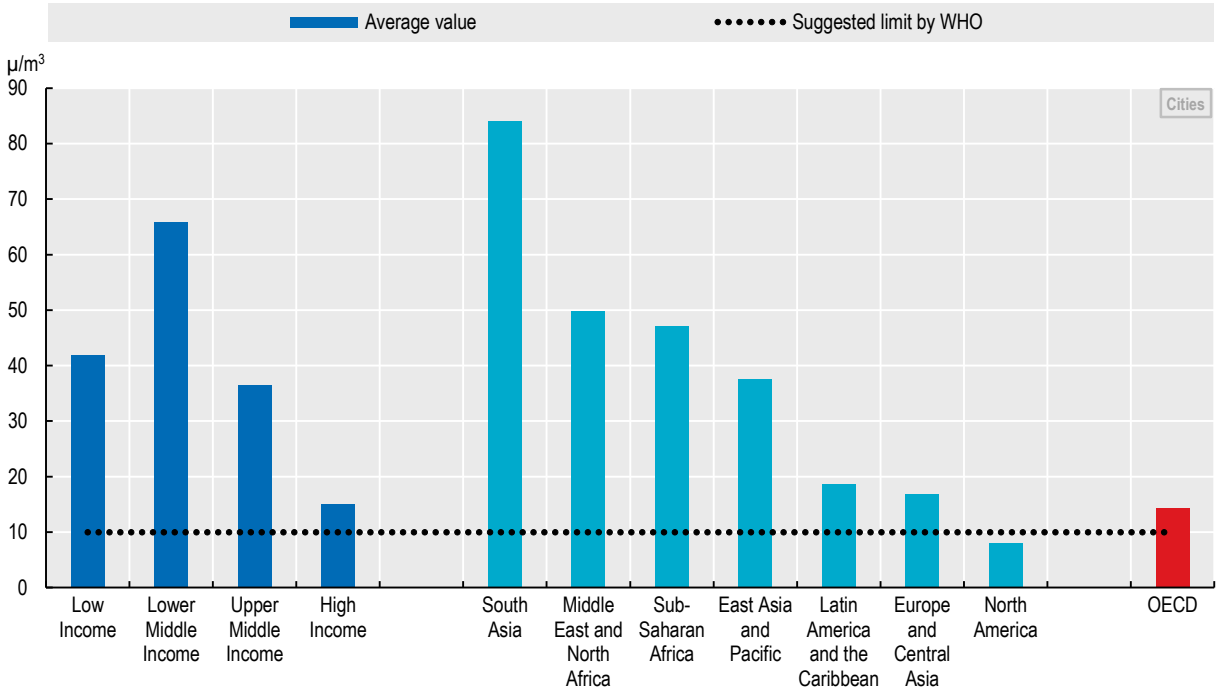
OECD/European Commission (2020), *Cities in the World: A New Perspective on Urbanisation*, OECD Urban Studies, OECD Publishing, Paris, *https://doi.org/10.1787/d0efcbda-en*.

OECD/European Commission (2020), *World Cities Tool (database)*, *http://www.worldcitiestool.org/*.

See country metadata in Annex B.

1.11. Air pollution in cities by countries' income and macro-region, 2019

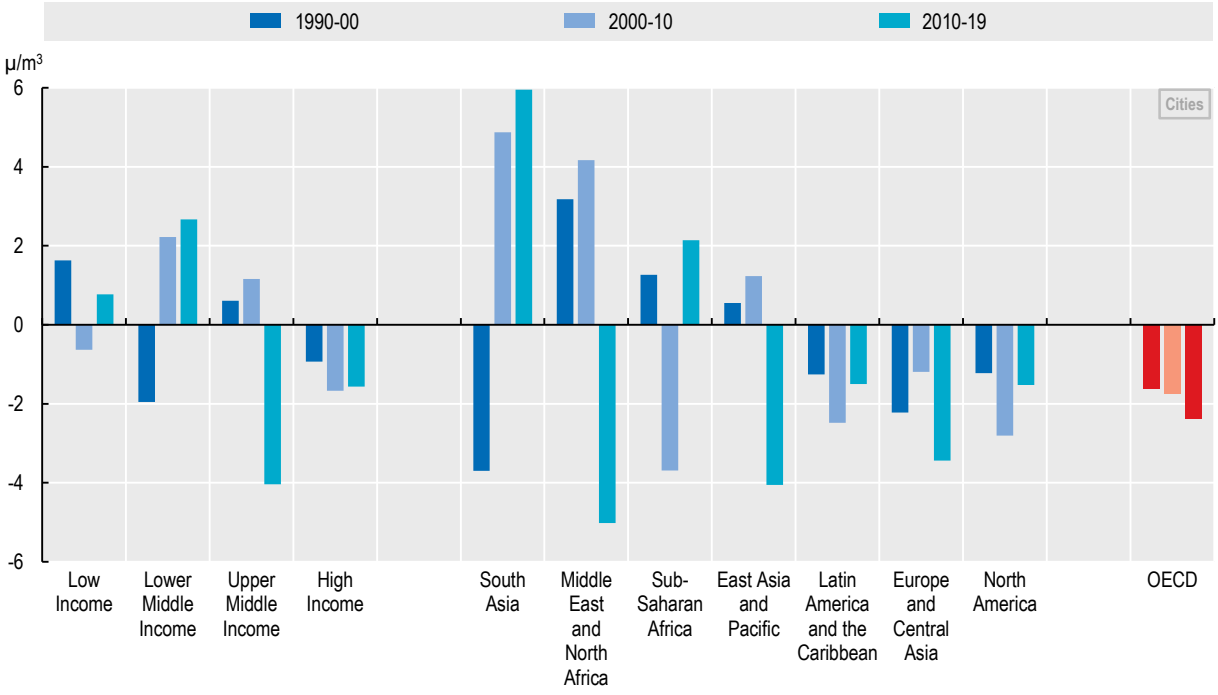
Population-weighted average of cities, levels of $PM_{2.5}$ in μ/m^3



StatLink https://doi.org/10.1787/888934189260

1.12. Change in air pollution in cities by countries' income and macro-region

Population-weighted average of cities, change in levels of $PM_{2.5}$ in μ/m^3, over periods

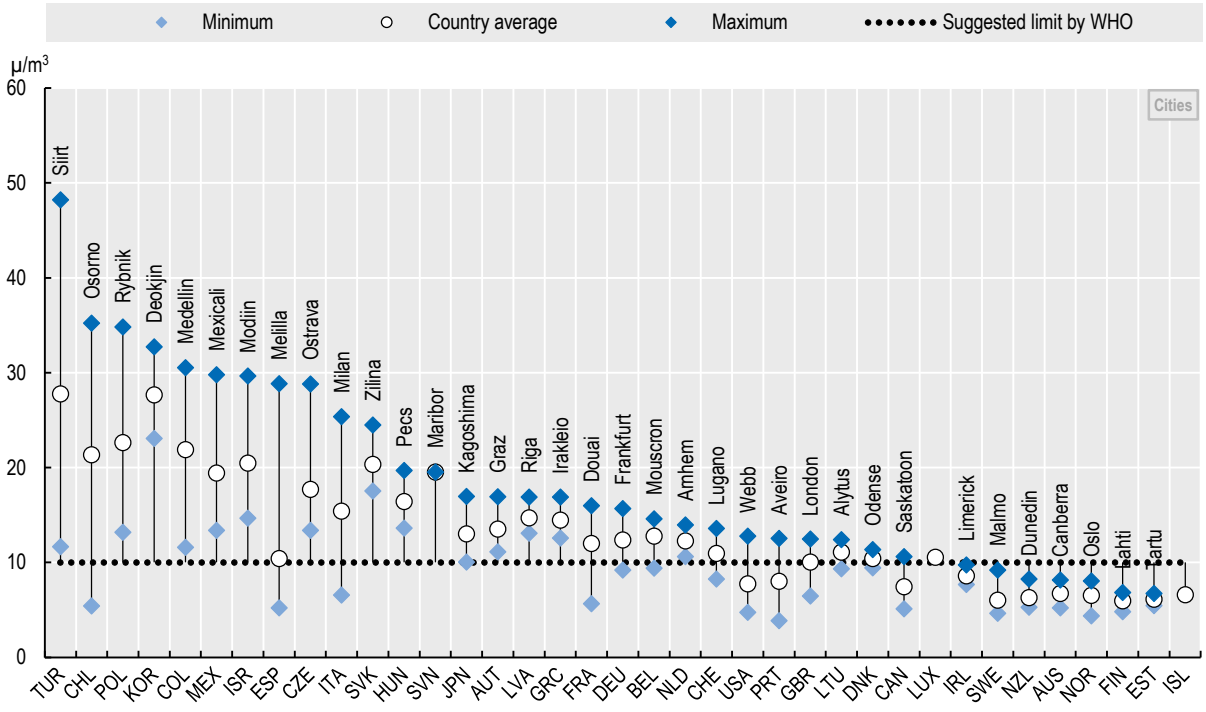


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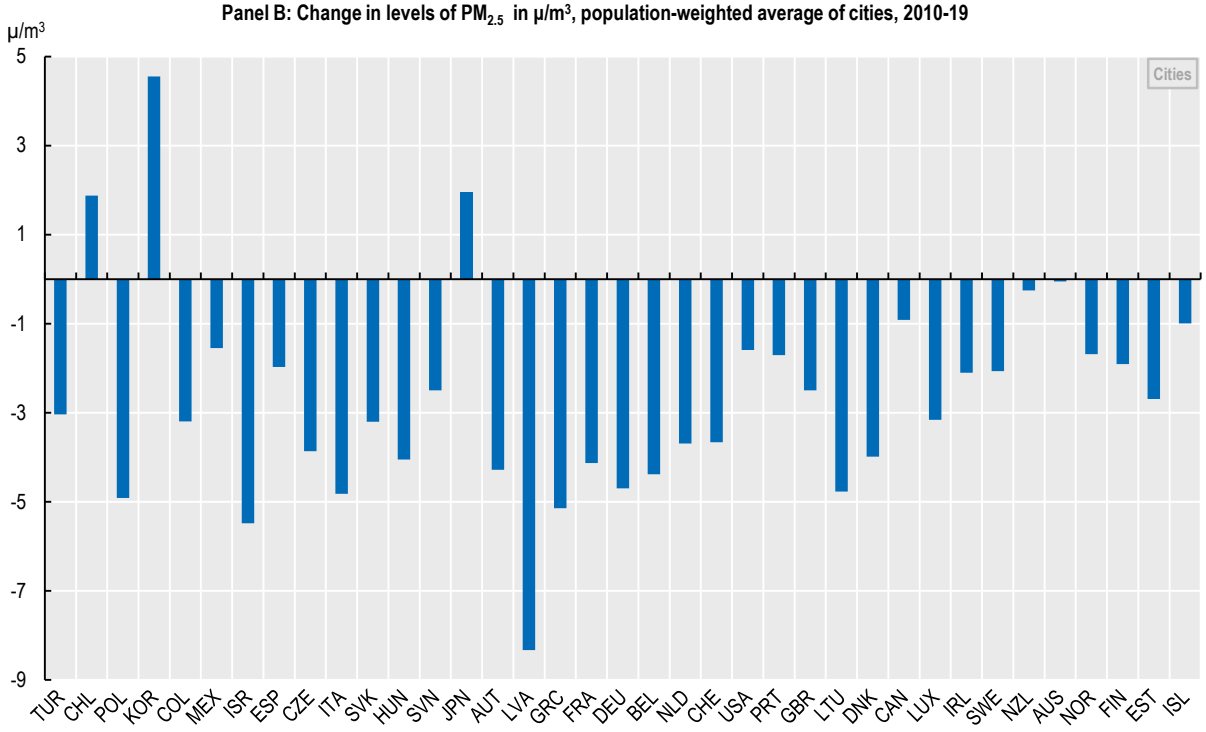
Breathing clean air in all the cities of the world (SDG 11)

1.13. Differences in air pollution levels in cities

Panel A: Levels of $PM_{2.5}$ in µ/m³, population-weighted average of cities, 2019



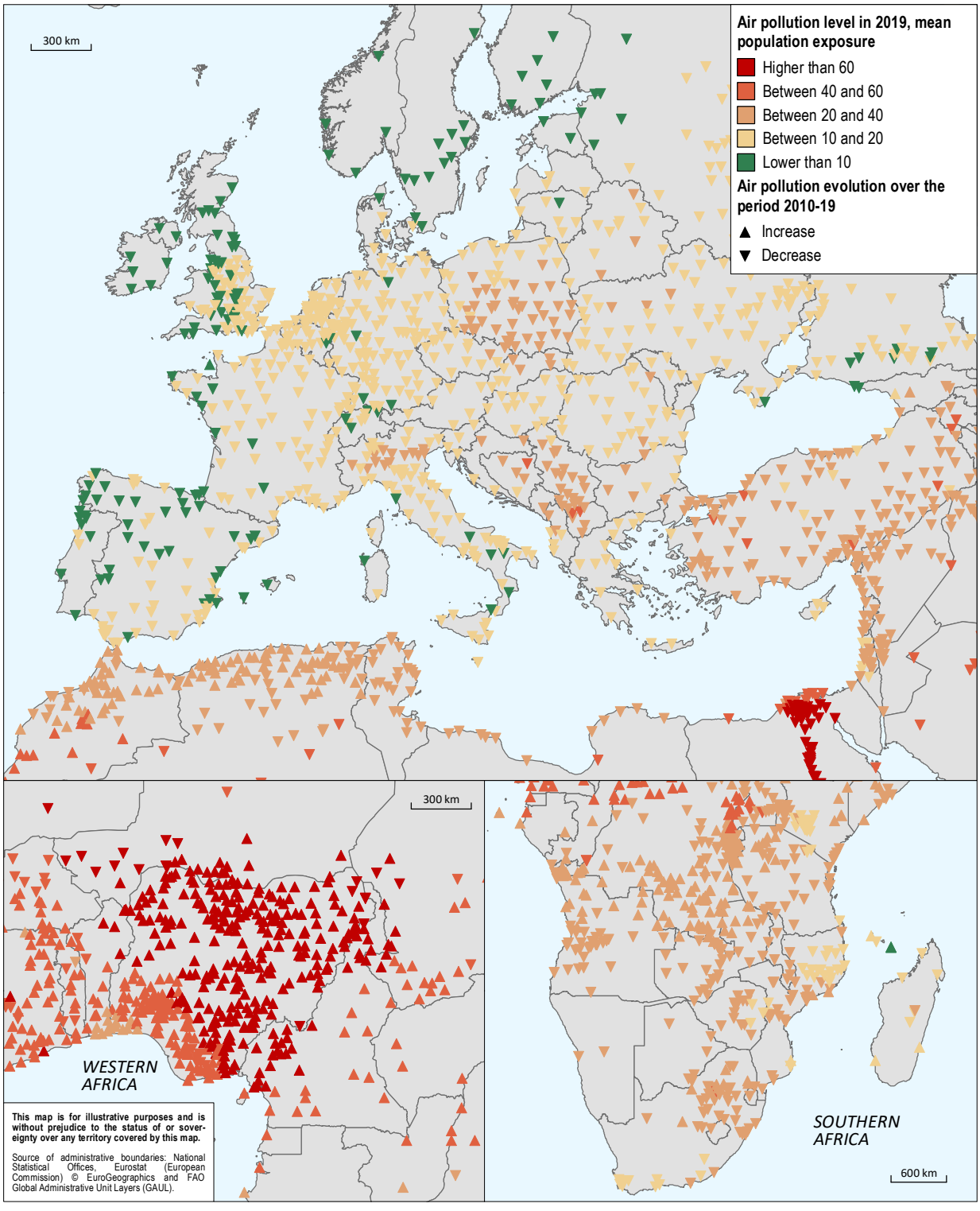
Panel B: Change in levels of $PM_{2.5}$ in µ/m³, population-weighted average of cities, 2010-19



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1.14. Air pollution in cities: Eurasia and Africa

Levels of $PM_{2.5}$ in μ/m^3, 2019, with change between 2010 and 2019



StatLink https://doi.org/10.1787/888934189317

1.15. Air pollution in cities: North and South Americas

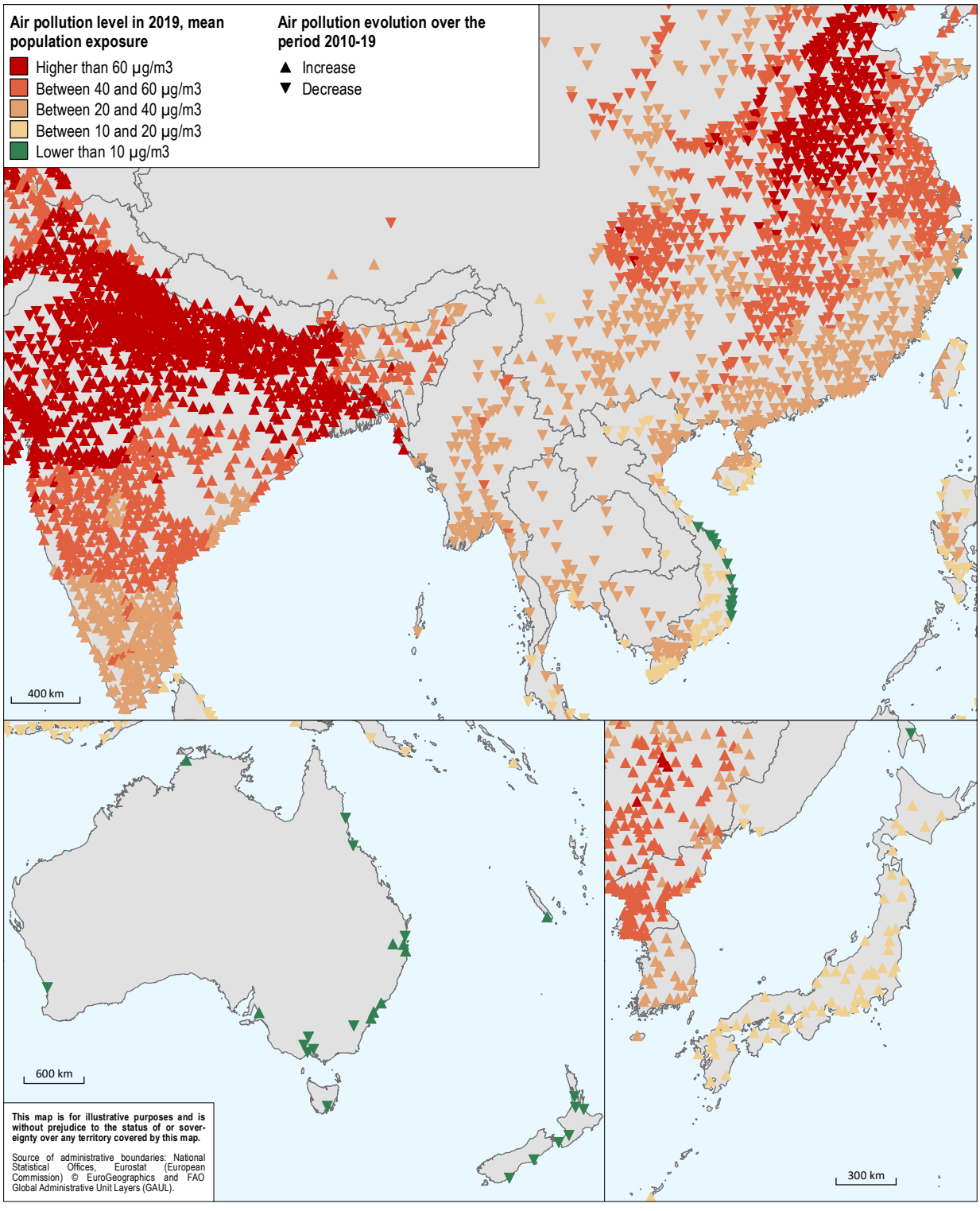
Levels of $PM_{2.5}$ in μ/m^3, 2019, with change between 2010 and 2019



StatLink https://doi.org/10.1787/888934189336

1.16. Air pollution levels in cities: Asia and Oceania

Levels of $PM_{2.5}$ in μ/m^3, 2019, with change between 2010 and 2019



StatLink https://doi.org/10.1787/888934189355

Ensuring inclusive education in all regions (SDG 4)

Capital regions tend to have lower school dropout rates and higher shares of tertiary-educated people than the rest of the country.

In most OECD countries, capital regions concentrate disproportionately large shares of the highly educated population. On average, the population share with tertiary education in capital regions is more than 10 percentage points higher than the national average. The capital region is the place with the highest share of people that completed tertiary education in 26 out of 30 OECD countries with comparable data. In the Czech Republic, Hungary, Poland and the United States, where differences between top and bottom regions within countries are above 30 percentage points, capital regions stand out in terms of educational attainment. In Poland, for example, 56% of the population in the Warsaw region completed tertiary education compared to 34% in Lower Silesia, the second best-performing Polish region. In the Czech Republic and the United States, the capital regions of Prague and the District of Columbia are respectively 20 and 10 percentage points above the second best-performing region in their country (Figure 1.17).

Lifelong learning matters for people's well-being. It contributes to mental health, subjective life satisfaction, as well as better job opportunities. In the context of the job crisis triggered by COVID-19 (OECD, 2020a), more flexible and short-time training (from formal and non-formal educational systems) will be required to facilitate workers' reintegration in the labour market and mobility across firms. Yet, lifelong learning – measured as the share of the adult population enrolled in any form of training or learning – is still very low in most OECD regions and significantly unequal within one-third of OECD countries (out of 22 with available data). Within-country differences are largest in Australia, Italy and Switzerland, where the share of lifelong learning is high on average – above 37%. On the other hand, in countries with overall low lifelong learning, regional disparities are the lowest. In half of OECD countries with available data, not a single region has more than 15% of their adult population enrolled in formal or informal training or learning (Figure 1.18).

School dropout and youth inactivity remain important challenges in many Latin American and Southern European regions, especially outside the capital regions. For example, the school dropout rate in Athens, Greece, is 3.3%, around half the national average and 5 times lower than in the North Aegean region – the area with the highest dropout rate in Greece. School dropout rates in Colombia, Mexico and Turkey are highest, on average, but they also show the starkest regional differences among OECD countries. In these three countries, students in the capital regions are much less likely to leave school at an early stage than in other regions – with school dropout rates being more than 10 percentage points below the national average. In terms of youth not in employment, education or training (also known as NEET), four out of the five worst-performing regions in the OECD are located in East and Middle Anatolia in Turkey. In these 4 regions, more than 40% of the 18-24 year-old population are not in any type of formal education or employed (Figure 1.19).

Definition

Educational attainment is defined as the highest grade completed within the most advanced level attended in the educational system of the country where the education was received. Population with tertiary education refers to people aged 25 to 64 having completed at least the short-cycle tertiary level (levels 5 to 8 of the International Standard Classification of Education).

Lifelong learning refers to the population aged 25 to 64 participating in formal and/or non-formal education and training in the past 12 months, expressed as the share of the total population of the same age.

Early leavers refer to persons aged 18 to 24 who have completed no more than a lower secondary education and are not involved in further education or training.

Sources

OECD (2020a), *OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis*, OECD Publishing, Paris, *https://doi.org/10.1787/1686c758-en*.

OECD (2020b), *OECD Regional Statistics (database)*, OECD, Paris *http://dx.doi.org/10.1787/region-data-en*.

See country metadata in Annex B.

Reference years and territorial level

See territorial grids and regional typology in Annex A.

Figure notes

Figure 1.17: 2018 for COL, MEX and USA; 2017 for AUS, CHL and ISR; 2016 for CAN and RUS; and 2015 for BRA.

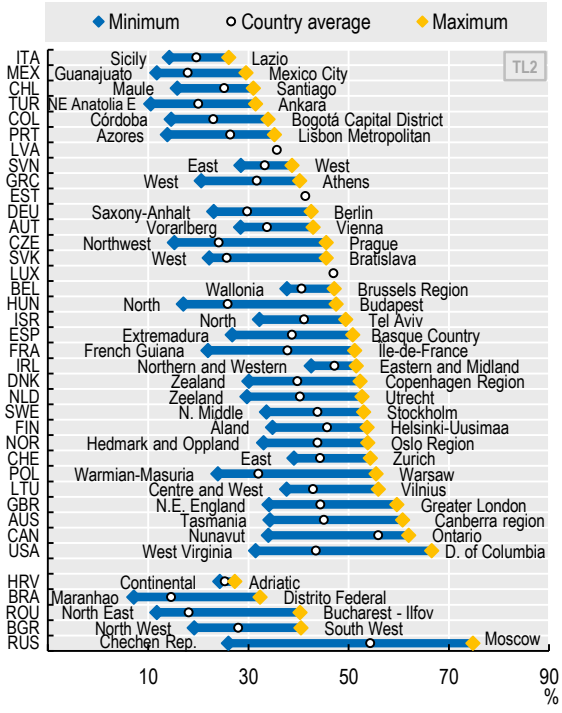
Figure 1.18: Population aged 25-64 in formal and/or non-formal training. Last available year was 2018 for COL, ESP, DEU and PRT; 2016 for AUS, EST, ITA, SVK and SWE; 2015 for BEL, CRI, ROU and TUR; and 2012 for KOR.

Figure 1.19 Panel A: Early leavers from education and training. Last available year was 2016 for AUS, CHL and ISR; 2013 for BRA.

Figure 1.19 Panel B: Population not in employment, education or training. Last available year was 2018 for COL, MEX, NZL and USA; 2017 for AUS, CHL, ISR and RUS; and 2013 for BRA.

1.17. Population with tertiary education, 2019

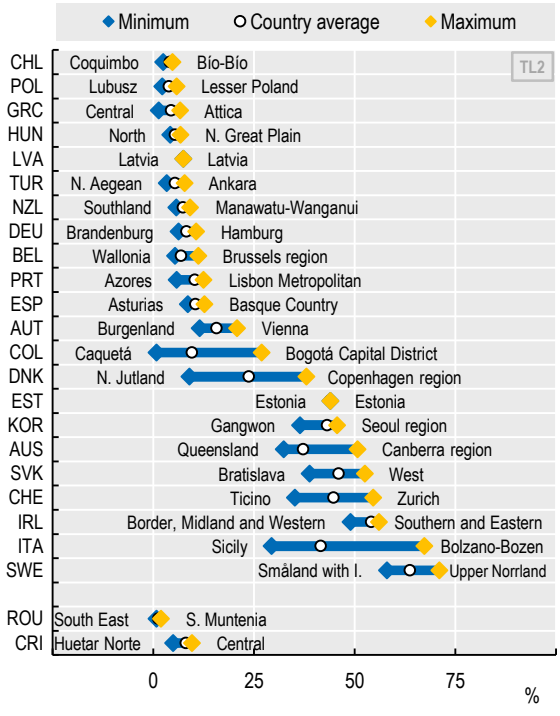
Share of 25-64 year-olds, large regions (TL2)



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1.18. Lifelong learning, 2017

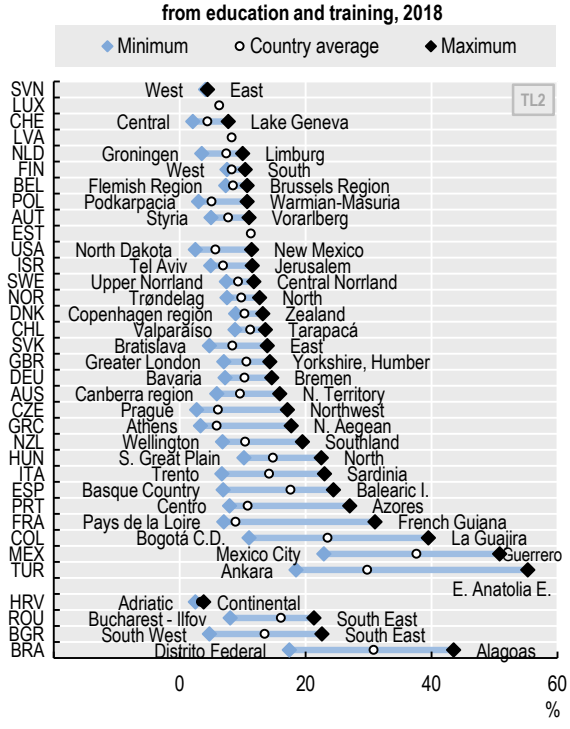
Share of 25-64 year-olds, large regions (TL2)



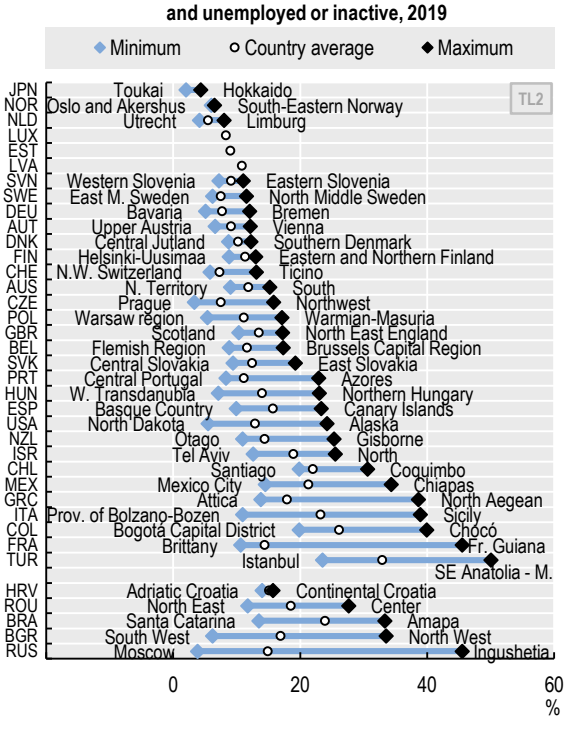
StatLink https://doi.org/10.1787/888934189393

1.19. Youth exclusion from education, 18-24 year olds, large regions (TL2)

Panel A: Early leavers from education and training, 2018



Panel B: Population not in education and unemployed or inactive, 2019



StatLink https://doi.org/10.1787/888934189412

Achieving gender equality in all places (SDG 5)

Women represent less than half of total mayors in all OECD regions with available data. Only in 10% of regions, located in Norway, Spain and Sweden, women account for at least 30% of mayors.

Achieving gender equality in all places requires pursuing inclusive labour markets, which are a source of economic empowerment and well-being for women. Between 2010 and 2018, the gender gap in the employment rate (male-female) of OECD countries has declined by one percentage point, although significant differences exist across regions. For example, from 2010 to 2018, two-thirds of OECD regions saw a widening of the gap between the employment rate of men and women. The 22 regions that registered the largest increase in this gender gap – above 4.5 percentage points – are located in Estonia, France, Hungary, Iceland, Poland, Turkey and the United States. In contrast, regions with very high gender gaps in employment rate in 2010 generally experienced an improvement (Figure 1.23-Figure 1.24).

Gender inequality is also present in research and development (R&D) occupations, as women hold less than half of the R&D jobs in virtually all (99%) OECD regions. Only 12 regions across Estonia, Greece, Hungary, Latvia, Lithuania, Poland and Portugal report a balanced integration of women in R&D occupations – with close to or slightly above 50% of R&D jobs being held by women. Nevertheless, significant differences exist within countries. For example, in Greece, Hungary and Poland, the difference between the regions with the highest (Lodzkie, North Great Plain and South Aegean) and lowest (Central Greece, Podkarpacia and Western Transdanubia) integration of women in R&D jobs exceeds 17 percentage points (Figure 1.20).

In addition to an inclusive labour market, the participation of women in politics is essential for designing laws and policies that generate gender-balanced opportunities and outcomes. Considering nine OECD countries with available data, there is not a single region where women account for at least half of all mayors. In addition, women account for at least 30% of mayors only in 8 regions (out of 78); those are located in Norway (Hedmark, Oppland, Oslo), Spain (Basque Country and Murcia) and Sweden (East Middle and Upper Norrland, Småland and the islands, Stockholm). In Norway and Sweden, 32% and 28% of all mayors are women respectively. However, these levels are still significantly below the 50% target suggested by the United Nations (UN, 2017) (Figure 1.21).

Fighting violence towards women remains another important objective to achieve gender equality in all places. In about one-third of regions in 10 countries with available data, at least 5% of women report having experienced physical or sexual violence in the past year. In 16 regions in Mexico, levels of violence towards women are alarmingly high, with at least 25% of women having experienced physical or sexual violence – 17 percentage points above the OECD average. Mexico is the country with the largest regional disparities in violence towards women, with a difference of more than 10 percentage points between the worst affected region and the country average. Regional disparities are also relatively high in Italy and Norway, although levels are significantly lower compared to Mexico. For example, whereas less than 2% of women reported having been victims of violence in Aosta Valley (Italy) and Hedmark and Oppland (Norway), at least 8% of women have suffered from violence over the past year in Abruzzo (Italy) and North Norway (Figure 1.22).

Definition

Women who experienced violence refers to women aged 15 years old or more who experienced physical and or sexual violence within the last 12 months.

Sources

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

UN (2017), *Resolution adopted by the General Assembly on 6 July 2017, 71/313. Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development*, *https://undocs.org/A/RES/71/313*.

See country metadata in Annex B.

Reference years and territorial level

See territorial grids and regional typology in Annex A.

Figure notes

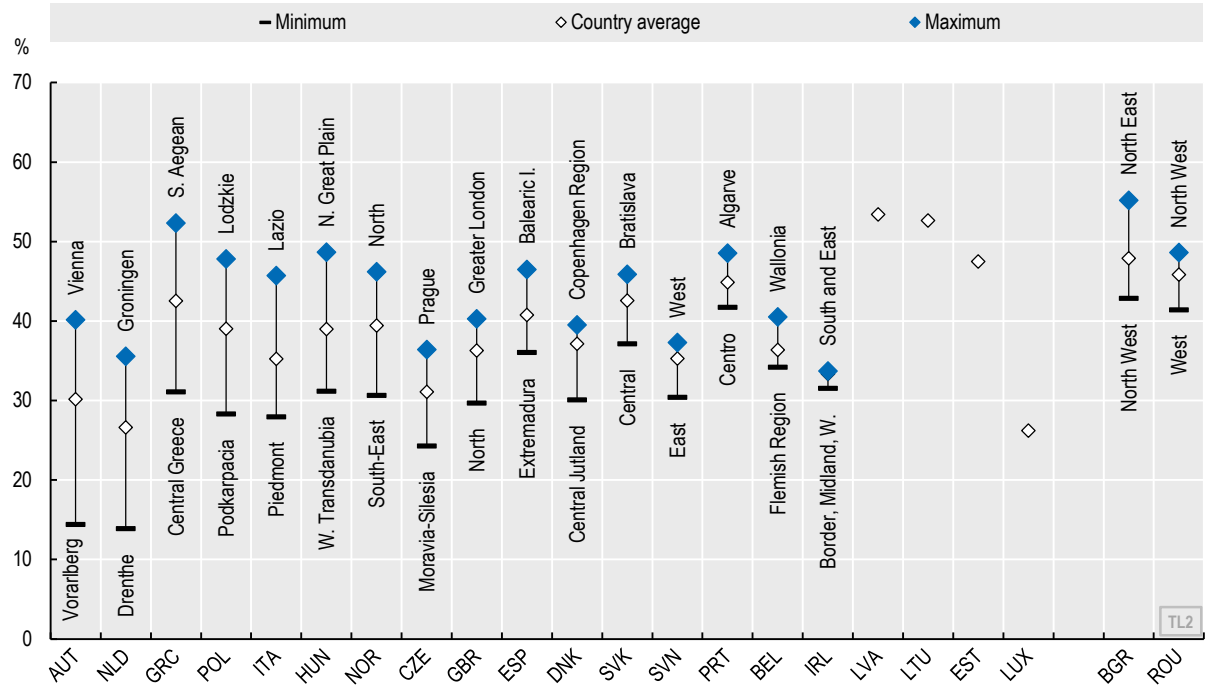
Figure 1.20: 2014 for NOR; 2013 for IRL; and 2012 for GRC.

Figure 1.21: 2018 for EST, KOR, LVA, SWE; 2016 for POL; 2015 for ESP; and 2015 for FRA.

Figure 1.22: 2018 for AUT, ISR, JPN and ESP; 2016 for FRA and MEX; and 2014 for ITA.

1.20. Regional disparities in women employment in R&D, 2015

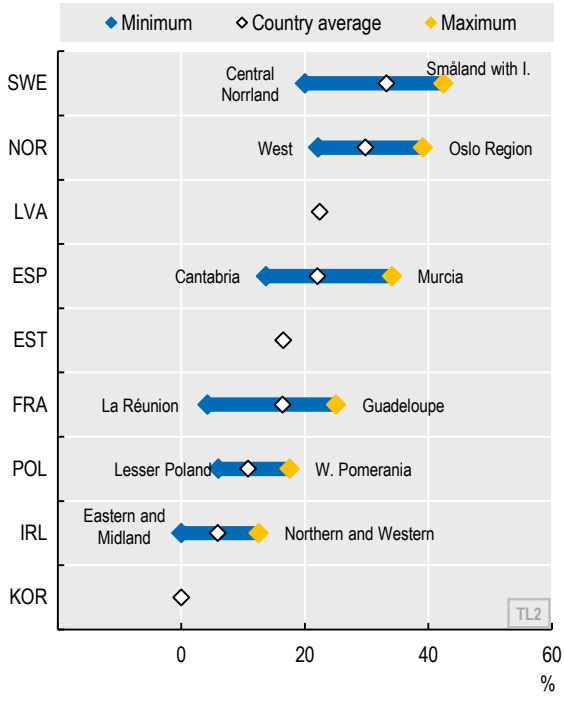
Percentage of total R&D employment, large regions (TL2)



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1.21. Women who are mayors, 2019

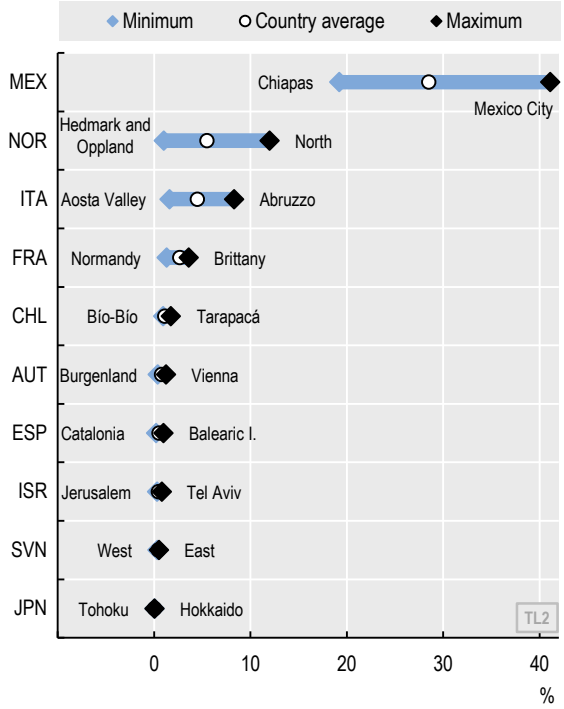
Percentage of total mayors, large regions (TL2)



StatLink https://doi.org/10.1787/888934189450

1.22. Women who experienced violence, 2019

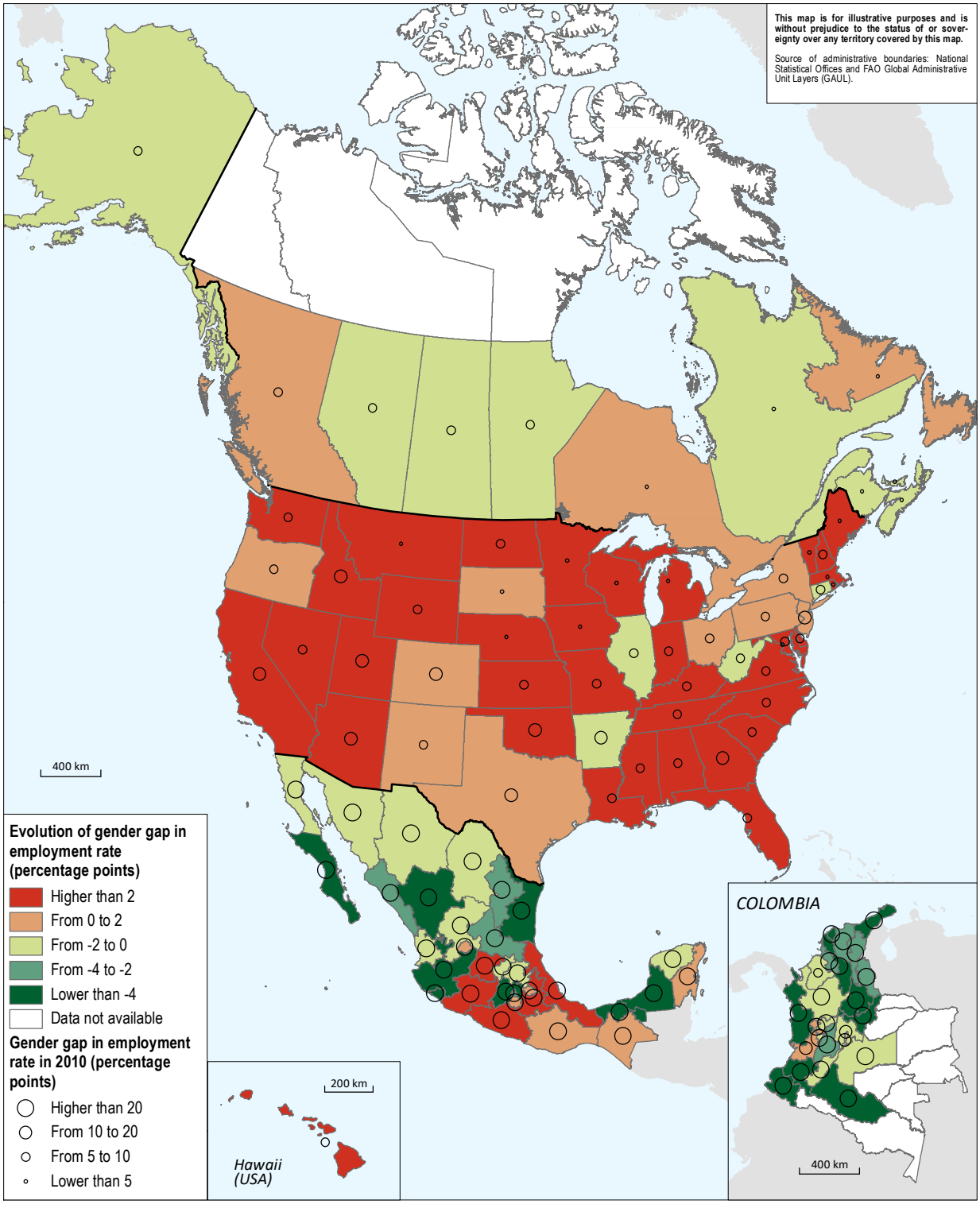
Physical or sexual in the previous 12 months, large regions (TL2)



StatLink https://doi.org/10.1787/888934189469

1.23. Evolution of gender gap in employment rate: Americas, 2010-18

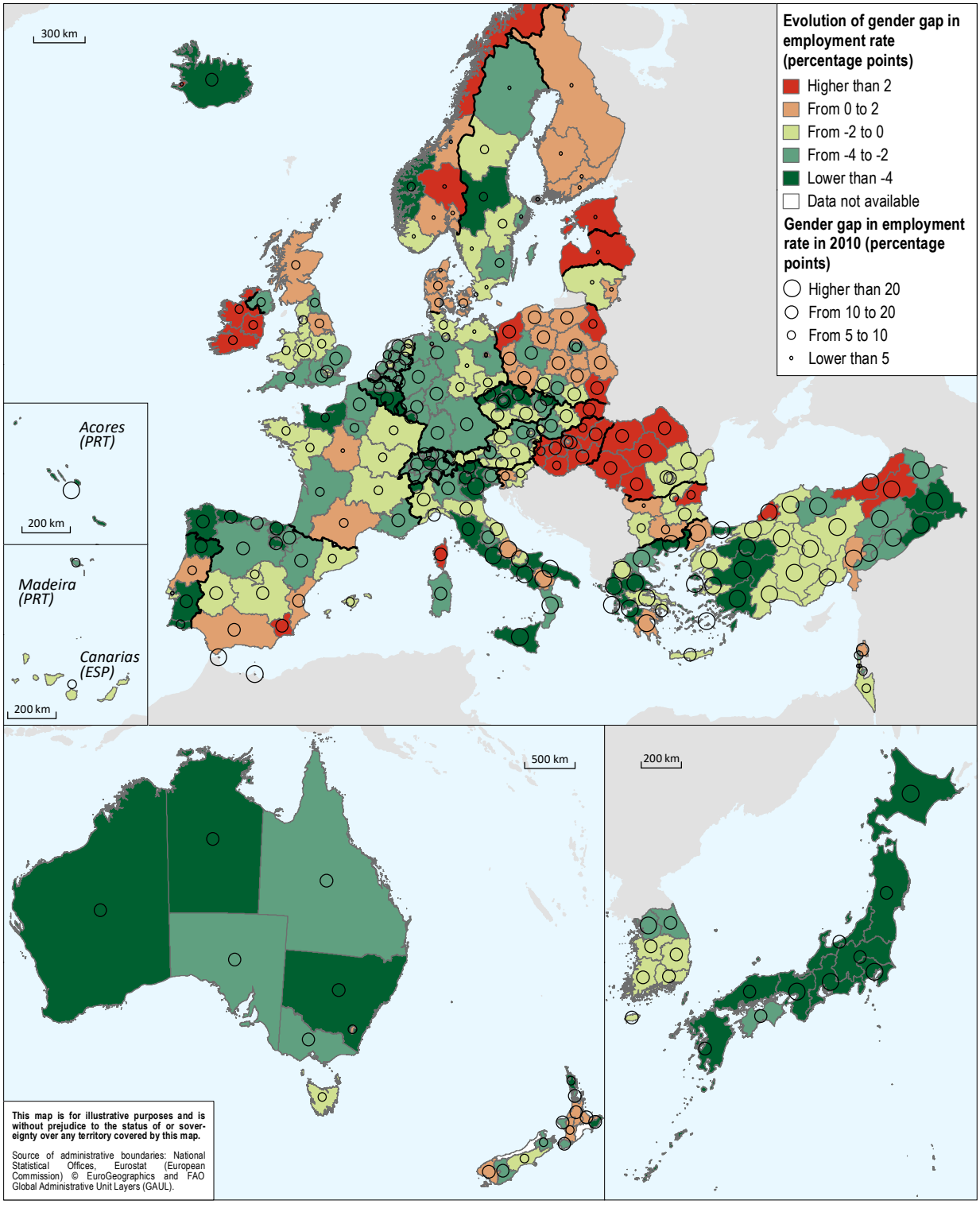
Difference between the gender gap (male-female) in 2018 and the gap in 2010, large regions (TL2)



StatLink https://doi.org/10.1787/888934189488

1.24. Evolution of gender gap in employment rate: Europe and Asia-Pacific, 2010-18

Difference between the gender gap (male-female) in 2018 and the gap in 2010, large regions (TL2)



StatLink https://doi.org/10.1787/888934189507

Safety, trust in institutions and political engagement in regions (SDG 16)

Confidence in national governments is very unequal across OECD regions, particularly in the Americas.

Safety in the place of residence is an essential determinant of individual well-being and confidence in institutions. Regional differences in personal safety, measured in terms of homicide rates, are persistent and stark within OECD countries. Although homicide rates declined by one-third in OECD countries since 2010, they remain very high in many regions of Latin and North American countries. Over the period 2000-19, annual homicide rates in OECD regions have declined from 3.8 to 2.7 homicides per 100 000 inhabitants on average. Despite this improvement, 40 regions in Colombia, Mexico and the United States still have homicide rates above 15 murders per 100 000 people (Figure 1.25).

Regional differences in confidence in national governments are highest in Latin American and Southern European countries. Such regional differences matter as trust in people and institutions, including the government, is associated with better economic and well-being outcomes (Algan and Cahuc, 2010; Macchia and Plagnol, 2019). During the period 2014-18, the levels of confidence in national governments between the regions with highest and lowest confidence levels differed by 15 percentage points on average in OECD and partner countries. However, in Brazil, Colombia, Mexico and Peru, those regional gaps exceeded 35 percentage points. In those countries, there is at least 1 region where less than 10% of the population expresses confidence in the national government. While trust in the government in Europe tends to differ to a lower extent within countries compared to Latin America, Southern European countries still show relatively high regional differences. In France, Italy, Portugal and Spain, the gap between top and bottom regions in terms of trust in the government ranges from 13 to 20 percentage points, while in Denmark, Finland, Iceland and Norway, it does not exceed 8 percentage points (Figure 1.26).

Low trust in institutions can trigger discontent and weak political participation in regions. Although over the last 20 years, voter turnout has slightly increased, on average, across OECD regions (by 2.7 percentage points), changes in voter turnout since 2000 differed by up to 20 percentage points across regions, leading to higher territorial disparities. Within OECD countries, the gap in voter turnout between the regions with the highest and lowest electoral participation averages 14 percentage points**.** Such regional differences are even more accentuated in countries such as Canada, Colombia, France, Greece and Mexico, where the difference between the top and bottom regions in terms of voter turnout is higher than 22 percentage points (Figure 1.27, panel A).

People in metropolitan regions participate more in elections than people living in regions far from metropolitan areas. Voter turnout is on average 3 percentage points higher in the former regions. This is even more pronounced in central European countries such as Estonia, Latvia, Lithuania and Poland where the differences in voter turnout between metropolitan regions and regions far from a metropolitan area range from 4 to 12 percentage points. Overall, regional disparities in political participation have widened across types of regions. In 12 out of 17 OECD countries, electoral participation has increased the most (or declined the least) in metropolitan regions compared to regions far from metropolitan areas (Figure 1.27, panel B).

Definition

Homicide is the unlawful killing of a human being with malice aforethought, also known as intentional murder. The annual homicide rate is the number of reported homicides per 100 000 inhabitants over the year.

Confidence in the government refers to the share of the population aged 18 or more who declare that they have confidence in the national government.

Voter turnout corresponds to the people who voted at the last national election as a percentage of the people eligible to vote.

Sources

Algan, Y. and P. Cahuc (2010), "Inherited trust and growth", *American Economic Review*, Vol. 100(5), pp. 2060-92, *https://www.aeaweb.org/articles?id=10.1257/aer.100.5.2060*.

Macchia, L. and A.C. Plagnol (2019), “Life satisfaction and confidence in national institutions: Evidence from South America”, *Applied Research in Quality of Life*, Vol. 1 4, pp. 721-736, *https://doi.org/10.1007/s11482-018-9606-3*.

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

See country metadata in Annex B.

Figure notes

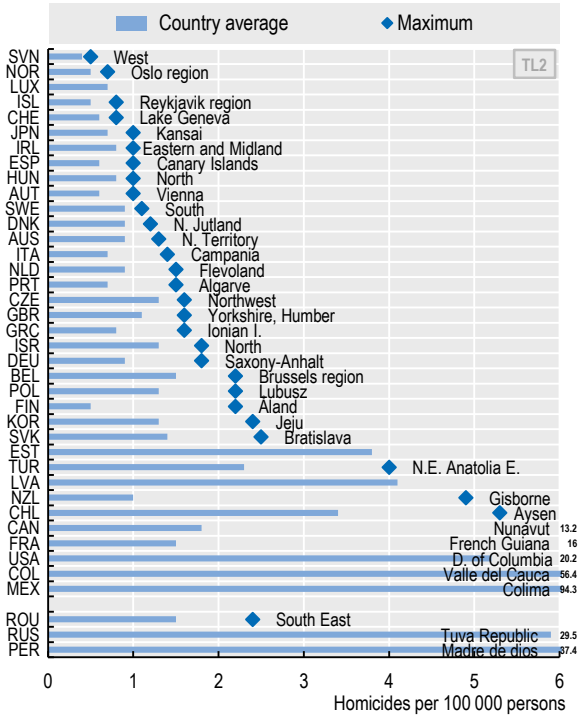
Figure 1.25: 2017-19 average or: AUS, AUT, BEL, CAN, CZE, DNK, FIN, DEU, GRC, IRL, ISR, JPN, KOR, MEX, POL, PRT and ESP, 2016-18; LUX, CHE, GBR and USA, 2015-17; COL and EST, 2014-16; ISL, LVA and ROU, 2013-15; NZL, PER and SWE, 2012-14; TUR, 2011-13; and NLD, 2010.

Figure 1.27, panel A: COL, FIN, HUN, ITA, KOR, MEX and SWE, 2018; CHL, CZE, FRA, DEU, NLD, NZL and NOR, 2017; IRL, ISL, SVK and USA, 2016; EST, GRC, TUR and GBR, 2015; ROU and SVN, 2014; LUX, 2013; and PER, 2011.

Figure 1.27, panel B: First year: NOR, 2001; AUT, CZE, FRA, DEU, HUN, IRL, LVA, LTU, PRT and SVK, 2002; EST and CHE, 2003; ISL, 2004; and DNK, 2007. Last year: HUN and KOR, 2018; AUT, CZE, FRA, DEU and NOR, 2017; IRL and SVK, 2016; LTU and ESP, 2015; LVA, 2014; and ISL, 2012.

1.25. Homicide rate, annual average 2017-19 or most recent

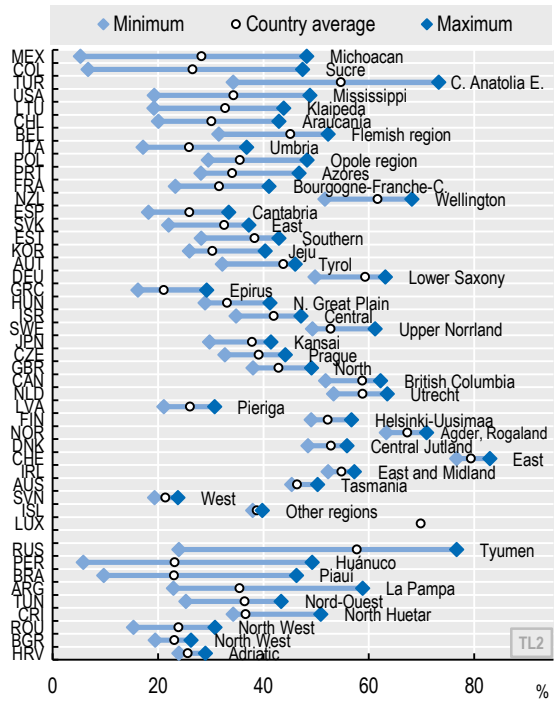
Homicides per 100 000 persons, large regions (TL2)



StatLink https://doi.org/10.1787/888934189526

1.26. Confidence in the government, average 2014-18

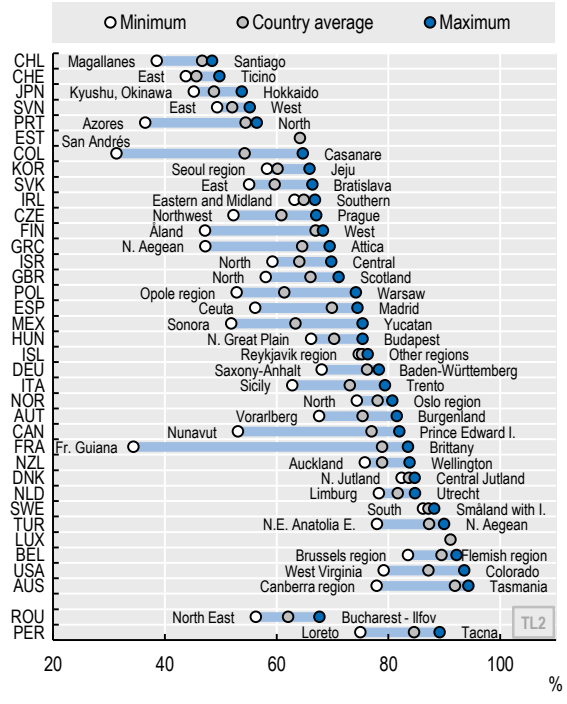
Percentage of the population aged 18 or more, large regions (TL2)



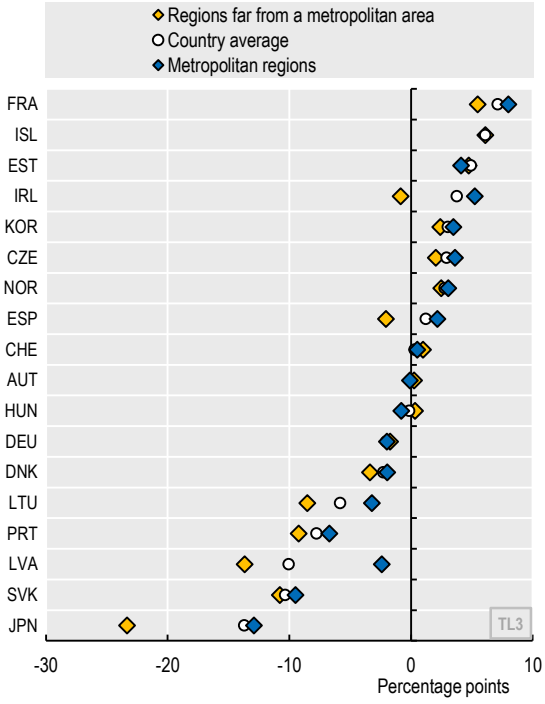
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1.27. Regional disparities in voter turnout

Panel A: Voter turnout % large regions (TL2), 2019



Panel B: Change in voter turnout by type of small regions (TL3), 2000-19



StatLink https://doi.org/10.1787/888934189564





2. ECONOMIC RESILIENCE AND REGIONAL ECONOMIC DISPARITIES

Regions facing COVID-19 lockdowns: The potential for remote working

The regional digital divide

Long-term regional economic disparities

Productivity trends in regions

International trade integration in regions

The contribution of metropolitan areas to national economies

Entrepreneurship, firm and employment creation in regions

This chapter presents key facts on and trends in the economy of regions and cities, assessing factors of economic resilience. Among the indicators presented in the chapter are remote working potential, trade openness, gross domestic product (GDP) per capita, productivity, business demography, the coverage of digital infrastructure and households' digital take-up.

Regions facing COVID-19 lockdowns: The potential for remote working

Cities and capital regions have the highest capacity for remote working.

The COVID-19 pandemic has affected regional economies in OECD countries with a significant and unprecedented severity. Widespread measures of social distancing to contain the spread of COVID-19 have required many workplaces to remain shut. While lockdowns practically forced many people to stop working, others were able to continue their activities from home. In this context, not all regions were equally prepared to adapt to remote working and therefore mitigate the economic disruptions due to the lockdown. The extent to which jobs are amenable to remote working depends on the nature of the tasks carried out by workers, meaning on the type of occupation. In turn, occupations that can be performed remotely are not evenly spread across space, with some places being able to shift a much larger share of employment to remote working than other places.

The share of jobs amenable to remote working varies greatly both between and within OECD countries (Figure 2.1, panel A). For example, while 50% of the employed people can potentially work from home in Luxembourg, only 20% can do so in Colombia. Within countries, there is, on average, a 15-percentage point difference between the regions with the highest and lowest shares of employed people that can potentially work remotely. This difference reaches more than 20 percentage points in the Czech Republic, France, Hungary, and the United States, driven by the much higher potential for remote working in those countries' capitals. In general, capital regions have the highest potential for remote working, with rates that are 8 percentage points higher than the respective country average.

