

# Eurostat regional yearbook

2023 edition





**Eurostat regional  
yearbook**

**2023 edition**

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## Foreword

The *Eurostat regional yearbook* provides statistics on the people, economy and environment for regions across the European Union (EU). National figures alone cannot reveal the full and sometimes complex picture of what is happening across the disparate regions of the EU.

This year, Eurostat celebrates the 70th anniversary since a European statistical service came into being; regional statistics have been published for more than 50 years. The coverage of regional statistics has expanded considerably since those early days, both in terms of topics covered and the number of countries for which information is released. This edition of the *Eurostat regional yearbook* includes data for 27 EU Member States, four EFTA countries, as well as eight candidate countries.

2023 is the *European Year of Skills*, which is designed to support individuals to get the right skills for quality jobs, while helping businesses – particularly small and medium-sized enterprises – address skills shortages. This initiative has the objective of contributing to a mindset where lifelong skills development is the norm. Having a workforce with in-demand skills is essential for long-term sustainable growth, innovation and competitiveness. It aims to ensure that those regions facing talent development deficits become more resilient and attractive. The actions and initiatives of the European Year of Skills reinforce the EU's commitment to the green and digital transitions. In this year's publication, several chapters unveil how different regions are performing with respect to this.

The *Eurostat regional yearbook* offers a set of indicators presented in the form of maps, figures and infographics; these have been designed to highlight regional variations and similarities. The publication is available online in *Statistics Explained* and in *PDF format* on Eurostat's [website](#). The latest data can be downloaded from Eurostat's [database](#), where more detailed and up-to-date statistics can be found.

I hope that you enjoy exploring the regions of the EU!



A handwritten signature in blue ink, which appears to read 'Mariana Kotzeva'.

**Mariana Kotzeva**

Director-General, Eurostat

## Abstract

Statistical information is an important tool for understanding and quantifying the impact of political decisions in a specific territory or region. The *Eurostat regional yearbook 2023* provides a detailed picture relating to a broad range of statistical topics across the regions of the EU Member States, as well as the regions of the EFTA and candidate countries.

Each chapter presents statistical information in the form of maps, figures and infographics, accompanied by a descriptive analysis highlighting the main findings. Regional indicators are presented for the following 13 subjects: population, health, education, the labour market, living conditions, the digital society, the economy, business, research and development, tourism, transport, the environment and agriculture.

### Chief editor

Mariana Kotzeva

### Editors

Teodóra Brandmüller, Reka Fodor and Bianka Fohgrub  
(Eurostat, Unit E.4., Regional statistics and geographical information)

### Production

Informa S.à r.l. – Giovanni Albertone, Simon Allen and Andrew Redpath

### Map production

Jorge Calvo, Joseph Davies, Bianka Fohgrub, Michael Harrop, Jørgen Rasmussen and Hannes Reuter  
(Eurostat, Unit E.4., Regional statistics and geographical information)

### Dissemination

Gorja Bartsch, Catherine Coyette, Nina Jere, Annika Johansson, Lucie Peterkova and Dubravka Sušilović  
(Eurostat, Unit B.4., Dissemination and user support)

### For more information/contact details

Eurostat  
Bâtiment Joseph Bech  
5, rue Alphonse Weicker  
2721 Luxembourg  
LUXEMBOURG  
Internet: <https://ec.europa.eu/eurostat/>  
E-mail: [estat-user-support@ec.europa.eu](mailto:estat-user-support@ec.europa.eu)

### Data extraction

The data presented within this publication were extracted during March–May 2023. The manuscript was completed in August 2023.

An online data code available under each map/figure can be used to directly access the most recent data on Eurostat's website.

All statements on policies within this publication are given for information purposes only. They do not constitute an official policy position of the European Commission and are not legally binding. To know more about such policies, please consult the European Commission's website at: <https://ec.europa.eu>

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- **Population:** Maja Berber, Encho Bicov, Veronica Corsini, Manfred Jacobi, Hannah Kiiver, Marta Labrence, Marija Mucic, Dara Petkovic Sesser and Gabriela Senchea Badea (Eurostat, Unit F.2., Population and migration)
- **Health:** Ebba Barany, Ilze Burkevica, Antigone Gikas and Ángeles Hermosa López (Eurostat, Unit F.5., Education, health and social protection)
- **Education:** Arnaud Desurmont, Ferenc Galik, Eric Géré, Leila Morris, Marco Picciolo and Malgorzata Stadnik (Eurostat, Unit F.5., Education, health and social protection); Elodie Cayotte and Sabine Gagel (Eurostat, Unit F.3., Labour market and lifelong learning)
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# Introduction







**Eurostat**, the statistical office of the **European Union (EU)**, collects, compiles and publishes statistics for the **EU and euro area**, as well as national, regional and other subnational data, primarily for the EU Member States, but also for the **EFTA** and **candidate countries**.

This edition of the *Eurostat regional yearbook* focuses on the **European Year of Skills** initiative. Having a workforce with the skills that are in demand contributes to sustainable growth, leads to more innovation and improves business competitiveness. These aspects are considered key to ensuring the economic recovery from the COVID-19 crisis and that the green and digital transitions are socially fair and just. The European Year of Skills puts skills centre-stage: helping people get the right skills for quality jobs and helping business, in particular **small and medium-sized enterprises (SMEs)**, address skills shortages. The European Year of Skills should assist the EU in reaching two of its social targets for 2030, namely that at least 60 % of adults should be in training and at least 78 % in employment. Several chapters in this edition of the *Eurostat regional yearbook* have a special focus highlighting issues in relation to skills. The impact of Russian military aggression against Ukraine and related sanctions, alongside population movements, disruptions to energy markets and global food security, as well as related cost-of-living price increases may be seen in the analyses of 2022 data presented within several chapters of the *Eurostat regional yearbook*. The COVID-19 crisis affected the EU and the wider world profoundly: the initial impact and subsequent signs of a recovery from the pandemic are presented for several chapters (where the latest regional information available is for 2020 and/or 2021).

## European statistics

### SUBNATIONAL STATISTICS

EU Member States are often compared with each other in statistical presentations, but in practice it can be difficult to compare small and large countries. For example, Malta had 521 000 inhabitants on 1 January 2022 and Luxembourg had 645 000 inhabitants, while the most populous EU Member State, Germany, had 83.2 million inhabitants. Furthermore, there are considerable differences between Member States as regards their territorial composition. For example, Ireland, Finland and Sweden are generally rural and sparsely-populated, whereas the **Benelux** countries and Malta are characterised by much higher levels of population density. Equally, within individual Member States there can be great diversity: for example, the densely-populated, urbanised areas of Nordrhein-Westfalen in the west of Germany may be contrasted with the sparsely-populated, largely rural, north-eastern region of Mecklenburg-Vorpommern.

Therefore, analysing data at a subnational or regional level is often more meaningful as it may highlight disparities within EU Member States, for example an east-west divide in Germany or a north-south divide in Italy. Furthermore, these analyses can reveal differences in patterns of economic development. Germany and Poland have largely polycentric patterns of (economic) development with several, relatively large cities spread across their territory. By contrast, France and Romania are examples of a more monocentric pattern of development, with their activity more concentrated in and around their respective capitals.

Over the past few years, Eurostat has expanded the range of statistics that it provides beyond national and regional information to cover other territorial typologies, addressing the growing needs of policymakers, particularly within the context of cohesion and territorial developments. These changes are based on harmonising and integrating various typologies under two broad headings: those linked to regional statistics and those linked to statistics for **local administrative units (LAU or municipalities)**. With this in mind, a process of legislative consolidation was accomplished by *Regulation (EU) 2017/2391 of the European Parliament and of the Council of 12 December 2017 as regards the territorial typologies (Tercet)*. This regulation establishes a common statistical classification of territorial units to enable the collection, compilation and dissemination of European statistics at different territorial levels.

### STATISTICS ON REGIONS – THE NUTS CLASSIFICATION

At the heart of regional statistics is **NUTS** – the EU's classification of territorial units for statistics. This regional classification for EU Member States is based on a hierarchy of regions and subdivides each Member State into regions that are classified according to NUTS levels 1, 2 and 3 (from larger to smaller areas). Some EU Member States have a relatively small population and/or area and may therefore not be subdivided at some (or even all) of the different levels of the NUTS classification. For example, Estonia, Cyprus, Latvia, Luxembourg and Malta are each composed of a single NUTS level 2 region according to the **2021 version of the NUTS classification**, which is the basis for classifying regional information in this edition of the *Eurostat regional yearbook*.

For non-EU countries – EFTA and candidate countries – the concept of 'statistical regions' is used instead of NUTS. This applies the same principles as those used in the establishment of the NUTS classification but is based on bilateral agreements between the countries concerned and Eurostat (rather than having any legislative basis).



Table 1 provides an overview of the number of regions for each of the EU Member States and non-EU countries that are covered in the *Eurostat regional yearbook*.

Most of the regional statistics shown in the *Eurostat regional yearbook* are for NUTS level 2 regions. However, subject to data availability, some maps and figures are shown for either NUTS level 1 regions (more aggregated geographical information) or NUTS level 3 regions (the most detailed level of regional information). The latter are only available for a limited selection of indicators that cover topics such as demography, economic accounts, tourism and environmental statistics.

There may also be specific cases (normally related to the limits of data availability) where particular regions are presented using a different NUTS level compared with the remainder of the regions in the same map or figure; these cases are documented in footnotes and are included to improve data coverage. Where little or no regional data exist for a particular EU Member State, national data have been used; these exceptions are also documented in footnotes. Furthermore, the source data (online data codes) are adapted so as to reflect any additional national data tables that may have been used. Where maps and/or figures are based on different territorial levels, any counts of regions that are provided in the accompanying commentaries are systematically based on the different territorial levels for which data are available in each country.

### The NUTS regulation and classification

The NUTS classification is defined in [Regulation \(EC\) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics \(NUTS\)](#), which has to be amended by a [European Commission](#) regulation each time the classification is updated (when a new version of the NUTS is needed). The NUTS regulation specifies that there should be a minimum period of three years stability during which time the classification should not be changed; exceptions are made when the accession (or departure) of an EU Member State occurs. Since 2003, the NUTS classification has been amended several times, due to:

- regular amendments;
- changes in EU membership;
- changes to the territorial boundaries of Member States (for example, the inclusion of data for the French region of Mayotte).

The sixth amendment of the NUTS classification ([Commission Delegated Regulation \(EU\) No 2019/1755](#)) was adopted in August 2019 and applies to any data transmitted to Eurostat from 1 January 2021 onwards. This version of NUTS – NUTS 2021 – is the basis for classifying regional statistics as used in the 2023 edition

**Table 1: Number of NUTS 2021 regions and statistical regions by country**

	NUTS level 1	NUTS level 2	NUTS level 3
<b>EU</b>	92	242	1 166
Belgium	3	11	44
Bulgaria	2	6	28
Czechia	1	8	14
Denmark	1	5	11
Germany	16	38	401
Estonia	1	1	5
Ireland	1	3	8
Greece	4	13	52
Spain	7	19	59
France	14	27	101
Croatia	1	4	21
Italy	5	21	107
Cyprus	1	1	1
Latvia	1	1	6
Lithuania	1	2	10
Luxembourg	1	1	1
Hungary	3	8	20
Malta	1	1	2
Netherlands	4	12	40
Austria	3	9	35
Poland	7	17	73
Portugal	3	7	25
Romania	4	8	42
Slovenia	1	2	12
Slovakia	1	4	8
Finland	2	5	19
Sweden	3	8	21
	Level 1	Level 2	Level 3
Iceland	1	1	2
Liechtenstein	1	1	1
Norway	1	7	13
Switzerland	1	7	26
Bosnia and Herzegovina	–	–	–
Montenegro	1	1	1
Moldova	–	–	–
North Macedonia	1	1	8
Albania	1	3	12
Serbia	2	4	25
Türkiye	12	26	81
Ukraine	–	–	–

Source: Eurostat

of the *Eurostat regional yearbook*. It should be noted that some older data presented in this publication may have been collected using a previous version of NUTS, although these statistics have (where possible) been recoded to NUTS 2021. As a consequence, data are sometimes not available for a small number of regions where a simple recoding or aggregation of data from previous versions of NUTS was not possible (for example due to changes in boundaries).

**Table 2: Population size constraints for NUTS 2021 regions**  
(number of inhabitants)

	Minimum population	Maximum population
NUTS level 1 regions	3 000 000	7 000 000
NUTS level 2 regions	800 000	3 000 000
NUTS level 3 regions	150 000	800 000

Source: Eurostat

## The main principles of the NUTS classification

**Principle 1:** NUTS favours administrative divisions. If available, administrative structures are used for the different NUTS levels. In those EU Member States where there is no administrative layer corresponding to a particular level of NUTS, so-called non-administrative regions are created by aggregating smaller administrative regions.

**Principle 2:** the NUTS regulation defines minimum and maximum population thresholds for the size of NUTS regions (see Table 2) to ensure a basic degree of comparability. Different rules apply to administrative and non-administrative layers. Deviations from these thresholds are only possible when particular geographical, socioeconomic, historical, cultural or environmental circumstances exist.

## OTHER TERRITORIAL TYPOLOGIES

Previous editions of the *Eurostat regional yearbook* have shown a range of other territorial typologies to extend subnational analyses to topics such as cities and commuting zones, or statistics compiled by [degree of urbanisation](#). The latter is a classification based on three types of area, which are defined using a population grid of 1 km<sup>2</sup> cells in combination with population thresholds to identify [cities](#) (densely-populated areas), [towns and suburbs](#) (intermediate density areas) and [rural areas](#) (thinly-populated areas). While statistics such as these remain highly relevant for policy debate in the EU and more generally at a global level, an editorial decision was taken when compiling this edition of the *Eurostat regional yearbook* to concentrate on regional statistics. Readers who are interested in alternative analyses of subnational statistics may refer to two sister publications released by Eurostat at the start of 2023:

**Rural Europe**  
(online publication)



**Urban Europe**  
(online publication)



## European policy background

European policymaking is inherently multidimensional: on the one hand, it has to encompass a broad framework providing objectives for the EU as a whole, while on the other it needs to acknowledge the often specific needs of national and subnational territories. Recent challenges such as the global financial and economic crisis, security concerns from terror attacks, the refugee crisis, the departure of the United Kingdom from the EU (Brexit), the COVID-19 crisis, the impact of Russian military aggression against Ukraine, or the cost-of-living crisis provide just a few examples of the complex nature of delivering EU-wide, national, regional and local solutions in a coherent manner.

One of the EU's main challenges is to ensure that policy developments are scrutinised to ensure they take account of the considerable geographical diversity within the EU. The territorial dimension of EU policy is increasingly recognised, as job creation and the transition towards a green and digital economy depend on making the best use of all assets, while ensuring that common resources are used in a coordinated and sustainable way. This section provides an overview of some of the main policy initiatives that have a territorial impact across the EU.

## COHESION POLICY

### What is cohesion policy?

EU cohesion policy is designed to promote harmonious development within the EU by strengthening economic, social and territorial cohesion. In doing so it promotes job creation, business competitiveness, economic growth, social inclusion and [sustainable development](#), thereby aiming to improve the overall quality of life.

During the period 2021–2027, the framework for regional development and cohesion policy in the EU focuses on providing funds to the least developed regions of the EU for five key investment priorities:

- smarter Europe, through innovation, digitalisation, economic transformation and support to SMEs;
- a greener, carbon-free Europe, implementing the [Paris Agreement](#) and investing in energy transition, renewables and the fight against climate change;
- a more connected Europe, with strategic transport and digital networks;





- a more social Europe, delivering on the [European Pillar of Social Rights](#) and supporting quality employment, education, skills, social inclusion and equal access to healthcare;
- a Europe closer to citizens, by supporting locally-led development strategies and sustainable urban development across the EU.

Cohesion policy is delivered through a number of specific funds.

- The [European Regional Development Fund \(ERDF\)](#) aims to strengthen economic, territorial and social cohesion in the EU by correcting development imbalances between its regions. It focuses on providing funding for key policy areas such as: innovation and research; the digital agenda; support for SMEs; and the low-carbon economy. The ERDF also supports cross-border and transnational cooperation, under the [European Territorial Cooperation objective \(Interreg\)](#).
- The [Cohesion Fund \(CF\)](#) aims to reduce economic and social disparities and to promote sustainable development. Funding is directed specifically at infrastructure projects to support the development of transport, energy and digital infrastructure within trans-European networks and at energy and transport projects that display clear environmental benefits in terms of energy efficiency, the use of renewable energy, developing rail transport, supporting inter-modality, or strengthening public transport.
- The [European Social Fund Plus \(ESF+\)](#) provides support for people, with a focus on improving employment and education opportunities across the EU, as well as the situation of the most vulnerable people (those at risk of poverty).
- The [Just Transition Fund \(JTF\)](#) is a financial instrument within cohesion policy. It aims to support territories facing serious socioeconomic challenges arising from the transition towards climate neutrality. It is designed to facilitate the implementation of a [European Green Deal](#), with the goal of reducing the EU's net greenhouse gas emissions by at least 55 % by 2030 (compared with 1990 levels) and to make the EU climate-neutral by 2050.

### Cohesion policy: how is the budget decided?

Overall, resources allocated to cohesion policy stem from the multiannual financial framework (MFF). Additional resources have been granted, exceptionally, under [NextGenerationEU](#), to complete financial resources under the 2014–2020 programmes ([Recovery assistance for cohesion and the territories of Europe \(REACT-EU\)](#) – €50.6 billion) and under the 2021–2027 programmes, to finance – together with MFF resources – the Just Transition Fund (€10.8 billion).

[Regulation \(EU\) No 2021/1060 of 24 June 2021](#) – the Common Provisions Regulation (CPR) – provides a policy framework so that shared management funds, including EU cohesion policy funds, continue to fulfil the objectives of promoting convergence and supporting the least developed parts of the EU. As the main legal basis for cohesion policy, the CPR makes it possible to address emerging economic and social challenges through greater flexibility in terms of transferring resources and extended capacity. Furthermore, through the CPR, all cohesion policy funds – the ERDF, the CF, the ESF+ and the JTF – are subject to the same rules of planning, management and monitoring.

The total budget for cohesion policy and the rules associated with its allocation are jointly decided by the [Council](#) and the [European Parliament](#). Political agreement on the [legislative package for cohesion policy for 2021–2027](#) was reached at the end of 2020.

A total of €378 billion has been allocated in the multiannual financial framework for regional development and cohesion between 2021 and 2027. For more information, including a breakdown of allocations by fund and by EU Member State, see: [Budget allocations for EU cohesion policy 2021–2027](#).

The bulk of the budget for the EU's cohesion policy is provided to regions whose development lags behind the EU average, with [less developed and transition regions](#) benefitting from 90 % of the ERDF and ESF+ resources. These concern, in particular, less developed regions predominantly located in the south or the east of the EU, the [Baltic countries](#) and several [outermost regions](#). Funding is concentrated on these less developed regions, with the goal of reducing economic, social and territorial disparities.

For the 2021–2027 period, the allocation of funds uses a method that remains largely based on regional [gross domestic product \(GDP\)](#) per inhabitant. However, it also incorporates a broad range of other indicators and criteria mirroring the social, economic and environmental challenges addressed by cohesion policy, referring notably to youth unemployment, low education levels, climate change, demography or the integration of migrants.

A specific allocation method is used to distribute REACT-EU funds between EU Member States. This is different from the normal cohesion policy allocation method and takes into account levels of prosperity, the magnitude of economic contraction due to the COVID-19 crisis, and the impact of the pandemic on unemployment (including among young people).



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## The NUTS classification – an objective basis for the allocation of cohesion policy funding

Statistics from regional accounts are used in the allocation of cohesion policy funds, with the NUTS classification providing the basis for regional boundaries and geographic eligibility.

During the period 2021–2027, eligibility for cohesion funds is based on NUTS level 2 regions being ranked and split into three groups:

- less developed regions, where GDP per inhabitant was less than 75 % of the EU average;
  - transition regions, where GDP per inhabitant was 75 %–100 % of the EU average; and
  - more developed regions, where GDP per inhabitant was more than 100 % of the EU average.
- 

### Cohesion policy: implementation

European structural and investment funds are attributed through shared management, a process which involves EU, national, regional and local authorities, as well as social partners and organisations from civil society (representative and community groups that are independent of government or business). Each EU Member State prepares a partnership agreement and subsequent programme(s), setting up relevant development and sectorial strategies and tailoring support in accordance with development challenges and needs. Once negotiated with the European Commission and formally adopted, national/regional managing authorities in each of the Member States implement these programmes, select operations and monitor and evaluate, together with the European Commission, their impact.

### Cohesion policy: responding to crises

The COVID-19 crisis that started in 2020 prompted the European Commission to set up additional instruments under cohesion policy that can be used to quickly meet short-term needs. The pandemic caused a health crisis and rapidly changed the socioeconomic landscape. As a result, the REACT-EU package was agreed <sup>(1)</sup>. It provided an additional €50.6 billion of funding for 2021 and 2022 as part of NextGenerationEU; these funds may be used through until the end of 2023.

In parallel, several packages of measures were introduced, notably through the [Coronavirus Response Investment Initiative \(CRII\)](#) and the [Coronavirus Response Investment Initiative Plus \(CRII+\)](#), introducing further flexibility in the management of 2014–2020 programmes to mitigate the social and economic impacts of the COVID-19 pandemic.

Two years later, in 2022, the impact of Russian military aggression against Ukraine led to a refugee crisis and an energy price shock. As a response, [CARE – Cohesion's Action for Refugees in Europe](#) and [Flexible Assistance to Territories \(FAST-CARE\)](#) allowed EU Member States and regions to provide emergency support to people fleeing from Ukraine and to use cohesion policy funds with maximum flexibility to mobilise investments for housing, healthcare, translation or training for displaced people, as well as for the EU Member States receiving them.

In December 2022, the co-legislators adopted the European Commission's proposal for [REPowerEU](#) to save energy, accelerate the production of renewable energy and diversify the EU's energy supplies. This agreement also covers the [SAFE \(Supporting Affordable Energy\)](#) measures under Cohesion Policy, which will enable EU Member States to use some of their available resources under their 2014–2020 allocation to provide direct support to vulnerable families and small and medium-sized businesses to help them face increased energy costs.

### Cohesion policy: integrated into broader policy goals

Regional policy and funding help deliver many of the EU's overall policy objectives. Cohesion policy programming is embedded within overall economic policy coordination, in particular the [European Semester](#), the [digital transition](#), [A European Green Deal](#) and promotion of the [European Pillar of Social Rights](#). These links between cohesion policy and broader reforms have been strengthened such that the European Commission may suspend regional funding to any EU Member State which does not comply with the EU's economic rules.

<sup>(1)</sup> REACT-EU provides additional funding to extend the EU's crisis response to the COVID-19 pandemic, while contributing towards a green, digital and resilient recovery. It is designed to support: job maintenance, including through short-time work schemes and support for the self-employed; job creation and youth employment measures; health care systems; and the provision of working capital and investment support for small and medium-sized enterprises.



## OTHER POLICY AREAS THAT IMPACT ON SUBNATIONAL AREAS

While the EU's regional policy can play an important role in delivering broader policy goals in a range of socioeconomic fields such as education, the labour market, energy, research and development or the environment, other EU policy areas can, in a similar way, have an impact on regions across the EU.

### Urban development policy in the EU

The various dimensions of urban life – economic, social, cultural and environmental – are closely inter-related. Successful urban developments are often based on coordinated/integrated approaches that seek to balance these dimensions through a range of policy measures such as urban renewal, increasing education opportunities, preventing crime, encouraging social inclusion or environmental protection.

At the end of May 2016, a meeting of ministers responsible for urban matters was held in Amsterdam, the Netherlands. It reached an agreement on an [Urban Agenda for the EU](#), as a multilevel governance working method, established by the [Pact of Amsterdam](#). This agreement identifies 12 priority areas for partnerships between EU institutions, EU Member States, cities and other stakeholders. This led to 14 partnerships being created with actions on the themes of: the inclusion of migrants and refugees; air quality; urban poverty; housing; the circular economy; jobs and skills in the local economy; climate adaptation; energy transition; sustainable land use; urban mobility; digital transition; public procurement; security in public space; culture and cultural heritage. The [Ljubljana Agreement and its multiannual working programme](#) were adopted in 2021 to renew the Urban Agenda for the EU with a common goal to make it more impactful and efficient. Four new themes have been put forward for multilevel governance cooperation on: greening cities; sustainable tourism; food; cities of equality.

The urban dimension of regional policy may play an important role, notably measures to assist actions against poverty and social exclusion. In this context, the urban dimension of cohesion policy has been strengthened for the period 2021–2027, with a minimum of 8 % of the ERDF dedicated to sustainable urban development strategies, alongside a new [European Urban Initiative \(EUI\)](#) launched in the third quarter of 2022 with the goal of supporting cities to innovate, access knowledge and reinforce the capacity for policy development. The EUI aims to strengthen integrated and participatory approaches to sustainable urban development by facilitating and supporting cooperation and capacity building among urban actors, innovative actions, knowledge, policy development and communication. It is complemented by the [URBACT](#) programme which encourages exchanges of practices among cities and the development of solutions to urban challenges.

### Rural development policy in the EU

The European Commission is implementing a Communication [A long-term Vision for EU's Rural Areas – Towards stronger, connected, resilient and prosperous rural areas by 2040](#). This vision comes with an [EU rural action plan](#), designed to help rural areas meet a wide range of economic, social and environmental challenges. Under the long-term vision, the European Commission has also proposed a [Rural Pact](#), a framework for cooperation that facilitates interaction on rural matters between public authorities and stakeholders and invites them to act on the shared goals of the EU rural vision and help rural communities and businesses reach their full potential.

After the European Agricultural Guarantee Fund (EAGF), also known as the first pillar, which provides income support and support to agricultural markets, the [European Agricultural Fund for Rural Development \(EAFRD\)](#) is the second pillar of the EU's [common agricultural policy \(CAP\)](#). The intention of the 2014–2022 period was to help develop farming and rural areas by providing stimuli for competitive and innovative actions at the same time as seeking to protect biodiversity and the natural environment. The six priority areas of the EAFRD in the 2014–2022 period were: the promotion of knowledge transfer and innovation in agriculture, forestry and rural areas; the viability and competitiveness of all types of agriculture and support sustainable forest management; the organisation of the food production chain, animal welfare and risk management in farming; the restoration, preservation and enhancement of agricultural and forest ecosystems; the efficient use of natural resources and support the transition to a low-carbon economy; social inclusion, poverty reduction and economic development in rural areas.

At the end of 2021, a political agreement was reached on a [new common agricultural policy for 2023–2027](#). The new legislation aims to make the CAP more environmentally friendly, result orientated and responsive to future challenges, while continuing to support EU farmers for a sustainable and competitive agricultural sector. The new policy aims to be greener, more modern and fairer and is built around 10 key objectives that are focused on social, environmental and economic sustainability. The objectives are: to ensure a fair income for farmers; to increase competitiveness; to improve the position of farmers in the food chain; climate change action; environmental care; to preserve landscapes and biodiversity; to support generational renewal; vibrant rural areas; to protect food and health quality; fostering knowledge and innovation. To realise synergies between funds active in rural areas, [CAP Strategic Plans](#) address the coordination and complementarities between the EAFRD and other EU funds, in particular CPR funds, as well as national funding.



### European Committee of the Regions

The **European Committee of the Regions (CoR)** – which is the EU’s assembly for regional and local representatives – provides a voice for regions and cities across the EU. It was created in 1994 and is composed of 329 members who are regional presidents, mayors or elected representatives from the 27 Member States of the EU; successive treaties have broadened its role.

During the period 2020–2025, the CoR has three main priorities.

- Bringing the EU closer to people – democracy and the future of the EU. The goal is to reinforce democracy at all levels of government, improve the way the EU works, ensure its policies and programmes meet the real needs of citizens.
- Managing fundamental societal transformations – building resilient regional and local communities. This aims to use the **United Nations (UN’s)** Sustainable Development Goals to identify solutions that ensure the EU sufficiently supports local and regional authorities in responding to future emergencies and addressing the societal transformations taking place in their communities from challenges such as global pandemics as well as climate, digital and demographic transitions.
- Promoting cohesion as a fundamental value – place-based EU policies. This aims to ensure that economic, social and territorial cohesion are fostered and respected in all EU policies that affect people and their places of living.

The **#CohesionAlliance** is a coalition of people who believe that the role of EU cohesion policy should be strengthened. The alliance was launched in 2017 through cooperation between leading European associations of cities and regions and the European Committee of the Regions. In October 2022, the partners of the alliance reaffirmed their commitment to reinforce cohesion policy.

The **European Week of Regions and Cities** is an annual multi-day event which allows regions and cities to showcase their capacity to encourage growth and job creation, implement EU cohesion policy, and provide evidence of the importance of the local and regional level for good governance. Organised by the CoR and the European Commission’s Directorate-General for Regional and Urban Policy, it has become a networking platform for regional and local development – which is viewed as a key event for policy practitioners – and is the biggest EU event dedicated to regional policy. The 21st European Week of Regions and Cities will be held 9–12 October 2023 under the headline of ‘Thriving Regions, Stronger Europe’ and will concentrate on six principal themes (that are closely aligned with the European Commission’s priorities):

- regions in the post-industrial transition;
- retaining talent for regional growth;
- small and medium-sized urban centres driving growth;
- breaking barriers to cross-border cooperation;
- local energy shift for security and sustainability; and
- promoting social innovation.







At the same time (October 2023), the European Committee of the Regions will also release its latest report providing a snapshot of the most pressing challenges faced by regions and cities across Europe (for example, how regions and cities address crises such as climate disasters or the Russian war against Ukraine, or transform over the long-term to green and digital transitions, while strengthening cohesion). For more information, please refer to <https://cor.europa.eu/en/our-work/Pages/State-of-Regions-and-Cities-2023.aspx#CorContainer>.

## The European Green Deal

To overcome the triple planetary crises of climate change, pollution and biodiversity loss, the EU has enacted a new growth strategy designed to transform the EU into a modern, resource-efficient and competitive economy, where:

- there are no net emissions of greenhouse gases by 2050;
- economic growth is decoupled from resource use; and
- no person and no place is left behind.

*The European Green Deal* (COM(2019) 640 final) provides details of how the EU plans to develop into a sustainable economy by turning climate and environmental challenges into opportunities, and making the transition fair and inclusive for all.

Reaching these targets will require action from all regions and all sectors of the EU economy, including:

- investing in environmentally-friendly technologies;
- ensuring a sustainable food system;
- supporting industry to innovate;
- rolling out cleaner, cheaper and healthier forms of private and public transport;
- decarbonising the energy sector;
- ensuring buildings are more energy efficient;
- boosting green finance; and
- working with international partners to improve global environmental standards.

At least 30 % of the NextGenerationEU recovery package and the EU's multiannual financial framework (2021–2027) are earmarked for tackling climate change and supporting green projects, while one tenth of annual spending under the long-term budget will contribute to halting and reversing the decline of biodiversity during 2026 and 2027. Financial support and technical assistance will be provided to help those that are most affected by the move towards the green economy. For example, assistance may be provided to regions and sectors that depend on fossil fuels or carbon-intensive processes, drawing on sources of funding from the EU budget, supplemented by national co-financing and funds from the [European Investment Bank](#).

In response to global energy market disruption caused by the impact of Russian military aggression against Ukraine, the European Commission is implementing its REPowerEU plan. Launched in May 2022, it helps the EU to save energy, produce cleaner energy and diversify its energy supplies, thereby accelerating a transition to clean energy. As a result, the EU has already: reduced its dependency on Russian fossil fuels; saved almost 20 % of its energy consumption; introduced a gas price cap and global oil price cap; doubled the additional deployment of renewables.

## A Europe fit for the digital age

Digital technology has and will continue to change people's lives in a rapid manner. The EU's digital strategy aims to make this transformation work for people and businesses. On 9 March 2021, the European Commission presented a vision for the EU's digital transformation by 2030. This is based on four key points – government, skills, infrastructure and business – that are the cornerstones of the *2030 Digital Compass: the European way for the Digital Decade* (COM(2021) 118 final). Some of the targets set for 2030 include:

- having 20 million employed ICT specialists in the EU (with convergence between women and men);
- having all households in the EU covered by a Gigabit network and all populated areas covered by 5G;
- having the EU produce at least 20 % of the world's output of cutting-edge and sustainable semiconductors;
- having 75 % of EU enterprises making use of cloud computing services, big data and artificial intelligence;
- having online provision for all key public services in the EU (those used by individuals and by enterprises);
- to provide all Europeans with access to their medical records online;
- to have 80 % of EU citizens using a digital ID solution.

The European Commission aims to strengthen the digital sovereignty of the EU and to set standards, rather than following those of others – with a focus on data, technology, and infrastructure. This should be achieved through a robust, joint governance structure (to identify successes and gaps) and through multi-country projects combining support from the EU's budget, national governments and the private sector.

## European Pillar of Social Rights

The [European Pillar of Social Rights](#) was jointly signed by the European Parliament, the Council and the European Commission in November 2017. It aims to take account of changing realities in the world of work, to promote the renewal of economic convergence across the EU, and to deliver new and more effective rights for citizens. The pillar is built around three main headings.



- Equal opportunities and access to the labour market – education, training and lifelong learning; gender equality; equal opportunities; active support for employment.
- Fair working conditions – secure and adaptable employment; wages; information about employment conditions and protection in case of dismissals; social dialogue and involvement of workers; work-life balance; healthy, safe and well-adapted work environment and data protection.
- Social protection and inclusion – childcare and support to children; adequate protection for workers; unemployment benefits; minimum income; old age income and pensions; healthcare; inclusion of people with disabilities; long-term care; housing and assistance for the homeless; access to essential services.

These three headings cover a set of [20 key principles](#). To monitor progress being made in relation to strengthening the social dimension of the EU, the European Commission has established a [social scoreboard of indicators](#). The information presented is also used for economic policy coordination as part of the European Semester. In her [Political guidelines for the next European Commission 2019–2024](#), Ursula von der Leyen highlighted the need to reconcile ‘the social and the market in today’s modern economy’ and undertook to implement fully the European Pillar of Social Rights. In January 2021, she stated that ‘As we overcome the pandemic, as we prepare necessary reforms and as we speed up the twin green and digital transitions, I believe it is time to also adapt the social rulebook’.

On 4 March 2021, the European Commission adopted the [European Pillar of Social Rights Action Plan](#) (COM(2021) 102 final) designed to turn the 20 key principles into specific actions, while also proposing three new headline targets for the EU to reach by 2030:

- at least 78 % of the population aged 20–64 years should be in employment by 2030;
- every year, at least 60 % of all adults should be participating in training by 2030;
- a reduction of at least 15 million in the number of people at risk of poverty or social exclusion should be achieved by 2030 (compared with the situation in 2019 when there were 91 million people at risk of poverty or social exclusion).

The action plan has been designed to address long-term transformations of the EU’s labour markets and economies – as shaped by climate change, digitalisation, globalisation and demographic developments – alongside more immediate challenges resulting from the COVID-19 crisis and its impact on jobs, education, the economy, welfare systems and social life.

Despite the European Pillar of Social Rights not making any specific reference to regional policy, there is an

interest in analysing information at a more detailed, subnational level. Many of the indicators in the social scoreboard may be provided by Eurostat for a range of territorial typologies – principally, [data by region](#) (using the NUTS classification) or [data by degree of urbanisation](#).

## Sustainable development goals

Sustainable development has been part of the political agenda within the EU for some time. However, this subject area was given fresh impetus with the adoption of the [2030 Agenda for Sustainable Development](#) in September 2015 by the UN General Assembly. At the core of the agenda, there is a set of [17 sustainable development goals \(SDGs\)](#). They provide a global policy framework until 2030 for stimulating action in areas of critical importance related to people, the planet, prosperity, peace and partnership.

On 22 November 2016, the European Commission adopted the Communication, [Next steps for a sustainable European future – European action for sustainability](#) (COM(2016) 739 final). It detailed the importance of the SDGs, identified EU policies that contribute to the implementation of SDGs, and announced plans for regular monitoring within an EU context. The EU has made a firm commitment towards delivering on the SDGs and on the [Paris Agreement](#) on climate change. Within this context, Eurostat has been called upon to regularly monitor progress towards the [SDGs in an EU context](#). For this purpose it coordinates the development and release of an EU SDG indicator set and produces regular monitoring reports.

In June 2023, an [EU Voluntary Review on the Implementation of the 2030 Agenda for Sustainable Development](#) was adopted by the EU and sent to the [High-Level Political Forum on Sustainable Development](#) of the United Nations, reaffirming the EU’s commitment to the full and timely implementation of the 2030 Agenda, through its internal and external action, as a shared global roadmap. Building on the concept of ‘whole-of-government’, the EU implements the 2030 Agenda in an integrated approach which places the SDGs at the core of EU policy.

## European Year of Skills

In May 2023, the Council and European Parliament adopted [Decision \(EU\) 2023/936 establishing the European Year of Skills](#) (which runs from May 2023 to May 2024). Its overall objective is to promote a mindset of reskilling and upskilling, to address skills gaps and shortages, to boost the competitiveness of European business and create quality jobs.

The European Year of Skills will pursue four main objectives:



- promoting investment in training and upskilling;
- ensuring the skills of the workforce match the needs of employers, by closely cooperating with social partners and businesses;
- matching people's aspirations and skill sets with opportunities on the job market, especially for the green and digital transition and the economic recovery from the COVID-19 pandemic;
- attracting people from outside the EU with relevant skills that will promote economic growth.

Among others, activities foreseen throughout the European year include:

- conferences, forum discussions and other events to promote debate on the role and contribution of skills policies;
- events to promote mutual learning on the actions and approaches that public, private and third-sector stakeholders can take;
- initiatives to promote the provision, financing and uptake of upskilling and reskilling opportunities;
- communication and awareness-raising campaigns on EU initiatives for upskilling and reskilling.

Further information can be found on a [dedicated website](#).

## A short reading guide

### COVERAGE

Each chapter in the *Eurostat regional yearbook* presents statistical information in the form of maps, figures and infographics, accompanied by descriptive analyses highlighting the main findings. Regional indicators are presented for the following 13 subjects: population, health, education and training, the labour market, living conditions, the digital society, the economy, business, research and innovation, tourism, transport, the environment and agriculture.

The *Eurostat regional yearbook* contains regional statistics for the Member States of the EU, alongside data for a number of non-EU countries – EFTA countries (Iceland, Liechtenstein, Norway and Switzerland) and candidate countries (Bosnia and Herzegovina, Montenegro, Moldova, North Macedonia, Albania, Serbia, Türkiye and Ukraine).

The geographical descriptions used to group EU Member States, for example, 'northern', 'eastern', 'southern' and 'western' are not intended as political categorisations. Instead, these references are made in relation to the geographical location of one or more Member States, based on [geography domain](#) of [Eurovoc](#), the European Commission's multilingual thesaurus. The northern Member States are often distinguished between the Baltic countries (Estonia, Latvia and Lithuania) and the [Nordic countries](#) (Denmark, Finland and Sweden).

The designations employed and the presentation of material in maps and figures do not imply the expression of any opinion whatsoever on the part of the EU concerning the legal status of any country, territory or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

### HOW TO INTERPRET THE MAPS

A majority of the maps in the *Eurostat regional yearbook* are choropleth maps (that use different colour shades to show regional differences for a particular indicator or a combination of two indicators).

- Most are composed of six sequential colours, from a light yellow (for low values) through to dark blue (for high values). The information presented has been normalised. In other words, rather than show data for absolute values (which could introduce bias linked to the size of each region), these maps are generally based on proportions or rates/ratios.
- The class boundaries in each map are computed exclusively in relation to the distribution of regional values for EU Member States (even when maps also include data for regions in non-EU countries). The boundaries for the lower classes are based on the 10th and the 25th percentiles, the middle class on the 50th percentile, and the upper classes on the 75th and the 90th percentiles. Each of these boundaries was subsequently rounded up/down to make the class boundaries easier to read. As such, the lightest shade of yellow and the darkest shade of blue portrays those EU regions with approximately the lowest/highest 10 % of values.
- Some choropleth maps have been produced using a diverging colour scheme. These maps have been produced to highlight the distribution of regions around a particular value (for example, those regions that have values that are above/below an EU policy target). Diverging choropleth maps in this edition of the *Eurostat regional yearbook* use three shades of teal/turquoise (progressively darker for values that are increasingly higher than the EU target) and three shades of gold (progressively darker for values that are increasingly lower than the EU target).



- There are a small number of bivariate choropleth maps. These allow two indicators to be combined in a single map, for example, information on the share of people making use of the internet and how this share changed over time. These maps are composed of nine different colours, from a very light shade (for regions that have low values for both indicators) to a very dark shade (for regions that have high values for both indicators).

The *Eurostat regional yearbook* also includes two types of maps based on circles.

- Proportional circles have been used to map data presented in absolute values (for example, the total number of people living in a region or the gross domestic product of a region); the size/area of each circle is linked to its underlying data.
- Pie charts may also be used to map absolute values, although they also provide supplementary information for the share of various categories in the overall total. As above, the size/area of individual pie charts is linked to its underlying data.

Non-EU countries that are excluded from the spatial coverage of the *Eurostat regional yearbook* are systematically denoted in all maps using a light shade of grey. If data are not available for any regions in the EU Member States, EFTA countries or candidate countries, these are denoted using a darker shade of grey.

### TIMELINESS

Information from a wide range of surveys and data collection exercises feed into the *Eurostat regional yearbook*. As a result, there may be differences concerning the latest available reference year between chapters and indicators, as each aims to show the latest information available. In general, 2022 data are available for demography (as used in the chapter on population), the labour force survey (as used in the chapters on education and training and the labour market), EU statistics on income and living conditions (as used in the chapter on living conditions) and the information society survey (as used in the chapter on the digital society). Otherwise, the most common reference period is generally 2021, as used in most of the other chapters, for example, the economy or tourism. Note

that [Eurostat's website](#) may have fresher data due to the continuous nature of data collection and processing (resulting in updates and new reference periods being added throughout the year). Online data codes are provided below each of the maps and figures and these can be used to locate the freshest data.

### METADATA

Eurostat's data are published with accompanying metadata that provide background information on each source, as well as specific information (flags) for individual data cells. The flags provide information relating to the status of the data, for example, detailing whether the data are estimated, provisional or forecasted. Such flags are generally not shown in this publication (in order to restrict the metadata presented under maps and figures to a minimum). For example, values that are flagged as confidential are simply shown as being 'not available'; as such, they cannot be distinguished from other values where data have not been provided (for whatever reason).

When compiling the maps and figures for this edition of the *Eurostat regional yearbook*, cases where the latest data were missing were identified. Given the considerable impact of the COVID-19 crisis and its associated restrictions, two different approaches were employed to try to fill these gaps for missing data.

- Datasets where the most recent data available were for 2020 or 2021: in these cases, because there could be considerable differences linked to COVID-19 impacts, an effort was made to fill missing cells with higher aggregates of NUTS or with national data rather than making use of data from an earlier reference period.
- Datasets where the most recent data available were for 2019 or for 2022: in these cases, an effort was made to fill missing cells first with data for the previous year (at the same NUTS level) before making use of more aggregated NUTS levels or national data.

In both cases, the exceptions for different geographical levels or for different reference periods are documented in the notes. This is also the case for breaks in series and other major methodological differences.



# A

## People and society

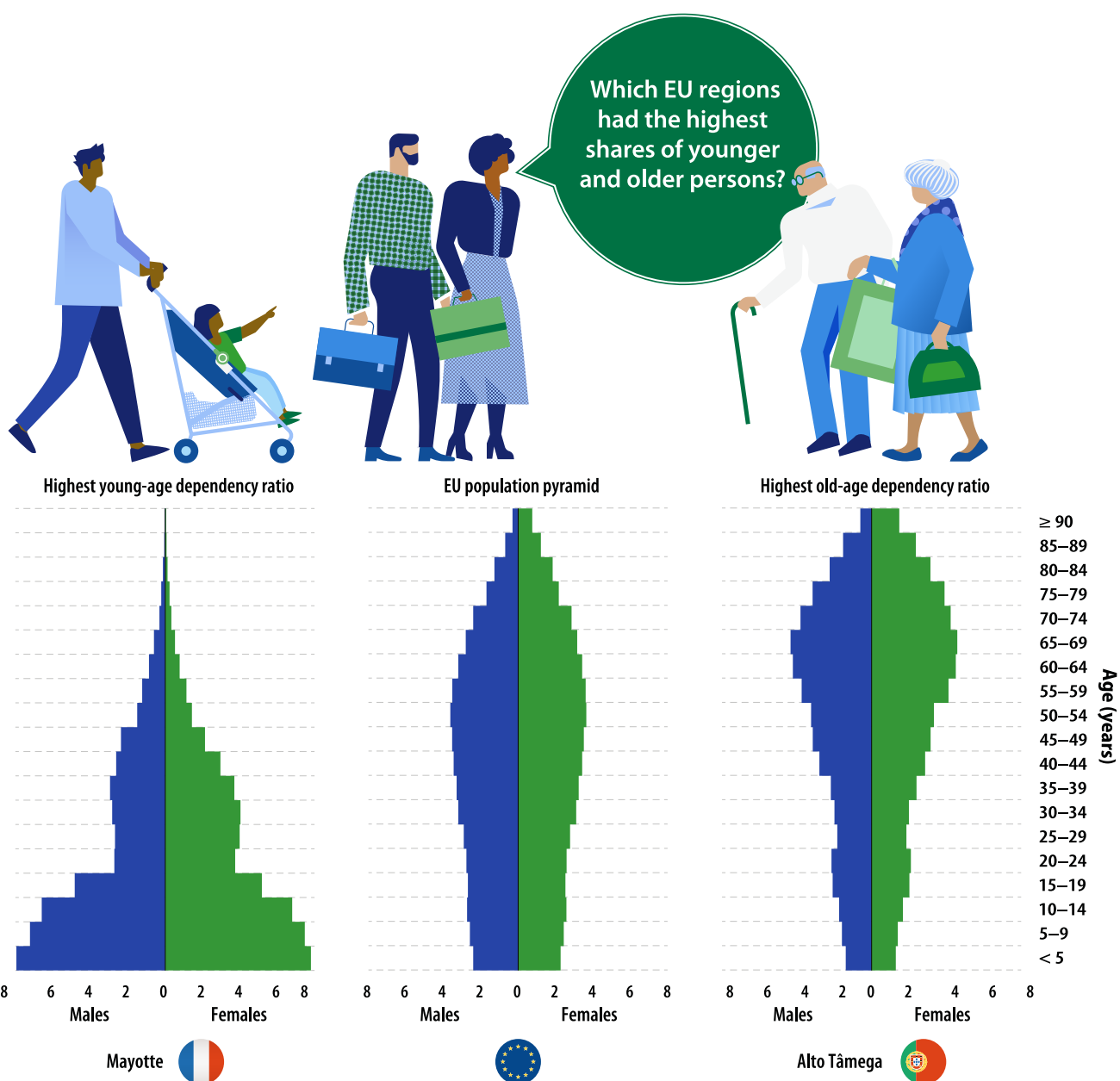


# 1. Population

Demographic developments in the [European Union \(EU\)](#) are far from uniform, with considerable variations both between and within individual EU Member States. One factor that is often key to explaining these divergences is the mobility of young people, reflecting – among other issues – their search for education and/or job opportunities. The increased mobility of younger generations can result in profound changes to demographic structures in particular geographic areas, with some regions thriving due to an inflow of younger more-qualified generations, whereas others lag behind and progressively age due to the departure of younger

cohorts. The [European Commission](#) has named 2023 as the [European Year of Skills](#). It is designed to give fresh impetus to two of the EU's 2030 [social targets](#), namely, that at least 60 % of adults should be in training every year, and that at least 78 % should be in employment.

Policymakers have identified that skills need to be nurtured, especially in those regions that suffer from: a shrinking labour force; a low share of persons with tertiary educational attainment; and/or the departure of young people (to other regions/countries). These regions often face a range of structural challenges such



(% of total population, 1 January 2022, by NUTS 3 regions)

Note: the infographic shows the NUTS level 3 region with the highest young-age dependency ratio, data for the EU average, and the NUTS level 3 region with the highest old-age dependency ratio.

Source: Eurostat (online data code: demo\_r\_pjangrp3)

as inefficiencies in labour market, education, training and adult learning systems, or low levels of access to services, innovation performance, public governance or business development. In response, the European Commission presented a Communication on *Harnessing talent in Europe's regions* (COM(2023) 32 final) that contributes towards the European Year of Skills. It offers a range of solutions to support regions most affected by the demographic transition through a range of pilot schemes that are designed to address, among other issues: the development of talent; the challenges of developing, retaining and attracting skilled workers; local market needs; innovation and opportunities for highly-skilled jobs.

This demographic transition has an impact on population structures across EU regions, resulting in (among other consequences):

- major urban areas which are often characterised by relatively youthful **populations**, large numbers of people living alone, high costs of living, diverse educational opportunities and buoyant labour markets;
- towns and cities in former industrial heartlands that have been left behind economically, characterised by relatively high levels of unemployment, poverty and social exclusion;
- commuter belts/suburban areas which are often inhabited by families;
- coastal and countryside locations, some of which may be viewed as retirement locations for relatively affluent pensioners;
- other rural and remote regions which may exhibit declining population numbers and a relatively elderly population structure, while being characterised by narrow labour market opportunities and relatively poor access to a range of services.

Together with one off shocks, such as the impact of the COVID-19 crisis or Russian military aggression against Ukraine, population events (**births**, **deaths** and **migratory** flows) shape demographic changes over time. Eurostat's latest population projections suggest the EU's population will increase through to 2026 when it will peak at 453.3 million, after which it is projected to gradually decrease to 447.9 million by 2050, before falling at a more rapid pace through to the end of the century (419.5 million in 2100). The EU's labour force is projected to retract at an even faster pace than population, as older people (aged 80 years or over) account for a growing share of the population.

The infographic above gives an idea of the scale of the challenge ahead, as the **population pyramids** highlight the considerable difference in age structures between NUTS level 3 regions in the EU. In 2022, the outermost region of Mayotte (France) had the highest **young-age dependency ratio** in the EU, while the northern Portuguese region of Alto Tâmega had the highest **old-age dependency ratio**.

## Population highlights

On 1 January 2022, there were 446.7 million persons living in the EU, this was 584 600 fewer than two years before. During the course of 2022, the EU's population started to increase once again, reflecting a mass-influx of displaced persons linked to Russian aggression against Ukraine.

Prior to the impact of the COVID-19 crisis, the rate at which the EU's population was growing had slowed during a period of several years. With the onset of the pandemic, **mortality** rates increased (especially among elderly populations), resulting in a fall in overall population numbers during 2020 and 2021. Indeed, this was the first time that the EU's population had declined since the start of the time series in 1960. The COVID-19 crisis changed the way that people lived, studied, worked and filled their leisure time. Although deaths were concentrated among older people, the pandemic was also a difficult period for many younger people: education was interrupted and increasing isolation led to sharp increases in cases of depression and anxiety.

Across the EU, people tend to live in relatively densely-populated cities, towns and suburbs, while the vast majority of the EU's land area is more sparsely populated. There are 242 NUTS level 2 regions and 1 166 NUTS level 3 regions across the EU from which a detailed typology for analysing demographic developments can be established. Note that some of the differences covered below reflect the criteria used to determine the administrative boundaries that delineate each of these regions.

## Population structure

The **median age** may be used to analyse population ageing; changes in this age give an idea of the pace at which the EU's population structure is developing. During the last two decades, the EU's median age increased by almost six years, up from 38.7 years in 2002 to 44.4 years in 2022.

The distribution of median ages among NUTS level 3 regions exhibited a certain degree of skewness. In 2022, there were 760 regions that had median ages equal to or above the EU average, while there were 406 regions with a median age below the EU average. At the top end of the distribution there were four regions with median ages higher than 55.0 years (see Figure 1.1):

- the northern Portuguese region of Alto Tâmega (56.2 years);
- Arr. Veurne in north-west Belgium (55.8 years);
- the mountainous region of Evrytania in central Greece (55.6 years); and
- the eastern German region of Suhl, Kreisfreie Stadt (55.4 years).

More generally, relatively high median ages – of at least 50.0 years – were principally concentrated in eastern regions of Germany as well as central and northern regions of Italy; there were also several regions in Greece, Spain, France and Portugal that had relatively high median ages. Many of these regions were relatively rural, characterised by low levels of disposable income and/or relatively high unemployment rates. As such, their high median ages likely reflect, at least to some degree, younger people having left – for example to regions with larger and more affluent cities, or venturing abroad – in search of educational opportunities, higher wages and/or better job opportunities.

**Some of the lowest median ages were recorded in and around capital cities**

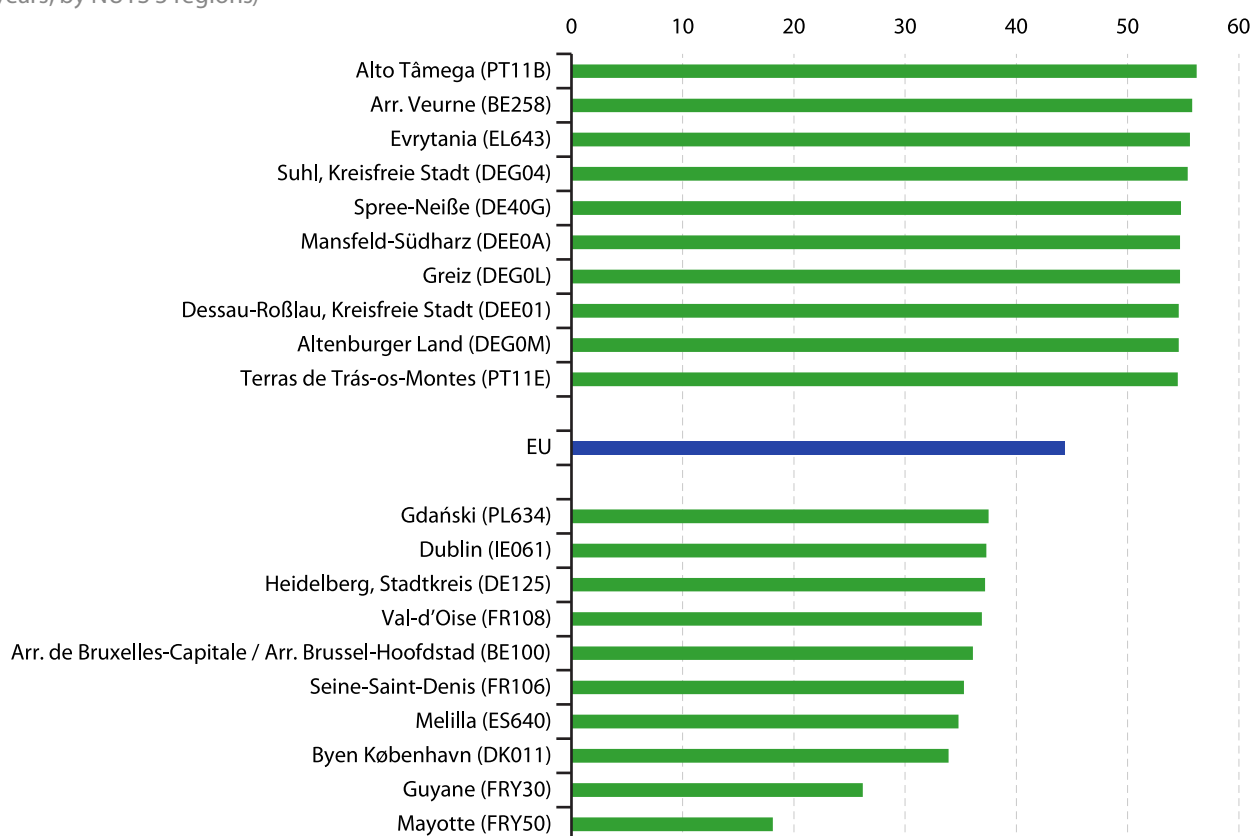
Capital regions often exert a considerable pull on inter-regional and international migrants, as they tend to provide a diverse range of educational and employment opportunities. This process can lead to

a shift in population structures, with younger people accounting for a growing share of a region’s population; over time, this pattern may self-reinforce, insofar as populations with younger age structures are more likely to have relatively high birth rates.

In 2022, several of the NUTS level 3 regions in the EU with the lowest median ages were capital regions or regions within close proximity of a capital – those of Denmark, France (the suburbs of Seine-Saint-Denis and Val-d’Oise), Belgium and Ireland. Among these, the lowest median age was recorded in the Danish capital region of Byen København (33.9 years). There were, however, a number of other regions with low median ages, including:

- the French outermost regions of Mayotte (18.1 years) and Guyane (26.2 years) and the Spanish autonomous region of Melilla (34.8 years) – the first two of these were characterised by particularly high fertility rates;
- two cities with relatively large student populations – Heidelberg, Stadtkreis in Germany and Gdański in Poland (2021 data).

**Figure 1.1: Median age of the population, 1 January 2022**  
(years, by NUTS 3 regions)



Note: the figure shows the EU regions with the highest and lowest values. Austria and Poland: 1 January 2021.

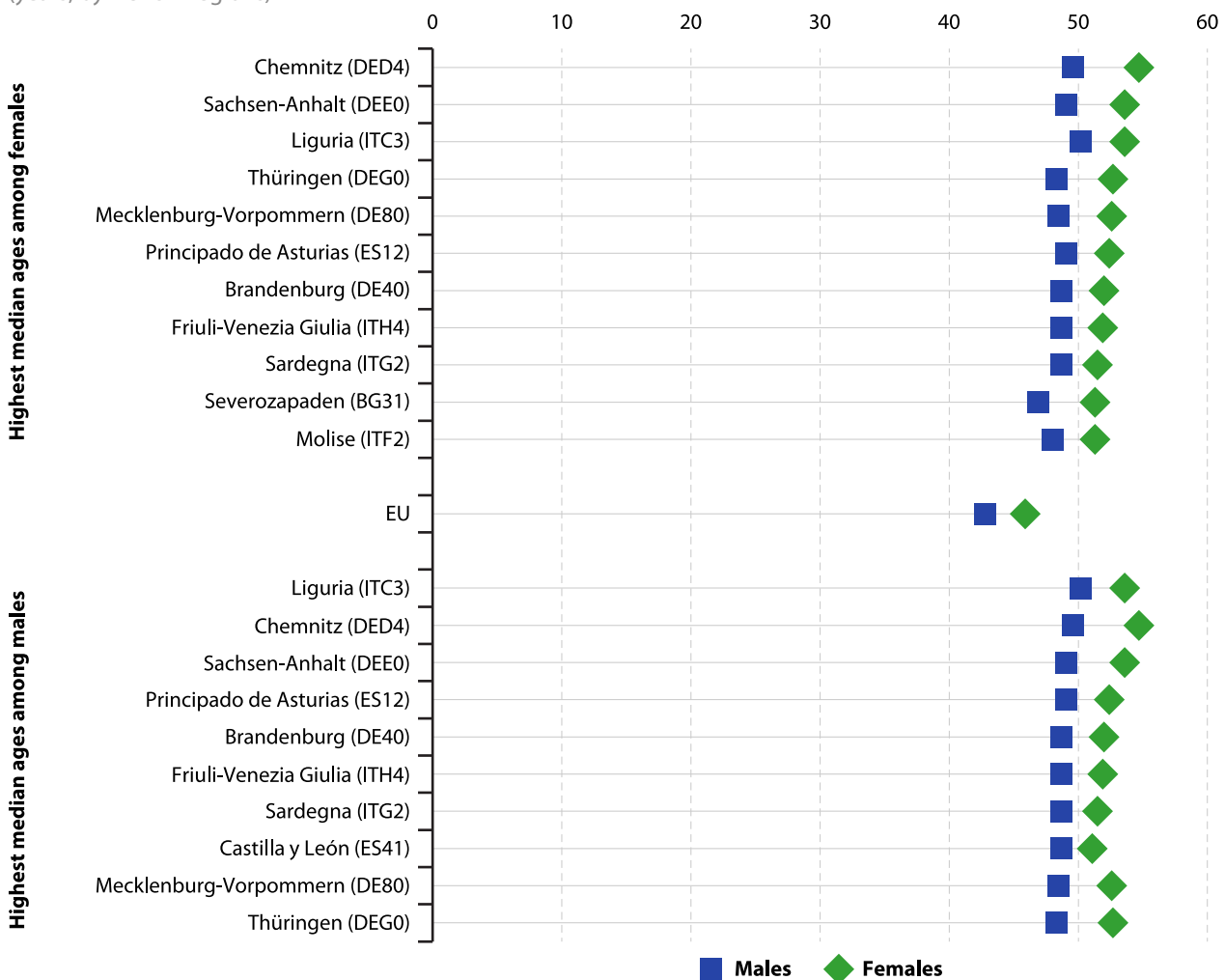
Source: Eurostat (online data codes: demo\_r\_pjanind3 and demo\_pjanind)

**The median age of females was higher than that of males in every region of the EU**

Figure 1.2 shows the median age of regional populations by sex; note these data are presented at a more aggregated level of geographical detail – for NUTS level 2 regions. The top half of the figure shows those EU regions with the highest median ages among females in 2022. They were principally located in eastern Germany or Italy, but also included Principado de Asturias in north-west Spain and Severozapaden in north-west Bulgaria. A similar pattern was observed in the bottom half of the figure, as the highest median ages for males were recorded across several regions of eastern Germany, Italy and north-west Spain. Many of these regions with high median ages were characterised by relatively low fertility rates and rural depopulation. In some cases, population ageing was reinforced as coastlines provided popular retirement destinations (thereby attracting additional older people).

A comparison between the sexes reveals that in 2022 the median age of females was consistently higher than that for males across every NUTS level 2 region. This pattern may be linked to higher levels of female life expectancy (see the section on mortality for more details), which may in turn be driven by factors such as lifestyle choices, working conditions, socioeconomic conditions and healthcare. The largest gender gaps were observed in the **Baltic Member States**. The median age of females in Latvia was 47.7 years, some 7.7 years higher than the corresponding figure for males. The next highest gender gap was recorded in the Lithuanian region of Vidurio ir vakarų Lietuvos regionas (7.2 years), followed by Estonia (6.1 years). At the other end of the range, there were much smaller differences between the sexes in the Spanish autonomous region of Ciudad de Ceuta (where the median age of females was 0.3 years higher than that for males), in Luxembourg (a difference of 1.0 years) and in the Spanish island region of Canarias (a difference of 1.1 years).

**Figure 1.2: Median age of the population by sex, 1 January 2022**  
(years, by NUTS 2 regions)



Note: the figure shows the EU regions with the highest values for females and the regions with the highest values for males. The rankings include more than 10 regions if several regions have identical values. Austria and Poland: 1 January 2021.

Source: Eurostat (online data codes: [demo\\_r\\_pjanind3](#) and [demo\\_pjanind](#))



**The Danish capital region of Byen København had the lowest age dependency ratio in the EU**

Medical progress and changes in lifestyles and working conditions have pushed back the frontiers of old age. Ageing is relative: a 65 year-old person may feel/consider themselves relatively young and active when comparing themselves to their ancestors. However, the EU’s population is becoming progressively older, driven by relatively low fertility rates, higher levels of life expectancy, and the continued ageing of the ‘baby boomer’ generation. As a result, EU Member States face a range of challenges that have implications, among others, for public finances, social security systems, pensions, and the provision of health and care services. These challenges may be particularly acute in regions/countries characterised by large numbers of very old people, as they may lose their autonomy, requiring higher levels of care and/or medical attention.

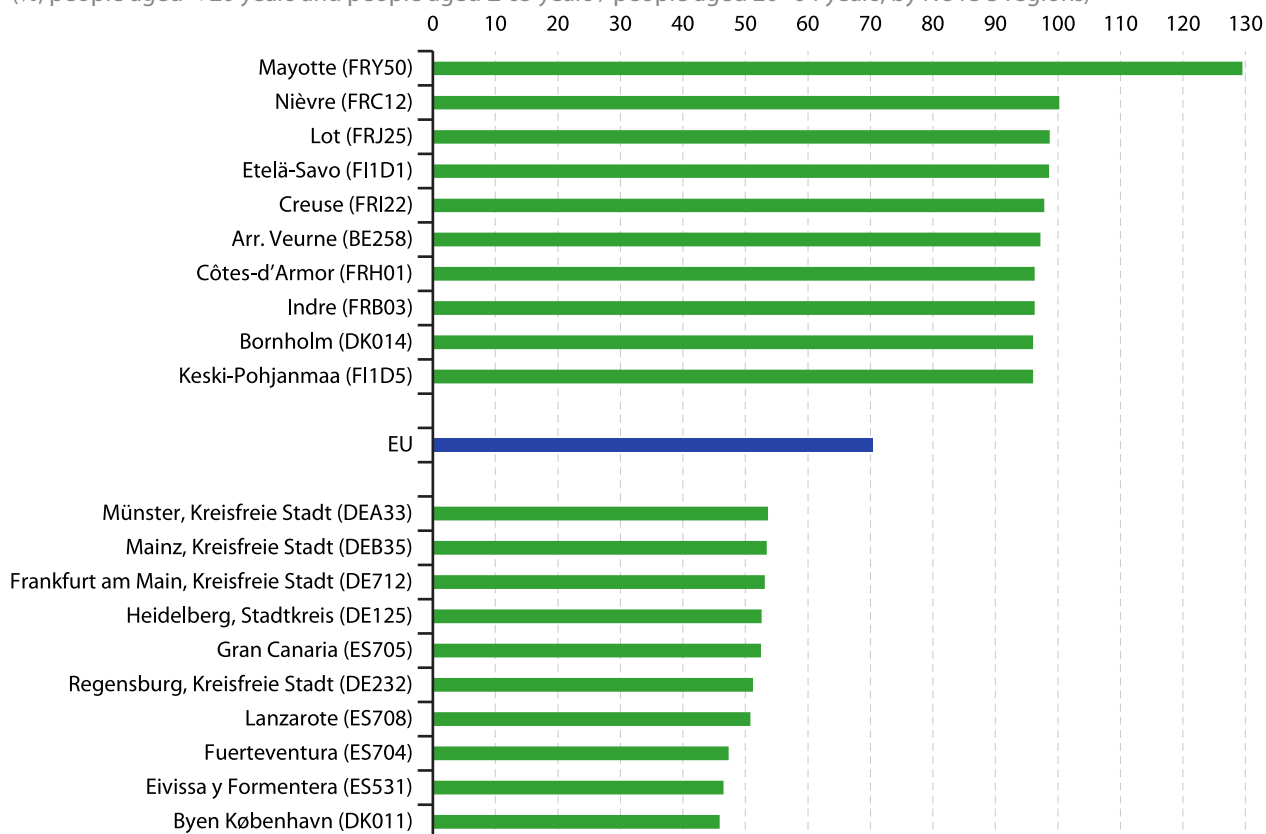
In 2022, more than one fifth (21.1 %) of the EU’s population was composed of people aged 65 or more. According to Eurostat’s latest population projections, the relative share of this group will likely increase during the remainder of this century, such that people aged 65 or more will account for almost one third (32.5 %) of the EU’s population by 2100. During the same period, the share of working age people – defined here as those

aged 20–64 – is projected to fall from 58.7 % to less than half (49.7 %). The latest projections also suggest that there will be a modest reduction in the share of younger people (aged less than 20), down from 20.2 % of the total population to 17.8 % by 2100.

Age dependency ratios measure the size of the dependent population relative to the working age population. Figure 1.3 shows a ratio based on the number of dependents (the sum of young people aged less than 20 and older people aged 65 or more) relative to the number of people of working age (those aged 20–64 years). In 2022, the EU’s age dependency ratio was 70.4 %. Across NUTS level 3 regions, the lowest age dependency ratio was recorded in the Danish capital region of Byen København, at 45.9 %. There were two other regions that recorded ratios below 50.0 % – indicating that their populations had at least two people of working age for each dependent – the Spanish island regions of Eivissa y Formentera (in Illes Balears) and Fuerteventura (in Canarias). At the other end of the range, the French regions of Mayotte (129.5 %) and Nièvre (100.2 %) recorded age dependency ratios of more than 100.0 %. In other words, both these regions had more dependents than people of working age: in the former a majority of the dependents were aged less than 20, whereas in the latter they were aged 65 or more.

**Figure 1.3: Age dependency ratio, 1 January 2022**

(%, people aged < 20 years and people aged ≥ 65 years / people aged 20–64 years, by NUTS 3 regions)



Note: the figure shows the EU regions with the highest and lowest ratios. Austria and Poland: 1 January 2021.

Source: Eurostat (online data codes: [demo\\_r\\_pjanind3](#) and [demo\\_pjanind](#))

Looking in more detail, the EU's old-age dependency ratio was 36.0 % in 2022, which was slightly higher than the young age dependency ratio of 34.4 %. The highest old age dependency ratios among NUTS level 3 regions were observed in the three regions that had the highest median ages: Alto Tâmega (Portugal; 68.5 %), Arr. Veurne (Belgium; 67.8 %) and Evrytania (Greece; 65.0 %). Leaving aside the atypical French outermost regions of Mayotte (123.4 %) and Guyane (78.9 %), the highest young age dependency ratio was recorded in Midland (Ireland; 51.4 %). Several other regions in Ireland and France had quite high young age dependency ratios, reflecting their above average fertility rates (see below for more information).

### ***During 2021, there were almost half a million more deaths than births across the EU***

Many of the demographic changes witnessed during 2021 may be attributed to direct and indirect impacts of the COVID-19 crisis. Between 1 January 2021 and 1 January 2022, the EU's population fell by 472 200 people. This reduction could be wholly attributed to natural population changes (in other words, more deaths than births), as net migration plus adjustment remained positive (in other words, more people entered the EU rather than left it).

### ***The lowest crude rates of natural population change were observed in Bulgaria***

Map 1.1 presents the crude rate of [natural population change](#) for NUTS level 3 regions. In 2021, this rate was  $-2.7$  per 1 000 persons for the EU. A clear majority of the 1 164 regions for which data are available had a negative rate of natural population change. This was the case in 980 regions (84.2 % of the total; they are shaded using three different golden tones in the map), while a positive rate of change was recorded in 173 regions (14.9 %); there were 11 regions (0.9 %) with no change – in other words, they had the same number of births as deaths (these latter two groups are shaded using three different teal tones).

In 2021, a negative crude rate of natural population change was observed for every NUTS level 3 region of Bulgaria, Estonia, Croatia, Latvia, Lithuania, Hungary, Portugal and Romania. There were several other EU Member States where almost every region recorded a negative rate for this indicator, the only exceptions being:

- the capital region of Hlavní město Praha in Czechia;

- Bolzano-Bozen in northern Italy;
- Poznański and Gdański in Poland;
- the capital region of Osrednjeslovenska in Slovenia;
- the capital region of Bratislavský kraj and Prešovský kraj in Slovakia.

Looking in more detail, the lowest crude rate of natural population change was recorded in the north-western Bulgarian region of Vidin, at  $-25.7$  per 1 000 persons. In fact, the 10 lowest regional rates in 2021 were all concentrated in Bulgaria, with Montana, Kyustendil, Gabrovo, Pernik and Vratsa also recording rates that were below  $-20.0$  per 1 000 persons.

By contrast, every region of Ireland had a positive crude rate of natural population change in 2021, while a relatively high number of regions located in (predominantly northern and eastern) Belgium, France, the Netherlands, (predominantly western) Austria, and Sweden also recorded positive rates; this was also the case in Luxembourg and Cyprus (which have only one region each). Among the nine NUTS level 3 regions in the EU where the crude rate of natural population change was at least 7.0 per 1 000 persons (as shown by the darkest shade of teal in Map 1.1), there were:

- three outermost regions in France – Mayotte, Guyane and La Réunion;
- four regions located within close proximity of the French capital region of Paris – Seine-Saint-Denis, Val-d'Oise, Essonne and Val-de-Marne;
- the Danish capital region of Byen København;
- Mid-East in Ireland, which surrounds the capital region of Dublin.

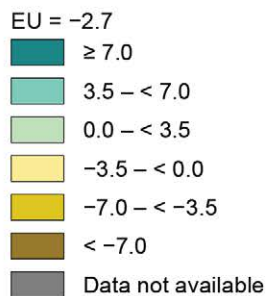
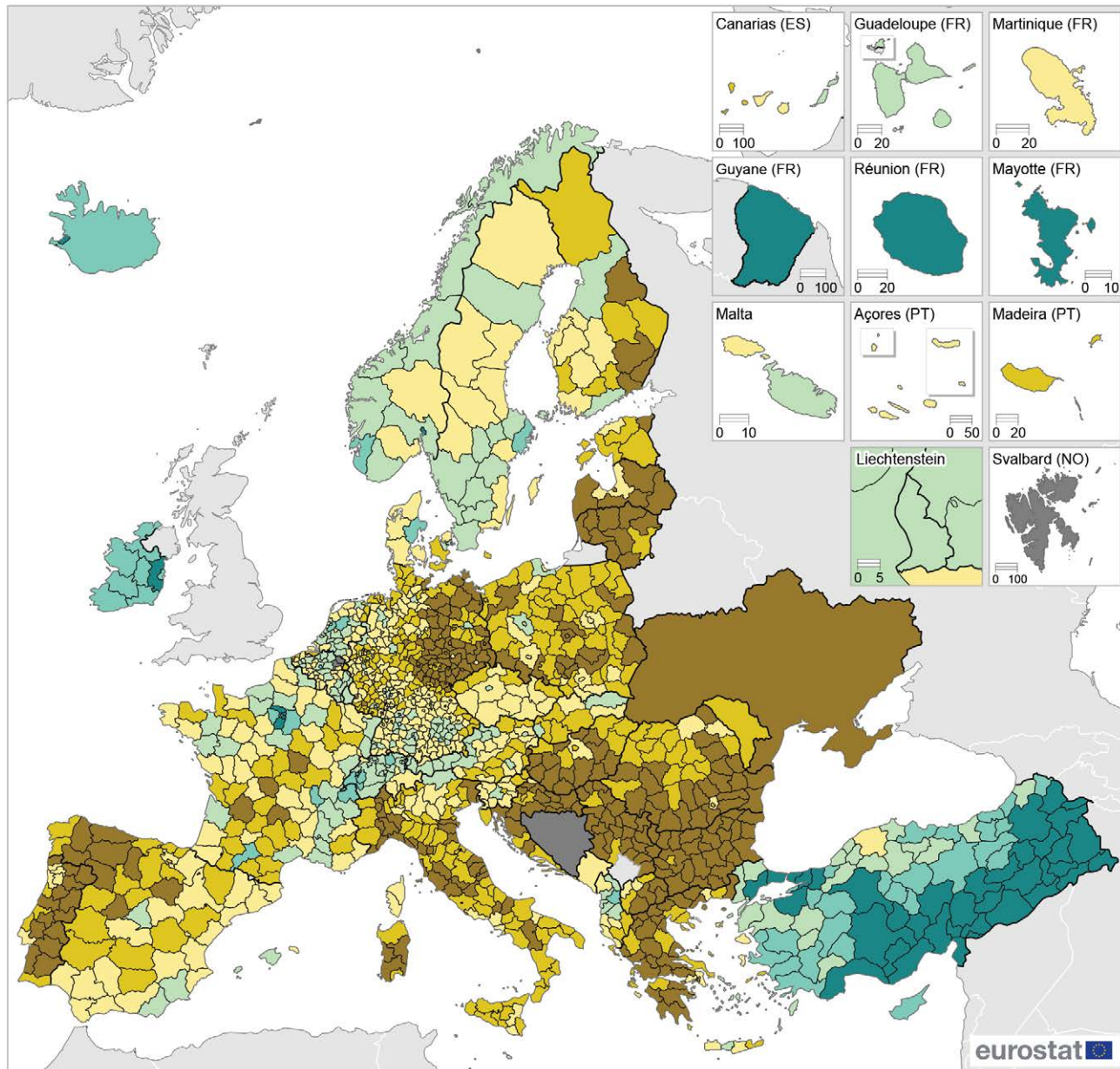
The highest crude rate of natural population change was recorded in Mayotte (32.2 per 1 000 persons), while Guyane (23.1 per 1 000 persons) was the only other region to report a double-digit rate of change.

Based on absolute figures in 2021, the largest increases in natural population change were recorded in:

- the French capital region of Paris (up 11 200 persons) and one of its neighbouring regions, Seine-Saint-Denis (up 15 800 persons);
- the Swedish capital region of Stockholm (up 13 400 persons).

The biggest absolute falls due to natural population change were recorded in Italy. In 2021, the population of Milano fell by 10 500 persons, with even larger decreases observed in Torino (down 14 300 persons) and the capital region of Roma (down 18 200 persons).

**Map 1.1:** Crude rate of natural population change, 2021  
 (% persons, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: Moldova and Albania, 2020. Türkiye: 2019.  
 Source: Eurostat (online data codes: demo\_r\_gind3 and demo\_gind)

## Fertility

Having fallen for four consecutive years (with a particularly large contraction in 2020 – the first year of the COVID-19 crisis), the number of live births across the EU increased at a modest pace in 2021, rising 0.4 % to 4.09 million.

### **The vast majority of regions in the EU had a total fertility rate that was below the natural replacement rate**

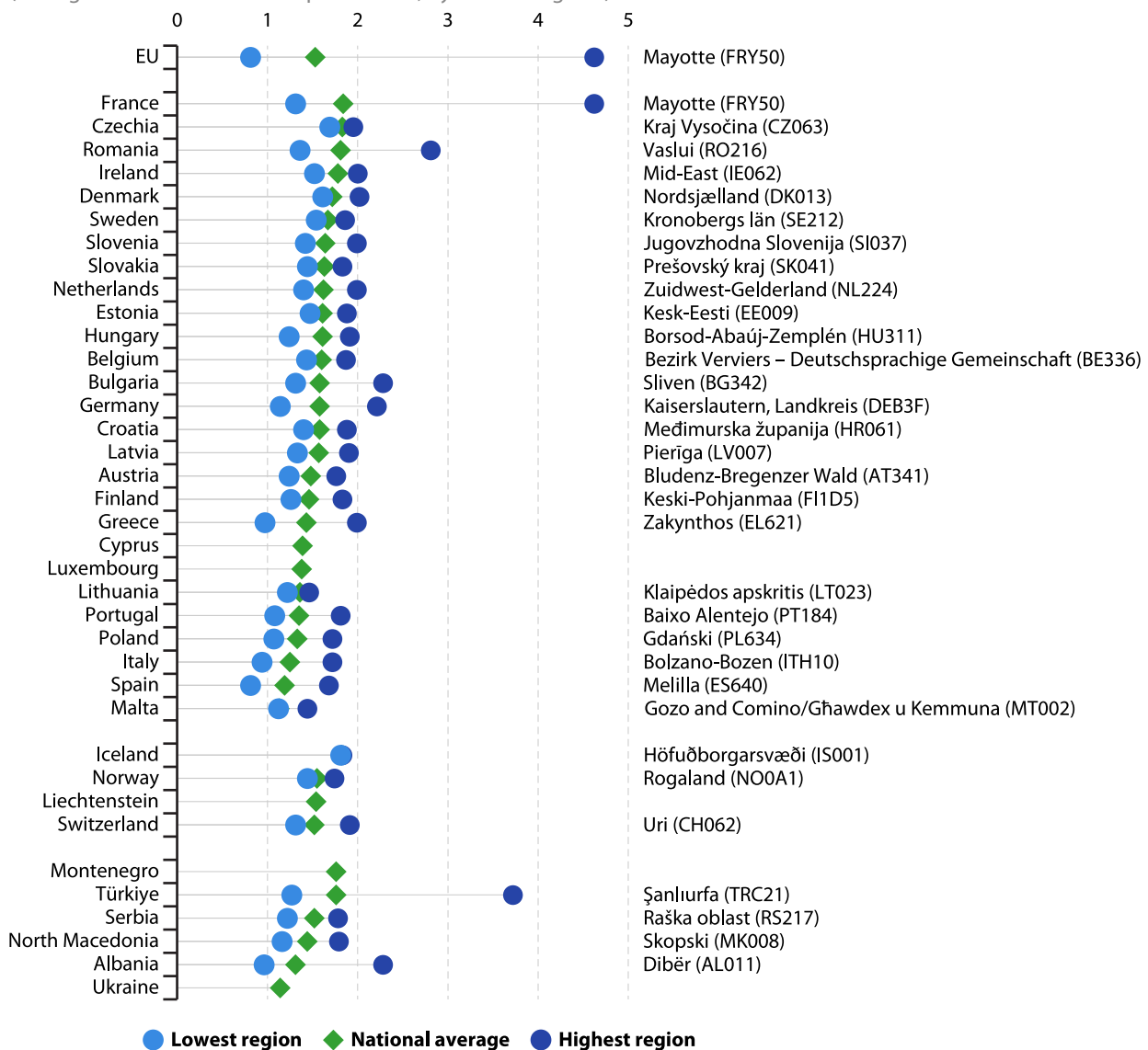
The total fertility rate is defined as the mean number of children who would be born to a woman during her lifetime, if she were to spend her childbearing years conforming to the age-specific fertility rates of a given

year. In 2021, the EU's total fertility rate was 1.53 live births per woman. This was considerably below the natural replacement rate – the average number of live births per woman required to keep the population size constant in the absence of migration in developed world economies (around 2.10 children per woman).

The regional distribution was somewhat skewed insofar as there were 448 NUTS level 3 regions (or 38.4 % of all regions) where the total fertility rate was below the EU average, while there were 718 regions (or 61.6 % of all regions) where the rate was equal to or higher than the EU average.

Figure 1.4 shows the distribution of total fertility rates for each of the EU Member States in 2021. There were 12

**Figure 1.4: Total fertility rate, 2021**  
(average number of live births per woman, by NUTS 3 regions)



Note: the figure shows, for each country, the highest and lowest total fertility rates by region, as well as the national average; the name of the region with the highest total fertility rate is also presented. Türkiye: 2020. Ukraine: 2019. Jan Mayen (NO0B1) and Svalbard (NO0B2): not available.

Source: Eurostat (online data codes: [demo\\_r\\_find3](#) and [demo\\_find](#))



NUTS level 3 regions that had total fertility rates that were above the natural replacement rate of 2.10 live births per woman. The highest rates were recorded in the French outermost regions of Mayotte (4.62 live births per woman) and Guyane (3.67 live births per woman). Half (5 out of 10) of the remaining regions with relatively high rates were located in France (either outermost regions or regions within close proximity of the capital), three were in Romania, while there were also single regions from each of Bulgaria and Germany.

At the other end of the range, there were 14 NUTS level 3 regions where the total fertility rate was less than 1.00 live births per woman in 2021. They were concentrated in southern EU Member States: with 10 located in Spain (in the north-west, Canarias or Illes Balears), three in Italy (all in Sardegna) and the central Greek region of Evrytania.

In 2021, the widest ranges for total fertility rates among EU Member States – the difference between the region with the highest rate and the region with the lowest rate – were observed in France, Romania and Germany.

### ***Women in the EU are giving birth later in life***

One factor which may explain the relatively low levels of fertility in the EU is the growing proportion of women giving birth later in life. This may be linked, among other factors, to: higher female participation rates in further education and/or more women choosing to establish a career before starting a family; lower levels of job security (for example, in precarious employment); the increasing cost of raising children and of housing; and a decline in the number of traditional family units (less people getting married, more same sex couples, and more people getting divorced). By contrast, policy initiatives reconciling work and childbearing within the broader context of societal values may, to some extent, sustain fertility rates. Examples include paid family leave (for both women and men) or the provision of childcare from an early age.