The potential for remote working is also higher in more densely populated areas. Using the "degree of urbanisation" to distinguish different types of settlement for European countries, cities – defined as local units above 50 000 inhabitants with a population density of over 1 500 inhabitants per square kilometre – have a 13-percentage point higher share of jobs amenable to remote working than rural areas (Figure 2.1, panel B).This city-rural gap is particularly significant in Croatia, Finland, Hungary and Luxembourg, where the difference is larger than 17 percentage points.

The skill requirement of occupations correlates to their amenability to being performed remotely. As a result, the share of the employed population that can potentially work remotely across regions reflects the skill composition of the local workforce. Figure 2.2 illustrates this relationship across regions by plotting regions' levels of potential remote working (vertical axis) against the share of workers with tertiary education (horizontal axis). The trend line shows that, as the share of workers with tertiary education increases, the share of jobs amenable to remote working also increases at a similar rate. However, there are some exceptions. In some countries (e.g. Canada, Spain or Turkey) all regions appear below the trend line, indicating that the share of jobs amenable to remote working in these regions is lower than expected given the education levels of the workforce. On the other hand, regions in other countries (e.g. Germany) tend to be above the trend line, indicating higher rates of jobs amenable to remote working than expected from the skill composition of the workforce. While these differences require further analysis, the industrial composition of the regional economies might play a role.

Definition

The degree of urbanisation definition acknowledges the urban-rural continuum and proposes three classes of settlements instead of the traditional urban vs. rural dichotomy. The three classes are: i) cities (or densely populated areas); ii) towns and semi-dense areas (or intermediate density areas); and iii) rural areas (or thinly populated areas).

Potential for remote working: The assessment of regions' capacity to adapt to remote working is based on the diversity of tasks performed in different types of occupations.

Source

OECD calculations based on the American Community Survey (ACS), Australian Labour Force Survey (LFS), Canadian LFS, European LFS, Turkish Household LFS, Turkish Statistical Institute and Occupational Information Network data (accessed in April 2020). Data for Colombia are based on Colombian Household Survey estimated by Cardenas and Montana (2020).

See methodology to estimate the potential for remote working in Annex C.

Reference years and territorial level

2018, large regions (TL2).

Further information

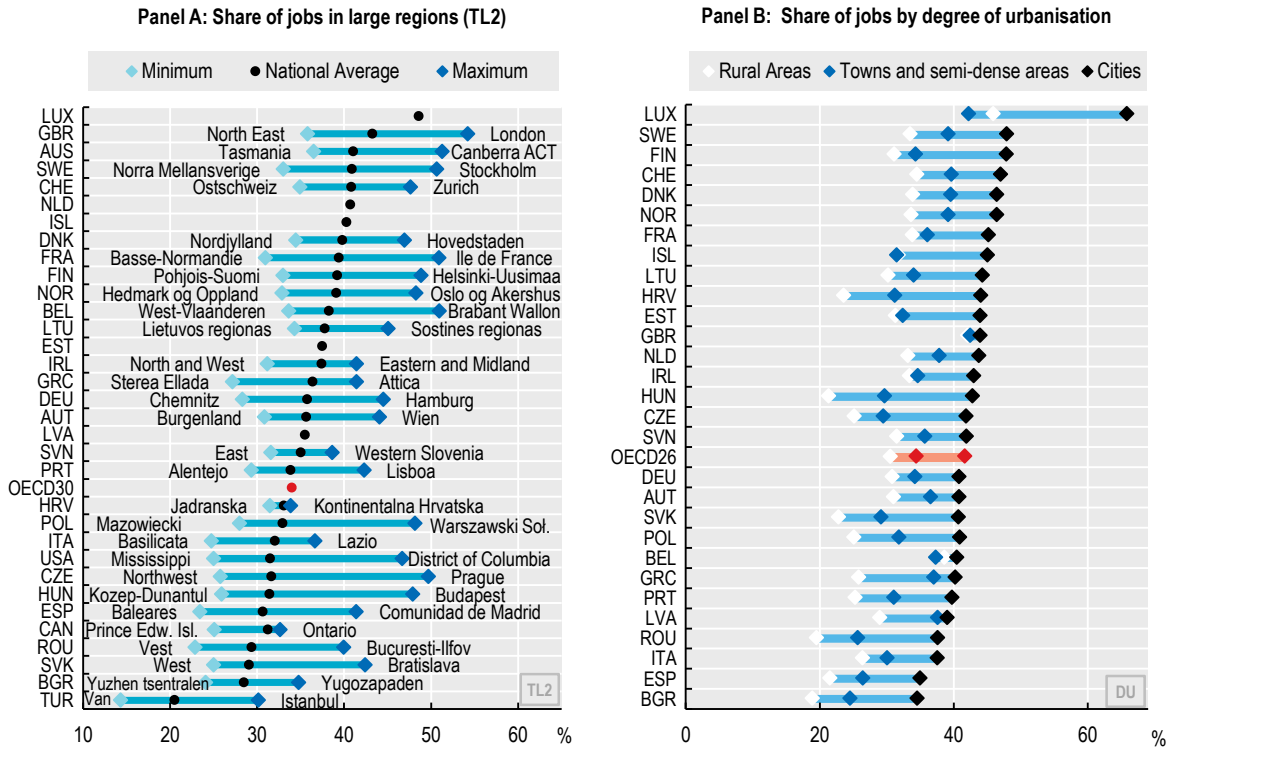
Cardenas J. and J. Montana (2020), "Possible effects of Coronavirus in the Colombian labour market", *Documento de Trabajo d'Alianza*, EFI – Colombia Cientifica.

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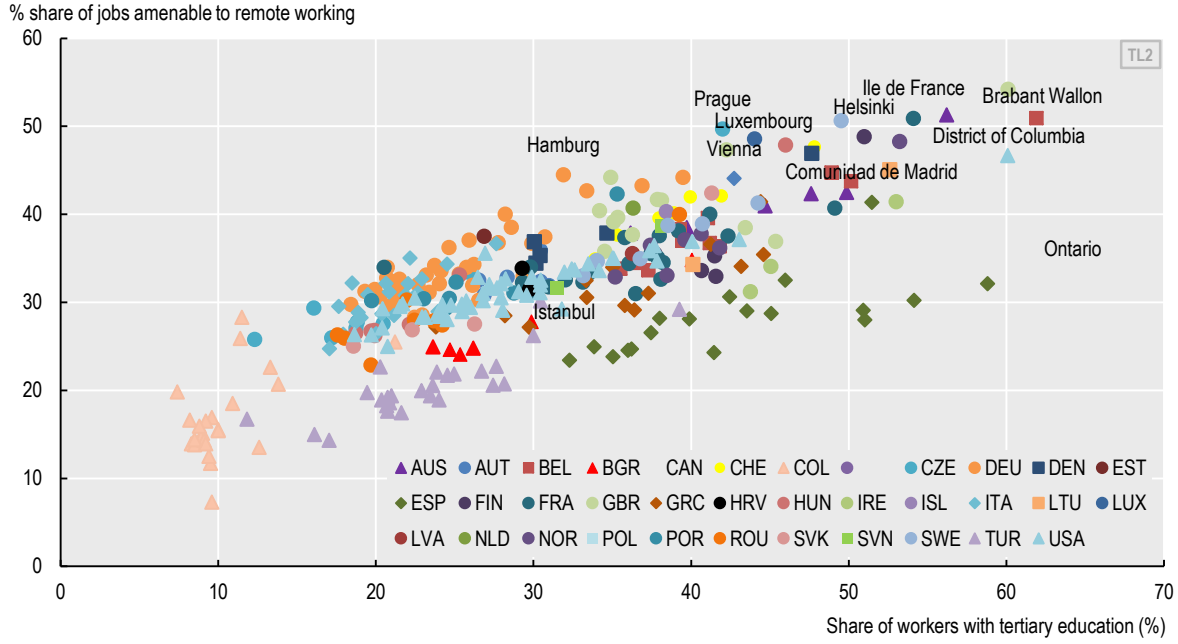
2.1. Share of jobs amenable to remote working, 2018



StatLink https://doi.org/10.1787/888934189583

2.2. Share of potential remote working increases with skill-levels in the region, 2018

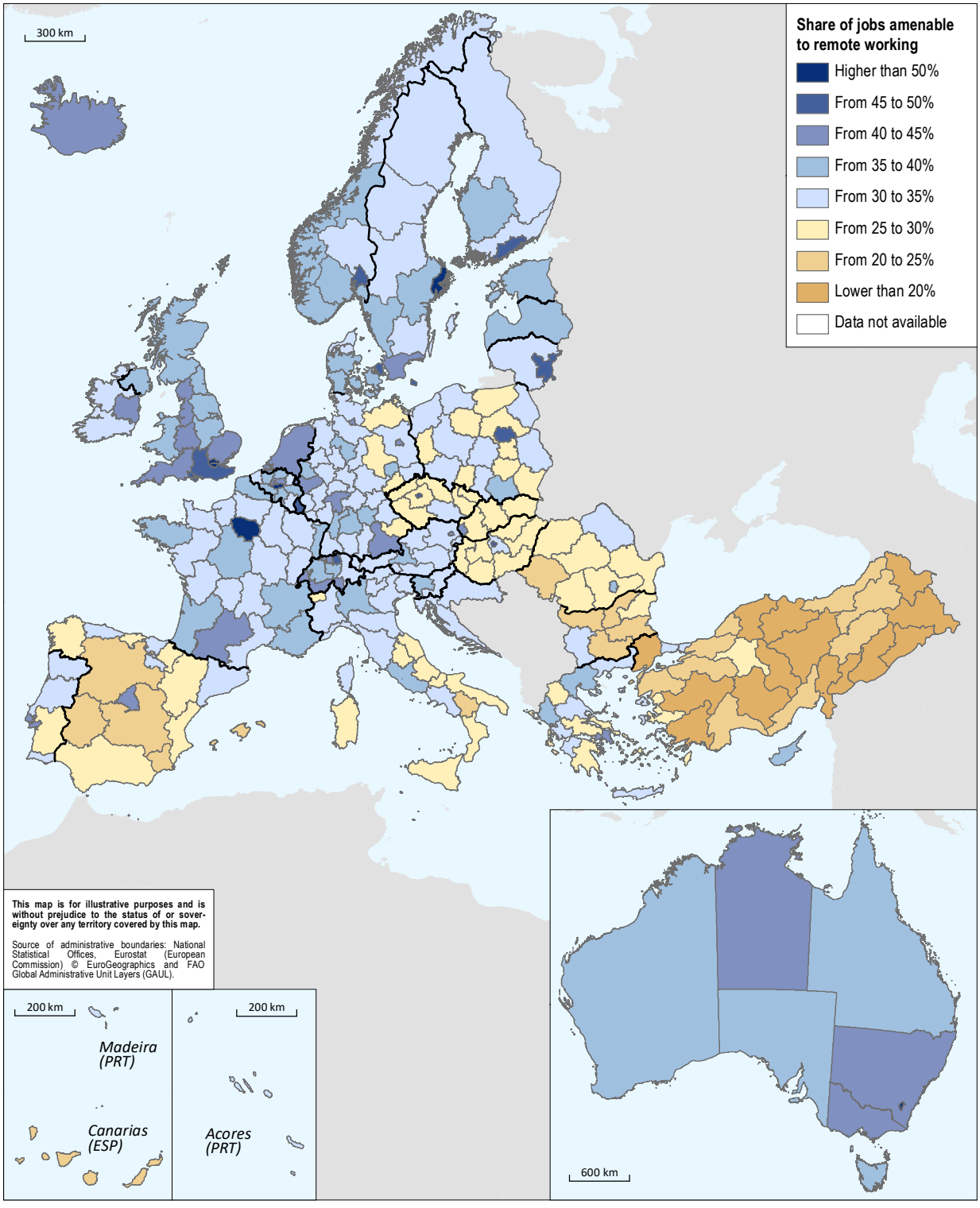
Share of jobs that can be performed remotely (%) and workers with tertiary education (%), large regions (TL2)



StatLink https://doi.org/10.1787/888934189602

2.3. Jobs amenable to remote working in selected European and OECD countries, 2018

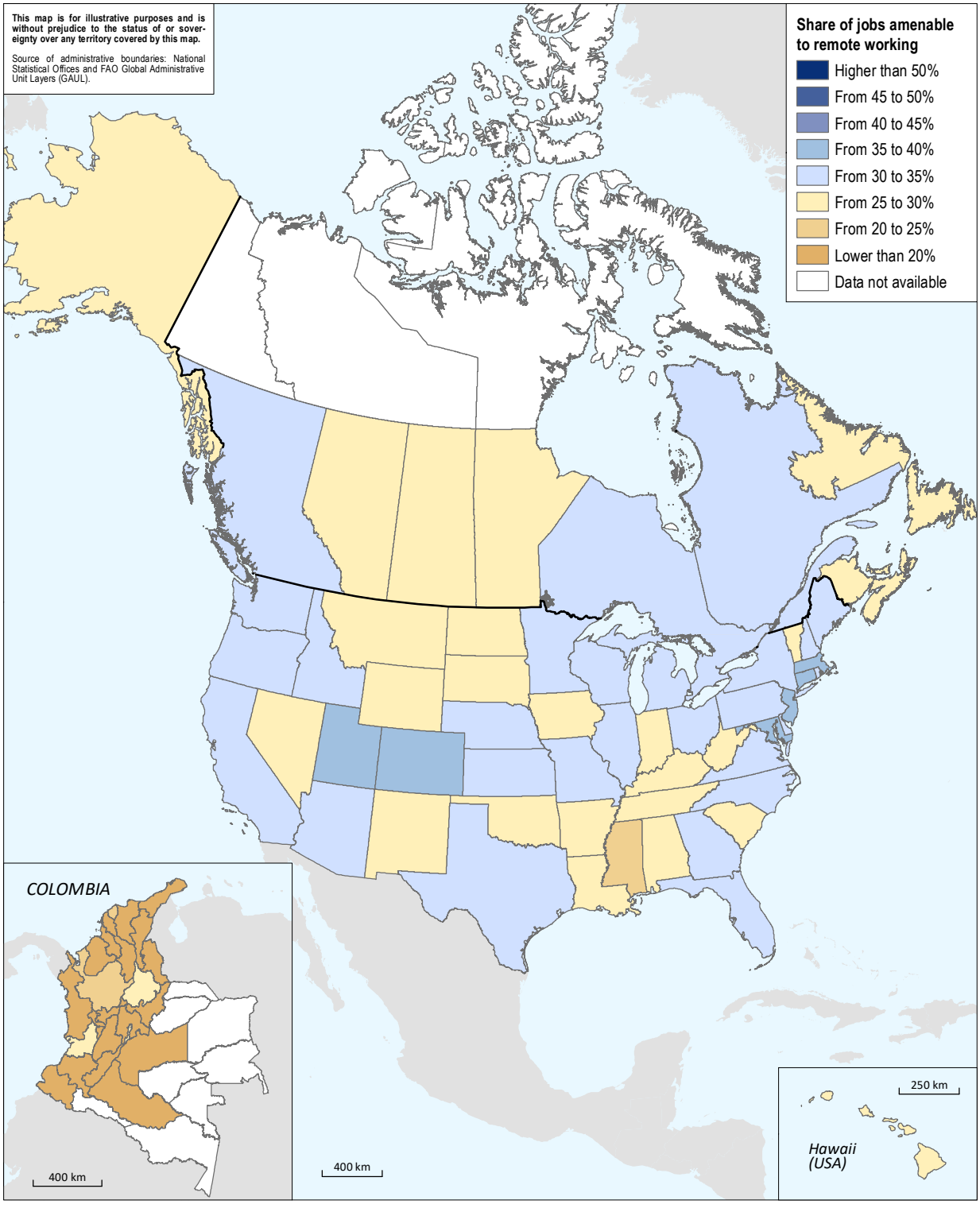
Share of total employment (%), large regions (TL2)



StatLink https://doi.org/10.1787/888934189621

2.4. Jobs amenable to remote working in Canada, Colombia and the United States, 2018

Share of total employment (%), large regions (TL2)



StatLink https://doi.org/10.1787/888934189640

The regional digital divide

Lack of high-speed broadband connections and digital take-up in some regions limit the benefits from digitalisation, including for remote working

The massive shift to remote working following the COVID-19 containment measures introduced in many countries has further increased the need for access to fast and efficient Internet connections and to minimum digital equipment. However, not all places within countries offer sufficient infrastructure for seizing the opportunities offered by digitalisation. Bridging the regional divide in access to fast broadband connections and terminal devices will become increasingly important as households, governments and businesses switch their activities to the digital terrain.

Across OECD regions, people enjoy significantly different access to high-quality Internet. This is particularly true for fibre fixed broadband connections (fibre-to-the-home, FTTH). In advanced economies like Germany and the United States (Figure 2.5, panel A), the gap between the region with the highest and lowest access is of 80 and 68 percentage points respectively. Among 9 countries with available data on fibre access, Colombia stands out for its low levels of coverage, with only 17% of households having access to fibre connections in the capital region and less than 1% of households in the region of Vichada.

Access to high-speed connections (above 30 Mbit/s) is fundamental to seize the opportunities of digitalisation, as the quality of connections matter beyond the access to basic Internet. With the exception of Colombia and Ireland, all 14 countries with available data have at least 1 region with more than 80% of households having access to high-speed connections, often the capital region. Within-country gaps tend to be stark, with a 23-percentage points difference between the most and least connected regions on average. France and Hungary show the largest regional disparities, with a 40-percentage point gap between the regions with the highest and lowest coverage of high-speed Internet (Figure 2.5, panel B). Other countries such as Belgium, Denmark, Spain and the United Kingdom have succeeded in ensuring broad access to a high-speed Internet connection to more than 90% of households across their territories.

A closer look at the access to high-speed broadband reveals a clear urban-rural divide. For example, while 90% of total households in Italy benefit from access to high-speed broadband, only 43% of rural households do so (Figure 2.6). According to the information provided from regulators in 26 OECD countries, 1 in 3 households in rural areas do not have access to high-speed broadband on average. Overall, only 7 out of 26 countries have succeeded in ensuring access to a high-speed connection to more than 80% of households in rural regions.

In order to seize the benefits of digitalisation, access to digital infrastructure needs to be accompanied by the widespread adoption of digital technologies and by minimum digital skills. Almost 11% of people in OECD countries are not using the Internet or do not have access to a computer. Large regional disparities in the take-up of digital technology also exist within countries, where the share of people using the Internet in the regions with the highest use is 10 percentage points higher than in the region with the lowest use, on average (Figure 2.7).

Definition

Following the terminology from the European Commission, the term “fast broadband” is used to refer to fixed broadband connections that allow for download speeds greater than 30Mbit/s. Such speeds are necessary to perform many of the tasks associated with remote working, such as high-quality video calls.

Download speeds are only one dimension of broadband quality and do not capture other aspects of service reliability (outages, packet loss rates, latency, etc.) that may vary across regions. In addition, statistics on Internet speed can differ widely according to the source, especially between user-reported and as-advertised information.

References

European Court of Auditors (2018), “Broadband in the EU member states: Despite progress, not all the Europe 2020 targets will be met”, *Special Report No. 12*, *https://op.europa.eu/webpub/eca/special-reports/broadband-12-2018/en*.

OECD (2019), *Measuring the Digital Transformation: A Roadmap for the Future*, OECD Publishing, Paris, *https://dx.doi.org/10.1787/9789264311992-en*.

Reference years and territorial level

Figure 2.5: TL2, 2020 or last available year: BEL, CAN, COL, DNK, FIN, FRA (Panel B), DEU, NOR, ESP and USA, 2019; ITA and IRL, 2018.

Figure 2.6: 2019 or latest available year: European Union (EU) countries 2018.

Figure 2.7: TL2, 2019 or latest available year: JPN and USA, 2018; AUS and CAN, 2017.

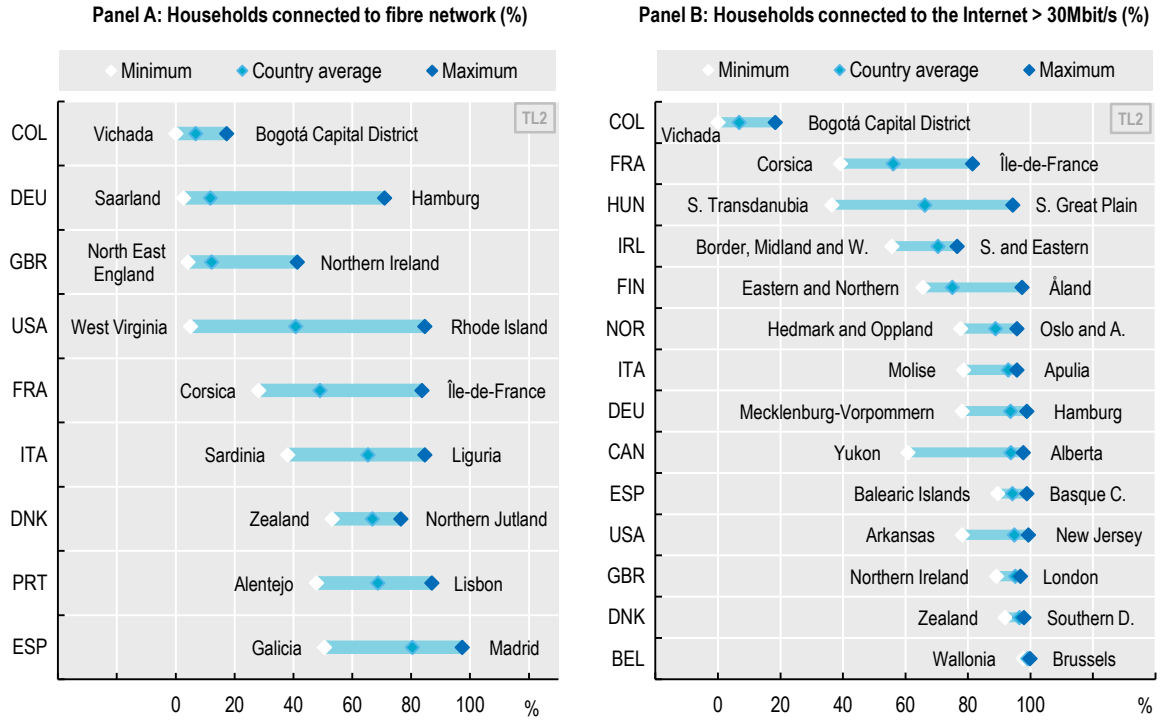
Figure notes

Figure 2.5, panel B: Internet access with a download speed greater than 30Mbit/s (25Mbits/s for CAN and USA).

Figure 2.6: Internet access with a download speed greater than 30Mbit/s (NGA technologies, for the EU). Rural areas are those with a population density lower than 100 inhabitants per km^2 for EU countries, 400 per km^2 for Canada, 1 000 per square mile (or 386 people per km^2) for the United States.

Figure 2.7: Internet use is expressed as the percentage of households that have not used the Internet (EU countries and JPN) or do not have a computer (USA).

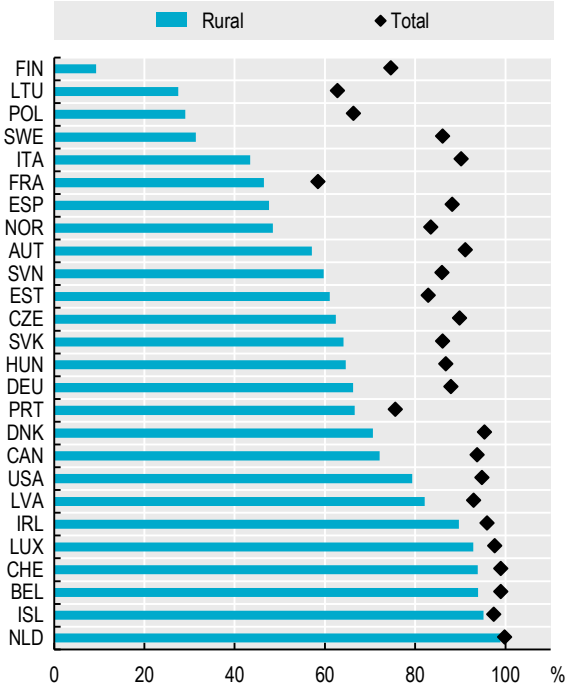
2.5. Regions differ in access to high-quality internet in 2020, large regions (TL2)



StatLink https://doi.org/10.1787/888934189659

2.6. Rural areas lag in access to fast broadband

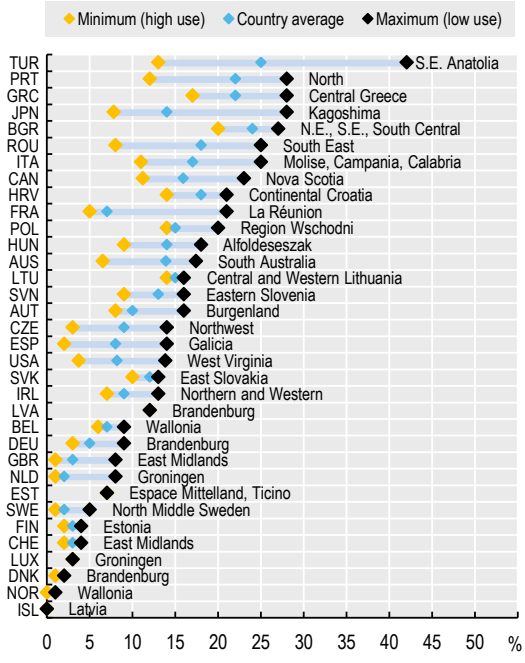
Percentage of households with access to Internet >30Mbit/s in 2019 or latest available year, at the rural and national levels



StatLink https://doi.org/10.1787/888934189678

2.7. Percentage of people not using the Internet

Percentage of people not using the Internet or who do not have a computer in 2019 or the latest available year, large regions (TL2)



StatLink https://doi.org/10.1787/888934189697

Long-term regional economic disparities

Within-country regional economic gaps have increased in half of OECD countries since 2000.

While the exact impact of the COVID-19 pandemic on regional economies remains to be seen, the last two decades offer important insights for the whole OECD area. Regional economic disparities show different trends depending on the geographical level observed. Overall, within-country disparities in GDP per capita tend to be starker when assessed across small regions (TL3), as small regions might capture the differences between cities and low-density areas more precisely. Within-country disparities in GDP per capita across large regions (TL2) have followed a bell-shaped pattern over the last two decades and are at the lowest level since 2000. They reached their peak in 2010, in the aftermath of the global financial crisis, after which they started to decline slowly (Figure 2.8, panel A). Disparities across the whole set of large regions have declined, mainly reflecting a process of convergence in economic development between OECD countries during the years before the global financial crisis. Some champion regions drove the convergence process, which initially raised disparities within their respective countries. However, when looking at economic gaps across small regions (TL3), it emerges that within-country disparities have slightly and almost constantly increased since 2000, reflecting both an increasing concentration of economic activities in cities and the difficulties of small remote regions to keep pace with the national frontier (Figure 2.8, panel B).

The moderate fall and rise of economic disparities across large and small regions respectively, in the OECD area taken as a whole, masks a substantial heterogeneity in how regional economic gaps have changed within countries. Half of OECD countries experienced an increase in the GDP per capita gap between the top and bottom 20% of regions, no matter whether small or large regions are taken into account. That increase has been particularly high in France, Italy, Poland and the United States. Estonia and the United Kingdom experienced a faster increase in economic disparities between small regions compared to that observed between large regions. Measuring GDP gaps between the richest and poorest regions in each country helps to capture the extent of economic polarisation across space. In 2018, the top 20% of large regions in terms of GDP per capita (i.e. the TL2 regions with highest GDP per capita representing 20% of the national population) recorded, on average, twice the level observed in the 20% bottom regions. Colombia, Hungary, Mexico and Turkey show the starkest regional gaps in GDP per capita (Figure 2.9).

Different geographic patterns of economic growth help to explain the observed changes in regional disparities across OECD countries. Most countries where regional economic disparities have increased since 2008 experienced faster economic growth in the richest regions. This pattern is particularly evident in Poland, where the richest 20% of regions grew by 4% per year over the period 2008-18. Greece and Italy are two exceptions characterised by economic stagnation in practically all regions but with poorer regions declining faster than richer regions.

Regional economic growth in OECD countries also differed by regions' location and access to markets and economic activity. Regions near metropolitan areas of at least 250 000 inhabitants have grown faster than other regions in terms of GDP per capita, including faster than metropolitan regions. On the other hand, regions far from metropolitan areas have increased their gap in GDP per capita with both metropolitan regions and regions near metropolitan areas since 2009 (Figure 2.10).Such an increase in disparities reversed the developments between 2000 and 2008 when regions far from metropolitan areas – potentially due to a natural resource boom – were growing faster than metropolitan regions on average.

Definition

The Theil index measures inequality in GDP per capita between all TL2 OECD regions. It breaks down the overall inequality into inequality due to differences within countries and inequality due to discrepancies across countries. See Annex C for further details.

The GDP per capita of the top and bottom 20% regions are defined as those with the highest/lowest GDP per capita until the equivalent of 20% of the national population is reached.

Source

Fadic, M. et al. (2019), "Classifying small (TL3) regions based on metropolitan population, low density and remoteness", *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris, *https://doi.org/10.1787/b902cc00-en*.

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

Reference years and territorial level

Figure 2.9: 2008-18, except last available year for COL, LVA, LTU, NZL and CHE: 2017; JPN: 2016. Panel A: TL2 regions except for EST, LVA and LTU: TL3.

Figure notes

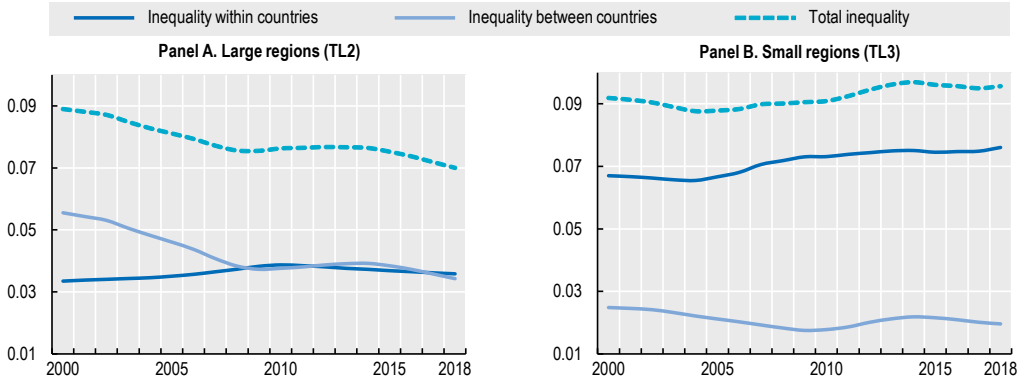
Figure 2.8 to Figure 2.10: Indicators based on GDP per capita values expressed at 2015 constant prices.

Figure 2.8: Theil index 3-year moving averages. 29 countries considered in panel A, 25 countries in panel B.

Figure 2.9: Unweighted average of TL3 regions by type metropolitan/non-metropolitan typology. 1 507 regions across 27 countries are considered.

2.8. Trends in regional economic disparities in OECD countries

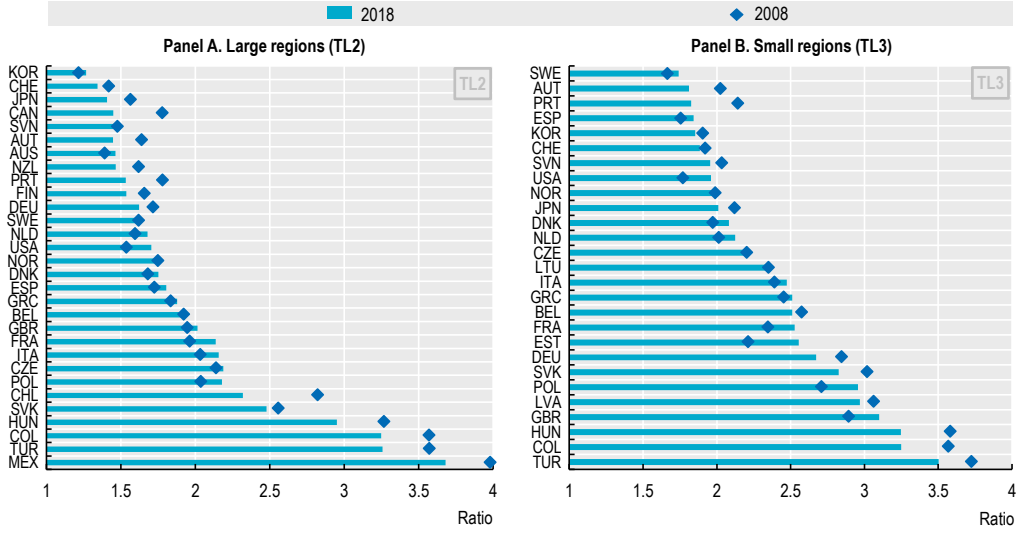
Theil inequality index of GDP per capita, based on large and small regions



StatLink https://doi.org/10.1787/888934189716

2.9. Index of regional disparity in GDP per capita

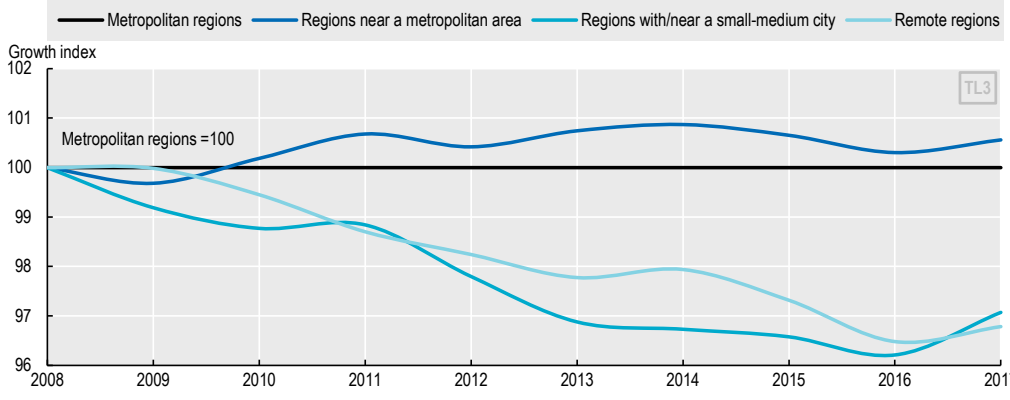
Ratio of the top 20% richest regions over the bottom 20% poorest regions



StatLink https://doi.org/10.1787/888934189735

2.10. GDP per capita growth index in non-metropolitan relative to metropolitan regions

OECD area, index (metropolitan regions=100), based on small regions (TL3)



StatLink https://doi.org/10.1787/888934189754

Productivity trends in regions

Only one-third of countries have experienced an increase in productivity in all regions since 2008.

Labour productivity growth is a crucial driver to enhance living standards. Measured in terms of gross value added (GVA) per worker, labour productivity differs substantially both between and within countries (Figure 2.11). In 21 out of 36 countries, the capital region generates the highest regional labour productivity. Overall, labour productivity tends to be higher in regions with a large service sector and in regions that benefit from access to natural resources (e.g. Antofagasta in Chile, Campeche in Mexico or Nunavut in Canada).

Overall, labour productivity in the most productive region is 1.8 times the productivity of the least productive region. In two-thirds of the countries, the most productive region is twice as productive as the least productive ones. Even in countries with high general labour productivity such as France or Germany, some regions clearly lag (Figure 2.11). Similarly, several countries with productivity levels below the OECD average have highly productive regions. For example, in Chile, the Czech Republic, Mexico, Poland, the Slovak Republic or Turkey, where average regional productivity is relatively low, the leading regions report higher labour productivity than the OECD average.

In a majority of OECD countries, the gap between the most and the least productive regions narrowed between 2008 and 2018. Such convergence, measured by changes in the ratio of labour productivity in the top 20% and the bottom 20% regions in the country, occurred in 15 out of 33 countries. However, in 8 countries, a fall in productivity of the most productive regions actually drove the regional convergence. This happened in Austria, Canada, Chile, Finland, Greece, Hungary, Mexico and Portugal. Only one-third of countries have experienced an increase in productivity in all regions since 2008. On the other hand, Greece was the only country where all regions declined in productivity during the same period. Overall, Chile and Mexico recorded the largest regional disparities in terms of productivity growth, with a difference of more than 10 percentage points between the highest and the lowest regional productivity growth. For these countries, as well for some other countries, the lowest growth occurred in the regions where the economy strongly relies on the extraction of natural resources (Atacama in Chile, Campeche in Mexico, Groningen in the Netherlands, Northwest Territories in Canada, Taranaki in New Zealand, Wyoming in the United States).

Differences in labour productivity persist across different types of regions in terms of population size and density but they have recently fallen. Predominantly rural regions still lag behind predominantly urban regions but they have slightly reduced the productivity gap (Figure 2.12) by 1.2 percentage point since 2008. Rural regions close to cities have successfully narrowed the difference in their labour productivity levels compared to urban regions, especially since 2010, and now their labour productivity levels are equivalent to 82% of urban regions' productivity. Contrary to this trend, remote rural regions, i.e. those that are far away from a city, were not able to reduce the productivity gap between 2000 and 2018 (Figure 2.12).

Overall, somewhat above 60% of the employed people live in regions with productivity levels below the national average (Figure 2.13). This share is slightly larger in 2018 than in 2008, following an increase of about one percentage point. Regions with productivity below the national average are spread evenly across types of regions. However, regions far from a metropolitan area often fall in this group in European countries, such as Estonia, Finland, France, Greece, Latvia, Lithuania and the Slovak Republic. On the other hand, various metropolitan regions in Denmark, Germany, Japan, Korea, Spain, the United Kingdom, and the United States also fall below the national average productivity (Figure 2.13).

Source

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

Fadic, M. et al. (2019), "Classifying small (TL3) regions based on metropolitan population, low density and remoteness", *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris, *https://doi.org/10.1787/b902cc00-en*.

Reference years and territorial level

Figure 2.11 and Figure 2.12: TL2 regions except for EST, LVA and LTU: TL3. 2018 or latest available year, AUS, CAN, COL, LVA, LTU and NOR: 2017; JPN, NZL, CHE: 2016; TUR: 2015.

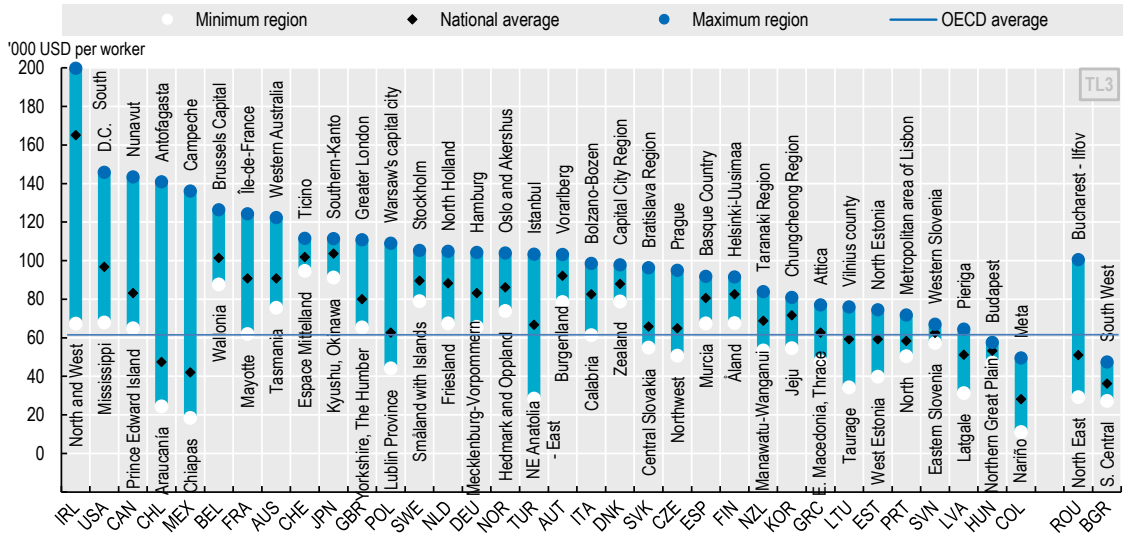
Figure 2.12: Two-year averages. FRA and POL are excluded due to lack of data over the period.

Figure notes

Figure 2.12 and Figure 2.13: Labour productivity based on GVA per worker at place of work expressed in 2015 constant prices, using OECD deflators and converted into constant USD purchasing power parities (PPPs), 2015 reference year. NOR: national average excludes GVA produced on the continental shelf.

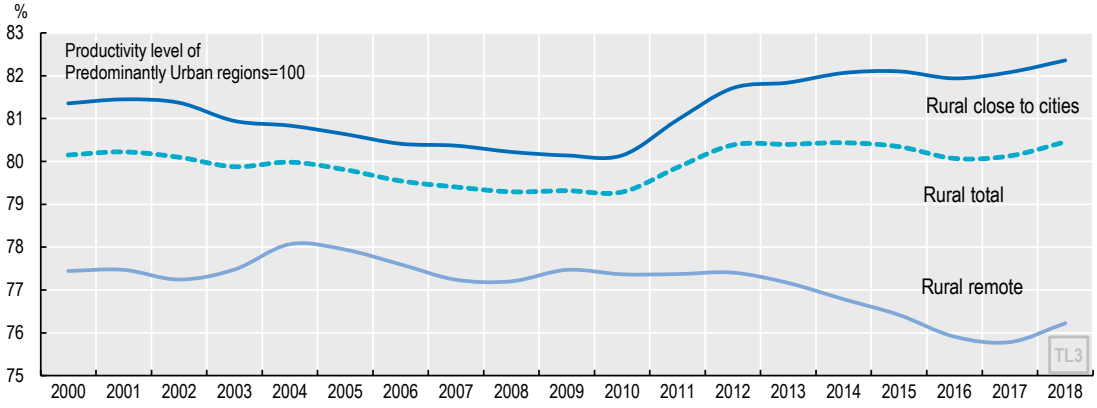
2.11. Labour productivity regional disparities, large regions (TL2), 2018

GVA per person employed



StatLink https://doi.org/10.1787/888934189773

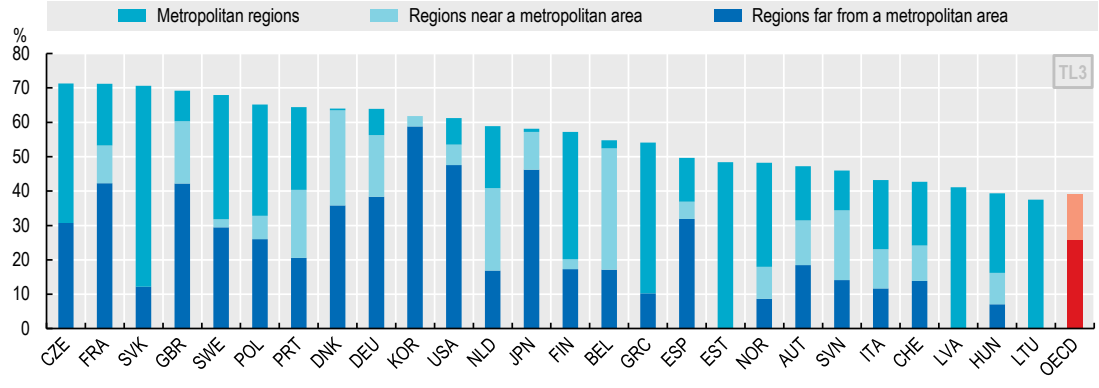
2.12. Labour productivity growth in rural regions (TL3), 2000-18



StatLink https://doi.org/10.1787/888934189792

2.13. Share of employment in regions with productivity levels below the national average, 2018

Share by type of small regions (TL3)



StatLink https://doi.org/10.1787/888934189811

International trade integration in regions

The regions most open to trade face higher costs as international trade is scaling back but they also have the potential to recover faster.

While openness to trade has been determinant of regional economic success in recent decades, the global pandemic has also highlighted the vulnerability that can arise from a reliance on international trade. As of 2018, the extent to which regions operate in international markets through buying and selling products and services varies substantially within OECD countries. "First-nature" geographical conditions, such as being a natural port or being located in proximity to country borders, can drive observed differences in the degree of international trade integration. One way to assess regional trade integration is to measure trade openness by looking at the share of exports plus imports over total regional GDP. In the regions most integrated into international trade, the value of import and export easily surpasses the regional GDP. This happens especially in European regions close to national borders, such as Ticino (Switzerland) or Western Slovenia, or regions with major ports and trade facilities, such as Hamburg (Germany), Kaliningrad (Russia), Peloponnese (Greece) and Riga (Latvia) (Figure 2.14). Large shares of employment in manufacturing or other tradeable sectors are associated with relatively higher trade openness within countries, as in the case of Veneto (Italy) or Wales (United Kingdom).

In general, trade openness has increased in OECD regions during the last decade. Between 2010 and 2018, the share of imports plus exports over GDP increased from 60% to 69%, for 17 countries with available data. The largest difference in changes to regional openness to trade occurred in Switzerland where imports and exports (relative to GDP) grew by more than 1.5% per year in the region Northwest while national trade openness declined (Figure 2.15). In contrast, in China, the United Kingdom and the United States, openness to trade declined more strongly in the most open region than for the respective national economy.

International trade integration exposes regions to larger markets and higher competition but also to external shocks, such as that caused by the recent COVID-19 crisis. Regions relatively more integrated into international trade are expected to face higher economic costs by the scaling back of international trade induced by the COVID-19 containment measures put in place by many countries (OECD, 2020a). However, those regions have also the potential to recover faster. By classifying regions based on their productivity profile since 2008, a clear positive correlation exists between regions' openness to trade and the regional productivity growth patterns in 20 countries with available data (Figure 2.16). Within countries, regions with the highest productivity – i.e. frontier regions – have on average the highest openness to trade, almost reaching 60% of regional GDP. Next to frontier regions, regions that have experienced catching up towards the frontier regions since 2008, report the second highest degree of trade openness, with import and export amounting to an average of around 40% of regional GDP. On the other hand, regions that have recorded further increases in their productivity gap with the national frontier have the lowest openness to trade (30% of GDP).

Definition

The trade openness ratio is the sum of exports and imports divided by GDP. This indicator measures a country or region's "openness" or "integration" in the world economy. The term openness to international competition may be somewhat misleading. In fact, a low ratio may be due to size and geographic remoteness from potential trading partners. For example, it is generally the case that exports and imports play a smaller role in large economies than they do in small economies.

The frontier is the region leading its country in terms of labour productivity, measured by the real GDP per employee. Catching-up/diverging/keeping pace regions is a classification of regions based on their labour productivity growth relative to the frontier between 2008 and 2018.

Source

OECD (2020a), "From pandemic to recovery: Local employment and economic development", *OECD Policy Responses to Coronavirus (COVID-19)*, OECD, Paris, *http://www.oecd.org/coronavirus/policy-responses/from-pandemic-to-recovery-local-employment-and-economic-development-879d2913/*.

OECD (2020b), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

OECD (2018), *Productivity and Jobs in a Globalised World: (How) Can All Regions Benefit?*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264293137-en*.

Territorial level

Large regions (TL2). EST, LVA and LTU: small regions (TL3).

Figure notes

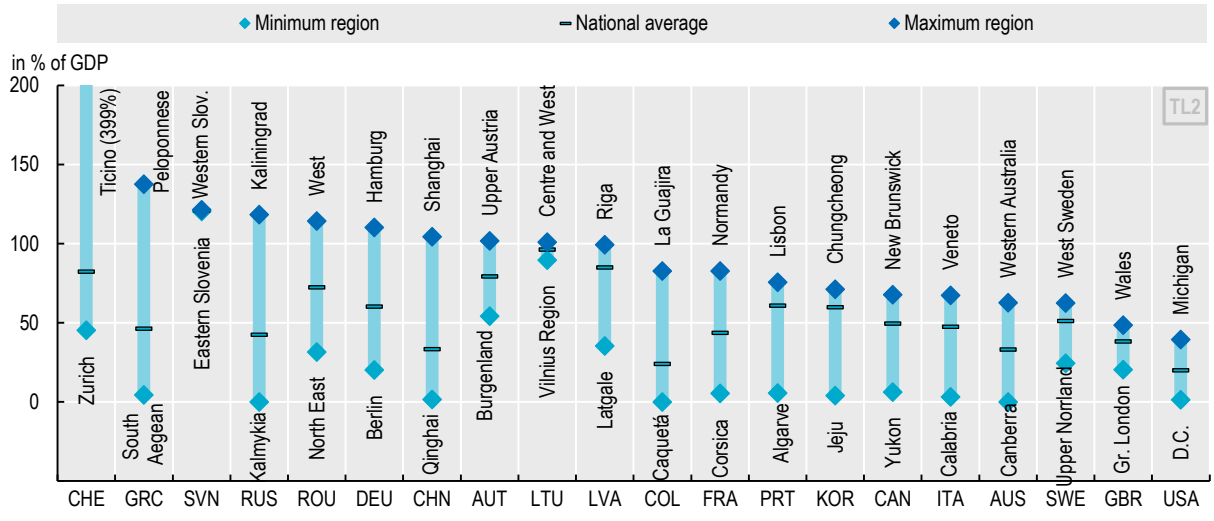
Imports and exports as a share of GDP expressed in 2015 constant prices, using OECD deflators and converted into constant USD purchasing power parities (PPPs), 2015 reference year.

Figure 2.15: Period 2010-18, or first available year: CHN, CHE, 2012; FRA, 2013. Last year available: CAN, COL, FRA, ITA, RUS, CHE, 2017; DEU, 2016; ROU, 2015.

Figure 2.16: Includes AUS, AUT, BEL, CAN, COL, FRA, DEU, GRC, ITA, KOR, LVA, LTU, CHN, PRT, ROU, SVN, SWE, CHE, GBR and USA. Number of regions by productivity profile: Frontier (32), Catching-up (86), Keeping pace (72), Diverging (69).

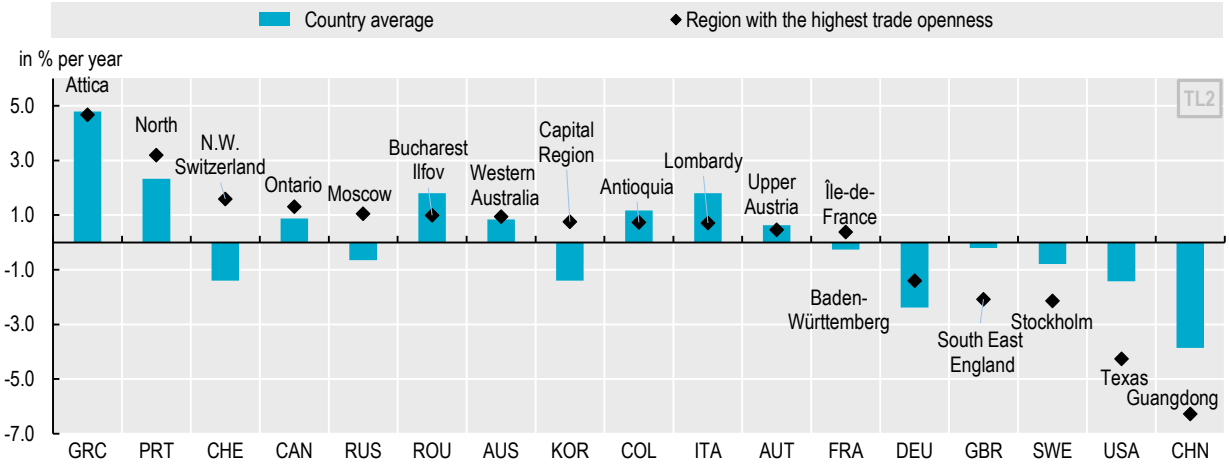
2.14. Regional trade openness, TL2 regions, 2018

International imports plus exports in percentage of GDP



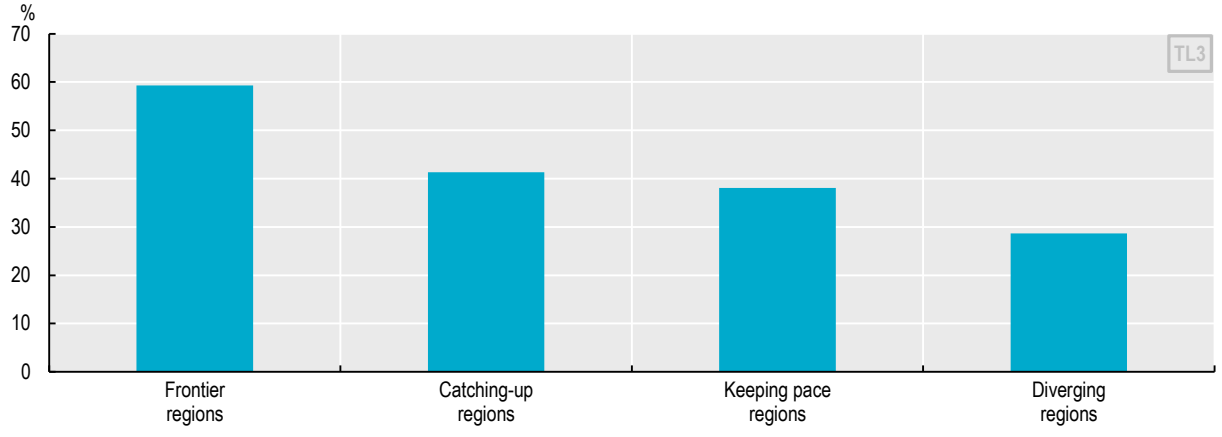
StatLink https://doi.org/10.1787/888934189830

2.15. Change in trade openness, 2010-18



StatLink https://doi.org/10.1787/888934189849

2.16. Trade openness by productivity profile of regions (TL2), 2018



StatLink https://doi.org/10.1787/888934189868

The contribution of metropolitan areas to national economies

Within countries, GDP per capita in the richest metropolitan areas is more than one-third higher than in other metropolitan areas.

While the COVID-19 crisis and the massive shift to remote working might reduce the benefits of density in the short term, assessing whether metropolitan areas will lose some of their capacity to attract population and highly-skilled workers will require time. Metropolitan areas – defined as functional urban areas (FUAs) composed of cities and their commuting zones – are able to generate a productivity premium from the proximity among firms and individuals, and long-term trends suggest that in OECD countries they have consistently shown higher levels of GDP per capita than other areas.

Metropolitan areas with at least half a million inhabitants accounted for 45% of the total OECD population and generated 52% of GDP in 2018 (Figure 2.17). Across OECD countries, there are significant differences in terms of the economic importance of metropolitan areas for the national economy. For instance, while metropolitan areas over half a million inhabitants represent more than 70% of the national GDP in Korea, Luxembourg and the United States, their share of the national economy falls below 30% in Lithuania, Norway and the Slovak Republic. Overall, the population tends to be less concentrated than GDP, with the exception of Chile and Korea, where the existence of natural-resource-based regional economies appears to play a role.

Stark differences in GDP per capita levels exist also across metropolitan areas of the same country, with the most developed metropolitan areas above half a million inhabitants having 36% higher GDP per capita than in other metropolitan areas of the same size and 80% higher than in the rest of the country, on average (Figure 2.18). The largest differences across metropolitan areas above half a million inhabitants are observed in Korea, the United Kingdom and the United States, where the gap exceeded 70%, twice the OECD average. Capital metropolitan areas (i.e. metropolitan areas that include the capital of the country) are the richest metropolitan areas in 18 out of the 30 OECD countries.

The economy of metropolitan areas has grown faster than in the rest of the country since the turn of the new millennium. According to OECD estimations, all metropolitan areas above half a million inhabitants, with the exception of those in Greece, experienced GDP growth between 2001 and 2018 (Figure 2.19). In most countries, metropolitan areas above half a million inhabitants experienced faster growth compared to the rest of the country, with the greatest differences observed in Lithuania and Poland, where the gap exceeded 1.5 percentage point between 2001 and 2018. Contrary to this trend, GDP grew slower in metropolitan areas than the rest of the country in Austria, Germany and Portugal.

During the period of 2001-18, GDP per capita in metropolitan areas over half a million inhabitants grew at different paces within countries, with some metropolitan areas even showing negative growth rates (Figure 2.20-Figure 2.21). The growth gap between the fastest and slowest growing metropolitan areas was largest in Australia, France, Poland and the United States. In the United States, fast-growing metropolitan areas, such as Utah, whose GDP grew by 5% in 2001-18, coexisted with shrinking metropolitan areas, such as Lehigh, Pennsylvania, whose GDP per capita declined by 0.3% per year during the same period. The smallest gap is observed in Chile, Denmark, Greece and Portugal, where the difference in the annual growth rate was less than 0.5 percentage points.

Definition

In 33 OECD countries, 351 metropolitan areas over half a million inhabitants were identified, according to the EU-OECD method that delineates FUAs by considering densely populated cities together with their commuting zones to reflect the economic geography of the population's daily commuting patterns (see Dijkstra, Poelman and Veneri, 2019, or Annex A for details).

GDP per capita in metropolitan areas above 500 000 inhabitants is modelled from available GDP data at smaller geographies, which are aggregated or adapted to the boundaries of metropolitan areas proportionally to its population, using a population grid. More details are available in Annex C.

Source

OECD (2020), "Metropolitan areas", *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/data-00531-en*.

Further information

Dijkstra, L., H. Poelman and P. Veneri (2019), "The EU-OECD definition of a functional urban area", *OECD Regional Development Working Papers*, No. 2019/11, OECD P ublishing, Paris, *https://doi.org/10.1787/d58cb34d-en*.

Figure notes

Figure 2.17 to Figure 2.21: Population weighted averages data. 2001-18 period, or 2009-16 (CAN); 2008-17 (CHE); 2008-18 (CHL); 2001-16 (JPN). GDP in constant prices, constant PPPs, OECD reference year.

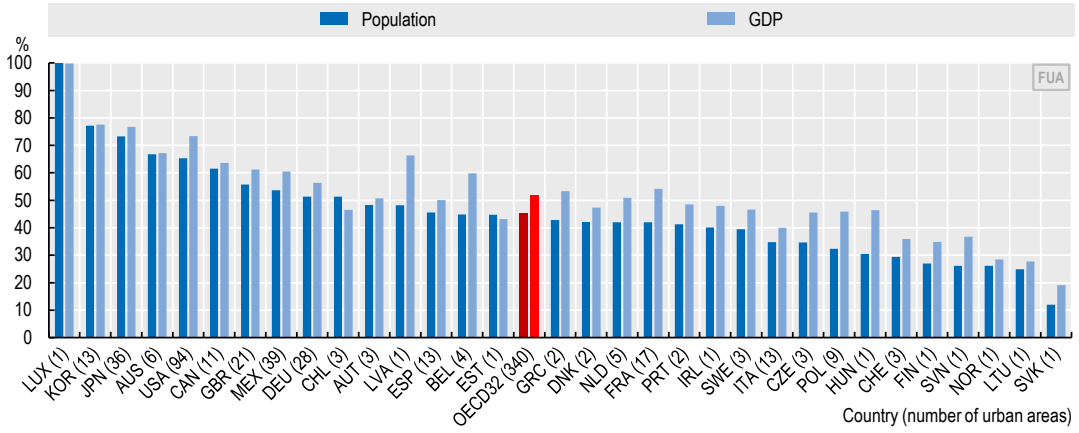
Figure 2.17: Countries ranked by decreasing share of the metropolitan population in the national economy.

Figure 2.18: Countries ranked in descending order of GDP per capita difference between the highest metropolitan and the rest of the economy.

Figure 2.19: Countries ranked according to the difference between growth rate in metropolitan areas and the growth rate in non-metropolitan areas, from the largest difference to the smallest.

2.17. Share of population and GDP in OECD metropolitan areas, 2018

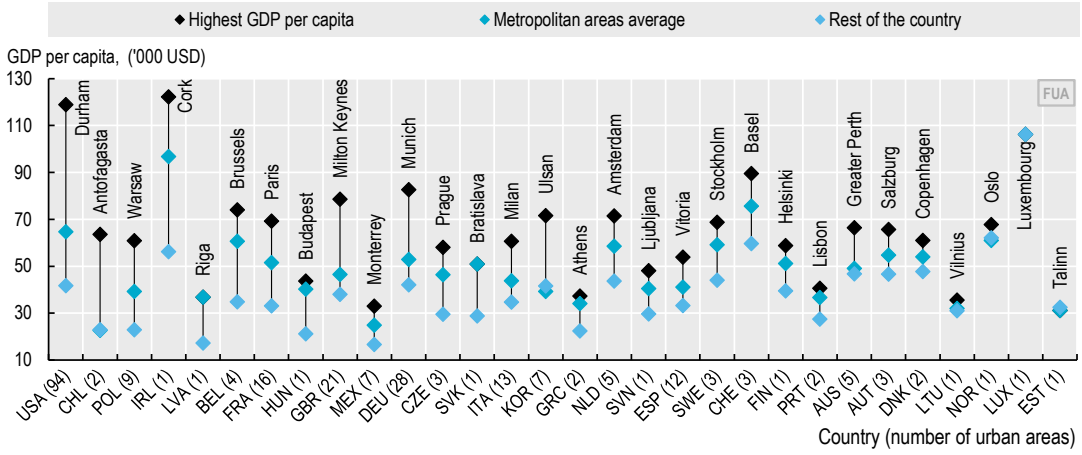
FUAs over 500 000 inhabitants



StatLink https://doi.org/10.1787/888934189887

2.18. GDP per capita levels in metropolitan areas, 2018

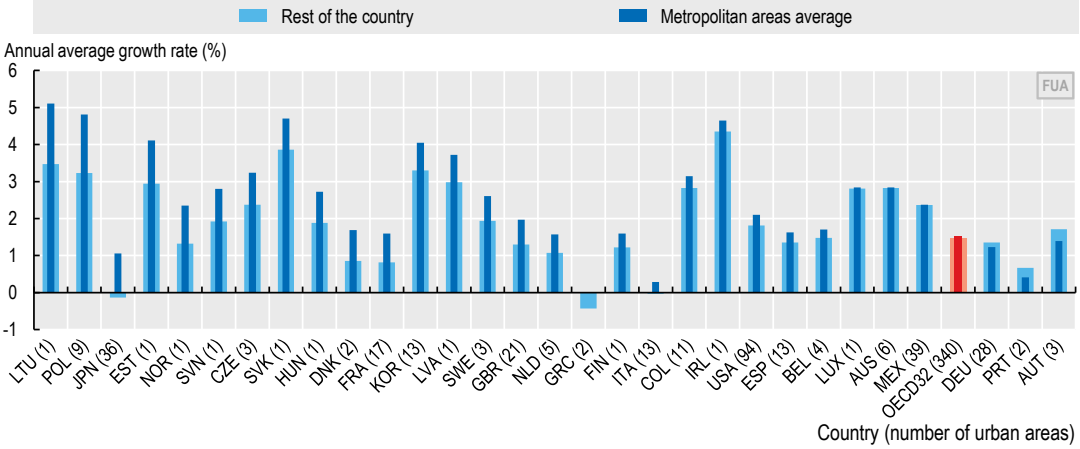
FUAs over 500 000 inhabitants



StatLink https://doi.org/10.1787/888934189906

2.19. GDP growth in metropolitan areas, 2001-18

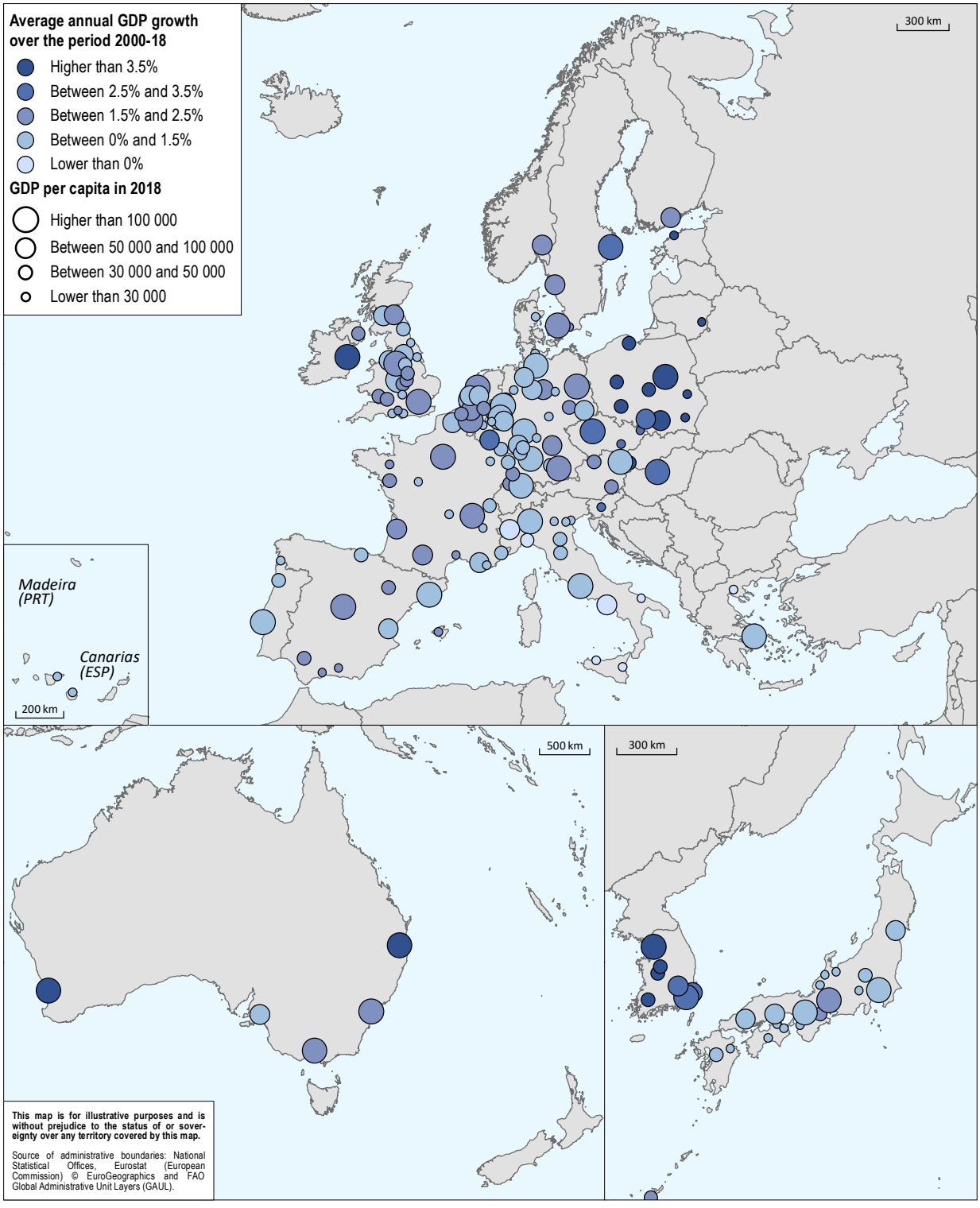
GDP growth rate in FUAs above 500 000 inhabitants



StatLink https://doi.org/10.1787/888934189925

2.20. Metropolitan GDP growth: Asia, Europe and Oceania, 2001-18

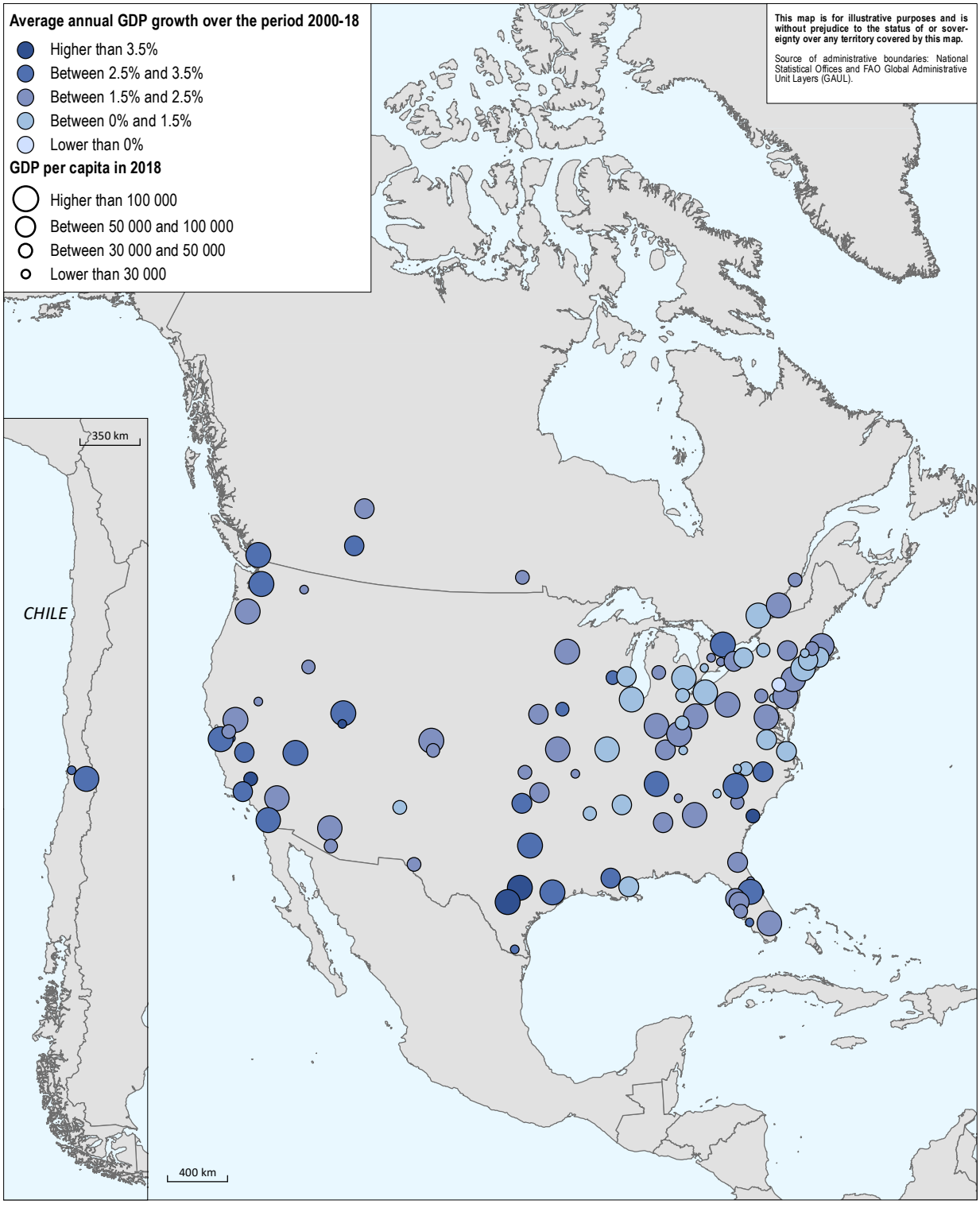
Average annual growth rate, FUAs over 500 000 inhabitants



StatLink https://doi.org/10.1787/888934189944

2.21. Metropolitan GDP growth: Canada and the United States, 2001-18

Average annual growth rate, FUAs over 500 000 inhabitants



StatLink https://doi.org/10.1787/888934189963

Entrepreneurship, firm and employment creation in regions

The number of new firms per capita in capital regions is 1.5 times higher than in the rest of their respective countries.

The measures taken to contain the COVID-19 pandemic have been generating widespread disruptions to the activities of many firms. Although firms of all sizes were affected, small and medium-sized enterprises (SMEs) were hit hardest due to their limited financing capacity compared to larger ones forcing them to run out of business or lay-off workers (OECD, 2020). In the post-COVID period, the creation of new firms will play an essential role in the recovery of economic activity and employment in regions. This section assesses the extent to which regions are able to enhance the creation of new firms generating employment.

Capital regions are often centres of economic activity and innovation in their respective countries, in particular when it comes to the presence and creation of firms. In 2017, capital regions accounted for 6% of the national population but they hosted 10% of all firms in their respective countries. The importance of capital regions is also visible in terms of new enterprises. The number of new firms per capita in capital regions is 1.5 times higher than in the rest of their respective countries on average (Figure 2.22). In this respect, the largest differences are observed in the Czech Republic and the Slovak Republic, where capital regions have twice as many new firms as the rest of the country.

The regional business environment in the OECD area is characterised by a considerable churning of firms, as new firms replace old ones every year. In 2017, 17% of firms with at least 1 employee in OECD regions consisted of newly created firms. However, the distribution of these new firms across regions can be highly uneven and differ from that of the population. In 2017, 57% of all newly created firms were located in predominantly urban regions although these regions were home to only 33.7% of the national population. The firm birth rate in predominantly urban regions was 2.1 percentage points (or 18%) higher than in other types of regions within the same country in 2017 (Figure 2.23). In some countries, such as Austria, France and the United Kingdom, that gap was larger than 30%, revealing a stark difference across places in terms of business dynamism.

New firms matter for regional economies in multiple important ways. They create new jobs, foster innovation and generate demand for other existing firms, with a direct contribution to the regional employment and economic dynamism. In 2017, new firms (i.e. those firms created in the previous 12-month period) directly employed an average of 3% of all employees in OECD regions. Notwithstanding a similar size of new firms across regions (2.5 employees in predominantly urban regions compared to 2.3 in other types of region), their weight on regional employment tends to differ depending on the country (Figure 2.24). Overall, across 17 OECD countries with available data, employment created by new firms accounted for 2.6%, 3.3% and 3.2% of the total employment in predominantly urban, intermediate and rural regions respectively.

Definition

Firm birth: Creation of a combination of production factors with the restriction that no other enterprise is involved in the event. Excludes entries in the business population due to reactivations, mergers, breakups, split-offs and restructuring. The firm birth rate is the ratio of new firms to active firms.

Firm death: Dissolution of a combination of production factors with the restriction that no other enterprises are involved in the event. Excludes exits from the population due to mergers, take-overs, breakups and restructuring of a set of enterprises.

Employment creation rate: The ratio of employees in new firms versus employees in all firms.

Employer enterprise: An enterprise having a positive number of employees in any part of the year.

Non-employer enterprise: An enterprise having no employees in any part of the year. The enterprise can have a positive number of persons employed (working proprietors, partners working regularly).

Source

OECD (2020), "Coronavirus (COVID-19): SME policy responses", *OECD Policy Responses to Coronavirus (COVID-19)*, OECD, Paris, *http://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-sme-policy-responses-04440101/*.

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

Further information

Territorial grids and regional typology (Annex A).

Figure notes

Figure 2.22 to Figure 2.23: Total economy: industry, construction and services excluding insurance activities of holding companies (ISIC Rev. 4 sectors B to S exc. K642).

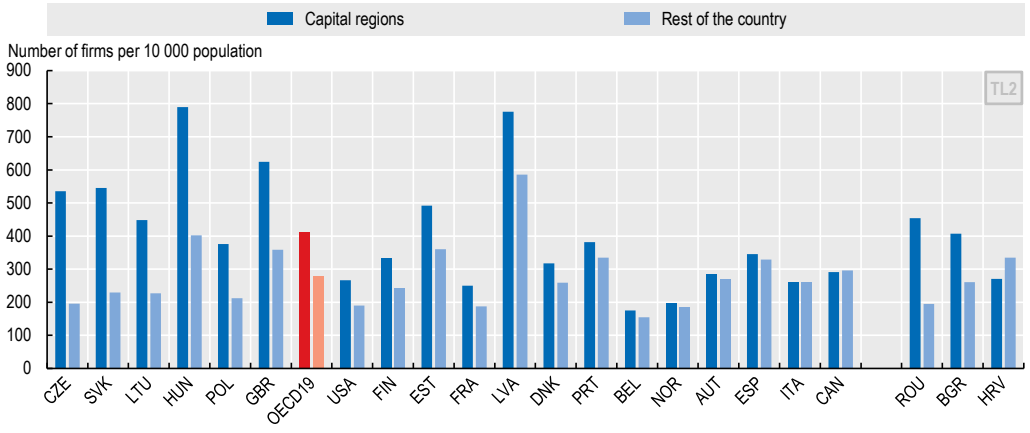
Figure 2.22: 2017 or latest available year: CAN, FIN, LVA, NOR and GBR, 2016; IRL and USA, 2014; DNK, 2013. Countries ranked according to decreasing difference between firms count in capital regions (TL2) and the rest of the country.

Figure 2.23: 2017 or latest available year: AUT, BGR, HRV, CZE, HUN, POL, PRT, ROU, SVK and GBR, 2016; LVA, 2015; DNK, 2013. Countries ranked in descending order of the firm creation rate in predominantly urban regions.

Figure 2.24: 2017 or latest available year: LVA and NOR, 2016; DNK, 2013. Countries ranked in descending order of the employment share in new firms in predominantly rural regions.

2.22. Number of firms in capital regions vs rest of the country, 2017

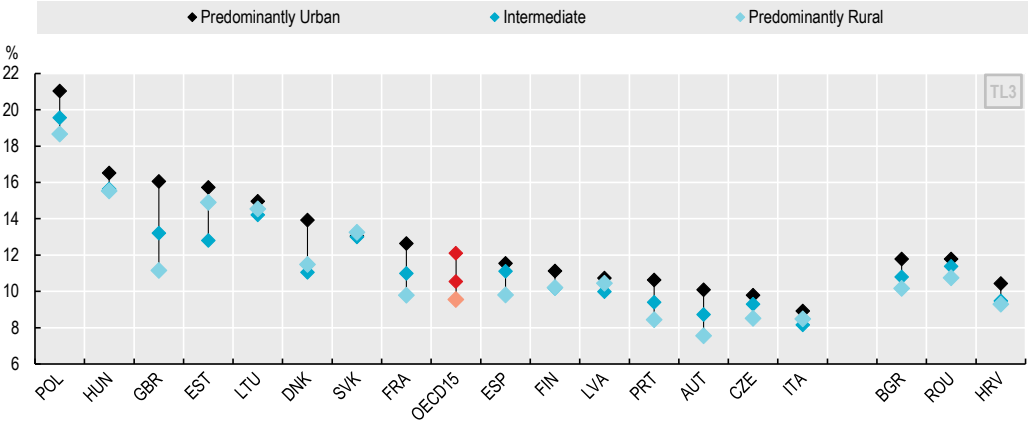
Number of firms of all sizes per 10 000 population, large regions (TL2)



StatLink https://doi.org/10.1787/888934189982

2.23. Firm birth rates by country and type of region, 2017 or latest year available

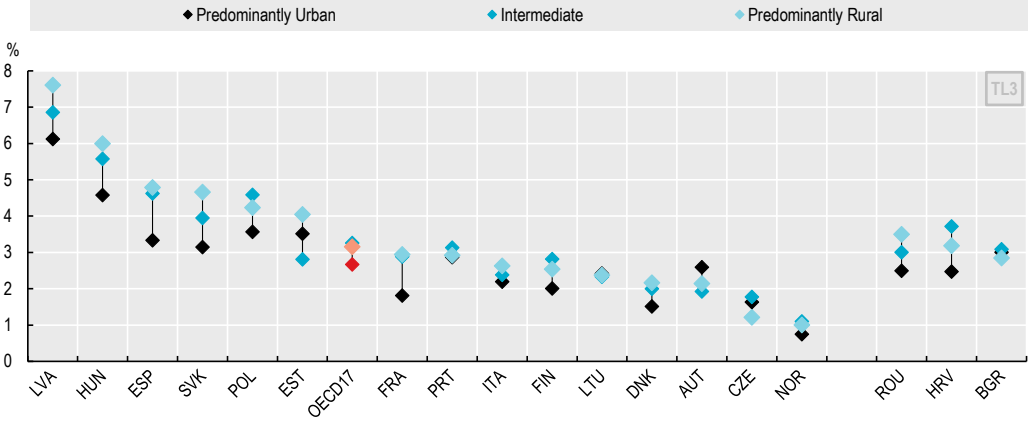
Newly created employer firms relative to the total number of employer firms, small regions (TL3)



StatLink https://doi.org/10.1787/888934190001

2.24. Employment creation of new firms by type of region, 2017 or latest year available

Number of employees in new firms as a share of total firm employees, small regions (TL3)



StatLink https://doi.org/10.1787/888934190020





3. ENVIRONMENTAL RESILIENCE AND SUSTAINABLE DEVELOPMENT

Protecting biodiversity and natural ecosystems in regions and cities (SDGs 14-15)

The role of regions and cities towards a climate-neutral economy (SDG 13)

Transitioning to clean electricity production in every region (SDG 7)

Fostering responsible consumption and circular economies in regions (SDG 12)

Efficient land use and public transport systems for sustainable cities (SDG 11)

This chapter assesses how regions and cities are contributing to the transition to a climate-neutral economy and sustainable development. The region- and city-level indicators presented in the chapter cover a wide range of topics including trends in land consumption and tree cover loss, biodiversity and ecosystem protection, household energy consumption, as well as the sources of electricity production and related carbon emissions.

Protecting biodiversity and natural ecosystems in regions and cities (SDGs 14-15)

Large metropolitan areas are experiencing higher tree cover loss than other areas, particularly in Australia and North America.

Deforestation, tree cover loss and habitat degradation are among the main drivers of wildlife displacement, which puts many species in closer contact with human settlements. Such closer contact can increase the risk of emerging infectious diseases, such as SARS, Ebola and COVID-19 (Brainard, 2020; OECD, 2020a). Protecting biodiversity and natural ecosystems from unsustainable human activity makes places less vulnerable to environmental and health risks. Yet, 15 out of 46 OECD and partner countries have not achieved the Aichi Biodiversity Target (integrated into the United Nations [UN] Sustainable Development Goals) of protecting at least 17% of their terrestrial areas by 2020 (Convention on Biological Diversity, 2011).

In 46 OECD and partner countries, regions protect 19% of their terrestrial area, on average, although there are large differences across regions. The share of protected areas (over the total regional area) in the most protected region is, on average, 30-percentage points higher than in the least protected region. In Brazil, Chile, France, Mexico, New Zealand, Peru and the United States, that gap exceeds 40 percentage points, with some regions having less than 10% of their area under protection. Expanding protection in regions with very low shares of protected areas could provide a significant contribution to reach the Aichi Biodiversity Target. For example, the percentage of protected terrestrial areas in Bolívar (Colombia), Guerrero (Mexico), Kansas (United States), Kursk (Russian Federation), La Pampa (Argentina), Manouba (Tunisia) and Western Black Sea-West (Turkey) falls below 1.5% (Figure 3.1).

Large within-country differences exist also in the protection of coastal areas. In the OECD, the most protected coastal regions assign 40% of their coastal areas a conservation status, compared to an average of 8% in the least protected ones. Preserving marine and coastal ecosystems helps halt overfishing, marine pollution and dead zones (i.e. areas where aquatic life cannot survive). Nonetheless, regions such as Auckland (New Zealand), Bolívar (Colombia), Guerrero (Mexico), New Hampshire (United States), O'Higgins (Chile) and Prince Edward Island (Canada) protect less than 6% of their coastal areas. These outliers with particularly low levels of coastal conservation have led to large regional disparities in coastal protection in their countries, where the average gap between the most and least coastal-protected region exceeds 44 percentage points (Figure 3.2).

Containing deforestation and tree cover loss contributes to preserving natural ecosystems. Tree cover also reduces surface temperature peaks in heatwaves substantially. Tree cover area has declined in more than half of OECD cities (637 out of 1 193 functional urban areas [FUAs] with at least 50 000 inhabitants) between 1992 and 2018, with an average reduction of 3 percentage points. However, this trend is not homogenous across cities. While only half of cities in FUAs with less than 1 million people have seen a decline in tree cover between 1992 and 2018, 72% of cities in FUAs with 1 million people or more have suffered from tree loss. In Australia and North America, cities in large metropolitan areas (of more than 1 million people) and with fast population growth (1.5% per year on average) have experienced very pronounced deforestation over the last 2 decades, with a decline of 9 percentage points or more in their surface covered by trees (Figure 3.3-Figure 3.4).

Definition

Protected terrestrial areas refer to all protected areas recorded in the World Database on Protected Areas (WDPA) that are located on land (including all categories from the International Union for Conservation of Nature management).

Protected coastal areas refer to protected terrestrial areas located within 50 km from the coast (regions with a coastline only).

Tree cover area corresponds to the land that is covered by woody vegetation consistently with the IPCC definition of forest land.

Sources

Brainard, C. (2020), "To stop pandemics, stop deforestation", *Scientific American*, Vol. 322/6.

Convention on Biological Diversity (2011), *Strategic Plan for Bi odiversity 2011-2020*, *www.cbd.int/decision/cop/?id=12268*.

OECD (2020a), "Making the green recovery work for jobs, income and growth", *Tackling Coronavirus (COVID-19): Contributing to a Global Effort*, *https://read.oecd-ilibrary.org/view/?ref=136_136201-ctwt8p7qs5&title=Making-the-Green-Recovery-Work-for-Jobs-Income-and-Growth_*.

OECD (2020c), "Land resources: Land cover change in countries and regions", *OECD Environment Statistics (database)*, *https://doi.org/10.1787/3bce4397-en*.

See country metadata in Annex B.

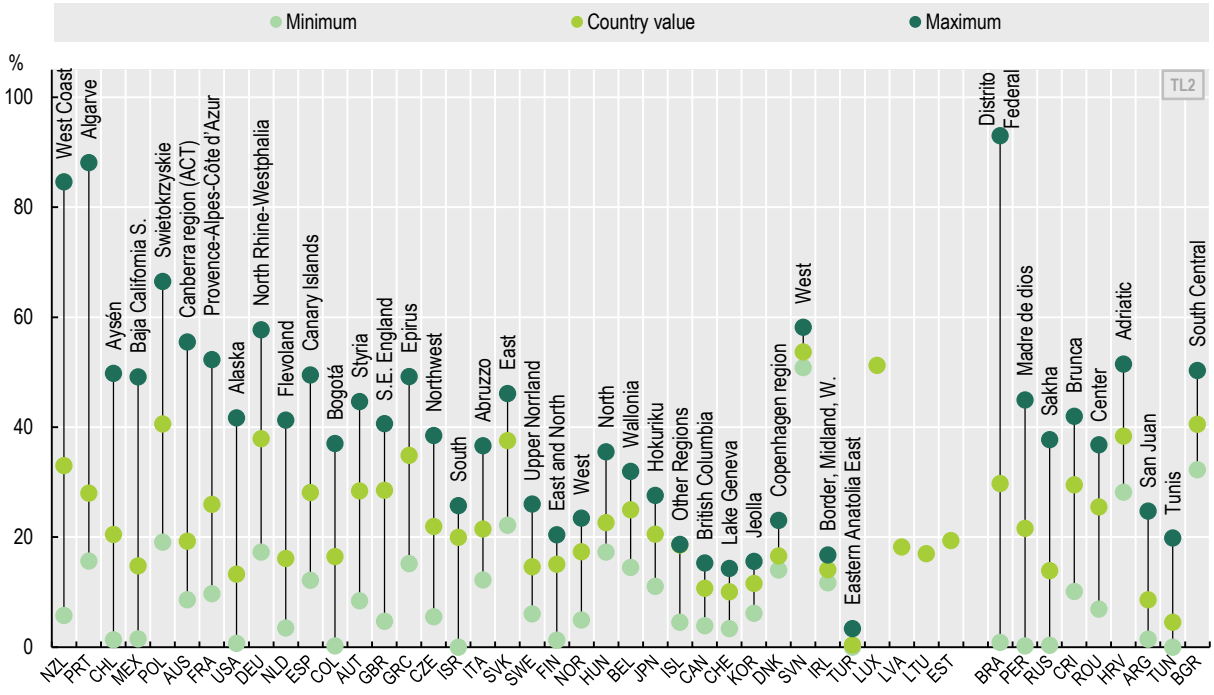
Further information

Haščič, I. and A. Mackie (2018), "Land Cover Change and Conversions: Methodology and Results for OECD and G20 Countries", *OECD Green Growth Papers*, No. 2018/04, OECD Publishing, Paris, *https://doi.org/10.1787/72a9e331-en*.

Mackie, A. et al. (2017), "Indicators on Terrestrial and Marine Protected Areas: Methodology and Results for OECD and G20 countries", *OECD Environment Working Papers*, No. 126, OECD Publishing, Paris, *https://doi.org/10.1787/e0796071-en*.

3.1. Regional disparities in protected terrestrial areas, 2017

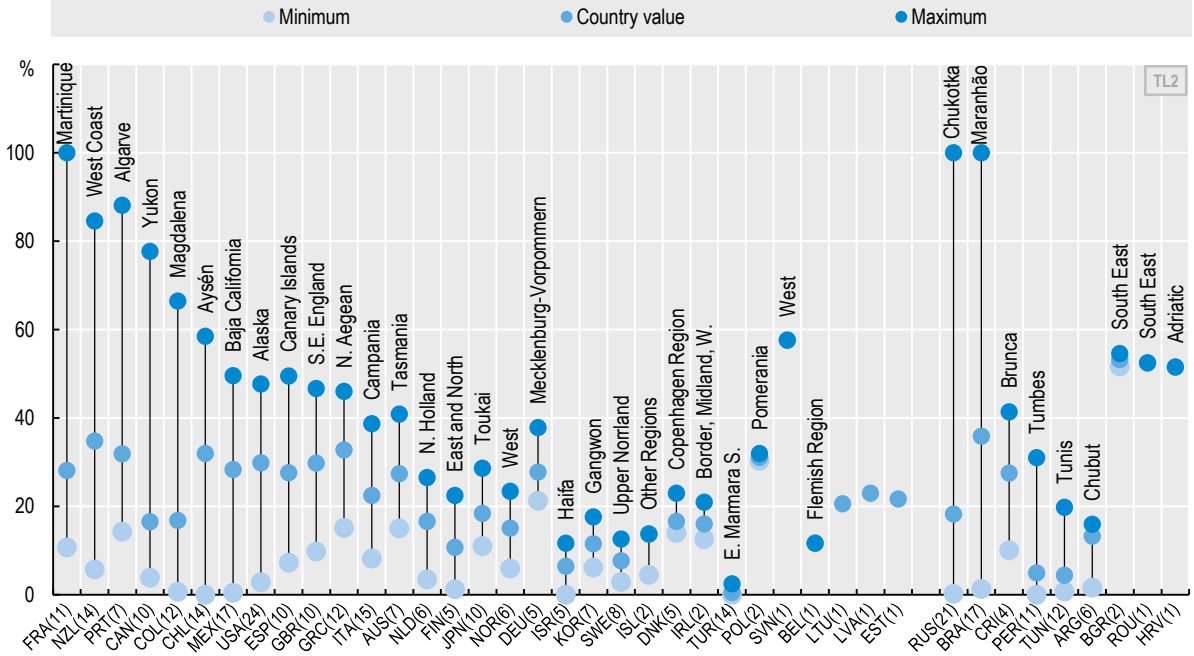
Protected terrestrial areas as a percentage of the total area, large regions (TL2)



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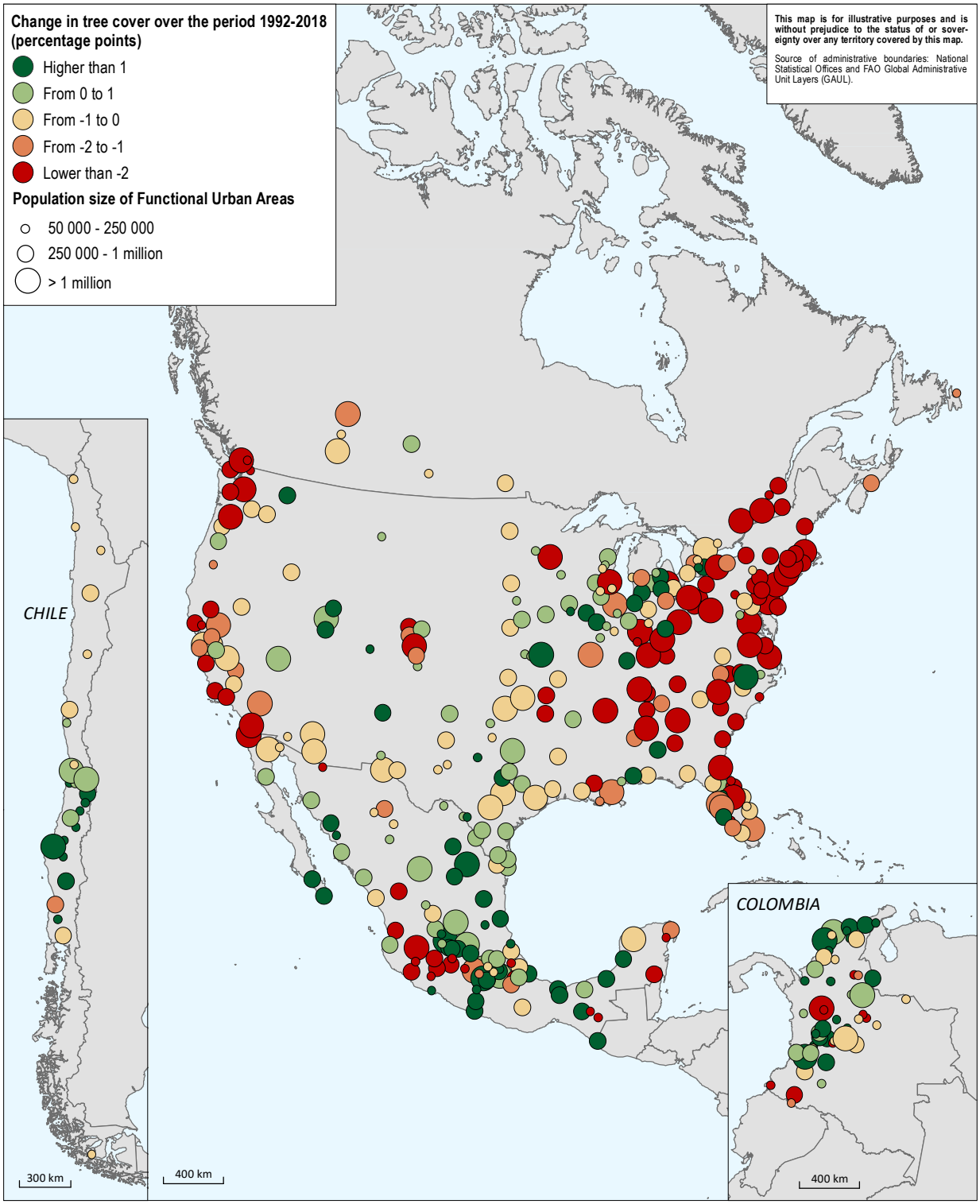
3.2. Regional disparities in protected coastal areas, 2017

Protected coastal areas as a percentage of the total coastal area, large regions (TL2), excluding regions without a coastline



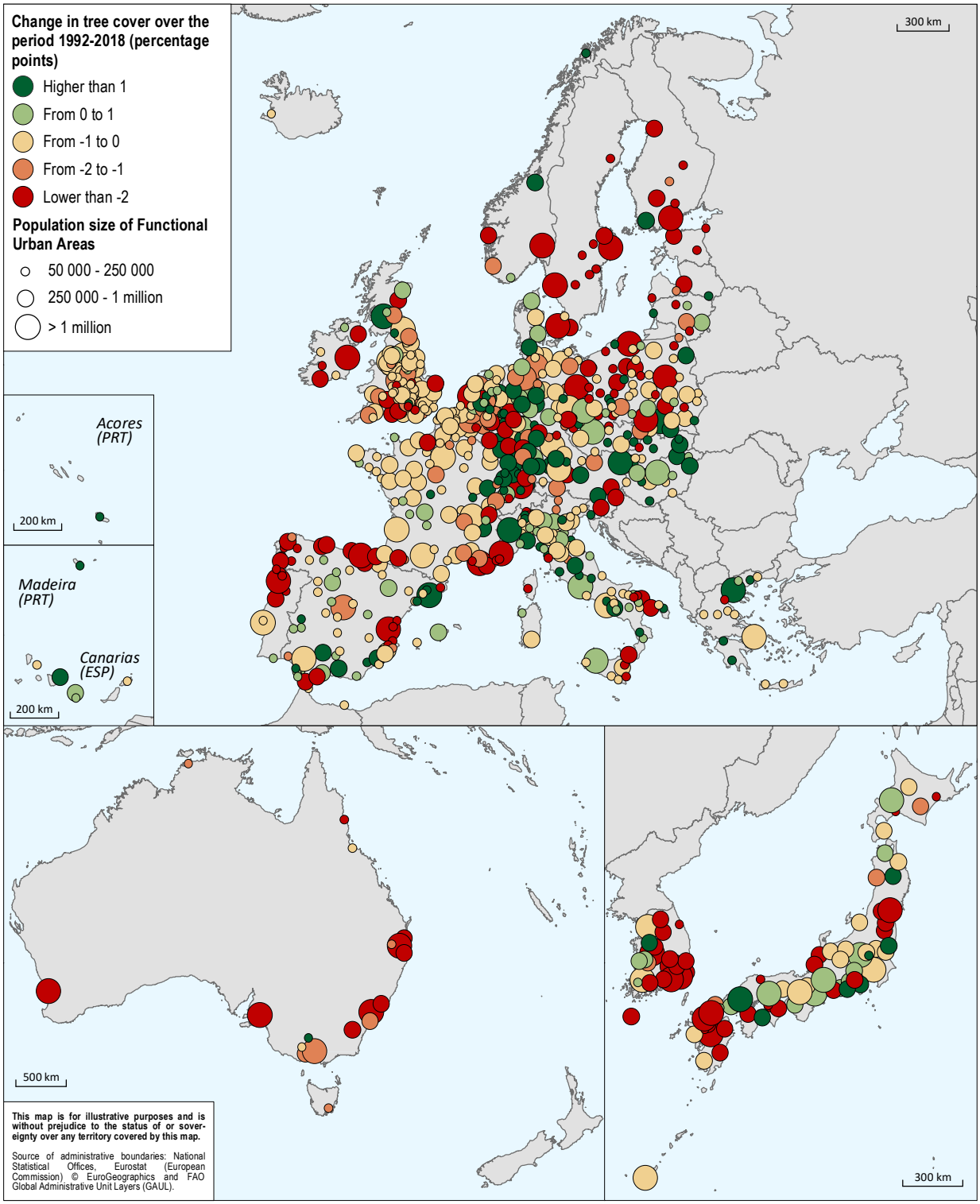
StatLink https://doi.org/10.1787/888934190058

3.3. Change in tree cover in cities: Americas, 1992-2018



StatLink https://doi.org/10.1787/888934190077

3.4. Change in tree cover in cities: Europe and Asia-Pacific, 1992-2018



StatLink https://doi.org/10.1787/888934190077

The role of regions and cities towards a climate-neutral economy (SDG 13)

Metropolitan regions release higher carbon emissions per electricity generated compared to other regions.

The dramatic increase in the energy required for cooling buildings, due to rising global temperatures, has been very unequal within countries over the last five decades. During the last 50 years, the annual cooling degree days (or CDD, a measure for how long outside air temperature was above 22°C) have on average increased by almost 25% in OECD cities and their commuting zones (functional urban areas or FUAs). Over the last decade, the 10% of FUAs with the highest average cooling needs were in Mexico, Colombia and the United States. These three countries have also recorded the largest differences across FUAs in terms of changes over time in CDD between 1970 and 2018. For example, in Mexico, Mexicali's average annual cooling needs increased from 700 to 1 400 CDD, while Villahermosa experienced a reduction of 320 CDD. In Europe, the cooling needs have increased in all cities and their commuting zones, although at a stronger pace in some southern regions. For example, in the metropolitan areas of Seville (Spain), Athens (Greece) and Taranto (Italy), the cooling needs have risen by more than 215 CDD since 1970 – an increase of 70%, 170% and 250% respectively (Figure 3.5, Figure 3.8-Figure 3.9).

In order to move towards a climate-neutral economy and halt global warming, regions and cities have an important role to play, including in the energy supply sector, which accounts for the largest share of global greenhouse gas (GHG) emissions (IPCC, 2014) due to its high reliance on fossil fuels. Since much energy use (in transport for example) needs to be electrified, progress in moving to zero-carbon electricity generation needs to be particularly rapid. Yet, the transition to zero-carbon electricity production remains very unequal across OECD regions.

In OECD countries, metropolitan regions have higher carbon emissions in electricity production than other regions. They emit 65% of the CO_2 associated with electricity generation but produce only 57% of electricity. On the other hand, regions far from metropolitan areas are more efficient than metropolitan regions, generating 27% of the electricity and accounting for only 21% of the CO_2. With an average of 285 tonnes of CO_2 per gigawatt-hour (GWh) of electricity generated, regions far from metropolitan areas release 34% fewer tonnes of CO_2 per GWh than metropolitan regions (Figure 3.6 and Figure 3.7, panel A).

Available data suggest that carbon efficiency in electricity production is also very unequal across OECD large regions. For the same amount of electricity production, high-carbon-intensive regions release, on average, 23 times more tons of CO_2 than low-carbon-intensive regions within each country (Figure 3.7, panel B). Behind such stark inequalities in carbon efficiency is the shift towards renewable sources for electricity production (see next section). The province of Quebec, the largest electricity producer in Canada, is among the most carbon-efficient regions in the OECD. In that region, which generates 94% of its electricity using hydropower, producing 1 GWh of electricity releases 30 tonnes of CO_2, significantly below the OECD average of 380 tonnes of CO_2 per GWh. On the other hand, the Canadian province of Alberta produces around 70% less electricity and has an emission intensity about 20 times higher than in Quebec. In the United States, the state of Washington emits an average of 110 tonnes of CO_2 per GWh of electricity production, which represents only 14% of the emissions per GWh in West Virginia (United States), a state that produces only 55% of the electricity of Washington. In France, the average emission intensity is among the lowest in OECD countries (80 tonnes of CO_2 per GWh) – due to its reliance on nuclear power. However, electricity production in Pays de la Loire (France) still releases 600 tonnes of CO_2 per GWh (Figure 3.10-Figure 3.11).

Definition

CDD measures how much (in degrees) and for how long (in days) outside air temperature was higher than 22°C (degrees Celsius). More precisely, annual CDD are the sum over a year of the differences between the threshold temperature (22°C) and the daily mean outdoor air temperature when the building needs to be cooled.

CO_2-equivalent emissions from electricity generation: GHG emissions are calculated using the Intergovernmental Panel on Climate Change (IPCC) estimates on GHG emissions of electricity supply technologies. It corresponds to the lifecycle emissions.

See methods in Annex C.

Sources

Byers, L. et al. (2020), *A Global Database of Power Plants*, *https://www.wri.org/publication/global-power-plant-database*.

IPCC (2014), *AR5 Climate Change 2014: Mitigation of Climate Change*, Intergovernmental Panel on Climate Change, *https://www.ipcc.ch/report/ar5/wg3/*.

Mistry, M.N. (2019), "A high-resolution (0.25 degree) historical global gridded dataset of monthly and annual cooling and heating degree days (1970-2018) based on GLDAS data", PANGAEA, *https://doi.org/10.1594/PANGAEA.903123*.

See country metadata in Annex B.

Territorial level

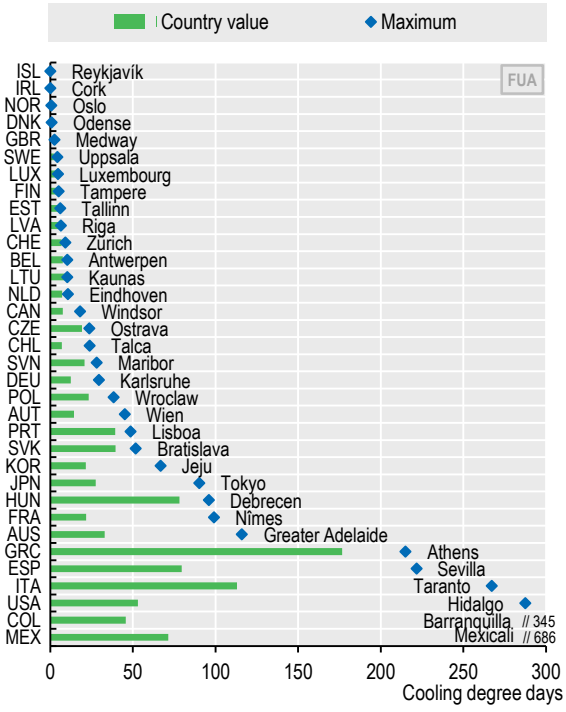
Figure 3.5,Figure 3.8-Figure 3.9: FUAs.

Figure 3.6-Figure 3.7 panel A: Small regions (TL3).

Figure 3.7, panel B: Large regions (TL2).

3.5. Increase in cooling needs in cities and their commuting zones, 1970-2018

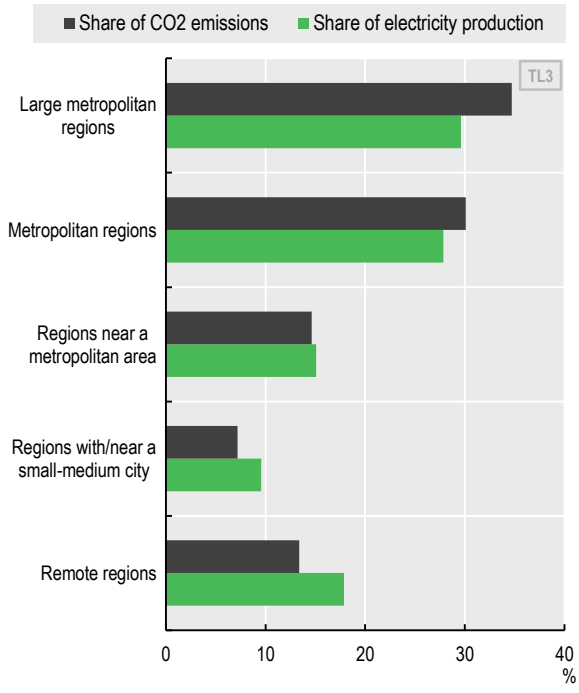
CDD needed over the year to maintain an indoor temperature of 22°C, FUAs



StatLink https://doi.org/10.1787/888934190115

3.6. Contribution to total CO_2 emissions from electricity production, 2017

By type of region, weighted averages of small regions (TL3)

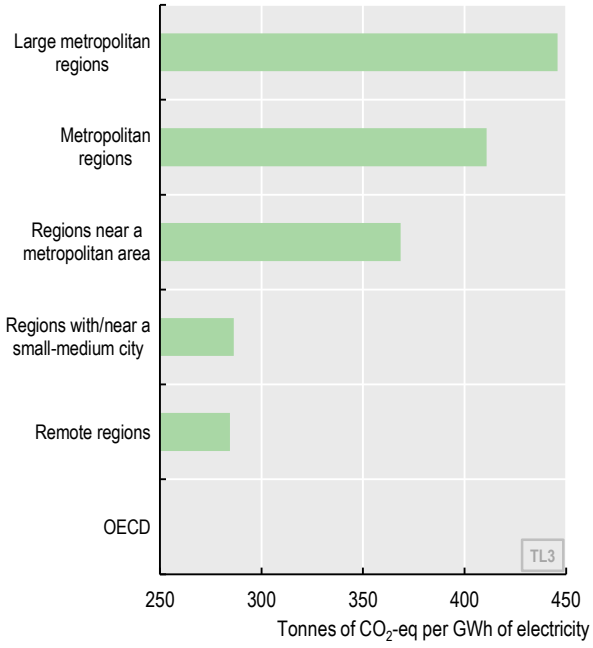


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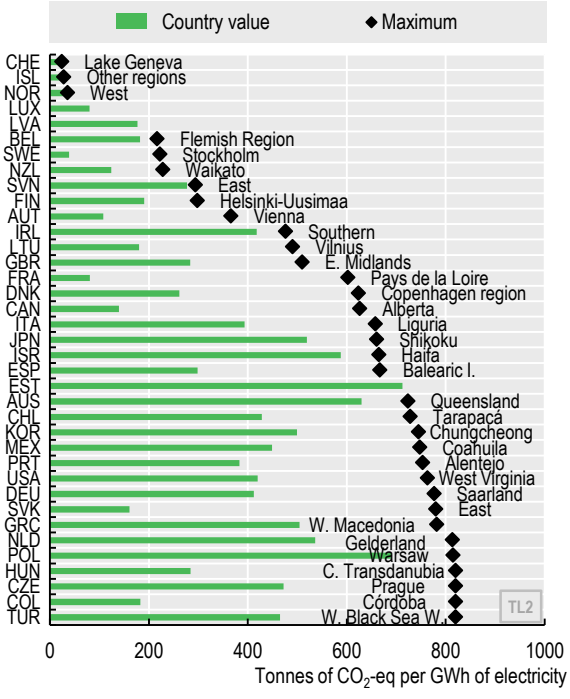
3.7. Carbon intensity in electricity production, 2017

Tonnes of CO2 emissions per gigawatt GWhhour of electricity generated

Panel A: Carbon intensity by type of small regions (TL3)



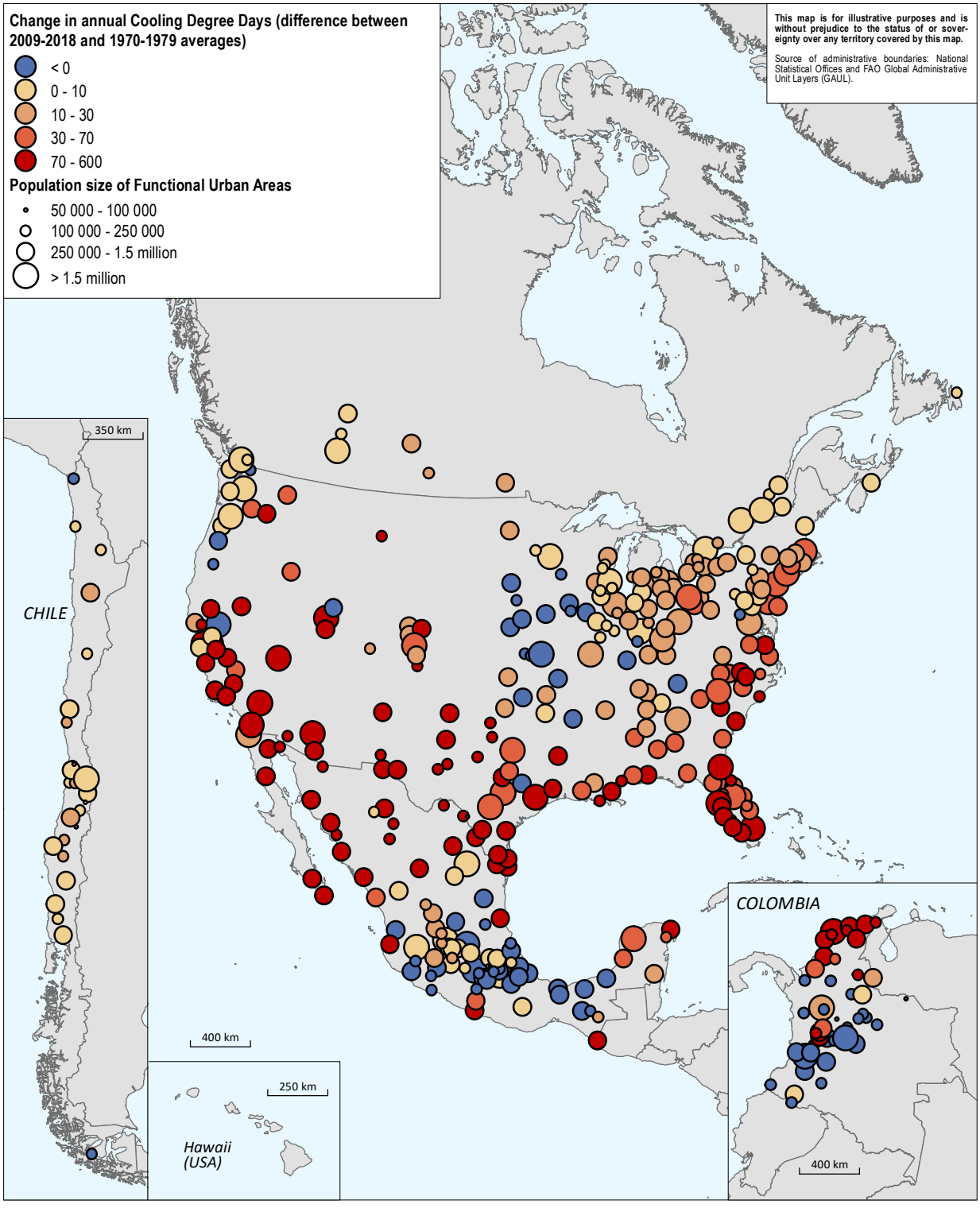
Panel B: Carbon intensity in large regions (TL2)



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3.8. Change in cooling needs in cities and their commuting zones: Americas, 1970-2018

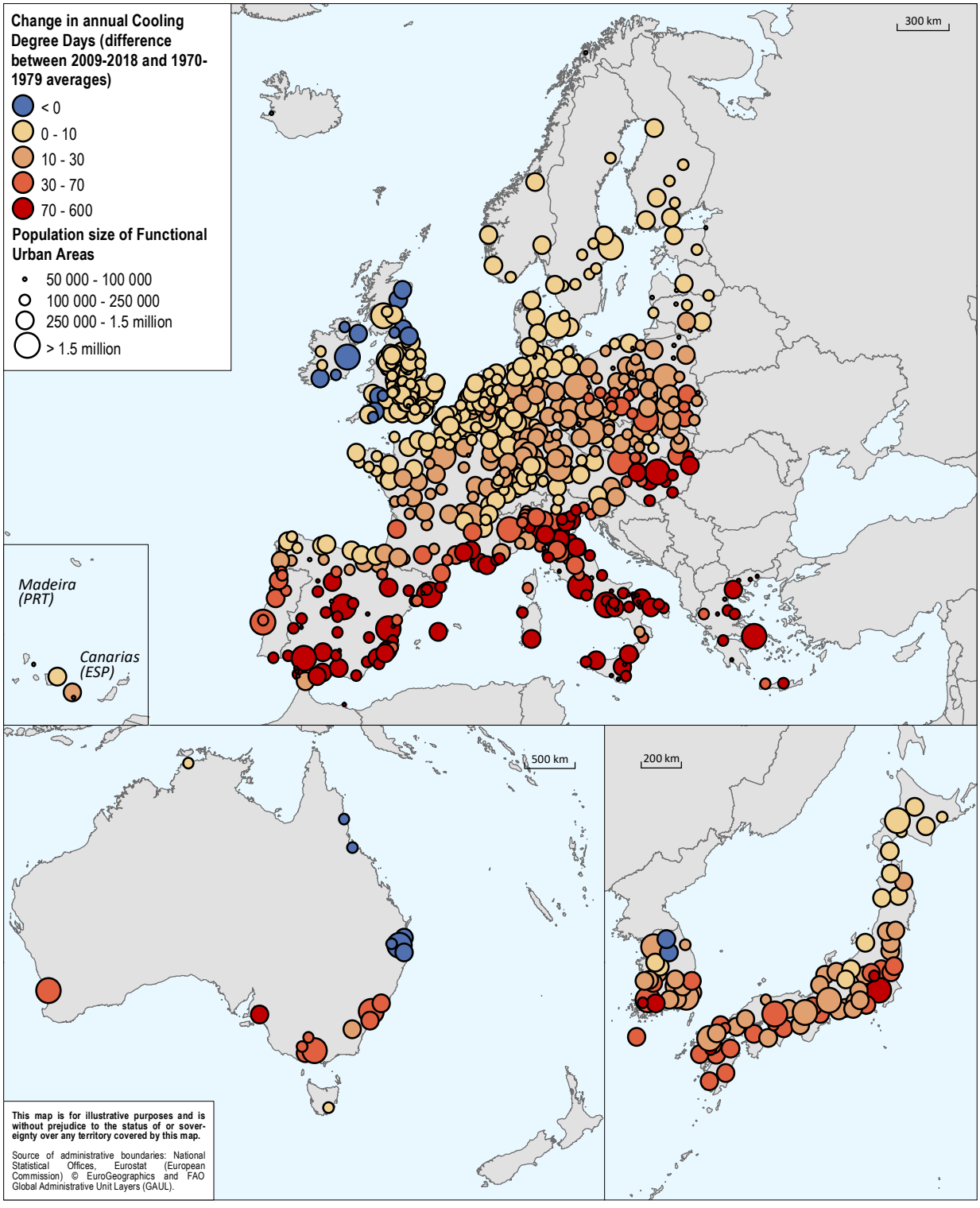
CDD needed over the year to maintain an indoor temperature of 22°C, FUAs



StatLink https://doi.org/10.1787/888934190172

3.9. Change in cooling needs in cities and their commuting zones: Europe and Asia-Pacific, 1970-2018

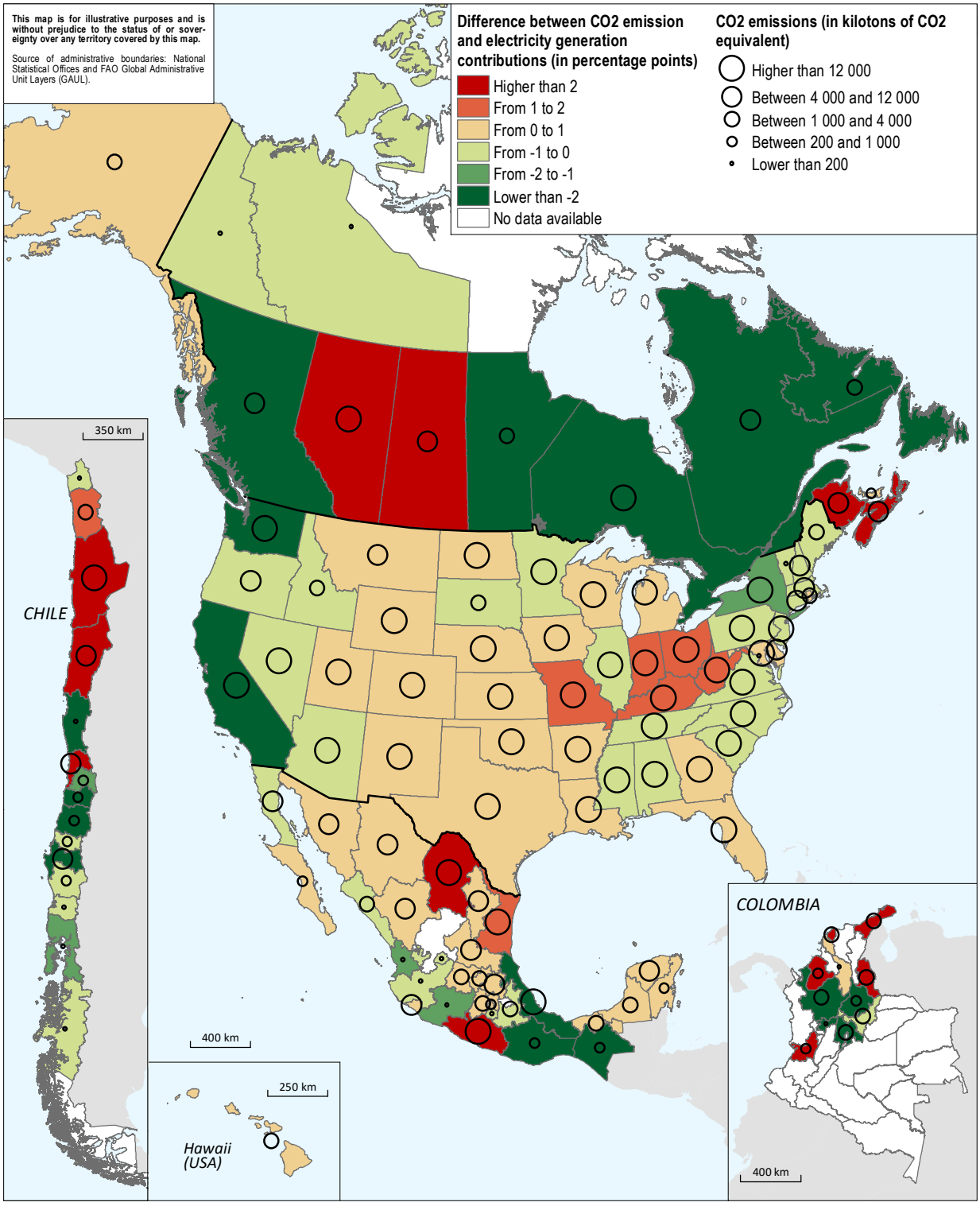
CDD needed over the year to maintain an indoor temperature of 22°C, FUAs



StatLink https://doi.org/10.1787/888934190191

3.10. Regions' contribution to the country's CO_2 emissions from electricity production: Americas, 2017

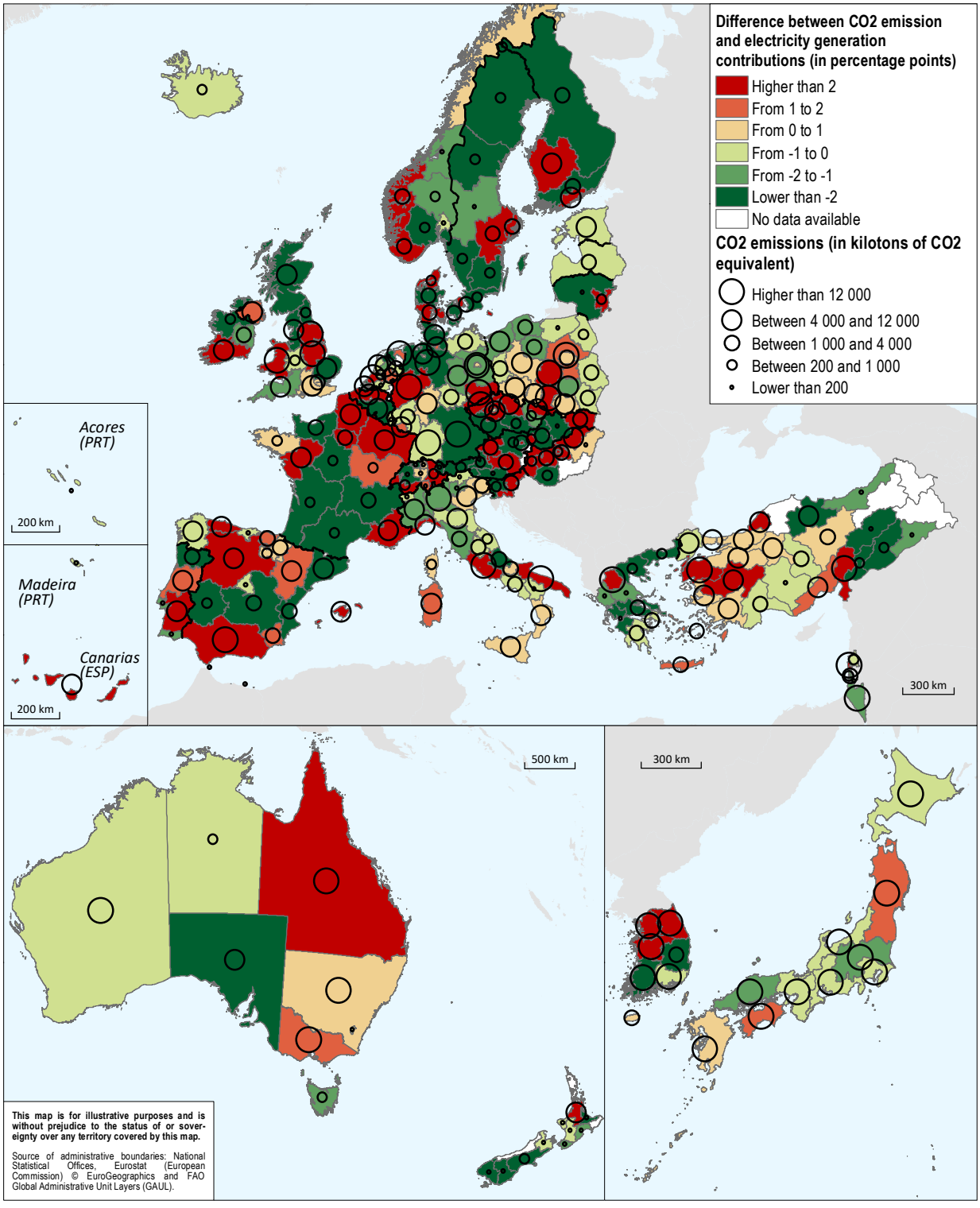
Large regions (TL2)



StatLink https://doi.org/10.1787/888934190210

3.11. Regions' contribution to the country's CO_2 emissions from electricity production: Europe and Asia-Pacific, 2017

Large regions (TL2)



StatLink https://doi.org/10.1787/888934190229

Transitioning to clean electricity production in every region (SDG 7)

Remote regions produce the most electricity using renewable sources and generate 36% of the clean electricity in OECD countries.