During the last two decades – between 2001 and 2021 – the mean age in the EU of women at childbirth gradually increased from 29.0 to 31.1 years. The regional distribution was relatively normal, insofar as there were 605 NUTS level 3 regions out of 1 166 for which data are available (or 51.9 %) where the mean age of women at childbirth was below the EU average. At the bottom end of the distribution, there were 44 regions where the mean age was less than 28.0 years: they were primarily located in Bulgaria or Romania, with only three exceptions – Košický kraj and Prešovský kraj in Slovakia, and Borsod-Abaúj-Zemplén in Hungary. The lowest mean age of women at childbirth was recorded in the eastern Bulgarian region of Sliven (24.9 years).

At the top end of the distribution, it was common to find capital regions and predominantly urban regions with some of the highest mean ages of women at childbirth. This may reflect a variety of cultural, socioeconomic and personal factors, including:

- better education/job opportunities leading some women to prioritise their education and/or career development;
- better access to healthcare in these regions, increasing the likelihood of a successful pregnancy for older women;
- more progressive social norms, giving women more freedom to decide when they have children;
- a wide range of recreational activities, cultural events and social networks, which some women may choose to enjoy before they give consideration to starting a family.

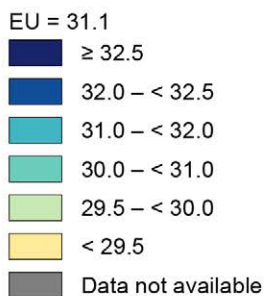
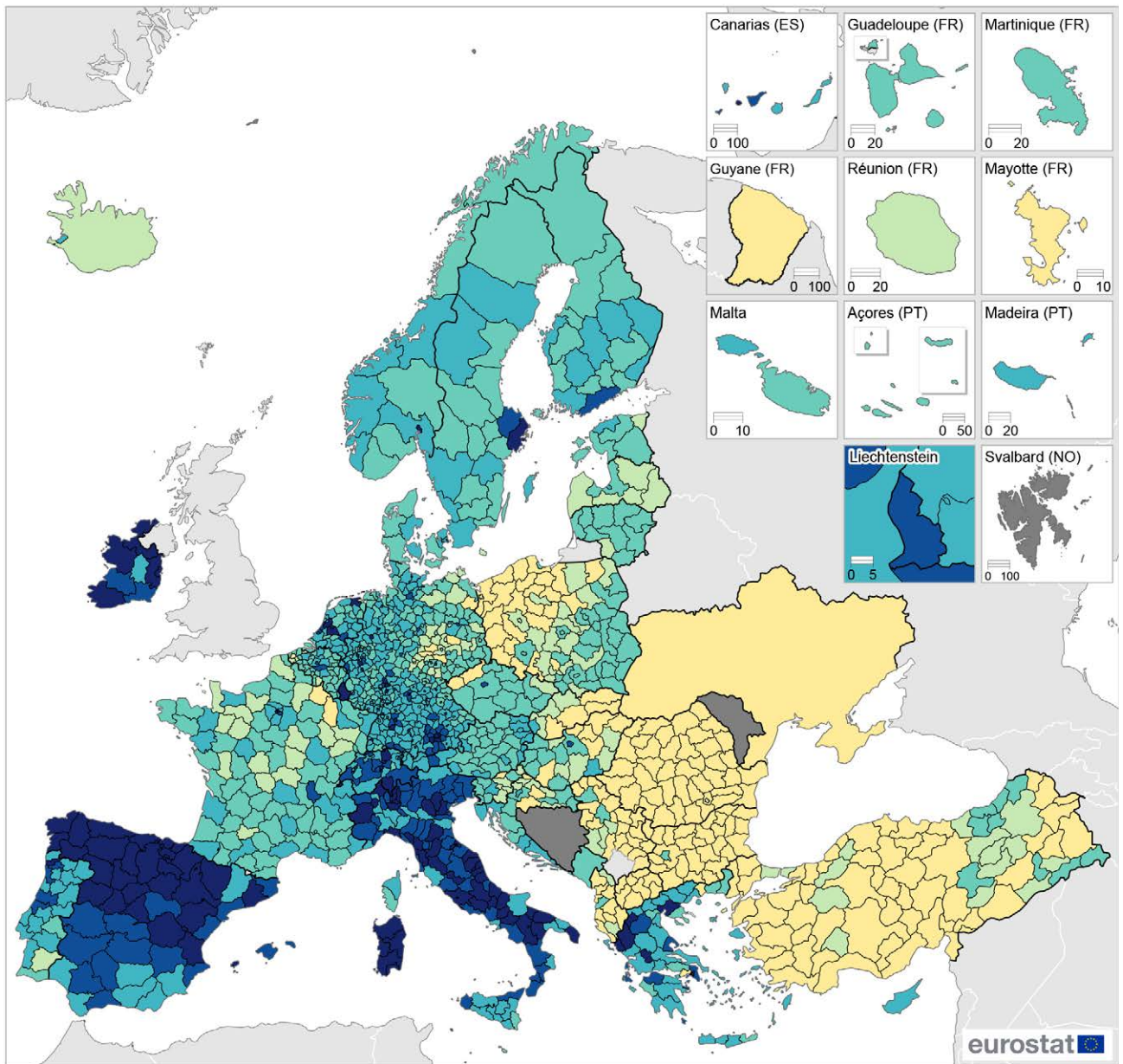
In 2021, there were 46 NUTS level 3 regions across the EU where the mean age of women at childbirth was at least 33.0 years. The vast majority of these regions were located in Spain (14 regions), Germany (12 regions) or Italy (10 regions), while the capital regions of Greece, France, Denmark, the Netherlands, Spain and Italy were all present within this group. The highest values were recorded in the capital regions of Voreios Tomeas Athinon (Greece; 34.7 years) and Paris (France; 34.2 years).

### ***More than one quarter of all live births in the EU were to women aged 35 years or more***

As noted above, the mean age of women at childbirth has been gradually increasing in the EU, as a growing number of women have children later in life. Prenatal care is generally accessible and encouraged for all pregnant women in the EU, regardless of their age. However, women aged 35 years or more may receive additional medical support as they have a higher risk of certain complications during pregnancy. Map 1.3 shows, for 2021, the proportion of live births to mothers aged 35 years or more; on average, more than one quarter (26.9 %) of all live births in the EU were to women aged 35 years or more.

In 2021, there were 26 NUTS level 2 regions where at least 37.5 % of all live births were to women aged 35 years or more (they are shown in the darkest shade of blue in Map 1.3). This group included every region of Ireland, 14 out of 19 regions in Spain, as well as seven regions in central and southern Italy. Looking in more detail, almost half (47.9 %) of the live births in the north-western Spanish region of Galicia were to women aged 35 years or more. There were five other regions in Spain – Cantabria, Principado de Asturias, the capital region of Comunidad de Madrid, Castilla y León and País Vasco – where more than 45.0 % of all live births were to women aged 35 years or more.

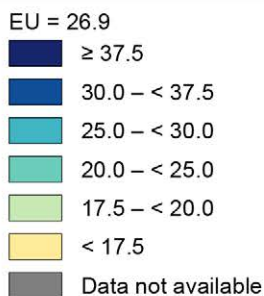
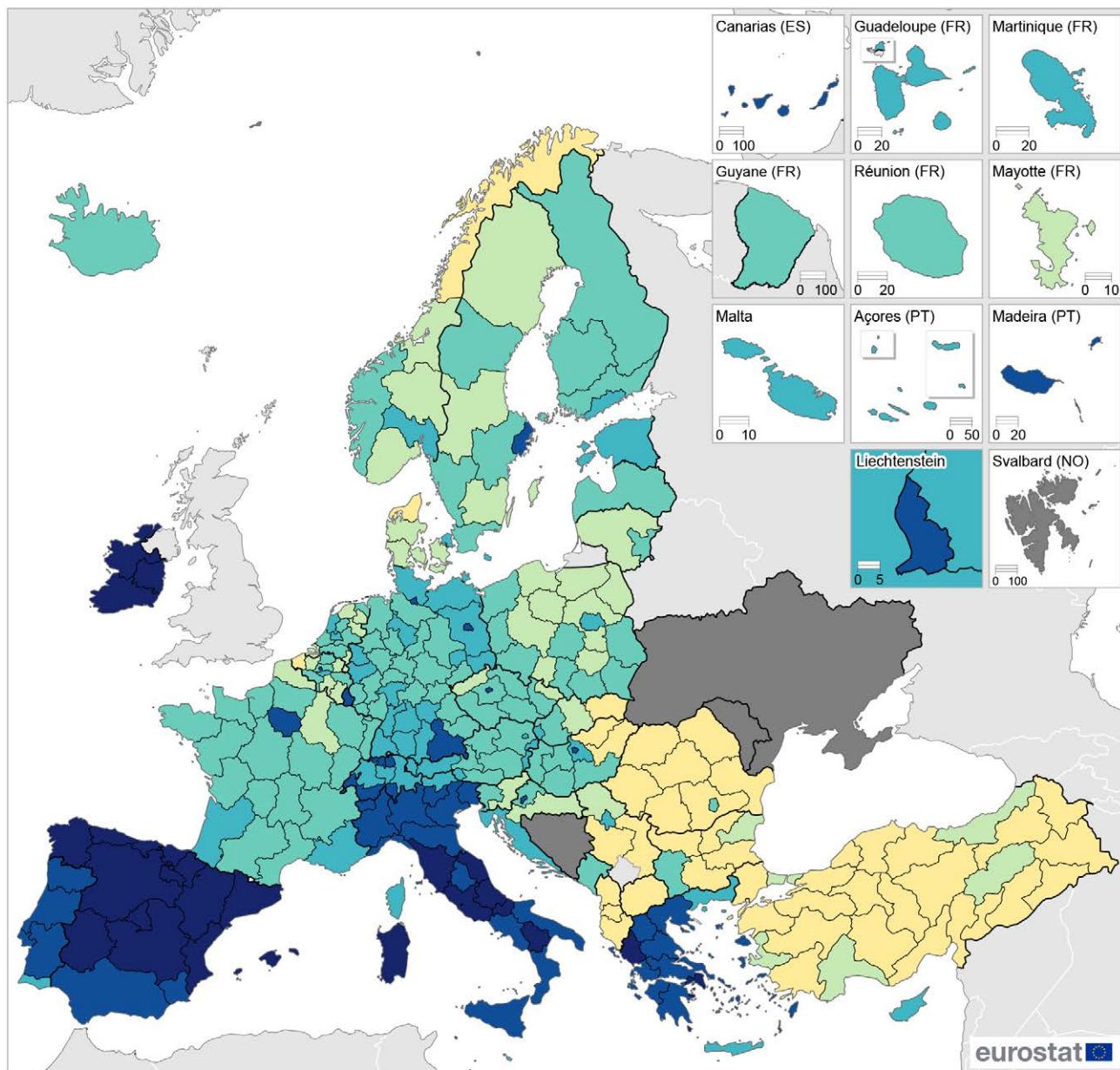
**Map 1.2: Mean age of mothers at childbirth, 2021**  
(years, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Note: Albania and Türkiye, 2020. Ukraine: 2019.  
Source: Eurostat (online data codes: demo\_r\_fnd3 and demo\_fnd)

**Map 1.3:** Live births to mothers aged ≥ 35 years, 2021  
 (% share of all live births, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 05/2023

Note: excluding live births where the age of the mother is unknown. Türkiye: 2020.  
 Source: Eurostat (online data code: [demo\\_r\\_fagec](#))





Map 1.3 also identifies a group of 16 regions where the share of live births to women aged 35 years or more was lower than 17.5 % in 2021 (they are presented in a yellow shade). Within this group, there were seven regions located in Romania, including Sud-Muntenia that had the lowest regional share, at 12.7 %. The remainder of this group was composed of four regions from Bulgaria, two regions from Hungary, as well as single regions from each of Belgium, Denmark and Slovakia.

## Mortality

During the last two centuries, [life expectancy](#) in the EU rose at a relatively consistent pace with a few exceptional periods (such as during war). Increased longevity can be attributed to a range of factors including significant advances in medical treatment and care, changes in living and environmental conditions, changes in working conditions/occupations, and/or lifestyle changes.

There are a range of potential drivers that may impact on inter-regional differences in life expectancy, including:

- proximity to healthcare services – capital regions tend to have a greater number and variety of healthcare facilities compared with rural regions;
- the prosperity of a region – life expectancy is generally higher in regions characterised by a higher standard of living and lower in regions characterised by poverty and social deprivation;
- lifestyle and cultural differences – for example, the type of work that predominates in a region, the typical diet of a region, or the incidence of smoking and alcohol consumption;
- climatic conditions – people living in warm or temperate and relatively dry climates tend to live longer lives than those living in regions that experience more extreme weather conditions.

Prior to the COVID-19 pandemic, life expectancy at birth in the EU had been 81.3 years in 2019. However, there was a fall of 0.9 years in 2020, followed by an additional fall of 0.3 years in 2021. The impact of the pandemic was unevenly spread in both geographic and socioeconomic terms, as successive waves of the virus impacted different EU Member States and their regions. Among other reasons, some of these differences may be linked to:

- the ability of regional health care facilities to cope with a sudden rush of cases and differential access to well-equipped hospitals;
- the health status of regional populations, such as the incidence and/or severity of pre-existing health conditions (particularly those affecting the respiratory system);

- regional population structures, for example the number and share of elderly people, the proportion of elderly persons living in care homes, the share of disadvantaged and minority ethnic groups in regional populations;
- a variety of other socioeconomic factors, such as the average number of people living alone and within extended families, or the share of people able to work from home during the pandemic;
- the timing, speed and severity of national and regional government measures that were put in place to slow the spread and mitigate the impact of the virus, coupled with public awareness, vigilance and adherence to rules/restrictions.

### ***A newborn female in Latvia could expect to live an additional 9.8 years compared with a newborn male***

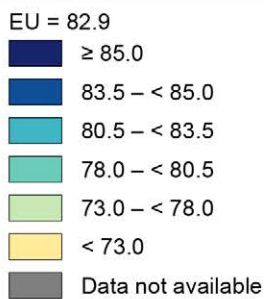
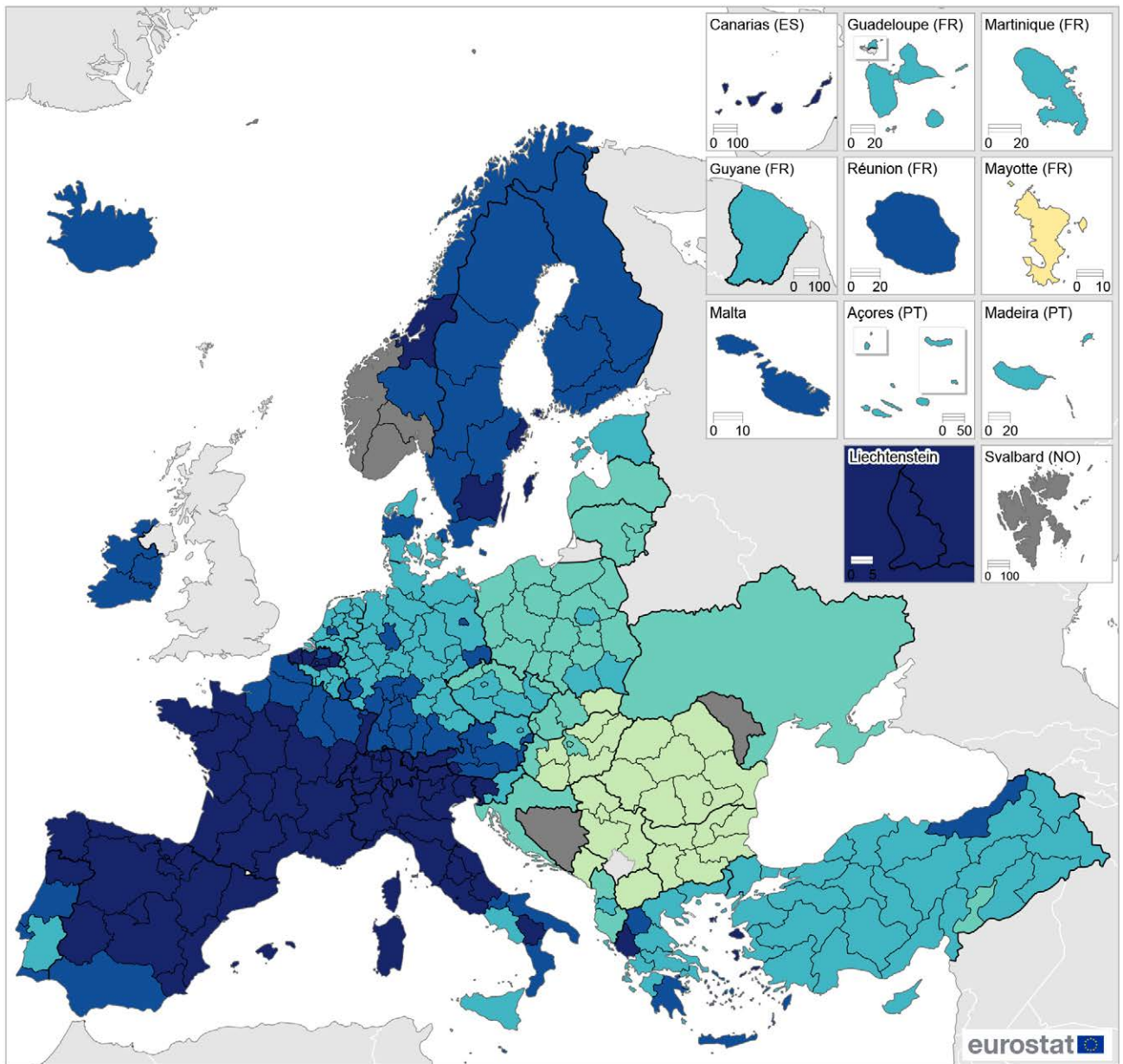
Maps 1.4 and 1.5 show female and male life expectancy at birth; note both maps use the same class boundaries in their legends to aid comparison. In 2021, the EU's overall life expectancy at birth was 80.1 years. Female life expectancy (82.9 years) was 5.7 years higher than male life expectancy (77.2 years). A gender gap in favour of females was observed for each of the 242 NUTS level 2 regions for which data are available. Some of the largest gender gaps were recorded in the Baltic Member States, as well as several Polish and Romanian regions, while differences between the sexes were generally much smaller in Danish, Dutch and Swedish regions. The smallest gender gap was observed in the French outermost region of Mayotte (where female life expectancy was 2.3 years higher than that for males), while the largest gender gap was recorded in Latvia (where female life expectancy was 9.8 years higher).

In 2021, some of the highest life expectancies at birth for women were located across Spain and France. The highest level was in the Spanish capital region of Comunidad de Madrid (88.2 years), followed by five other regions in Spain – Comunidad Foral de Navarra (87.6 years), Castilla y León (87.5 years), Cantabria (87.1 years), Galicia and País Vasco (both 87.0 years). Outside of Spain, the next highest levels of female life expectancy at birth were reported for Rhône-Alpes in France and Provincia Autonoma di Trento in Italy (both 86.7 years).

The highest levels of male life expectancy at birth were generally recorded across several regions of Spain, (northern and central) Italy and (southern and central) Sweden. However, the highest figure across EU regions in 2021 was recorded in the autonomous island region of Åland (Finland), at 82.8 years. The next highest levels were reported for two Spanish regions, Comunidad de Madrid (82.2 years) and Comunidad Foral de Navarra (81.9), and for two Swedish regions, Stockholm (82.1 years) and Småland med öarna (81.9 years).



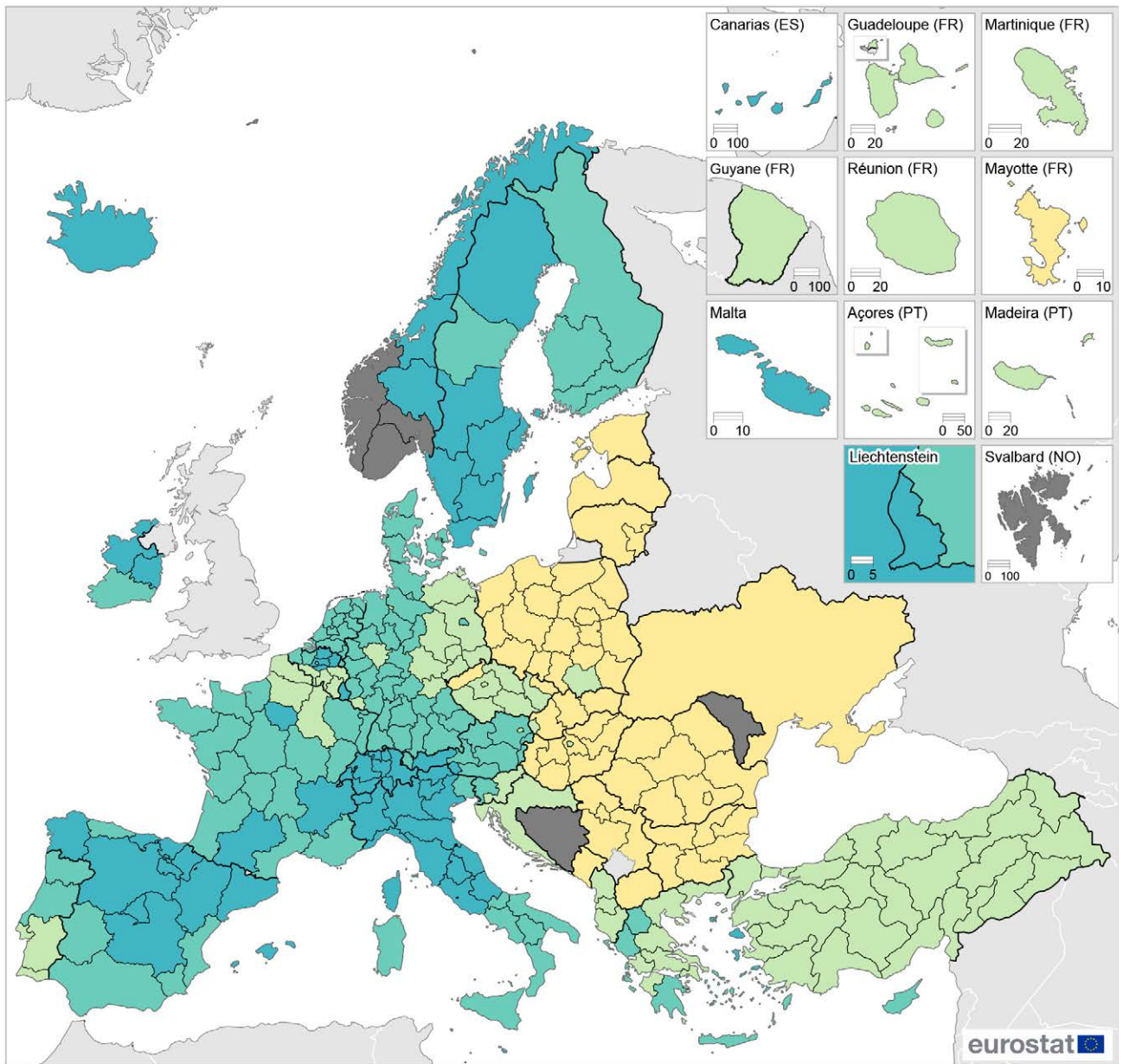
**Map 1.4:** Life expectancy at birth for females, 2021  
(years, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Note: Croatia, national data. Albania: 2020. Türkiye and Ukraine: 2019.  
Source: Eurostat (online data codes: [demo\\_r\\_mlifexp](#) and [demo\\_mlifexp](#))

**Map 1.5:** Life expectancy at birth for males, 2021  
(years, by NUTS 2 regions)



- EU = 77.2
- ≥ 85.0
  - 83.5 – < 85.0
  - 80.5 – < 83.5
  - 78.0 – < 80.5
  - 73.0 – < 78.0
  - < 73.0
  - Data not available

Note: Croatia, national data. Albania: 2020. Türkiye and Ukraine: 2019.  
Source: Eurostat (online data codes: [demo\\_r\\_mlifexp](#) and [demo\\_mlexpec](#))

## Infant mortality rates

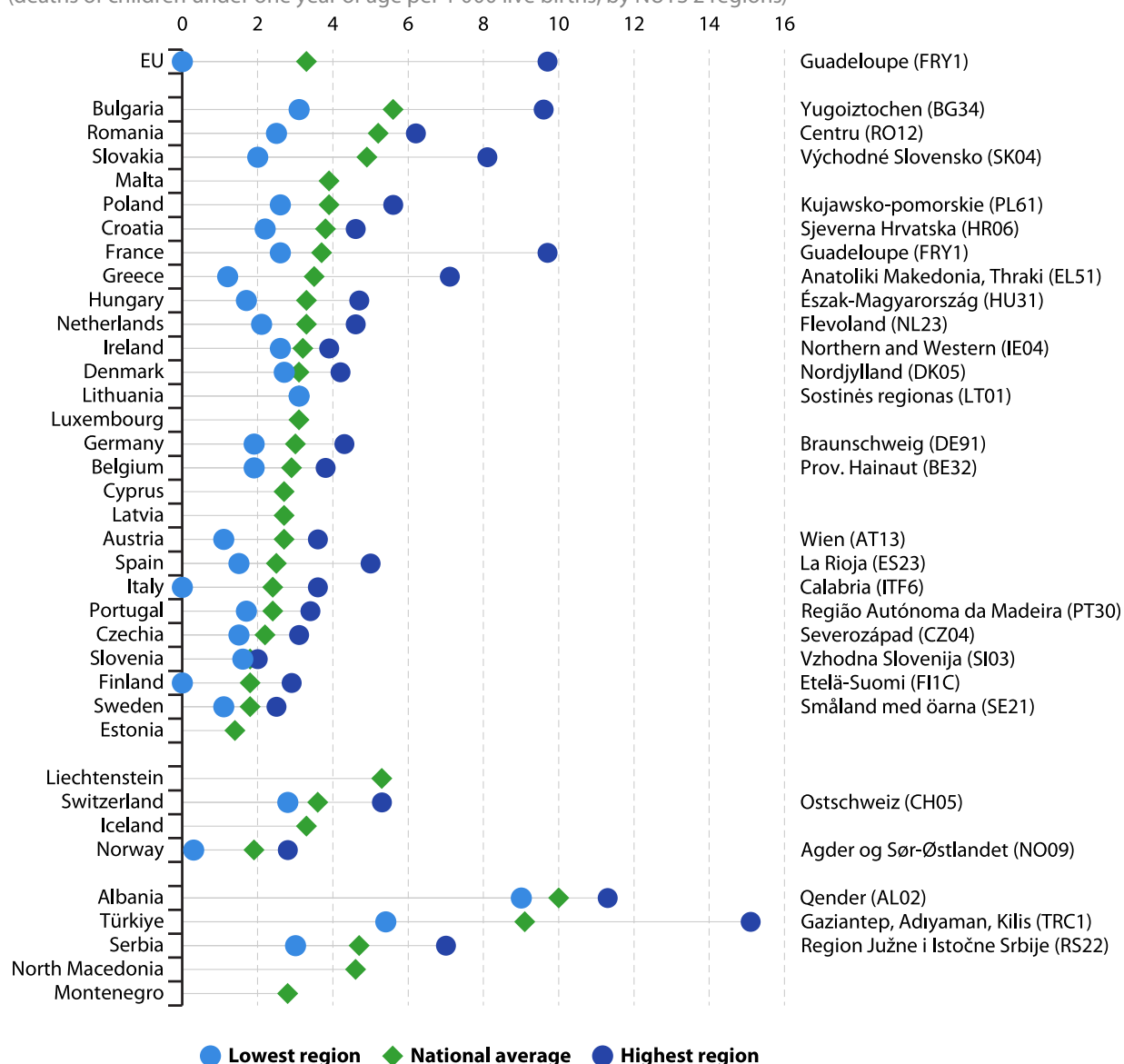
Within the EU, one of the principal drivers behind increases in life expectancy is the marked reduction in **infant mortality rates**. The EU's infant mortality rate is low by international standards, reflecting well-established healthcare systems, access to quality prenatal and neonatal care, and comprehensive social support. In 1970, the EU's infant mortality rate was 26.5 deaths per 1 000 live births. By 2010, it had fallen

to 4.0 deaths per 1 000 live births and a decade later it continued to fall (albeit at a slower pace). Nevertheless, in 2020 there were 13 250 children in the EU that died before reaching their first birthday; the infant mortality rate was 3.3 deaths per 1 000 live births.

Regional data for most NUTS level 2 regions are available for 2021 (the latest information for Estonia and Italy refers to 2020). Figure 1.4 shows the distribution of infant mortality rates in each EU Member State, as well as the name of the region with the highest infant

**Figure 1.5: Infant mortality rate, 2021**

(deaths of children under one year of age per 1 000 live births, by NUTS 2 regions)



Note: the figure shows, for each country, the highest and lowest infant mortality rates by region, as well as the national average; the name of the region with the highest infant mortality rate is also presented. EU, Estonia, Italy, Switzerland, Montenegro and Albania: 2020. Türkiye: 2019. Svalbard og Jan Mayen (NO0B): not available.

Source: Eurostat (online data code: demo\_r\_minfind)



mortality rate. There were 20 regions across the EU – most of which were relatively rural or remote and/or regions characterised by a low standard of living – which recorded rates of at least 5.0 deaths per 1 000 live births in 2021. Particularly high infant mortality rates were observed in the five French outermost regions, including Guadeloupe, which had the highest rate (9.7 deaths per 1 000 live births) in the EU. This group of 20 regions also included:

- five out of the six regions in Bulgaria (the exception being the capital region of Yugozapaden);
- Východné Slovensko in Slovakia;
- Anatoliki Makedonia, Thraki and Ionia Nisia in Greece;
- five out of the eight regions in Romania (the exceptions being Sud-Muntenia, Vest and Bucureşti-Ilfov);
- Kujawsko-pomorskie in Poland; and
- La Rioja in Spain.

Some of the lowest infant mortality rates in the EU were often observed in capital regions. This may reflect, among other factors, higher living standards, better access to healthcare facilities, and/or a concentration of expertise and resources (for example, specialised neonatal units for infants requiring advanced medical interventions). However, there were some exceptions to this pattern, as infant mortality rates in the capital regions of Wien (Austria), Área Metropolitana de Lisboa (Portugal), Ile-de-France (France), and Noord-Holland (the Netherlands) were higher than their respective national averages.

In 2021, there were 32 NUTS level 2 regions where the infant mortality rate was below 2.0 deaths per 1 000 live births. These relatively low rates were concentrated in Italy (eight regions; 2020 data), Finland, Sweden (both four regions), and Czechia (three regions). Note there were no deaths of children under the age of one in Valle d'Aosta/Vallée d'Aoste (Italy; 2020 data) or Åland (Finland).

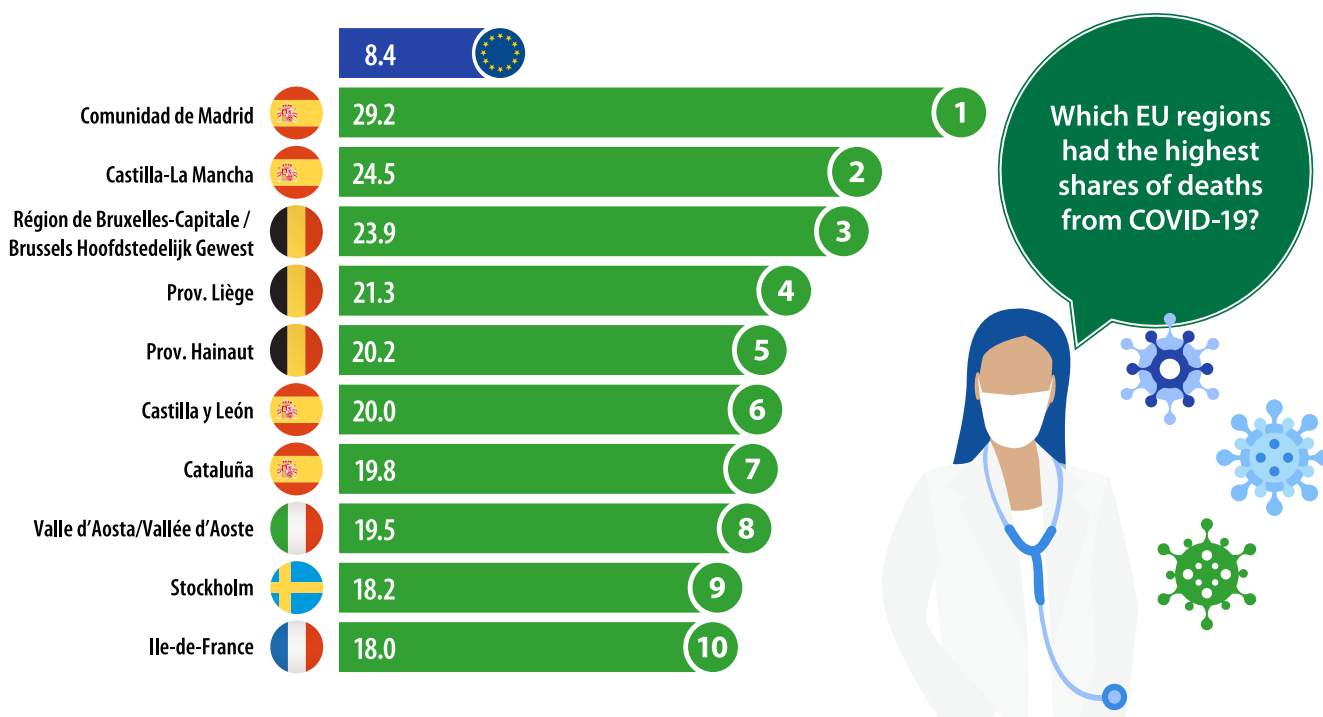


## 2. Health

Health is an important priority for most Europeans who expect to receive efficient **healthcare** services – for example, if contracting a disease or being involved in an accident – alongside timely and reliable public health information. One of the 20 principles of the **European Pillar of Social Rights** is that everyone has the right to timely access to affordable, preventive and curative health care of good quality. The overall health of the **European Union's (EU's)** population is closely linked to that of the environment through – among other influences – the quality of the air we breathe, the water we drink and the food we eat.

The COVID-19 crisis resulted in severe human suffering and a considerable loss of life. The pandemic highlighted the need to prioritise public health and to strengthen healthcare systems across the EU. The **European Commission** took a series of coordinated actions to support the EU Member States' efforts to contain the spread of the coronavirus, support health systems and counter the socioeconomic impact of the pandemic; for more information, see [here](#).

This year's edition of the *Eurostat regional yearbook* is the first to include data on **causes of death** relating to COVID-19. In 2020, some 8.4 % of all deaths in the EU were attributed to COVID-19: as such, it was the third most common cause of death, behind circulatory diseases and malignant neoplasms (cancer). At the start of May 2023, the WHO declared that the pandemic was no longer a global threat. Most aspects of life in the EU have returned to 'normality', with the majority of restrictions on personal mobility and economic sectors having been lifted. That said, COVID-19 continues to impact healthcare systems in the EU: for example, large numbers of operations/treatments were cancelled or delayed during the pandemic because frontline staff had been redeployed to take care of those suffering from the virus or because they were suffering from the virus themselves. Furthermore, at an individual level, some patients decided to forego hospital visits, thereby missing regular check-ups and screening for a variety of diseases.



(% of all deaths, 2020, by NUTS 2 regions)  
 Note: based on standardised death rates per 100 000 inhabitants.  
 Source: Eurostat (online data code: hlth\_cd\_asdr2)

In 2020, almost 3 out of every 10 deaths (29.2 %) in the Spanish capital region of Comunidad de Madrid were attributed to COVID-19 (see the infographic above). This was, by far, the highest share recorded across NUTS level 2 regions of the EU. There were five more regions where COVID-19 accounted for at least one in five deaths:

- two of these bordered the Spanish capital – Castilla-La Mancha (24.5 %) and Castilla y León (20.0 %);
- three were located in Belgium – Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (23.9 %), Prov. Liège (21.3 %) and Prov. Hainaut (20.2 %).

## Health care

***In 2021, some 8.9 % of the population in the Greek region of Anatoliki Makedonia, Thraki had unmet needs for medical examination***

In 2021, 2.0 % of the EU population aged 16 years or over reported that they had unmet needs for a medical examination or treatment in the previous 12 months for reasons of finance, distance/transport, and/or waiting lists (hereafter referred to as unmet needs for medical examination). An analysis of NUTS level 2 regions reveals this share ranged from 0.1 % in Germany (national data), Cyprus and Malta up to 8.9 % in the Greek region of Anatoliki Makedonia, Thraki; note that data for Belgium, Italy and Serbia relate to level 1 regions and that only national data are available for Czechia, Germany, Spain, France, the Netherlands, Austria, Portugal and Türkiye.

The regional distribution of this indicator was balanced, insofar as there were 53 regions that recorded shares that were higher than the EU average, 50 regions with shares that were lower than the EU average, and two regions that had shares identical to the EU average. At the top end of the distribution, there were 12 regions where the self-reported share of people aged 16 years or over with unmet needs for medical examination in 2021 was at least 6.0 % (as shown by the darkest shade in Map 2.1). These regions were principally located in Greece (six regions) and Romania (three regions); the three remaining regions with relatively high shares included:

- Estonia;
- Stredné Slovensko in Slovakia (2020 data); and
- Wielkopolskie in Poland.

At the other end of the distribution there were nine regions across the EU where less than 0.5 % of the population aged 16 years or over reported unmet needs for medical examination in 2021 (as shown by the lightest shade in Map 2.1). This group included three regions in Hungary – Közép-Dunántúl, Dél-Dunántúl and Dél-Alföld – Cyprus and Malta, as well as Czechia, Austria, the Netherlands and Germany (only national data available for this latter group of four).

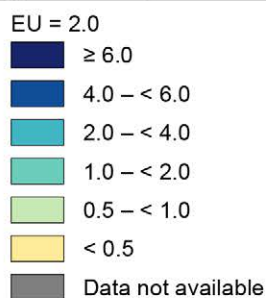
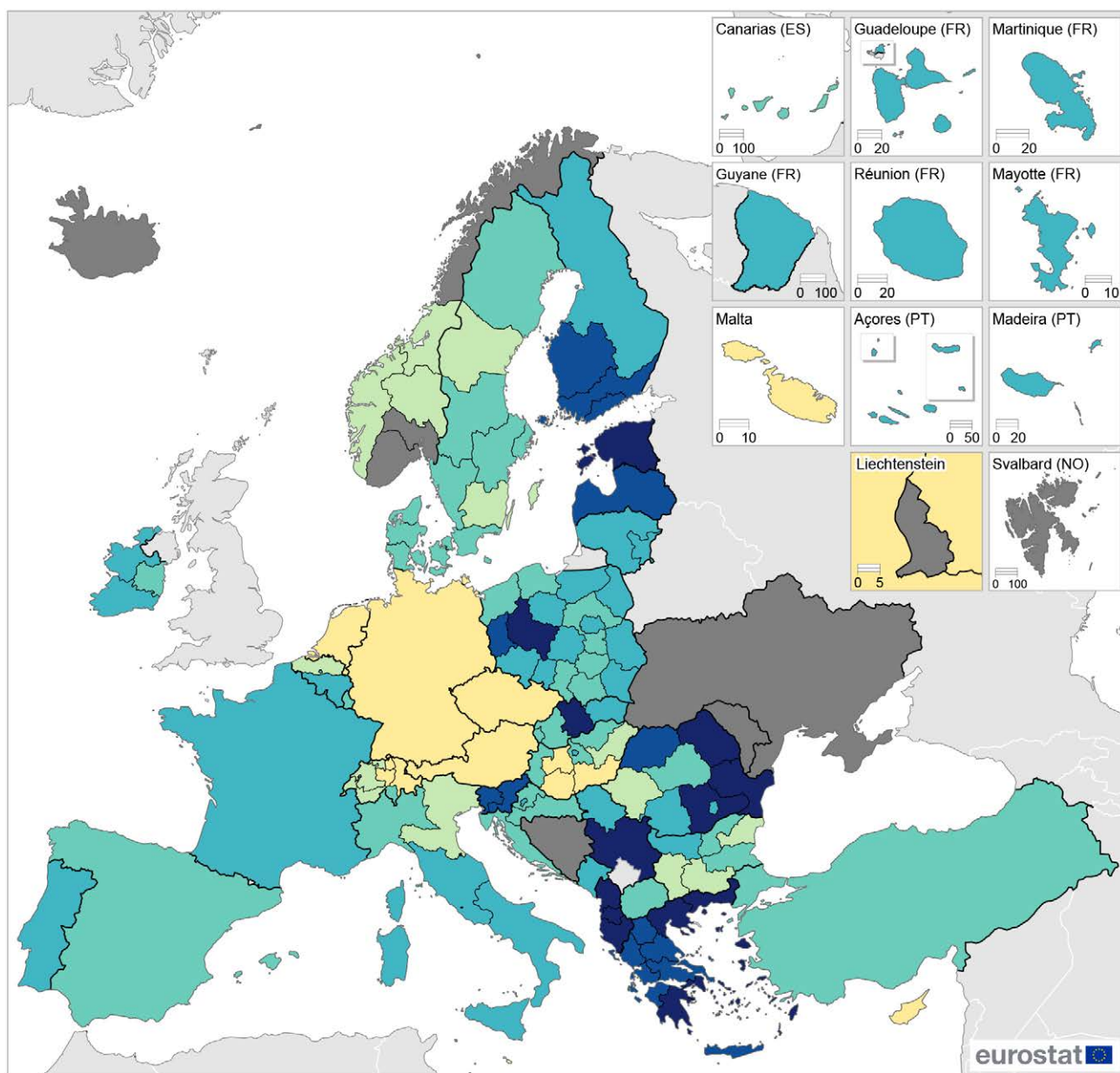
## HOSPITAL BEDS AND MEDICAL DOCTORS

The number of hospital beds and the number of medical doctors are indicators that may be used to measure the capacity of healthcare systems in regular times and their preparedness/resilience to pandemics (such as COVID-19).

The number of hospital beds includes those which are regularly maintained and staffed and immediately available for the care of patients admitted to hospitals; these statistics cover beds in general hospitals and in speciality hospitals. In 2019, there were 2.38 million hospital beds across the EU. This equated to 532 hospital beds per 100 000 inhabitants, or – expressed in a different way – there was, on average, one hospital bed for every 188 people.