The transition to zero-carbon electricity production requires investing in renewable sources of energy and abandoning the use of fossil fuels. Among the main fossil fuels used in electricity generation, coal is particularly emission-intensive and its unabated use will need to be phased out first. In the Powering Past Coal Alliance, many OECD countries have committed to exiting all unabated coal-fired electricity generation by 2030 (unless CO_2 emissions are captured and stored) – consistent with the Paris Agreement. Although capturing and storing emissions is an option towards climate objectives, which has not yet been deployed at scale, the use of renewable sources is the main strategy to decarbonise electricity.

Regions located further away from metropolitan areas are leading in clean electricity. Such regions, which account for 27% of the electricity produced in OECD countries, generate 44% of their electricity using renewable sources. Among them, remote regions record a higher share of renewables (51% of total production) than regions that are close to a small or medium city (32% of total production). Taken together, regions far from metropolitan areas account for around half of the total electricity produced from renewable sources in the OECD, with hydropower being the most used renewable source (Figure 3.12-Figure 3.13).

Overall, the use of renewable sources tends to increase with distance to metropolitan areas. Metropolitan regions, which are home to around 70% of the OECD population, generate almost 60% of the total electricity in OECD countries but only 16% of their total electricity production comes from renewable sources. The dependency on fossil fuels (including coal) for electricity production in metropolitan regions remains high, raising their carbon emissions and associated long-term environmental risks. In 2017, metropolitan regions generated 29% of their electricity using coal and 37% using other fossil fuels (Figure 3.12-Figure 3.13).

Electricity production from renewable sources is also very unequal across regions of the same country. In 14 OECD countries, the use of renewable sources is particularly concentrated, with regions far from metropolitan areas generating twice as much of their electricity through renewable sources compared to metropolitan regions. The differences are largest in Canada, Finland, Germany and Latvia (Figure 3.14). Similarly, electricity production from clean energy sources is also highly concentrated across large OECD regions (TL2). Available estimates indicate (see Annex C) that in around three-quarters of OECD countries, the share of electricity produced through renewable sources can be more than 50 percentage point higher than in the region with the lowest share in the same country.

Definition

Indicators on production of electricity are based on the Global Power Plant Database (GPPD). The GPPD provides information on power plants located in 164 countries all over the world, including the 37 OECD countries. For each power plant, the GPPD provides the geographic coordinates, the energy source, the generation capacity (the maximum power that the plant can deliver) and the gross annual electricity generation (i.e. the electricity consumption of the power plant for its operation is not deducted). See methodology to estimate electricity indicators at the regional level in Annex C.

Renewable energy sources include hydropower, wind, waste, biomass, wave and tidal, geothermal and solar.

Fossil fuels are divided into two subcategories: coal, which corresponds to the most carbon-intensive energy source; and the other fossil fuels, including oil, petroleum coke and gas.

Sources

Byers, L. et al. (2020), *A Global Database of Power Plants*, *https://www.wri.org/publication/global-power-plant-database*.

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

See country metadata in Annex B.

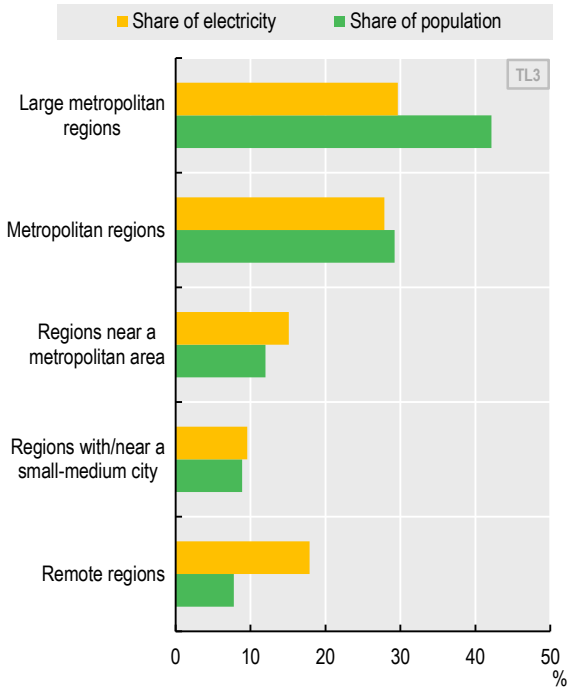
Reference years and territorial level

See territorial grids and regional typology in Annex A.

Figure notes

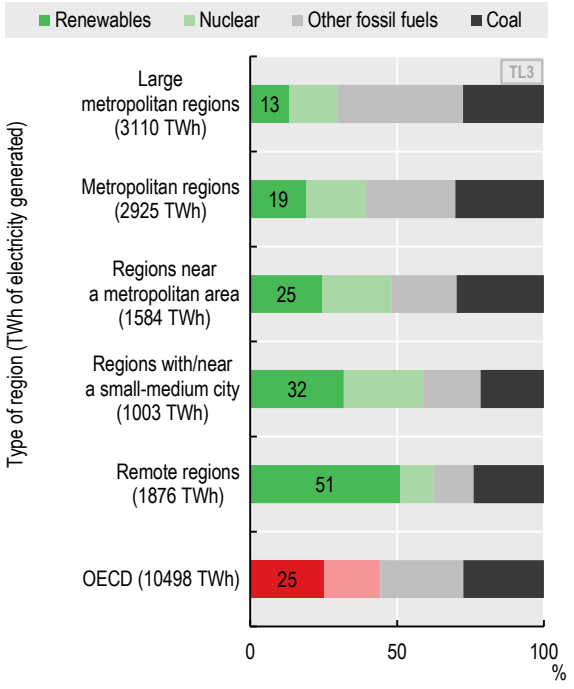
Figure 3.12-Figure 3.13: Weighted averages by type of small regions (TL3) across 35 OECD countries. COL and EST are not included.

3.12. Share of total electricity production by type of small regions (TL3), 2017



StatLink https://doi.org/10.1787/888934190248

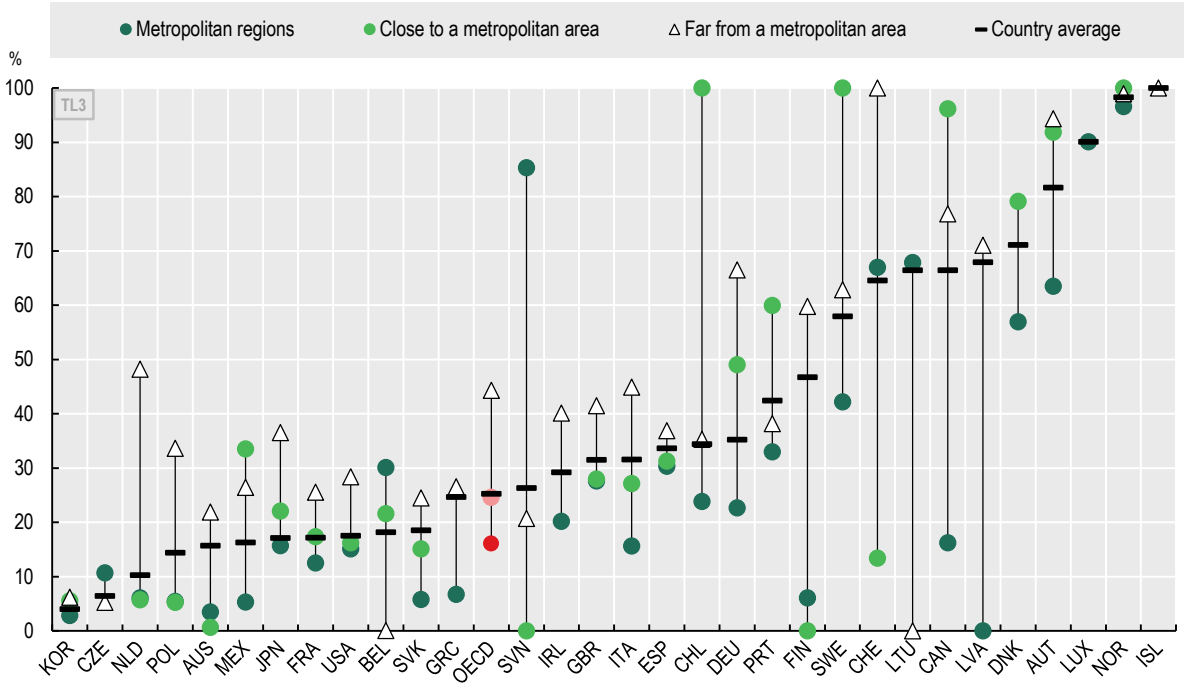
3.13. Sources of electricity production by type of small regions (TL3), 2017



StatLink https://doi.org/10.1787/888934190267

3.14. Regional differences in electricity production from renewables, 2017

Electricity from renewable sources as a percentage of total electricity production, by type of small regions (TL3)



StatLink https://doi.org/10.1787/888934190286

Fostering responsible consumption and circular economies in regions (SDG 12)

With lower levels of household energy consumption and declining waste generation over the last two decades, capital regions in Europe lead the way to more sustainable consumption.

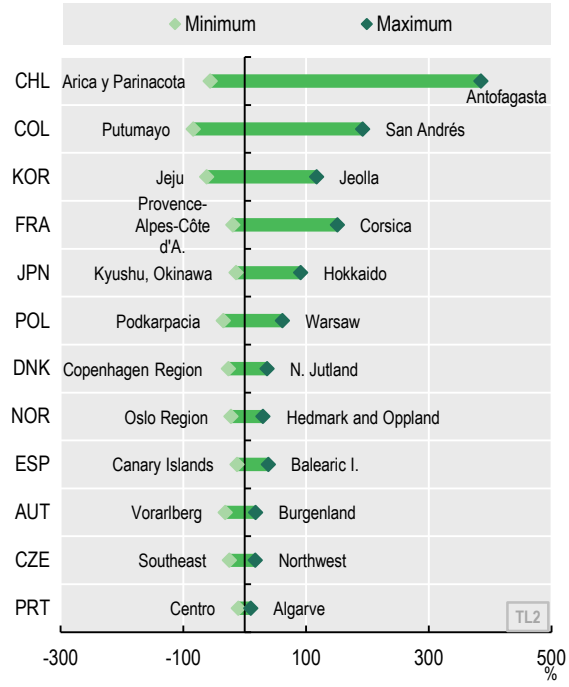
The preservation of the environment requires all regions and cities to increase resource efficiency and promote responsible consumption. Yet, within OECD countries, per capita energy consumption in the region with the highest consumption is typically three times higher than in the region with the lowest consumption – where household energy consumption includes water heating, space cooling and heating, cooking, lighting and electrical appliances but excludes transport and consumption outside the house. In Europe, households living in capital regions tend to consume less energy per capita than the national average. In Denmark and Norway, Copenhagen and Oslo are the regions with the lowest energy consumption per capita in 2018. With an energy consumption per capita of 490 kg of oil equivalent (see Definition), Ile-de-France records the second-lowest level of energy consumed per capita in France, 3 times lower than in Corsica. In Portugal, where the level of energy consumption is relatively high compared to other European countries, the average households' energy consumption in the region of Lisbon is about 15% lower than in the touristic region of Algarve – the Portuguese region with the highest energy use per capita. Similarly, in Spain, households in the region of Madrid consume on average 35% less energy than in the Balearic Islands (Figure 3.15).

Since transitioning from fossil-fuel-powered vehicles to cleaner modes of transport is essential to reduce both CO_2 emissions and air pollution, responsible consumption also relates to people's choices in available modes of transport. Road transport generates close to 22% of the CO_2 emissions in Europe and is among the main sources of air pollution (EC, 2019; EEA, 2019). However, the number of private vehicles per capita contributing to such emissions differs widely across types of regions in OECD countries. In Asian and European countries, metropolitan regions have on average fewer vehicles per inhabitant than regions far from metropolitan areas. In Austria, Estonia, Finland, Sweden, Switzerland and the United Kingdom, motor vehicle rates are at least 15% higher in regions far from metropolitan areas than in metropolitan regions (Figure 3.16).

Within-country differences in the use of private vehicles are particularly large in North American and Southern European countries. In the United States, Montana records around 3 times more vehicles per inhabitant than the District of Columbia that counts only 286 private vehicles per 1 000 people. Similar differences exist in France, Italy and Portugal. The largest regional disparities in vehicles rates, however, are recorded in Greece, Italy, Mexico and the United States. Moreover, motor vehicle rates have increased at a very high speed in some regions of Mexico over the past 20 years. In the region of Tlaxcala (Mexico) for example, where 54 vehicles were registered per 1 000 inhabitants in 2000, the private vehicle rate has multiplied by a factor of 6, going up to 347 vehicles per 1 000 inhabitants in 2018 (Figure 3.17).

3.15. Disparities in energy consumption per capita, large regions (TL2), 2018

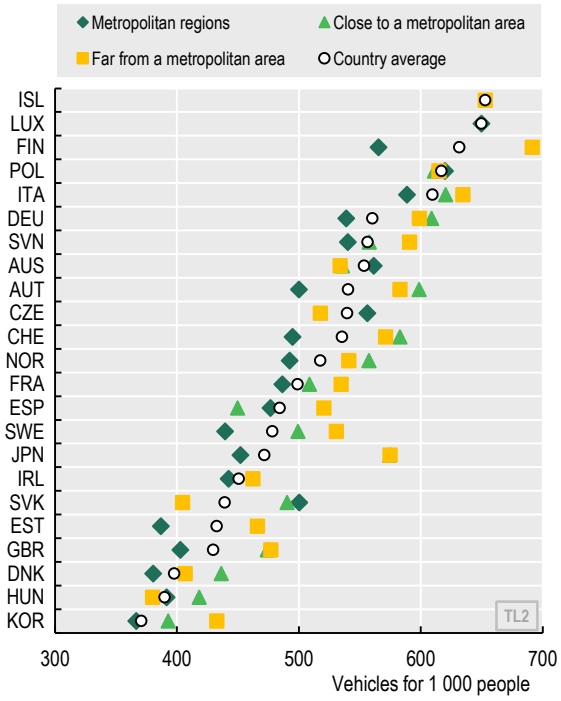
Percentage deviation from the country average



StatLink https://doi.org/10.1787/888934190305

3.16. Private vehicles rate by type of small regions (TL3), 2018

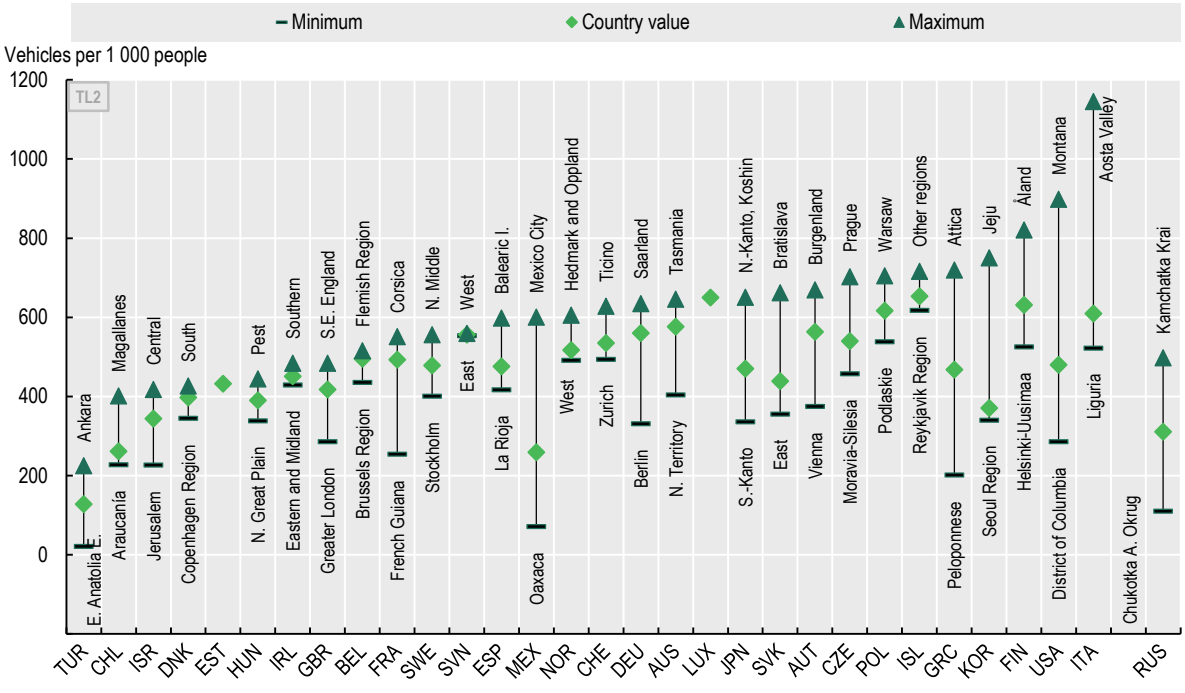
Private motor vehicles per 1 000 people



StatLink https://doi.org/10.1787/888934190324

3.17. Regional disparities in private vehicles rate, 2018

Vehicles per 1 000 people, large regions (TL2)



StatLink https://doi.org/10.1787/888934190343

In addition to efficient energy consumption and cleaner modes of transport, pursuing sustainable development also requires lowering materials consumption, thereby avoiding waste and recycling more. Materials extraction and processing contributes to GHG emissions and accounts for substantial water, soil and air pollution (OECD, 2019).

While European capital regions have significantly reduced their municipal waste generation per inhabitant over the last 20 years, most Latin American regions have increased it, though municipal waste per capita remains much lower, reflecting lower income levels. In Europe, capital regions often show the highest reduction in waste generation per person in their respective countries. For example, the regions of London (United Kingdom) and Vienna (Austria) decreased municipal waste generation by over 30% between 2000 and 2018 – equivalent to a reduction of 190 and 250 kilograms of waste per capita respectively. Similarly, the regions of Berlin, Ile-de-France and Lisbon reduced their waste production by more than 33 kilograms of waste per capita, even though most of the regions in France, Germany and Portugal actually experienced an increase in per capita waste generation from 2000 to 2018. In contrast to European capital regions, most regions in Chile, Colombia and Mexico have increased their waste generation over the period 2000-18 (Figure 3.18-Figure 3.19). In addition to reducing waste generation, recycling constitutes another challenge in Latin American regions as its practice remains very limited. For example, although Atacama (Chile) and Mexico City (Mexico) show the highest levels of recycled waste in their country (24% and 17% respectively), these levels are significantly below the OECD average of 40% (Figure 3.20).

Definition

Energy consumption per capita refers to households' electricity and heat consumption, excluding energy used for transportation. Kilograms of oil equivalent, or kgoe, is a normalised unit of energy. It is equivalent to the amount of energy that can be generated from one kilogram of crude oil.

Motor vehicles per capita refers to the road motor vehicles intended for the carriage of passengers and designed to seat no more than nine persons including the driver. Motorcycle are excluded.

Recycled municipal waste includes waste that undergoes material recycling, composting or energy recovering. Landfilling is excluded.

Sources

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

OECD (2019), *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*, OECD Publishing, Paris, *https://dx.doi.org/10.1787/9789264307452-en*.

See country metadata in Annex B.

Reference years and territorial level

See territorial grids and regional typology in Annex A.

Figure notes

Figure 3.15: 2017 for FRA, KOR and PRT; 2016 for JPN; and 2012 for NOR.

Figure 3.16: 2014 for DNK, ISL, ITA, CHE and TUR; 2013 for AUT, JPN, MEX and GBR; 2012 for AUS and LUX; 2011 for EST; and 2010 for FRA and ESP.

Figure 3.17: 2020 for AUS; 2017 for FRA; 2014 for AUS, BEL, DNK, GRC, ISL, ITA, CHE and TUR; 2013 for JPN and GBR; 2012 for LUX; 2011 for EST; and 2010 for ESP.

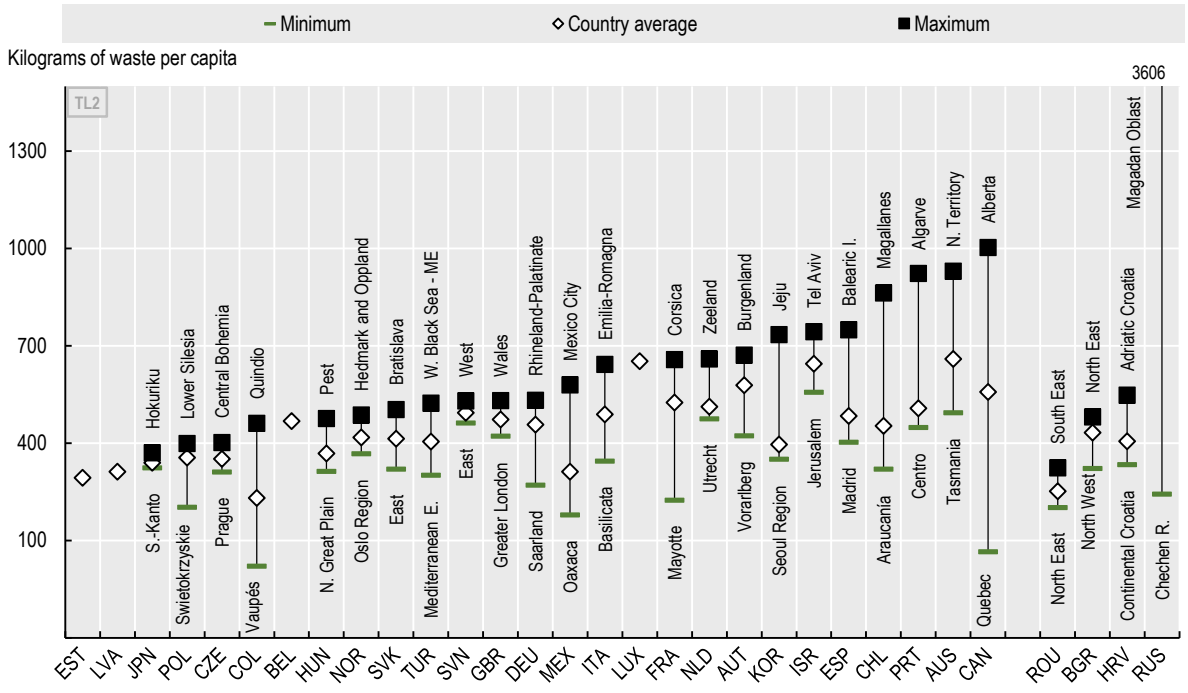
Figure 3.18: 2017 for FRA; 2014 for AUS, BEL, DNK, GRC, ISL, ITA, CHE and TUR; 2013 for JPN and GBR; 2012 for LUX; and 2010 for EST and ESP.

Figure 3.19: First year: 2001 for TUR; 2002 for CAN, SVK and SVN; 2004 for AUT, BGR and CZE; 2005 for FRA; 2006 for DEU and JPN; 2007 for AUS and COL; and 2008 for KOR. Last year: as in Figure 3.18.

Figure 3.20: 2017 for AUS, CHL, ITA and NLD; 2016 for JPN and MEX; 2015 for DEU and NOR; 2013 for BGR, HRV, CZE, EST, LVA, LUX, GBR; 2012 for BEL and ROU; and 2010 for SWE.

3.18. Regional disparities in municipal waste per capita, 2018 or most recent

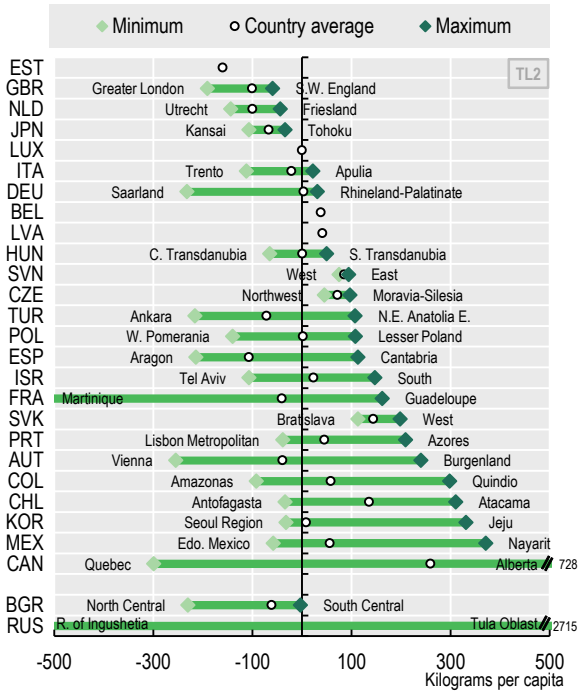
Kilograms of municipal waste per capita, large regions (TL2)



StatLink https://doi.org/10.1787/888934190362

3.19. Change in municipal waste per capita, 2000-18

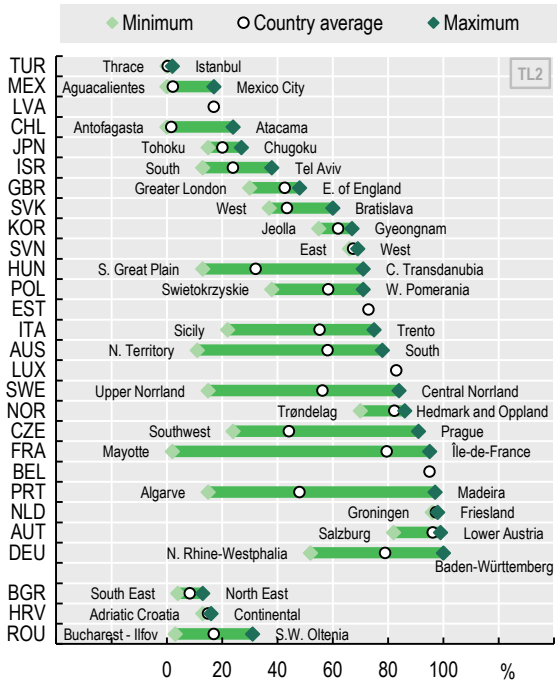
Change in kilograms of municipal waste per capita, large regions (TL2)



StatLink https://doi.org/10.1787/888934190381

3.20. Recycled municipal waste, 2018

Recycling includes energy recovery and composting, percentage of total waste, large regions (TL2)



StatLink https://doi.org/10.1787/888934190400

Efficient land use and public transport systems for sustainable cities (SDG 11)

In OECD countries, cities and their respective commuting zones have three and a half times more buildings and infrastructure per capita than in the rest of the world.

In cities and their commuting zones (i.e. FUAs) of OECD countries, around 280 m^2 of land per person are built-up, 3.5 times more than the average in the rest of the world. While housing and infrastructure for public services are crucial for well-being, extensive artificial surface cover can have major environmental impacts, such as diminishing biodiversity and deteriorating soil quality (Haščič and Mackie, 2018). In addition, low-density housing and urban sprawl can be associated with higher energy demand and transport-related CO_2 emissions (OECD, 2018). The extent to which built-up land in cities changes with respect to population is an indicator included in the UN Sustainable Development Goals to promote efficient land use and prevent urban sprawl. In this respect, FUAs in OECD countries differ remarkably from those in the rest of the world, with much higher average values, reflecting relatively high levels of infrastructure provision and road network (Figure 3.21, panel A).

In many OECD countries, the change in built-up area per capita in FUAs during the last 15 years has been high despite already high initial levels of the built environment. For example, in 160 out of 428 (37%) FUAs with high levels of built-up area per capita in 2000 (above 300 m^2 per person), land consumption has increased at a higher rate than the population. On the other hand, in 40 out of 143 FUAs with initial low levels of built-up area per capita in 2000 (below the 100 m^2 per person), the population is growing faster than the built-up area, which can intensify pressure on relatively limited infrastructure networks and undermine the provision of basic services to a growing population (Figure 3.23-Figure 3.24).

The amount of land dedicated to buildings and infrastructure has been increasing at different speeds depending on city size, with faster increases in the small- and medium-sized cities. Built-up areas per capita in FUAs with less than half a million inhabitants have increased by 15.6 m^2 per person since 2000, while it has increased by only 1.2 m^2 per person in those above half a million inhabitants during the same period. This trend is leading to a convergence in built-up area per capita across FUAs of different sizes in OECD countries – to an average close to 280 m^2 per inhabitant (Figure 3.21, panel B).

Efficient public transport systems can make cities not only more sustainable but also more productive. Good transport networks improve people's accessibility to existing services and amenities. They also minimise the commuting time of workers to their place of work and maximise the number of jobs (firms) reachable to workers, which can contribute to higher productivity (OECD, 2020b). European metropolitan areas display a positive and significant correlation between the performance of the public transport network (see Definition) and labour productivity (gross value added [GVA] per worker). Such a correlation does not hold between the performance of the road network and labour productivity. While metropolitan areas with the best public transport performance in Europe, such as Helsinki, London and Oslo, display the highest levels of labour productivity, the metropolitan areas of Athens, Nottingham and West Midlands report a low public transport performance and have the lowest labour productivity. On average, the labour productivity gap between the top and bottom metropolitan areas in terms of public transport performance in Europe is close to USD 28 000 per worker (in 2015 PPP) (Figure 3.22).

Definition

Transport performance is the ratio between the accessibility to certain amenities (including the number of people) by a mode of transport (i.e. how many amenities can be accessed by 30 minutes of a specific mode of transport) and the proximity of these amenities (i.e. how many are located in a radius of 8 km).

Sources

Haščič, I. and A. Mackie (2018), "Land Cover Change and Conversions: Methodology and Results for OECD and G20 Countries", *OECD Green Growth Papers*, No. 2018/04, OECD Publishing, Paris, *https://doi.org/10.1787/72a9e331-en*.

ITF (2019), "Benchmarking accessibility in cities: Measuring the impact of proximity and transport performance", *International Transport Forum Policy Papers*, No. 68, OECD Publishing, Paris, *https://doi.org/10.1787/4b1f722b-en*.

OECD (2020a), *The Future of Regional Development and Public Investment in Wales, United Kingdom*, OECD Multi-level Governance Studies, OECD Publishing, Paris, *https://doi.org/10.1787/e6f5201d-en*.

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OECD (2018), *Rethinking Urban Sprawl: Moving Towards Sustainable Cities*, OECD Publishing, Paris, *https://dx.doi.org/10.1787/9789264189881-en*.

See country metadata in Annex B.

Further information

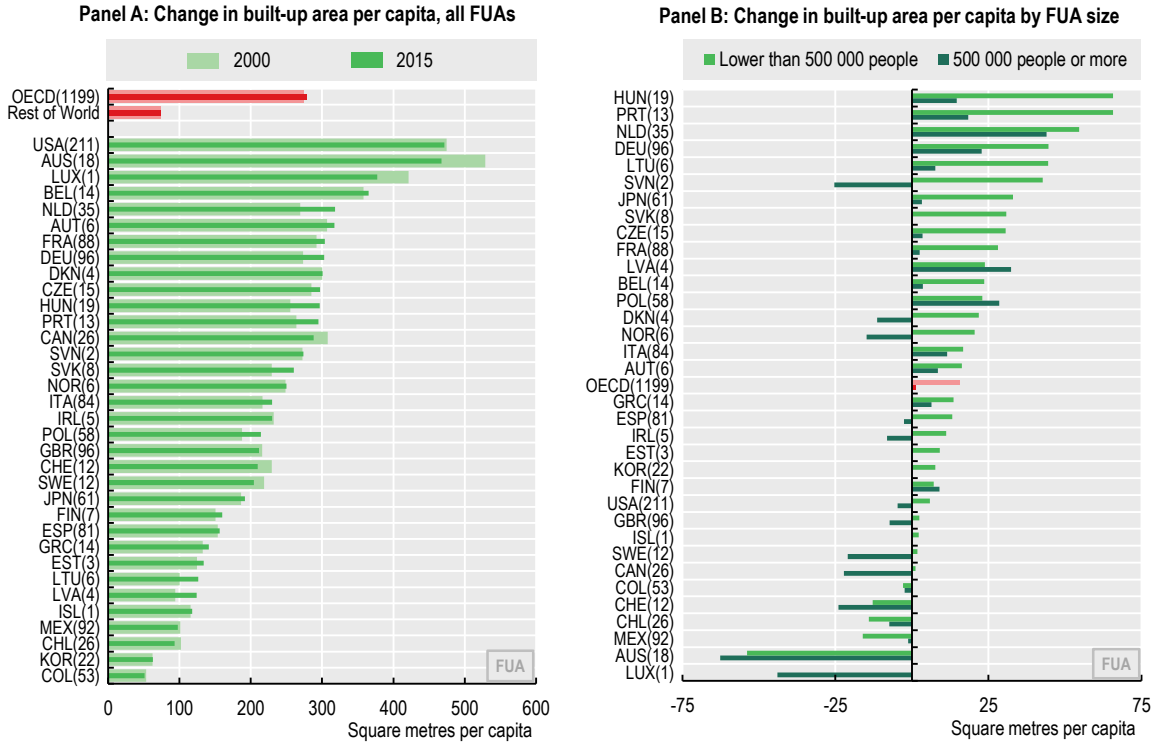
OECD (2017), *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264268609-en*.

Figure notes

Figure 3.21: Functional urban areas of more than 50 000 people.

Figure 3.22: 79 metropolitan areas from 23 European countries.

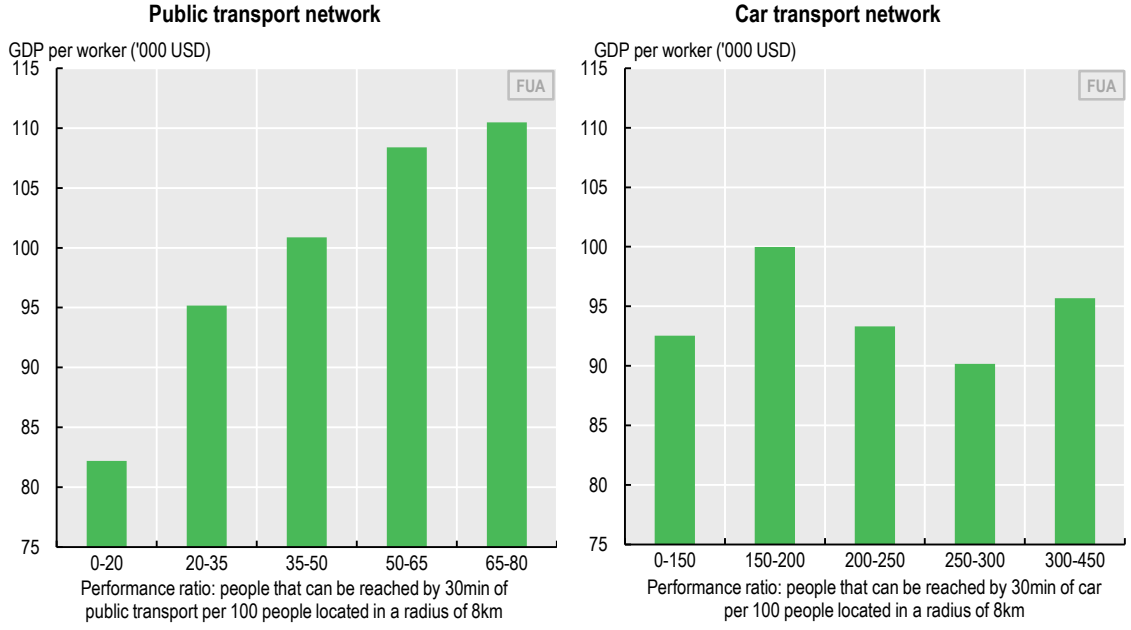
3.21. Built-up area per capita in cities and their commuting zones, 2000 and 2015



StatLink https://doi.org/10.1787/888934190419

3.22. Productivity and transport performance in European metropolitan areas, 2017

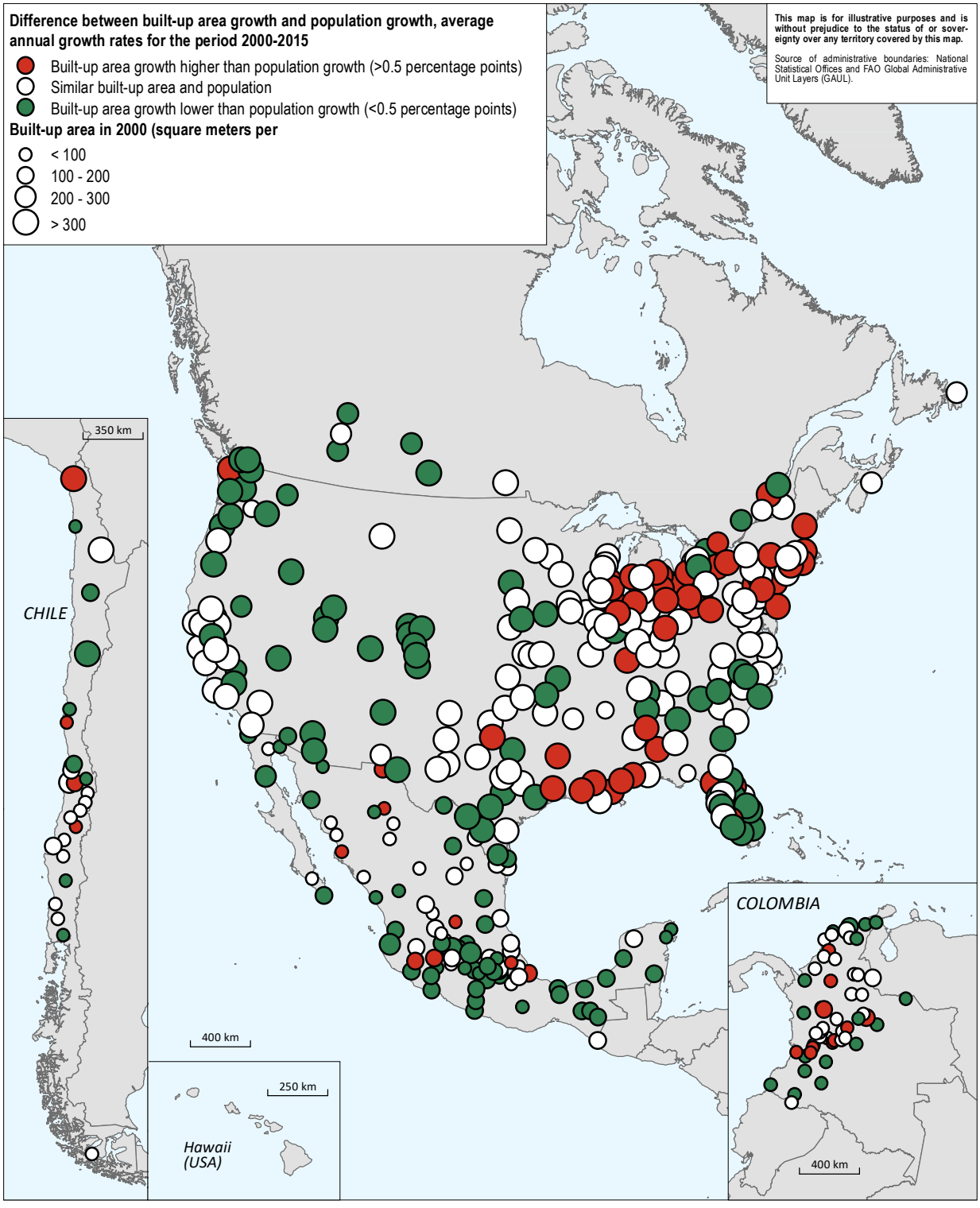
FUAs of more than 250 000 people



StatLink https://doi.org/10.1787/888934190438

3.23. Difference between built-up area growth and population growth: Americas, 2000-15

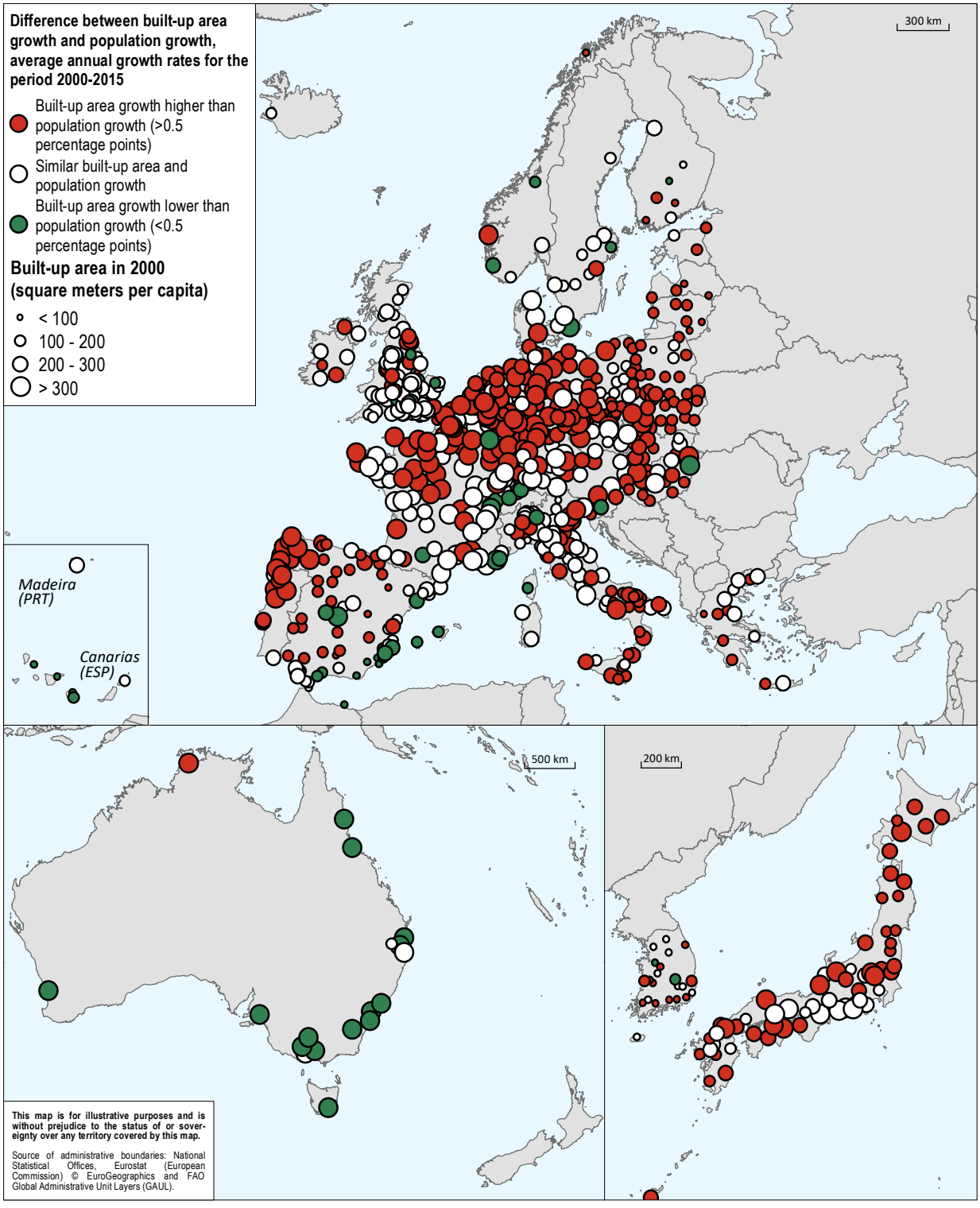
Functional urban areas



StatLink https://doi.org/10.1787/888934190457

3.24. Difference between built-up area growth and population growth: Europe and Asia-Pacific, 2000-15

Functional urban areas



StatLink https://doi.org/10.1787/888934190476





4. REGIONS AND CITIES IN THE FACE OF DEMOGRAPHIC CHANGE, AGEING AND URBANISATION

Population growth in regions

Global trends in city population growth

The changing shape of cities: Density and suburbanisation

Regions and cities facing ageing

Population mobility across regions

This chapter assesses how demographic change, ageing and urbanisation are playing out in regions and cities of OECD countries and beyond. The chapter covers indicators on population growth, elderly dependency rate, within-country residential mobility and trends in density and population across and within functional urban areas in the whole world.

Population growth in regions

The share of the population in metropolitan regions has increased since 2000.

Over the last 40 years, there has been a slow but constant process of concentration of population in or around large and densely populated places in OECD countries. The concentration and geographic distribution of the population within a country reflects that of economic activities and it affects the way public services are delivered, with implications for people's well-being. In 2019, almost half of the population of OECD countries (48%) lived in predominantly urban regions, which represented only 6% of the total OECD surface area. Of the remaining population, 28% lived in intermediate regions and 24% in regions with a predominantly rural population (Figure 4.1).

Across OECD countries, the distribution of population across different types of regions is highly heterogeneous. While more than 70% of the population live in predominantly urban regions in Australia, the Netherlands and the United Kingdom, less than 20% of the population live in such regions in Croatia, Hungary, the Slovak Republic and Slovenia (Figure 4.1). On average, predominantly rural regions accounted for around one-quarter of the population and 82% of the land area in OECD countries but in countries such as Ireland or Slovenia, the share of the national population in predominantly rural regions was more than twice as high as the OECD average (Figure 4.2). Since 2000, the share of population living in predominantly urban regions has increased by 0.8 percentage points across the OECD, mainly at the expense of predominantly rural regions.

The relatively small increase in the population shares of predominantly urban regions masks a more pronounced increase in regions located close to metropolitan areas (i.e. FUAs of at least 250 000 inhabitants). Distinguishing regions based on the extent to which people live in or close to metropolitan areas reveals a more nuanced picture of changing spatial concentration of the population during the last two decades. Since 2000, the share of population living in metropolitan regions – i.e. regions where more than half of the population live in a metropolitan area – has increased faster than in all other types of regions in almost all OECD countries with available data. During this period, the share of the population in metropolitan regions has increased on average by 1.8 percentage points across OECD countries. The relative growth of metropolitan regions was particularly strong in Austria, Canada, Estonia, Finland, Lithuania, Norway and Sweden, where their population share rose by over 3 percentage points over the last 2 decades.

Overall, the population of regions across OECD countries grew at an average rate of 0.4% per year between 2000 and 2019 (Figure 4.3 to Figure 4.6). This picture masks a substantial heterogeneity, with a significant share of regions in Asia and Europe experiencing population decline. The 10 regions with the highest population growth rate – 3.6% per year or more on average – are found in Canada (Mirabel, Quebec), Chile (Chacabuco and Isla de Pascua), Mexico (Baja California Sur, Hidalgo, Nayarit, Nuevo Leon and Quintana Roo) and Spain (Fuerteventura). Belgium, Ireland, Israel, Luxembourg, New Zealand, Norway and Switzerland recorded population growth in all of their regions during this period, while Estonia, Hungary, Japan, Latvia and Lithuania experienced a decrease in the total resident population in more than 80% of their regions, partially due to the overall decrease in the national population.

In various OECD countries, population growth was particularly concentrated in specific regions. Chile, Spain and Turkey recorded the largest regional differences in the population growth rate between 2000 and 2019, with gaps above 4 percentage points between the fastest and slowest growing regions. On the other hand, regions in Belgium, the Czech Republic and Italy experienced relatively similar growth paths, with at most a 1.5 percentage point difference between the fastest and slowest growing regions.

Definition

The OECD classifies small regions (Territorial Level 3, TL3) according to two different but complementary classifications.

The urban-rural typology classifies regions in predominantly urban, intermediate or predominantly rural. The access to metropolitan areas typology considers the extent to which the majority of the regional population lives either within or in proximity to metropolitan areas of different sizes. More details are provided in the Reader's guide.

Source

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris http://dx.doi.org/10.1787/region-data-en.

Reference years and territorial level

2000-19; TL3. TL2 regions for BRA, COL, CRI, IND, PER, CHN, RUS and ZAF.

Further information

Territorial grids and regional typology (Reader's Guide and Annex A)

Eurostat (2013), *Urban-Rural Typology*, *http://ec.europa.eu/eurostat/web/rural-development/methodology*.

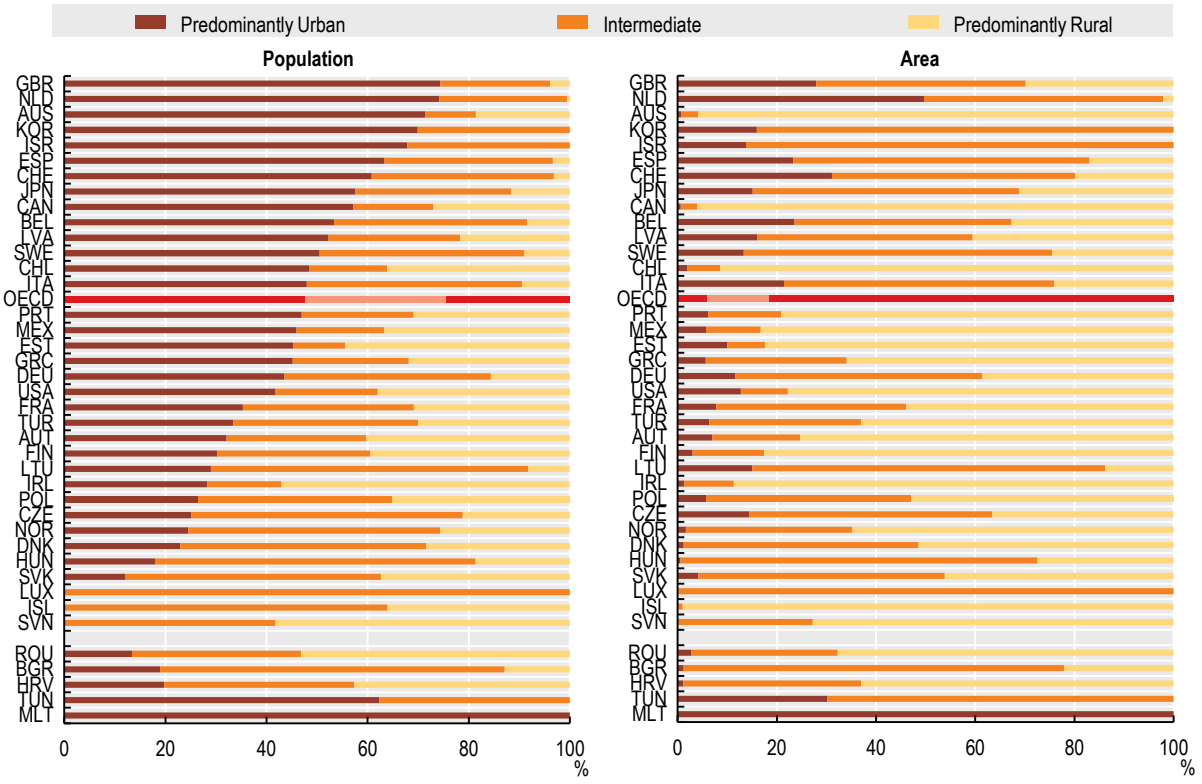
Fadic, M. et al. (2019), "Classifying small (TL3) regions based on metropolitan population, low density and remoteness", *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris, *https://doi.org/10.1787/b902cc00-en*.

Figure notes

Figure 4.1-Figure 4.2: Weighted average of TL3 regions.

Figure 4.1: 2019 or latest available year. TUN (2016); AUS, CAN, HRV, HUN, ISR, JPN, LTU, and USA (2018).

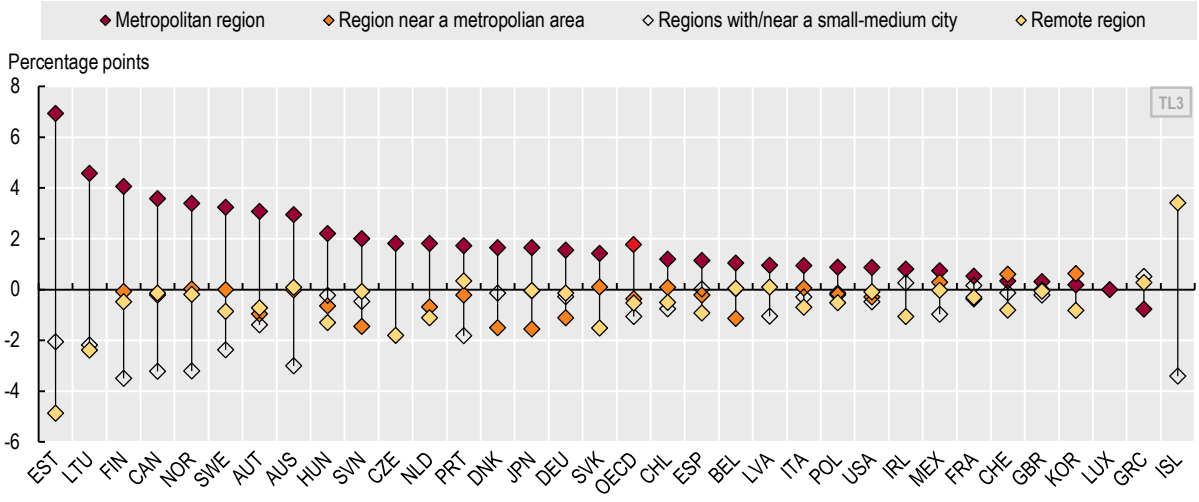
4.1. Distribution of population and area by type of small regions (TL3), 2019



StatLink https://doi.org/10.1787/888934190495

4.2. Change in the share of population by type of small regions (TL3), 2000-19

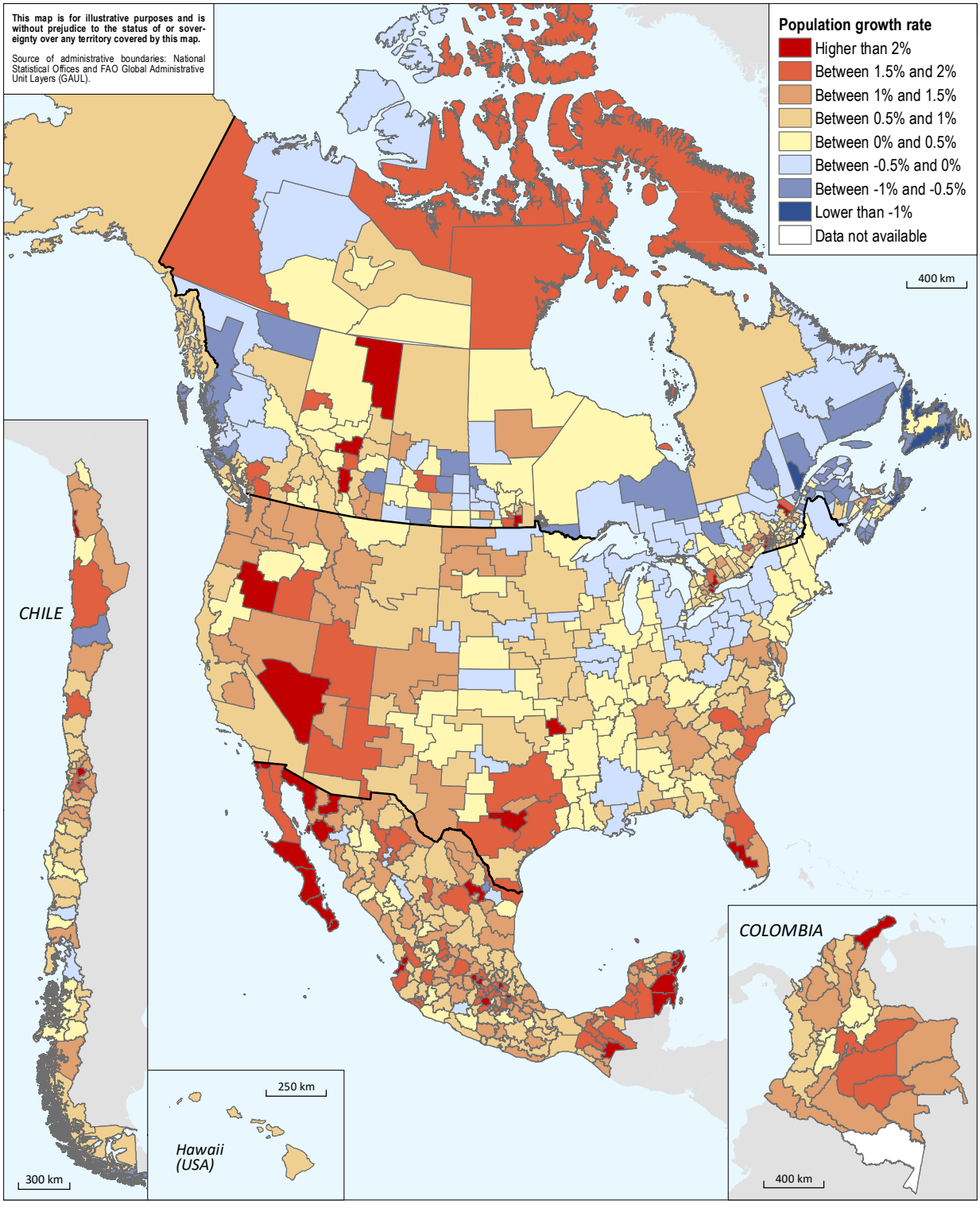
Change in the share of the population by type over total population



StatLink https://doi.org/10.1787/888934190514

4.3. Regional population growth: North America, Chile and Colombia, 2000-19

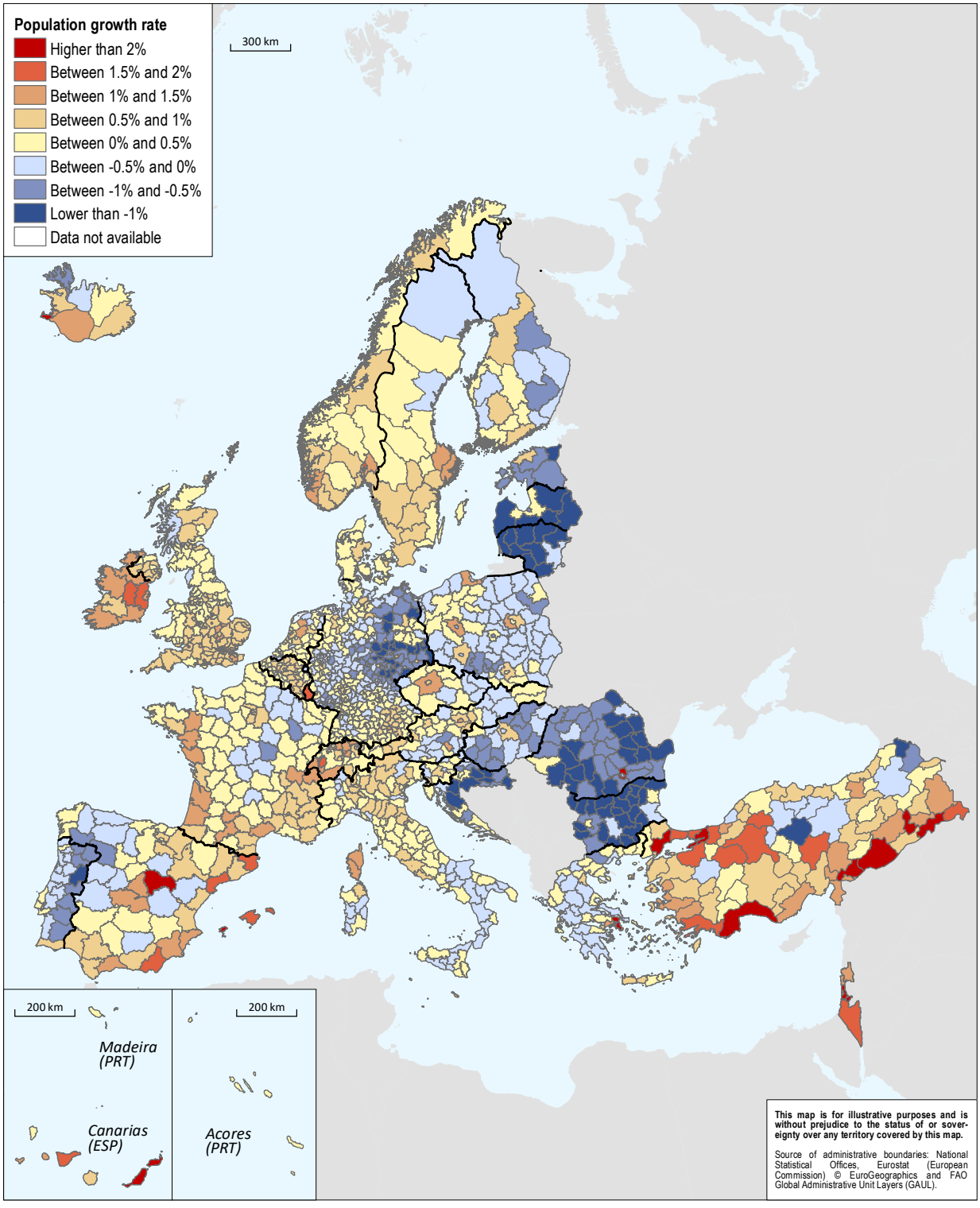
Average annual growth rate, small regions (TL3)



StatLink https://doi.org/10.1787/888934190533

4.4. Regional population growth: Europe, 2000-19

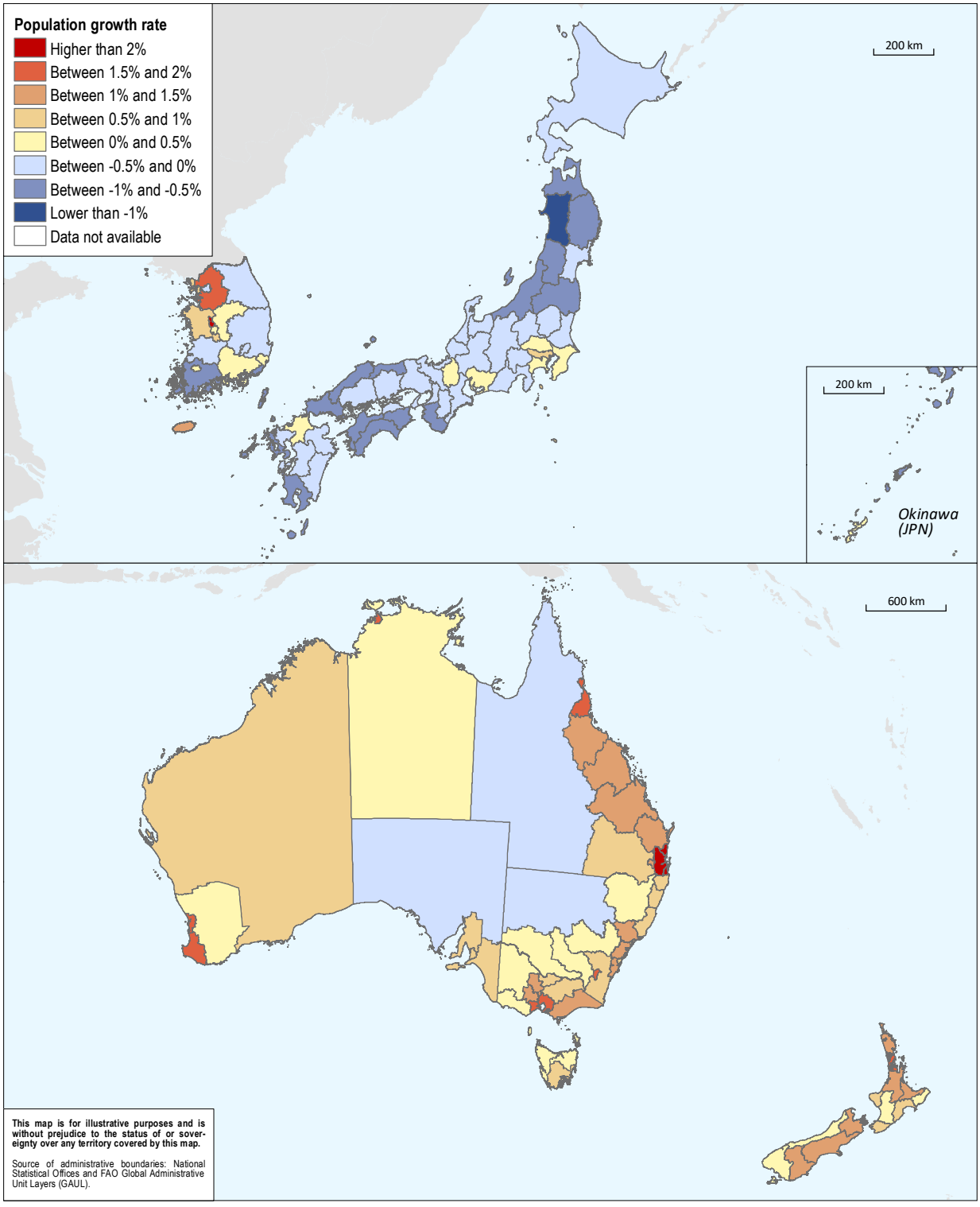
Average annual growth rate, small regions (TL3)



StatLink https://doi.org/10.1787/888934190552

4.5. Regional population growth: Asia and Oceania, 2000-19

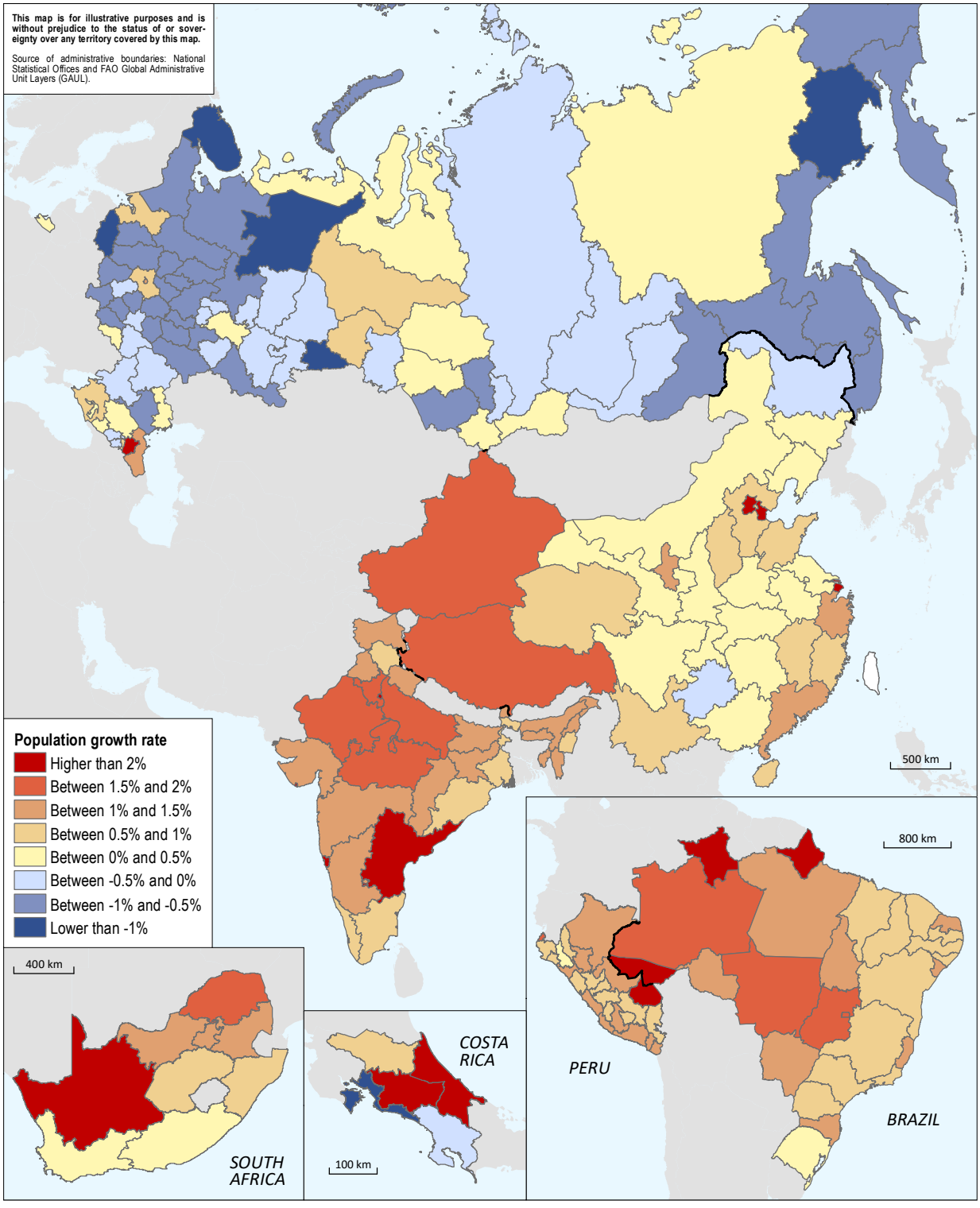
Average annual growth rate, small regions (TL3)



StatLink https://doi.org/10.1787/888934190571

4.6. Regional population growth: Emerging economies, 2000-19

Average annual growth rate, small regions (TL3)



StatLink https://doi.org/10.1787/888934190590

Global trends in city population growth

Across the world, high-income countries have the highest shares of people in cities and their commuting zones but that proportion is growing faster in poorer countries.

An increasing share of the world's population lives in cities and their commuting zones (FUAs). Between 1975 and 2015, the population living in FUAs increased from 2.1 billion (or 51.5% of the world population) to 4.9 billion (53.7%) (Figure 4.7). FUAs with a population above 5 million experienced the fastest growth. Based on elaborations on global population projections made by the European Union (EU) (Jones et al, forthcoming), these large FUAs are projected to continue to grow by 180% over the next 30 years, mostly driven by low-income countries, which are experiencing fast population growth. According to such projections, the population will increase in cities of all sizes globally but growth in small FUAs will occur at a slower pace. The population of FUAs between 50 000 and 250 000 inhabitants is expected to remain practically stable but the population of those between 1 and 5 million inhabitants is projected to grow by around 46% over the next 3 decades, reaching 1.5 billion by 2050.

The share of people living in cities and their commuting zones changes significantly across income levels, being significantly larger in high-income countries, compared to other income groups. While 71% of the population in high-income countries live in FUAs, this rate drops to 34% in low-income countries (Figure 4.8). The average city size varies depending on the income level of the country. When moving from high- to low-income countries (i.e. from the left to the right of Figure 4.8), the population share in FUAs between 250 000 and 1 million inhabitants halves (from 17% to 8%). In contrast, the average share of people living in FUAs with less than 250 000 people increases from 7% to 11%.

Many countries have experienced sizeable shifts in the geographic distribution of their population in the past decades, in particular less urbanised countries, where many towns transformed into cities and metropolitan areas. Between 2000 and 2015, the total world population living in FUAs has increased by 1.3% per year (21% over the whole period). Low-income countries experienced the fastest growth of cities and their commuting zones, in those countries, the population has increased by 3% per year (or about 55% across the period), while OECD countries grew by 0.83% per year (13.2% over the whole period) (Figure 4.9). During the same period, cities and their commuting zones grew fastest in Sub-Saharan Africa by 3% annually (or about 52% across the period), reflecting both the general high population growth in that region and growing urbanisation. On the other hand, the slowest growth was observed in Central Asia and Europe, where the total FUA population increased by 0.55% per year (or 8% over the whole period).

While FUAs have been growing faster than other places in OECD countries, around one in five FUAs has been shrinking since 2000. Population decline in FUAs was particularly pronounced in Latvia and Lithuania, where all FUAs lost population. In countries, such as Hungary, Japan, Korea and Slovenia, about half of all FUAs have recorded population loss since 2000 (Figure 4.10 to Figure 4.12). The "shrinking cities" phenomenon brings unprecedented challenges to policymakers and it is projected to become even more pressing in the coming decades. According to recent estimations (Jones, B. et al), 35% of all FUAs (20% in OECD FUAs) is expected to experience population decline between 2020 and 2050.

Definition

Delineation of cities and their commuting zones: This section documents population trends of cities and their respective commuting zones for the entire world. For such global analysis, cities and commuting zones were consistently delineated without relying on any local administrative definition and using gridded population data only. Details on the gridded FUA delineation method are provided in Moreno-Monroy, Schiavina and Veneri (2020).

Classification of countries by income levels: According to the World Bank, low-income economies are defined as those with a gross national income (GNI) per capita of USD 1 025 or less in 2018; lower-middle-income with a GNI per capita between USD 1 026 and USD 3 995; upper-middle-income economies with a GNI per capita between USD 3 996 and USD 12 375; high-income economies with a GNI per capita of USD 12 376 or more.

Sources

OECD (2020), *World Cities Tool (database)*, OECD, Paris, *http://www.worldcitiestool.org/*.

Jones, B. et al. (forthcoming), *Projecting Global Population Grids to 2100*, Publications Office of the European Union.

Reference years and territorial level

2000-15, estimated FUAs (eFUAs).

Further information

EU-OECD (2020), *Cities in the World: A New Perspective on Urbanisation*, OECD Urban Studies, OECD Publishing, Paris, *https://doi.org/10.1787/d0efcbda-en*.

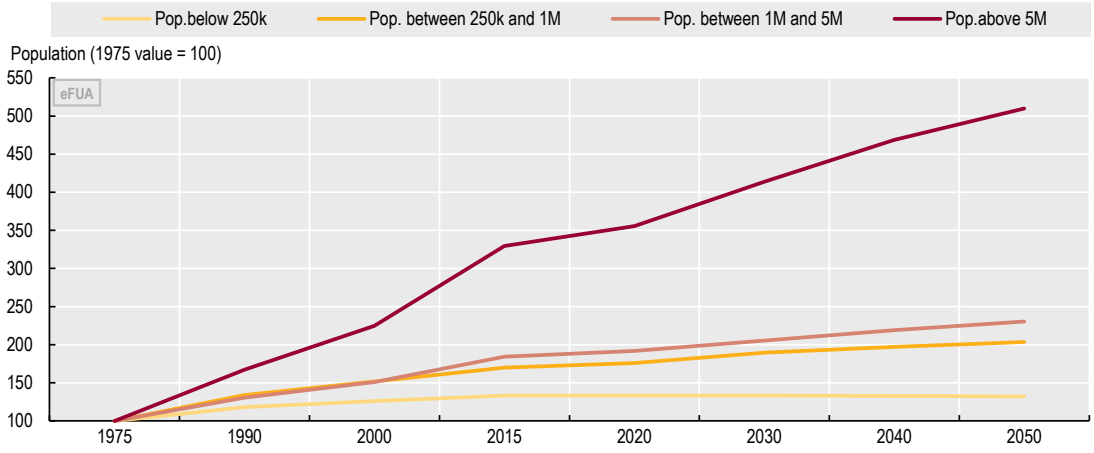
Moreno-Monroy A.I., M. Schiavaina and P. Veneri (2020), "Metropolitan areas in the world. Delineation and population trends", *Journal of Urban Economics*, *https://doi.org/10.1016/j.jue.2020.103242*.

Figure notes

Figure 4.8 and Figure 4.9: NA: North America; ME & NA: Middle East and North Africa; LA & C: Latin America and the Caribbean; E & CA: Europe and Central Asia; EA & P: East Asia and the Pacific, SSA: Sub-Saharan Africa.

4.7. Changes in global population in FUAs, 1975-2050

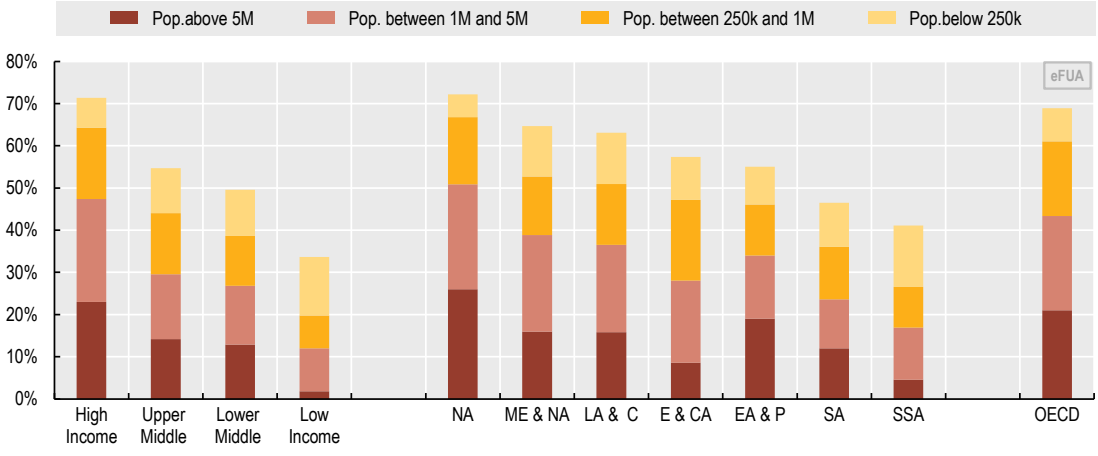
Total population (in millions)



StatLink https://doi.org/10.1787/888934190609

4.8. Functional urban areas by countries' income and region, 2015

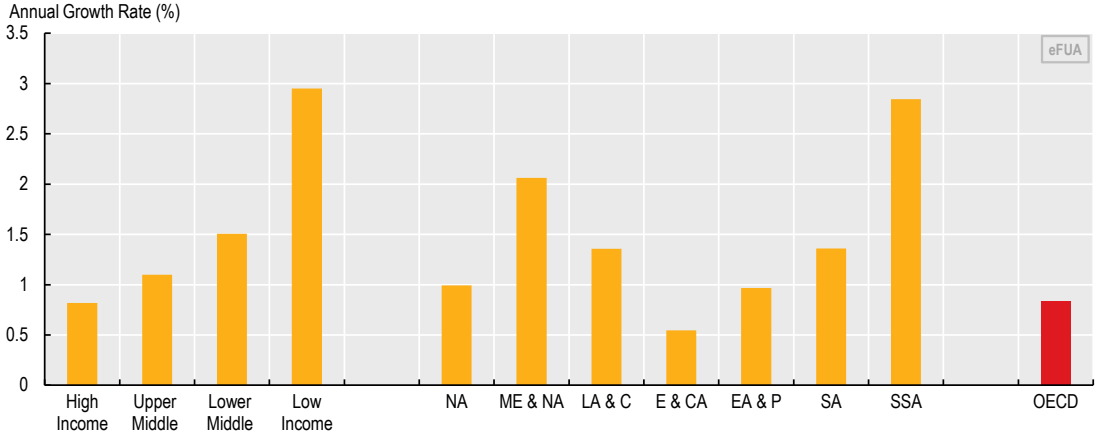
FUA population as a percentage of the total population



StatLink https://doi.org/10.1787/888934190628

4.9. Annual metropolitan population growth by countries' income and region, 2000-15

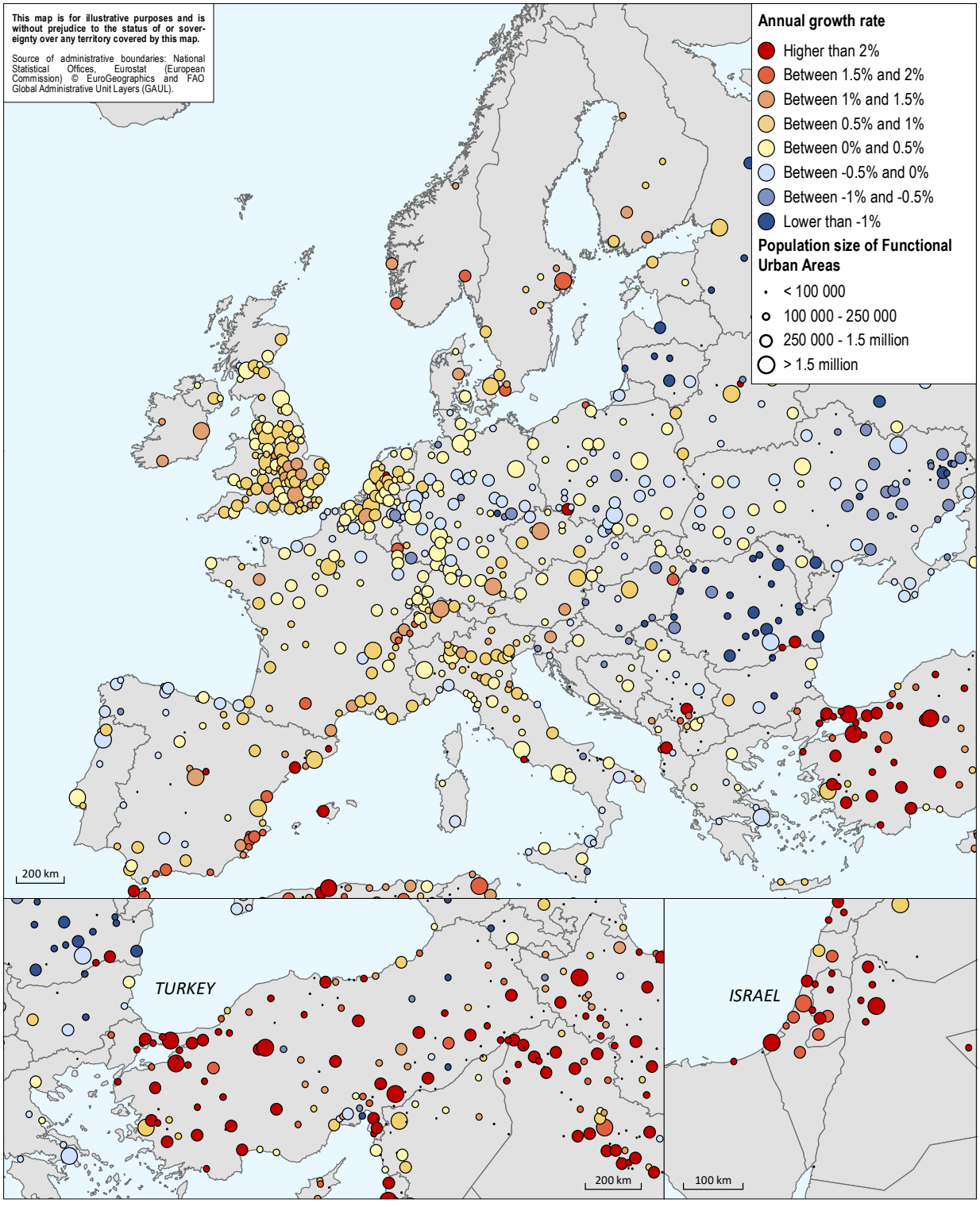
Annual average population growth rate in FUAs



StatLink https://doi.org/10.1787/888934190647

4.10. Population growth and size in metropolitan areas: Eurasia and Africa

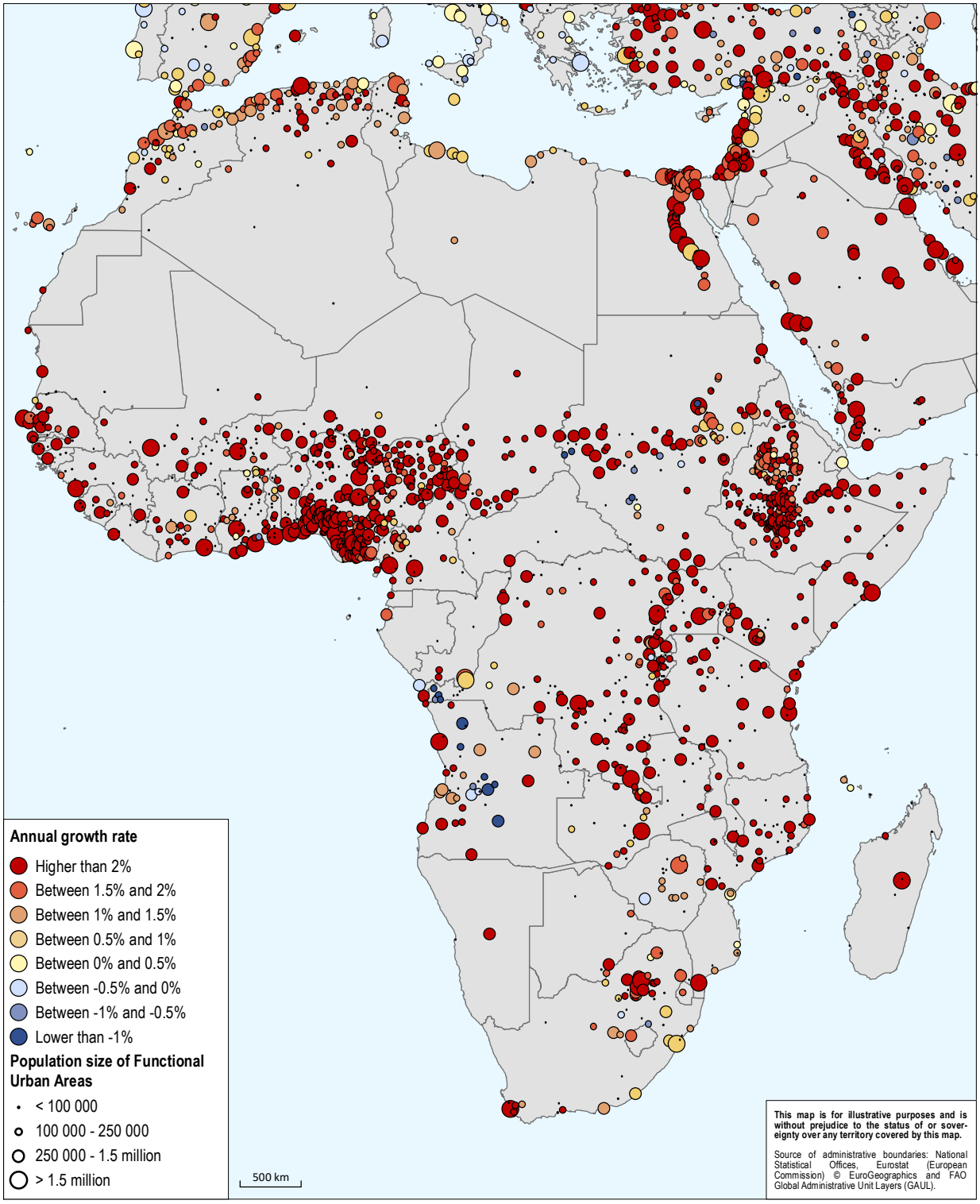
Annual population growth between 2000 and 2015, population size in 2015



StatLink https://doi.org/10.1787/888934190666

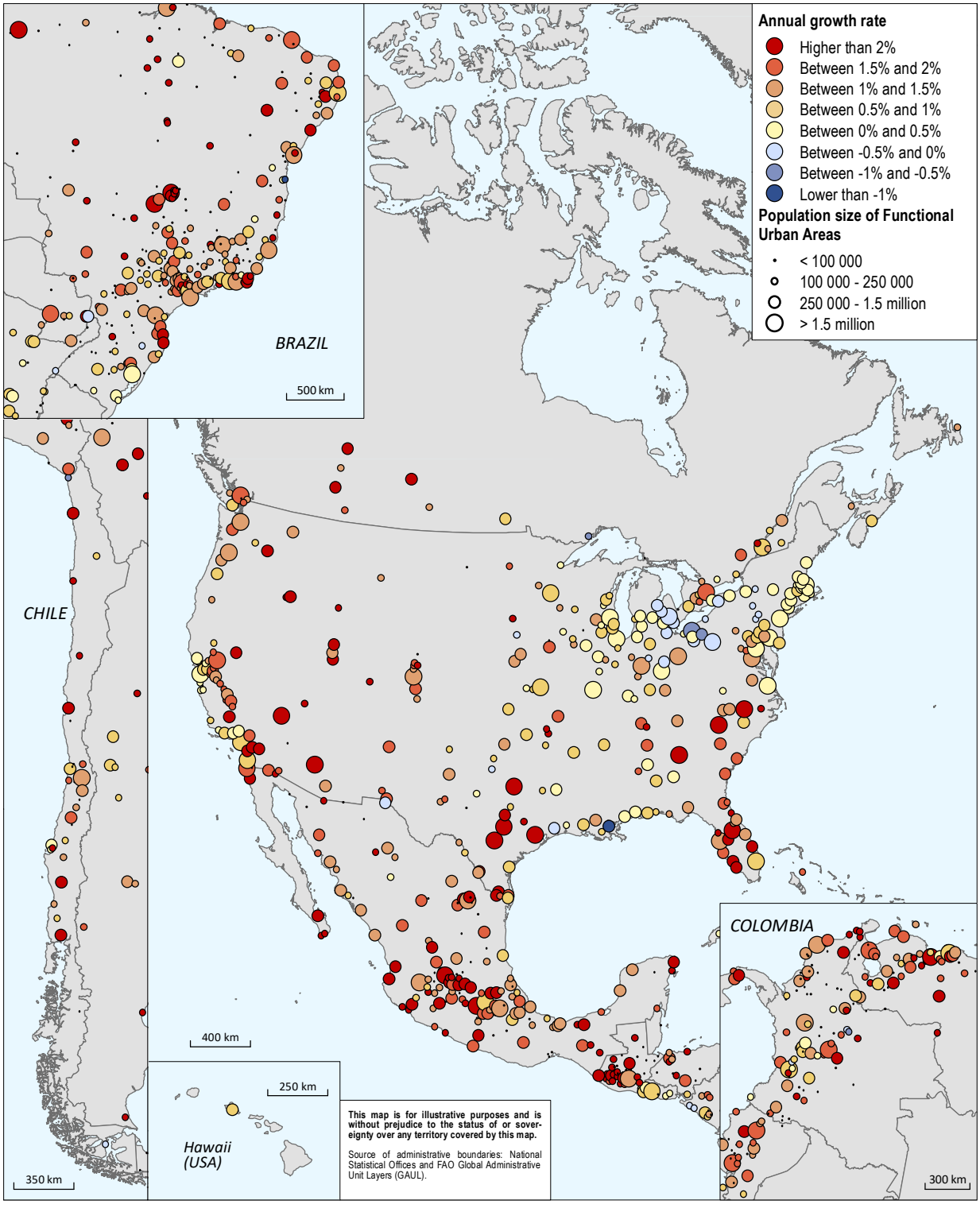
4.10. Population growth and size in metropolitan areas: Eurasia and Africa *(cont.)*

Annual population growth between 2000 and 2015, population size in 2015



4.11. Population growth and size in metropolitan areas: North and South America

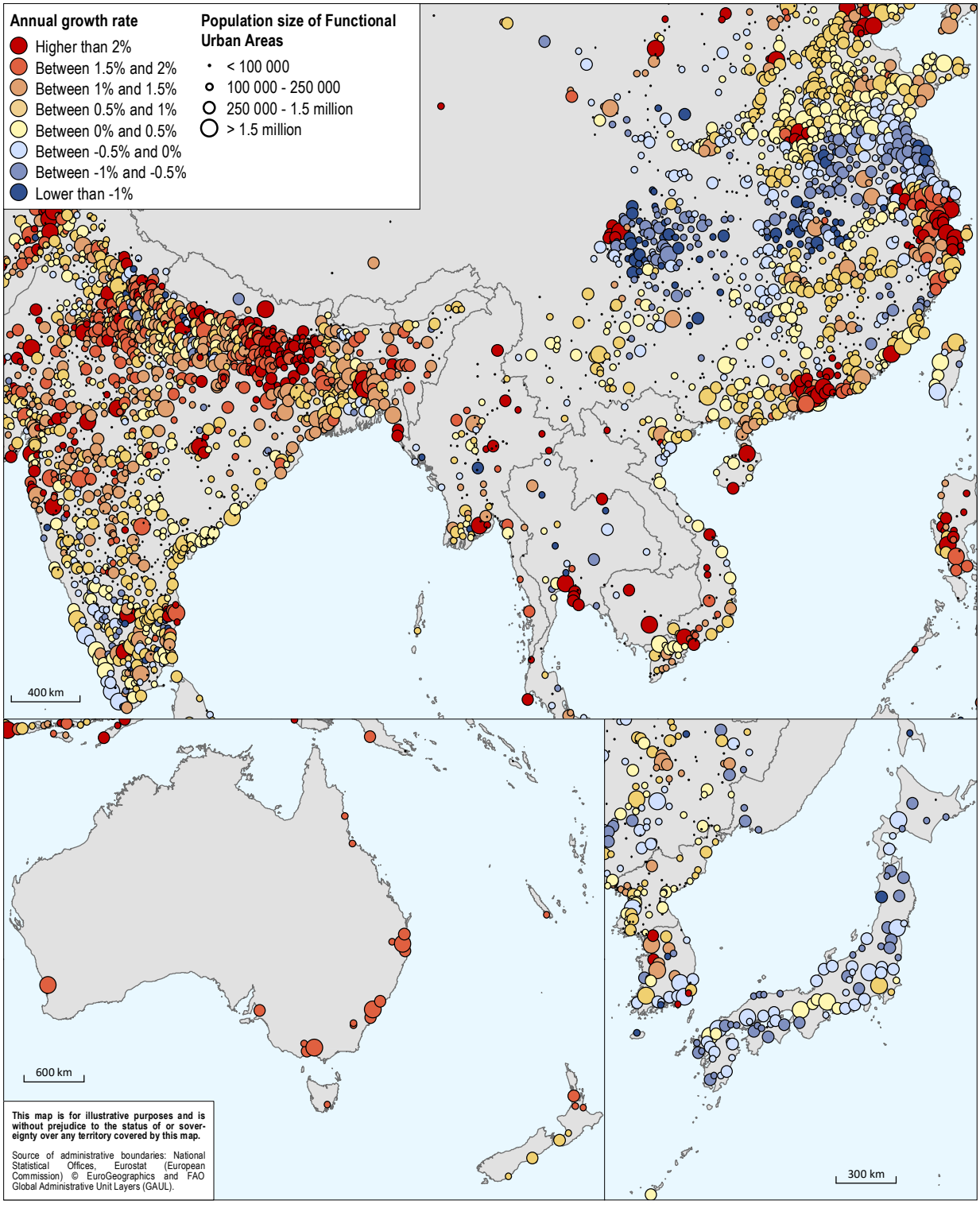
Annual population growth between 2000 and 2015, population size in 2015



StatLink https://doi.org/10.1787/888934190685

4.12. Population growth and size in metropolitan areas: Asia and Oceania

Annual population growth between 2000 and 2015, population size in 2015



StatLink https://doi.org/10.1787/888934190704

The changing shape of cities: Density and suburbanisation

Cities in low-income countries are almost four times denser than in high-income countries.

By definition, cities are densely populated areas. However, not all cities are equally dense. On average, cities in low-income countries have the highest densities in the world, close to 10 000 inhabitants per km^2, compared to 7 200 in lower-middle-income countries, 5 300 in upper-middle-income and only 2 800 in high-income countries (Figure 4.13). These differences in population density are also noticeable by world regions. In North America, the world region with the lowest density, cities have on average 1 700 inhabitants per square kilometre, which is significantly lower than in the second least densely populated region, Europe, where cities have close to 4 000 inhabitants per square kilometre. In contrast, cities in South Asia and Sub-Saharan Africa are the most densely populated, with an average of 8 000 inhabitants per square kilometre.

Globally, the population density of cities has grown since 2000 practically everywhere, due to widespread population growth. In general, the growth of the city population can occur in three ways. First, new cities can emerge from towns and other smaller settlements by reaching a population of at least 50 000 inhabitants. Second, cities can expand through the emergence of new dense neighbourhoods at their edge. Finally, city population can grow through densification within existing city boundaries (i.e. densification).

Over the last decades, the city densification has gained further importance as the main source of city population growth (Figure 4.14). Between 1975 and 1990, densification accounted for 50% of the global city population growth, while its contribution increased to 60% in 2000-15. Across the period 1975-2015, the importance of city expansion remained unchanged and accounted for roughly a quarter of city population growth. From 1975 to 1990, towns growing into cities accounted for 24% of city population growth but this contribution decreased to 16% in between 2000-15.

The growth of the city population occurred together with the growth of their surrounding commuting zones. Overall, the population in commuting zones surrounding cities have grown at a higher pace than in the cities themselves since 2000. In 2015, the population in commuting zones represented 17% of the overall metropolitan population and 9% of the total world population, compared to 16% and 7% in 1975 respectively. However, these figures do not capture significant differences across country income groups. In high-income countries, the population in commuting zones is often considerable, representing on average 30% of the total FUA population, while it is still negligible in low-income countries. In upper-middle and lower-middle countries, commuting zones account for 18% and 10% of the total FUA population (Figure 4.15).

Definition

Delineation of cities and their commuting zones: This section documents population trends of cities and their respective commuting zones for the entire world. For such global analysis, cities and commuting zones were consistently delineated without relying on any local administrative definition and using gridded population data only. The method to delineate commuting zones surrounding cities does make direct use of commuting flow data, as such data would not be available for the entire world. Instead, commuting zones are defined through a probabilistic approach which is trained using the information on the boundaries of FUAs, where the EU-OECD definition was already available (Dijkstra, Poelman, Veneri, 2019). Details on the gridded FUA delineation method are provided in Moreno-Monroy, Schiavina and Veneri (2020).

Source

OECD (2020), *World Cities Tool (database)*, OECD, Paris, *http://www.worldcitiestool.org/*.

Reference years and territorial level

1975-2015, estimated FUAs (eFUAs).

Further information

EU-OECD (2020), *Cities in the World. A New Perspective on Urbanisation*, OECD Urban Studies, OECD Publishing, Paris, *https://doi.org/10.1787/d0efcbda-en*.

Moreno-Monroy A.I., M. Schiavaina and P. Veneri (2020), “Metropolitan areas in the world. Delineation and population trends”, *Journal of Urban Economics*, *https://doi.org/10.1016/j.jue.2020.103242*.

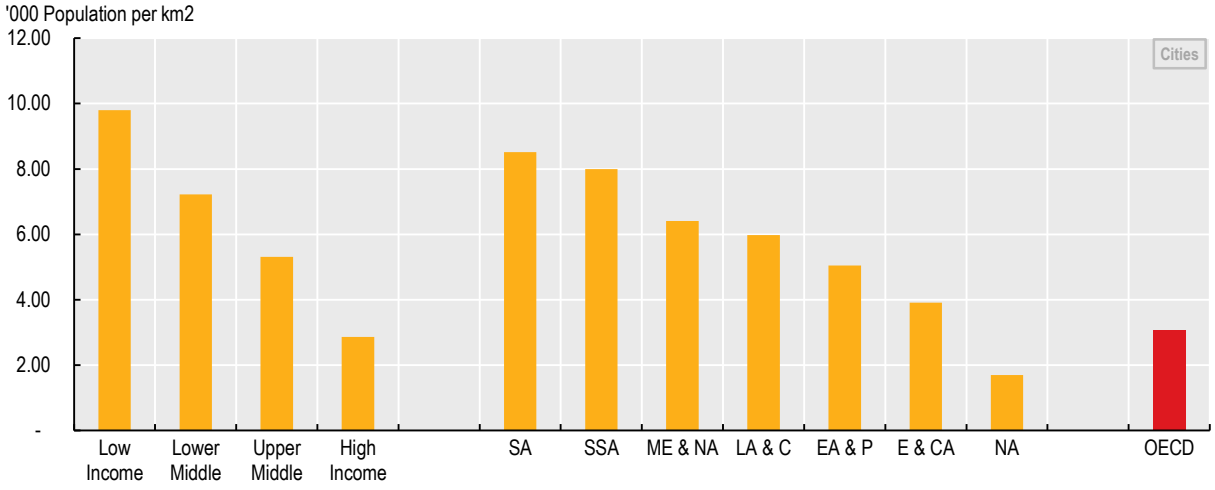
Dijkstra, L., H. Poelman and P. Veneri (2019), "The EU-OECD definition of a functional urban area", *OECD Regional Development Working Papers*, No. 2019/11, OECD P ublishing, Paris, *https://doi.org/10.1787/d58cb34d-en*.

Figure notes

Figure 4.13: NA: North America; ME & NA: Middle East and North Africa; LA & C: Latin America and the Caribbean; E & CA: Europe and Central Asia; EA & P: East Asia and the Pacific, SSA: Sub-Saharan Africa.

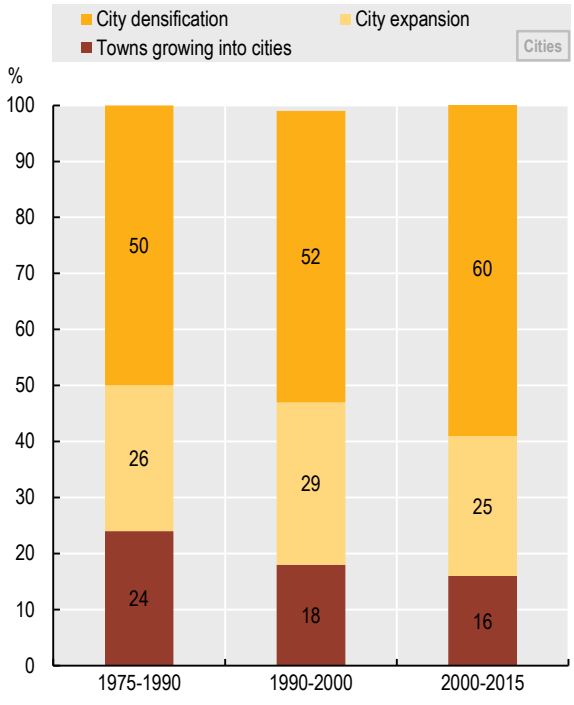
4.13. The population density in cities by country income class and region, 2015

Resident population in cities over land areas



StatLink https://doi.org/10.1787/888934190723

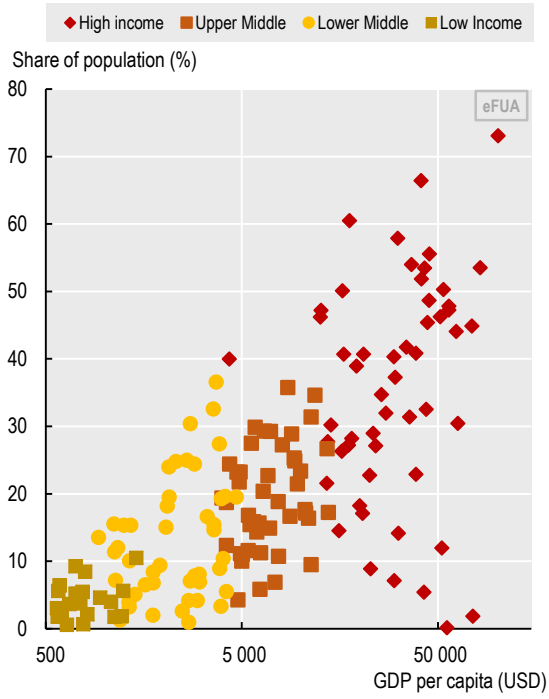
4.14. Sources of population growth, 1975-2015



StatLink https://doi.org/10.1787/888934190742

4.15. Country income and cities' commuting zones, 2015

Average share of the population living in the commuting zone over total FUA population by country



StatLink https://doi.org/10.1787/888934190761

Regions and cities facing ageing

While population ageing challenges all regions, large metropolitan regions have fewer elderly residents relative to the working-age population.

While demographic change is often less prominent in the public debate than other global megatrends, the effects of population decline and ageing within OECD countries will be significant (OECD, 2019). Although increases in life expectancy are one of the greatest human achievements, the transition to an ageing society will create challenges in ensuring high-quality public services. Continuous ageing of the population of OECD regions and cities will put social security systems under pressure, as shrinking workforces will have to cover the benefits for an increasing number of retirees. Moreover, healthcare and other public services will have to be adapted while tax revenues might decline due to a shrinking workforce.

Population ageing has been asymmetric across regions, affecting specific places more strongly than others. The differences within countries are particularly significant in Australia, Canada, France and the United Kingdom, where the elderly dependency rate (the share of individuals aged 65 or older over the economically-active population 15-64 years old), ranges from more than 50% in some regions to less than 10% in others (Figure 4.16).

Not all types of regions face the same level of pressure from ageing. In most countries, dependency rates remain significantly lower in metropolitan regions compared to other regions (Figure 4.17). This is particularly the case in countries where all non-metropolitan regions have particularly high elderly dependency rates such as Denmark, France, Japan and Korea. In these countries, all non-metropolitan regions have elderly dependency rates above 40% (reaching 62% in Japan). Elderly dependency rates in metropolitan regions remain below 30% in all OECD countries, with the exception of Japan where the rate is 46%. Between 2002 and 2019, the elderly dependency rate increased from 7.6 percentage points in remote regions near a small/medium city to 10 percentage points in regions near a metropolitan area across OECD countries (Figure 4.18).

Definition

The elderly population is the population aged 65 years and over.

Elderly dependency rate is defined as the ratio between the elderly population and the working-age population (15-64 years), multiplied by 100.

Access to metropolitan areas typology distinguishes TL3 regions based on the level of access to metropolitan areas (Fadic et al., 2019). At a first level, regions, where at least half of the regional population live in a metropolitan area of at least 250 000 inhabitants, are considered as “metropolitan regions”, and as “non-metropolitan” otherwise. Metropolitan regions are further distinguished in “large metropolitan regions” regions if they include or are part of a metropolitan area of at least 1.5 million inhabitants. Non-metropolitan regions are sub-classified in regions “with access to a metropolitan region” if half of its population can reach a metropolitan area within a 60-minute drive. When half of the regional population can reach only a smaller-sized city (between 50 000 and 250 000 inhabitants), the region is classified as “with access to a small/medium city”. In all other cases, the region is classified as “remote”. The classification relies on the concept of FUAs (Dijkstra et al., 2019; OECD, 2012) to delineate metropolitan areas of at least 250 000 inhabitants or smaller-sized cities.

Source

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, http://dx.doi.org/10.1787/region-data-en.

Reference years and territorial level

2002-19, TL3 regions or TL3 regions classified according to metropolitan access classification (see definition).

Further information

Dijkstra, L., H. Poelman and P. Veneri (2019), “The EU-OECD definition of a functional urban area”, *OECD Regional Development Working Papers*, No. 2019/11, OECD P ublishing, Paris, *https://doi.org/10.1787/d58cb34d-en*.

Fadic, M. et al. (2019), “Classifying small (TL3) regions based on metropolitan population, low density and remoteness”, *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris, *https://doi.org/10.1787/b902cc00-en*.

OECD (2019), *OECD Regional Outlook 2019: Leveraging Megatrends for Cities and Rural Areas*, OECD Publishing, Paris, *https://doi.org/10.1787/9789264312838-en*.

OECD (2012), *Redefining “Urban”: A New Way to Measure Metropolitan Areas*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264174108-en*.

Figure notes

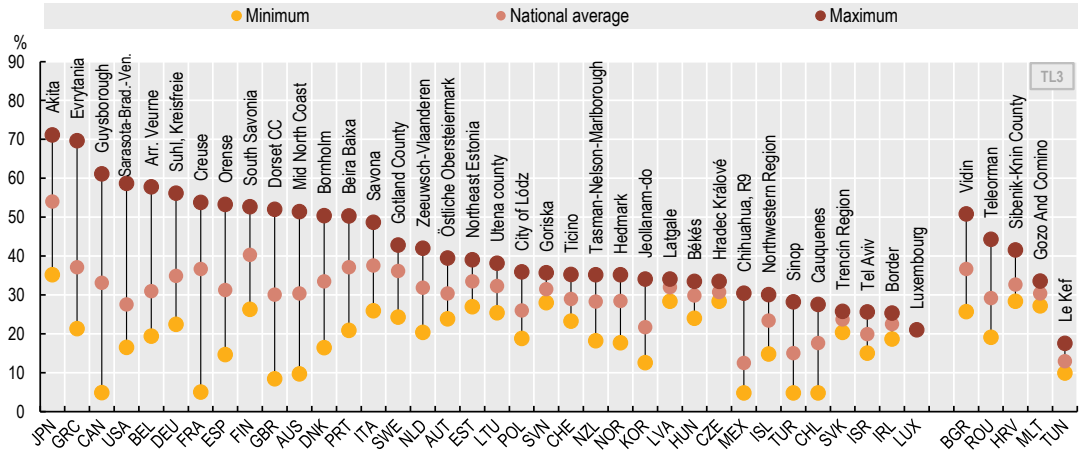
Figure 4.16: 2019 data, except USA (2018).

Figure 4.17: 2019 Population weighted average elderly ratios, except USA (2018).

Figure 4.18: Population weighted average elderly ratios by metropolitan access typology covering the following countries: AUS, AUT, BEL, CAN, CHL, CZE, DNK, EST, FIN, FRA, DEU, GRC, HUN, IRL, ISL, ITA, KOR, LVA, LTU, LUX, NLD, NOR, POL, PRT, ESP, SVK, SVN, SWE, CHE, GBR. Figure excludes JPN, MEX and USA.

4.16. Regional differences in the elderly dependency rates, 2019

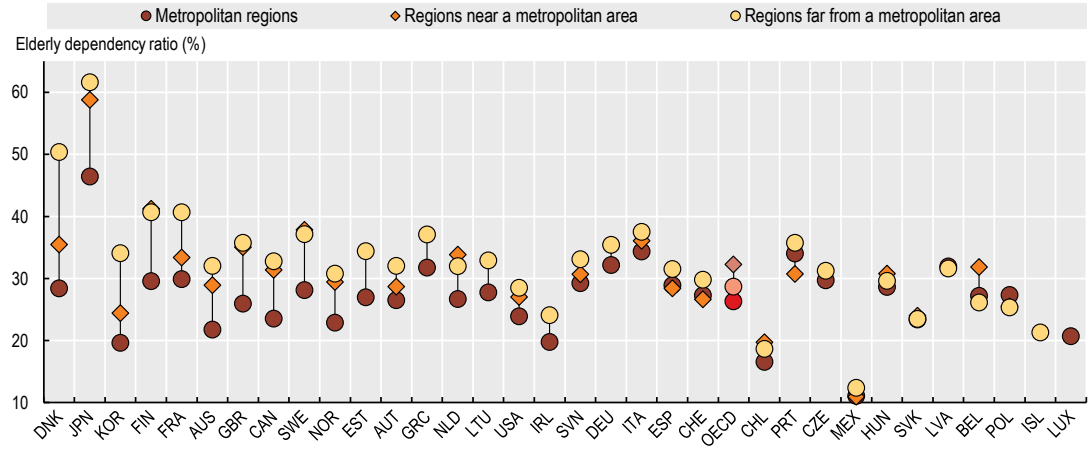
Small regions (TL3)



StatLink https://doi.org/10.1787/888934190780

4.17. Elderly dependency rates by country and type of region, 2019

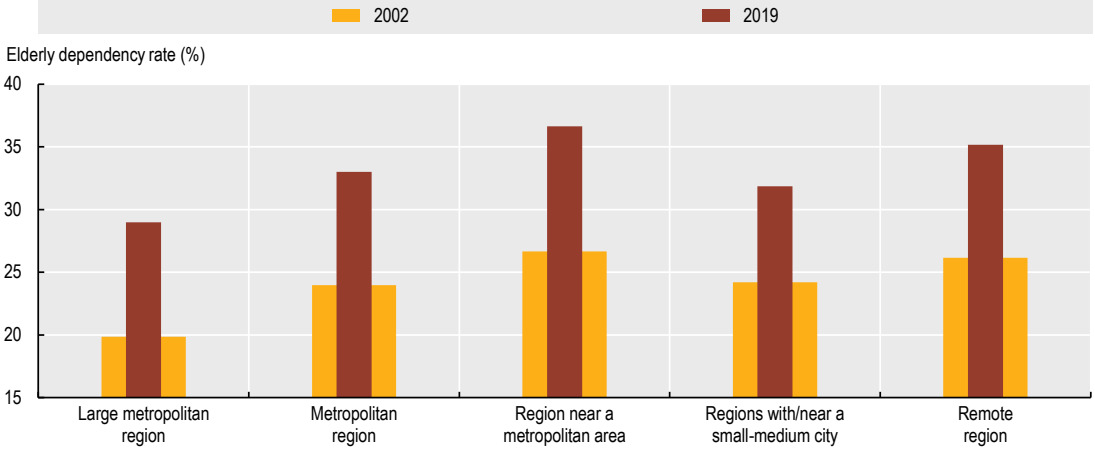
Small regions (TL3)



StatLink https://doi.org/10.1787/888934190799

4.18. Elderly dependency rates by type of region

Small regions (TL3)



StatLink https://doi.org/10.1787/888934190818

Population mobility across regions

Since 2015, within-country migration of people below 30 years old has been almost exclusively concentrated towards metropolitan regions.