The number of [medical doctors](#) includes generalists (such as general practitioners (GPs)) as well as medical and surgical specialists. These doctors provide services to patients as consumers of health care, including: giving advice, conducting medical examinations and making diagnoses; applying preventive medical methods; prescribing medication and treating diagnosed illnesses; giving specialised medical or surgical treatment. Eurostat gives preference to the concept of practising healthcare staff. Note that the data for Greece, Portugal and Finland relate to medical doctors licensed to practice, while the data for Slovakia, North Macedonia and Türkiye relate to professionally active medical doctors. In 2020, there were 1.8 million medical doctors in the EU; this equated to an average of 391.4 per 100 000 inhabitants.

**Map 2.1: Self-reported unmet needs for medical examination, 2021**  
 (% , people aged ≥ 16 years, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 04/2023

Note: Belgium, Italy and Serbia, NUTS level 1. Czechia, Germany, Spain, France, the Netherlands, Austria, Portugal and Türkiye: national data. Länsi-Suomi (FI19) and Åland (FI20) are aggregated (same value for both regions). Slovakia, Norway, Montenegro, North Macedonia, Albania and Türkiye: 2020.

Source: Eurostat (online data codes: [hlth\\_silc\\_08\\_r](#) and [hlth\\_silc\\_08](#))

***The capital region of Romania – București-Ilfov – was the only region in the EU to report more than 1 000 hospital beds per 100 000 inhabitants***

Map 2.2 shows the number of hospital beds and the number of medical doctors per 100 000 inhabitants in 2020 for NUTS level 2 regions; only national data are available for Germany, Ireland, Croatia, the Netherlands and Finland. There were 13 regions across the EU with a relatively high concentration of both of these healthcare resources – with at least 575.0 hospital beds per 100 000 inhabitants and at least 450.0 medical doctors per 100 000 inhabitants – as shown by the darkest shade of green in the map. A closer analysis reveals that this group included:

- seven capital regions – those of Bulgaria, Czechia, Lithuania, Hungary, Austria, Romania and Slovakia (to some extent, this may reflect country-specific ways of organising health care and the types of service provided to patients; it also reflects a large number of healthcare services and medical doctors being concentrated in urban regions with high levels of population density);
- five additional regions from Austria;
- the island region of Região Autónoma da Madeira (Portugal).

By contrast, there were 13 regions in the EU with a relatively low concentration of healthcare resources per 100 000 inhabitants – less than 350.0 hospital beds and less than 350.0 medical doctors – as shown by the lightest shade in the map. This group included Pest in Hungary, a region which surrounds the national capital of Budapest (that featured among the 13 regions with the highest ratios of hospital beds and medical doctors per 100 000 inhabitants). This contrasting situation reflects, at least in part, a relatively centralised healthcare system in Hungary, with a high proportion

of hospitals and other medical facilities in the region of Budapest, where demand is further stimulated by medical tourism (for example, cosmetic and orthopaedic surgery, fertility treatment, balneotherapy or dentistry). The remaining 12 regions with a relatively low concentration of healthcare resources were composed of rural, remote and outermost regions:

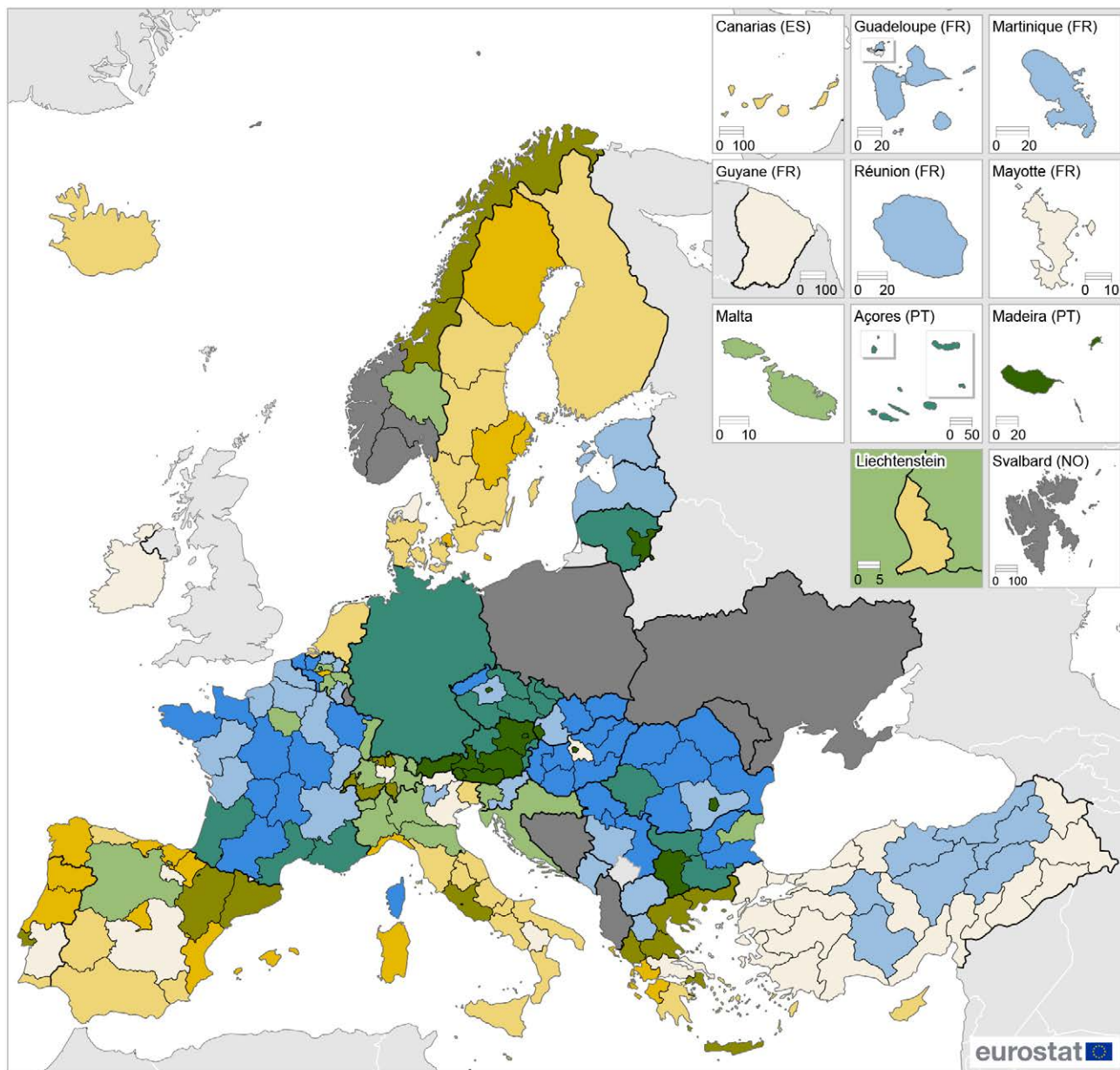
- the northern Danish region of Nordjylland (2019 data);
- Ireland (national data);
- the Greek regions of Voreio Aigaio and Sterea Elláda (2019 data);
- the Spanish regions of La Rioja and Castilla-La Mancha;
- the French outermost regions of Guyane and Mayotte;
- the Italian regions of Basilicata, Provincia Autonoma di Bolzano/Bozen and Veneto; and
- the southern Portuguese region of Alentejo.

***The number of hospital beds relative to the population fell in almost two thirds of EU regions***

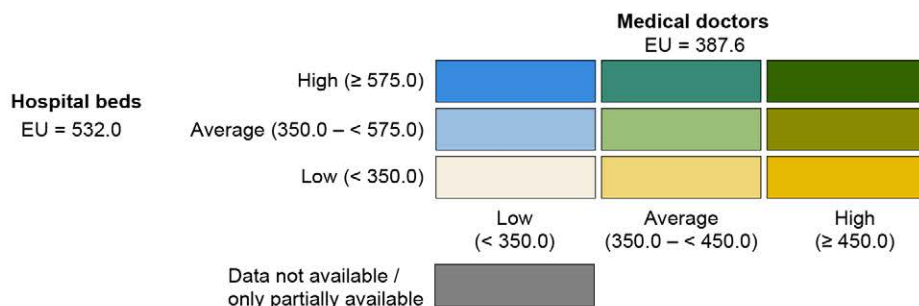
Falling numbers of hospital beds relative to population numbers may reflect, among other factors: cuts to healthcare spending in the aftermath of the global financial and economic crisis; medical and technological developments; or changes in healthcare policies. For example, the need for hospital beds may be reduced through a greater provision of day-care and outpatient services as well as reductions in the average length of hospital stays; such changes may result from the introduction of new treatments and less invasive forms of surgery. In addition, during the pandemic, hospital services outside of emergencies were often closed (for example, many planned operations were postponed and/or staff shortages meant that certain wards were shut down); these factors may also have contributed to a decrease in bed numbers.



**Map 2.2: Hospital beds and medical doctors, 2020**  
(per 100 000 inhabitants, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 04/2023



Note: Eurostat gives preference to the concept of practising health care staff. Greece, Portugal and Finland: medical doctors licensed to practice. Slovakia, North Macedonia and Türkiye: professionally active medical doctors. Germany, Ireland, Croatia, the Netherlands and Finland: national data. EU, Denmark, Estonia, Greece, Cyprus, Latvia, Malta, Sweden, Montenegro and North Macedonia: 2019.

Source: Eurostat (online data codes: hlth\_rs\_bdsrg, hlth\_rs\_bds1, hlth\_rs\_physreg, hlth\_rs\_prs1, hlth\_rs\_phys and demo\_gind)

Figure 2.1 shows the NUTS level 2 regions in the EU with the highest and lowest annual rates of change for their number of hospital beds per 100 000 inhabitants; the latest data available for Germany relate to NUTS level 1 regions, while only national data are available for Ireland, Croatia and the Netherlands. For the vast majority of regions, the latest data available relate to annual changes between 2019 and 2020, although the latest information for the EU, Germany, Estonia, Greece, Cyprus, Latvia, Luxembourg and Malta refers to the change in hospital bed numbers per 100 000 inhabitants between 2018 and 2019.

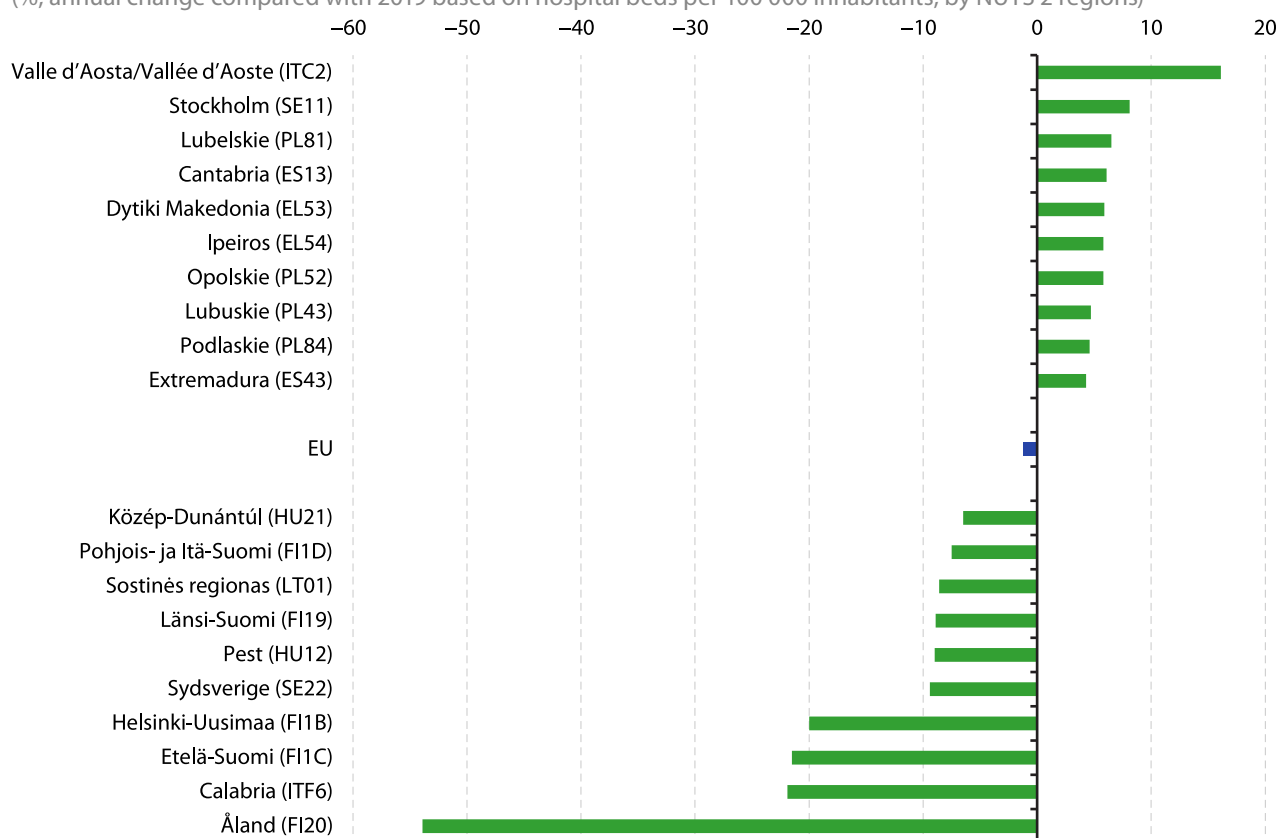
The number of hospital beds per 100 000 inhabitants across the EU was 1.2 % lower in 2019 than in 2018. Almost two thirds (65.7 %) of EU regions (134 out of 204) recorded a fall in their number of hospital beds per 100 000 inhabitants between 2019 and 2020. There were 10 regions where the annual fall in the number of hospital beds per 100 000 inhabitants was within the range of –5.0 % to –10.0 %. The six largest decreases within this group are shown in Figure 2.1, along with information for four other regions that recorded much bigger losses, namely:

- the southern Italian region of Calabria (down 21.9 %); and
- three regions located in Finland – the capital region of Helsinki-Uusimaa (down 20.0 %), Etelä-Suomi (down 21.5 %) and the archipelago of Åland (down 53.9 %) which has a relatively small population and a limited range of medical facilities.

By contrast, there were 70 regions across the EU where the number of hospital beds per 100 000 inhabitants increased between 2019 and 2020. Only one of these recorded a double-digit increase: the mountainous, north-western Italian region of Valle d'Aosta/Vallée d'Aoste (up 16.1 %). The next highest increases were observed in the Swedish capital region of Stockholm (up 8.1 %), the Polish regions of Lubelskie (up 6.5 %) and Opolskie (up 5.8 %), the northern Spanish region of Cantabria (up 6.1 %), and the Greek regions of Dytiki Makedonia (up 5.9 %) and Ipeiros (up 5.8 %). All but one of the regions in Romania – the exception being Nord-Est – recorded a positive development in hospital bed numbers per 100 000 inhabitants in 2020.

**Figure 2.1: Change in the number of hospital beds, 2020**

(%, annual change compared with 2019 based on hospital beds per 100 000 inhabitants, by NUTS 2 regions)



Source: Note: the figure shows the EU regions with the highest and lowest rates of change. Germany, NUTS level 1. Ireland, Croatia and the Netherlands: national data. EU, Germany, Estonia, Greece, Cyprus, Latvia, Luxembourg and Malta: 2018–2019 instead of 2019–2020.

Source: Eurostat (online data codes: [hlth\\_rs\\_bdsrg](#) and [hlth\\_rs\\_bds1](#))

**The number of medical doctors relative to the population rose in approximately three fifths of EU regions**

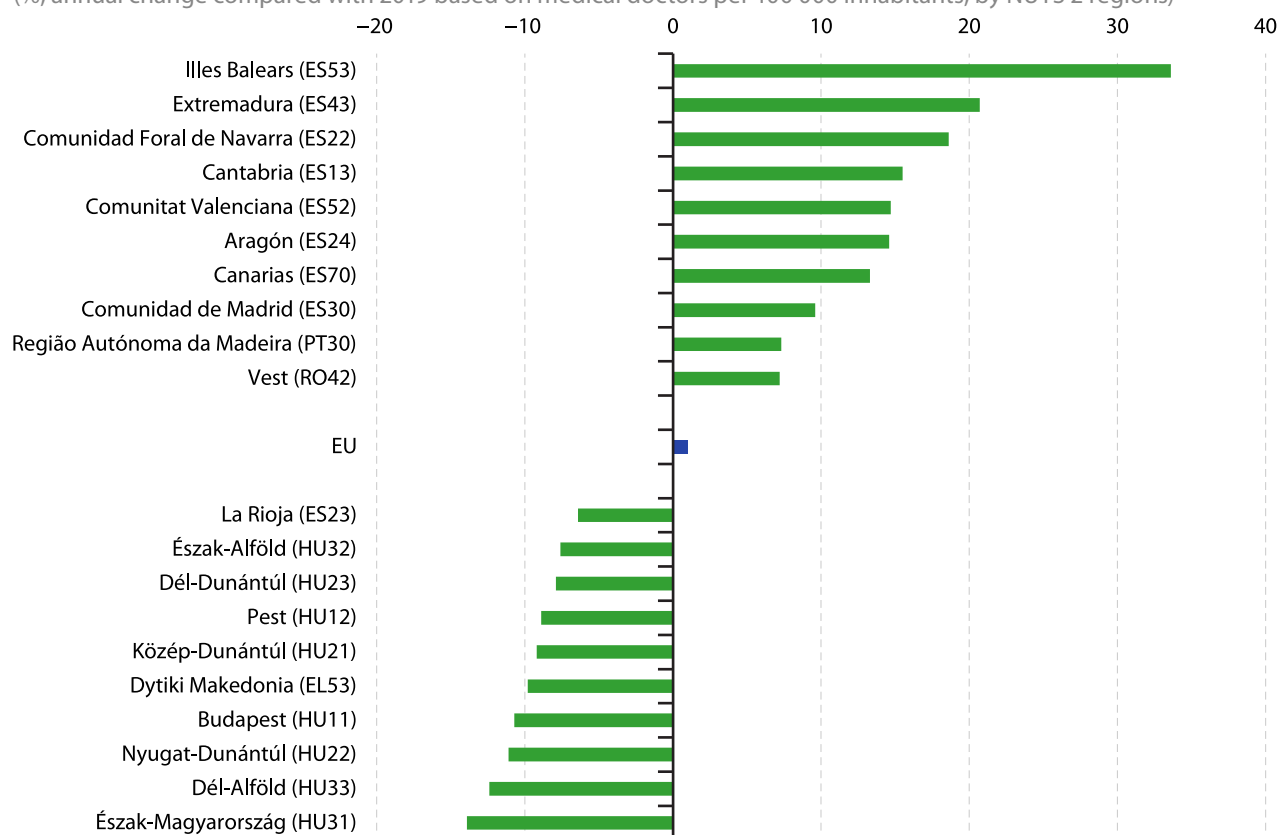
Figure 2.2 shows the NUTS level 2 regions in the EU with the highest and lowest annual rates of change for their number of medical doctors per 100 000 inhabitants; only national data are available for Germany, Ireland, Croatia and Finland. The number of medical doctors per 100 000 inhabitants increased in the EU at an annual rate of 1.0 % in 2019.

Approximately three out of every five (or 108 out of 177) regions across the EU recorded an increase in their number of medical doctors per 100 000 inhabitants between 2019 and 2020; data for Denmark, Estonia, Cyprus, Latvia and Sweden relate to 2018–2019 instead of 2019–2020. Every region of Belgium, Cyprus (2019), Malta, the Netherlands, Portugal, Slovenia and Slovakia recorded an annual increase in their respective number of medical doctors per 100 000 inhabitants in 2020. There were also positive rates of change observed in Germany, Ireland, Croatia and Finland (where only national data are available).

However, the eight regions with the highest annual growth rates were all located in Spain, with double-digit increases observed for seven of these. The highest rate of change was recorded in the island region of Illes Balears (up 33.6 %), followed by Extremadura (20.7 %) and Comunidad Foral de Navarra (18.6 %). The number of medical doctors per 100 000 inhabitants increased 9.6 % in the Spanish capital region of Comunidad de Madrid, while the only regions outside of Spain to record growth rates of at least 7.0 % were the Portuguese islands of Região Autónoma da Madeira, Vest in Romania, and Ipeiros in north-western Greece.

At the other end of the range, 8 out of the 10 EU regions with the biggest falls in 2020 for their number of medical doctors per 100 000 inhabitants were located in Hungary; in other words, this group included every region of Hungary. The largest declines were observed in Budapest (down 10.7 %), Nyugat-Dunántúl (down 11.1 %), Dél-Alföld (down 12.4 %) and Észak-Magyarország (down 13.9 %). The only regions outside of Hungary to record annual reductions of at least 6.0 % were Región de Murcia and La Rioja (both in Spain) and Dytiki Makedonia (Greece).

**Figure 2.2: Change in the number of medical doctors, 2020**  
(%, annual change compared with 2019 based on medical doctors per 100 000 inhabitants, by NUTS 2 regions)



Note: the figure shows the EU regions with the highest and lowest rates of change. Eurostat gives preference to the concept of practising health care staff. Greece, Portugal and Finland: medical doctors licensed to practice. Slovakia: professionally active medical doctors. Germany, Ireland, Croatia and Finland: national data. EU, Denmark, Estonia, Cyprus, Latvia and Sweden: 2018–2019 instead of 2019–2020. Ciudad de Melilla (ES64), Luxembourg and Poland: not available.

Source: Eurostat (online data codes: hlth\_rs\_physreg, hlth\_rs\_prs1, hlth\_rs\_phys and demo\_gind)

## Causes of death

Information presented in this section is based on [standardised death rates](#), whereby age-specific mortality rates are combined to reflect the structure of a [standard population](#). This removes the influence of different age structures between regions (as elderly persons are more likely to die than younger persons or are more likely to catch/contract a specific illness/disease); the result is a measure that is more comparable across space and/or over time.

### **The total number of deaths in the EU increased by more than half a million between 2019 and 2020**

In 2020, there were 5.18 million deaths across the EU. This equated to an increase of more than half a million compared with the year before (up 11.4 %), reflecting, at least in part, the impact of the COVID-19 crisis; more information about deaths during the early stages of the pandemic is provided below.

Map 2.3 shows information both for the relative number and for the main causes of deaths across NUTS level 1 regions with information generally available for 2020. There were eight regions in the EU where standardised death rates were at least 1 500 deaths per 100 000 inhabitants (as shown by the largest circles). Most of these had relatively low living standards, as their GDP per inhabitant (in [purchasing power standards \(PPS\)](#)) was commonly less than two thirds of the EU average. This situation was most notable in Severna i Yugoiztochna (Bulgaria) which recorded the highest death rate in the EU (1 854 deaths per 100 000 inhabitants) and the lowest level of GDP per inhabitant (39 % of the EU average). The other regions with particularly high death rates included all four regions in Romania, the two non-capital regions of Hungary, and the other Bulgarian region (Yugozapadna i Yuzhna tsentralna).

A similar pattern was often apparent for different regions within individual EU Member States. For example, the highest standardised death rates in three of the largest Member States in 2020 were recorded in Sachsen-Anhalt (eastern Germany), Sur (southern Spain) and Hauts-de-France (northern France). These regions are relatively disadvantaged, with levels of GDP per inhabitant that are considerably lower than their respective national averages. However, a different pattern was observed in Italy, as the highest death rate in 2020 was recorded in Nord-Ovest (which is a relatively rich region). This may be linked to the impact of the COVID-19 crisis, as several areas of northern Italy were particularly impacted during the early stages of the pandemic (as hospitals in some regions were overburdened).

### **In 2020, almost one third of all deaths in the EU were attributed to diseases of the circulatory system**

In 2020, the three main causes of death in the EU were: diseases of the circulatory system, malignant neoplasms (hereafter referred to as cancer) and COVID-19. Diseases of the circulatory system – which include heart diseases, hypertensive diseases and diseases of pulmonary circulation – accounted for almost one third (32.4 %) of all deaths. Cancer accounted for 22.8 % of the total number of deaths in the EU.

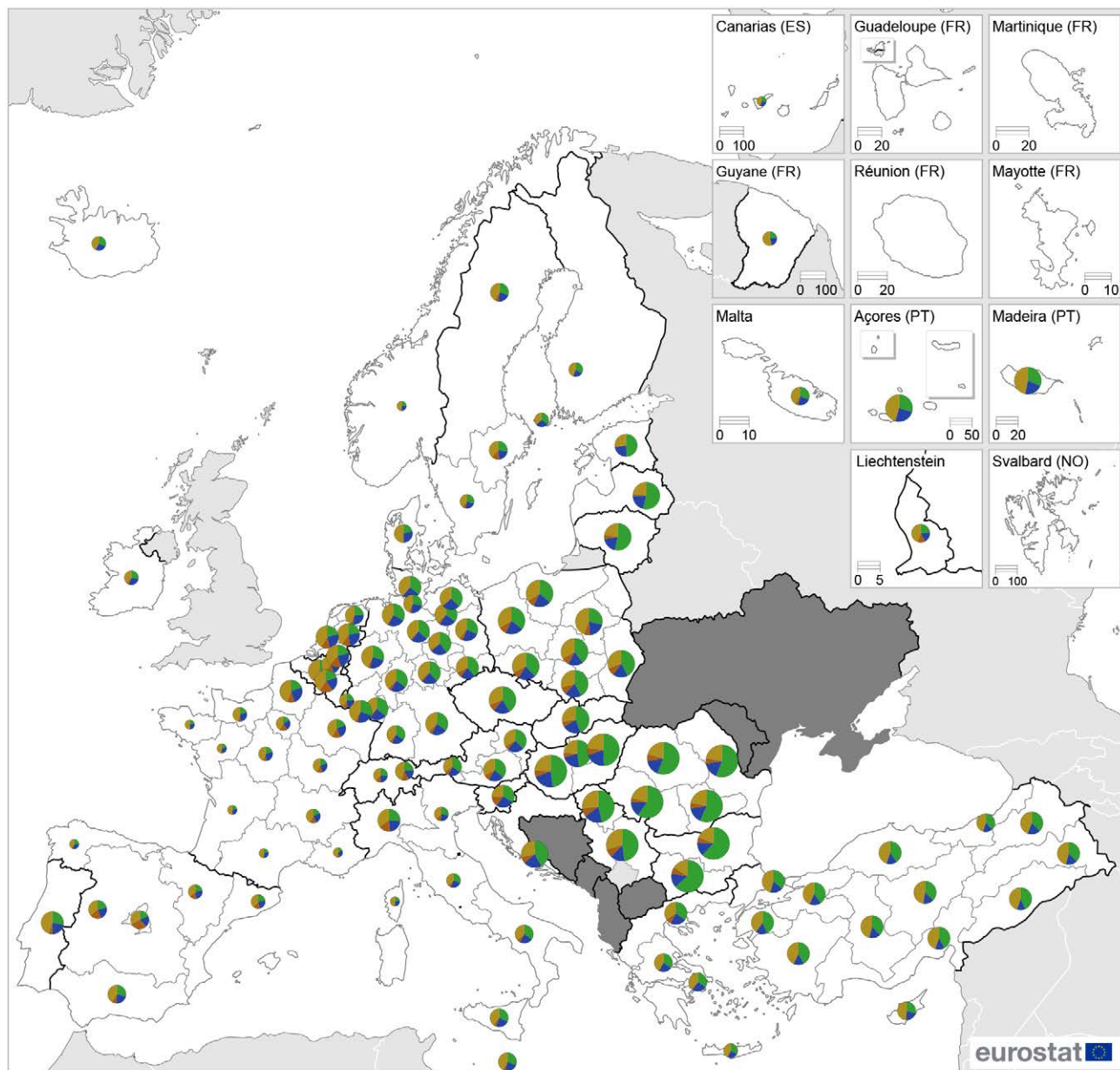
Having been declared a pandemic on 11 March 2020 by the [World Health Organization \(WHO\)](#), the COVID-19 virus spread rapidly across the world, including across the EU. Aside from its considerable impact in terms of lives lost, the pandemic and its associated measures caused widespread disruption to daily lives and the economy. In 2020, COVID-19 accounted for 8.4 % of all deaths in the EU. To put this share into context, there were 439 000 deaths from COVID-19 in 2020, considerably higher than the 348 000 deaths from diseases of the respiratory system – the fourth most common cause of death in 2020.

Map 2.3 also shows data for the three main causes of death in 2020. Diseases of the circulatory system were the main cause of death in 71 % (65 out of 92) of NUTS level 1 regions. Among these, there were eight regions where more than half of all deaths were caused by diseases of the circulatory system: this group included both regions of Bulgaria, Latvia, Lithuania and all four regions of Romania. In Yugozapadna i Yuzhna tsentralna Bulgaria, close to two thirds of all deaths (63.5 %) were attributed to diseases of the circulatory system – the highest share in the EU. By contrast, the French capital region of Ile-de-France had the lowest share of deaths attributed to diseases of the circulatory system, at 16.7 %.

In 2020, cancer was the main cause of death in more than a quarter of all NUTS level 1 regions (25 out of 92). The 10 regions in the EU with the highest shares of deaths from cancer all had shares that were within a relatively narrow range (27.5–29.1 %). More than half of this group – six regions – was located in France (principally in western or central regions, but also including Corse), while the others included Åland (Finland), Ireland, the Dutch capital region of Noord-Nederland, and Denmark. Pays de la Loire in western France had the highest share of deaths from cancer, at 29.1 %. At the other end of the range, cancer accounted for a relatively low share of the total number of deaths in several regions where diseases of the circulatory system accounted for more than half of all deaths. This pattern was most apparent in the two Bulgarian regions and the Romanian region of Macroregiunea Patru, as cancer accounted for no more than 15.0 % of all deaths in these three regions.



**Map 2.3: Death rates and main causes of death, 2020**  
(by NUTS 1 regions)



Main causes of death  
(% of all deaths)

- Diseases of the circulatory system
- Cancer (malignant neoplasms)
- COVID-19
- Other causes of death
- Data not available

Standardised death rates  
(per 100 000 inhabitants)  
EU = 1 061

- ≥ 1 500
- 1 250 – < 1 500
- 1 000 – < 1 250
- 925 – < 1 000
- 850 – < 925
- < 850

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 06/2023

Note: the map shows the three main causes of death across the EU in 2020. Iceland, Serbia and Türkiye: excluding non-residents who died on the territory. Various regions (too many to document): excluding COVID-19 deaths where the virus was not identified. Türkiye: 2019. Åland (FI2): deaths from COVID-19, not available. Türkiye: deaths from COVID-19, not relevant. For Régions Ultrapériphériques Françaises (FRY) – composed of Guadeloupe, Martinique, Guyane, La Réunion and Mayotte – the pie chart is displayed within the inset for Guyane.

Source: Eurostat (online data code: hlth\_cd\_asdr2)

In 2020, COVID-19 was the main cause of death in the Spanish capital region of Comunidad de Madrid, accounting for almost 3 out of every 10 deaths (29.2 %). The only other NUTS level 1 region in the EU where COVID-19 was the main cause of death was Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest; almost a quarter (23.9%) of all deaths in the Belgian capital region were attributed to COVID-19. At the other end of the range, there were four regions in the EU where COVID-19 accounted for less than 1.0 % of all deaths in 2020. Three of these were island regions, where (at least during the initial stages of the pandemic) it may have been somewhat easier to control the spread of the virus through containment measures – Nisia Aigaiou, Kriti (Greece) and Regiões Autónomas dos Açores e da Madeira (both Portugal) – the other was the sparsely-populated, northern German region of Mecklenburg-Vorpommern.

## Focus on deaths from COVID-19

COVID-19 is a respiratory infection caused by the novel coronavirus 2 (SARS-CoV-2 virus), first identified in Wuhan, China during December 2019. During its initial stages, the spread of COVID-19 was largely concentrated around international travel hubs that played a vital role in global transmission. The impact of the COVID-19 crisis was considerable, and undoubtedly played a part in the total number of deaths in the EU rising by more than half a million between 2019 and 2020 (up 11.4 %).

It is important to note that the information presented here is derived from the causes of death data collection. These data provide a measure of the number of deaths 'from' COVID-19 (in other words, as established by medical experts and as documented on death certificates). It takes a substantial period of time to produce the causes of death data and information are only now available for reference year 2020 (the first year of the COVID-19 pandemic). Statistics on causes of death were supplemented during the pandemic by information from the [European Centre for Disease Prevention and Control \(ECDC\)](#) on the number of deaths 'with' COVID-19 (in other words, deaths among people having tested positive for the virus); this alternative dataset (from the ECDC) was principally used for the daily monitoring of COVID-19 mortality patterns.

Health inequalities were brought into stark contrast during the COVID-19 pandemic, with the number of deaths disproportionately high among elderly persons, people already suffering from pre-existing health conditions and disadvantaged groups within society. However, a wide range of factors determine regional mortality patterns, with deaths linked, among other

issues, to age structures, the balance of males/females in the population, access to healthcare services, living/working conditions, types of occupation, and the surrounding environment.

Based on the latest causes of death data, there were 439 000 deaths in the EU attributed to COVID-19 during 2020, equivalent to 8.4 % of the total number of deaths (based on standardised death rates). Map 2.4 shows the proportion of deaths attributed to COVID-19 for NUTS level 2 regions; there are no data available for Åland (Finland). The regional distribution of deaths was heavily skewed during the first year of the pandemic, with approximately one third (32.8 %) of EU regions (79 out of 241) reporting a share of deaths from COVID-19 that was equal to or above the EU average. Successive waves of the pandemic had different distributions, as the virus became more prevalent and higher death rates were recorded, particularly in eastern EU Member States.

Looking in more detail, there were 24 regions where COVID-19 accounted for at least 15.0 % of all deaths in 2020 (as shown by the darkest shade in Map 2.4), they were principally concentrated in urban regions and included:

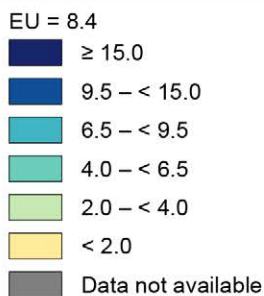
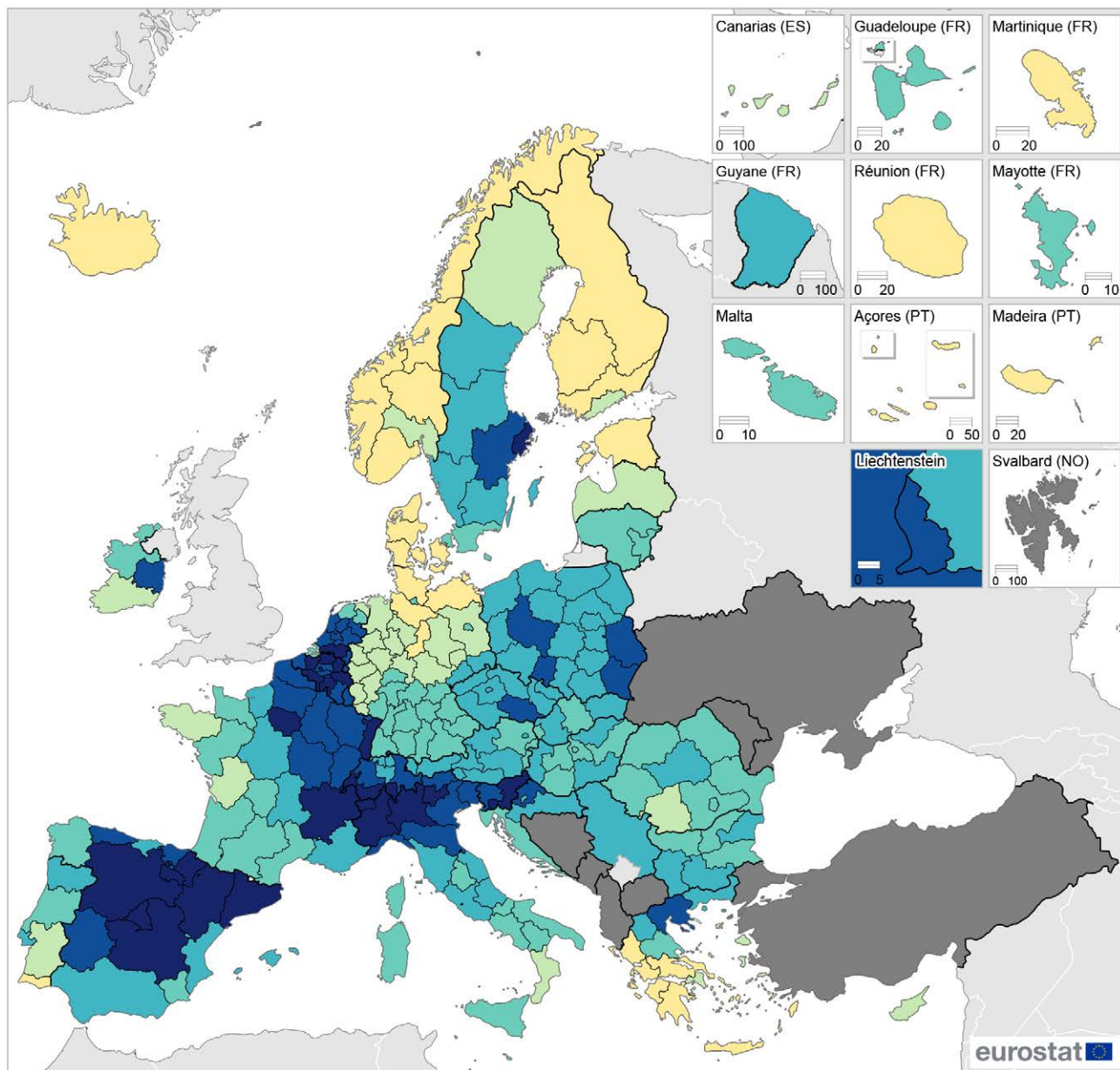
- seven regions from Belgium (one of which was the capital);
- seven regions from Spain (one of which was the capital);
- four regions from (northern) Italy;
- three regions from France (one of which was the capital); as well as
- Noord-Brabant in the Netherlands, Vzhodna Slovenija in Slovenia and Stockholm (the Swedish capital region).

There were 24 regions in the EU where COVID-19 accounted for less than 2.0 % of all deaths in 2020 (as shown by the lightest shade in Map 2.4). This group included many popular holiday destinations – where visitor numbers were drastically lower in 2020 – several of these were island regions that had particularly low case/death rates. The complete list of 24 regions included:

- seven regions from Greece;
- four out of five regions in Denmark (the exception being the capital region);
- four regions in central and northern Germany;
- three out of the four regions in Finland for which data are available (the exception being the capital region);
- three regions from Portugal;
- two of the French outermost regions; and
- Estonia.

**Map 2.4: Deaths from COVID-19, 2020**

(% of all deaths, based on standardised death rates per 100 000 inhabitants, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 04/2023

Note: Serbia, national data.

Source: Eurostat (online data code: hlth\_cd\_asdr2)

**In 2020, the Bulgarian region of Yugozapadna i Yuzhna tsentralna had the highest share of deaths from diseases of the circulatory system**

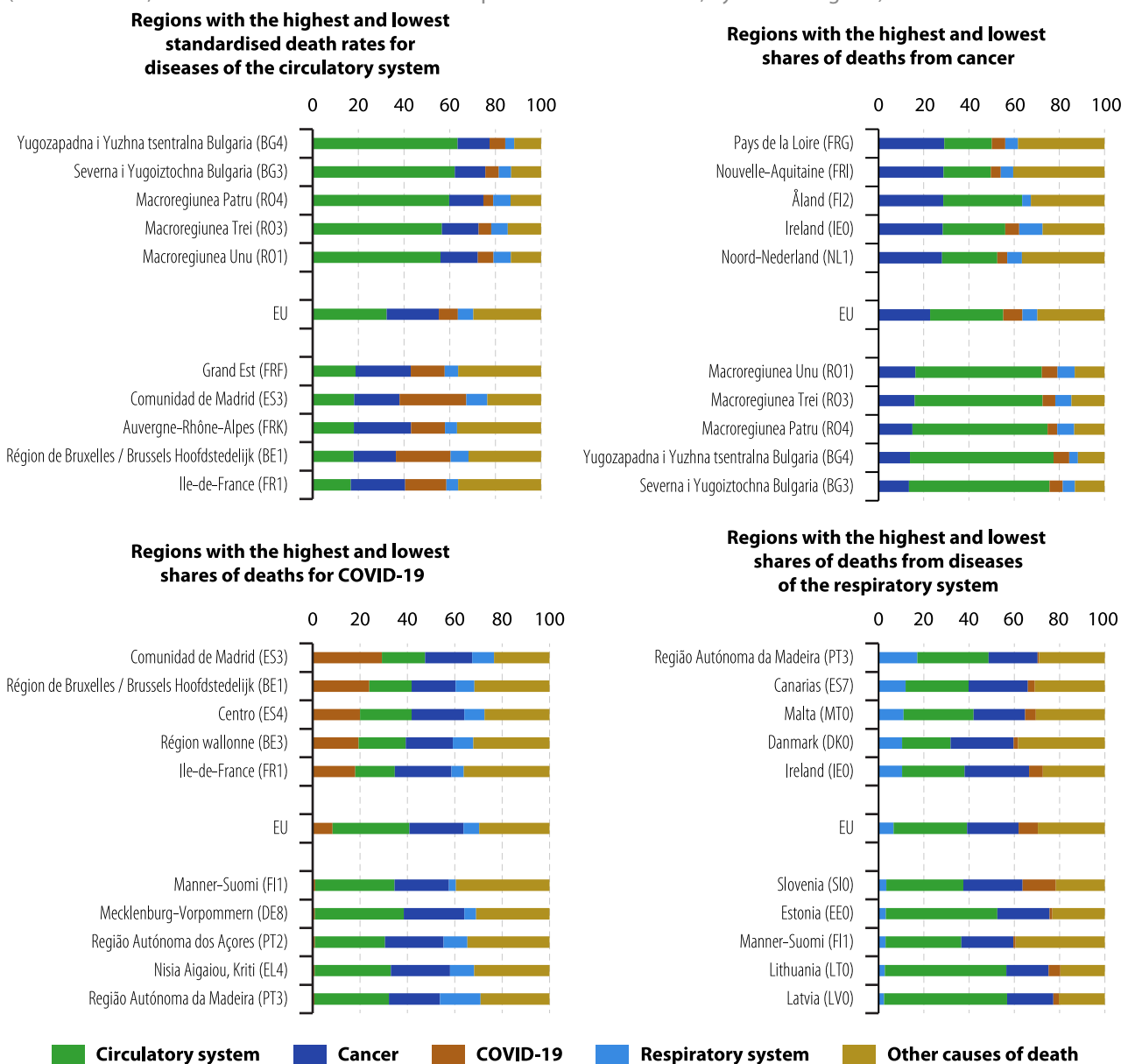
Figure 2.3 consolidates the information presented above, providing information on the four main causes of death within the EU in 2020: diseases of the circulatory system; cancer; COVID-19; diseases of the respiratory system. It shows, for each cause of death, the EU average and information for the five NUTS level 1 regions with the highest and lowest shares of total deaths (based on standardised death rates per 100 000 inhabitants). The order in which the four main causes of

death are displayed is rotated for each part of the figure to always start with the specific cause being studied.