Differences in economic opportunities or amenities can drive people to move within a country. The resulting mobility of people has wide-ranging implications for the region affecting the demographic structure of the local population, the labour markets and local housing costs.

Between 2015 and 2018, 33 million people changed their region of residence per year, on average, in the 30 OECD countries with available data. These mobility flows across regions corresponded to 2.5% of the total population in the OECD area. However, regional mobility varied significantly across countries, ranging from around 5% of the total population in Hungary and Korea to less than 0.5% in the Slovak Republic (Figure 4.19).

Inter-regional migration does not affect all regions of a country in the same way. While metropolitan regions and regions near a metropolitan area record significant positive net inflows, other types of regions often face net outflows. In the 27 OECD countries with available data, metropolitan regions and regions near a metropolitan area experienced an average net inflow of 9 and 12 persons per every 10 000 inhabitants between 2015 and 2018 respectively (Figure 4.20). In contrast, regions far from a metropolitan area experienced net outflows of 9 persons, for every 10 000 inhabitants. Looking at individual regions, Sejong (Korea), Parinacota (Chile), and Flagstaff (United States) were the regions with the highest positive net migration rate, corresponding to 12%, 3.8% and 2.8% of the regional population respectively (Figure 4.21). In contrast, during the same period, Trier (Germany), Anchorage (United States) and Noord-Drenthe (Netherlands) experienced net out-migration that corresponded to 12%, 5.1% and 4.2% of the respective regional population.

Mobility of young people (aged from 15 to 29 years) represents more than half of the total within-country migration. In almost all OECD countries for which data is available, young people move almost exclusively to metropolitan regions, as they seek educational and professional opportunities (Figure 4.22). On average, metropolitan regions have captured 95% of within-country youth migration during the last four years. Greece represents an exception to those trends, as regions with small-/medium-sized cities and remote regions actually recorded positive net inflows possibly driven by high youth unemployment that has resulted in young people returning to live with their families.

Definition

Data refer to yearly flows of the population from one TL3 region to another TL3 region of the same country. Outflows are represented as the number of persons who left the region the previous year to reside in another region of the same country, while inflows are represented as the number of new residents in the region coming from another region of the same country.

The net migration flow is defined as the difference between inflows and outflows in a region. A negative net migration flow means that more people left the region than entered it.

Young internal migrants are those aged between 15 and 29 years old.

Access to metropolitan areas typology: The proposed classification distinguishes TL3 regions based on the level of access to metropolitan areas (Fadic et al., 2019). To capture the boundaries of metropolitan areas, the classification relies on the concept of FUAs (Dijkstra et al., 2019; OECD, 2012) which are composed of cities and their respective commuting zones.

Source

OECD (2020), *OECD Regional Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/region-data-en*.

Reference years and territorial level

2015-18; TL3 or TL3 regions classified according to metropolitan access classification.

Further information

Fadic, M. et al. (2019), "Classifying small (TL3) regions based on metropolitan population, low density and remoteness", *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris, *https://doi.org/10.1787/b902cc00-en*.

Territorial grids and regional typology (Annex A)

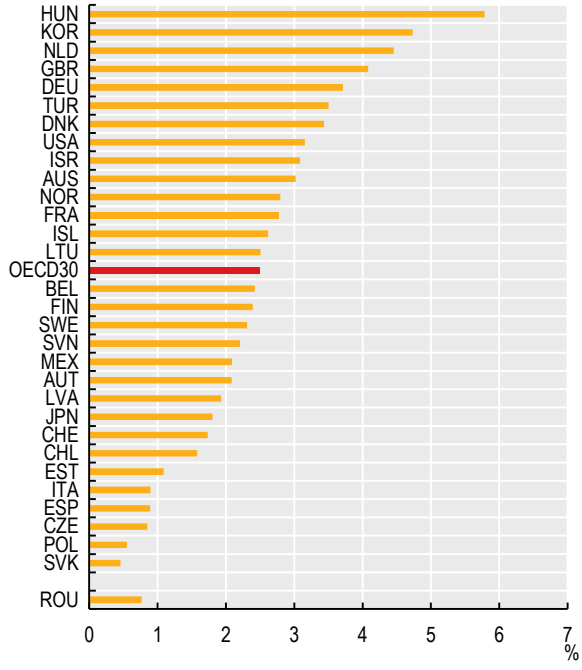
Figure notes

Figure 4.19 to Figure 4.21: 4-year average, 2015-18.

Figure 4.22: N-M access to a metro: Non-metropolitan region with access to a metro; N-M access to s/m city: Non-metropolitan region with access to a small/medium city.

4.19. Annual inter-regional population mobility, 2015-18

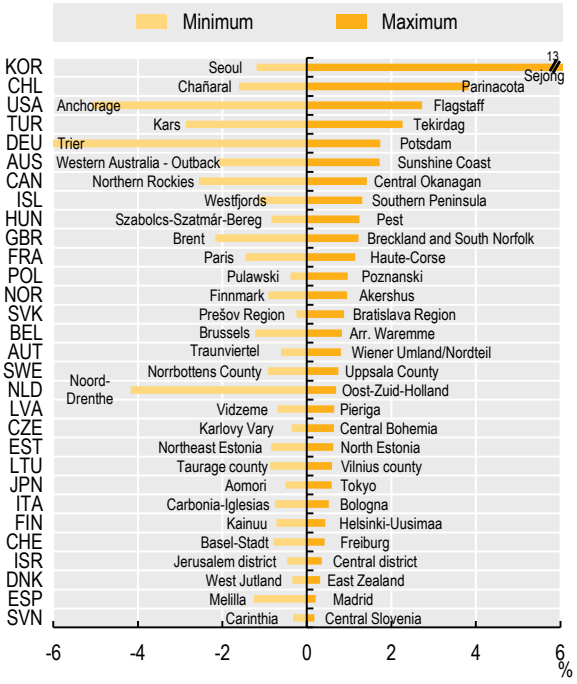
Flows across TL3 regions, percentage of the total population



StatLink https://doi.org/10.1787/888934190837

4.20. Population flows across small regions, 2015-18

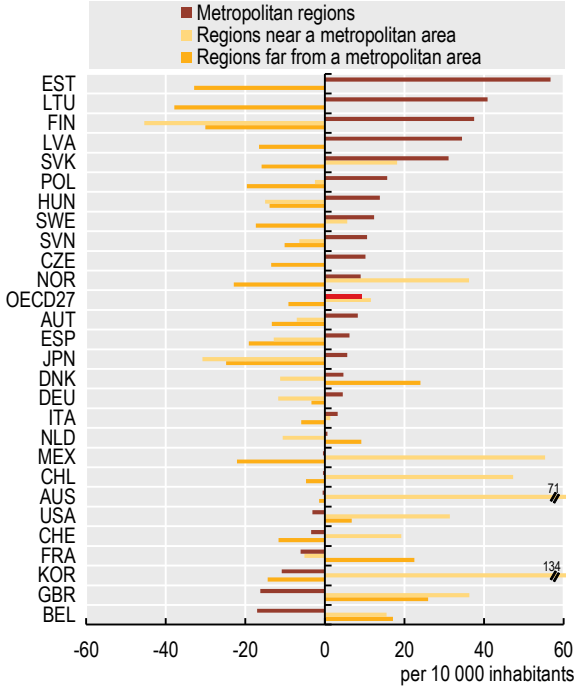
Net flows across TL3 regions, percentage of the total population



StatLink https://doi.org/10.1787/888934190856

4.21. Annual regional population flows by type of region, 2015-18

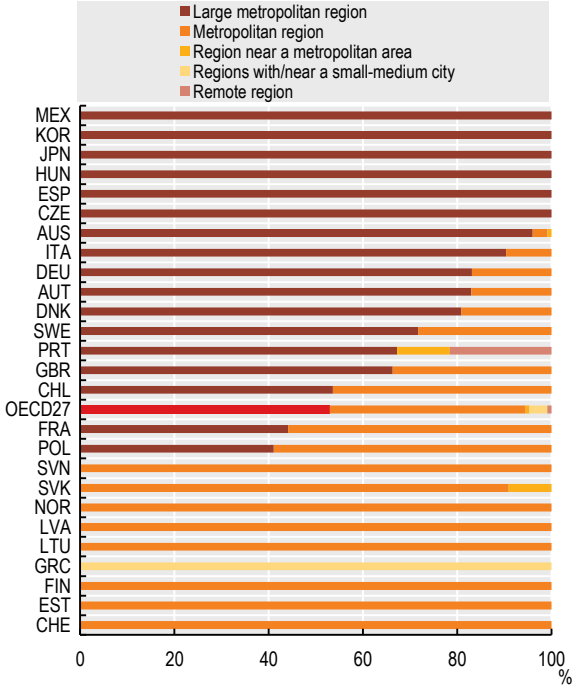
Net flows across regions per 10 000 population, 4-year average



StatLink https://doi.org/10.1787/888934190875

4.22. Share of young movers by type of region, 2015-18

Positive net population flows of youth (15 to 29 years old) across regions, 4-year average



StatLink https://doi.org/10.1787/888934190894





5. SUBNATIONAL GOVERNMENT FINANCE AND INVESTMENT

Subnational government spending

Spending responsibilities across levels of government

Subnational government investment

Subnational government revenue

Subnational government debt

Regional government finance and investment in OECD countries

Municipal governments' finances and investments

This chapter presents an overview of the subnational finance of OECD countries. The chapter provides an update of the indicators on subnational government spending and investment. In addition, the chapter provides new disaggregated figures on expenditure and investment of regional governments for European Union (EU) and OECD countries, as well as on municipalities in 26 European and OECD countries.

Subnational government spending

Subnational governments play a significant role in public spending. Education, health and protection amount to 57% of total subnational government expenditure.

In 2018, subnational government (SNG) expenditure in the OECD accounted for 40.5% of total public expenditure, corresponding to 16.2% of gross domestic product (GDP) (Figure 5.1). SNG spending varies according to country size, territorial organisation, federal or unitary status, and the nature of responsibilities assigned to different government tiers. In federal countries, SNG expenditure accounted for 50.1% of total public expenditure and 19.3% of GDP in 2018. In contrast, in unitary countries, the share of SNG expenditure stood at 28.6% of total public expenditure and 12% of GDP respectively.

The share of public spending by SNGs is not homogeneous across countries, even considering federal and unitary countries separately. While in Austria, SNG spending represented 35.6% of total public expenditure, in Switzerland, this ratio amounted to 61.8% in 2018. Among unitary countries, the Nordic ones (Denmark, Finland, Sweden), as well as Japan and Korea stood out for their high share of local public spending (Figure 5.1). Spending indicators must, however, be interpreted with caution. While they provide valuable insights into the level of decentralisation, they do not convey the degree of decision-making power of SNG authorities, which can be limited due to mandatory expenses in case of shared or delegated competencies.

The breakdown of subnational expenditure by function provides an overview of SNGs' involvement in key economic sectors. In 2017, education represented the largest sector SNG spending, accounting for 24% of their expenditure (weighted average) (Figure 5.2) and 3.9% of GDP in the whole OECD area. This share was highest in the Baltic countries and the Slovak Republic.

The health sector is the second most important item in SNG expenditure in 2017, although its weight differs across countries. On average, health spending accounted for 18% of SNG expenditure and 2.9% of GDP. Health spending by SNGs reached 48.6% in Italy, whereas it accounted for less than 0.5% in Greece, Iceland, Ireland, Israel and New Zealand.

General public services (administration) and social protection were the third- and fourth-largest spending items for SNGs respectively. General public services accounted on average for 15% of SNG expenditure and 2.4% of GDP whereas social protection spending stood at 14% of SNG expenditure and 2.3% of GDP.

Economic affairs constituted the fifth most important sector (13% of total SNG expenditure in the OECD area). This sector encompasses spending in areas such as transport, commercial and labour affairs, economic intervention, manufacturing, energy and mining. The combined spending categories of defence and public order and safety summed up to 6.5% of subnational expenditure in 2017. The sector of recreation, culture and religion accounted for 3% of SNG expenditure. Housing and community amenities (water supply, public lighting, urban planning and renovation) averaged to 2.9% of subnational expenditure. Lastly, environmental protection (waste management, sewerage, parks and green spaces, among others) accounted for 2.6% of subnational spending.

Definition

General government includes four sub-sectors: central/federal government and related public entities; state government (e.g. states in the United States, *länder* in Germany, *cantons* in Switzerland, etc.) and related public entities; local government, i.e. regional and local governments and related public entities; and social security funds. Data are consolidated within the four sub-sectors. Subnational government is defined as the sum of state governments and local/regional governments.

Expenditure includes "current expenditure" and "capital expenditure". Capital expenditure is the sum of capital transfers and investment.

Expenditure by economic function follows the Classification of the 10 Functions of Government (COFOG): general public services; defence; public order and safety; economic affairs; environmental protection; housing and community amenities; health; recreation, culture and religion; education; and social protection.

Sources

OECD (2020a), *National Accounts Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/na-data-en*.

OECD (2020b), "Subnational government finance", *OECD Regional Statistics (database)*, OECD, Paris http://dx.doi.org/10.1787/region-data-en.

Estimates from IMF Government Statistics for Australia and Chile.

See Annex B for data sources and country-related metadata.

Reference years and territorial level

2018: National accounts; Levels of government; 2017: JPN, NZL, TUR.

Further information

OECD (2020), *Subnational Governments in OECD Countries: Key Data (brochure)*, OECD, Paris.

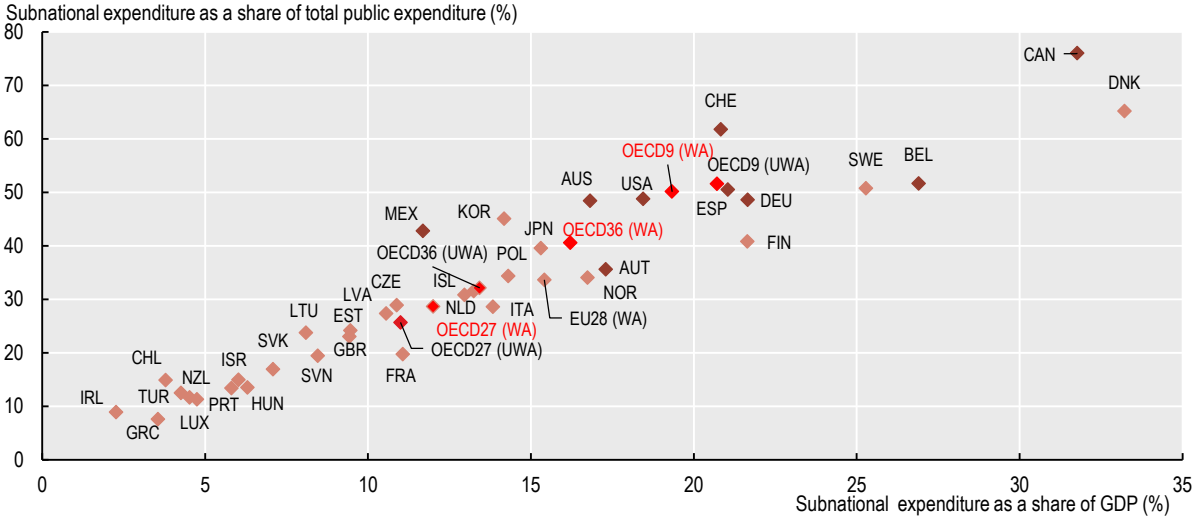
Figure notes

Figure 5.1 and Figure 5.2: OECD averages are presented as weighted (WA) and unweighted (UWA) average of OECD countries.

Figure 5.1: OECD9 and OECD27 refer respectively to the averages for OECD federal countries and OECD unitary countries. Federal countries: dark brown markers; Unitary countries: light brown markers.

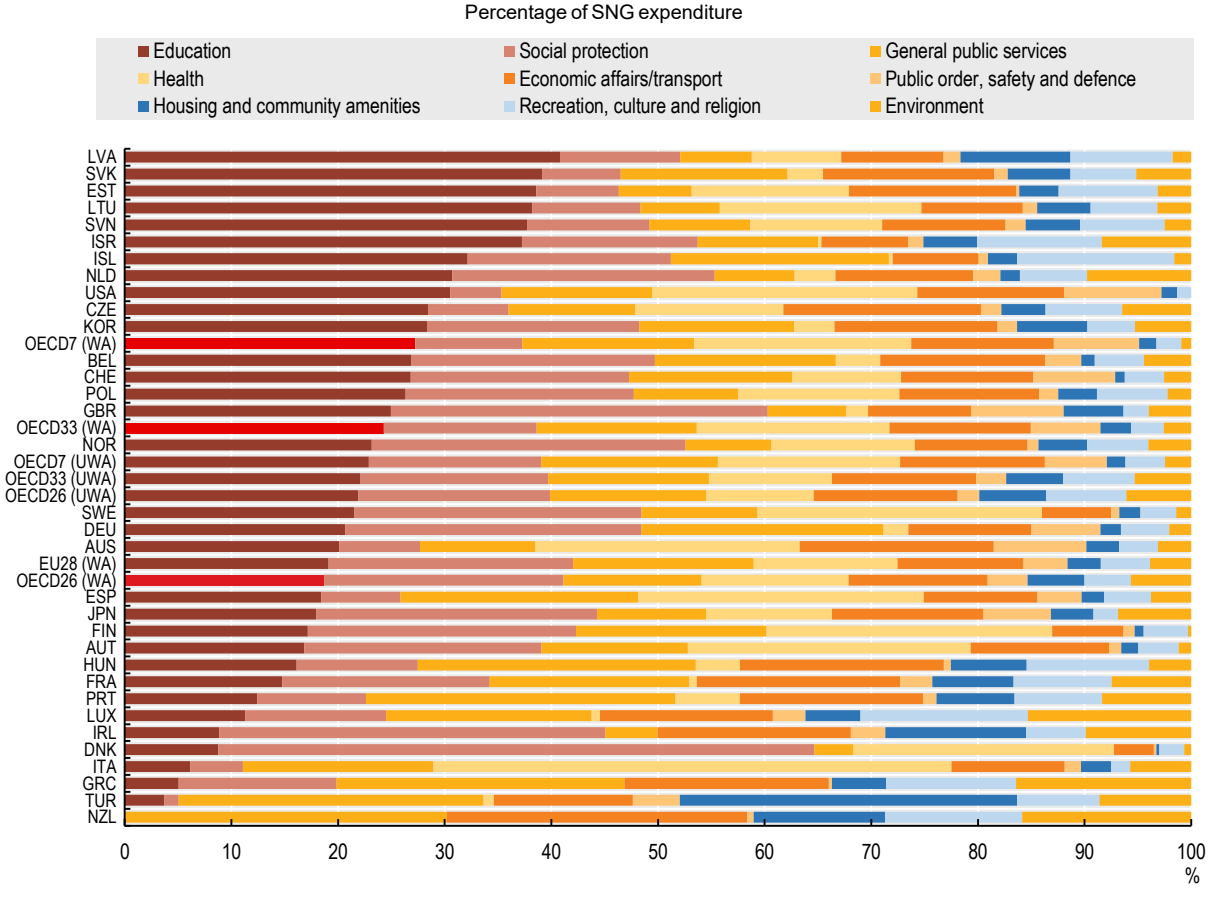
Figure 5.2: No data for Canada, Chile and Mexico. For the United States, data showed in the function "Housing and community amenities" include the "environment protection" function data. OECD7 and OECD26 refer respectively to the averages for OECD federal countries and OECD unitary countries.

5.1. Subnational government expenditure as a percentage of GDP and total public expenditure, 2018



StatLink https://doi.org/10.1787/888934190913

5.2. Breakdown of SNG expenditure by function (COFOG), 2017



StatLink https://doi.org/10.1787/888934190932

Spending responsibilities across levels of government

More than 59% of public spending in the areas of housing and community amenities, environmental protection and culture and recreation fall under the responsibility of SNGs.

The share of SNG expenditure in public expenditure by economic function reflects the distribution of responsibilities across levels of government. However, such an assignment does not imply that SNGs have full autonomy in exercising them.

SNGs in OECD member countries carry out a large share of the total public spending related to housing and community amenities, a sector that represents one of their key assigned responsibilities. In 2017, SNGs accounted for 76% of total public spending (unweighted average) in housing and community amenities (Figure 5.3); it exceeded 80% in half of the 33 OECD countries (Figure 5.4, panel A) and was even above 95% in Belgium, Estonia, Israel, Portugal, Spain and Switzerland.

The share of SNG spending in total public environmental protection spending was also sizable in 2017 and reached close to 64% (Figure 5.3). Environmental protection covers activities related to waste management, sewerage, parks and greens spaces, which are often devolved to local governments or undertaken by decentralised functional bodies (e.g. water boards in the Netherlands). The importance of SNG environmental spending was particularly high in the Netherlands and Turkey, where it accounted for more than 90% of total public environmental expenditure (Figure 5.4, panel B).

SNG spending on recreation, culture and religion also accounted for a large share (59%) of total public expenditure in that sector, with a ratio above 90% in Belgium, Germany, Japan and Switzerland.

Education is a shared competency across levels of government in a relatively equal manner. As a share of total public spending on education, subnational expenditure on education represented 48%. In many countries, SNGs are in charge of the construction and maintenance of education infrastructures, and the financing of school-related activities, especially at the primary level. SNGs are also often in charge of the payment of salaries for administrative staff and teachers, although they act more as paying agents with little discretion over such budget.

In the health sector, SNG spending represented 24.5% of public expenditure in the OECD. It exceeded 84% of total public health spending in Spain, Sweden and Switzerland where SNGs undertake broad responsibilities for planning and delivering healthcare services, especially in primary care centres at the municipal level, and hospital and specialised medicine at the provincial/regional levels. Yet, the health sector remains highly centralised in other countries, such as Greece, Ireland and New Zealand where SNG health expenditure accounted for less than 1% of total public health expenditure in 2017.

In the sector of economic affairs, SNGs accounted for approximately 34% of public spending. SNG economic affairs spending is highest in federal countries, reaching more than 60% in Australia, Belgium, Germany and the United States. Among unitary countries, Japan stood out as SNGs accounted for more than 53% of total economic affairs spending in 2017.

SNG spending on social protection accounted for 14% of total public spending in that sector. In most OECD countries, social protection and benefits are mainly provided by the central government, social security bodies or by insurance institutions. To date, defence and public order-related functions remain highly centralised in most OECD countries.

Definition

General government includes four sub-sectors: central/federal government and related public entities; state governments (e.g. states in the United States, *länder* in Germany, *cantons* in Switzerland, etc.) and related public entities; local government, i.e. regional and local governments and related public entities; and social security funds. Data are consolidated within the four sub-sectors. Subnational government is defined as the sum of state governments and local/regional governments.

Definitions of expenditure, expenditure by economic function are developed in Annex D.

Sources

OECD (2020a), *National Accounts Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/na-data-en*.

OECD (2020b), "Subnational government finance", *OECD Regional Statistics (database)*, OECD, Paris http://dx.doi.org/10.1787/region-data-en.

Estimates from IMF Government Statistics for Australia and Chile.

See Annex B for data sources and country-related metadata.

Reference years and territorial level

2018: National accounts; Levels of government; 2017: JPN, NZL, TUR.

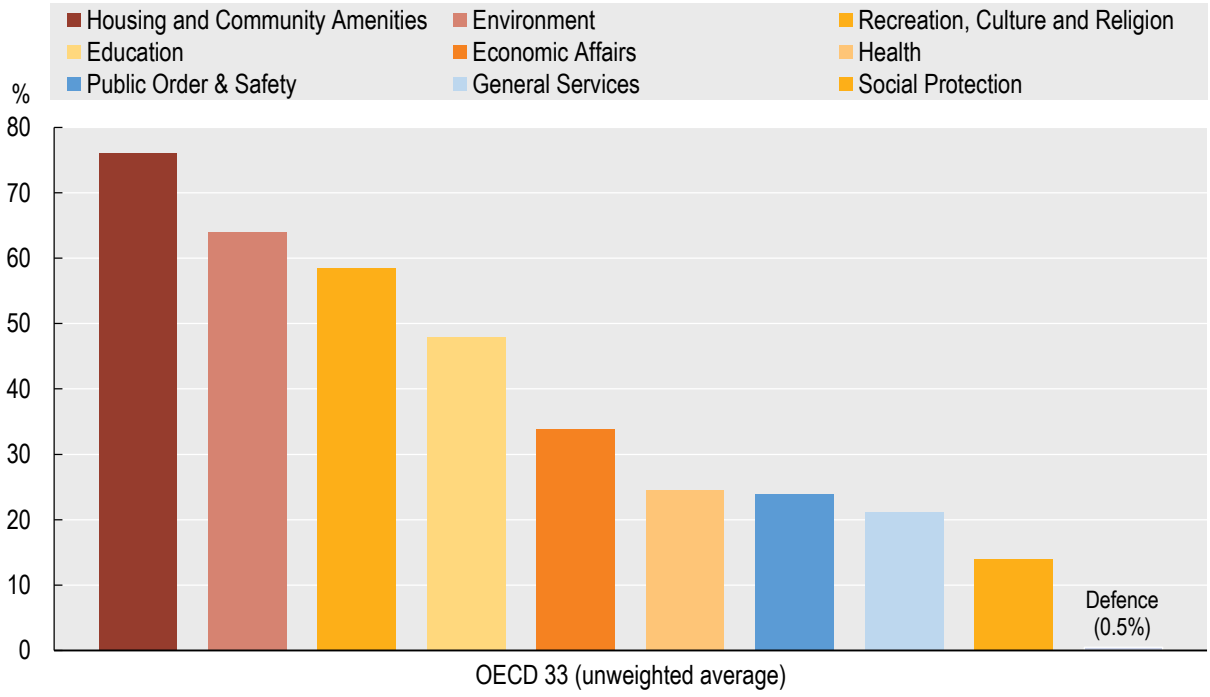
Further information

OECD (2020), *Subnational Governments in OECD Countries: Key Data (brochure)*, OECD, Paris.

Figure notes

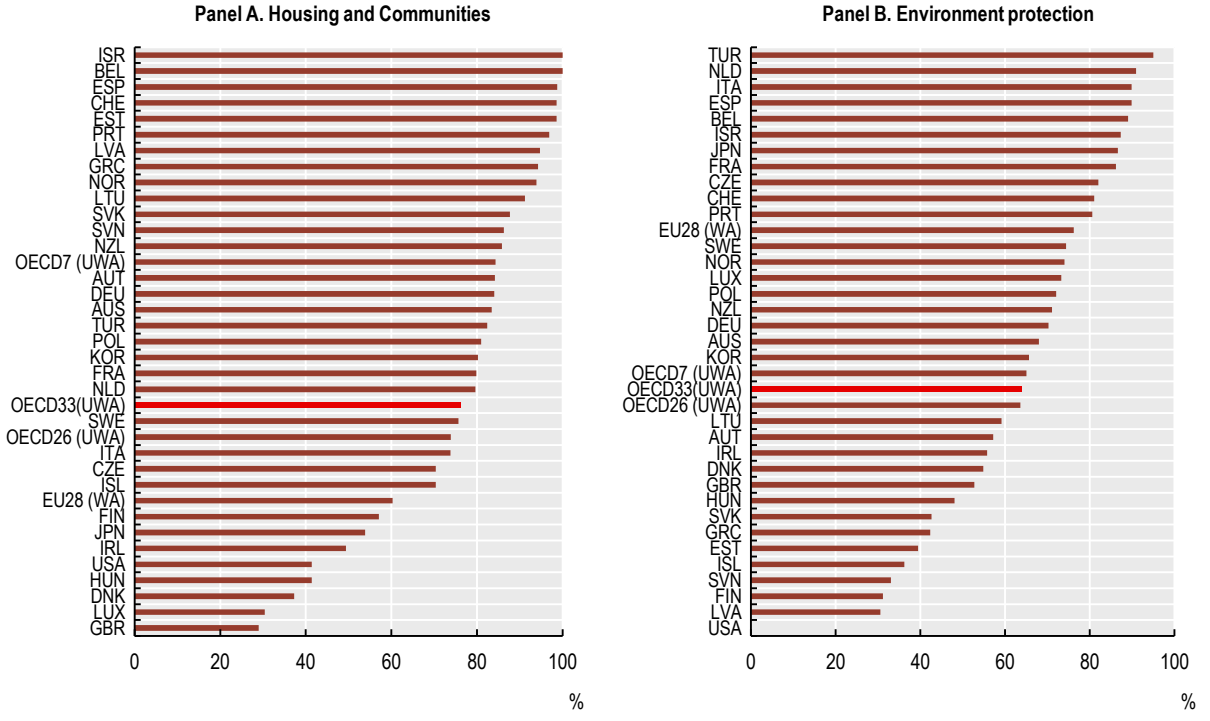
Figure 5.3 and Figure 5.4: OECD averages are presented as weighted (WA) and unweighted (UWA) average of OECD countries. The OECD average is calculated for 33 countries (no data for Canada, Chile and Mexico). For the United States, data showed in the function "Housing and community amenities" include the "environment protection" function data. OECD7 and OECD26 refer respectively to the averages for OECD federal countries and OECD unitary countries. The total of general government spending is non-consolidated.

5.3. The share of SNG in public expenditure by sector in OECD countries, 2017



StatLink https://doi.org/10.1787/888934190951

5.4. Subnational expenditure: Housing and community amenities, environment as a percentage of total public expenditure by economic function, 2017



StatLink https://doi.org/10.1787/888934190970

Subnational government investment

After strongly declining between 2009 and 2016, SNG investment has started to rebound. Regional and local governments remain key public investors, accounting for almost 58% of total public investment in 2018.

In 2018, SNGs in OECD countries undertook 57.6% of total public investment on average (Figure 5.5). The share of public investment made by SNGs is significantly higher in federal countries (62.6% compared to 51.9% in unitary countries). Combining investments by the state governments and the local level, SNG investment exceeds 80% of public investment in Belgium and Canada. At the other end of the spectrum, the role of SNGs in public investment is particularly low in Hungary, Ireland and especially Chile, where the local share is 10%.

In a large number of OECD countries, public investment is therefore a shared responsibility across government tiers. Whether through shared policy competencies or joint funding arrangements, public investment typically involves different levels of government at some stage of the investment process. The OECD member countries have acknowledged the importance of better governance for public investment by adopting the *OECD Recommendation of Effective Public Investment across Levels of Government* in March 2014 (OECD, 2014).

SNG investment-to-GDP ratio stood at an average of 1.9% in 2018 (total public investment represented 3.2% of GDP), a ratio that was above 2.5% of GDP in Canada, Japan, Korea and Sweden but below 1% of GDP in Chile, Greece, Ireland, Portugal and the United Kingdom.

SNG investment represented 11.4% of total SNG expenditure in the OECD in 2018. This ratio ranges from less than 7% in countries like Denmark to more than 30% in Luxembourg and Turkey. These differences reflect that in the least-decentralised countries SNGs tend to be more investors than managers of public services, having few functions that affect current expenditure. By contrast, in countries where SNGs carry out a large number of responsibilities involving significant staff spending, intermediate consumption or benefits, the relative weight of investment in total subnational expenditure may be low. In addition, it can vary a lot, from one year to another as investment is often a budgetary adjustment variable in many countries.

The deepening of the social and economic crisis and the adoption of budget consolidation measures from 2010 onwards put a severe strain on subnational finance. SNG investment was thus cut back in a majority of OECD countries (Figure 5.6). However, public investment has started to recover since 2017 across the board (central and SNGs) both in real terms and as a percentage of GDP. Overall, between 2009 and 2018, SNG investment decreased by -0.3% per year in real terms in the OECD area, compared to -0.7% in the EU. SNG investment contracted sharply in Greece, Spain and particularly in Ireland where it declined on average by approximately 10% annually, in real terms, between 2009 and 2018. Yet, not all OECD countries followed this trend, as SNG investment increased in some countries during this period, especially in Sweden and Switzerland.

One of the main risks in the current context of the COVID-19 crisis is a new decline of SNG investment, which would weaken the recovery. In several countries, the risk is high, given the contraction of self-financing capacities and increasing deficits. It is also important to avoid large investment stimulus plans followed by very strong fiscal consolidation, a sequence seen in 2008-10 that undermined public investment for almost a decade.

Definition

General government includes four sub-sectors: central/federal government and related public entities; state governments (e.g. states in the United States, *länder* in Germany, *cantons* in Switzerland, etc.) and related public entities; local government, i.e. regional and local governments and related public entities; and social security funds. Data are consolidated within the four sub-sectors. Subnational government is defined as the sum of state governments and local/regional governments.

Expenditure comprises: “current expenditure” and “capital expenditure”. Capital expenditure is the sum of capital transfers and investment. Gross fixed capital formation is the main component of investment (see Annex D for a detailed definition).

Sources

OECD (2020a), *National Accounts Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/na-data-en*.

OECD (2020b), “Subnational government finance”, *OECD Regional Statistics (database)*, OECD, Paris http://dx.doi.org/10.1787/region-data-en.

OECD (2014), *OECD Recommendation on Effective Public Investment across levels of Government,* OECD, Paris, *https://www.oecd.org/effective-public-investment-toolkit/*.

Estimates from IMF Government Statistics for Australia and Chile.

See Annex B for data sources and country-related metadata.

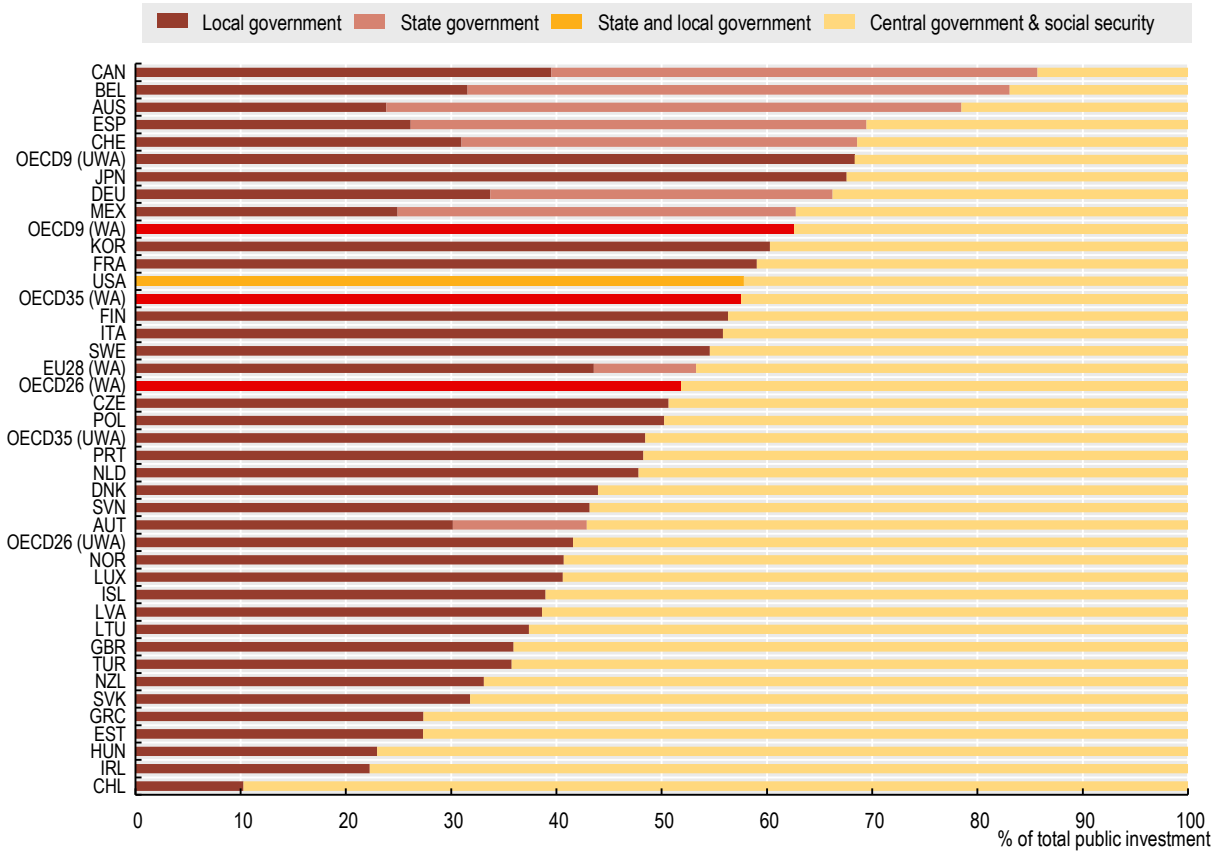
Reference years and territorial level

2018: National accounts; Levels of government; 2017: JPN, NZL, TUR.

Figure notes

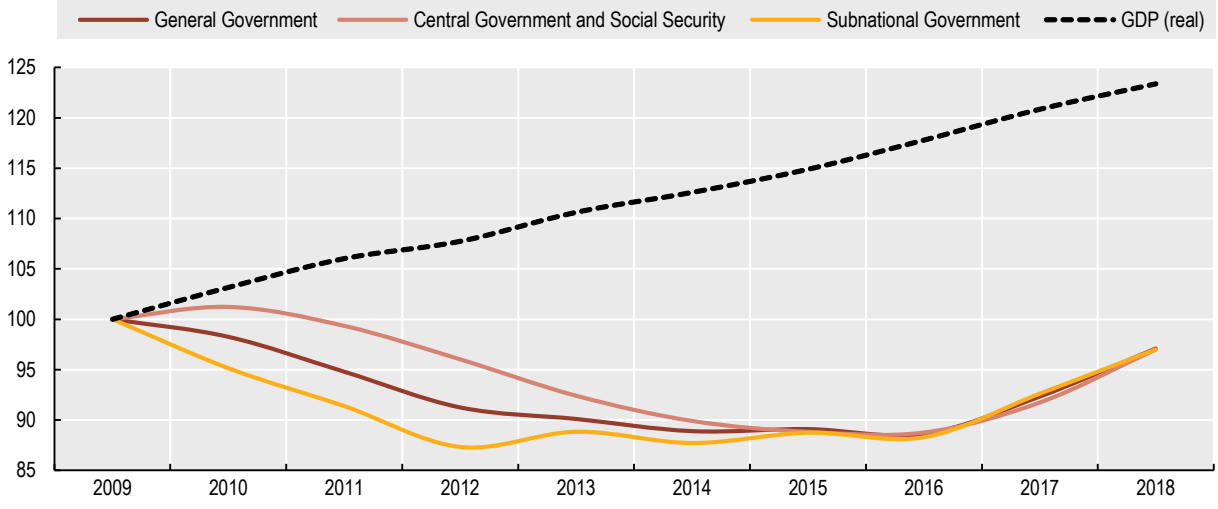
Figure 5.6: JPN, NZL, TUR (2009-17). Not including Israel. OECD averages are presented as weighted (WA) and unweighted (UWA) average of OECD countries. OECD9 and OECD26 refer respectively to the averages for OECD federal countries and OECD unitary countries.

5.5. Public investment by levels of government, 2018



StatLink https://doi.org/10.1787/888934190989

5.6. Change in public investment from 2009 to 2018 by levels of government in the OECD (in real terms)



StatLink https://doi.org/10.1787/888934191008

Subnational government revenue

The COVID-19 crisis has affected more significantly SNGs in countries where taxes, user charges and fees represent a high share of SNG revenues.

In 2018, SNG revenue accounted for 42.5% of total public revenue in the OECD and 15.7% of GDP. This proportion varies significantly across countries. The average share of SNG in total public revenue is greater in federal countries (54% versus 29.4% for unitary countries), while Denmark and Sweden stood out among unitary countries with a share of subnational revenue close to or above 50% of total public revenue in 2017. As a share of GDP, subnational revenue exceeded 20% in Belgium, Canada, Denmark, Finland, Germany, Spain, Sweden and Switzerland.

Subnational revenue in OECD countries primarily comprises tax revenues and grants and subsidies. In 2017, taxes accounted for 44% of total SNG revenues, whereas grants and subsidies accounted for 37%. Revenue deriving from local public service charges (tariffs and fees) is the third most important source of SNG revenue (15%). Other minor sources of revenues are property income revenue (sale and operation of physical and financial assets) and social contributions, which represented 2.1% and 1.3% of total SNG revenue respectively. The unweighted OECD average of the share of taxes in SNG revenue is however lower than that of grants and subsidies (35% vs. 50% in 2018) while tariffs and fees accounted for 12% (Figure 5.7).

Grants and subsidies make up the bulk of SNG revenue in Estonia, Lithuania and the Slovak Republic (more than 75% of SNG revenue) but represent less than 25% in Switzerland and the United States.

The share of tax revenue of total SNG revenue varies a lot from one country to another. It tends to be higher in federal countries – especially in Canada, Germany and Switzerland – than in unitary countries. However, some unitary countries stand out by the high share of taxes in local revenues such as France, Iceland, Latvia, New Zealand and Sweden, where tax revenue made up more than 50% of local revenue in 2018. At the opposite end, taxes amounted to less than 11% of local revenue in Estonia, the Netherlands, the Slovak Republic and Turkey.

A high share of tax revenue in subnational revenues does not imply, however, a high level of tax revenue. While subnational tax revenue accounted for 7% of GDP in the OECD and 31.7% of public tax revenue in 2018, there is great variation across countries (Figure 5.8). The share of subnational tax revenue relative to total public tax revenue and GDP is particularly high among federal countries, where SNG tax revenue accounted for 43.5% of public tax revenue and 8.9% of GDP in 2018, compared to 18.3% of public tax revenue and 4.4% of GDP in unitary countries. SNG tax revenue stood at less than 10% of total public tax revenue in 15 OECD countries including 2 federal countries, Austria and Mexico. SNG tax revenue is below 2% of GDP in 12 countries and below 0.5% of GDP in Estonia, Ireland, Lithuania and Turkey.

Tax indicators offer an incomplete gauge of tax autonomy as SNG tax revenues include both shared and own-source tax revenue. Shared taxes are national taxes, often based on personal or corporate income tax, value-added or excise tax, which are redistributed to subnational authorities according to nationally defined allocation criteria, leaving SNGs with limited or no decision-making power over such taxes. Own-source taxes, on the other hand, provide some leeway for SNGs to set the tax rates or bases even if the taxing power may be restricted (imposition of caps on rate, constraints on exemptions or tax reliefs, etc.). Property tax is the cornerstone of local taxation. It is par excellence a local own-source tax, particularly for the municipal level.

Definition

General government includes four sub-sectors: central/federal government and related public entities; state governments (e.g. states in the United States, *länder* in Germany, *cantons* in Switzerland, etc.) and related public entities; local government, i.e. regional and local governments and related public entities; and social security funds. Data are consolidated within the four sub-sectors. Subnational government is defined as the sum of state governments and local/regional governments.

Definitions of expenditure and tax revenue are developed in Annex D.

Sources

OECD (2020a), *National Accounts Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/na-data-en*.

OECD (2020b), "Subnational government finance", *OECD Regional Statistics (database)*, OECD, Paris http://dx.doi.org/10.1787/region-data-en.

Estimates from IMF Government Statistics for Australia and Chile.

See Annex B for data sources and country-related metadata.

Reference years and territorial level

2018: National accounts; Levels of government; 2017: JPN, NZL, TUR.

Further information

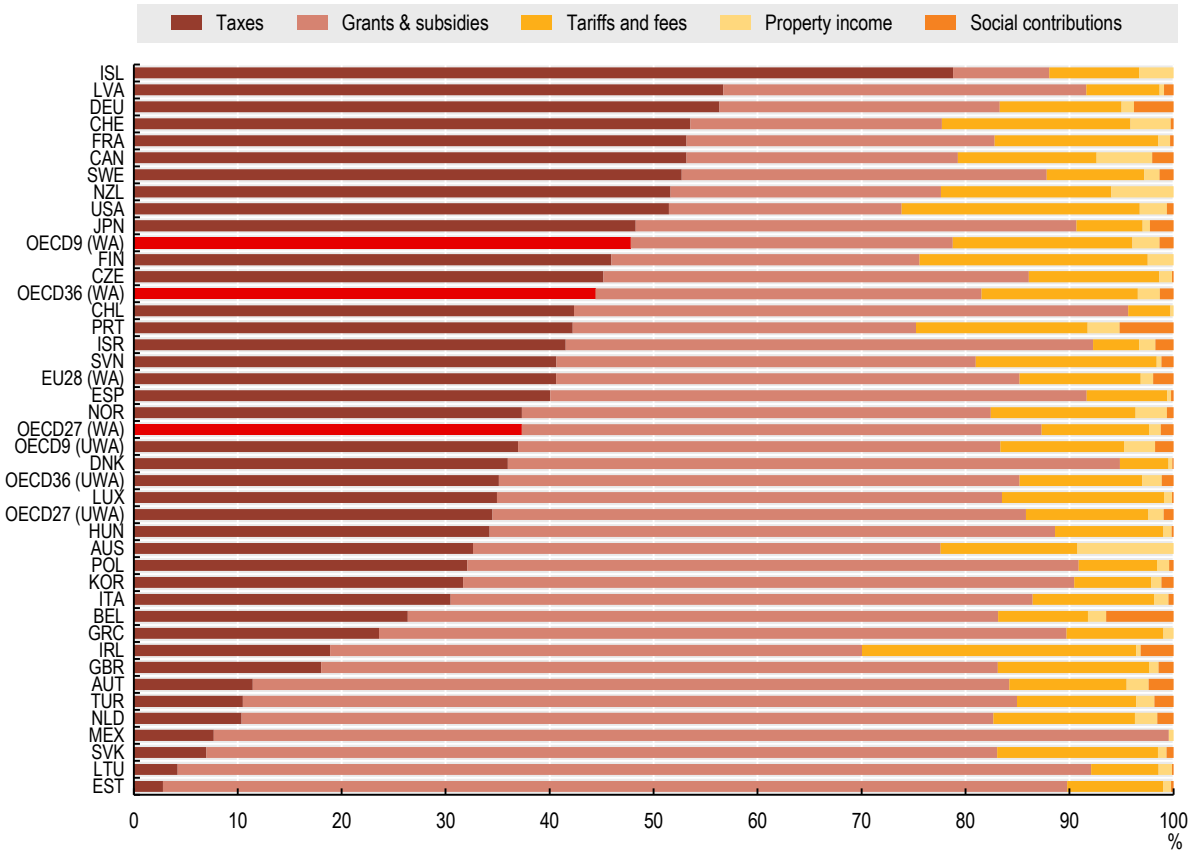
OECD (2020), *Subnational Governments in OECD Countries: Key Data (brochure)*, OECD, Paris.

Figure notes

Figure 5.7 and Figure 5.8: OECD averages as weighted (WA), or unweighted (UWA) average of OECD countries. OECD9 and OECD27 refer respectively to the averages for OECD federal countries and OECD unitary countries.

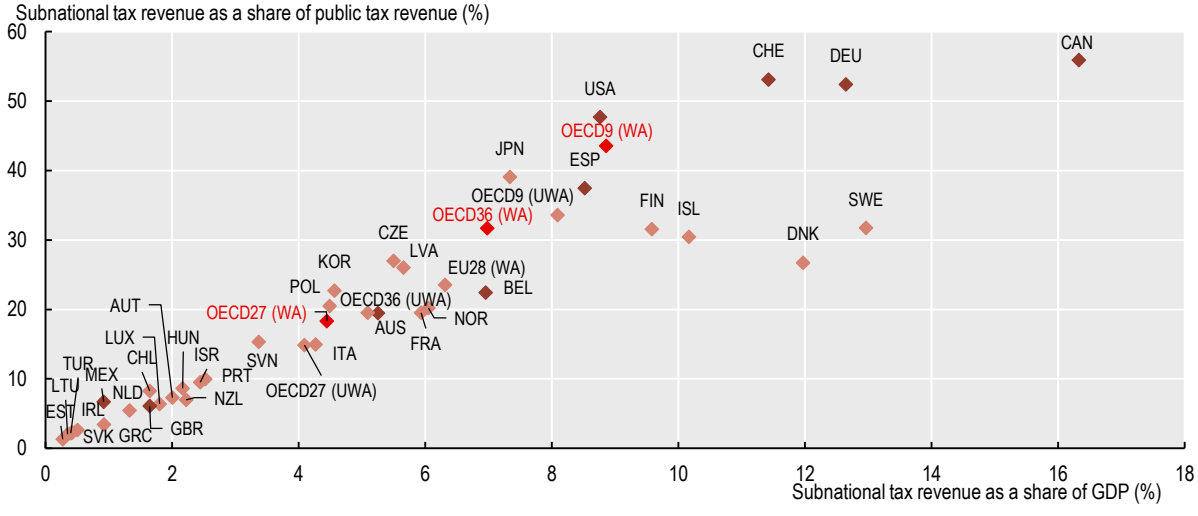
Figure 5.8: Federal countries: dark brown markers; Unitary countries: light brown markers.

5.7. Structure of subnational revenue, percentage, 2018



StatLink https://doi.org/10.1787/888934191027

5.8. SNG tax revenue as a percentage of public tax revenue and GDP, 2018



StatLink https://doi.org/10.1787/888934191046

Subnational government debt

In 2018, SNG debt remains moderate. However, in the context of the COVID-19 crisis, a significant debt increase is expected in some countries where SNGs will likely apply a countercyclical fiscal policy and support public investment.

Following the 2008 financial and economic crisis, SNG budget balance has been deteriorating in most OECD countries and debt has been increasing. However, the situation has improved over the last years in many OECD countries.

The subnational deficit reached -0.6% of GDP on average in OECD countries in 2018. Overall, subnational government debt corresponded to 28.5% of GDP and amounted to 23.2% of total public debt in 2018. SNG outstanding debt is very unevenly distributed among OECD countries. Overall, SNG debt corresponds to around 38% of GDP and amounts to 31% of public debt on average in federal countries, compared to 14.2% of GDP and around 11% of public debt in unitary countries, where local governments are subject to stricter fiscal and borrowing rules (Figure 5.9).

Canada stands out for its high level of subnational debt, which accounts for around 60% of total public debt, corresponding to 35% of national GDP. It is followed by the United States, where the debt of the states and local governments was equivalent to 41% of GDP and 30% of total public debt in 2018. On the other hand, Austria has a low level of SNG debt compared to other federal countries, corresponding to 12.8% of GDP and 12.6% of public debt.

On the opposite end, SNG debt is particularly low in unitary countries such as Greece, Hungary, Ireland, Israel, the Slovak Republic, Slovenia and Turkey, both in terms of GDP and weight in total public debt. Subnational debt relative to GDP was lowest in Greece, Hungary, Ireland and Israel. Japan stands out as a unitary country with a high level of SNG debt as a percentage of GDP (34%).

In federal countries, the share of state government debt tends to be significantly higher than that of local governments (Figure 5.10), as these countries are not subject to the "golden rule". Such a rule reserves the right to borrow for the long-term only to finance investment in infrastructures and large facilities. In addition, local government borrowing is generally constrained by strict prudential rules on debt stock and service defined by central or state governments. This limits the level of local government indebtedness in most OECD countries, with some exceptions such as Iceland, Japan, Norway or Sweden.

The level of subnational debt is expected to increase further in 2020, as the COVID-19 crisis is putting pressure on subnational government finances through higher expenditure and reduced revenues. While the COVID-19 crisis has already put short-term pressure on health and social expenditures and SNG revenues (tax revenues, tariffs and fees), strongest impacts are expected in the medium term.

Definition

General government includes four sub-sectors: central/federal government and related public entities; state governments (e.g. states in the United States, *länder* in Germany, *cantons* in Switzerland, etc.) and related public entities; local government, i.e. regional and local governments and related public entities; and social security funds. Data are consolidated within the four sub-sectors. Subnational government is defined as the sum of state governments and local/regional governments.

Fiscal balance is the difference between government revenues and expenditure. Gross debt includes the sum of the following liabilities: currency and deposits + debt securities + loans + insurance pension and standardised guarantees + other accounts payable. The SNA definition of gross debt differs from the one applied under the Maastricht Protocol (see Annex B for a detailed definition).

Sources

OECD (2020a), *National Accounts Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/na-data-en*.

OECD (2020b), "Subnational government finance", *OECD Regional Statistics (database)*, OECD, Paris http://dx.doi.org/10.1787/region-data-en.

Estimates from IMF Government Statistics for Australia and Chile.

See Annex B for data sources and country-related metadata.

Reference years and territorial level

2018: National accounts; Levels of government; 2017: ISR, JPN, KOR.

Further information

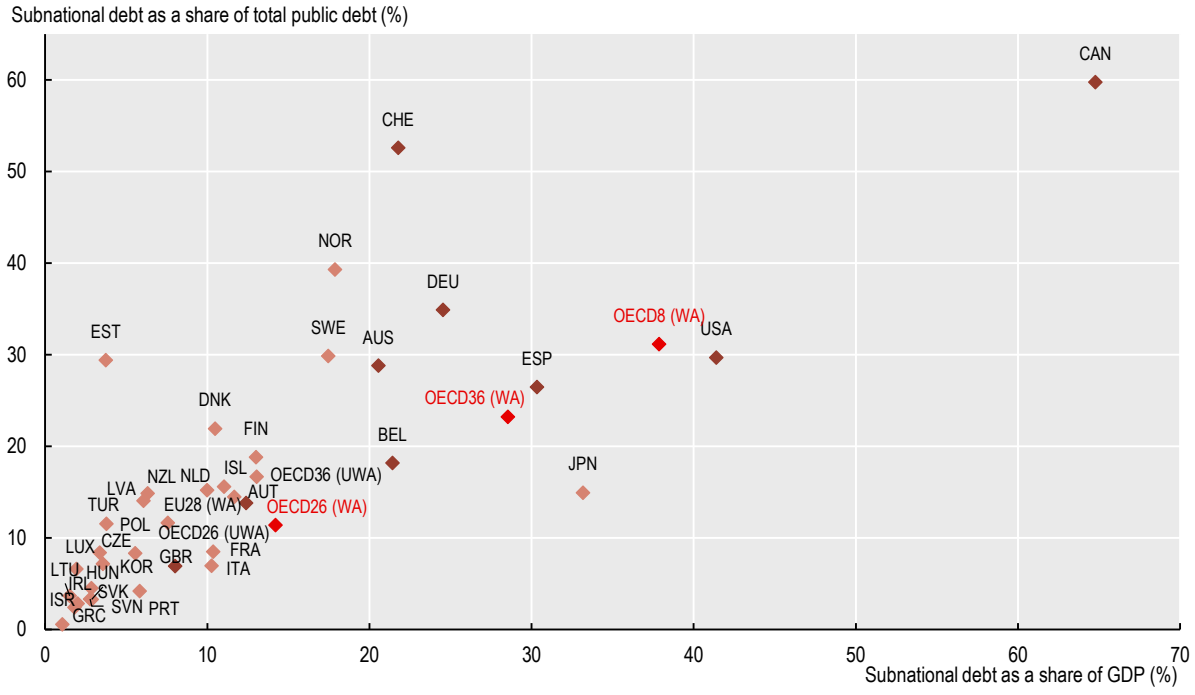
OECD (2020), *Subnational Governments in OECD Countries: Key Data (brochure)*, OECD, Paris.

Figure notes

Figure 5.9 and Figure 5.10: OECD averages are presented as weighted (WA) and unweighted (UWA) average of OECD countries. No data for Chile and Mexico.

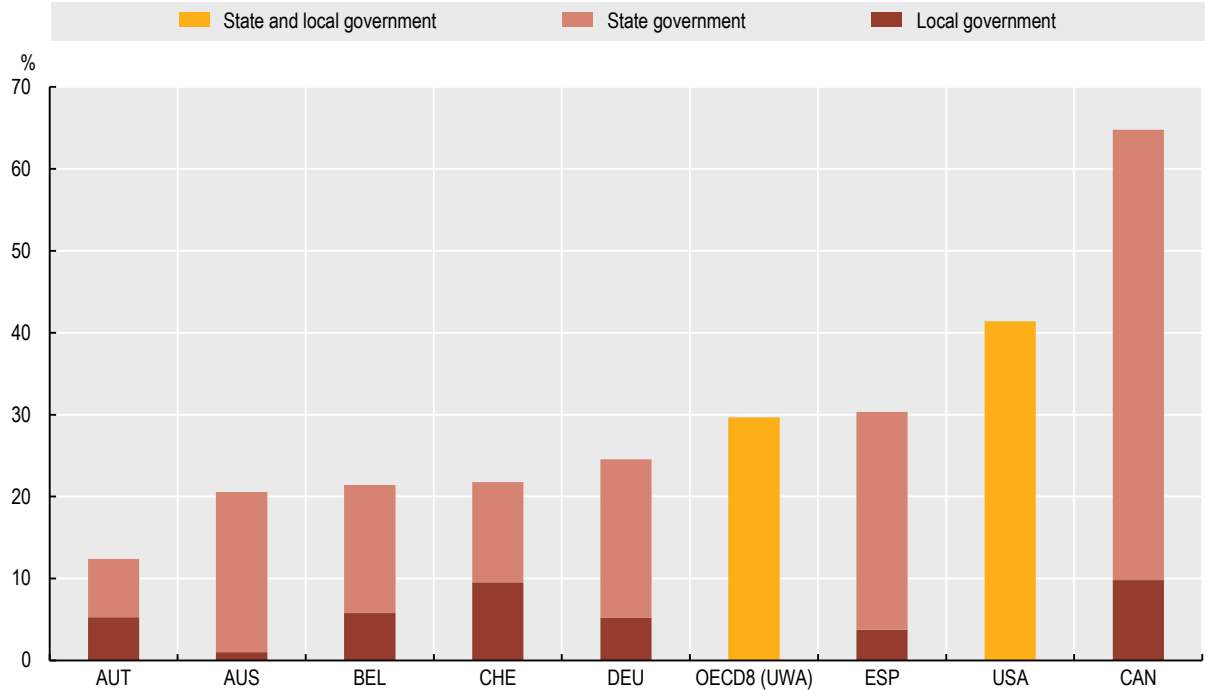
Figure 5.9: OECD8 and OECD26 refer respectively to the averages for OECD federal countries and OECD unitary countries. Federal countries: dark brown markers; Unitary countries: light brown markers.

5.9. Subnational government debt as a percentage of GDP and total public expenditure, 2018



StatLink https://doi.org/10.1787/888934191065

5.10. Local and state government debt in federal countries, percentage of GDP, 2018



StatLink https://doi.org/10.1787/888934191084

Regional government finance and investment in OECD countries

Given their weight on public spending and investments, regional governments have a fundamental social and economic role, especially in federal countries.

In 2016, regional governments' spending in EU and OECD countries accounted for nearly 19% of total public expenditure on average, representing up to 7.6% of GDP (Figure 5.11). On average, regional governments' spending accounted for 41% of total SNG expenditure, with the remainder consisting of spending by municipalities, intermediate governments (e.g. provinces in Belgium and Spain, *départements* in France) and other related local entities. In federal countries, state governments (e.g. the states in the United States, *cantons* in Switzerland or *Länder* in Germany) expenditure accounted for 69% of total SNG expenditure, whereas this ratio reached only 25% for regional governments in unitary states (e.g. the regions in France or the provinces in the Netherlands).

Regional governments spent primarily on education (23%), economic affairs (20%), social protection and general public services (both 16%). In federal countries, education, social protection and health are the main spending areas, while in unitary countries, a large share of regional spending goes to economic affairs, education and general public services. In 2016, regional government investment accounted for 22.4% of total public investment, 0.7% of GDP and around 35% of total subnational investment. These ratios are much higher in federal countries (35.6% of total public investment) where state governments undertake a large share of investment projects. Economic affairs, which encompasses all investment in transport, economic development, energy and construction, constituted the main area of investment (36%).

Regional government revenue amounted to 41% of SNG revenue, 7.6% of GDP and 19.3% of total public revenue in 2016. The data show significant differences across countries, especially between federal and unitary countries. In federal countries, regional government revenue accounted on average for 69% of SNG revenue, while it averaged 23% of SNG revenue in unitary countries.

Regional governments' revenue primarily comprises grants (50% of regional government revenue in 2016), and tax revenue (35%). Tariffs and fees stood at 8% of total regional revenue, followed by property income (4%) and other income (3%) (Figure 5.12). It is interesting to note that there is no large difference between the group of federal countries and that of unitary countries. Main discrepancies are at the country level. In some countries, regions are funded mainly through grants (Denmark, Mexico) while in other countries regions are mainly funded by taxes, be they shared or own-source based (Germany, Sweden).

The capacity of regional governments to raise tax revenues differs across countries. In 2016, regional government tax revenue accounted for 13.5% of total public tax revenue, and 3.3% of GDP. Taxes are the primary source of regional government revenue in Canada, France, Germany, Sweden and Switzerland, whereas in Denmark, the Slovak Republic and Turkey, regional governments do not receive tax revenues.

On average, regional government debt accounts for 13.2% of public debt and 11.7% of GDP in 2016 but federal and unitary countries differ substantially in this respect. In federal countries, regional government debt amounted to 25.8% of public debt and 23.4% of GDP in 2016, compared to 2.1% and 1.4% respectively in unitary countries. The possibility for state governments to borrow with fewer limitations imposed by the federal government help to explain this difference.

Definition

The Regional Government Finance and Investment Database (REGOFI) is a unique and first attempt to provide reliable comparative data on regional government finance at an international level. The concept of "regional government" refers to elected administrative regions. It includes state governments in federal and quasi-federal countries, and county or regional level governments (TL2 or TL3) in unitary countries. The database so far covers 24 countries and the period of 2010 to 2016. Possible limitations in the comparisons of federal and unitary governments in terms of regional government revenues are acknowledged.

Definitions of expenditure, expenditure by economic function, revenue, tax revenue and debt are developed in Annex D.

Sources

OECD (2020a), *National Accounts Statistics (database)*, OECD, Paris, *http://dx.doi.org/10.1787/na-data-en*.

OECD (2020b), "Subnational government finance", *OECD Regional Statistics (database)*, OECD, Paris *http://dx.doi.org/10.1787/region-data-en*.

OECD (2020c), *Regional Government Finance and Investment Database*, OECD, Paris, *https://stats.oecd.org/Index.aspx?DataSetCode=RFD*.

OECD (2020d), *Pilot Database on Regional Government Finance and Investment: Key Findings*, OECD, Paris, *http://www.oecd.org/cfe/regionaldevelopment/REGOFI_Report.pdf*.

Estimates from IMF Government Statistics for Australia and Chile.

Reference years and territorial level

2014-16: HRV; 2010-15: JPN.

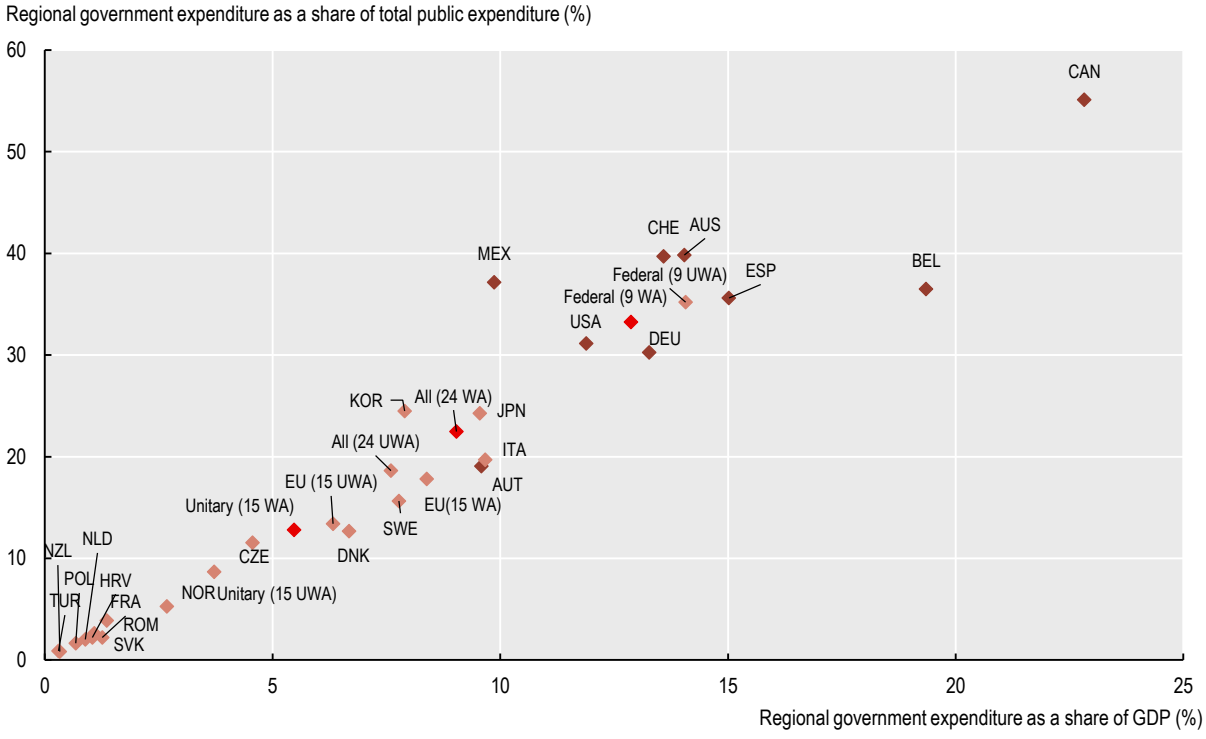
Figure notes

Averages are presented as the unweighted averages (UWA) for EU and OECD countries for which data are available unless otherwise specified (i.e. weighted average, WA).

For Turkey, the figures show data for the 51 special provincial administrations (İl Özel İdareleri).

Figure 5.11: Federal countries: dark brown markers; Unitary countries: light brown markers.

5.11. Regional government expenditure as a percentage of GDP and total public expenditure, 2016



StatLink https://doi.org/10.1787/888934191103

5.12. Structure of regional government revenue in EU and OECD countries, percentage, 2016



StatLink https://doi.org/10.1787/888934191122

Municipal governments' finances and investments

Decentralisation in spending exceeds decentralisation in revenues. While municipal governments account for 19% of total public expenditure, they raise 13% of public revenues.

Municipal governments in EU and OECD countries have an important role in public expenditures and revenues. However, there is very little comparative evidence on how their spending and investment responsibilities are set across countries. While municipalities are included in the set of SNGs, which also include regions and intermediary level governments, municipal finance rarely appears as an independent item in international comparisons. This section provides new indicators on municipal government finance for 26 EU and OECD countries.

Municipal governments have a relatively greater responsibility in spending than in raising revenues. In 2017, municipal governments accounted for 19% of total public expenditure among the countries analysed but they accounted for only 13% of public revenues. Since 2011, the municipal government share in public spending has increased by one percentage point (Figure 5.13).

While the relative share of municipal government spending appears to be stable across the OECD, significant differences across countries exist. Between 2011 and 2017, the municipal share of general government expenditure increased significantly in Lithuania, New Zealand, Poland and Korea, while it decreased in the Czech Republic, Finland, Ireland and the United Kingdom. Similar patterns hold for the share of municipal revenue, which increased significantly in Chile, the Czech Republic, Lithuania and South Korea and declined significantly in Japan, Latvia, the Slovak Republic and Slovenia. In the majority of countries analysed, the municipal expenditure share of total expenditure increased more than the revenue share.

Specific spending items are particularly important for municipal governments. Data for 18 EU and OECD countries disaggregated by 10 categories (COFOG classification) reveal that education, general public services and social protection represent the most important spending categories for municipal governments. The main exception to this is Finland, where healthcare is the most important municipal expenditure category, followed by social services (Figure 5.14).

In most countries analysed, transfer systems form an important component of municipal finances. In Estonia, central government transfers finance over 80% of municipal sector spending. Bulgaria and the Netherlands also have relatively high shares of transfers from the central government, above 70% of municipal finances. However, some countries differ significantly with respect to the importance of central government transfers. In the Czech Republic, New Zealand and Sweden, central government transfers fund less than 20% of municipal spending.

A composite measure based on different indicators of municipal finance can provide an overarching picture of differences in the degree of municipal decentralisation across countries. This measure rests on three sub-indicators: municipal share of general government spending, municipal own revenue share and the portion of non-shared municipal tax revenues (for a description of the methodology behind the composite indicator, please see Annex D) (Figure 5.15). According to the results, Denmark, Finland, Japan, Korea, Norway and Sweden have the highest degree of decentralisation at the municipal level. For the rest of the countries, the between-country differences are relatively small. In 16 out of 26 countries, decentralisation at the municipal level increased between 2011 and 2017. This trend was particularly visible in Chile and New Zealand, where decentralisation at the municipal level increased by more than 10%. On the other end, decentralisation decreased at the highest rates in Cyprus, the Czech Republic and Malta.

Definition

Composite indicator on municipal decentralisation: In order to get an overview of the degree of decentralisation at the municipal level using several fiscal aspects, we constructed a composite indicator using three sub-indicators: municipal share of general government spending, municipal own revenue share and the portion of non-shared municipal tax revenues. Our methodology assumes that the degree of decentralisation at the municipal level is higher when: i) a large share of public expenditures is decentralised; AND ii) municipalities have a low dependency on central government transfers; AND iii) municipal tax revenues are mostly based on non-shared taxes. Using the following formula, we calculate the decentralisation indicator, for which the values range from 0 to 100:

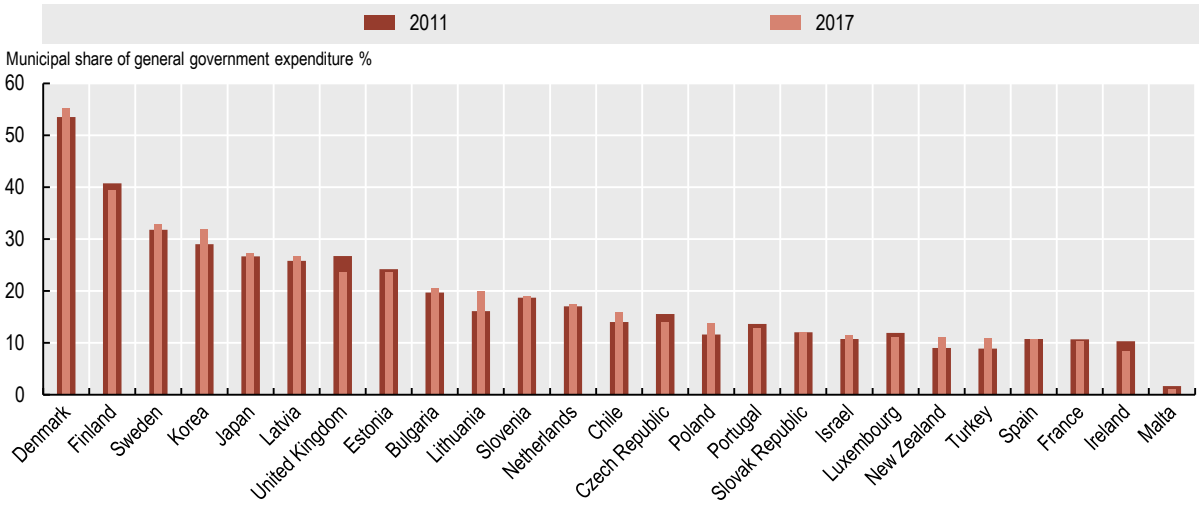
$$MDI = 100 \times MSS^{0.5} \times (1 - VFG)^{0.25} \times (1 - STR)^{0.25}$$

where MDI is the municipal decentralisation indicator, MSS is the municipal spending share, VFG is the vertical fiscal gap and STR is the portion of shared taxes in municipal incomes. The weighting of each term ensures that municipal spending share gets the biggest weight but that revenue side is also taken into account.

Reference years and sources

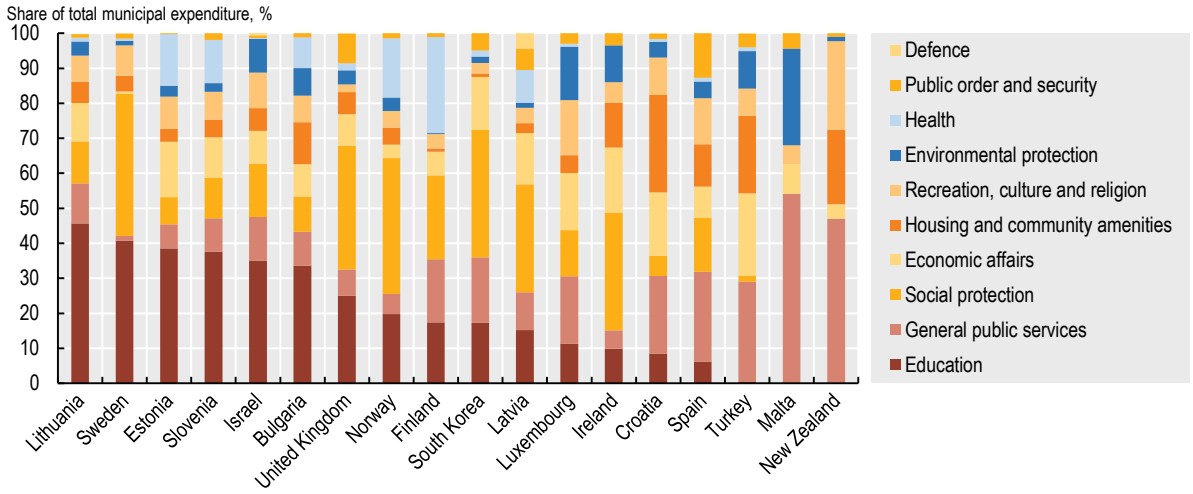
This analysis refers to a period before the pandemic COVID-19. Significant variations in subnational government finance are expected because of the impacts of the pandemic. See more definitions in Annex D.

5.13. Municipal share of general government expenditure in a sample of EU and OECD countries, 2011 and 2017



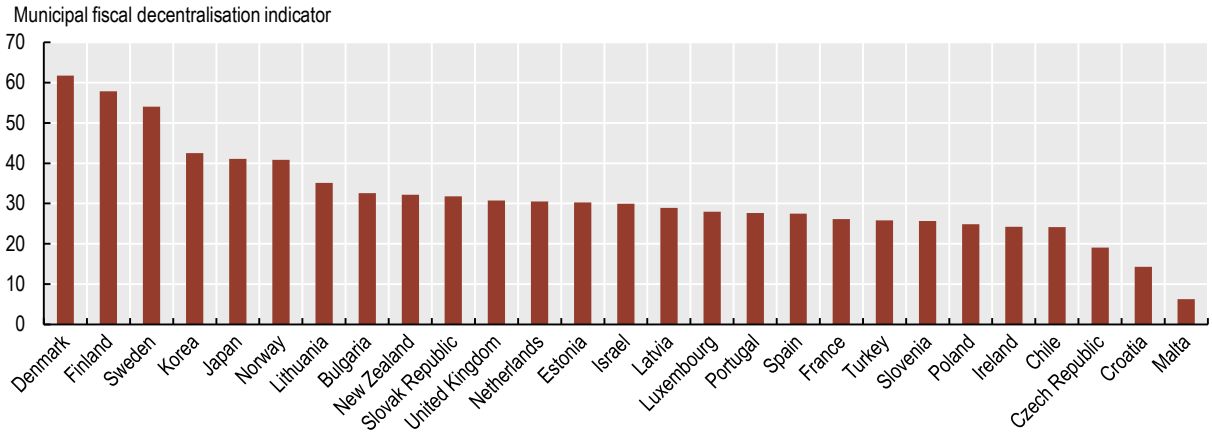
StatLink https://doi.org/10.1787/888934191141

5.14. The structure of municipal spending by COFOG expenditure groups in countries, 2017



StatLink https://doi.org/10.1787/888934191160

5.15. Composite indicator for fiscal decentralisation at the municipal level, 2017



StatLink https://doi.org/10.1787/888934191179

ANNEX A

Defining regions and functional urban areas

Table A.1. **Territorial grid of OECD member countries**

Country	Territorial level 2 (TL2)	Territorial level 3 (TL3)
Australia	States/territories (8)	Statistical Areas Level 4 and Greater Capital City Statistical Area (49)
Austria	Bundesländer (9)	Gruppen von Politischen Bezirken (35)
Belgium	Régions (3)	Arrondissements (44)
Canada	Provinces and territories (13)	Census divisions (294)
Chile	Regions (16)	Provincias (56)
Colombia	Departamentos + Capital District (33)	Departamentos + Capital District (33)
Czech Republic	Oblasti (8)	Kraje (14)
Denmark	Regioner (5)	Landsdeler (11)
Estonia	Region (1)	Groups of maakond (5)
Finland	Suuralueet (5)	Maakunnat (19)
France	Régions (13) + Régions d'outre-mer (5)	Départements (96) + Départements d'outre-mer (5)
Germany	Länder (16)	Kreise (401)
Greece	Regions (13)	Regional units and combination of regional units (52)
Hungary	Planning statistical regions (8)	Counties and Budapest (20)
Iceland	Regions (2)	Landsvaedi (8)
Ireland	Groups Regional Authority Regions (3)	Regional Authority Regions (8)
Israel	Districts (6)	Districts (6)
Italy	Regioni (21)	Province (110)
Japan	Groups of prefectures (10)	Prefectures (47)
Korea	Regions (7)	Special city, metropolitan area and province (17)
Latvia	Region (1)	Statistical regions (6)
Lithuania	Group of counties (2)	Counties (10)
Luxembourg	State (1)	State (1)
Mexico	Estados (32)	Grupos de municipios (209)
Netherlands	Provinces (12)	COROP regions (40)
New Zealand	Regional councils (14)	Regional councils (14)
Norway	Landsdeler (7)	Fylker (18)
Poland	Vojewodztwa (17)	Podregiony (73)
Portugal	Comissaoes de coordenaçao e desenvolvimento regional e regioes autonomas (7)	Grupos de municipios (25)
Slovak Republic	Zoskupenia krajov (4)	Kraj (8)
Slovenia	Kohezijske regije (2)	Statisticne regije (12)
Spain	Comunidades autonomas (17)/Ciudades autónomas (2)	Provincias (50)
Sweden	Riksomraden (8)	Län (21)
Switzerland	Grandes regions (7)	Cantons (26)
Turkey	Regions (26)	Provinces (81)
United Kingdom	Regions and countries (12)	Upper-tier authorities or groups of lower-tier authorities or groups of unitary authorities or LECs or groups of districts (179)
United States	States and the District of Columbia (51)	Economic areas (179)

Country	Non-official grid (NOG)
Canada	LFS, Economic regions (72)
France	Regions before 2015 territorial reform (22)
Germany	Spatial planning regions (96)

Table A.2. **Territorial grid of selected emerging economies**

Region	Territorial levels 2	Territorial levels 3
Brazil	Estados + districto federal (27)	Mesoregiao (137)
Bulgaria	Planning regions/Rayoni za planirane (6)	Oblasts/Podregioni (28)
China	31 provinces; special administrative region of Hong Kong, special administrative region of Macao and Chinese Taipei (33)	-
Costa Rica	Regiones Mideplan (6)	Regiones Mideplan (6)
India	States and union territories (35)	-
Malta	State (1)	Islands/Gzejjer (2)
Peru	Departamentos + Provincia Constitucional del Callao (25)	-
Romania	Regions/Regiuni (8)	Counties + Bucharest/Județe + București (42)
Russian Federation	Oblast or okrug (83)	-
South Africa	Provinces (9)	-
Tunisia	Grandes régions (6)	Régions (24)

Table A.3. **Smallest and largest regional population and surface by country, 2019**

Country	Number of TL3 regions	Region with the highest		Region with the lowest		Number of TL2 regions	Region with the highest		Region with the lowest	
		Population	Density	Population	Density		Population	Density	Population	Density
Australia	49	5 230 330	510.1	38 608	0.1	8	8 089 526	181.7	245 869	0.2
Austria	35	1 897 491	4 791.6	20 320	20.1	9	1 897 491	4 791.6	293 433	59.9
Belgium	44	1 215 290	7 501.8	49 125	46.7	3	6 596 233	7 501.8	1 215 290	216.1
Canada	294	2 965 713	4 707.5	734	<0.1	13	14 566 547	27.6	38 780	<0.1
Chile	56	5 838 768	2 876.2	2 107	0.1	16	7 915 199	513.9	106 680	1.0
Colombia	33	8 281 030	5 218.0	44 134	0.6	33	8 281 030	5 218.0	44 134	0.6
Czech Republic	14	1 369 332	2 698.2	294 896	66.8	8	1 696 941	2 698.2	1 115 685	71.6
Denmark	11	890 567	4 509.3	39 662	61.3	5	1 835 562	753.8	589 755	76.4
Estonia	5	599 478	138.2	122 922	13.3	1	1 324 820	30.5	1 324 820	30.5
Finland	19	1 671 024	183.7	29 789	1.9	5	1 671 024	183.7	29 789	6.3
France	101	2 594 456	20 979.9	76 401	3.4	18	12 244 807	1 024.5	269 471	3.4
Germany	401	3 644 826	4 746.8	34 209	36.1	16	17 932 651	4 308.3	682 986	71.3
Greece	52	1 104 690	10 431.4	18 814	10.3	13	3 742 235	987.9	203 869	28.9
Hungary	20	1 752 286	3 435.9	189 304	52.5	8	1 752 286	3 435.9	879 596	63.9
Iceland	8	228 231	218.8	7 063	0.5	2	228 231	220.7	128 760	1.3
Ireland	8	1 387 606	1 501.7	304 163	33.7	3	2 411 912	168.6	867 947	34.8
Israel	6	2 196 100	8 297.7	1 032 800	91.8	6	2 196 100	8 297.7	1 032 800	91.8
Italy	110	4 342 212	2 627.7	56 362	30.5	21	10 060 574	436.5	125 666	38.7
Japan	47	13 822 000	7 272.2	560 000	63.0	10	36 584 000	2 801.9	3 756 000	63.0
Korea	17	13 237 797	15 944.0	331 136	91.5	7	25 843 830	2 207.9	659 539	91.5
Latvia	6	632 614	2 452.0	186 095	12.4	1	1 919 968	30.3	1 919 968	30.3
Lithuania	10	810 538	86.0	93 695	19.1	2	1 983 646	86.0	810 538	37.3
Luxembourg	1	613 894	237.4	613 894	237.4	1	613 894	237.4	613 894	237.4
Mexico	209	8 259 863	7 434.6	9 752	0.8	32	17 841 825	5 905.7	771 377	11.6
Netherlands	40	1 441 452	3 367.6	46 051	142.4	12	3 709 139	1 286.1	383 032	184.3
New Zealand	14	1 642 800	367.0	32 600	1.4	14	1 642 800	367.0	32 600	1.4
Norway	18	681 067	1 576.5	75 863	1.6	7	1 305 122	257.6	386 951	4.5
Poland	73	1 775 986	3 509.9	185 908	41.7	17	4 488 998	507.8	946 038	57.6
Portugal	25	2 863 272	950.09	80 230	13.9	7	3 575 338	950.0.9	242 796	22.0
Slovak Republic	8	825 022	326.4	563 591	68.6	4	1 826 145	326.4	659 598	82.8
Slovenia	12	549 171	235.9	52 544	36.7	2	1 094 435	126.3	986 473	88.7
Spain	59	6 641 649	6 049.2	11 154	8.7	19	8 427 405	6 049.2	84 689	25.7
Sweden	21	2 344 124	359.3	59 249	2.6	8	2 344 124	359.3	375 733	3.4
Switzerland	26	1 520 968	5 410.2	16 145	28.0	7	1 877 154	919.6	353 343	104.3
Turkey	81	15 067 724	2 903.8	82 274	11.9	26	15 067 724	2 903.8	819 468	26.7
United Kingdom	179	1 194 634	15 991.1	22 055	7.0	12	9 175 033	5 717.5	1 885 189	70.0
United States	179	23 598 359	612.0	83 057	0.5	51	39 512 223	4 438.7	578 759	0.5
OECD average	62	3 911 228	4 338.4	147 764	34.0	12	7 656 033	2 062.8	688 145	52.4

Figure A.1. **Extended regional typology**

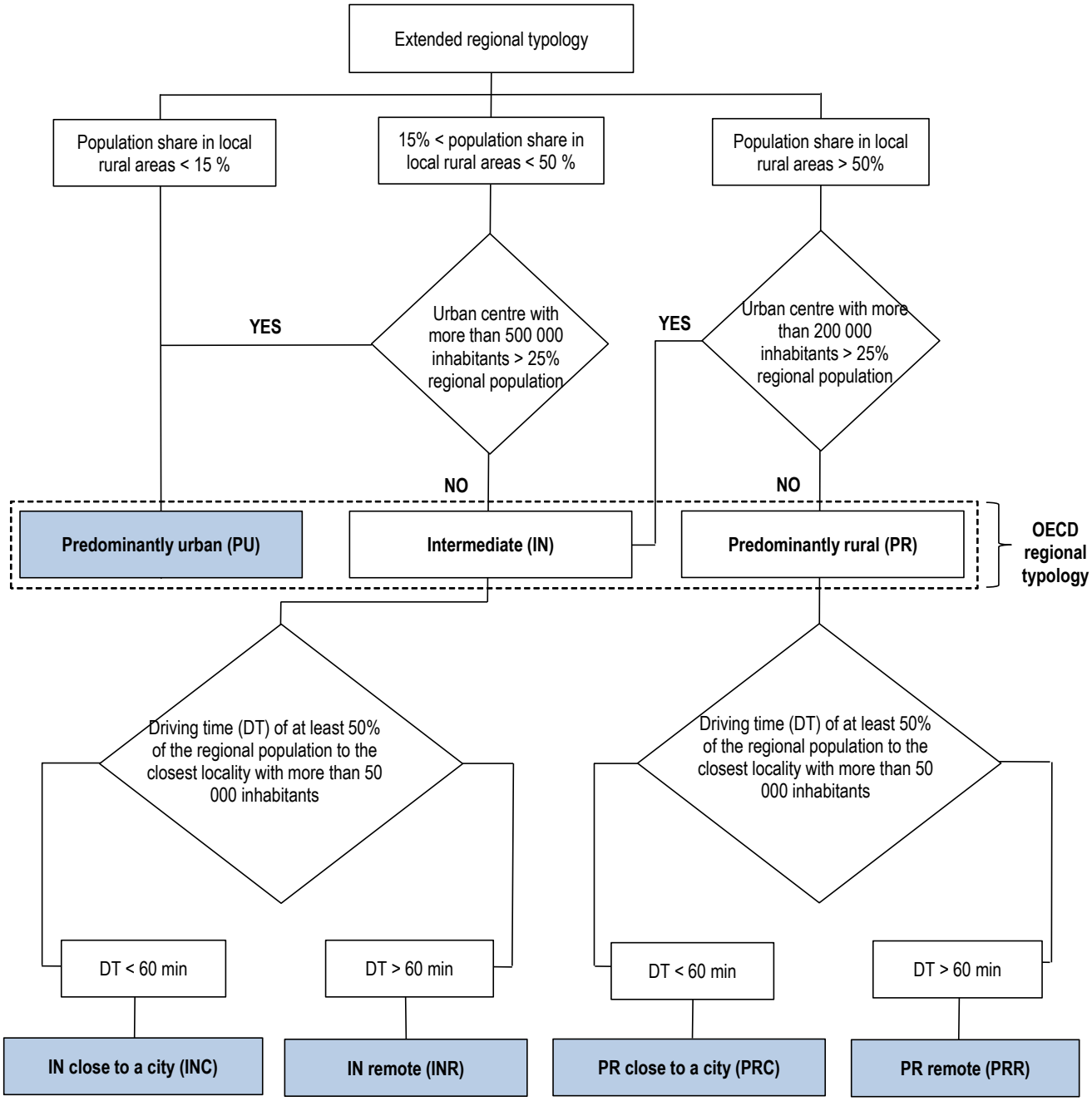


Figure A.2. **Methodology to define the functional urban areas**

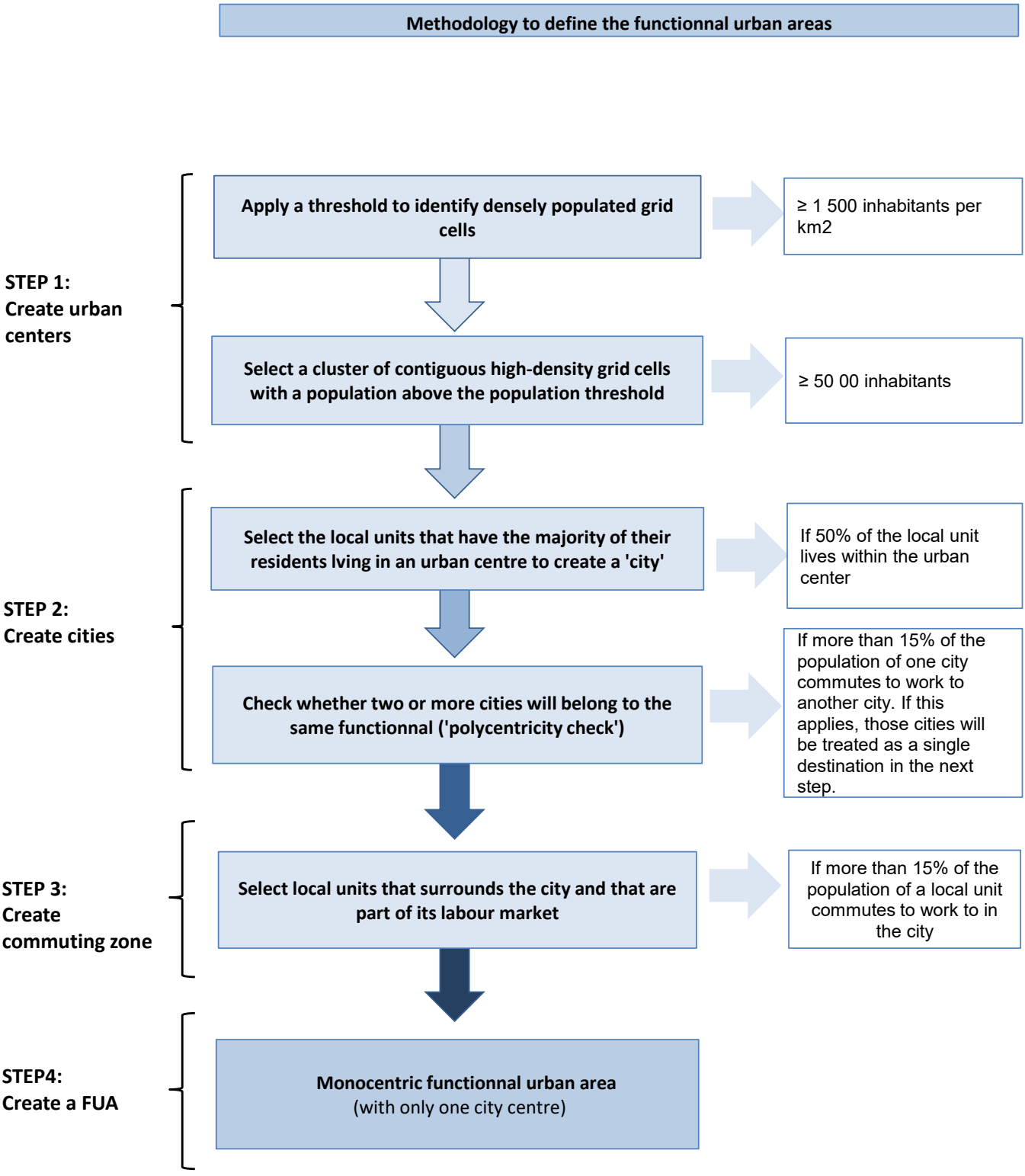


Table A.4. **Number of metropolitan areas and share of national population in metropolitan areas, 2018**

Metropolitan areas (FUAs with a population above 250 000)

	Total metropolitan areas		Population between 250 000 and 500 000		Population between 500 000 and 1.5 million		Population above 1.5 million		Rest (non-metropolitan)
Country	Number	% of national population	Number	% of national population	Number	% of national population	Number	% of national population	% of national population
Australia	11	73.8	5	7	2	7.9	4	58.9	26.2
Austria	6	59.4	3	11.1	2	14.7	1	33.6	40.6
Belgium	5	49.2	1	4.3	3	21.6	1	23.3	50.8
Canada	16	66.6	5	5	6	13.8	5	47.7	33.4
Switzerland	5	39.3	2	9.9	3	29.4	0	0	60.7
Chile	10	65.9	7	14.5	2	11	1	40.3	34.1
Colombia	22	55.9	11	8.4	7	11.1	4	36.4	44.1
Czech Republic	4	37.9	1	3.3	2	13.7	1	20.9	62.1
Germany	68	68.4	40	17.2	20	20.3	8	30.9	31.6
Denmark	4	54.2	2	12.1	1	8.9	1	33.2	45.8
Spain	26	55.2	13	9.7	9	13.3	4	32.3	44.8
Estonia	1	44.7	0	0	1	44.7	0	0	55.3
Finland	4	46.2	3	19.2	1	27	0	0	53.8
France	46	56.6	29	14.7	15	19.5	2	22.4	43.4
United Kingdom	46	69.3	25	13.8	15	18	6	37.5	30.7
Greece	2	42.8	0	0	1	9.8	1	33	57.2
Hungary	5	42.1	4	11.6	0	0	1	30.5	57.9
Ireland	2	49.1	1	9	0	0	1	40.1	50.9
Italy	25	41.5	12	6.7	9	10.5	4	24.4	58.5
Japan	54	78.3	18	5.2	30	18.9	6	54.2	21.7
Korea	20	81.6	7	4.5	9	14.4	4	62.7	18.4
Lithuania	2	38.5	1	13.6	1	24.9	0	0	61.5
Luxembourg	1	100	0	0	1	100	0	0	0
Latvia	1	48.2	0	0	1	48.2	0	0	51.8
Mexico	65	61	26	7.1	30	20.1	9	33.8	39
Netherlands	16	64.4	11	22.4	3	15.9	2	26	35.6
Norway	4	45.7	3	19.6	1	26.1	0	0	54.3
Poland	20	42.8	11	10.5	7	17.3	2	15	57.2
Portugal	3	43.9	1	2.6	1	12.4	1	28.9	56.1
Slovak Republic	2	18.7	1	6.7	1	12	0	0	81.3
Slovenia	2	41.8	1	15.6	1	26.2	0	0	58.2
Sweden	4	42.4	1	2.9	2	16.7	1	22.8	57.6
United States	166	72.5	72	7.8	59	15.3	35	49.4	27.5

ANNEX B

Sources and data description

List of variables

Variables used	Page	Chapter(s)
Area	133	4
Business demography, births and deaths of enterprises	133	2
Built-up area	133	3
Confidence in the government	133	1
Cooling degree days (CDD)	134	3
COVID-19 deaths	134	1
Doctors	135	1
Employment at place of work and gross value added (GVA) by industry (labour productivity)	139	2
Education: educational attainment (25-64 year-old population)	136	1
Education: participation in formal and/or non-formal training (25-64 year-old population)	138	1
Education: rate of young people not in employment, education or training (NEET)	137	1
Electricity indicators	139	3
Energy consumption per capita	140	3
Excess mortality	140	1
Gross domestic product (GDP) per capita	141	2
Homicide rate	142	1
Hospital beds	144	1
Internet via fibre networks	145	2
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Internet in rural areas	146	2
Internet access	146	2
Metropolitan population	147	2
Mortality rate due to cardiovascular or respiratory diseases	147	1
Municipal waste	148	3
Obesity rate	149	1
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Population mobility among regions	150	4
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Subnational government expenditure, investment, revenue and debt	152	5
Trade openness	153	2
Tree cover	153	3
Vehicles rate	154	3
Voter turnout	155	1

Area

Country	Source
EU23 countries and United Kingdom[1]	Eurostat: General and regional statistics, demographic statistics, population and area
Australia	Australian Bureau of Statistics (ABS), summing up SLAs
Canada	Statistics Canada *http://www12.statcan.ca/english/census01/products/standard/popdwell/Table-CD-P.cfm?PR=10&T=2&SR=1&S=1&O=A*
Colombia	DANE – Departamento Administrativo Nacional de Estadistica
Iceland	Statistics Iceland
Israel	Central Bureau of Statistics – Statistical Abstract of Israel
Japan	Statistical Office, Area by Configuration, Gradient and Prefecture www.stat.go.jp/English/data/nenkan/1431-01.htm
Korea	Korea National Statistical Office
Mexico	Mexican Statistical Office (INEGI)
New Zealand	Statistics New Zealand, data come from the report "Water Physical Stock Account 1995–2005"
Norway	Statistics Norway, StatBank table: Table: 09280: Area of land and freshwater (km²) (M)
Switzerland	Office fédéral de la statistique, ESPOP, RFP
Turkey	Eurostat: General and regional statistics, demographic statistics, population and area
United States	Census Bureau
Brazil	Instituto Brasileiro de Geografia e Estadística (IBGE)
China	National Bureau of Statistics of China
India	Statistics India (Indiastat)
Russian Federation	Federal State Statistics Service of the Russian Federation
South Africa	Statistics South Africa

1. EU23 countries: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain and Sweden.

Built-up area

Country	Source	Year	Territorial level
All countries	Corbane, Christina; Florczyk, Aneta; Pesaresi, Martino; Politis, Panagiotis; Syrris, Vasileios (2018): GHS built-up grid, derived from Landsat, multitemporal (1975-1990-2000-2014), R2018A. European Commission, Joint Research Centre (JRC) doi: 10.2905/jrc-ghsl-10007 PID: *http://data.europa.eu/89h/jrc-ghsl-10007*	2000-14	Functional urban areas (FUAs)

Business demography

Country	Source	Year	Territorial level
EU17 countries and United Kingdom[1]	Eurostat Regional Business Demography	2017	3
Canada	Statistics Canada, special tabulation	2016	2
United States[2]	U.S. Census Bureau. Statistics of US Businesses (SUSB)	2014	2

1. Denmark: 2013; Ireland: 2014; Canada, Finland, Latvia, Norway, United Kingdom: 2016.
2. United States: Data refer to establishments/local units.

Confidence in the government

Country	Source	Year	Territorial level
All countries	OECD estimates based on Gallup World Poll Gallup World Poll	2014-18 average	2

Cooling degree days (CDD)

Country	Source	Year	Territorial level
All countries	Mistry, Malcolm Noshir (2019): A high-resolution (0.25 degree) historical global gridded dataset of monthly and annual cooling and heating degree days (1970-2018) based on GLDAS data. PANGAEA, *https://doi.org/10.1594/PANGAEA.903123*, Supplement to: Mistry, MN (2019): Historical global gridded degree-days: A high-spatial resolution database of Cooling Degree Days (CDD) and Heating Degree Days (HDD). Geoscience Data Journal, *https://doi.org/10.1002/gdj3.83*	1970-2018	FUAs

COVID-19 deaths

Country	Source	Territorial level	Period
Australia[1]	Guardian Australia	2	8 March - 10 August
Austria	European Commission Joint Research Centre	2	20 April - 13 August
Belgium	European Commission Joint Research Centre	2	11 March - 12 August
Canada	Government of Canada	2	16 March - 9 August
Chile	Ministry of Science, Technology, Knowledge and Innovation	2	24 March - 11 August
Colombia	National Health Institute	2	20 March - 9 August
Croatia	European Commission Joint Research Centre	2	27 March - 12 August
Denmark	European Commission Joint Research Centre	2	9 May - 12 August
Estonia	European Commission Joint Research Centre	2	30 March - 12 August
France	European Commission Joint Research Centre	2	26 March - 12 August
Germany	European Commission Joint Research Centre	2	9 March - 13 August
Italy	European Commission Joint Research Centre	2	24 February - 12 August
Japan[2]	Toyo Keizai Online	2	18 March - 9 August
Korea[3]	Korean Disease and Control Prevention Agency	2	12 March - 15 August
Latvia	European Commission Joint Research Centre	2	8 April - 12 August
Luxembourg	European Commission Joint Research Centre	2	19 March - 12 August
Mexico	SINAVE, Government of Mexico	2	23 March - 9 August
Netherlands	National Institute for Public Health and the Environment	2	13 March - 13 August
Poland	European Commission Joint Research Centre	2	22 March - 12 August
Portugal	European Commission Joint Research Centre	2	20 March - 12 August
Russia	European Commission Joint Research Centre	2	12 May - 12 August
Spain	European Commission Joint Research Centre	2	6 March - 12 August
Sweden	Public Health Agency	2	9 March - 9 August
Switzerland	European Commission Joint Research Centre	2	10 March - 13 August
United Kingdom	Public Health England and NHSX	2	5 March - 11 August
United States	USAFacts	2	17 February - 9 August

Note: Deaths per 100 000 people are based on the latest available population estimates from the OECD Regional Database.

1. Australia: Guardian Australia's data verified with aggregated data from the Department of Health.
2. Japan: Toyo Keizai Online's data verified with data from the Ministry of Health, Labour and Welfare.
3. Korea: Data downloaded from press releases by the Korean Disease and Control Prevention Agency.

Doctors

Country	Source	Year	Territorial level
Australia[1]	Australian Institute of Health and Welfare (AIHW), Medical Workforce	2015	2
Austria	Austrian Medical Association, Register of practising physicians (Österreichische Ärztekammer)	2018	2
Belgium	Eurostat, health personnel, table (hlth_rs_prsrg)	2016	2
Canada	Canadian Insitute for National Health Information. Physician Database,	2016	2
Chile	INE, Chile. Department of health statistics and information (DEIS), Ministry of health (MINSAL)	2017	2
Colombia[2]	Direction of Human Resources for Health, Ministry of Health and Social Protection (Dirección de Desarrollo del Talento Humano en Salud)	2018	2
Czech republic	Institute of Health Information and Statistics of the CR	2018	2
Denmark	Eurostat	2015	2
Estonia[3]	National Institute for Health Development (NIHD), statistical report on "Health care personnel". National Institute for Health Development (NIHD), Department of Health Statistics.	2016	2
Finland	The Register of the Finnish Medical Association	2014	2
France	DREES	2018	2
Germany[3]	German Medical Association, Medical practitioner statistics	2016	2
Greece	Hellenic Statistical Authority. Health, Social Insurance and Protection Statistics Section	2018	2
Hungary	Health Registration and Training Center, NSDCP 1589: Statistics on the distribution of physicians by region, specialist qualification, age and sex	2018	2
Israel[4]	Central Bureau of Statistics Israel, Labour Force Survey	2019	2
Italy[5]	ISTAT, Labour Force Survey.	2018	2
Japan[6]	Statistics Bureau, Statistics of Physicians, Dentists and Pharmacists, MHLW Japan	2018	2
Korea	Korean Ministry of Health and Welfar.e 2011 National Health Insurance Statistical Yearbook(National Health Insurance Corporation). Medical physicians & Oriental medical physicians	2018	2
Luxembourg	Eurostat, health personnel, table (hlth_rs_prsrg)	2017	2
Latvia	The Centre for Disease Prevention and Control (CDPC) of Latvia	2017	2
Mexico[7]	INEGI/Health SSA. Datos abiertos. Recursos 2014-2017	2017	2
Netherlands	Eurostat, health personnel, table (hlth_rs_prsrg)	2016	2
Norway	Statistics Norway	2018	2
Poland	The Ministry of Health, the Ministry of Interior and Administration. Statistics Poland	2018	2
Portugal	Statistics Portugal (INE), Health Personnel Statistics and Hospital Survey.	2018	2
Slovak Republic	National Centre of Health Information	2018	2
Slovenia	Health Care Providers Database, The National Institute of Public Health of the Republic of Slovenia (NIJZ)	2018	2
Spain	INE - Labour Force Survey	2017	2
Sweden	Swedish National Board of Health and Welfare	2017	2
Switzerland	Federal Statistical Office (FSO), Neuchâtel; Swiss Medical Association (FMH), Bern; Medical Statistics of Physicians, yearly census.	2018	2
Turkey	Ministry of Health, General Directorate of Health Research, Health Statistics Yearbook	2016	2
United Kingdom	United Kingdom National Health Service	2016	2
United States	American Medical Association, Physician masterfile. Number of active physicians.	2014	2

1. Australia: Count of medical practictionner employed in medecine. It includes clinician and non-clinician (administrator, teacher or educator, researcher, other). A clinician is a medical practitioner mainly involved in the diagnosis, care and treatment of individuals, including recommending preventive action. It excludes dental practitioners, therapists and oral health therapists, nurses and midwives, optometrists, osteopaths, pharmacists, physiotherapists, podiatrists, psychologists, Aboriginal and Torres Strait Islander health practitioners, Chinese medicine practitioners, medical radiation practitioners, occupational therapists.

2. Colombia: Estimation of the number of physicians, including general practitioners and specialists, without distinction of their field of exercise. However, this estimation includes physicians that may not be practicing medicine (e.g. physicians working in administration and research).
3. Estonia and Germany: Data include generalist medical practitioners (ISCO-08 code: 2211), specialist medical practitioners (ISCO-08 code: 2212), medical doctors not further defined (ISCO-08 code: 2210). Data exclude students who have not yet graduated, dentists, stomatologists, dental and maxillofacial surgeons, physicians working in administration, research and in other posts that exclude direct contact with patients, unemployed physicians and retired physicians, physicians working abroad.
4. Israel: Moving average of three years of number of physicians (numbers of previous, current and next years).
5. Italy: Data are not perfectly complying with the definition because are referred to Professionally active physicians and not to Practicing physicians.
6. Japan: Survey of Physicians, Dentists and Pharmacists, MHLW Japan. Data consist of physicians working at medical institutions (including those who work as clinical teaching staffs at medical school hospitals) and at healthcare facilities for the elderly requiring long-term care. Data include foreign physicians licensed to practice. Data exclude physicians working in the areas such as industry, research and administration, physicians working abroad and not-acting physicians.
7. Mexico: Medical information generated by the INEGI corresponding to the Private Health Facilities (general practitioners and specialists) and information from the Secretariat for Health (physicians in direct contact with the patient).

In 2001 there is no information to private health facilities in Baja California state. La información de Médicos y Camas hospitalarias de 2014 a 2017 incluye la corresponde a establecimientos públicos (generada por la Secretaría de Salud) y privados (generada por el INEGI).

Education: Educational attainment (population 25-64 year-olds)

Country	Source	Year	Territorial level
EU25 countries plus GBR and NOR	25-64 year-olds: Eurostat, regional education, table [edat_lfse_04]	2019	2
Australia	Survey of Education and Work (cat. no. 6227.0), ABS (unpublished) 2016 Census of Population and Housing	2017	2
Canada	Statistics Canada. Historical data provided by the delegate of the INES Working Party	2016	2
Chile	INE, National Socioeconomic Characterization Survey	2017	2
Colombia	DANE – Departamento Administrativo Nacional de Estadistica	2018	2
Israel	Central Bureau of Statistics Israel. Labour Force Survey	2017	2
Japan	n.a.	-	-
Korea	n.a.	-	-
Mexico	INEGI. Customised data provided by the delegate of the WPTI	2018	2
New Zealand	n.a.	-	-
Switzerland	Federal Statistical Office, Structural Survey	2019	2
Turkey	Customised data provided by the delegate of the WPTI	2019	2
United States	American Community Survey, 2000 to 2017	2018	2
Brazil	Historical data provided by the delegate of the INES Working Party	2015	2
Costa Rica	n.a.	-	-
Russian Federation	Historical data provided by the delegate of the INES Working Party	2016	2

Education: Rate of young people not in employment, education or training (NEET)

Country	Source	Year	Territorial level
EU25 countries plus GBR and NOR	Eurostat, regional education statistics, table [edat_lfse_22]	2019	2
Australia	Australian Bureau of Statistics (ABS). Work-Related Training and Adult Learning (cat. no. 4234.0)	2017	2
Canada	n.a.	-	-
Chile	INE, Chile. National Socioeconomic Characterization Survey (2009, 2011, 2013, 2015 and 2017)	2017	2
Colombia	Central Bureau of Statistics Israel. Labour Force Survey	2018	2
Israel	Ministry of Internal Affairs and Communications. Labour Force Survey	2017	2
Japan	n.a.	2019	2
Korea	Customised data provided by the delegate of the WPTI	-	-
Mexico	Statistics New Zealand. Household Labour Force Survey. Year Ended June. Employed Persons aged 15 and over	2018	2
New Zealand	Swiss Labour Force Survey	2018	2
Switzerland	TURKSTAT, Household Labour Force Survey Results	2018	2
Turkey	US Census. American Community Survey (ACS)	2018	2
United States	Customised data provided by the delegate of the WPTI	2018	2
Brazil	Customised data provided by the delegate of the WPTI	2013	2
Costa Rica	n.a.	-	-
Russian Federation	Customised data provided by the delegate of the WPTI	2015	2

Education: Participation in formal and/or non-formal training (25-64 year-old population)

Country	Source	Year	Territorial level
Australia	Australian Bureau of Statistics (ABS). Work-Related Training and Adult Learning (cat. no. 4234.0)	2016	2
Austria	Statistics Austria, Labour Force Survey	2017	2
Belgium	Customised data provided by the delegate of the WPTI	2015	2
Canada	n.a.	-	-
Chile[1]	INE, Chile. National Socioeconomic Characterization Survey (2009, 2011, 2013, 2015 and 2017)	2017	2
Colombia[2]	DANE - Great Integrated Household Survey (GEIH)	2018	2
Czech Republic	n.a.	-	-
Denmark	Customised data provided by the delegate of the WPTI	2017	2
Estonia	Statistics Estonia, Adult Education Survey	2016	3
Finland	n.a.	-	-
France	n.a.	-	-
Germany	Federal Statistical Office, Labour Force Survey (Mikrozensus)	2018	2
Greece	Hellenic Statistical Authority. EL.STAT - Labour Force Survey	2017	2
Hungary	Labour force survey of HCSO	2017	2
Ireland	CSO,Adult Education Survey 2017	2017	2 (NUTS2013)
Israel	n.a.	-	-
Italy	ISTAT - Customised data transmitted to Secretariat	2016	2
Japan	n.a.	-	-
Korea	Korean National Statistical Office Customised data provided by the delegate of the WPTI	2012	2
Latvia[3]	CSB Labour Force Survey	2017	3
Lithuania	Statistics Lithuania, Labour Force Survey	2017	3
Mexico	n.a.	-	-
Netherlands	n.a.	-	-
New Zealand[4]	Statistics New Zealand. Household Labour Force Survey. Year Ended June. Employed Persons aged 15 and over	2017	2
Norway	n.a.	-	..
Poland	Statistics Poland, Labour Force Survey	2017	2
Portugal	Statistics Portugal, Labour Force Survey	2018	2
Slovak Republic	Statistical Office of the Slovak Republic. AES (Adult Education Survey)	2016	2
Slovenia	n.a.	-	-
Spain	Customised data provided by the delegate of the WPTI	2018	2
Sweden	Statistics Sweden, Adult Education Survey	2016	2
Switzerland[3]	Swiss Labour Force Survey	2017	2
Turkey	TURKSTAT, Household Labour Force Survey Results	2015	2
United Kingdom	n.a.	-	-
United States	n.a.	-	-

1. Chile: The classification only includes formal education.
2. Colombia: Exclude attendance at non-formal education or training courses.
3. Latvia and Switzerland: reference period for the survey is the last 4 weeks
4. New Zealand: Gisborne/Hawke's Bay combined (NZ16 included in NZ15), Tasman/Nelson/Marlborough/West Coast combined (NZ22 included in NZ21).

Electricity indicators

Country	Source	Year	Territorial level
All countries	L. Byers, J. (2019), A Global Database of Power Plants, *http://dx.doi.org/www.wri.org/publication/global-database-power-plants* IEA (2020), "OECD - Electricity and heat generation", IEA Electricity Information Statistics (database), *https://dx.doi.org/10.1787/data-00457-en* Schlömer S., T. (2014), Annex III: Technology-specific cost and performance parameters. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change	2017	2.3

Employment at place of work and gross value added (GVA) by industry (ISIC rev. 4)

Country	Source	Year	Territorial level
EU22 countries and United Kingdom[1]	Eurostat, Regional economic accounts, Branch accounts, Employment	2018 2017	2 3
Australia[2]	Australian Bureau of Statistics, cat. no. 5220.0 - Australian National Accounts: State Accounts, and Table 6291.0.55.003 Labour Force	2017	2
Canada	Statistics Canada. CANSIM database, Tables 379-0028 Gross domestic product (GDP) at basic prices and 282-0008 Labour force survey estimates (LFS), by North American Industry Classification System	2017	2
Chile	Banco Central de Chile	2018	2
Colombia	National Administrative Department of Statistics - DANE, Directorate of Synthesis and National Accounts	2017	2
Iceland	n.a.	-	-
Israel	n.a.	-	-
Japan	Statistics Bureau, Economically Active Population Survey and Local Area Labour Force Survey	2016	2.3
Korea	Korean National Statistical Office - KOSIS Census on basic characteristics of establishments	2018	2.3
Mexico	INEGI. Consulta interactiva de datos *www.inegi.org.mx/sistemas/olap/proyectos/bd/consulta.asp?p=16859&c=17383&s=est&cl=3#*	2018	2
New Zealand	Statistics New Zealand. GDP by industry, per region	2016	2.3
Norway	Eurostat, Regional economic accounts, Branch accounts, Employment	2017	2.3
Switzerland	Federal Statistical Office FSO. Gross value added (GVA) by canton and industries (je-e-04.06.02) and Swiss Labour Force Survey - SLFS	2016	2.3
Turkey	Turkish Statistical Institute (TurkStat). Employment data from the Household Labour Force Survey. No regional breakdown for GVA by industry	2015	2
United States	Bureau of Economic Analysis. GVA by State and employment by industry (SA25, SA25N)	2018	2.3

1. EU23 countries: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom. Last available year for TL3: 2018 (BEL, DNK, EST, HUN, SVK, SVN, GBR); 2016 (FRA).
2. Australia: Data are derived from ANZSIC and do not match the ISIC classification.

Energy consumption per capita

Country	Source	Last year	Territorial level
Austria	Statistics Austria, energy balances and population statistics	2018	2
Chile	Electricity consumption: Data base Discoverer- UPME (Date: Febrero 27 de 2019). Total Population: DANE. Total population: GEIH - Gran encuesta integrada de hogares (GEIH)	2018	2
Colombia	Electricity consumption: Data base Discoverer-UPME (Date: Febrero 27 de 2019)	2019	2
Czech Republic	Czech Statistical Office	2018	2
Denmark	Danish Regional Energy Accounts	2018	2
France	SDES pour les données régionales sur l'énergie 2014 - 2017, INSEE-Recensement pour la population	2017	2
Japan	Energy consumption: (1) Agency for Natural Resources and Energy, "Energy Consumption by Prefectures" h*ttp://www.enecho.meti.go.jp/statistics/energy_consumption/ec002/results.html#headline1*. (2) Population: Statistics Bureau, Ministry of International Affairs and Communications, "Population Estimates", *https://www.stat.go.jp/english/data/jinsui/2.html*.	2016	2
Korea	Korea Energy Economics Institute. Residential and commercial consumption	2017	2
Latvia	CSB	2017	2
Norway	Statistics Norway, table 10580 Energy usage in households by region	2012	2
Poland	Statistics Poland, Energy statistics	2018	2
Portugal	Ministry for Environment, Spatial Planning and Energy - Directorate-General for Energy and Geology (DGEG). Statistics on coal, oil, electric power and natural gas	2017	2
Spain	Aplicación ESCILA, competencia de la DG de Política Energética y Minas, donde las empresas reportan la energía eléctrica suministrada a cliente final. Población residente a 1 de julio publicada por el INE.	2018	2

Excess mortality

Country	Source	Territorial level	Period
EU20 countries[1] plus Norway, Switzerland, United Kingdom	Eurostat, table demo_r_mweek3	2, 3	February to June
Australia	ABS	2	February to June
Canada	Statistics Canada	2	February to June
Chile[2]	Ministry of Science, Technology, Knowledge and Innovation	2, 3	February to June
Colombia	DANE. Customised data provided directly to the OECD	2	February to June
Germany[3]	DESTATIS	2	February to June
Japan	Official Statistics of Japan	2, 3	February to June
Korea	KOSIS	2, 3	February to June
New Zealand	Stats NZ Tatauranga Aotearoa	2	February to June
United States	CDC	2	February to June

1. EU20 countries: Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Spain, Poland, Portugal, Slovak Republic and Sweden.
2. Chile: Death counts correspond to deaths reported to the National Registry office and have not been verified by the National Statistics Office.
3. Germany: Deaths correspond to a pure case number count of the death reports received from registry offices and have not gone through the usual statistical processing, *https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Sterbefaelle-Lebenserwartung/Tabellen/sonderauswertung-sterbefaelle.html*.

Gross domestic product

	Source	Year	Territorial level
EU24 countries[1,2] plus United Kingdom	Eurostat, Regional economic accounts	2000-18	2, 3, metropolitan areas
Australia[2]	Australian Bureau of Statistics, 5220.0. Gross state product, figures based on fiscal year (July-June)	2000-18	2, metropolitan areas
Canada[2]	Statistics Canada, Provincial economic accounts	2000-18 2001-13	2, metropolitan areas
Chile[2]	Banco central de Chile. Cuentas nacionales de Chile	2008-18	2, metropolitan areas
Colombia[3]	DANE, Directorate of Synthesis and National Accounts	2005-17	2, 3
Iceland[3]	n.a.	-	-
Israel[3]	n.a.	-	-
Japan[2]	Economic and Social Research Institute, Cabinet Office, data are based on fiscal year (April-March)	2001-16	2, 3, metropolitan areas
Korea[2]	Korean National Statistical Office	2000-18	2, 3, metropolitan areas
Mexico[2]	INEGI, System of national accounts of Mexico	2003-18	2, metropolitan areas
New Zealand	Statistics New Zealand	2000-15	2, 3
Norway[4]	Norwegian Regional Accounts	2000-18	2, 3, metropolitan areas
Switzerland[2]	Swiss Federal Statistical Office, Statweb	2008-17	2, 3, metropolitan areas
Turkey	Turkish Statistical Institute (TurkStat)	2004-18	2.3
United States[2]	Bureau of Economic Analysis	2001-18	2.3, metropolitan areas

1. EU24 countries: AUT, BEL, BGR, CZE, DNK, EST, FIN, FRA, DEU, GRC, HUN, IRL, ITA, LVA, LTU, LUX, NLD, POL, PRT, ROU, SVK, SVN, ESP, SWE. Last available year for TL3 regions: 2017 (AUT, CZE, FIN, DEU, GRC, IRL, ITA, LVA, LTU, POL, PRT, ESP, SWE); 2016 (FRA).
2. GDP estimates at the metropolitan area level were based on TL3 data with the exception of Australia, Chile, Colombia and Mexico where TL2 data were used. Metropolitan estimates for the United States were based on county-level data from the U.S. Bureau of Economic Analysis and for Canada, based on Census Metropolitan Areas from Statistics Canada. The methodology used to estimate GDP figures at the metropolitan level is described in Annex C.
3. Iceland and Israel: Data not available at the regional level.
4. Norway: 2000-07 data estimated by the Secretariat to obtain long time series linked with 2008-16 series.