- The Bulgarian region of Yugozapadna i Yuzhna tsentralna had the highest share of deaths from diseases of the circulatory system.
- The western French region of Pays de la Loire had the highest share of deaths from cancer.
- The Spanish capital region of Comunidad de Madrid had the highest share of deaths from COVID-19.
- The Portuguese Região Autónoma da Madeira had the highest share of deaths from diseases of the respiratory system.

**Figure 2.3: Main causes of death, 2020**

(% of all deaths, based on standardised death rates per 100 000 inhabitants, by NUTS 1 regions)



Note: the figure shows the EU regions with the highest and lowest shares of total deaths for the four principal causes of death in the EU (based on standardised death rates per 100 000 inhabitants). Various regions (too many to document): excluding COVID-19 deaths where the virus was not identified. Åland (FI2): deaths from COVID-19, not available.

Source: Eurostat (online data code: hlth\_cd\_asdr2)



### 3. Education

Alongside the provision of health care, public expenditure on education is often considered as one of the most important investments that can be made in people. Education has the potential to drive socioeconomic development forward: this is particularly the case in a globalised world, where a highly-skilled workforce can be an advantage in terms of productivity, innovation and competitiveness.

The COVID-19 crisis put considerable pressure on education and training institutions, their staff and pupils/students. It often resulted in a widespread shift to remote learning during specific lockdown periods. This change in the means of delivery of education and training underlined a range of inequalities, including a digital divide, with pupils and students from disadvantaged backgrounds and those living in rural and remote areas often facing greater obstacles when trying to study at home.

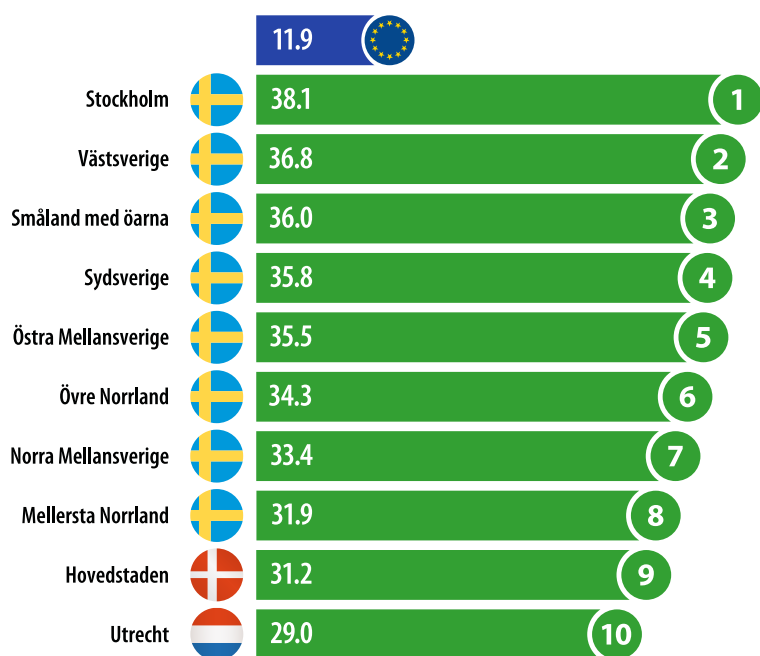
Education and training play a vital role in the economic and social strategies of the European Union (EU). In February 2021, a *Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond*

(2021–2030) (2021/C 66/01) was adopted. It builds on previous strategies and pursues five priority actions:

- improve quality, equity, inclusion and success for all in education and training;
- make **lifelong learning** and mobility a reality for all;
- enhance competences and motivation in the education profession;
- reinforce tertiary education; and
- support the green and digital transitions in and through education and training.

The resolution also sets a number of policy targets for the **European Education Area** designed to promote collaboration between EU Member States and monitor progress; several of these targets are referred to in this chapter.

The **European Year of Skills 2023** is designed to ‘promote reskilling and upskilling, helping people to get the right skills for quality jobs’. It should also provide fresh impetus to help the EU reach two of its social targets that form part of the **European Pillar of Social Rights Action Plan**: to have, by 2030, at least 60 % of adults in training every year, and at least 78 % in employment.



Which EU regions had the highest shares of people aged 25–64 participating in education and training?



(% having participated during the four weeks prior to the survey, 2022, by NUTS 2 regions)  
 Note: Ionia Nisia (EL62), 2020. Mayotte (FRY5): not available.  
 Source: Eurostat (online data code: trng\_lfse\_04)

Embedded within the European Year of Skills, the [European Vocational Skills Week](#) – to be held during the week of 23–27 October 2023 – will outline how vocational education and training is key for people of all ages to upskill and reskill for their personal development and careers.

The infographic above provides information for the 10 NUTS level 2 regions across the EU that recorded the highest shares of people (aged 25–64) participating in education and training <sup>(1)</sup>. In 2022, the highest participation rates were recorded across Sweden (all eight regions), with a peak in the capital of Stockholm. Relatively high rates were also recorded in the Danish capital region of Hovedstaden and the Dutch region of Utrecht.

<sup>(1)</sup> Note these data cover a shorter recall period (education and training during the four weeks prior to the survey) than the recall period of 12 months that is used for the targets that form part of the European Pillar of Social Rights Action Plan or the strategic framework for European cooperation in education and training.

This chapter presents data following the natural progression of pupils and students through different levels of the education system (according to the [International standard classification of education \(ISCED\)](#) – see box for more details) – before analysing transitions from education into the [labour market](#). Note that data on the participation of pupils and students in various levels of education generally refer to 2021, while the latest data on transitions into the labour market are for 2022.

Based on the latest information available for EU Member States (Czechia: 2020 data), in 2021 there were an estimated 93.6 million pupils and students enrolled across the EU in all levels of education from pre-primary to tertiary (as covered by ISCED levels 02–8).

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## International standard classification of education (ISCED)

As national education systems vary in terms of structure and curricular content, statistics on education and training are compiled according to the international standard classification of education (ISCED).

ISCED is the reference classification for organising formal education programmes and related qualifications by education levels and fields into internationally agreed categories. The most recent version of the classification – [ISCED 2011](#) – was adopted by the UNESCO General Conference in November 2011 and identifies the following levels of education:

- early childhood education – ISCED level 0;
- primary education – ISCED level 1;
- lower secondary education – ISCED level 2;
- upper secondary education – ISCED level 3;
- post-secondary non-tertiary education – ISCED level 4;
- short-cycle tertiary education – ISCED level 5;
- bachelor's or equivalent level – ISCED level 6;
- master's or equivalent level – ISCED level 7;
- doctoral or equivalent level – ISCED level 8.

The term 'tertiary education' refers to ISCED levels 5–8.

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## Early childhood education

Research has shown that early experiences of children are often critical for their long-term development. Early childhood education and care programmes which are intentionally designed to support children's cognitive, language, physical and socio-emotional development are considered as educational in the ISCED classification (ISCED level 0, early childhood education) <sup>(?)</sup>. Early childhood education programmes – typically designed to introduce young children to organised instruction outside of the family context; programmes have an intentional education component and target children below the age of entry into ISCED level 1 (primary education) – constitute the first level of education in education and training systems and play a key role in redressing 'unequal' life chances, tackling inequalities through preventing the formation of early skills gaps.

Within the strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030), one of the seven key policy targets concerns the share of children aged between 3 years and the starting age of compulsory primary education participating in early childhood education and care. Eurostat data on early childhood education (ISCED level 0) are used to measure progress towards the goal that, by 2030, at least 96 % of children in this age group are participating in early childhood education and care <sup>(?)</sup>.

### ***In 2021, there were 26 regions across the EU where every child between the age of 3 years and the age for starting compulsory primary education participated in early childhood education***

Based on the latest available information for EU Member States, there were an estimated 15.5 million children enrolled in early childhood education across the EU in 2021 (Czechia, Greece and Malta: 2020 data; Belgium: only pre-primary education); young boys accounted for a 51.5 % share of pupils at this level.

Map 3.1 shows a more detailed analysis for 199 NUTS level 2 regions; note that statistics presented for Germany relate to NUTS level 1 regions, while national data are presented for the Netherlands. There were considerable differences in regional participation rates, with the highest rates generally recorded in the westernmost regions and lower rates across most eastern regions.

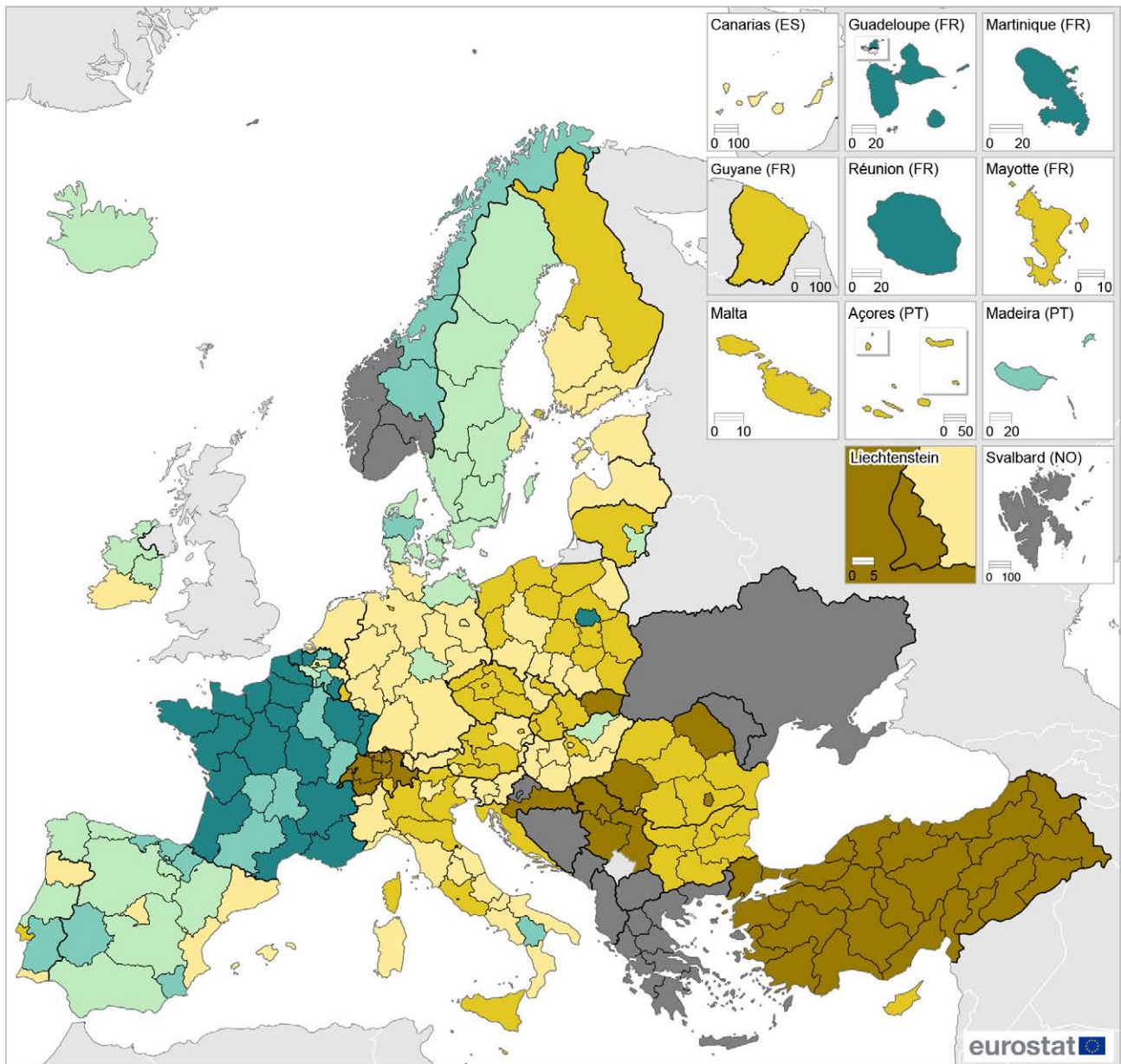
Looking in more detail: in 2021, the share of children between the age of 3 years and the age for starting compulsory primary education participating in early childhood education had already reached the strategic target of 96.0 % in approximately one third (69 out of 199) of the EU regions for which data are available; they are shaded using three different teal tones in Map 3.1. These regions with the highest rates – where (practically) all children in this age group participated in early childhood education – were principally located across Belgium, Denmark, Ireland, Spain, France and Sweden. There were also three regions in Portugal, two regions in Germany (NUTS level 1), the capital regions of Lithuania and Poland, as well as single regions in Italy and Hungary where the policy target of 96.0 % had already been achieved. At the very top end of the distribution, there were 26 regions in the EU where every child between the age of 3 years and the age for starting compulsory primary education participated in early childhood education (as shown by the darkest shade of teal).

In Map 3.1, the regions with participation rates below the strategic target may be identified as they are shaded using three different golden tones. In 2021, the share of young children participating in early childhood education was less than 75.0 % in 5 out of 199 EU regions for which data are available. These regions with relatively low participation rates (shown by the darkest shade of gold) were located in Panonska Hrvatska (Croatia) and Východné Slovensko (Slovakia), as well as three regions in Romania – București-Ilfov, Nord-Est and Vest. The lowest share was recorded in Panonska Hrvatska (61.9 %).

<sup>(?)</sup> At this age, learning activities will be very different to the traditional methods adopted within the context of compulsory schooling, and will take place alongside/as part of caring activities (in other words, supervision, nutrition and health) most of the time. Programmes providing childcare only (in other words, supervision, nutrition and health) without a sufficient set of purposeful learning activities cannot be considered as educational according to ISCED and are not classified as early childhood education.

<sup>(?)</sup> It should be noted that the wording of the EU target is for participation in 'early childhood education and care' and not 'early childhood education'. Early childhood education and care refers to any regulated arrangement for children from birth to compulsory primary school age, regardless of the programme content, whereas early childhood education refers specifically to ISCED programmes. The former encompasses not only early childhood education but also programmes which do not meet the minimum requirements to be classified as such (for example, childcare only programmes). Although the EU target is for participation in early childhood education and care, the Regulation stipulates that Eurostat's data on participation rates in early childhood education will be used to measure progress towards this target. This means that, in practice, the EU target for participation in early childhood education and care programmes concerns only those programmes which meet criteria to be classified as early childhood education. For more details on the difference between these two terms, please consult an article on Early childhood education statistics at this link: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Early\\_childhood\\_education\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Early_childhood_education_statistics).

**Map 3.1:** Participation rates in early childhood education, 2021  
(%, by NUTS 2 regions)



- EU = 92.9
- = 100.0
- 97.5 – < 100.0
- 96.0 – < 97.5
- 90.0 – < 96.0
- 75.0 – < 90.0
- < 75.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: pupils participating in early childhood education from age 3 years to the starting age of compulsory education at primary level, as a share of the population of the corresponding age. The EU has a policy target in this area, namely to reach a share of at least 96 % by 2030 (regions already having attained this target are shaded in teal). Germany: NUTS level 1. The Netherlands: national data. EU, Czechia and Iceland: 2020.

Source: Eurostat (online data code: [educ\\_uoe\\_enra22](#))



## Upper secondary education

School attendance in the EU Member States is compulsory at least for primary and lower secondary education. Young people who have successfully completed lower secondary education may enter upper secondary education (ISCED level 3), when they may have to make choices concerning subjects or specialisations to study, as well as their future education and/or career paths. Upper secondary education in the EU typically ends when students are aged 17 or 18. These programmes are designed primarily to prepare students so that they may continue their studies at a tertiary level (general programmes), or to provide them with the necessary skills and competencies that are relevant for a specific occupation or trade (vocational programmes).

### ***Just under half of all upper secondary students in the EU were enrolled in vocational programmes***

Based on the latest available information for EU Member States, there were an estimated 18.0 million students enrolled in upper secondary education programmes across the EU in 2021 (Czechia: 2020 data). Just under half of these (48.7 %) were enrolled in vocational education programmes that tend to be more technical or practical in nature; the remainder followed general education programmes that tend to be more academic.

Map 3.2 reflects the organisation of educational systems at a national level and the relative position of vocational education and general education programmes. Among the 218 NUTS level 2 regions for which data are available (note that statistics presented for Germany relate to NUTS level 1 regions), the split was fairly even between the number with a majority enrolled in vocational education programmes and the number with a majority enrolled in general education programmes. There were 102 regions across the EU where a majority of upper secondary students followed vocational education programmes. Some of these differences between regions can be attributed to the availability of and perceptions concerning general and/or vocational education.

In 2021, there were 25 regions across the EU where the share of upper secondary students following vocational education programmes was at least 70.0 % (as shown by the darkest shade of blue in Map 3.2). These regions were concentrated in:

- Czechia (2020 data) – every region except for the capital region of Praha;
- the Netherlands – seven out of 12 regions;
- Austria – six out of nine regions.

This group also included both of the regions in Croatia for which data are available – Panonska Hrvatska and Jadranska Hrvatska – as well as Zápádne Slovensko (Slovakia), Vzhodna Slovenija (Slovenia) and Provincia Autonoma di Bolzano/Bozen (Italy). At the top of the ranking, there were three regions in the EU where more than three quarters of all upper secondary students were enrolled in vocational education programmes: Panonska Hrvatska in Croatia (75.5 %), Oberösterreich in Austria (76.0 %) and Severozápad in Czechia (77.0 %; 2020 data).

At the other end of the range, there were 23 regions across the EU where the share of upper secondary students enrolled in vocational education programmes was less than 35.0 % in 2021 (they are shown with a yellow shade in Map 3.2). Nine of this group were capital regions, characterised by a relatively high concentration of general and academic establishments: Hovedstaden (Denmark), Berlin (Germany), Eastern and Midland (Ireland), Attiki (Greece), Comunidad de Madrid (Spain), Ile-de-France (France), Sostinės regionas (Lithuania), Warszawski stołeczny (Poland) and Stockholm (Sweden).

### ***Male upper secondary students were more likely (than female students) to enrol in vocational education programmes that tend to be more technical/practical than academic***

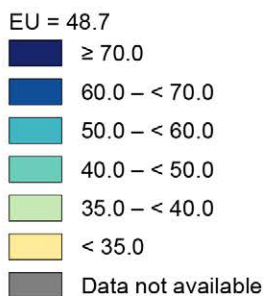
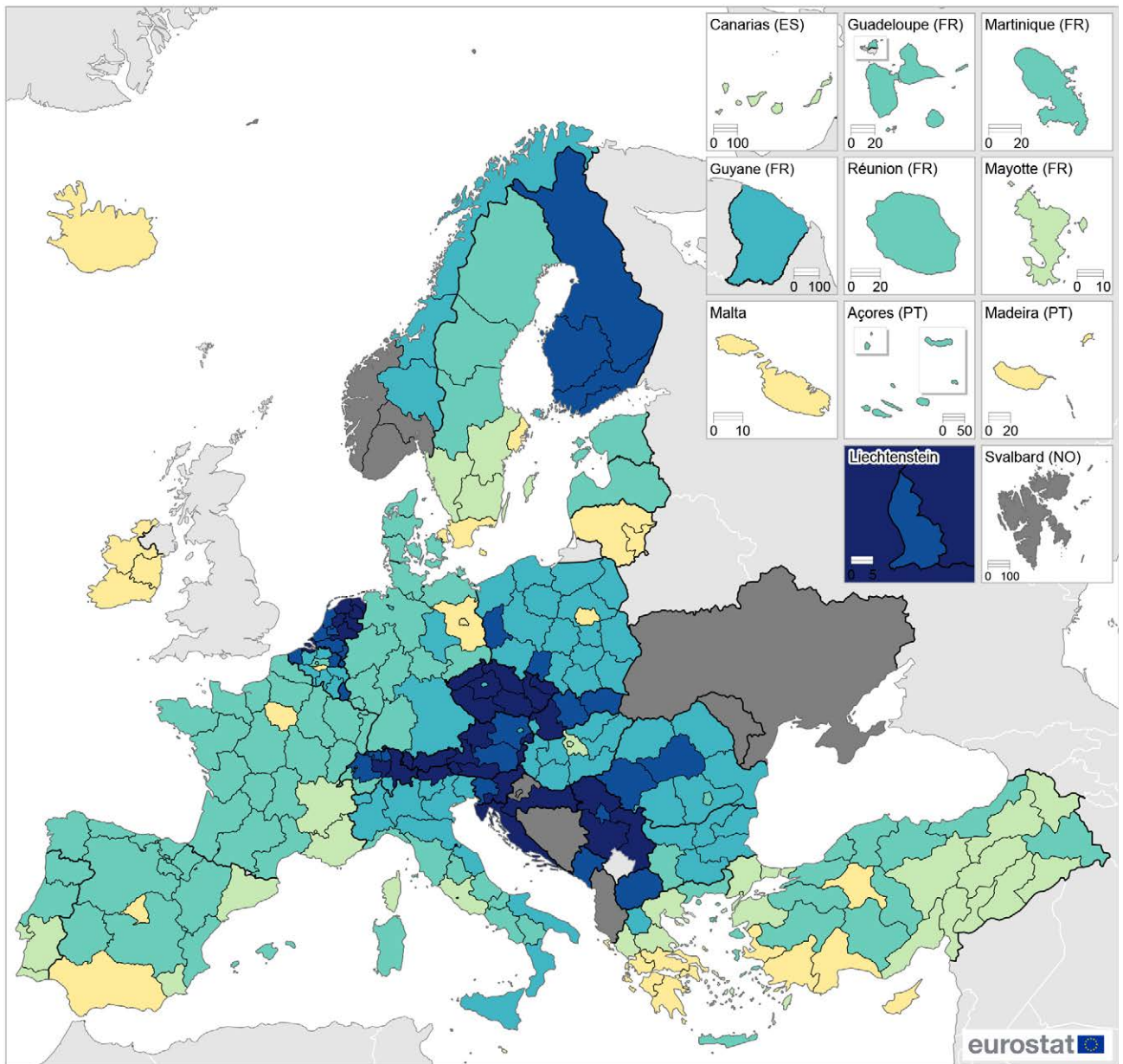
Based on the latest available information for 2021 (Czechia: 2020 data), there were an estimated 9.2 million male upper secondary students across the EU, a majority of whom (55.6 %) were enrolled in vocational education programmes. By contrast, there were an estimated 8.8 million female upper secondary students, with a considerably lower share (41.6 %) enrolled in vocational education programmes. As such, a greater proportion of female students in upper secondary education were enrolled in more academic studies, following general education programmes.

The first part of Figure 3.1 (left-hand side) highlights those regions with the highest and lowest shares of upper secondary students following vocational education programmes; note the ranking is based on overall shares for the whole population (males and females combined).

Looking in more detail at the results for 2021, more than four out of every five male upper secondary students followed a vocational education programme in:

- Provincia Autonoma di Bolzano/Bozen in Italy (82.3 %);
- Vzhodna Slovenija in Slovenia (82.0 %);
- Severozápad (81.6 %), Moravskoslezsko (80.5 %) and Jihozápad (80.3 %) in Czechia (2020 data);
- Oberösterreich in Austria (81.3 %).

**Map 3.2: Students enrolled in upper secondary education – vocational, 2021**  
 (% of all students in upper secondary education, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 04/2023

Note: Germany: NUTS level 1. Czechia and Iceland: 2020. EU estimate (includes 2020 data for Czechia).

Source: Eurostat (online data code: educ\_uoe\_enrs06)

There were six regions across the EU where, in 2021, more than 7 out of 10 female upper secondary students followed a vocational education programme:

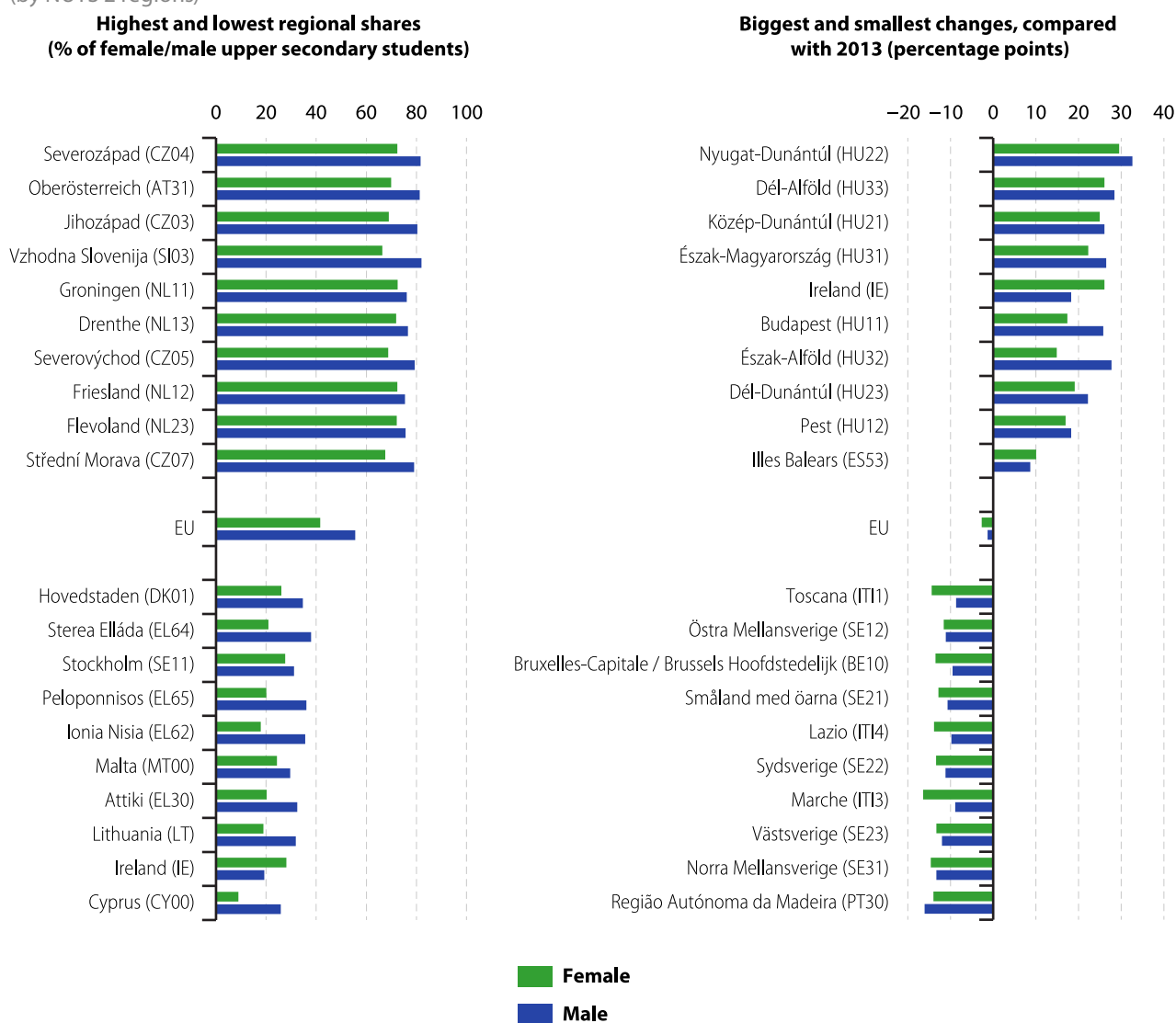
- five of these six regions were located in the Netherlands – Groningen (72.5 %), Friesland (72.3 %), Flevoland (72.1 %), Drenthe (71.9 %) and Overijssel (71.6 %);
- the other was in Czechia – Severozápad (72.3 %; 2020 data).

The second part of Figure 3.1 (right-hand side) highlights those regions with the biggest and smallest changes in their shares of upper secondary students following vocational education programmes

between 2013 and 2021; note the ranking is based on overall changes for the whole population (males and females combined) and that the period under consideration is the longest time series for which EU data are available.

The share of upper secondary students in the EU who were enrolled in vocational education programmes fell by 2.1 percentage points from 50.8 % in 2013 (including 2014 data for Croatia) to 48.7 % in 2021 (including 2020 data for Czechia). During this period, the proportion of upper secondary students following vocational education programmes fell in 129 out of 213 NUTS level 2 regions. Some of the largest reductions in

**Figure 3.1: Upper secondary students who are enrolled in vocational courses, by sex, 2021**  
(by NUTS 2 regions)



Note: the first part of the figure shows the EU regions with the highest and lowest shares in 2021 (ranked on the total for both sexes), while the second part shows the regions with the biggest and smallest changes compared with 2013. Germany: NUTS level 1. Ireland, Croatia and Lithuania: national data. Czechia: 2020 instead of 2021. Croatia: 2014 instead of 2013. EU: estimate for 2021 (includes 2020 data for Czechia). EU: estimate for 2013 (includes 2014 data for Croatia). Mayotte (FRY5): only partial information.  
Source: Eurostat (online data code: educ\_uoe\_enrs06)

the relative importance of vocational education were recorded across Italy, Portugal and Sweden. This was particularly noticeable in Sydsverige, Västsverige and Norra Mellansverige in Sweden, as well as Marche in Italy, and Região Autónoma da Madeira in Portugal; the share of students enrolled in upper secondary vocational education programmes fell by more than 12.0 percentage points in all five of these regions.

Among the 84 NUTS level 2 regions where the proportion of upper secondary students enrolled in vocational education programmes rose between 2013 and 2021, there were nine that reported double-digit increases. The highest increases were concentrated in Hungary (all eight regions) and Ireland (only national data available for a comparison over time), peaking – for both males and females – in the westernmost Hungarian region of Nyugat-Dunántúl. Its share of female upper secondary students enrolled in vocational education programmes increased by 32.6 percentage points during the period under consideration, while the corresponding increase for male students was 29.5 percentage points.

## Tertiary education

Tertiary education (ISCED levels 5–8) builds on secondary education, providing learning activities at a higher level of complexity. This level of education – provided by universities and other tertiary educational institutions – can play an important role in society, fostering innovation, increasing economic development and growth, and more generally improving individual well-being.

The number of people enrolling in tertiary education across the EU has risen in recent decades, reflecting a number of factors, such as: demographic patterns; changes in labour force participation (particularly for women); increased demand from employers for tertiary education qualifications for jobs that previously required a secondary level of education; an increased awareness of the benefits of tertiary education; access to student finance, scholarships and other benefits; different patterns of learning mobility (within and from outside of the EU); an increased demand for longer tertiary education, such as the extension from a bachelor's degree to master's or doctoral (PhD) studies; an increasing share of adults participating in lifelong learning.

There were an estimated 18.5 million students enrolled in the EU's tertiary education institutions in 2021 (this figure includes 2020 data for Czechia). As such, tertiary students accounted for almost one in five (19.9 %) of the total number of pupils and students enrolled within the EU's education system. A majority of the students enrolled in the tertiary education sector were female (54.2 % of the total).

In 2021, there were 11.0 million EU students enrolled in bachelor's programmes. This figure was slightly more than twice as high as the count of students enrolled in master's programmes (5.4 million). The other two types of tertiary programmes had fewer students: 1.4 million were enrolled in short-cycle programmes (either academic or vocational) and 0.7 million in doctoral programmes. As noted above, women accounted for a majority of the students enrolled within tertiary education: this gender gap was particularly apparent among students studying for a master's degree (57.5 % were women) and somewhat smaller among those studying for a bachelor's degree (53.7 % were women). By contrast, men accounted for a small majority of the students studying for a doctoral degree (51.2 %) and for a short-cycle tertiary education qualification (51.6 %).

Unsurprisingly, the highest numbers of tertiary students were recorded in some of the EU's principal urban centres that have large populations. In 2021, there were five NUTS level 1 regions with more than half a million tertiary students enrolled: Nordrhein-Westfalen in Germany had the highest count at 833 900, followed by Ile-de-France (the French capital region), Este in Spain, Centro and Nord-Ovest (both in Italy).

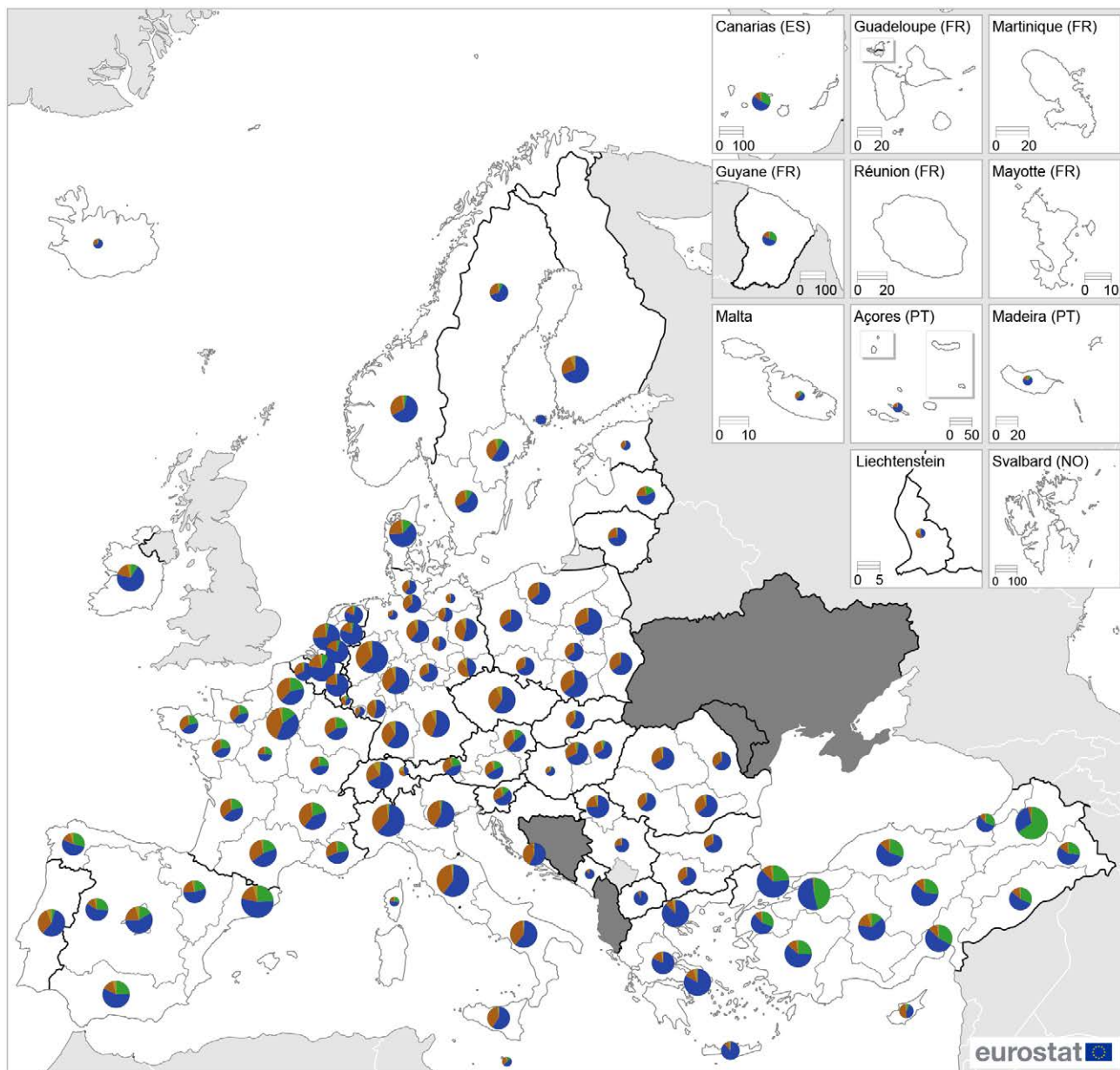
A more detailed analysis reveals that Nordrhein-Westfalen (521 500), the Spanish region of Este (368 300) and the Dutch region of West-Nederland (344 500) had the highest numbers of tertiary students studying for a bachelor's degree in 2021. The highest numbers of students studying for a master's degree were observed in Ile-de-France (306 600), Nordrhein-Westfalen (274 000) and the Italian region of Centro (207 600), while the biggest numbers of students studying for a doctoral degree were recorded in Nordrhein-Westfalen (38 300), Baden-Württemberg (Germany; 31 600) and Este (Spain; 30 000).

Map 3.3 shows the proportion of tertiary students who were enrolled to study for a short-cycle, bachelor's, master's or doctoral degree. Note that each national education system has its own specific characteristics, with an education offer that is focused on particular fields or levels of education. This may explain, why there were 27 NUTS level 1 regions where there were no students enrolled to study for a short-cycle tertiary education qualification, as this educational level was not applicable in 15 regions, while the data for this level was combined with data for another educational level in 12 regions. In a similar vein, there were no students enrolled to study for a master's or doctoral (PhD) degree in Åland (a small island region of Finland).

In 2021, almost one third of the tertiary students in Canarias (Spain) and Régions Ultrapériphériques Françaises (France) were studying for a short-cycle tertiary education qualification. Leaving aside the atypical case of Åland – where every tertiary student was studying for a bachelor's degree – the highest shares of bachelor's students were recorded in the



**Map 3.3: Students enrolled in tertiary education, 2021**  
(by NUTS 1 regions)



Students by type of tertiary education  
(% of all tertiary students)

- Short-cycle
- Bachelor's
- Master's
- Doctoral (PhD)
- Data not available

Number of tertiary students  
(1 000)

EU = 18 579

- ≥ 500
- 250 – < 500
- 150 – < 250
- 75 – < 150
- 50 – < 75
- < 50

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 06/2023

Note: Ireland, private government independent institutions are only partially covered. Czechia and Iceland: 2020.

EU: estimate for 2021 (includes 2020 data for Czechia).

Source: Eurostat (online data code: educ\_uoe\_enrt06)

Greek regions of Nisia Aigaiou, Kriti and Voreia Elláda, with close to 9 out of 10 tertiary students studying for a bachelor's degree. Cyprus (a single region at NUTS level 1) was the only region in the EU to report a higher number of tertiary students studying for a master's rather than a bachelor's degree. Almost half (46.4 %) of all tertiary students in Cyprus was enrolled on a master's degree course; the next highest shares were recorded in the German regions of Sachsen (43.8 %) and Mecklenburg-Vorpommern (43.1 %). Luxembourg (a single region at NUTS level 1) was the only region in the EU to record a double-digit share of doctoral students. Some 12.2 % of all tertiary students in Luxembourg was enrolled on a doctoral degree course; the next highest shares were recorded in the German regions of Sachsen (9.9 %) and Baden-Württemberg (7.8 %).

## Educational attainment

Educational attainment is measured by looking at the highest level of education (based on the ISCED classification) that an individual has successfully completed. A basic level of education is desirable for all, as it provides the opportunity to participate in economic and social life. Nevertheless, people with higher levels of educational attainment generally tend to experience a wider range of job opportunities, higher levels of income and tend to be more satisfied with life, while they usually have a lower likelihood of being unemployed.

### **People with at least an upper secondary level of educational attainment**

The strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030) includes a complementary indicator for measuring progress in relation to educational attainment, adding to the indicator on early leavers (see below). It is defined as the share of people aged 20–24 with at least an upper secondary (or intermediate) level of educational attainment and the EU aims to increase the share of young people meeting this criterion to at least 90 %.