Homicide rates

Country	Source	Year	Territorial level
Australia	Australian Bureau of Statistics, Recorded Crime - Victims, Australia (cat. no. 4510.0)	2016-18	2
Austria	Austria Home Office, Crime Statistics	2016-18	2
Belgium	Belgian Federal Police	2016-18	2
Canada	Statistics Canada. CANSIM Table 253-0001 - Homicide Survey	2016-18	2
Chile[1]	INE, Chile. Undersecretariat of Crime Prevention, Ministry of Interior and Public Safety.	2017-19	2
Colombia	Policía Nacional, Colombia	2014-16	2
Czech Republic	Czech Statistical Office; Police of the Czech Republic.	2016-18	2
Denmark	Statistics Denmark, StatBank Table STRAF11: Reported criminal offences, Homicide series	2016-18	2
Estonia[2]	OECD Regional Questionnaire; information provided by the delegate of the Working Party of Territorial Indicators (WPTI)	2014-16	3
Finland	Statistics Finland, Justice statistics	2016-18	2
France	INSEE, Etat 4001 annuel, DCPJ.	2017-16	2
Germany	OECD Regional Questionnaire; information provided by the delegate of the Working Party of Territorial Indicators (WPTI)	2016-18	2
Greece	Hellenic Statistical Authority, Hellenic Police (offences committed)/ completed and attempted action	2016-18	2
Hungary	Ministry of Justice, Chief Prosecutor's Department	2017-19	2
Iceland	Statistics Iceland	2013-15	2
Ireland	CSO, StatBank Ireland, Table CJQ02: Recorded Crime Offences by Garda Region	2016-18	2
Israel[4]	Central Bureau of Statistics Israel	2016-18	2
Italy	ISTAT, crimes reported by the police forces to the judicial authority	2017-19	2
Japan	National Police Agency, criminal Statistics. Publications of the Police Policy Research Center	2016-18	2
Korea	Korean Ministry of Justice	2016-18	2
Latvia	CSB. Data provided by the delegate of the Working Party of Territorial Indicators (WPTI)	2013-15	3
Lithuania	-	-	-
Mexico[5]	Directorate-General of Government of Mexico, Public Safety and Justice Statistics	2016-18	2
Netherlands	Statistics Netherlands (CBS)-STATLINE	2010-10	2
New Zealand	Statistics New Zealand, Annual Recorded Offences for the latest Calendar Years (ANZSOC)	2012-14	2
Norway[3]	Directorate of the Police of Norway (homicides) and Statistics Norway (crime against property)	2017-19	2
Poland[6]	National Police Headquarters.	2016-18	2
Portugal	Ministry of Justice - Directorate-General for Justice Policy	2016-18	2
Slovak Republic	Statistical Office of the Slovak Republic, regional database Datacube	2017-19	2
Slovenia	OECD Regional Questionnaire; information provided by the delegate of the Working Party of Territorial Indicators (WPTI)	2017-19	2
Spain	INE	2016-18	2
Sweden	Swedish National Council for Crime Prevention (Brå)	2012-14	2
Switzerland	Federal Statistical Office (FSO), Police crime statistics	2015-17	2
Turkey	General Directorate of Security, General Commandership of Gendarme	2011-13	2
United Kingdom	ONS, Crime and Justice, Table 04, Police Force Area Data Tables - Crime in England and Wales, Year Ending December 2013	2015-17	2
United States	Federal Bureau of Investigation, Crime in the United States, Table 4	2015-17	2
Peru	Ministerio del Interior - Oficina Estadística de la Policía Nacional del Perú y Dirección General de Gestión en Tecnologías de Información y Comunicación.	2012-14	2
Romania	General Inspectorate of Romanian Police within the Ministry of Internal Affairs	2013-15	2
Russian Federation	Federal State Statistics Service (Rosstat), data according to the law enforcement authorities	2017-19	2

1. Chile: Figures are people who have been the victim of murder. Data based on crimes known by one police force (Carabineros de Chile).

Estonia and Italy: In some cases, the exact place where a crime is committed is unknown. Therefore, the sums of regions are not always equal with larger geographic aggregation or country total data (the latter including more crimes).

2. Norway: Homicides data exclude acts of terrorism and mass killing.
3. Israel: Police districts are different from CBS districts; Northern district data includes Haifa District. Some files are not included in the district data when they are managed at the national level. Homicide data include acts of terrorism.
4. Mexico: As part of the implementation of the National Census of Law Enforcement, data correspond to administrative records of deaths from homicide location occurrence, registered preliminary enquiries initiated by the Public Prosecutor of the Common Jurisdiction in each of the federal states.
5. Poland: Data include ascertained crimes from the category of homicide and infanticide in any form.

Hospital beds

Country	Source	Year	Territorial level
Australia[1]	Australian Institute of Health and Welfare (AIHW), for Public Hospitals: Australia Hospital Statistics (cat. no. 4390.0)	2016	2
Austria	Austrian Federal Ministry of Labour, Social Affairs, Health and Consumer Protection, Hospital statistics (Bundesministerium für Gesundheit)	2018	2.3
Belgium	Eurostat, Total available beds in hospitals, table hlth_rs_bdsrg	2013	2
Canada[2]	Canadian Institute for Health Information, Hospital Beds Staffed and In Operation	2015	2
Chile	INE, Chile. Department of health statistics and information (DEIS), Ministry of health (MINSAL)	2018	2
Colombia	Special Register of Health Services Providers (REPS), Ministry of Health and Social Protection.	2017	2
Czech Republic	Institute of Health Information and Statistics of the Czech Republic	2018	2.3
Denmark	Eurostat, Total available beds in hospitals, table hlth_rs_bdsrg	2018	2
Estonia[3]	National Institute for Health Development (NIHD), monthly statistical report "Hospital beds and hospitalisation"	2017	2.3
Finland	National Institute for Health and Welfare (THL): Care Register for Institutional Health Care	2017	2.3
France	DRESS, SAE 2017	2018	2.3
Germany[4]	Federal Statistical Office, Hospital statistics (basic data of hospitals and prevention or rehabilitation facilities)	2017	2
Greece	Hellenic Statistical Authority. Health, Social Insurance and Protection Statistics Section	2017	2
Hungary	Source of data: National Health Insurance Fund Administration, NSDCP 2155: Summary report on hospitals' nursing cases	2018	2.3
Iceland	-	-	-
Ireland	Eurostat, Total available beds in hospitals, table hlth_rs_bdsrg	2018	2.3
Israel	Central Bureau of Statistics Israel. Ministry of Health of Israel, Health Information Department	2018	2
Italy[5]	Ministry of Health – D.G. of Health Information System – Office of Statistics *http://www.salute.gov.it/servizio/datisis.jsp*	2017	2.3
Japan	Statistics Bureau, Survey of Medical Institutions, MHLW Japan	2018	2.3
Korea	Statistics Korea. Data provided by the country delegate of the WPTI	2018	2.3
Latvia	The Centre for Disease Prevention and Control (CDPC) of Latvia	2017	2.3
Lithuania	Statistics Lithuania, Institute of Hygiene, annual survey of healthcare institutions	2017	2.3
Luxembourg	Eurostat, Total available beds in hospitals, table hlth_rs_bdsrg	2018	2
Mexico	INEGI. Departamento de Estadísticas de Salud. Estadísticas de Salud en Establecimientos Particulares.. Ministry of health	2017	2
Netherlands	Eurostat, Total available beds in hospitals, table hlth_rs_bdsrg	2002	2
New Zealand	-	-	-
Norway	Statistics Norway, Geir Hjemas	2018	2.3
Poland[6]	The Ministry of Health, the Ministry of Interior and Administration. Statistics Poland. Ministry of Justice (prison hospitals)	2017	2
Portugal	Statistics Portugal (INE), Health Personnel Statistics and Hospital Survey.	2018	2.3
Slovak Republic	National Centre of Health Information	2018	2.3
Slovenia	Treating Institution Report (Form 3-21-60), The National Institute of Public Health of the Republic of Slovenia (NIJZ)	2018	2.3
Spain	Eurostat, Total available beds in hospitals, table hlth_rs_bdsrg	2018	2.3
Sweden	Swedish Association of Local Authorities and Regions	2018	2.3
Switzerland	Federal Statistical Office (FSO), Neuchâtel; Swiss Medical Association (FMH), Bern; Medical Statistics of Physicians, yearly census.	2017	2.3
Turkey	Ministry of Health, General Directorate of Health Research, Health Statistics Yearbook	2017	2
United Kingdom	NHS UK. Beds open overnight and day, Welsh Government, Northern Ireland Health department, ISD Scotland.	2018	2
United States	Kaiser Family Foundation, AHA Annual Survey	2018	2

1. Australia: Average available beds count from public hospital and private hospital. Private hospital includes both private acute and/or psychiatric hospitals and free-standing day hospital facilities. Available beds are those immediately available (occupied and unoccupied) for the care of admitted patients as required. In the case of free-standing day hospital facilities, they include chairs, trolleys, recliners and cots and are used mainly for post-surgery recovery purposes only.
2. Canada: Beds and cribs available and staffed to provide services to inpatients at the required type and level of service at the beginning of the fiscal year. When the number of hospital beds staffed and in operation is not available, calculations are made based on other methods, such as rated bed capacity. Bassinets set up outside the nursery and used for infants other than newborns are included.
3. Estonia: Beds in HP.1 hospitals.
4. Germany: Total hospital beds comprise psychiatric and non-psychiatric beds in all types of hospitals (HP1.1, 1.2 and 1.3) in all sectors (public, not-for-profit and private). Included are beds in general hospitals, mental health hospitals and prevention and rehabilitation facilities. Beds in long-term nursing care facilities are excluded. Cots for healthy infants, recovery trolleys, emergency stretchers, surgical tables and beds for same-day care and palliative care are also not included.
5. Italy: Data refer to all hospitals, public and private, including private hospitals not accredited by National Health Service and except military hospitals.
6. Poland: deviation from definition - cots for healthy infants are included.

Internet via fibre networks: Percentage of households with access to the Internet via fibre networks

Country	Source	Year	Territorial level
Colombia[1]	MinTIC; DANE	2019	2
Denmark	Danish Energy Agency. Broadband coverage map website, *https://tjekditnet.dk/dataudtr%C3%A6k* (accessed 18 June 2020)	2019	2
France[2,5]	ARCEP. "Le marché du haut et très haut débit fixe (déploiements)", ARCEP, *https://www.data.gouv.fr/fr/datasets/le-marche-du-haut-et-tres-haut-debit-fixe-deploiements/#_* (accessed 18 June 2020)	2020	2
Germany[6]	BMVI. “Bericht zum Breitbandatlas Teil 1: Ergebnisse (Stand Ende 2019)”	2019	2
Italy[5]	AGCOM. Broadband Map website, *https://maps.agcom.it/* (accessed 18 June 2020)	2018	2
Portugal[7]	ANACOM. “Redes e serviços de alta velocidade em local fixo (FTTH e HFC) - 1.º semestre de 2020”	2020	2
Spain[5]	Ministry of Economic Affairs and Digital Transformation. Broadband Map website, *https://avancedigital.gob.es/banda-ancha/cobertura/consulta/Paginas/consulta-cobertura-banda-ancha.aspx* (accessed 18 June 2020)	2019	2
United Kingdom[3,6]	Ofcom; Office for National Statistics	2020	2
United States[4]	FCC. Area Table June 2019, FCC Open Data Website, *https://opendata.fcc.gov/Wireless/Area-Table-June-2019/tun5-dwjh* (accessed 24 June 2020)	2019	2

1. Colombia: Number of Internet accesses via fibre networks, “Boletín trimestral del sector TIC - Cifras cuarto trimestre de 2019”, published by the Ministry of Information Technologies and Communications. The number of households by TL2 region comes from the 2018 Population Census.
2. France: Internet access expressed as the percentage of establishments.
3. United Kingdom: Data on coverage availability in residential premises is published by Ofcom at the output area level. Output areas were aggregated to TL2 regions using the “Output Area to Region (December 2018) Lookup in England and Wales” table published by the Office of National Statistics.
4. United States: Internet access is expressed as the percentage of the population.
5. FTTH-only connections for France, Italy and Spain.
6. FTTH/B for Germany and the United Kingdom.
7. FTTH and HFC for Portugal.

Internet speed: Percentage of households with access to the Internet with download speeds greater than 30Mbit/s

Country	Source	Year	Territorial level
Belgium	BIPT; STATBEL Landland Atlas Open Data website. *https://www.bipt-data.be/en/opendata* (accessed 3 July 2020)	2019	2
Canada	Canadian Radio-television and Telecommunications Commission. "Communications Monitoring Report 2019", Table 9.2	2019	2
Colombia	MinTIC, DANE. "Boletín trimestral del sector TIC - Cifras cuarto trimestre de 2019"	2019	2
Denmark	Danish Energy Agency. Broadband coverage map website, *https://tjekditnet.dk/dataudtr%C3%A6k* (accessed 18 June 2020)	2019	2
Finland	TRAFICOM, Statistics Finland. "Fixed broadband availability", TRAFICOM website, *https://www.traficom.fi/en/statistics/fixed-broadband-availability* (accessed 17 June 2020)	2019	2
France	ARCEP; INSEE. Ma connexion Internet website, *https://www.data.gouv.fr/fr/datasets/ma-connexion-internet-beta/* (accessed 6 July 2020)	2020	2
Germany	BMVI. "Bericht zum Breitbandatlas Teil 1: Ergebnisse (Stand Ende 2019)"	2019	2
Hungary	Hungarian Ministry for Innovation and Technology. Data was provided to the OECD	2017	2
Ireland	Department of Communications, Climate Action and Environment. "High-Speed Broadband Map, County Coverage Statistics, Q1 2018"	2018	2
Italy	AGCOM. Broadband Map website, *https://maps.agcom.it/* (accessed 18 June 2020)	2018	2
Norway	Norwegian Communications Authority; Statistics Norway	2019	2
Spain	Ministry of Economic Affairs and Digital Transformation. "Banda Ancha – Información de cobertura", *https://avancedigital.gob.es/banda-ancha/cobertura/consulta/Paginas/consulta-cobertura-banda-ancha.aspx* (accessed 18 June 2020)	2019	2
United Kingdom	Ofcom; Office for National Statistics	2020	2
United States	FCC. Area Table June 2019, Open Data Website, *https://opendata.fcc.gov/Wireless/Area-Table-June-2019/tun5-dwjh* (accessed 24 June 2020)	2019	2

1. Belgium: Communes were aggregated to TL2 regions using the REFNIS tables from STATBEL.
2. Colombia: The number of households by TL2 region comes from the 2018 Population Census.
3. Finland: Municipalities were aggregated to TL2 regions using data on the number of household-dwelling units published by Statistics Finland, Table 115a.
4. France: The data published by the ARCEP corresponds to a beta release that is subject to updates and improvements. *Communes* were aggregated to TL2 regions using the official geographical code tables from the INSEE.
5. Norway: Households were mapped to TL2 regions using table "Landsdelsinndeling 2002 - Kommuneinndeling 2019" published by Statistics Norway.
6. United Kingdom: Data on coverage availability in residential premises is published by Ofcom at the output area level. Output areas were aggregated to TL2 regions using the "Output Area to Region (December 2018) Lookup in England and Wales" table published by the Office of National Statistics

Internet in rural areas: Percentage of households with access to the Internet with download speeds greater than 30Mbit/s, rural and national level

Country	Source	Year	Territorial level
Canada	Canadian Radio-television and Telecommunications Commission, Communications Monitoring Report 2019", Figure 9.23	2019	1
EU countries	European Commission, Study on Broadband Coverage in Europe 2018	2018	1
United States	FCC Area Table June 2019, FCC Open Data Website	2019	1

1. United States: *https://opendata.fcc.gov/Wireless/Area-Table-June-2019/tun5-dwjh* (accessed 24 June 2020).

Internet access: Share of individuals without Internet

Country	Source	Year	Territorial level
EU countries	Eurostat, table [isoc_r_iuse_i], Individuals without Internet	2019	2
Japan	Ministry of Internal Affairs and Communications, Survey on telecommunication use trend	2018	2
United States	US Census CS 1-year estimates, Computer and Internet Use, table B28003		2

Metropolitan population

Country	Source	Year	Territorial level
EU22 countries[1]	European Commission, Joint Research Centre (JRC); Columbia University, Center for International Earth Science Information Network - CIESIN (2015): GHS population grid, derived from GPW4, multitemporal (1975, 1990, 2000, 2015). European Commission, Joint Research Centre (JRC) [Dataset] PID: *http://data.europa.eu/89h/jrc-ghsl-ghs_pop_gpw4_globe_r2015a*	1975, 1990, 2000, 2015	FUA, metropolitan area
Australia			
Canada			
Chile			
Japan			
Korea			
Mexico			
Norway			
Switzerland			
United States			
Colombia			

Note: Population in metropolitan areas is estimated by adding the population per square kilometre (of the GHS population grid) within the metropolitan boundaries.

1. EU22 countries: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom.

Mortality rate due to cardiovascular or respiratory diseases

	Source	Year	Territorial level
EU24 countries plus United Kingdom[1]	Eurostat, Causes of death - crude death rate by NUTS 2 region of residence	2018	2
Australia	Australian Institute of Health and Welfare	2018	2
Canada	-	-	-
Chile	INE	2017	2
Colombia	-	-	-
Iceland	World Health Organization Mortality Database	2019	1
Israel	Central Bureau of Statistics	2017	2
Japan	Statistics Bureau of Japan, MIC	2018	2
Korea	Statistics Korea	2018	2
Mexico	INEGI	2018	2
New Zealand	-	-	-
Norway	Eurostat, Causes of death - crude death rate by NUTS 2 region of residence	2017	2
Switzerland	Swiss Federal Statistical Office	2017	2
Turkey	-	-	-
United States	-	-	-

1. EU24 last available year 2018: AUT, CZE, ESP, HUN, PRT, SVK, SVN; 2017: BGR, CHE, DEU, DNK, EST, FIN, GBR, GRC, HRV, IRL, ITA, LTU, LUX, LVA, POL, ROU, SWE; 2016: FRA.

Municipal waste

Country	Source	Last year	Territorial level
Australia	National Waste report	2017	2
Austria	Environment Agency Austria (UBA) - Austrian Federal Waste Management Plan and related Status Reports	2018	2
Belgium	Eurostat, Municipal waste (env_rwas_gen)	2012	2
Chile	INE, Chile. Pollutant Release and Transfer Register (PRTR) ~ Registro de Emisiones y Transferencias de Contaminantes (RETC)	2017	2
Czech Republic	Czech Statistical Office CZSO, Annual statistical survey	2013	2
Estonia	Eurostat, Municipal waste (env_rwas_gen)	2013	2
France	Années impaires : enquêtes collecte de l'Ademe ; Années paires : estimations SDES	2018	2
Germany	Waste Statistics of the Federal Statistical Office and the Statistical Offices of the Federal States, Spatial Monitoring System of the BBSR	2015	2
Hungary	Eurostat	2018	2
Israel	Central Bureau of Statistics Israel.	2018	2
Italy	ISPRA (Italian Institute for Environmental Protection and Research)	2017	2
Japan	Ministry of Internal Affairs and Communications	2016	2
Korea	Korean Ministry of Environment	2018	2
Latvia	Eurostat, Municipal waste (env_rwas_gen)	2013	2
Luxembourg	Eurostat, Municipal waste (env_rwas_gen)	2013	2
Mexico	INEGI. Censo Nacional de Gobiernos Municipales y Delegacionales 2017	2016	2
Netherlands	Statistics Netherlands	2017	2
Norway	Statistics Norway. No longer reported on NUTS2	2015	2
Poland	Central Statistical Office	2018	2
Portugal	Statistics Portugal, Urban waste statistics.	2018	2
Slovak Republic	Statistical Office of the SR statistical survey	2018	2
Slovenia	SURS, Generated amounts	2018	2
Sweden	Swedish Environmental Protection Agency	2010	2
Turkey	Municipal Waste Statistics Survey	2018	2
United Kingdom	Department for Environment, Food and Rural Affairs, Local Authority Collected Waste Statistics	2013	2

Obesity rate

Country	Source	Year	Territorial Level
Australia	ABS, 4364.0.55.001 - National Health Survey	2018	2
Austria	Statistics Austria, Demographic Indicators, Obesity: Statistics Austria, Austrian Health Interview Surveys 2006/07 and 2014	2014	2
Belgium	-	-	-
Canada	Statistics Canada. Canadian Community Health Survey. Body mass index, overweight or obese, self-reported, adult, age groups (18 years and older)	2017	2
Chile	INE	2016	2
Colombia	DANE - ENSIN, Prevalence of obesity for the 15 to 64 years population	2015	2
Czech Republic	Institute of Health Information and Statistics of the CR. Results of the European Health Interview Survey (EHIS) 2008 and 2014	2014	2
Denmark	Danish National Institute of Public Health	2017	2
Estonia	National Institute for Health Development, Health Behaviour among Estonian Adult Population Study	2016	2
Finland	-	-	-
France	-	-	-
Germany	-	-	-
Greece	-	-	-
Hungary	European Health Interview Survey 2009 and 2014	2014	2
Iceland	-	-	-
Ireland	-	-	-
Israel	Israel Central Bureau of Statistics, The Israeli Social Survey 2017 and 2010	2017	2
Italy	Istat, Multipurpose survey on households: aspects of daily life - general part	2017	2
Japan	-	-	-
Korea	-	-	-
Latvia	CSB - EHIS 2008; EHIS 2014	2014	2
Lithuania	Statistics Lithuania, Health Interview Survey	2014	2
Luxembourg	-	-	-
Mexico	INEGI	2018	-
Netherlands	-	-	-
New Zealand	-	-	-
Norway	Statistics Norway table 08284	2015	2
Poland	-	-	-
Portugal	Statistics Portugal, Complete life tables. Statistics Portugal, National Health Survey	2019	2
Slovak Republic	Statistical Office of the Slovak Republic, regional database	2014	2
Slovenia	National Institute of Public Health (NIJZ)	2014	2
Spain	INE Ministerio de Sanidad, Consumo y Bienestar Social	2017	2
Sweden	Living Conditions Surveys	2017	-
Switzerland	Swiss Health Survey	2017	2
Turkey	-	..	2
United Kingdom	NHS Obesity 16+ years	2018	2
United States	US Center for Disease Control and Prevention. CDC Nutrition, Physical Activity and Obesity	2018	2

$PM_{2.5}$ particles concentration

Country	Source	Year	Territorial level
All countries	Air quality and health: Exposure to $PM_{2.5}$ fine particles - countries and regions", OECD Environment Statistics (database), using IHME GBD 2019 concentration estimates *https://doi.org/10.1787/96171c76-en*	2000-19	2, Cities

Population mobility among regions (total and young)

Country	Source	Year	Territorial level
Australia[1]	Australian Bureau of Statistics (ABS), ABS.Stat	2015-18	3
Austria	Statistics Austria, Migration statistics	2015-18	3
Belgium	FPS Economie/Statistics Belgium	2015-18	3
Canada	Statistics Canada. Cansim Table 051-0012	2015	2
Chile	INE, Population and Housing Census	2015-17	2
Czech Republic	Czech Statistical Office CZSO	2015-18	3
Denmark	Statistics Denmark, StatBank, table FLY55	2016-18	3
Estonia	Statistics Estonia, Statistical database, table POR06	2015-18	3
Finland	Statistics Finland, Population Statistics, Migration	2014-16	3
France	INSEE, Recensement de la Population	2015-16	3
Germany	Spatial Monitoring System of the BBSR. Periodic update of population statistics by the Federal Office of Germany and the Statistical Offices of the Federal States	2015-17	3
Greece[2]	n.a.	-	-
Hungary	HCSO, Hungarian Central Statistical Office, Internal migration statistics based on the registration system of home addresses	2015-18	3
Iceland	Statistics Iceland, Internal migration	2015-18	3
Ireland[2]	n.a.	-	-
Israel	Central Bureau of Statistics Israel	2015-18	2
Italy	Istat, Iscrizioni e cancellazioni anagrafiche (changes of residence from/to Italian municipalities)	2015-18	3
Japan	Statistics Bureau, Migrants by prefecture derived from the Basic Resident Registers	2016-18	3
Korea	Statistics Korea, KOSIS database - Internal Migration Statistics	2015-18	3
Latvia	Central Statistical Bureau of Latvia	2015-17	3
Lithuania	Statistics Lithuania, Data sources – the State Enterprise Centre of Registers, the Population Register; the Ministry of the Interior	2015-18	3
Mexico	INEGI. Censo de población y vivienda 2010	2015	3
Netherlands	Statistics Netherlands on Statline	2015-18	2
New Zealand[2]	n.a.	-	-
Norway	Statistics Norway. Statbank, table 01222: Population change (M)	2015-18	3
Poland	Central Statistical Office of Poland, PESEL register	2015-18	3
Portugal[2]	n.a.	-	-
Slovak Republic	Statistical Office of the SR	2015-18	3
Slovenia	Statistical Office of the Republic of Slovenia, Ministry of the Interior - Central Population Register, Ministry of the Interior - Administrative Internal Affairs Directorate	2015-18	3
Spain	INE - Data provided by the delegate of the OECD Working Party on Territorial Indicators	2015-18	3
Sweden	Statistics Sweden, Central Office for Administrative and Electronic Public Services registration system	2015-18	3
Switzerland	Swiss Federal Statistical Office, 1990 to 2010: Annual Population Statistics (ESPOP), from 2011 onwards: Population and Households Statistics (STATPOP)	2015-18	3
Turkey	Turkish Statistical Institute (TurkStat), Address Based Population Registration System	2015	3
United Kingdom[3]	National Statistical Office, Population Estimates	2015-18	3
United States	Census Bureau. County-to-County Migration Flows, 5-year ACS datasets	2015; 2017	3
Romania	National Institute of Statistics	2015	2

Note: Data refer to domestic migration: inflows and outflows of population from one region to another region of the same country. They do not include international immigration and outmigration.

1. Australia: Regional internal migration covers the movement of people from one location to another within Australia. Regional internal migration estimates (RIME) are prepared for sub-state regions and captures moves over each financial year on an annual basis.
2. Greece, Ireland, New Zealand and Portugal recent data not available at the regional level.
3. United Kingdom: Data do not include Northern Ireland and Scotland.

Population: Total, by age and gender

Country	Source	Year	Territorial level
EU24 countries plus United Kingdom[1]	Eurostat, regional statistics, population at 1 January, table demo_r_pjangrp3	2000-19	3
Australia	Australian Bureau of Statistics, cat. no. 3235.0, Population Estimates by Age and Sex, Regions of Australia (ASGS 2011), population at 30 June	2001-19	3
Canada	Statistics Canada. CansimTable 051-0062. Population Estimates based on Standard Geographical Classification 2011, population at 1 July	2000-19	3
Chile[1]	INE, Chile. Population projection and estimates by gender and age. 1990-2020, average annual population	2000-19	3
Colombia	DANE. Estimation of population 1985-2005 and projection of population 2005-2020 by department.	2000-19	2
Iceland	Statistics Iceland, population at 1 of January by municipality	2000-19	3
Israel[2]	Central Bureau of Statistics Israel	2000-19	3
Japan	Statistics Bureau, Current Population Estimates as of 1 October	2000-19	3
Korea	Statistics Korea, KOSIS database, yearly average projected population by age, population at 1 October	2000-19	3
Lithuania	Eurostat regional statistics, population on 1 January, table demo_r_pjangrp3	2000-17	3
Mexico	INEGI, mid-year estimates, Population and Housing Census (1990,95,00,05,2010), OECD estimates for inter-census years. As from 2011 data are based on population projection, population at 30 June	2000-10	3
New Zealand	Statistics New Zealand, Population Statistics. Boundaries at 1 January 2013. NZ.DOTSTAT (Tablecode 7501), population at 30 June	2000-19	3
Norway	Statistics Norway, population at 1 January; 2014 data collected from Eurostat	2000-19	3
Switzerland[2]	Swiss Federal Statistical Office: from Dec-2010 onwards (Population and Households Statistics (STATPOP); Dec-1990 to Dec-2009: Annual Population Statistics (ESPOP); break in series between 2010 and 2011	2000-19	3
Turkey[1,2]	Turkish Statistical Institute (TurkStat). The source of 2007-19 data is Address Based Population Registration System (ABPRS) and de jure population	2001-19	3
United States	United States Census Bureau - State and County Population Estimates, Table PEPAGESEX, population at 1 July	2000-19	3
Brazil	Instituto Brasileiro de Geografia e Estatística, IBGE, census 1991, 2000, 2010	2000-18	2
Costa Rica		2000-19	2
China	China Statistical database - Age composition and dependency ratio of population table	2000-19	2
Peru		2000-17	2
India		2001-15	2
Russian Federation	Federal State Statistics Service (Rosstat). Number of de jure (resident) population on subjects of the Russian Federation	2000-19	2
Tunisia	Statistiques Tunisie (INS)	2000-18	3
South Africa	Statistics South Africa, population estimates for the period 2002-2017 based on 2011 Census	2002-19	2

1. First available year for population by age: Chile and Romania; 2002; Netherlands 2003; Turkey 2008.
2. Population at 31 December restated at 1 January of the following year by the OECD.

Protected area

Country	Source	Year	Territorial level
All countries	IUCN and UNEP-WCMC (2017), The World Database on Protected Areas (WDPA), Online, January 2017, Cambridge, UK: UNEP-WCMC, *www.protectedplanet.net*	2017	2

Subnational government expenditure, investment, revenue and debt

Country	Source	Year	Territorial level
All countries [12345]	OECD National Accounts	2018	-

1. Data at the country level are derived mainly from the OECD National Accounts harmonised according to the new standards of the System of National Accounts (SNA) 2008. They are complemented by data from Eurostat, the International Monetary Fund (IMF) (Chile, Australia) and national statistical institutes for some countries or indicators (in particular, territorial organisation). Subnational government is defined here as the sum (non-consolidated) of subsectors S 1312 (state governments in federal countries) and S 1313 (local governments).
2. Total public expenditure comprises current expenditure (compensation of employees, intermediate consumption, social expenditure, subsidies and other current transfers, taxes, financial charges, adjustments) and capital expenditure (investments – see below – plus capital transfers – i.e. investment grants and subsidies in cash or in kind made by subnational governments to other institutional units).
3. Public investment includes gross capital formation and acquisitions, less disposals of non-financial non-produced assets. Gross fixed capital formation (or fixed investment) is the main component of investments. NB: since the new standards of the SNA 2008, expenditures on research and development and weapons systems are included in gross fixed capital formation.
4. Total public revenue comprises tax revenue (see below), transfers (current and capital grants and subsidies), tariffs and fees, property income and social contributions.
5. Tax revenue comprises taxes on production and imports (D2), current taxes on income and wealth (D5) and capital taxes (D91). It includes both own-source tax revenue (or “autonomous”) and tax revenue shared between central and subnational governments. NB: The SNA 2008 has introduced some changes concerning the classification of some shared tax revenues. In several countries, certain tax receipts have been recently reclassified as transfers and no longer as shared taxes.
6. Public debt: Based on the SNA 2008, gross debt includes the sum of the following liabilities: currency and deposits + debt securities + loans + insurance pension and standardised guarantees + other accounts payable. Most debt instruments are valued at market prices. NB: the OECD definition differs from the one defined in the EU Maastricht protocol which is restricted to the sum of the first three items (i.e. mainly borrowing).

Trade openness

Country	Source	Year	Territorial level
Australia	Australian Bureau of Statistics, 5368.0 - International Trade in Goods and Services. Table 15a. Merchandise exports, State and Australia, FOB Value and Table 15b. Merchandise imports, State and Australia, Customs Value	2018	2
Austria[1]	Statistics Austria compiles on behalf of the Austrian Chamber of Commerce (WKO) and the nine Austrian federal states regionalised foreign trade data by federal states	2018	2
Canada	Statistics Canada. CANSIM database. Table 228-0060 Merchandise imports and domestic exports	2017	2
Colombia	National Administrative Department of Statistics - DANE, Directorate of Methodology and Statistical Production	2017	2
France	Douanes. Statistiques départementales et régionales du commerce extérieur pour l'exportation de marchandises	2018	2
Germany	Spatial Monitoring System of the BBSR	2016	2
Greece	Hellenic Statistical Authority. External Trade Survey	2018	2
Italy	ISTAT, Instrastat System	2017	2
Korea	Statistics Korea	2018	2
Latvia[2]	The External trade database and the Business register information of the Central Statistical Bureau	2015	2
Lithuania[3]	Statistics Lithuania, Lithuanian Customs: extra-EU trade Customs declarations, intra-EU trade (since 2004) Intrastat survey; Statistics Lithuania: Statistical Business Register	2017	2
Portugal[4]	Statistics Portugal, Statistics on external trade of goods.	2018	2
Slovenia	SURS	2018	2
Sweden	Statistics Sweden	2018	2
Switzerland[5]	Swiss Federal Customs Administration FCA	2017	2
United Kingdom	HM Revenue and Customs: Trade Statistics, UK Regional Trade in Goods Statistics	2018	2
United States	U.S. Census Bureau: Economic Indicators Division USA Trade Online. U.S. Import and Export Merchandise trade statistics	2017	2
China	National Bureau of Statistics China. Customs statistics	2018	2
Russian Federation	Federal customs service	2017	2

1. Austria: Austrian federal states regionalised foreign trade data by federal states. In order to calculate statistically reliable regional foreign trade data in compliance with the principles of the national official statistical institution, individual records are matched and reassigned by resorting to already existing data sources.
2. Latvia: Unspecified data have been adjusted for non-response as well as trade below threshold related to the trade between the member states. Other unspecified information includes trade figures about the enterprises that are not registered in the business register (foreign enterprises) but which were carried out the trade in goods activities in Latvia.
3. Lithuania: Trade data are compiled according to the Special Trade System. Data by regions were compiled by linking International Trade in Goods Statistics (ITGS) and Statistical Register of Economic Entities (Statistical Business Register) data. Intrastat adjustments for non-response and trade below exemption thresholds are not included. Data are based on the information of only successfully linked enterprises.
4. Portugal: The value for Portugal may not match the sum of the regions, since head offices of some economic operators are not identified or are located abroad.
5. Switzerland: Data include gold, silver in bars and coins, electricity, returned goods and outward processing. Data omits two regions considered by FCA (the Principality of Liechtenstein and *canton* not specified); therefore, the sum of CH01-CH07 does not correspond to the official Swiss foreign trade at total level, *www.swiss-impex.admin.ch*.

Tree cover

Country	Source	Year	Territorial level
All countries	Data collected from OECD (2020), "Land resources: Land cover change in countries and regions", OECD Environment Statistics (database), *https://doi.org/10.1787/3bce4397-en*	1992-2018	Cities

Vehicles rate

Country	Source	Last year	Territorial level
Australia	Australian Bureau of Statistics (ABS), Motor Vehicle Census (cat. no. 9309.0)	2020	3
Austria	Statistics Austria, Transport statistics	2018	3
Belgium	Statbel and IWEPS computation	2014	3
Czech Republic	Czech Statistical Office CZSO, Ministry of Transport of the Czech Republic	2019	3
Denmark	Statistics Denmark, StatBank Table BIL707: Stock of vehicles per 1 January by region, passenger cars (for private use, taxis and rental)	2014	3
Finland	Statistics Finland, Transport and tourism statistics	2018	3
France	MEDDTL (CGDD/SOeS) Fichier central des automobiles	2017	3
Germany	Motorist's Federal Office (Kraftfahrt-Bundesamt), Spatial Monitoring System of the BBSR	2018	3
Hungary	Hungarian Central Statistical Office. Until 2017: Central Office for Administrative and Electronic Public Services, from 2017 Ministry of Interior - stock of road vehicles	2019	3
Iceland	Iceland road traffic directorate (*www.us.is/umferdarstofa*). Private vehicles	2014	3
Ireland	Department of Transport, Tourism and Sport. Irish Bulletin of vehicle and driver statistics, Table 5a. Number of Private Cars by CO_2 Emission Band in each Licensing Authority Area	2018	3
Israel	Central Bureau of Statistics Israel	2018	3
Italy	Automobile club d'Italia	2014	3
Japan	Ministry of Internal Affairs and Communications	2013	3
Korea	Ministry of Land, Infrastructure and Transport	2019	3
Norway	Statistics Norway, table 11823	2018	3
Poland	Ministry of Interior of Poland, Central Register of Vehicles	2018	3
Slovak Republic	Ministry of Interior of the SR	2019	3
Slovenia	Statistical Office of the Republic of Slovenia (SURS), the Central Register of Vehicles and Traffic Documents (MRVL) by the Ministry of Infrastructure (MZI)	2018	3
Spain	Gobierno de España, Ministerio del Interior, Dirección General de Tráfico. Parque de vehículos por provincias y tipos	2010	3
Sweden	Statistics Sweden, Registered vehicles	2018	3
Switzerland	Federal Statistical Office (FSO). Motor road vehicles statistics	2014	3
United Kingdom	Office for National Statistics, ONS. Number of cars (thousands) licensed at the end of 2013 in Great Britain; by upper- and lower-tier local authority. Before 2013: United Kingdom Ministerial Department for Transport statistics	2013	3

Voter turnout

Country	Source	Last year	Territorial level
Australia	Australian Electoral Commission. Federal election	2019	2
Austria	Austrian Federal Ministry of the Interior, parliamentary elections	2019	2, 3
Belgium	Federal Portal of Belgium. Parliamentary elections	2019	2
Canada	Elections Canada, Election Results 19 October 2015 - enr.elections.ca	2019	2
Chile	INE, Chile. Electoral service (Servel)	2017	2
Colombia	National Administrative Department of Statistics - DANE	2018	2
Czech Republic	Czech Statistical Office CZSO, Results of Election to the Chamber of Deputies of the parliament	2017	2, 3
Denmark	Danish general election - *http://electionresources.org/dk/data*	2019	2, 3
Estonia		2015	2
Finland	Statistics Finland, Presidential elections, second round	2018	2
France	BEEP - Ministère de l'intérieur.	2017	2
Germany	Federal Returning Officer *www.bundeswahlleiter.de*	2017	2.3
Greece	Ministry of Interior, Parliamentary Elections 2012 - *www.ypes.gr/en/Elections/*	2017	2
Hungary	Hungarian National Election Office	2015	2, 3
Iceland	Results of general elections - *www.statice.is/statistics/plation/elections/general-elections*	2018	2, 3
Ireland	Houses of the Oireachtas - *www.oireachtas.ie*	2016	2, 3
Israel	Central Bureau of Statistics Israel	2016	2, 3
Italy	Ministero dell'interno, Dipartimento per gli Affari Interni e Territoriali. Servizi Elettorali	2019	2
Japan	Statistics Bureau (2014: Representatives elections)	2018	2, 3
Korea	Korean National Election Commission	2019	2, 3
Luxembourg	STATEC	2018	2
Lithuania	The Central Electoral Commission of the Republic of Lithuania	2015	3
Mexico	INEGI, general elections	2018	2
Norway	Statistics Norway	2017	2.3
Netherlands	Dutch Electoral Council (Kiesraad) - *www.kiesraad.nl*	2018	2
New Zealand	Electoral commission. General election, official result	2018	2
Norway	Statistics Norway	2017	2, 3
Poland	Central Statistical Office of Poland, National Election Commission	2017	2
Portugal	Ministry of Internal Administration of Portugal- Directorate-General of Internal Administration	2019	2, 3
Slovak Republic	Statistical Office of the SR	2019	2, 3
Slovenia	Republic of Slovenia Early elections for deputies to the National Assembly	2016	2
Spain	INE	2014	2, 3
Sweden	Swedish Election Authority	2019	2, 3
Switzerland	Statistique suisse - *www.politik-stat.ch/nrw2015wb_fr.html*	2018	2, 3
Turkey	Data sent by the Turkish delegate of the OECD Working Party on Territorial Indicators	2019	2, 3
United Kingdom	Data sent by the UK delegate of the OECD Working Party on Territorial Indicators	2015	2
United States	US Census. Reported Voting and Registration of the Citizen Voting-Age Population	2015	2

ANNEX C

Indexes and estimation techniques

Theil entropy index

Definition: Regional disparities are also measured by a Theil entropy index, which is defined as:

$$Theil = \sum_{i=1}^{N} \frac{y_i}{\overline{y}} ln\left(\frac{y_i}{\overline{y}}\right)$$

where N is the number of regions in the OECD, y_i is the variable of interest in the i-th region (i.e. household income, life expectancy, homicide rate, etc.) and $\overline{y}$ is the mean of the variable of interest across all regions.

The Theil index can be easily decomposed in two components: i) the disparities within subgroups of regions – where for example a subgroup is identified by a set of regions belonging to a country; ii) the disparities between subgroups of regions (i.e. between countries). The sum of these two components is equal to the Theil index.

In order to decompose the Theil index, let us start by assuming m groups of regions (countries). The decomposition will assume the following form:

$$Theil = \sum_{j=1}^{M} \sum_{i=1}^{N} s_j \frac{y_{ij}}{\overline{y}_j} ln\left(\frac{y_{ij}}{\overline{y}_j}\right) + \sum_{j=1}^{M} s_j ln\left(\frac{\overline{y}_j}{\overline{y}}\right)$$

where the first term of the formula is the *within* part of the decomposition equal to the weighted average of the Theil inequality indexes of each country. Weights, s_j, are computed as the ratio between the country average of the variable of interest and the OECD average of the same variable. The second term is the between component of the Theil index and represents the share of regional disparities that depends on the disparities across countries.

Interpretation: The Theil index ranges between zero and ∞, with zero representing an equal distribution and higher values representing a higher level of inequality.

The index assigns equal weight to each region regardless of its size; therefore, differences in the values of the index among countries may be partially due to differences in the average size of regions in each country.

Methodology to estimate the potential for remote working

The assessment of regions' capacity to adapt to remote working is based on the diversity of tasks performed in different types of occupations and is structured in two steps.

The first step requires classifying each occupation based on the tasks required and according to the degree to which those tasks can be performed remotely. Such a classification is based on a recent study by Dingel and Neiman (2020, "How many jobs can be done at home?", Becker Friedman Institute White Paper March, *https://bfi.uchicago.edu/working-paper/how-many-jobs-can-be-done-at-home/*), which is built from the O*NET surveys conducted in the United States. The second step relies on data from labour force surveys and consists of assessing the geographical distribution of different types of occupations and subsequently matching those occupations with the classification performed

in the first step. Combining the two data sets allows assessing the number of workers that can perform their task from home as a share of the total employment in the region.

This assessment does not consider the specific regulations or arrangements that each country applies to remote working and which affect the actual share of people working remotely. For example, limitations in the days of remote working for cross-border workers are not reflected in the estimates presented here.

Methodology to estimate GDP at the metropolitan level

The proposed methodology uses GDP per capita values in TL3 regions, TL2 regions (for Australia, Chile, Colombia and Mexico) and census metropolitan areas (CMA) in Canada as data inputs and the distribution of the population based on the Global Human Settlement (GHS) population grids.

The suggested methodology is composed of three main steps:

1. Intersect the functional urban area's (FUA) boundaries with the TL3 boundaries.
2. Calculate the share of population living in the intersection of the TL3 boundary and the FUA.
3. Derive the gross domestic product (GDP) value based on the share of population living in the area calculated in the previous step.

It has to be noted that the estimates of GDP in the metropolitan areas do not adhere to international standards; the comparability among countries relies on the use of the same methodology applied to areas defined with the same criteria.

For the United States, county-level data was aggregated to FUAs.

Methodology to estimate cooling degree days at the FUA level

The data used to compute cooling degree day (CDD) indicators at the FUA level comes from the historical global gridded degree days database of CDD and heating degree days (HDD)The database includes three types of indicators corresponding to CDD, HDD, and CDD computed using wet-bulb temperature (CDDwb). Each indicator is available at 6 different threshold temperatures: 18, 18.3, 22, 23, 24 and 25°C for CDD and CDDwb and 10, 15, 15.5, 16, 17 and 18°C for HDD. The database provides these three indicators both by year and by month over the period 1970-2018.

The dataset used to compute indicators at the FUA level is the CDD raster corresponding to a threshold temperature of 22°C. The 49 bands of the raster correspond to the annual CDD values from 1970 to 2018 included.

Indicators were computed using the geopandas, rasterstats python libraries and by intersecting the raster file with the shapefile corresponding to the FUAs' boundaries. For each FUA, the average cell value is calculated. All cells having an intersection with the FUA are included in the mean value calculation. The cells with missing values are ignored.

Methodology to estimate electricity indicators at the regional level

The Global Power Plant Database (GPPD) provides information on power plants located in 164 countries all over the world, including the 37 OECD countries. For each power plant, the GPPD provides the geographic co-ordinates and a number of attributes, as follows:

- The energy source: oil, gas, coal, petroleum coke, cogeneration, hydro, wind, waste, biomass, wave and tidal, geothermal, solar, nuclear and others.
- The generation capacity, which is the maximum power (in megawatts, MW) that the plant can deliver. The capacity is a facility-specific characteristic and does not change over time, unless extension or upgrade of the power station, or a shutdown of a part of it.

- The annual electricity generation, which provides the amount of electricity generated over a year (in GWh). This indicator is reported for 24% of the power plants over the period 2013-17. When no electricity generation was reported, the annual electricity generation was estimated. The annual generation corresponds to the gross generation, i.e. the electricity consumption of the power plant for its operation is not deducted.
- The country where the power plant is registered.

The International Energy Agency (IEA) database (see Annex B) includes national-level electricity generation data by energy source for most OECD countries (excluding Colombia). The IEA dataset used to estimate electricity generation indicators at the local level corresponds to the gross electricity production by energy source in 2017. A breakdown of 53 different sources is available.

Electricity generation estimates

In order to remain consistent across countries and energy sources, electricity generation was estimated at the power plant level based on the relative capacity of each power plant (from the GPPD) and on the total national electricity generation form each energy source (from the IEA). The methodology follows the four steps below:

1. Map energy sources from the IEA to the GPPD classification.
   The IEA electricity production data provides a higher level of detail in terms of breakdown by energy source compared to the GPPD data. For this reason, each energy source type recorded in the IEA database was matched to a source category in the GPPD.
2. Determine the share of national capacity for each power plant.
   For each power plant *p*, located in the country *c* and generating electricity from the energy source *f*, the share of the capacity of the power plant in the national capacity for the source *f* is calculated as:

$$share_{p,c,f} = \frac{capacity_{p,c,f}}{\sum_i capacity_{i,c,f}}$$

where $i \in$ power plants located in the country *c*, and generating electricity from the source *f*.

1. Allocate a part of the national generation to each power plant.
   For each power plant *p*, generating electricity from source *f*, in the country *c*, the estimated generation is calculated as:

$$generation_{p,c,f} = share_{p,c,f} * national\ generation_{c,f}$$

1. Exceptions.
   Since no data on electricity generation by source is available for Colombia in the IEA database, only the GPPD estimated generation data was used. In contrast, GPPD data was not necessary to estimate electricity production within Estonia, Latvia and Luxembourg, as those countries do not have a geographical disaggregation according to the OECD definition of large regions (TL2) (see the OECD Territorial Grid in Annex A). For these countries, direct use of IEA was sufficient for comparisons with other TL2 regions.

Aggregation at local scales

In order to compute indicators at different geographical scales, a point shapefile was created from the GPPD using the latitude and longitude provided for each facility – each point representing a power plant. The point shapefile was overlapped with two other shapefiles corresponding to the boundaries of the subnational geographies available in OECD countries (TL2 and TL3 regions). Thus, each power plant can be associated to a TL2 region and a TL3 region. Offshore power plants were assigned to the closest region (of the registered host country) based on the distance to the coast.

Year of reference

All indicators presented in this document refer to the year 2017, which corresponds to the latest year for which capacity data is available in the GPPD.

Breakdown by energy source categories

The GPPD includes 13 different energy sources. These energy sources were aggregated into three categories (fossil fuels, renewables and nuclear). The energy sources within each category are comparable in terms of technology, risks and impacts on the environment. A sub-category for coal was made, as coal is the most carbon-intensive fuel to produce electricity.

Electricity generation indicators

For each region *r*, generation data was aggregated into each category *i* as:

$$generation_{r,\ i} = \sum_{k\ \in\ i} power\ plant\ generation_{r,k}$$

where *k* ∈ {coal, gas, oil, petroleum coke, cogeneration, nuclear, hydro, wind, waste, biomass, wave, geothermal, solar}, *i* ∈ {fossil fuels, coal, nuclear, renewables}, and $power\ plant\ generation_{r,\ k}$ is the electricity generation of a power plant located in the region *r*, generating electricity from the source type *k*.

Energy mix indicators

For each region *r*, the share of each energy source category *i* (fossil fuels, coal, nuclear, renewables) is calculated as:

$$share_{r,i} = \frac{generation_{r,\ i}}{\sum_j generation_{r,\ j}} * 100$$

where j ∈ {fossil fuels, renewables, hydro, wind, nuclear}.

Greenhouse gas (GHG) emissions from electricity generation indicators

GHG emissions indicators are derived from both the electricity generation by energy source and the emission intensity of each energy source. Electricity generation was estimated at the power plant level for each energy source included in the GPPD as described above. Emission intensity by energy source comes from the IPPC estimates on GHG emissions of supply technologies.

For each region *r*, the GHG emissions (in tons of CO_2 equivalent) are calculated as:

$$emissions_r = \sum_{k\ \in\ f} generation_{r,\ k} * emission\ intensity_k$$

where the emission intensity corresponds to the median value of the lifecycle emissions (in gCO_2eq/kWh), f ∈ {coal, gas, oil, petroleum coke, cogeneration, nuclear, hydro, wind, waste, biomass, wave, geothermal, solar}.

Emission intensity indicator

For each region r, the emission intensity (in tons of CO_2 equivalent per GWh) is calculated as:

$$emission\ intensity_r = \frac{emissions_r}{\sum_i generation_{r,i}}$$

where *i* ∈ {fossil fuels, renewables, nuclear}.

Methodology to estimate protected areas at the regional level

The World Database on Protected Areas (Annex B) is a worldwide record of marine and terrestrial protected areas. Launched by the International Union for Conservation of Nature (IUCN) and the United Nations Environment Programme (UNEP), the geospatial database has been compiled and is

updated monthly by the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC).

The database is made up of about 242 000 records of protected areas, split into 2 shapefiles. Each protected area is recorded either as a polygon, delimiting the boundaries of the area or as a point with a reported area providing information on the extent of the protected area. One shapefile contains all the protected areas recorded as polygons and the other one is for protected areas recorded as points.

Non-geospatial information is also available for each record, giving more details on the protected areas. Among the 28 fields accessible through the attributes table, 5 are useful for the analysis described in this document:

- IUCN management categories (IUCN_CAT): The different categories of protected areas made by the IUCN correspond to the management objectives within the areas. Seven different categories can be distinguished, going from the most restrictive natural zone management to a zone with sustainable use of natural resources (Ia: Strict Nature Reserve; Ib: Wilderness Area; II: National Park; III: Natural Monument or Feature; IV: Habitat/Species Management Area; V: Protected Landscape/Seascape; VI: Protected area with sustainable use of natural resources). This variable can also take the following values: not applicable, not assigned or not reported.
- Status (STATUS): Refers to the administrative status of the protected areas: “Designated”, “Inscribed”, “Adopted”, “Proposed” or “Established”.
- Status year (STATUS_YR): Year corresponding to the entry into force of the current status of the protected area.
- Designation (DESIG): Corresponds to the subnational, national or international framework or agreement the protected area is part of.
- Reported area (REP_AREA): Protected area extent (useful for protected areas recorded as points).

Following the methodology developed for country-level indicators (see Mackie, A., et al. (2017), «Indicators on Terrestrial and Marine Protected Areas : Methodology and Results for OECD and G20 countries», *OECD Environment Working Papers*, n° 126, Éditions OCDE, Paris, *https://doi.org/10.1787/e0796071-en*), protected areas with “not reported” or “proposed” status, and UNESCO Man and Biosphere Reserves are excluded for the analysis as well as protected areas recorded as points without a reported area.

The shapefile containing protected areas recorded as polygons was dissolved to avoid overlaps between protected areas and converted afterwards into a 300 meter-resolution raster file. The raster does not take into account IUCN management categories.

Two indicators (share of regional protected area and share of regional coastal protected area) are computed from this raster file, following the steps below:

1. Share of regional protected area
    - The regional area (RA) is calculated from the regions’ shapefile.
    - The regional protected area extent (PA) is calculated from the protected areas raster, the protected areas recorded as points shapefile and the regional boundaries’ shapefile. The first part of the regional protected area extent (PA1) is calculated as the sum of the reported areas of all the points located within the region. The second part (PA2) is calculated as the protected zones extent within the regional boundaries measured from the raster. The regional PA is thus calculated as PA1 + PA2.
    - The share of protected area within the region (%) is calculated as 100*PA/RA.

2. Share of regional coastal protected area
   - A 50 km-buffer is created around the coastlines.
   - The regional coastal area (CA) is calculated for each region as the area of the intersection between the 50 km-buffer and the regions' shapefile.
   - The coastal protected area extent (CPA) is calculated from the protected areas raster, the protected areas recorded as points shapefile, the 50 km-buffer and the regional boundaries' shapefile. The first part of the coastal protected area extent (CPA1) is calculated as the sum of the reported areas of all the points located within the intersection between the buffer and the region. The second part (CPA2) is calculated as the protected zones extent within the intersection between the buffer and the region measured from the raster. The CPA is thus calculated as CPA1 + CPA2.
   - The share of coastal protected area within the region (%) is calculated as 100*CPA/CA.

ANNEX D

Subnational government finance

General and subnational government

Data refer to the general and subnational government finance data included in the OECD National Accounts harmonised according to the System of National Accounts (SNA08), with the exception of Australia and Chile, extracted from IMF Government Statistics (see *www.oecd.org/std/na/*). Eurostat and International Monetary Fund data were also used.

General government (S.13) includes four sub-sectors: central/federal government and related public entities (S.1311); federated government ("states") and related public entities relevant only for countries having a federal or quasi-federal system of government (S.1312); local government, i.e. regional and local governments and related public entities (S.1313), and social security funds (S.1314). Data are consolidated within these four sub-sectors, as well as within each sub-sector (neutralisation of financial crossflows).

The subnational government (SNG) is defined as the sum of state governments (S.1312) and local (regional and local) governments (S.1313). For Australia and the United States, there is no breakdown available at the subnational level between local and state government data.

The concept of "regional government" refers to state governments in federal and quasi-federal countries (e.g. *länder* in Germany, provinces and territories in Canada, states in the United States, autonomous communities in Spain) and county or regional level governments (TL2 or TL3) in unitary countries.

Expenditure

Total public expenditure comprises current and capital expenditure:

- Current expenditure: Compensation of employees (staff expenditure) + intermediate consumption + social expenditure (social benefits and social transfers in kind via market producers) + subsidies + other current transfers + paid taxes + financial charges (including interest) + adjustment for the net equity of households in pension fund reserves.
- Capital expenditure is the sum of capital transfers and investment.
- Capital transfers comprise investment grants and subsidies in cash or in kind made by SNGs to other institutional units.
- Investment is defined as gross capital formation and acquisitions fewer disposals of non-financial non-produced assets during a given period. Gross fixed capital formation (GFCF or fixed investment) is the main component of investment). Investment consists of both positive and negative values. Since the new standards of the SNA 2008, expenditures on research and development and weapons systems are included in GFCF.

- The Classification of Functions of Government (COFOG) includes 10 functions: general public services; defence; public order and safety; economic affairs; environmental protection; housing and community amenities; health; recreation, culture and religion; education; social protection.

Revenue

Total public revenue comprises tax revenues, transfers (current and capital grants and subsidies), tariffs and fees, property income and social contributions.

- Tax revenue comprises taxes on production and imports (D2), current taxes on income and wealth (D5) and capital taxes (D91). It includes both own-source tax (when SNGs have full or significant control over the tax base and rates) and shared tax (tax base and rates are defined nationally; tax proceeds are shared between the central and SNGS according to specific redistribution mechanisms). Tax sharing can be also a combination of both arrangements (e.g. local tax surcharges on national taxes).
- NB: The SNA 2008 has introduced some changes concerning the classification of some shared tax revenues. In several countries, certain tax receipts have been reclassified as transfers and no longer as shared taxes (e.g. Austria, Estonia, Slovak Republic, Spain).
- Grants and subsidies: Current and capital transfers and subsidies.
- Tariffs and fees: Total sales (market output and output for own final use) and payments for non-market output.

Fiscal balance

Fiscal balance is the difference between government revenues and expenditure. A fiscal deficit occurs when, in a given year, a government spends more than it receives in revenues. A government runs a surplus, instead, when revenues exceed expenditures.

Debt

Based on the SNA 2008, gross debt includes the sum of the following liabilities: currency and deposits + debt securities + loans + insurance pension and standardised guarantees + other accounts payable. Most debt instruments are valued at market prices. Some liabilities such as shares, equity and financial derivatives are not included in this definition.

These data are not always comparable across countries due to different definitions or treatment of debt components (e.g. pensions) or valuation (market vs. nominal prices).

The SNA definition of gross debt differs from the one applied under the Maastricht Protocol which excludes insurance pension and other accounts payable and thus corresponds roughly to borrowing. In addition, “Maastricht debt” is valued at nominal prices and not at market prices.

OECD Regions and Cities at a Glance 2020

Regions and Cities at a Glance 2020 provides a comprehensive assessment of how regions and cities across the OECD are progressing towards stronger, more sustainable and more resilient economies and societies. The publication provides a unique comparative picture in a number of aspects connected to economic development, health, well-being and net zero-carbon transition across regions and cities in OECD and selected non-OECD countries. In the light of the health crisis caused by the COVID-19 pandemic, the report analyses outcomes and drivers of social, economic and environmental resilience.

This edition provides several new features. First, an extended set of health-related indicators, including excess mortality, morbidity rates, and air quality. Second, novel indicators on the potential of regions and cities to remote working, as well as on trade openness and access to digital infrastructure enrich the economic chapter. Third, the report offers a number of new climate-and environment-related indicators, including on sustainable electricity production and related carbon emissions. The report shows population trends in over nine thousands cities and metropolitan areas across the entire world. Finally, the last chapter presents new indicators on spending and revenues capacity of regional governments in OECD countries.

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