The last couple of decades have seen a gradual expansion in the number of students graduating across the EU in intermediate (at most upper secondary or non-tertiary post-secondary) and higher (tertiary)

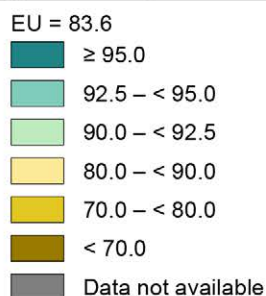
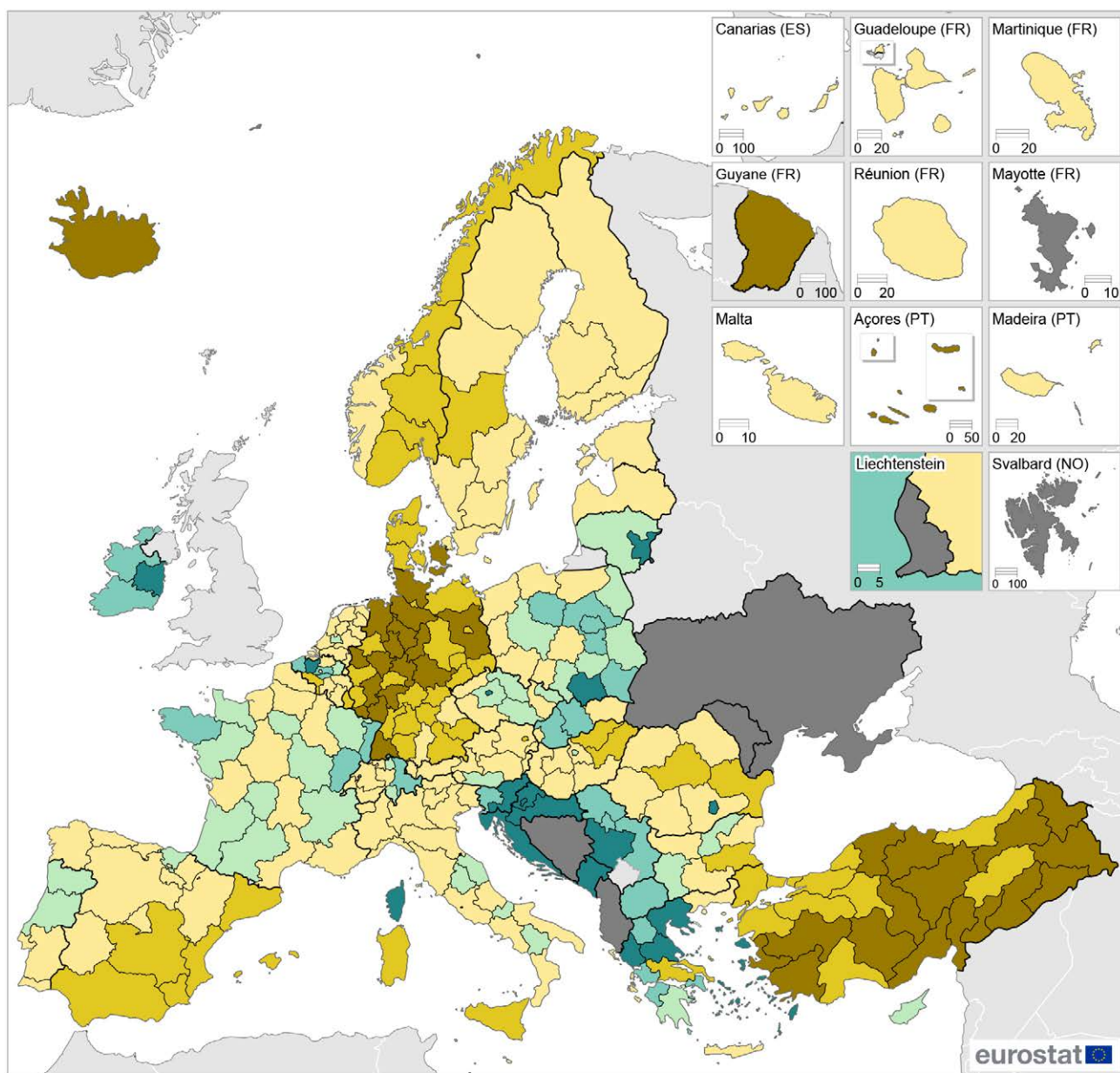
levels of education. The share of the EU population aged 20–24 with at least an intermediate level of educational attainment increased between 2002 and 2021 from 76.8 % to 84.4 %. During this period, the share rose almost continuously, the only exception being 2009 (when there was no change). However, this pattern ended in 2022, as the latest information available shows the share of people aged 20–24 with at least an intermediate level of educational attainment falling 0.8 percentage points to 83.6 %, a development that was mainly driven by a decrease in the data reported by Germany.

Map 3.4 presents information for the share of young people (aged 20–24) with at least an intermediate level of education. Those regions that had already reached the goal of 90.0 % are shaded using three different teal tones. Among the 240 NUTS level 2 regions for which data are available (no data for Mayotte in France or Åland in Finland), there were 17 regions where this measure of educational attainment was at least 95.0 % in 2022 (as shown by the darkest shade of teal). This group of regions with very high shares of young people having attained at least an intermediate level of education were concentrated in Croatia (all four regions) and Greece (5 out of 13 regions). The remaining regions with very high shares included the capital regions of Czechia, Ireland, Lithuania and Romania, as well as single regions in each of Belgium, France, Poland and Slovenia. The highest shares of young people aged 20–24 having attained at least an intermediate level of educational attainment were recorded in:

- two Greek regions – the island region of Voreio Aigaio (99.2 %) and the central region of Thessalia (99.0 %);
- two Croatian regions – the coastal region of Jadranska Hrvatska (98.4 %) and the capital region of Grad Zagreb (98.1 %).

At the other end of the range, there were 21 regions across the EU where less than 70.0 % of all young people aged 20–24 had attained at least an intermediate level of educational attainment in 2022 (as shown by the darkest shade of gold in Map 3.4). These regions were primarily located in Germany (17 regions), with the northern region of Bremen recording the lowest share in the EU, at 58.2 %. There were also relatively low levels of intermediate educational attainment in Sjælland (Denmark), Guyane (France), Ciudad de Ceuta (Spain) and Região Autónoma dos Açores (Portugal).

**Map 3.4:** People with at least an upper secondary education qualification, 2022  
 (% of people aged 20–24, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: the EU has a goal in this area, namely to reach a share of at least 90% (regions already having attained this goal are shaded in teal). Montenegro, North Macedonia and Türkiye: 2020.

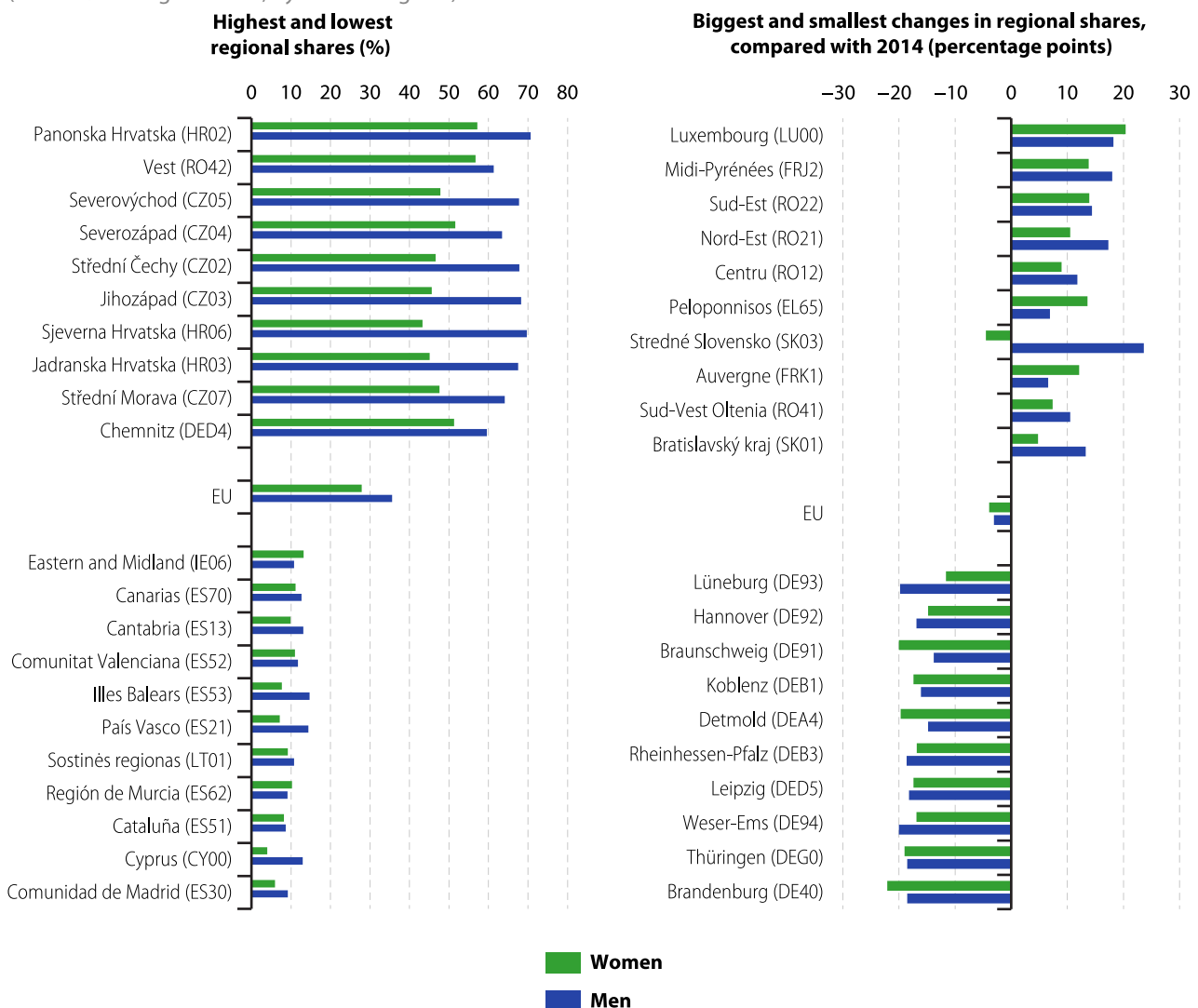
Source: Eurostat (online data code: edat\_lfse\_04)

Note that statistics on educational attainment pertain to the highest level of attainment reached at the moment of the survey interview and that some people in the target age range might still be studying. Equally, people may leave the region where they completed a particular level of education in order to find work or continue their studies, moving to regions offering a wider range of labour market and educational opportunities. Bearing this in mind, Figure 3.2 and Map 3.5 use a different age range to that presented above in Map 3.4; they are based on an analysis of attainment levels for people aged 25–34 (by when the vast majority of the population have completed their education).

**More than one third of young men in the EU had a vocational upper secondary or post-secondary non-tertiary education qualification**

In 2022, more than two fifths (43.4 %) of the EU population aged 25–34 reported that their highest level of educational attainment was an upper secondary or post-secondary non-tertiary level of education. Most of these had followed a vocational education programme (31.8 % of the EU population aged 25–34) providing technical or practical skills, rather than a general education programme (11.5 %) that tends to be more academic in nature and is often used as a stepping stone to higher education.

**Figure 3.2: People with a vocational upper secondary or post-secondary non-tertiary education qualification, 2022 (women/men aged 25–34, by NUTS 2 regions)**



Note: the first part of the figure shows the EU regions with the highest and lowest shares in 2022 (ranked on the total for both sexes), while the second part shows the regions with the biggest and smallest changes compared with 2014. The rankings include more than 10 regions if several regions have identical values. Trier (DEB2), Northern and Western (IE04), Voreio Aigaio (EL41), Ciudad de Ceuta (ES63), Ciudad de Melilla (ES64), Corse (FRM0), Mayotte (FRY5), Valle d'Aosta/Vallée d'Aoste (ITC2), Algarve (PT15), Região Autónoma dos Açores (PT20), Região Autónoma da Madeira (PT30) and Åland (FI20): not available or only partially available. Croatia (other than Jadranska Hrvatska (HR03)): not available for 2014-2022. All EU Member States and Serbia: break in series.

Source: Eurostat (online data code: edat\_lfse\_04)



Across the EU, more than one third (35.6 %) of men aged 25–34 reported their highest level of attainment was a vocational upper secondary or post-secondary non-tertiary education qualification; this was 7.7 percentage points higher than the corresponding share for women of the same age. The first part of Figure 3.2 (left-hand side) highlights those regions with the highest and lowest shares of people aged 25–34 having attained (at most) a vocational upper secondary or post-secondary non-tertiary education qualification; note the ranking is based on overall shares for men and women combined. Panonska Hrvatska in Croatia was the only NUTS level 2 region in the EU where, in 2022, more than 6 out of 10 people aged 25–34 reported their highest level of attainment was a vocational upper secondary or post-secondary non-tertiary education qualification. An analysis by sex reveals:

- there were two regions – Stredné Slovensko in Slovakia and Panonska Hrvatska – where more than 70.0 % of men aged 25–34 reported their highest level of educational attainment was a vocational upper secondary or post-secondary non-tertiary education qualification;
- there were three regions – Panonska Hrvatska in Croatia, Vest in Romania and Mecklenburg-Vorpommern in Germany – where more than 55.0 % of women aged 25–34 reported their highest level of educational attainment was a vocational upper secondary education or post-secondary non-tertiary qualification.

The second part of Figure 3.2 (right-hand side) highlights those regions with the biggest and smallest changes between 2014 and 2022 in their shares of people aged 25–34 with a vocational upper secondary or post-secondary non-tertiary education qualification; note the ranking is based on overall changes for men and women combined.

Across the EU, the share of people aged 25–34 having attained (at most) a vocational upper secondary or post-secondary non-tertiary education qualification fell by 3.5 percentage points from 35.3 % in 2014 to 31.8 % in 2022. During the period under consideration, almost two thirds of NUTS level 2 regions for which data are available (151 out of 236 regions) reported a fall in the proportion of people aged 25–34 having attained (at most) a vocational upper secondary or post-secondary non-tertiary education qualification. The largest decreases were recorded across Germany: Brandenburg (that surrounds the capital region of Berlin) registered the largest decrease, down 20.2 percentage points, while there were 13 more German regions with falls within the range of 15.3–18.7 percentage points. The largest decrease outside of Germany was reported in the Czech capital region of Praha, where the share of people aged 25–34 having attained (at most) a vocational upper secondary education qualification fell by 14.8 percentage points.

Among the 82 NUTS level 2 regions where the share of people aged 25–34 having attained (at most) a vocational upper secondary or post-secondary non-tertiary education qualification rose between 2014 and 2022, the highest increase was recorded in Luxembourg, up 19.3 percentage points. There were seven other regions which recorded double-digit increases: three of these were located in Romania, two in Greece, as well as single regions from each of France and Slovakia.

## People with a tertiary level of educational attainment

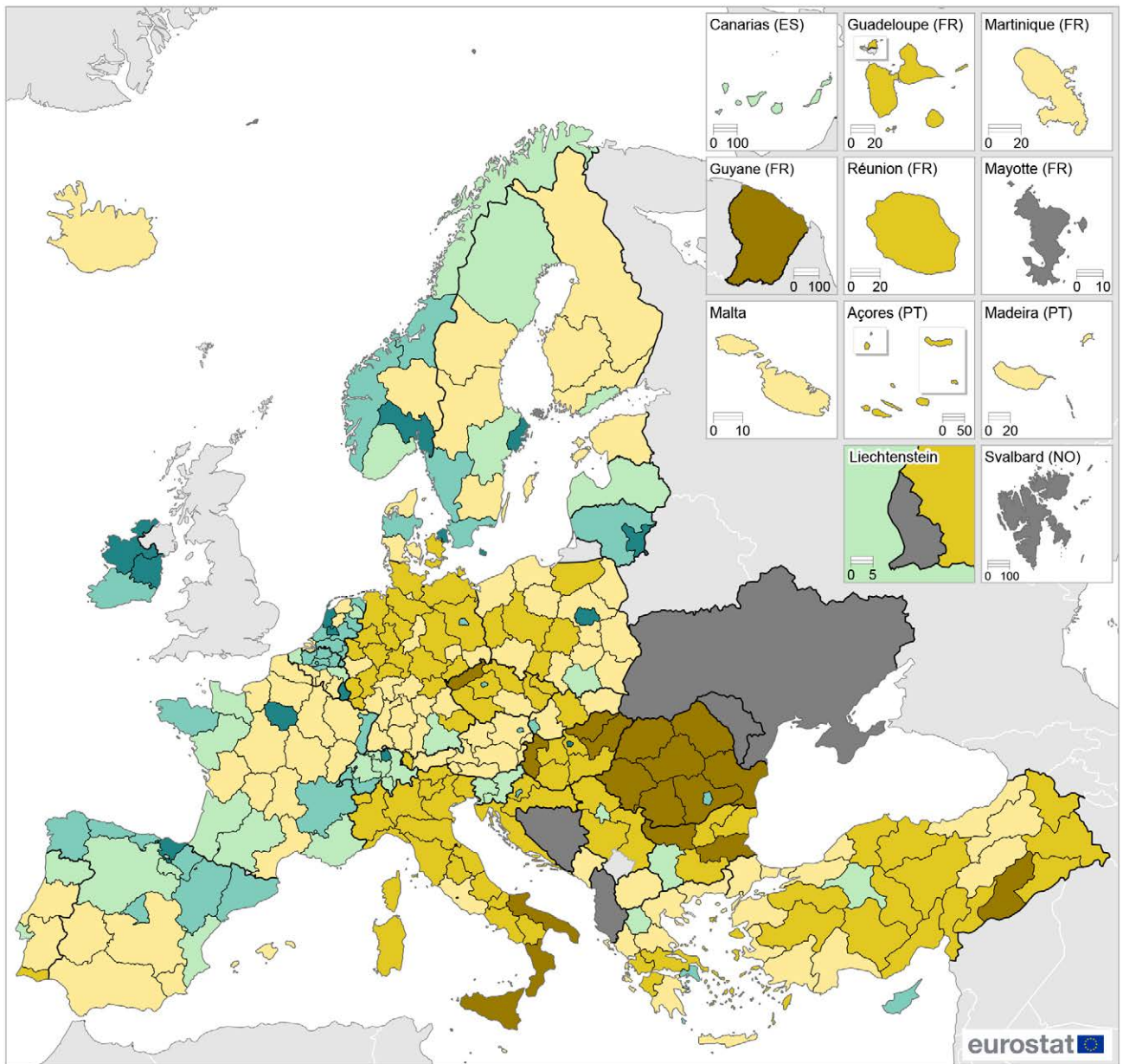
One of the seven EU policy targets within the strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030) concerns tertiary educational attainment. The EU seeks to ensure that, by 2030, the share of people aged 25–34 with a tertiary educational attainment should be at least 45.0 %.

### ***Approximately one quarter of all EU regions have reached the policy goal for tertiary educational attainment***

In 2022, more than two fifths (42.0 %) of the EU population aged 25–34 had a tertiary level of educational attainment; note that some people within this age group might still be studying. Of the 240 NUTS level 2 regions for which data are available (no data for Mayotte in France or Åland in Finland), there were 72 regions (equivalent to 30 % of all EU regions) where this share had already reached or surpassed the policy target of 45.0 % (as shown by three shades of teal in Map 3.5). At the top end of the distribution, there were 12 regions where at least 60.0 % of young people aged 25–34 had a tertiary level of educational attainment. Many of these regions appear to act as a magnet for highly-qualified people, exerting considerable ‘pull effects’ through the varied educational, employment and social/lifestyle opportunities that they offer. They included the capital regions of Lithuania, France, Ireland, the Netherlands, Poland, Hungary, Sweden, Luxembourg and Denmark. Relatively high shares of tertiary educational attainment were also recorded in two regions specialised in research and innovation activities and/or high-technology manufacturing: Utrecht in the Netherlands and País Vasco in northern Spain; Northern and Western in Ireland was the only other region in the EU to record a share above 60.0 %.

At the bottom end of the distribution, there were 17 NUTS level 2 regions in the EU where less than a quarter of all people aged 25–34 had a tertiary level of educational attainment in 2022 (as shown by the darkest shade of gold). They were concentrated in

**Map 3.5: Tertiary educational attainment, 2022**  
 (% of people aged 25–34, by NUTS 2 regions)



- EU = 42.0
- ≥ 60.0
- 50.0 – < 60.0
- 45.0 – < 50.0
- 35.0 – < 45.0
- 25.0 – < 35.0
- < 25.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: the EU has a policy target in this area, namely to reach a share of at least 45 % by 2030 (regions already having attained this target are shaded in teal). Montenegro, North Macedonia and Türkiye: 2020.

Source: Eurostat (online data code: edat\_lfse\_04)

eastern EU Member States – seven out of the eight regions in Romania (the exception being the capital region of Bucureşti-Illfov), three regions in Hungary, two regions in Bulgaria and a single region in Czechia – but also included three regions in the south of Italy and the outermost region of Guyane (France). Many of these regions were characterised as rural/isolated regions that had a relatively large agricultural sector, with a low level of highly-skilled employment opportunities. Others were characterised by their relatively high specialisation in vocational educational programmes, with students moving into the labour market through apprenticeships and training schemes rather than as a result of obtaining academic qualifications. The lowest regional levels of tertiary educational attainment among people aged 25–34 were recorded in the Hungarian region of Észak-Magyarország (18.2 %), the Czech region of Severozápad (18.0 %) and the Romanian regions of Sud-Est (17.0 %) and Sud-Muntenia (16.0 %).

## Transition from education to work

The final section in this chapter provides information on the situation of young people as they aim to transition from education into work. When students complete their studies there may be a number of barriers that restrict their progression into the labour market, for example: a lack of relevant work experience; a lack of skills; a lack of job opportunities in the region where they reside; or high levels of unemployment during an economic downturn.

### EARLY LEAVERS FROM EDUCATION AND TRAINING

Within the EU, education policy seeks to ensure that all people in the EU (irrespective of age) have the skills, knowledge and capabilities to develop their careers. The transition from education into work may prove particularly difficult for people with low levels of literacy and numeracy, those who leave education at an early age, and people coming from disadvantaged backgrounds. One particular area of concern is the proportion of [early leavers from education and training](#). These are individuals aged 18–24 who have at most a lower secondary level of educational attainment (ISCED levels 0–2) and who were not engaged in any further education and training (during the four weeks preceding the [EU labour force survey](#)). This indicator forms one of the seven key targets outlined in the strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030); the EU has set a goal to reduce the proportion of early leavers to less than 9.0 % by 2030.

Over the last two decades, the share of early leavers from education and training declined across the EU. From a peak of 16.9 % in 2002 (the start of the time series), this share fell each and every year through to 10.5 % by 2017. Having remained unchanged in 2018, there were further falls in the following four years. By 2022, the share of young people who had at most a lower secondary level of educational attainment and who were not engaged in any further education and training was 9.6 %; this was 0.6 percentage points higher than the policy target set for 2030. With relatively few job opportunities available for young people during the COVID-19 crisis, it is possible that some young people deferred their entry into the labour market (during 2020 and/or 2021) and instead sought education and training opportunities.

***Across the EU, the share of early leavers from education and training was higher among young men (11.1 %) than among young women (8.0 %)***

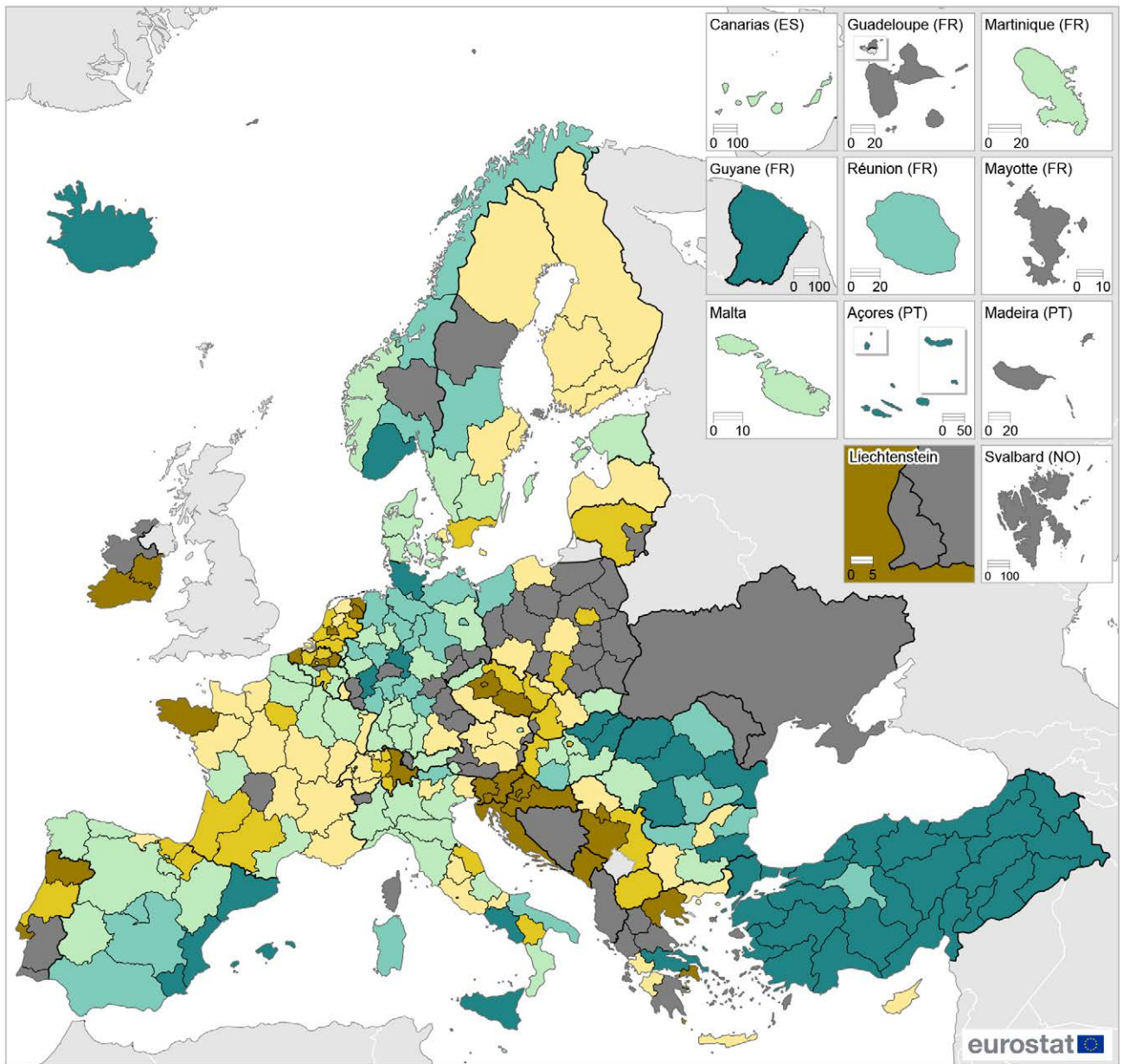
There is both a spatial and a gender dimension to the issue of early leavers from education and training. The proportion of early leavers tends to be higher in rural and sparsely-populated regions of the EU, as well as in regions characterised as former industrial heartlands. Among other reasons, this pattern may be a reflection of lower life chances and weak local labour markets (which may act as a ‘push factor’ to drive away more talented students). For the gender dimension, a higher proportion of young men (compared with young women) tend to be early leavers. Across the EU, the share of early leavers from education and training in 2022 was 11.1 % among young men, which was 3.1 percentage points higher than the corresponding share among young women (8.0 %). It is however interesting to note that this gender gap narrowed during the last couple of years: the share of early leavers fell 0.7 percentage points among young men between 2020 and 2022, while there was no change in the share recorded for young women.

***Almost half of all EU regions had already attained the EU’s policy target for early leavers***

In 2022, the share of early leavers from education and training was already less than the 9.0 % policy target in 94 out of 196 NUTS level 2 regions for which data are available (as shown by three shades of gold in Map 3.6; note the map also provides further information on data coverage). Some of the lowest shares of early leavers were concentrated in Belgium, Czechia, Ireland, Greece, Croatia, the Netherlands and Slovenia. At the bottom end of the distribution, there were four regions that recorded shares below 3.0 %: Utrecht (the Netherlands), Praha (the capital region of Czechia), Kentriki Makedonia (Greece) and Jadranska Hrvatska (Croatia).



**Map 3.6: Early leavers from education and training, 2022**  
 (% of people aged 18–24, by NUTS 2 regions)



- EU = 9.6
- ≥ 15.5
- 12.5 – < 15.5
- 9.0 – < 12.5
- 6.5 – < 9.0
- 5.0 – < 6.5
- < 5.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: the EU has a policy target in this area, namely to reach a share of less than 9% by 2030 (regions already having attained this target are shaded in gold). Prov. Luxembourg (BE34), Schwaben (DE27), Franche-Comté (FRC2), Martinique (FRY2), Grad Zagreb (HR05), Zachodniopomorskie (PL42), Łódzkie (PL71), Warszawski stołeczny (PL91), București-Ilfov (RO32) and Stredné Slovensko (SK03): 2021. Montenegro, North Macedonia and Türkiye: 2020.

Source: Eurostat (online data code: edat\_lfse\_16)

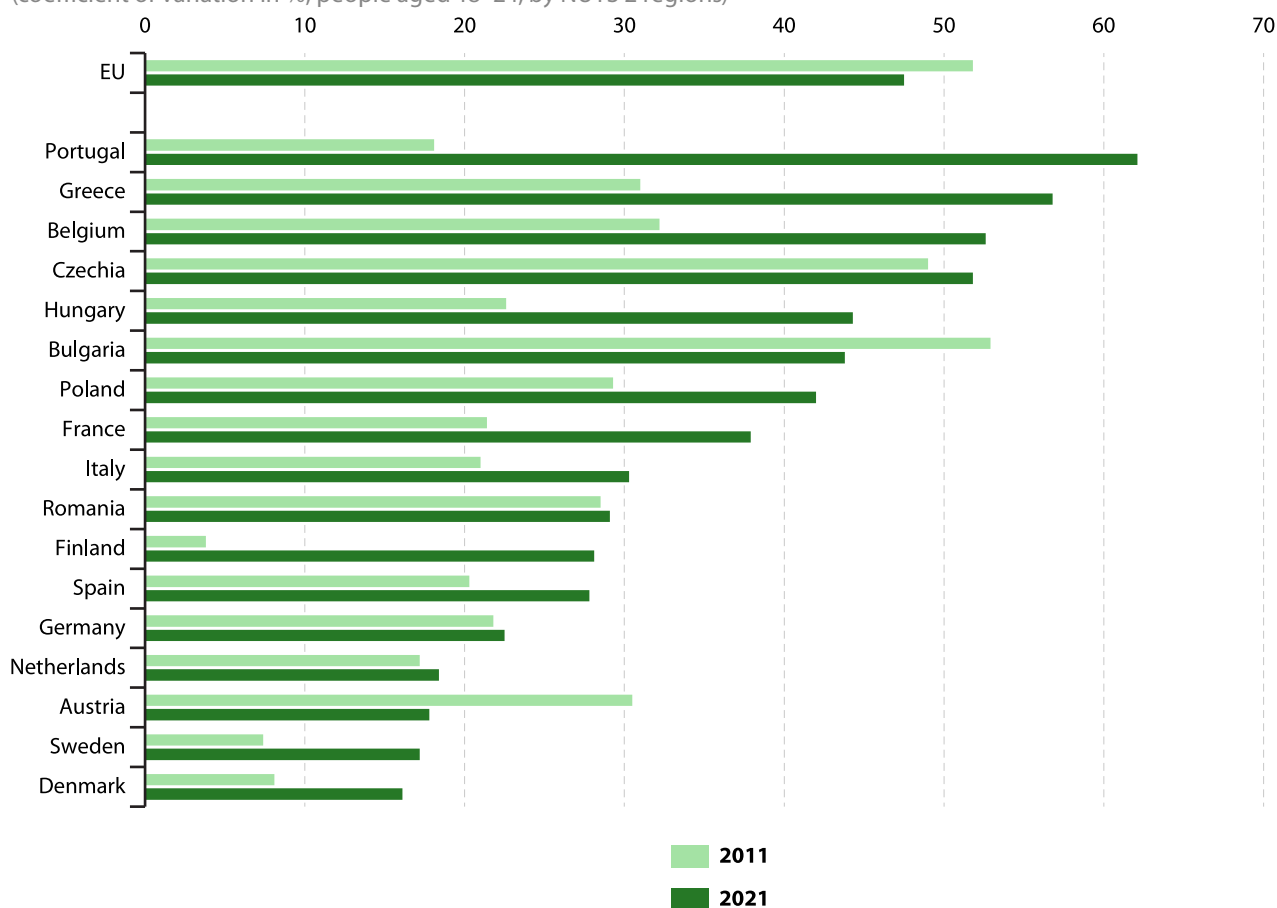


At the other end of the range, there were 20 NUTS level 2 regions across the EU where the share of early leavers from education and training in 2022 was at least 15.5 %; they are denoted by the darkest shade of teal in Map 3.6. This group included multiple regions from each of Germany, (principally eastern and southern) Spain, southern Italy, eastern Hungary and Romania. It also included a number of sparsely-populated, island and/or peripheral regions (note it is likely that a disproportionately high share of students from island and/or peripheral regions have to leave home if they wish to follow a particular course or programme, leaving behind a higher concentration of early leavers). At the top of the distribution, there were two regions where the share of early leavers peaked at more than one quarter of all individuals aged 18–24: Região Autónoma dos Açores in Portugal (26.5 %) and Guyane in France (28.0 %).

**The highest regional disparities for early leavers from education and training were observed in the southern EU Member States of Portugal and Greece**

Within several EU Member States, there are persistent regional disparities in labour market; for example, some regions that are characterised by labour shortages coexist alongside others that are characterised by persistently high unemployment rates. A population-weighted coefficient of variation provides one measure for comparing these intra-regional disparities in EU Member States. Figure 3.3 shows that the highest regional disparities in 2021 for the share of early leavers from education and training were recorded in Portugal and Greece, at 62.1 % and 56.8 % (2020 data), respectively. At the other end of the range, the lowest regional disparities – less than 20.0 % – were recorded in the Netherlands, Austria, Sweden and Denmark.

**Figure 3.3: Regional disparities in the rate of early leavers from education and training, 2011 and 2021**  
(coefficient of variation in %, people aged 18–24, by NUTS 2 regions)



Note: as measured by population-weighted coefficient of variation for EU Member States with more than four NUTS 2 regions (Estonia, Ireland, Croatia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia: not applicable). Greece: 2020 instead of 2021. Poland: 2019 instead of 2021.

Source: Eurostat (online data code: [fst\\_r\\_edatd\\_16](#))

Figure 3.3 shows there was a modest regional convergence for the share of early leavers from education and training across the whole of the EU between 2011 and 2021, as the coefficient of variation fell from 51.8 % to 47.5 %. However, there were only two EU Member States that reported a reduction in their intra-regional disparities over this period, Bulgaria and Austria. By contrast, the highest increase was observed in Portugal, as regional disparities for the share of early leavers from education and training increased 44.0 percentage points. There were also considerable increases – within the range of 20.4–25.8 percentage points – recorded in Belgium, Hungary, Finland and Greece (2011–2020).

### EMPLOYMENT RATE OF RECENT GRADUATES FROM VOCATIONAL PROGRAMMES

A *Council Recommendation of 24 November 2020 on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience* (2020/C 417/01) set an EU benchmark for the employment rate of recent graduates from vocational programmes. The policy target – defined in relation to people aged 20–34 having graduated 1–3 years earlier with an upper secondary or post-secondary non-tertiary vocational education – is for the employment rate of this subpopulation to be at least 82.0 % by 2025.

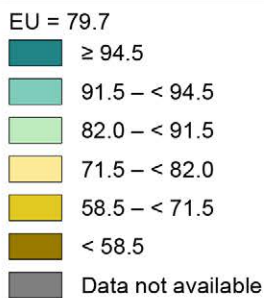
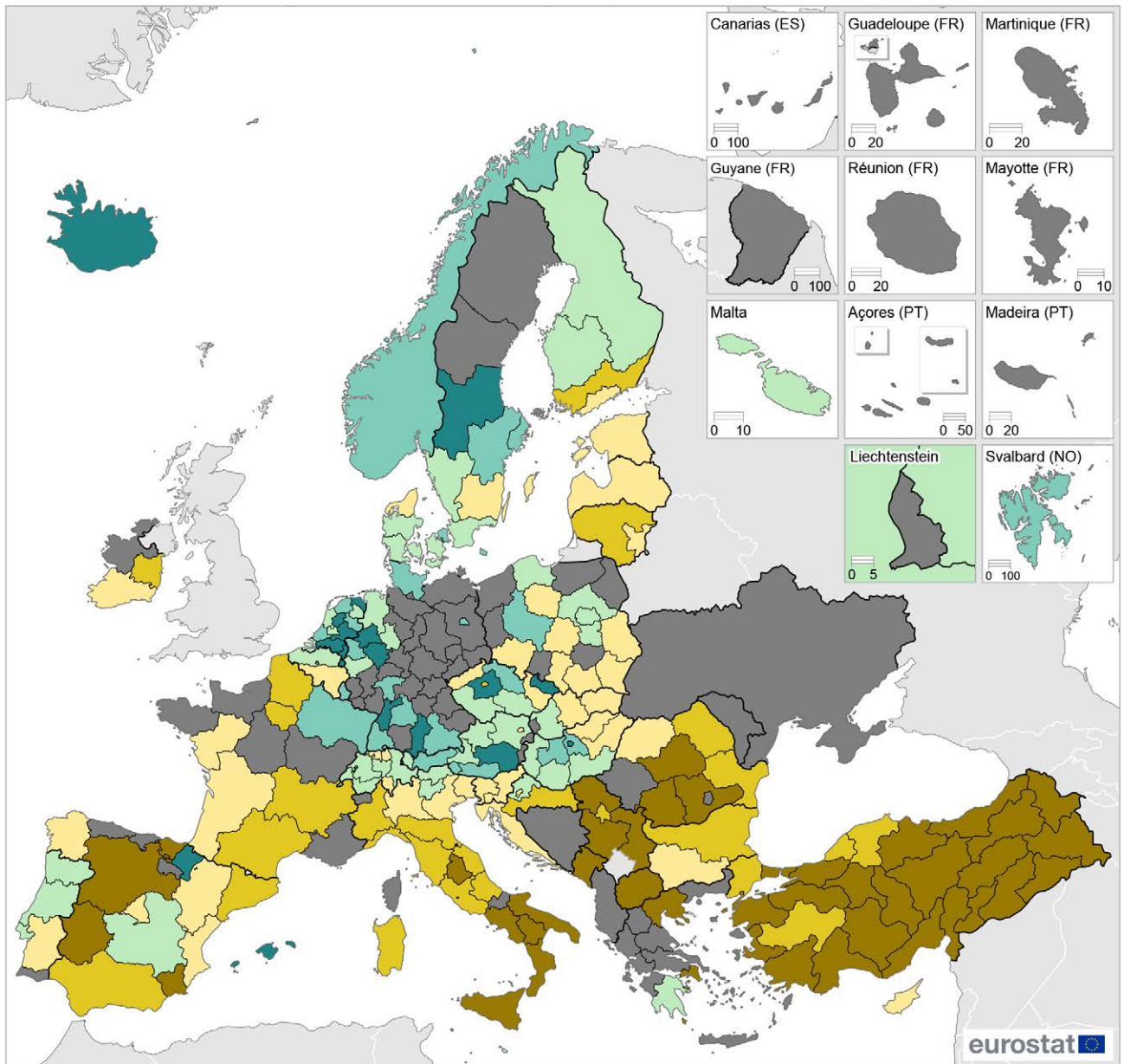
Between 2015 and 2019, the EU employment rate of recent graduates from vocational education programmes in upper secondary or post-secondary non-tertiary education (as covered by ISCED levels 3 and 4) increased from 72.3 % to 79.1 %. However, it subsequently fell 3.4 percentage points in 2020 as the COVID-19 crisis likely impacted on the number of (new) job opportunities that were open to young people. There was a modest recovery in 2021, with the employment rate rising to 76.2 %, with the recovery accelerating a year later. In 2022, the EU's employment rate for recent vocational graduates stood above its pre-pandemic level, at 79.7 %; as such, it was 2.3 percentage points below the EU target for 2025.

Map 3.7 shows that the employment rate of recent vocational graduates was already at or above the EU's policy target of 82.0 % in 74 out of 151 NUTS level 2 regions for which data are available in 2022 (note the statistics presented for Belgium, Bulgaria and France relate to NUTS level 1 regions, while the latest period available is 2021 for some regions; the notes under the map provide further information on data coverage). These 74 regions with relatively high employment rates are shaded using three different teal tones in Map 3.7: they included every region (for which data are available) in Germany and the Netherlands, as well as all but one of the regions in Denmark, Austria, Portugal and Sweden, and a large majority of the regions in Czechia and Hungary. Looking in more detail, there were 16 regions across the EU where the employment rate of recent vocational graduates was at least 94.5 % (as shown by the darkest shade of teal). This group included four regions where all recent vocational graduates were in work in 2022: Comunidad Foral de Navarra in Spain, Groningen and Flevoland in the Netherlands, and Norra Mellansverige in Sweden (2021 data).

In 2022, there were 16 NUTS level 2 regions where less than 58.5 % of all recent vocational graduates had found work. The lowest employment rates for this subpopulation were concentrated in southern EU Member States: six (predominantly southern) regions of Italy (two of which had their latest data for 2021), four regions in Spain (one of which had data for 2021) and two regions in Greece. The remainder of this group was composed of three regions from Romania and the French outermost region of Régions Ultrapériphériques Françaises (NUTS level 1). Among these 16, there were 11 regions which had employment rates of recent vocational graduates that were below 50.0 %. The lowest rates were observed in four Italian regions: Basilicata (37.5 %; 2021 data), Calabria (34.8 %), Sicilia (31.2 %) and Campania (30.2 %).

**Map 3.7: Employment rate of recent graduates from vocational programmes, 2022**

(% of graduates aged 20–34 with an upper secondary or post-secondary non-tertiary level of vocational educational attainment having left education and training 1–3 years earlier, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: as covered by ISCED levels 3 and 4. The EU has a policy target in this area, namely to reach a share of at least 82 % by 2025 (regions already having attained this target are shaded in teal). Belgium, Bulgaria and France: NUTS level 1. Norway: national level. Yugozapadna i Yuzhna tsentralna Bulgaria (BG4), Berlin (DE30), Detmold (DEA4), Comunidad de Madrid (ES30), Extremadura (ES43), Occitanie (FRJ), Basilicata (ITF5), Umbria (ITI2), Vorarlberg (AT34), Dolnośląskie (PL51), Pomorskie (PL63), Nord-Vest (RO11) and Norra Mellansverige (SE31): 2021. Montenegro, North Macedonia and Türkiye: 2020.

Source: Eurostat (online data code: edat\_lfse\_33)

## Adult education and training

**Lifelong learning** – or lifelong education and training – seeks to improve an individual's knowledge, skills, competences and/or qualifications for personal, social and/or professional reasons. For many occupations, it is increasingly important for the labour force to develop existing skills and learn new ones that are relevant to a specific job or which provide opportunities for new career paths. Some jobs/occupations will likely cease to exist in the future as a result of technological change.

The strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030) has a specific EU policy target in this area; by 2025, at least 47 % of people aged 25–64 should have participated in adult learning during the previous 12 months. This target was revised in June 2021 as it was included as one of three EU 2030 social targets within the European Pillar of Social Rights Action Plan; the revised goal is to have, by 2030, at least 60 % of people aged 25–64 participating in education and training every year.

Up until 2021, the data collected by the labour force survey included information on the share of the population that received formal or non-formal education and training during the four weeks prior to the survey; this indicator is used in the analyses below. As of reference year 2022, an additional recall period has been added, with labour force survey statistics also collected for people participating in education and training during the 12 months prior to the survey. At the time of writing (May 2023), this new data collection is not yet available at a regional level.

Prior to the COVID-19 crisis, the share of people aged 25–64 in the EU who participated in education and training during the four weeks prior to the survey had been 10.8 % in 2019. Participation rates fell with the onset of the pandemic (9.1 % in 2020) but rebounded the following year (10.8 % in 2021) and continued to grow thereafter. In 2022, the adult participation rate in education and training during the four weeks prior to the survey was 11.9 %.

### **The highest levels of adult participation in education and training were recorded in Denmark, the Netherlands and Sweden**

Map 3.8 shows participation rates in education and training in 2022; data are presented for 240 NUTS level 2 regions (no data for Ionia Nisia in Greece or Mayotte in France). The regional distribution of adult

participation rates was very homogeneous within individual EU Member States, at least in part reflecting national rather than regional education and training initiatives. There were 96 regions that had participation rates that were equal to or above the EU average of 11.9 %; this group included every region of Denmark, Spain, the Netherlands, Austria, Slovenia, Finland and Sweden, as well as Estonia, Luxembourg and Malta (all single regions at this level of detail). At the top end of the distribution there were 24 regions where at least one quarter of all people aged 25–64 participated in education and training during the four weeks prior to the 2022 survey (as shown by the darkest shade of blue in the map). This group included all eight regions of Sweden, where participation rates were higher than in any other region of the EU, peaking at 38.1 % in the capital region of Stockholm. It also included all five regions of Denmark and 9 out of the 12 regions in the Netherlands, with the highest rates observed in Hovedstaden (the Danish capital region) and Utrecht (the Netherlands). There were only two other regions – both capital regions – that reported at least one quarter of all people aged 25–64 participating in education and training during the four weeks prior to the survey; they were Helsinki-Uusimaa in Finland and Bratislavský kraj in Slovakia.

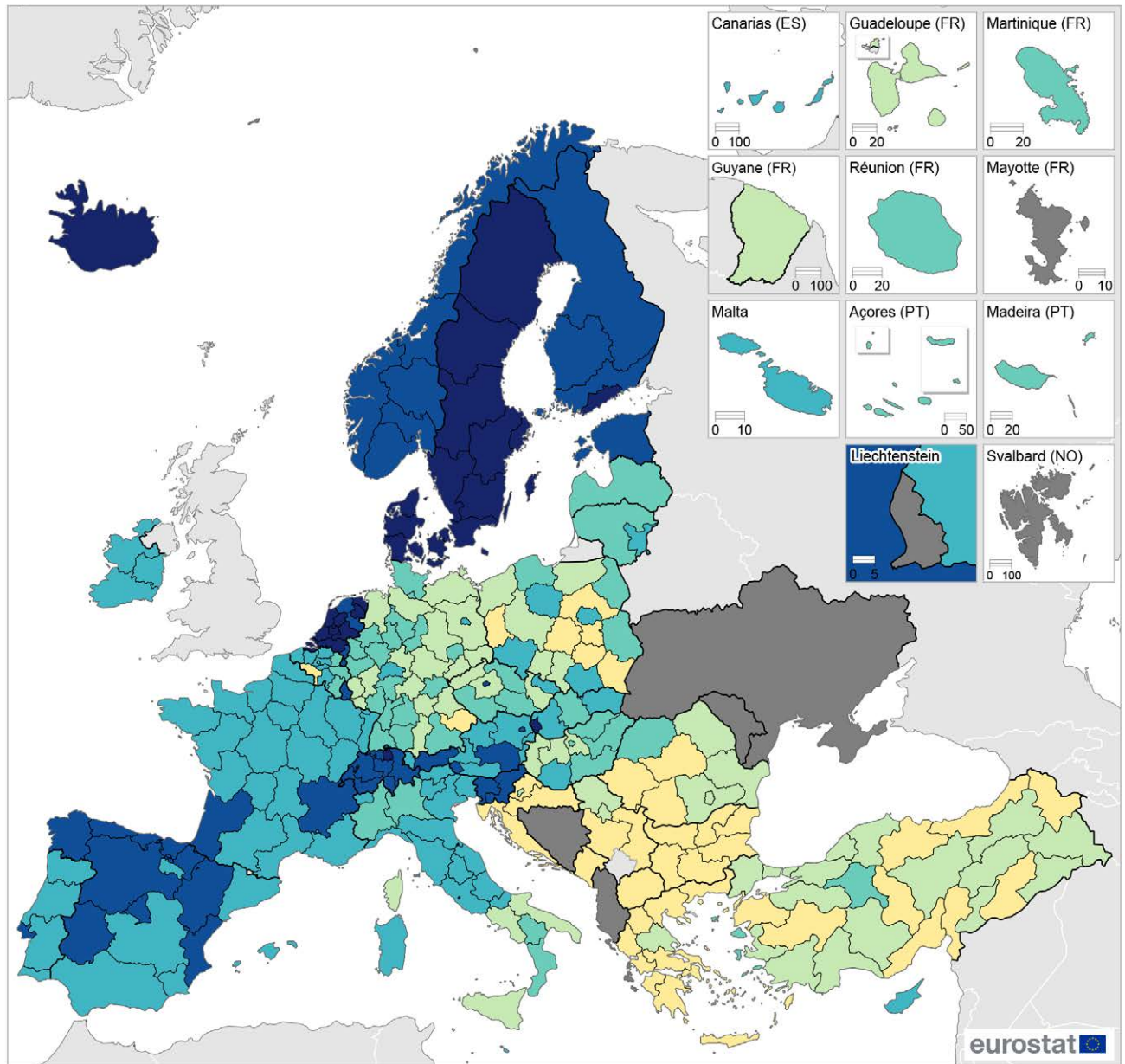
There were 29 NUTS level 2 regions across the EU where the participation rate for adult education and training was below 5.0 % in 2022 (they are indicated by the yellow shade in Map 3.8). This group was principally concentrated in Bulgaria (all six regions), Greece (10 out of 12 regions; no data for Ionia Nisia) and Croatia (three out of four regions), but also included five regions from Poland, three from Romania, as well as single regions from each of Belgium and Germany. At the bottom end of the range, there were five Bulgarian and two Greek regions that reported adult participation rates for education and learning that were less than 2.0 %, with the lowest rates recorded in the Greek region of Sterea Ellada (1.1 %) and the Bulgarian regions of Severozapaden (1.0 %) and Severoiztochen (0.9 %).

In 2022, some 12.9 % of women aged 25–64 participated in education and training during the four weeks prior to the survey. This was 2.1 percentage points higher than the corresponding share recorded for men (10.8 %). A gender gap with higher participation rates in education and training for women was observed in 192 out of 233 NUTS level 2 regions for which data are available. There were three regions where there was no difference in participation rates between the sexes, while the remaining 38 regions had higher participation rates for men.



**Map 3.8: Participation rate in education and training, 2022**

(% of people aged 25–64 who participated in education and training during the four weeks prior to the survey, by NUTS 2 regions)



- EU = 11.9
- ≥ 25.0
- 15.0 – < 25.0
- 10.0 – < 15.0
- 7.5 – < 10.0
- 5.0 – < 7.5
- < 5.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

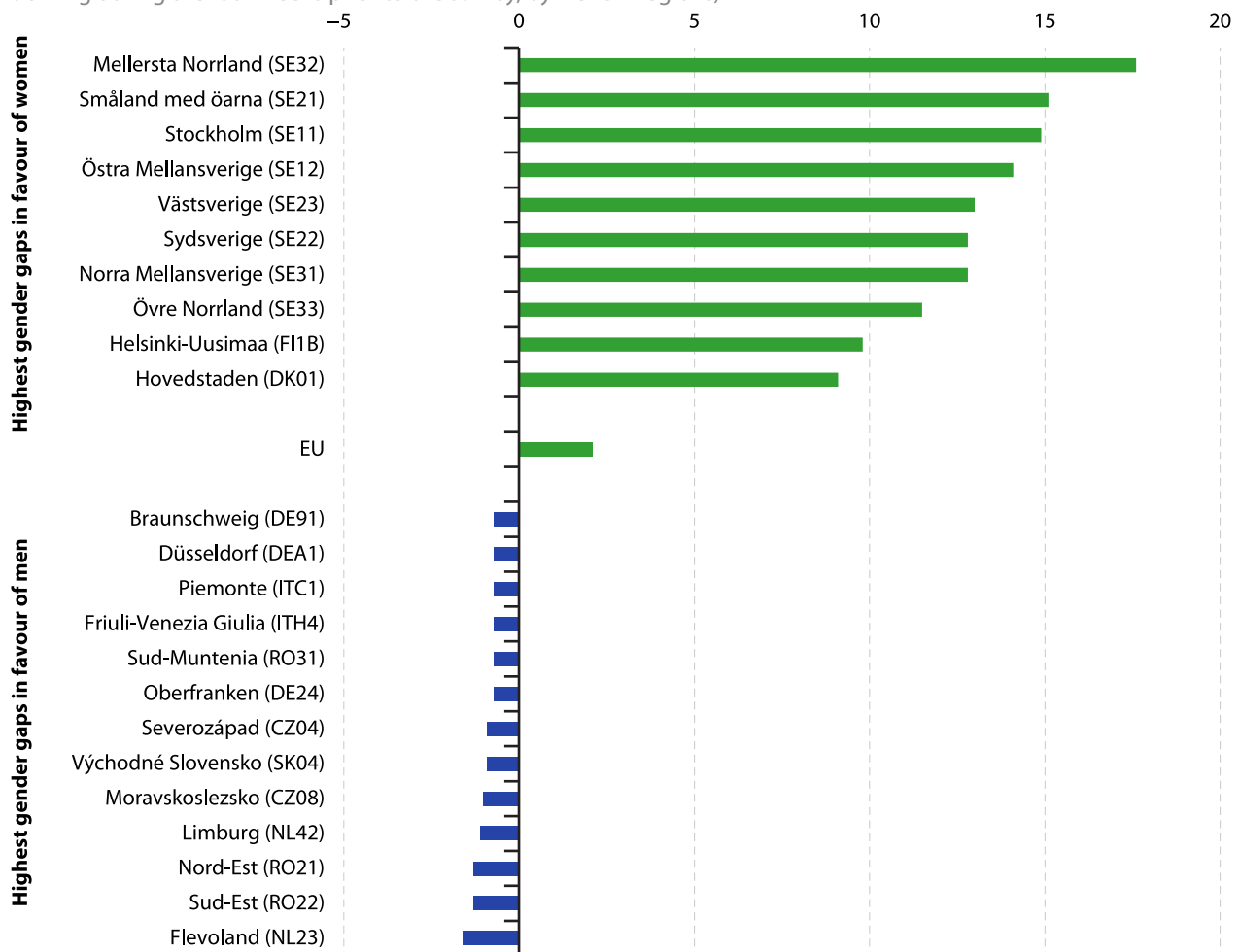
Note: Montenegro, North Macedonia and Türkiye, 2020.  
Source: Eurostat (online data code: trng\_lfse\_04)

Figure 3.4 shows the largest regional gender gaps for participation rates in education and training. In 2022, the biggest gaps in favour of women were recorded in regions characterised by very high overall participation rates. This was particularly the case for the eight Swedish regions, as their gender gaps in favour of women ranged from 11.5–17.6 percentage points; the largest gap was observed in Mellersta Norrland. The next highest gender gaps in favour of women were recorded in the capital regions of two other Nordic Member States: Helsinki-Uusimaa in Finland (where the gap was 9.8 percentage points) and Hovedstaden in Denmark (9.1 points).

In 2022, adult participation rates in education and training were higher among men (than women) in 38 NUTS level 2 regions. These regions were concentrated across Germany (13 regions), Romania (five regions), Czechia (four regions), Italy (also four regions, principally in the north), Greece and Slovakia (both three regions); in addition, there were one or two regions in each of Belgium, Croatia, the Netherlands, Poland and Portugal. All gender gaps in favour of men were relatively small in size, with the largest gap recorded in the Dutch region of Flevoland (1.6 percentage points).

**Figure 3.4: Gender gap for participation rates in education and training, 2022**

(percentage point difference between the shares of women and men aged 25–64 who participated in education and training during the four weeks prior to the survey, by NUTS 2 regions)



Note: the figure shows the EU regions with the highest gender gaps in favour of women, the EU average, and the regions with the highest gender gaps in favour of men. The rankings include more than 10 regions if several regions have identical values. Sterea Elláda (EL64); 2021. Severozapaden (BG31), Severoiztochen (BG33), Rheinhessen-Pfalz (DEB3), Ionia Nisia (EL62), Corse (FRM0), Mayotte (FRY5), Lubuskie (PL43), Świętokrzyskie (PL72) and Åland (FI20): not available or only partially available.

Source: Eurostat (online data code: trng\_lfse\_04)

## 4. Labour market

The COVID-19 crisis had a considerable impact on all European Union (EU) labour markets. With the exception of key workers, there was generally an increase in the number of people usually working from home. Other members of the labour force were impacted in different ways: some were placed on furlough schemes <sup>(1)</sup>, others were made unemployed and some self-employed persons lost their income. The crisis impacted particular

groups within the labour market, for example, young people, temporary employees, those in precarious employment, or those working in leisure, hospitality and transport-related activities.

The asymmetric impact of the COVID-19 crisis was driven, at least in part, by the level of social contact and the feasibility of making use of technology at

(1) Also known by other names, such as temporary lay-off or technical unemployment. In a furlough scheme, for a fixed or open-ended period of time employees were not required to work but were not made unemployed. Depending on the details of specific schemes: the workers received full, reduced or no pay; the employers received full, partial or no financial support from public authorities. Furlough schemes helped employers to retain employees during economically difficult times, with the intention of the employees returning to work for the same employer at the end of the scheme.



(people aged 20–64, 2022, by NUTS 2 regions)

Note: Mayotte (FRY5), not available. Niederbayern (DE22), Oberpfalz (DE23), Trier (DEB2), Lubuskie (PL43) and Opolskie (PL52): unemployed persons, not available (low reliability). Åland (FI20): unemployed persons and persons outside the labour force, not available (low reliability).

Source: Eurostat (online data code: lfst\_r\_lfsd2pwn)



work. It is likely that the crisis accelerated some labour market transformations. The crisis also accelerated the introduction of digital technologies and a move towards more widespread use of flexible working arrangements.

On 4 March 2021, the [European Commission](#) set out its ambition for a stronger social EU to focus on jobs and skills, paving the way for a fair, inclusive and resilient socioeconomic recovery from the COVID-19 crisis. The [European Pillar of Social Rights Action Plan](#) (COM(2021) 102 final) outlines a set of specific actions and headline targets for employment, skills and social protection across the EU.

The [European Year of Skills 2023](#) is designed to 'promote reskilling and upskilling, helping people to get the right skills for quality jobs'. It should also provide fresh impetus to help the EU reach two of its social targets for 2030 that form part of the European Pillar of Social Rights Action Plan: to have at least 60 % of adults in training over the course of a year; to have an [employment rate](#) for people aged 20–64 of at least 78 %.

This chapter analyses regional labour markets across the EU and is split into three main sections, covering:

- employment rates for people aged 20–64;
- a special focus on qualifications and skills, including:
  - information on [young people neither in employment nor in education and training \(NEET\)](#),
  - employment rates of people with a [tertiary level](#) of educational attainment,
  - the over-qualification rate,
  - employment of highly-skilled persons;
- unemployment rates and labour market slack.

In 2022, the core working-age population of the EU (composed of people aged 20–64) numbered 259.2 million, of which 53.5 million persons were economically [inactive](#); this latter group is composed, among others, of students, pensioners, people caring for other family members, as well as volunteers and those unable to work because of long-term sickness or disability. There were 193.5 million [employed persons](#) of core working age, in contrast to 12.3 million [unemployed persons](#) who were not working but were actively seeking and available for work. The highest regional employment rate among [NUTS level 2](#) regions was recorded in the Finnish archipelago of Åland (89.7 %), while the lowest rate was observed in the southern Italian region of Sicilia (46.2 %). The infographic above provides more details on the composition of the EU's labour force as well as other regional highlights.

## Employment

Within this section, data are presented for people aged 20–64. The choice of this age range reflects the growing proportion of young people who remain within education into their late teens (and beyond), potentially restricting their participation in the labour market, while at the other end of the age spectrum the vast majority of people in the EU are retired after the age of 64.

In recent decades, one of the EU's main policy objectives has been to increase the number of people in work. This goal has been part of the [European employment strategy \(EES\)](#) from its outset in 1997 and was subsequently incorporated as a target in the Lisbon and Europe 2020 strategies. The employment rate is also included as one of the indicators in the [social scoreboard](#) which is used to monitor the implementation of the [European Pillar of Social Rights](#). The EU has an employment rate target: by 2030, at least 78 % of the population aged 20–64 should be in employment.

### **The EU employment rate was 74.6 % in 2022**

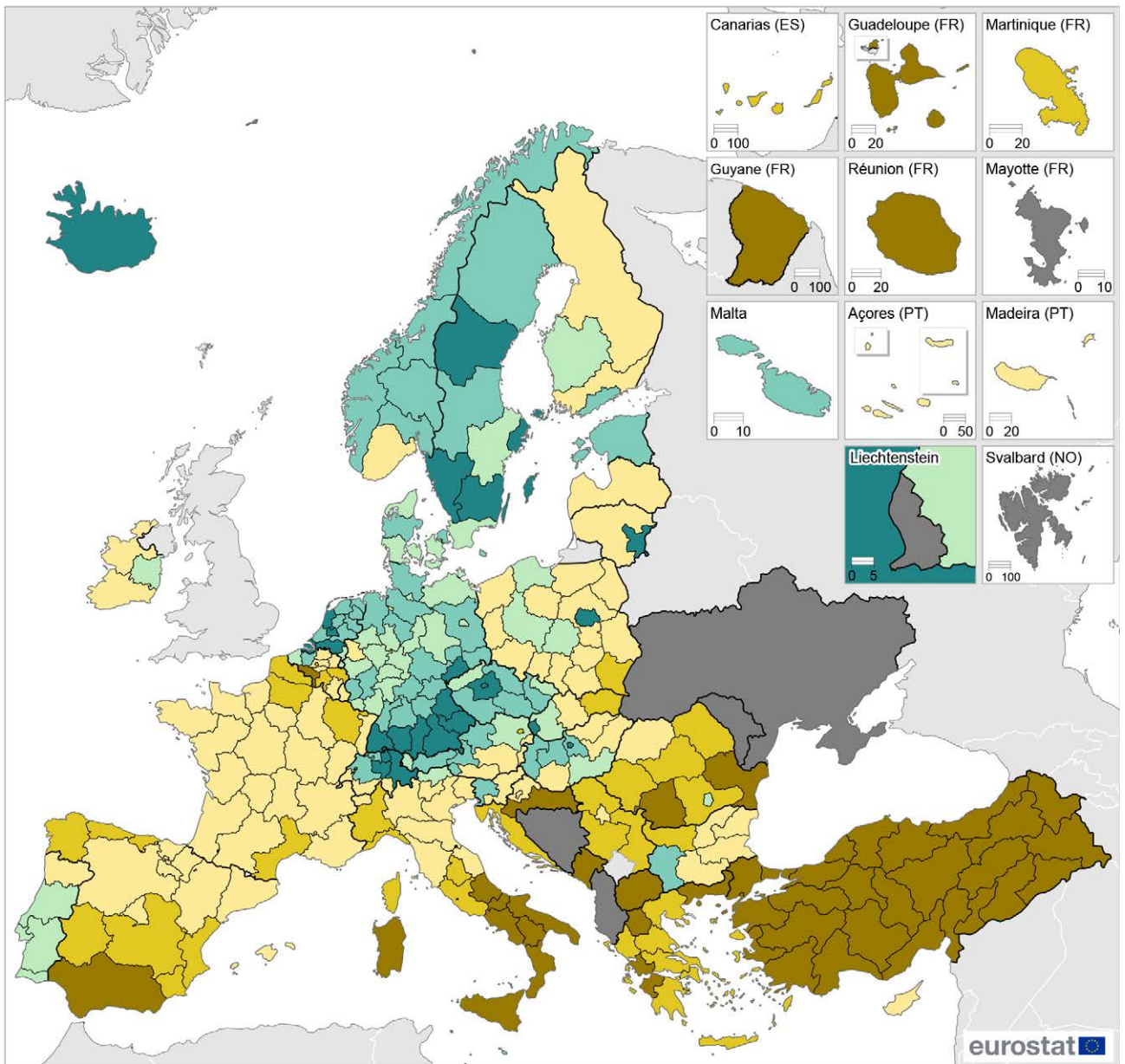
The employment rate is the ratio of employed persons (of a given age) relative to the total population (of the same age). Prior to the onset of the COVID-19 crisis, the EU's employment rate for the working-age population (20–64 years) had increased for six consecutive years to 73.1 % by 2019; this pattern came to an abrupt end in 2020 as the rate fell 0.9 [percentage points](#). In 2021, the EU's employment rate recovered all of its loss during the initial stages of the pandemic. There was an even faster increase recorded in 2022 as the rate gained 1.5 percentage points to reach an historical high of 74.6 %.

Map 4.1 presents the employment rate for [NUTS level 2](#) regions: those regions with rates equal to or above the employment rate target of 78.0 % are shown in shades of teal. In 2022, more than two fifths of all regions (102 out of the 241 for which data are available; no recent data available for Mayotte in France) in the EU had already reached or surpassed this level. These regions were mainly concentrated in Czechia (all eight regions), Denmark (all five regions), Germany (36 out of 38 regions; the exceptions being Bremen and Düsseldorf), Estonia, Malta, the Netherlands (all 12 regions) and Sweden (all eight regions).

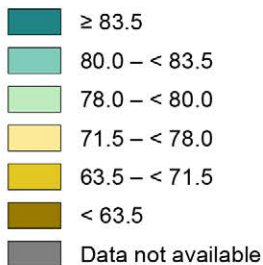
Looking in more detail, the highest regional employment rate in 2022 was recorded in the Finnish archipelago of Åland, at 89.7 %. Leaving this atypical region aside, the next highest rates were in the Polish capital region of [Warszawski stołeczny](#) (85.4 %), the Dutch region of Utrecht (85.1 %) and the Swedish capital region of Stockholm (also 85.1 %). There were several other capital regions with relatively high



**Map 4.1: Employment rate, 2022**  
(%, people aged 20–64, by NUTS 2 regions)



EU = 74.6



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: the EU has a policy target in this area, namely to reach a share of at least 78 % by 2030 (regions already having attained this target are shaded in teal). Montenegro, North Macedonia and Türkiye: 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [fst\\_lfe2emprtn](#))

employment rates, including Budapest in Hungary (84.7 %), Bratislavský kraj in Slovakia (84.5 %), Praha in Czechia (84.4 %), Sostinės regionas in Lithuania (84.4 %), and Noord-Holland in the Netherlands (83.5 %).

At the other end of the range, the regions characterised by relatively low employment rates were often rural, sparsely-populated or peripheral regions of the EU. This pattern was apparent in Spain and Italy (particularly the southern parts), much of Greece, some regions in Romania and the outermost regions of France. Most of these regions were characterised by a lack of employment opportunities for people with intermediate and high skill levels.

Former industrial heartlands that have not adapted economically make up another group of regions characterised by relatively low employment rates. Some of these have witnessed the negative impact of globalisation on traditional areas of their economies (such as coal mining, steel or textiles manufacturing). Examples include a band of regions running from north-east France into the Région wallonne (Belgium).

Approximately one quarter (61 out of the 241 regions for which data are available) of all EU regions had an employment rate that was below 71.5 % in 2022 (as shown by the two darkest golden tones in Map 4.1). Among these, there were three regions in southern Italy – Sicilia, Calabria and Campania – where less than half of the working-age population was employed. The lowest regional employment rate was recorded in Sicilia, at 46.2 %.

### **The highest regional disparities for employment rates were observed in Italy**

Within individual EU Member States, there were often considerable differences in employment rates between regions. For example, in most of the multi-regional eastern and [Baltic Member States](#) it was common to find the capital region had the highest employment rate, as was the case in Bulgaria, Czechia, Croatia, Lithuania, Hungary, Poland, Romania, Slovenia and Slovakia in 2022. This pattern was also observed in Denmark, Ireland, Greece and Sweden. However, the situation was reversed in a number of western Member States – for example, Belgium and Austria – where the capital region had one of the lowest regional employment rates.

Several EU Member States were characterised by regional disparities in their labour markets, with some regions having labour shortages, while others had persistently high unemployment rates. A population-weighted coefficient of variation provides one measure for comparing these intra-regional disparities. Figure 4.1 shows that in 2021 the highest regional disparities were recorded in Italy (a coefficient of variation of 17.5 %). Broadly, there was a north–south split between Italian regions: the northern Provincia Autonoma di Bolzano/Bozen recorded the highest employment rate (79.2 %),

while the southern, island region of Sicilia had the lowest (46.2 %).

Belgium (8.8 %) and Spain (8.4 %) had the next highest coefficients of variation for employment rates. The former was also characterised by a north–south split, with relatively high rates recorded across the northern regions of Vlaams Gewest and generally lower rates across Région wallonne. In Spain, the highest employment rates were often located in northern and eastern regions, while lower rates tended to be observed in southern and western regions. At the other end of the range, the lowest regional disparities for employment rates – with a coefficient of variation that was less than 2.0 % – were recorded in the Netherlands and Denmark.

Figure 4.1 also shows that there was a modest degree of convergence for regional employment rates across the EU between 2011 and 2021, as the coefficient of variation fell from 11.9 % to 11.2 %. Eight (out of 17) EU Member States reported a decrease in their intra-regional disparities during this period, the biggest falls – in relative terms – being observed in Finland, Czechia and Hungary. By contrast, the largest increase was recorded in Poland, where regional disparities increased by more than one third; Portugal and Austria reported increases of more than one quarter.

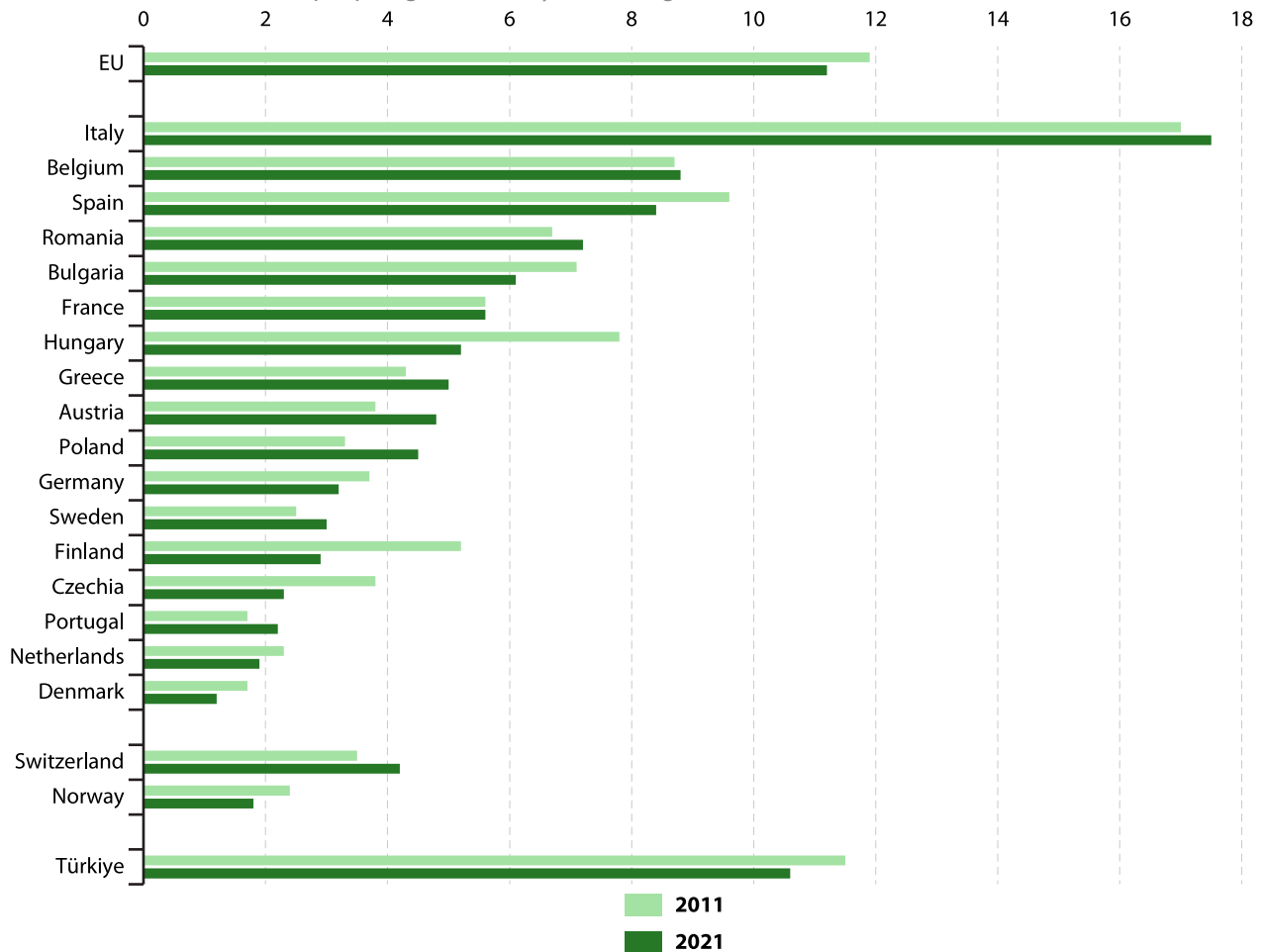
### **The EU's gender employment gap was 10.7 percentage points in 2022**

In 2022, long-standing challenges linked to female participation in EU labour markets continued, as illustrated by persistent gender gaps for employment and pay. These gaps between the sexes exist for a variety of reasons, among which:

- women often bear a disproportionate share of unpaid care and household chores that may limit their availability for paid employment;
- gender bias and discrimination when hiring, promoting and paying women;
- fewer women in leadership positions to introduce gender-related policies or mentor more junior female staff;
- a lack of affordable childcare and support for working parents;
- disincentives in tax and benefit system that can lead to second earners bearing a higher tax burden when they choose to participate in the labour market;
- occupational segregation, with women often concentrated in specific activities that are characterised by lower wages and/or fewer opportunities for career development.

The gender employment gap is defined as the difference between the employment rates of men and women aged 20–64. The employment rate is calculated by dividing the number of persons aged 20–64 in employment by the total population of the same age group.

**Figure 4.1: Regional disparities in employment rates, 2011 and 2021**  
(coefficient of variation in %, people aged 20–64, by NUTS 2 regions)



Note: as measured by population-weighted coefficient of variation for EU Member States with more than four NUTS 2 regions (Estonia, Ireland, Croatia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia: not applicable). Türkiye: 2020 instead of 2021. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [lfst\\_lmder](#))

The European Pillar of Social Rights Action Plan set a subgoal of halving the EU's gender employment gap; it forms part of the overall target to increase the EU's employment rate to 78 % by 2030. The subgoal foresees halving the EU's gender employment gap between 2019 and 2030 from its initial level of 11.7 percentage points to less than 5.8 points; this is equivalent to an average fall of 0.5 points each year. In 2022, the gender employment gap was 10.7 percentage points, some 0.2 points lower than in 2021 and 1.0 points lower than in 2019.

***Sostinės regionas in Lithuania and Etelä-Suomi in Finland were the only regions across the EU where a higher proportion of working-age women (than men) were employed***

Map 4.2 shows that in approximately one fifth (47 out of 241 regions for which data are available; no recent

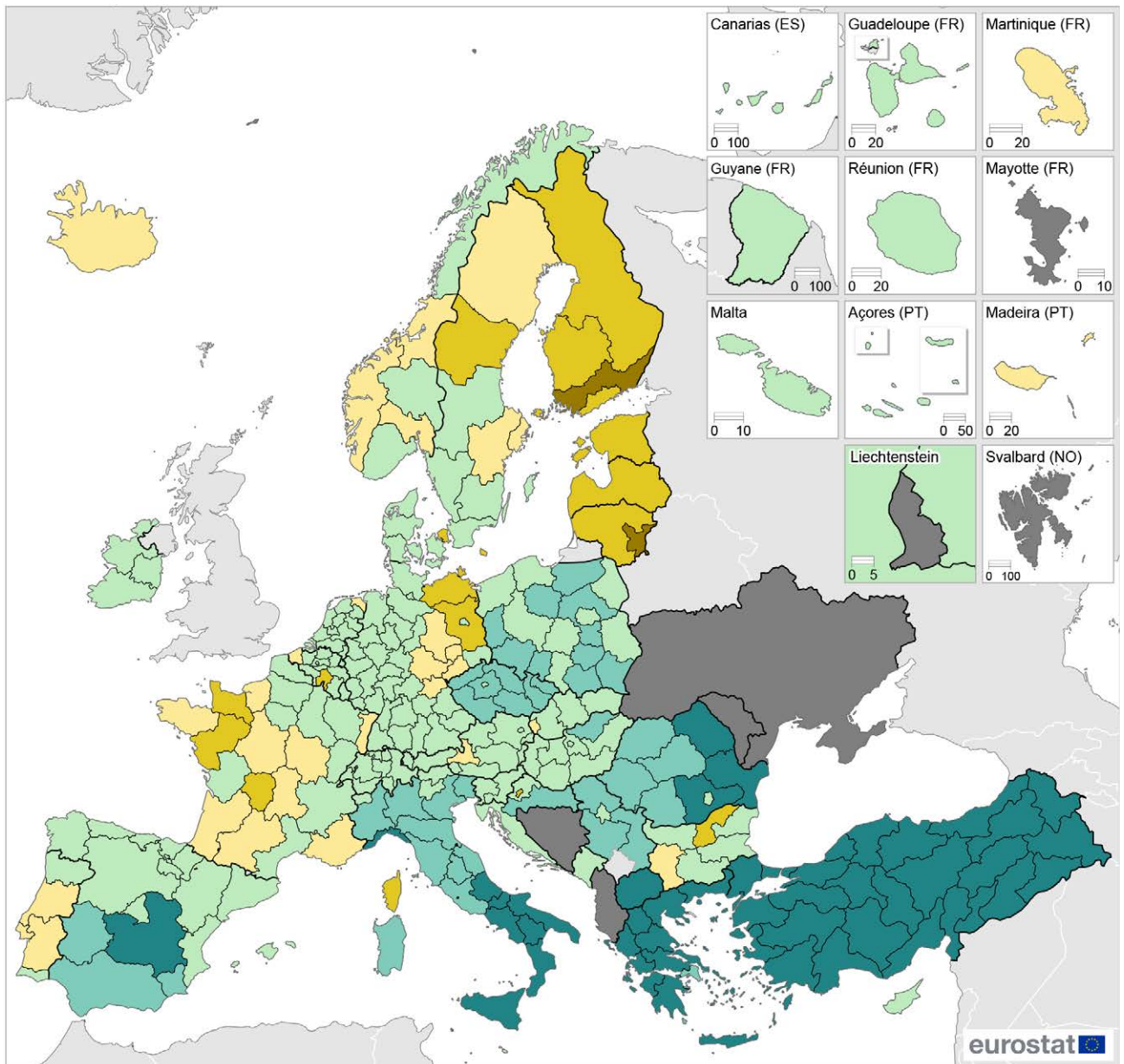
data available for Mayotte (France)) of all NUTS level 2 regions, the gender employment gap was already less than 5.8 percentage points in 2022; these regions are shown using three different golden tones in the map. They were concentrated in France (14 regions), Germany (seven regions), Finland (all five regions), Sweden and Portugal (both four regions), as well as both regions in Lithuania and Estonia. Those regions with relatively small gender employment gaps were generally characterised by high overall employment rates.

In *Sostinės regionas* (the capital region of Lithuania) and *Etelä-Suomi* (Finland), the employment rate of women aged 20–64 was higher than that recorded for men of the same age in 2022. The gender employment gap (in favour of women) was 1.2 percentage points in *Sostinės regionas* and 0.2 points in *Etelä-Suomi*; there was no difference in employment rates between the sexes in *Pohjois- ja Itä-Suomi* (also Finland).



**Map 4.2: Gender employment gap, 2022**

(percentage points, employment rate of men minus the employment rate of women for people aged 20–64, by NUTS 2 regions)



- EU = 10.7
- ≥ 18.5
- 13.5 – < 18.5
- 5.8 – < 13.5
- 4.0 – < 5.8
- 0.0 – < 4.0
- < 0.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: the EU has a policy target in this area, namely to halve the gender employment gap from 11.7 percentage points in 2019 to 5.8 percentage points by 2030 (regions already having attained this target are shaded in gold). Montenegro, North Macedonia and Türkiye: 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [lfst\\_r\\_lfe2emprtn](#))



Despite some progress being made, female employment rates still lag behind male rates in the vast majority of EU regions. The European Commission's [Gender Equality Strategy 2020–2025](#) is designed, among other goals, to counter gender stereotypes, promote women's participation in decision-making, while closing gender gaps in the labour market. In general terms, EU regions with relatively large gender employment gaps were often characterised by higher unemployment rates and levels of inactivity among women.

There were 20 NUTS level 2 regions where the gender employment gap was at least 20.0 percentage points in 2022. Half of these were located in Greece, while the remainder were concentrated in Italy (seven regions) and Romania (three regions). The highest gender employment gaps were recorded in the Greek region of Sterea Elláda (31.4 percentage points) and the southern Italian region of Puglia (30.7 points).

## Employment – focus on qualifications and skills

A number of EU Member States have, in recent years, enacted employment laws that seek to liberalise their labour markets, for example, by providing a wider range of possibilities for hiring staff through temporary, fixed-term or zero hours contracts. In some cases, this has resulted in a division between permanent full-time employees and those with more precarious employment contracts. The latter are often young people and/or people with relatively low levels of educational attainment. This may explain, at least to some degree, why young people in the labour market generally fare worse during economic downturns such as the COVID-19 crisis; during downturns, employers are also less likely to recruit new workers (young people coming into the labour market) or to replace older workers (who retire).

The share of young people (aged 15–29) who are neither in employment, nor in education or training (NEET) provides a useful measure for studying the vulnerability of young people in terms of their labour market and social exclusion. The NEET rate is expressed relative to the total population of the same age (15–29); note that the numerator includes not only young people who are unemployed but also young people who are outside the labour force for reasons other than education or training (for example, because they are caring for family members, volunteering or travelling, sick or disabled).

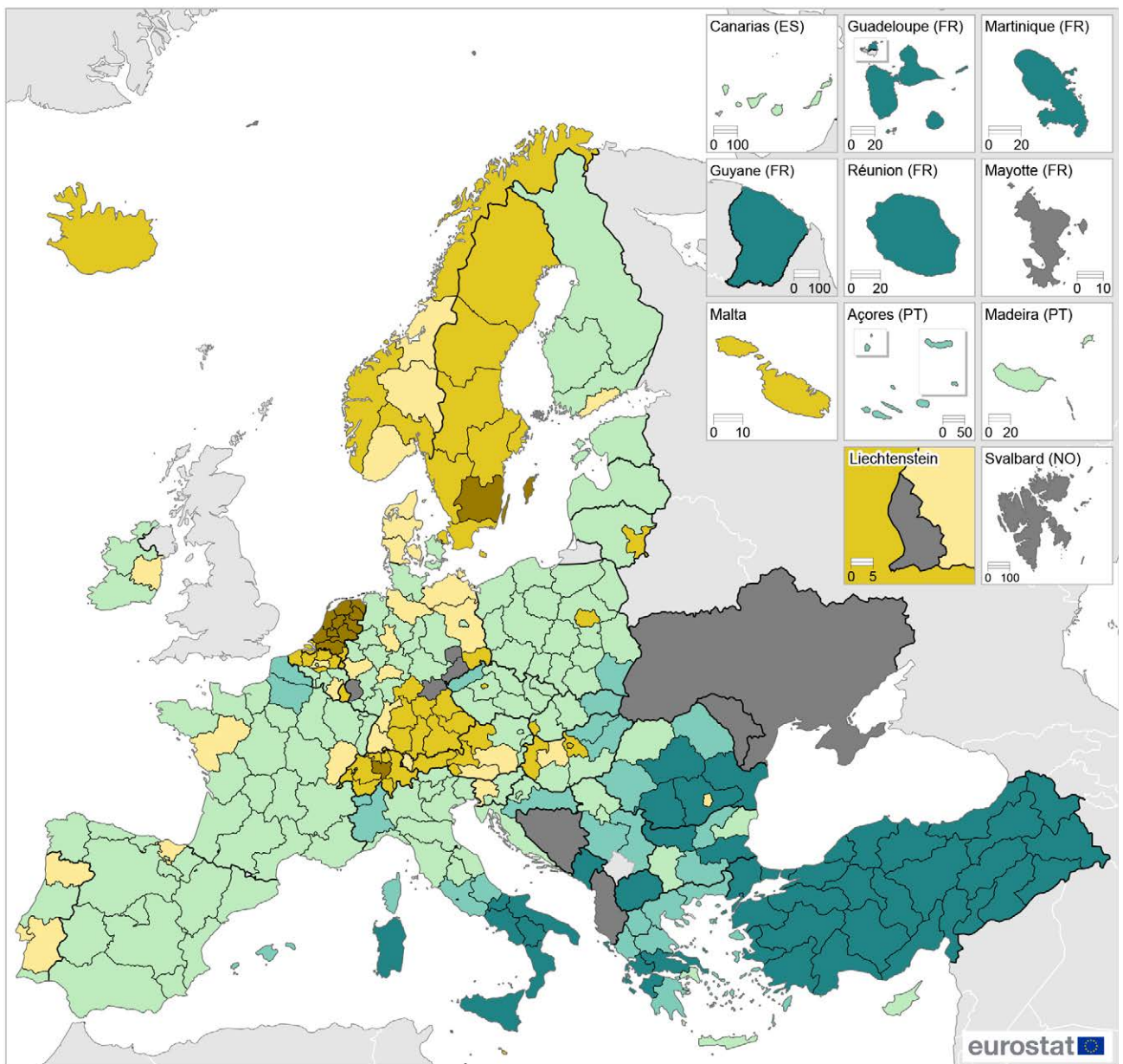
Within the European Pillar of Social Rights Action Plan, the EU set a policy target whereby the NEET rate should decrease to less than 9 % by 2030. Having peaked at 16.1 % in 2013 – during the aftermath of the global financial and economic crisis – the EU's NEET rate fell at a relatively slow pace during six consecutive years, to 12.6 % in 2019. With the onset of the COVID-19 pandemic, the rate climbed to 13.8 % in 2020. The downward trend returned in 2021 and accelerated the following year when its largest decrease for more than a decade was observed. The EU's NEET rate stood at 11.7 % in 2022.

Map 4.3 provides an analysis of the situation across 236 NUTS level 2 regions (see the note under the map for more details concerning data coverage). There were 21 regions across the EU where at least one fifth of all young people aged 15–29 were neither in employment, nor in education or training in 2022; these regions are shaded in the darkest tone of teal. Some of the highest NEET rates were recorded in southern and eastern EU Member States, as well as the outermost regions of France. More narrowly, there were eight regions where more than one quarter of all young people were neither in employment, nor in education or training:

- four of these were located in Italy – Puglia (26.0 %), Calabria (28.2 %), Campania (29.7 %) and Sicilia (32.4 %);
- three were located in Romania – Centru (25.5 %), Sud-Est (25.6 %) and Sud-Vest Oltenia (28.3 %);
- however, the highest NEET rate was recorded in the French outermost region of Guyane, where more than one third (33.9 %) of all young people were neither in employment, nor in education or training.

There were 74 NUTS level 2 regions that reported a NEET rate in 2022 that was already below the EU's policy target of 9.0 % (to be reached by 2030); these are shown in Map 4.3 in golden tones. These regions were mainly concentrated in Belgium (7 out of 11 regions, principally located in the north), Denmark (four out of five regions), Germany (17 regions), the Netherlands (all 12 regions), Austria (six out of nine regions) and Sweden (all eight regions). At the lower end of the ranking, there were 11 NUTS level 2 regions that recorded a NEET rate of less than 5.0 %. All but one of these was located in the Netherlands; the only other was the southern Swedish region of Småland med öarna (4.4 %). The lowest rates were in Flevoland, Zuid-Holland, Noord-Brabant (all 3.8 %) and Overijssel (3.1 %).

**Map 4.3:** Share of young people neither in employment nor in education and training (NEET), 2022  
 (% , people aged 15–29, by NUTS 2 regions)



- EU = 11.7
- ≥ 20.0
- 15.0 – < 20.0
- 9.0 – < 15.0
- 7.5 – < 9.0
- 5.0 – < 7.5
- < 5.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: the EU has a policy target in this area, namely to reach a share of less than 9 % by 2030 (regions already having attained this target are shaded in gold). Niederbayern (DE22), Corse (FRM0) and Innlandet (NO02): 2021. Switzerland, Montenegro, North Macedonia and Türkiye: 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: edat\_lfse\_22)

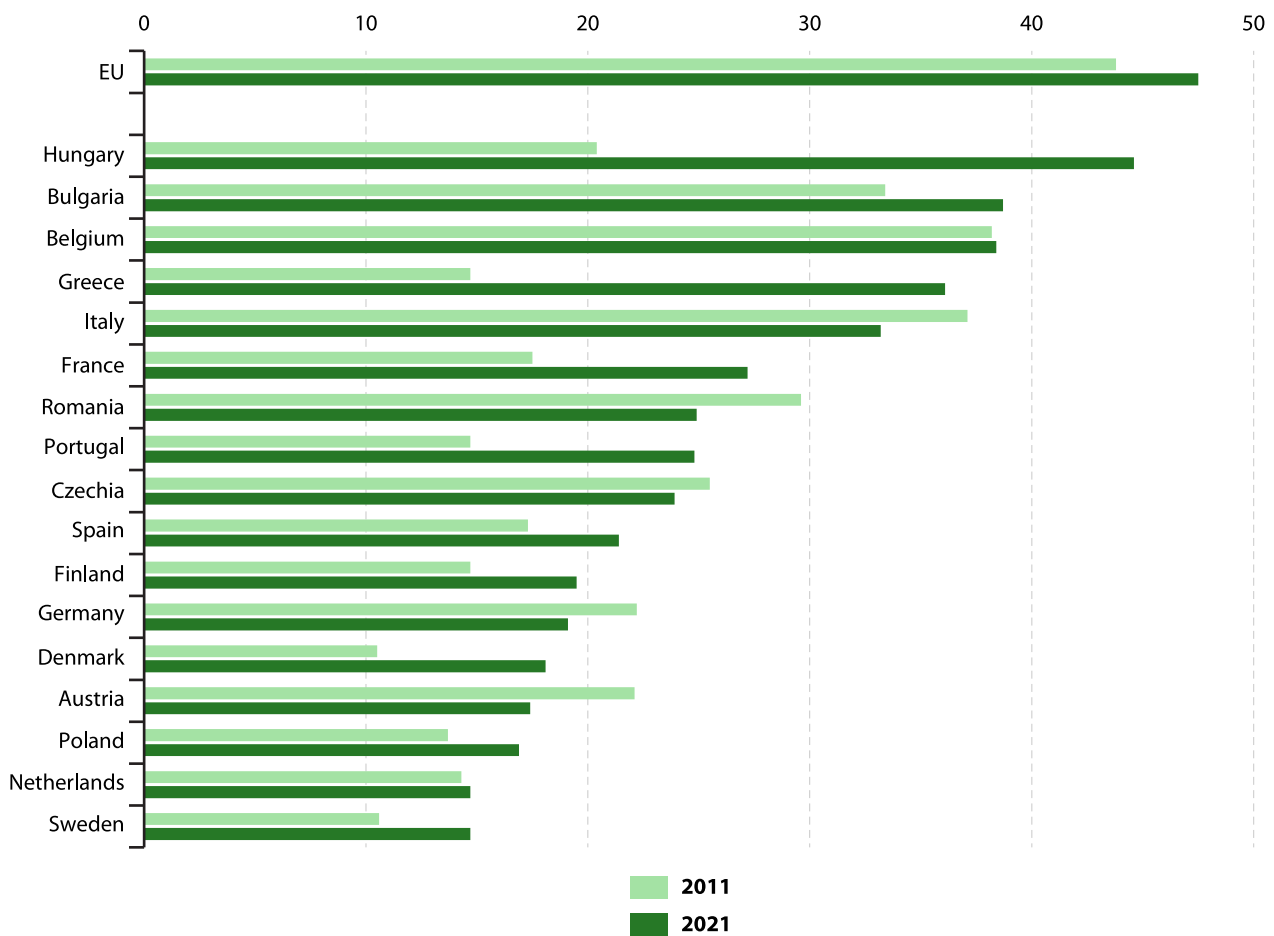
There were two other patterns apparent across most EU Member States.

- Capital city regions generally recorded lower than (national) average shares of young people who were neither in employment nor in education or training. The only exceptions (among multi-regional EU Member States) were Belgium, Austria, Germany and the Netherlands; the difference in the latter was minimal.
- Former industrial heartlands had some of the highest NEET rates in their territories. For example, the three highest rates in Belgium (leaving aside the capital region) were registered in Prov. Namur, Prov. Liège and Prov. Hainaut, while relatively high rates were also recorded in the northern French regions of Champagne-Ardenne, Picardie and Nord-Pas de Calais.

**The highest regional disparities for the NEET rate were recorded in Hungary**

The NEET rate can be used to analyse the share of young people who have not transitioned from education to employment. It is generally considered a more comprehensive measure than the unemployment rate, insofar as it is more closely linked to young people’s risk of social and labour exclusion. A population-weighted coefficient of variation provides one measure for comparing intra-regional disparities within individual EU Member States. In 2021, the highest regional disparities for the NEET rate – across NUTS level 2 regions – were recorded in Hungary, Bulgaria, Belgium, Greece and Italy. Within Hungary, the highest NEET rate was observed in Észak-Magyarország (17.7 %), which was three times as high as the lowest rate, which was recorded in the capital region of Budapest

**Figure 4.2: Regional disparities in the share of young people neither in employment nor in education and training (NEET), 2011 and 2021**  
(coefficient of variation in %, people aged 15–29, by NUTS 2 regions)



Note: as measured by population-weighted coefficient of variation for EU Member States with more than four NUTS 2 regions (Estonia, Ireland, Croatia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia: not applicable). Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [lfst\\_r\\_edatd\\_22](#))

(5.9 %). By contrast, the lowest regional disparities were observed in the Netherlands and Sweden. For the latter, the highest NEET rate was recorded in Östra Mellansverige (7.4 %), some 3.0 percentage points above the rate reported in Småland med öarna (4.4 %).

Economic crises tend to hit young people disproportionately, as young people are more likely to work with temporary and other forms of atypical contract that are easier to terminate. The EU's coefficient of variation for NEET rates across NUTS level 2 regions increased at a relatively fast pace between 2009 and 2013 – a period characterised by the impact of the global economic and financial crisis – from 37.9 % to 47.7 %. Between 2013 and 2018, regional disparities across the EU continued to widen – although at a slower pace. In 2019, there was a modest reduction in the EU's coefficient of variation, which was followed by a more marked decline a year later, likely reflecting the impact of the COVID-19 crisis. The EU's coefficient of variation for regional NEET rates increased once again in 2021, when it stood at 47.5 %.

Figure 4.2 shows that five EU Member States reported a narrowing of intra-regional disparities for the NEET rate during the period from 2011 to 2021; there was a modest pattern of convergence observed across the regions of Austria, Romania, Italy, Germany and Czechia. By contrast, regional disparities widened in all of the remaining Member States with more than four NUTS 2 regions; the most rapid increases were recorded in Hungary and Greece.

Maps 4.4–4.6 are presented for the subpopulation of people aged 25–64. This age group represents a cohort of individuals who have generally completed their education or training and are most likely to be actively participating in the labour market. As such, it excludes younger individuals who may still be studying, as well as older individuals who may be transitioning into or already in retirement.

An individual's level of educational attainment plays a key role when seeking employment. Persons with a tertiary level of educational attainment (as defined by ISCED 2011 levels 5–8) generally enjoy the most success when trying to find work and they also tend to be better shielded from the risks of unemployment than their peers with lower levels of attainment. In 2022, the EU employment rate for people aged 25–64 with a tertiary level of educational attainment was 87.4 %. The regional distribution was somewhat skewed: of the 241 NUTS level 2 regions for which data are available (no information for Mayotte in France), there were 146 – or 60.6 % of all regions – where the employment rate for people with a tertiary level of educational attainment was equal to or above the EU average.

### ***The highest regional employment rate for people with a tertiary level of educational attainment was observed in Região Autónoma dos Açores in Portugal ...***

At the top end of the distribution, there were 23 regions in the EU where the employment rate of people aged 25–64 with a tertiary level of educational attainment was at least 91.5 % in 2022 (as shown by the darkest shade of blue in Map 4.4). This group was largely concentrated in eastern EU Member States, with six regions located in Poland, five in Hungary, three in Romania and single regions from each of Bulgaria and Slovakia. It also featured three regions from Portugal, as well as Prov. Oost-Vlaanderen in Belgium, Sostinès regionas (the capital region of Lithuania), Niederbayern in Germany, and Malta. The highest rate was recorded in the Portuguese Região Autónoma dos Açores, at 94.7 %.

Across the EU Member States, the employment rate of people aged 25–64 with a tertiary level of educational attainment was generally higher than the national average in capital city regions. These regions often act as a magnet for highly-qualified people, exerting considerable 'pull effects' through the varied educational, employment and social/lifestyle opportunities that they offer. This was particularly the case in Croatia and Greece, as the employment rates for people with a tertiary level of educational attainment were at least 3.0 percentage points higher in their capital regions than their national average; relatively large gaps were also observed in Poland, Bulgaria, Lithuania and Slovakia. By contrast, the opposite pattern was observed in several western EU Member States – Belgium, Austria, Germany and the Netherlands – as their capital regions recorded relatively low employment rates for people with a tertiary level of educational attainment; this was also the case in Portugal.

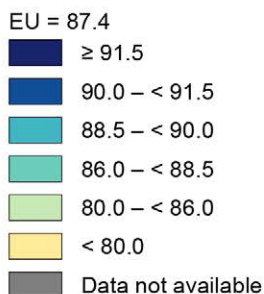
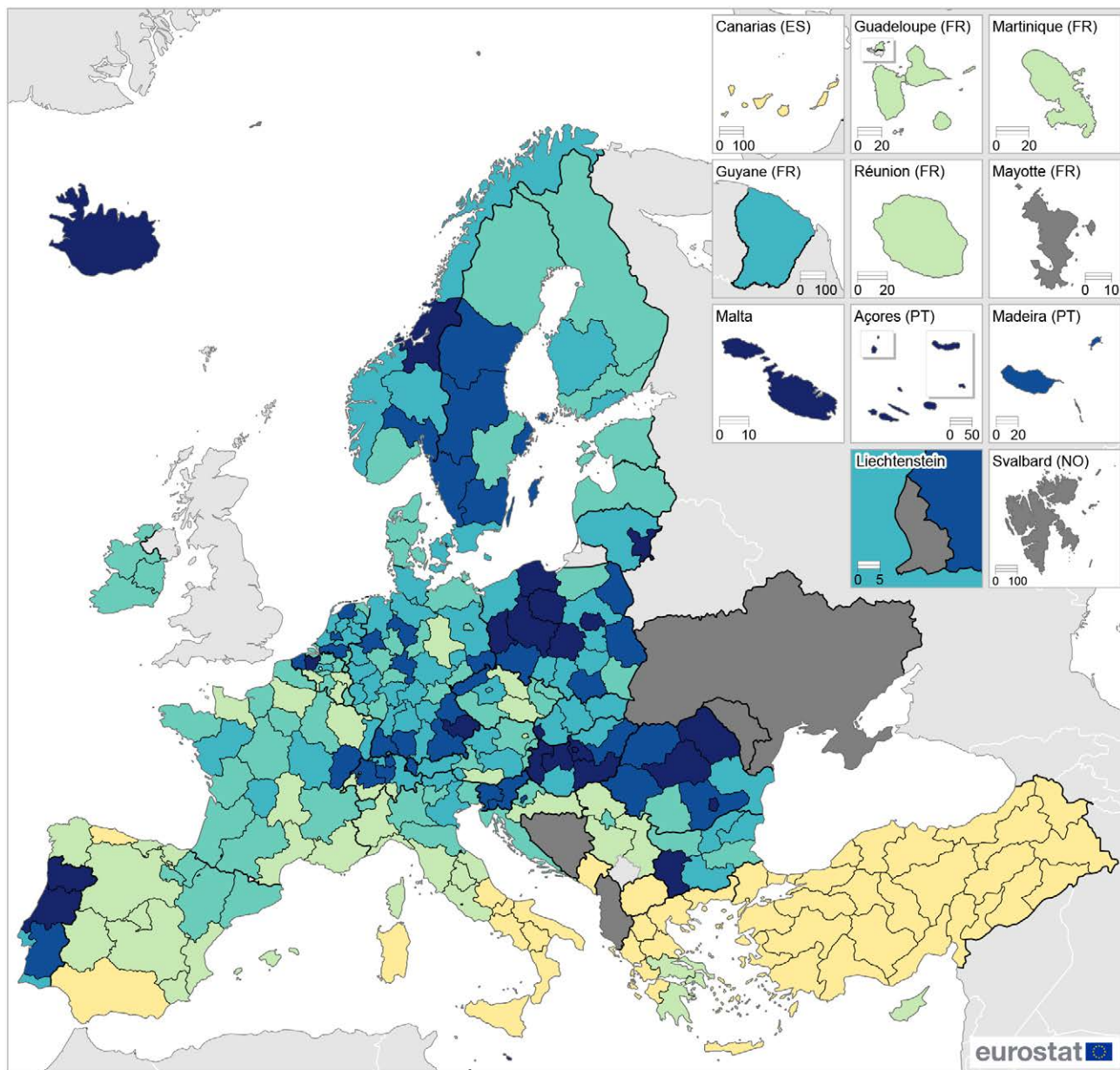
### ***... by contrast, the lowest rate was recorded in the Greek region of Dytiki Makedonia***

There were 22 NUTS level 2 regions where the employment rate of people aged 25–64 with a tertiary level of educational attainment was less than 80.0 % in 2022 (these regions are denoted by a yellow shade in Map 4.4). They were concentrated in southern EU Member States: 10 regions in Greece, eight regions in Italy and four regions in Spain. The lowest employment rate was recorded in the north-western Greek region of Dytiki Makedonia, at 69.0 %. The southern Italian region of Calabria was the only other region in the EU to report a rate that was below 70.0 %; there were three southern Italian regions and two regions in Greece with employment rates within the range of 70.0–75.0 %. Almost all of the 22 regions where less than 80.0 % of people aged 25–64 with a tertiary level of educational attainment were in employment were characterised as rural regions, with relatively large agricultural sectors and few employment opportunities for highly-skilled people.





**Map 4.4:** Employment rate of people with a tertiary level of educational attainment, 2022  
(%, people aged 25–64, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Note: Montenegro, North Macedonia and Türkiye, 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data codes: [lfst\\_r\\_lfsd2pop](#) and [lfst\\_r\\_lfe2eedu](#))



**Approximately one in five people with a tertiary level of educational attainment are over-qualified for the job they do**

*A New Skills Agenda for Europe* (COM(2016) 381 final) and the *European Skills Agenda for sustainable competitiveness, social fairness and resilience* (COM(2020) 274 final) defined EU policy priorities and actions to be undertaken to improve the anticipation, development and activation of skills. The European Year of Skills 2023 is designed to 'promote reskilling and upskilling, helping people to get the right skills for quality jobs'. Among their principal goals, these initiatives seek to ensure that the skills available in the labour market match those required by businesses and the economy.

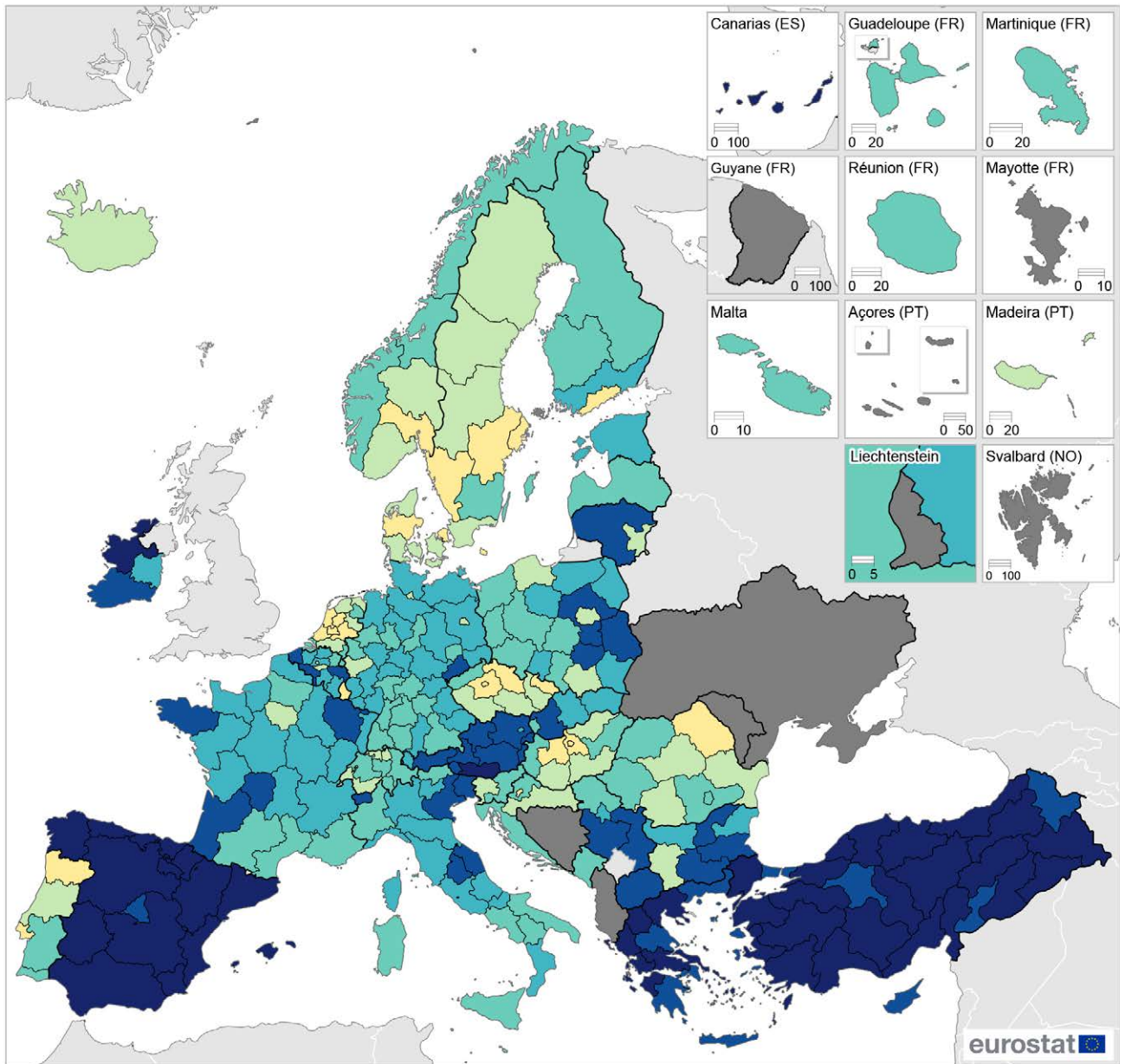
The gap between the demand for and supply of skills is referred to as the skills mismatch. Using data from the EU's labour force survey, Eurostat has established an experimental indicator for the over-qualification rate, which provides one means of analysing discrepancies between educational attainment levels and occupations. The over-qualification rate is defined as: the share of employed persons (aged 25–64) with a tertiary level of educational attainment (as defined by ISCED 2011 levels 5–8) who are employed in low or medium-skilled occupations for which a tertiary education is generally not required (as defined by major groups 4–9 of the [international standard classification of occupations \(ISCO-08\)](#)). Low or medium-skilled occupations include clerical support workers; service and sales workers; skilled agricultural, forestry and fishery workers; craft and related trades workers; plant and machine operators, and assemblers; elementary occupations. This indicator may be used to measure imbalances in labour markets. During periods characterised by labour shortages, enterprises that have difficulties in recruiting staff may have to scale down their qualification requirements in order to fill a post. By contrast, during periods that are characterised by an excess supply of labour, enterprises that have no difficulties in filling a post may choose to increase their qualification requirements.

In 2022, more than one fifth (21.7 %) of the EU's population aged 25–64 with a tertiary level of educational attainment who were employed were considered to be over-qualified. Of the 238 NUTS level 2 regions for which data are available (no data for Guyane and Mayotte in France, Região Autónoma dos Açores in Portugal or Åland in Finland), there were 107 regions (equivalent to 45.0 % of all EU regions) where the share was equal to or above the EU average. At the top end of the distribution, there were 26 regions where at least one third of this subpopulation was considered to be over-qualified (as shown by the darkest shade of blue in Map 4.5). The vast majority of these regions were concentrated in the southern EU Member States of Spain (17 regions) and Greece (seven regions); they were joined by the southern Austrian region of Kärnten and the Irish region of Northern and Western. The highest over-qualification rates were observed in the Greek island regions of Ionia Nisia (47.5 %) and Notio Aigaio (47.1 %), followed by the northern Spanish region of Cantabria (45.1 %) and the Spanish island region of Canarias (44.5 %). In Spain and Greece, it was commonplace to find rural regions recording some of the highest shares of over-qualified people, while more urban regions tended to have somewhat lower shares. In absolute terms, the biggest numbers of over-qualified people were reported in three Spanish regions – Cataluña (558 400), Andalucía (462 100) and Comunidad de Madrid (434 100) – and the French capital region of Ile-de-France (446 800).

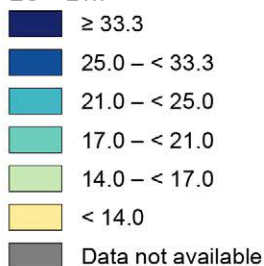
At the bottom end of the distribution, there were 23 NUTS level 2 regions where less than 14.0 % of people aged 25–64 with a tertiary level of educational attainment were considered to be over-qualified in 2022 (as shown by the yellow shade in Map 4.5). Most of these were capital city regions and/or regions characterised by relatively high standards of living. Although spread across 10 different EU Member States, they were concentrated in four Member States: five regions located in the Netherlands, four in Czechia and three in Hungary and Sweden. These 23 regions included the capital regions of the Netherlands, Finland, Portugal, Denmark, Hungary, Czechia, Croatia and Sweden, as well as Luxembourg (a single region at this level of detail). The lowest shares of over-qualified people were reported in Luxembourg (6.3 %) and the Swedish capital region of Stockholm (8.9 %).

**Map 4.5: Over-qualification rate – share of over-qualified people in the total number of employed people with a tertiary education, 2022**

(%, people aged 25–64, by NUTS 2 regions)



EU = 21.7



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: over-qualification is when people with tertiary educational attainment (ISCED levels 5-8) are employed as clerical support workers (ISCO 04), service and sales workers (ISCO 05), skilled agricultural, forestry and fishery workers (ISCO 06), craft and related trades workers (ISCO 07), plant and machine operators, and assemblers (ISCO 08) or in elementary occupations (ISCO 09). The denominator excludes persons who gave no response when asked about their occupation. Montenegro, North Macedonia and Türkiye, 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (labour force survey)





A recent communication from the European Commission, *Harnessing talent in Europe's regions* (COM(2023) 32 final), highlighted increasing global competition for talent (as many developed world economies are expected to face shrinking populations in the years to come). The communication identified demographic transformation as a cause for concern in a number of EU regions (for more information on population developments, see [Chapter 1](#)), with shrinking working-age populations and the potential departure of young and skilled workforces to other regions/territories leading to a talent development trap. It acknowledged these challenges may limit the capacity of some regions to build sustainable, competitive and knowledge-based economies, while regional disparities within the EU could be further exacerbated by other structural transformations, such as technological change or the transition to a climate-neutral economy.

With this in mind, the European Commission launched a talent booster mechanism in early 2023 with the aim of supporting EU regions that were affected by a decline in their working-age populations through training, retaining and attracting the people, skills and competences needed to address the demographic transition. It is the first key initiative contributing towards the European Year of Skills.

Employed people with high-skills are defined – for the purpose of this publication – as people aged 25–64 who are employed in the following occupations: managers; professionals; or technicians and associate professionals (ISCO-08 major groups 1–3). In 2022, there were approximately 80 million highly-skilled people employed across the EU; they accounted for 44.2 % of the total number of people employed aged 25–64.

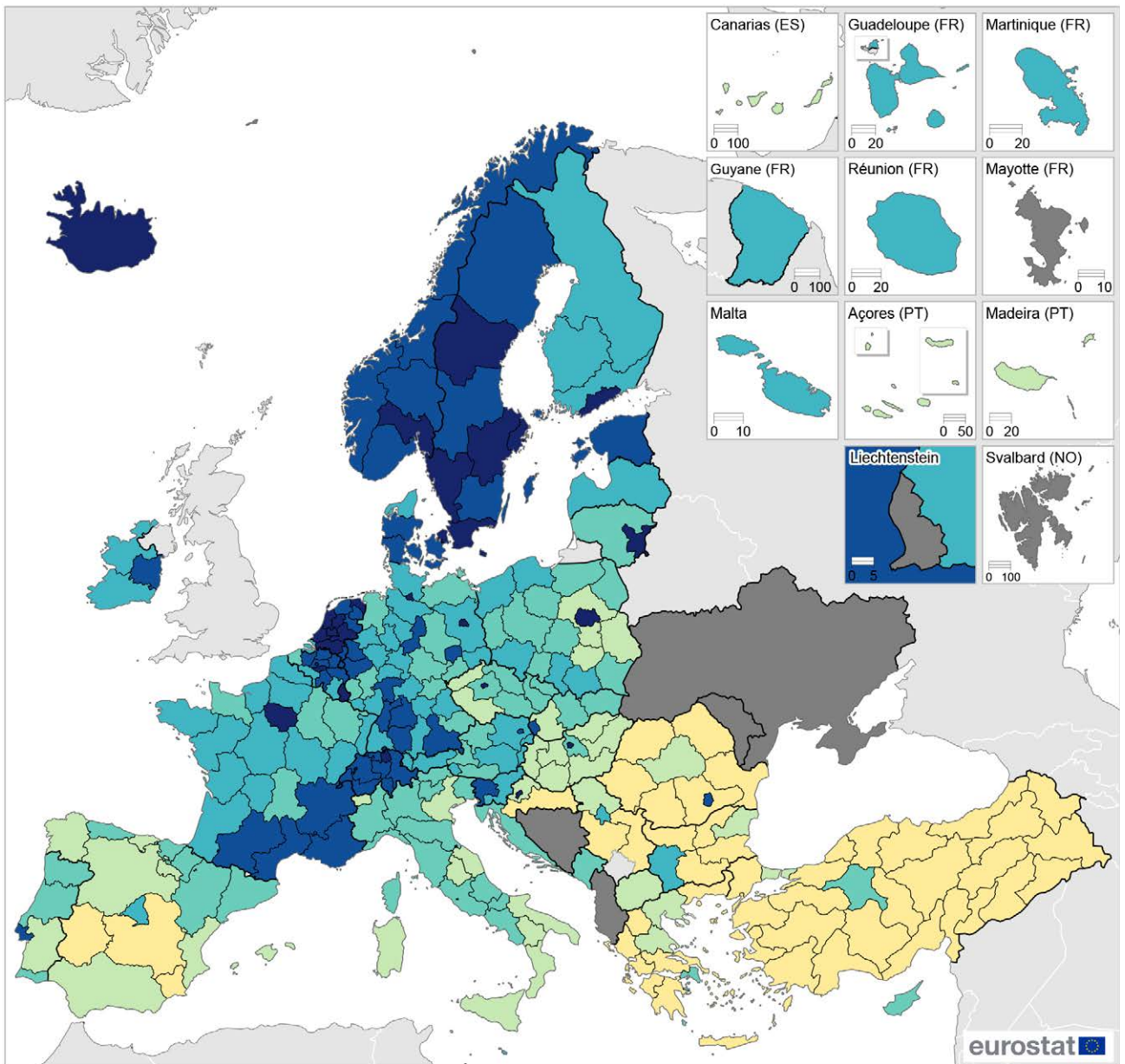
Map 4.6 shows the share of highly-skilled employed people for NUTS level 2 regions. In 2022, the regional distribution was somewhat skewed: 106 out of 241 regions for which data are available (no data for Mayotte in France) reported a share of highly-skilled employed people that was equal to or above the EU average. There were 53 regions across the EU where at least half of all employed persons aged 25–64 were considered to be highly-skilled. The highest shares of highly-skilled employed people were in capital regions and other urban regions: these regions tend to 'pull' highly-qualified individuals through a wide array of

job prospects in dynamic sectors of the economy and may also offer a diverse range of cultural and social opportunities. Looking in more detail, 12 out of the 14 regions across the EU with the highest shares of highly-skilled employed people were capital regions: the two exceptions were the Belgian Prov. Brabant Wallon (65.8 %) and the Dutch region of Utrecht (68.9 %). The capital regions of Belgium, France, Lithuania, Hungary, Finland, Germany, Poland, the Netherlands, Denmark and Czechia all reported shares within a relatively narrow range – from 62.6–65.6 %. A somewhat higher proportion of highly-skilled employed people was recorded in Luxembourg (a single region at this level of detail; 67.4 %), while a peak of 73.6 % was observed in the Swedish capital region of Stockholm. At the other end of the range, the lowest proportions of highly-skilled employed people among capital regions were recorded in the Greek capital region of Attiki (41.8 %) and the Italian capital region of Lazio (40.5 %); Cyprus (a single region at this level of detail) had a lower share (39.8 %).

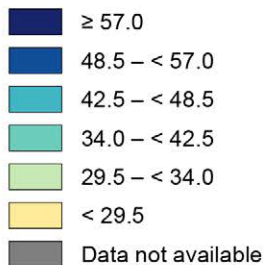
Many of the EU regions experiencing the impact of declining working-age populations and struggling to retain and attract highly-skilled individuals are rural regions. However, outermost and peripheral regions, as well as former industrial heartlands struggling with the transition to new industrial structures are also affected. This broad range of diverse regions may be collectively referred to as 'regions that have been left behind'. In 2022, there were 24 NUTS level 2 regions in the EU where highly-skilled employed people accounted for less than 29.5 % of total employment among those aged 25–64 (these regions are denoted by a yellow shade in Map 4.6). This group was principally concentrated in the south-eastern corner of Europe, with 10 regions in Greece, six in Romania, and four in Bulgaria; it also included three sparsely-populated regions in the southern half of Spain and Panonska Hrvatska in Croatia. The central Greek region of Sterea Elláda had the lowest regional share of highly-skilled employed people (21.8 %), closely followed by another Greek region – Ionia Nisia (22.3 %) – and the southern Romanian region of Sud-Muntenia (22.8 %). The lowest share of highly-skilled employed people among western EU Member States was recorded in the eastern French region of Lorraine (37.0 %), while the lowest share among northern EU Member States was recorded in the Lithuanian region of Vidurio ir vakarų Lietuvos regionas (40.0 %).



**Map 4.6: Highly-skilled employed people, 2022**  
 (% of people employed aged 25–64, by NUTS 2 regions)



EU = 44.2



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 06/2023

Note: highly-skilled employed people covers persons employed as managers (ISCO 01), professionals (ISCO 02), and technicians and associate professionals (ISCO 03). The denominator excludes persons who gave no response when asked about their occupation. Montenegro, North Macedonia and Türkiye, 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (labour force survey)



## Unemployment

Unemployment can have a bearing not just on the macroeconomic performance of a country (lowering productive capacity) but also on the well-being of individuals without work and their families. Rising unemployment results in a loss of income for individuals, increased pressure with respect to government spending on social benefits and a reduction in tax revenues. Furthermore, the personal and social costs of unemployment are varied and include a higher risk of [poverty](#) and social exclusion, debt or homelessness, while the stigma of being unemployed may have a potentially detrimental impact on (mental) health.

Within this section, data are presented for people aged 15–74; this is the standard age range employed by Eurostat and the [International Labour Organization \(ILO\)](#) for analyses of unemployment rates. Note also that contrary to what may be thought, the unemployment rate is not the direct opposite of the employment rate, since the two measures do not have the same denominator; the unemployment rate uses the active labour force and the employment rate uses the total population.

### **The EU unemployment rate was 6.2 % in 2022**

After six consecutive years of falling unemployment rates between 2013 and 2019 – from a peak of 11.6 % down to a low of 6.8 % – the EU’s unemployment rate among people aged 15–74 increased with the onset of the COVID-19 crisis. It rose 0.4 percentage points in 2020, with no change recorded the following year, as the pandemic continued to impact some parts of the economy. In 2022, there was a marked reduction in unemployment across the EU, as labour shortages became apparent in certain sectors of the economy and in several EU Member States characterised by tight labour markets. There were 13.3 million unemployed people in 2022, while the unemployment rate fell to 6.2 % (in other words, lower than it had been prior to the pandemic).

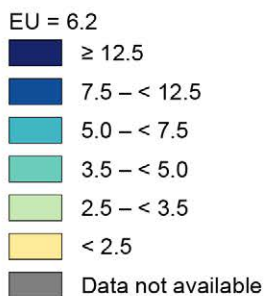
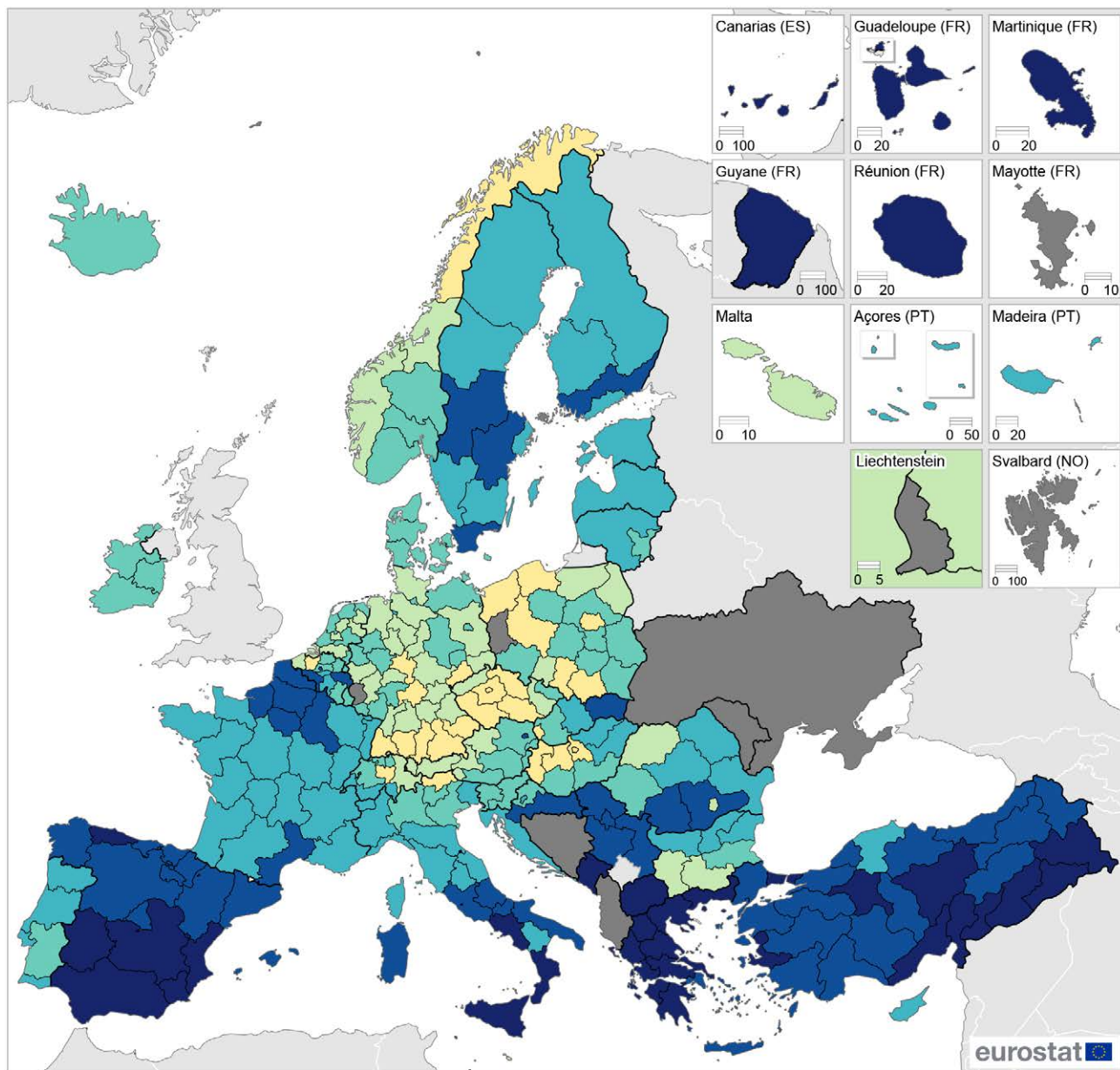
Map 4.7 shows unemployment rates across NUTS level 2 regions: the highest rates – as shown by the darkest shade of blue in the map – were principally recorded in southern and outermost regions of the EU. By contrast, the lowest rates – shown in yellow – were largely concentrated in a cluster of regions that stretched from Germany into Poland, Czechia and Hungary. The distribution of unemployment rates across NUTS level 2 regions exhibited a certain degree of skewness. There were 99 regions (out of 238 for which data are available; no recent data are available for Trier in Germany, Mayotte in France, Lubuskie in Poland or Åland in Finland) that had unemployment rates equal to or above the EU average of 6.2 %, while there were 139 regions that recorded rates below the EU average.

In 2022, there were 25 NUTS level 2 regions in the EU that reported unemployment rates of at least 12.5 %. They were concentrated in Greece and Spain (nine regions in each), four outermost regions of France, as well as three regions in southern Italy. The Spanish autonomous regions of Ciudad de Ceuta and Ciudad de Melilla were the only regions in the EU to record unemployment rates that were higher than 20.0 %. Leaving these aside, the next highest rate was also recorded in Spain, in the southern region of Andalucía (19.0 %).

There were 26 NUTS level 2 regions which recorded unemployment rates of less than 2.5 % in 2022. As noted above, they were largely concentrated in Germany, Poland, Czechia and Hungary; there were also relatively low unemployment rates in Provincia Autonoma di Bolzano/Bozen (northern Italy), Bratislavský kraj (the capital region of Slovakia) and Prov. Oost-Vlaanderen (northern Belgium). The lowest unemployment rates in the EU were recorded in the Czech regions of Střední Čechy (that surrounds the capital) and Praha (the capital region), at 1.2 % and 1.6 % respectively. There were six other regions that recorded unemployment rates below 2.0 %: Közép-Dunántúl in Hungary, two other regions in Czechia – Jihozápad and Jihovýchod, Niederbayern (2021 data) in southern Germany, and Pomorskie and Warszawski stołeczny in Poland (the latter being the capital region).



**Map 4.7: Unemployment rate, 2022**  
(% of labour force, people aged 15–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Note: Niederbayern (DE22), Oberpfalz (DE23) and Innlandet (NO02): 2021. Montenegro, North Macedonia and Türkiye: 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [lfst\\_r\\_lfur2gan](#))



### The highest regional disparities for unemployment rates were observed in Italy, Belgium and Austria

A population-weighted coefficient of variation provides one measure for comparing intra-regional disparities within EU Member States. Figure 4.3 shows that the highest regional disparities in 2021 for unemployment rates were recorded in Italy, Belgium and Austria (with coefficients higher than 50.0 %):

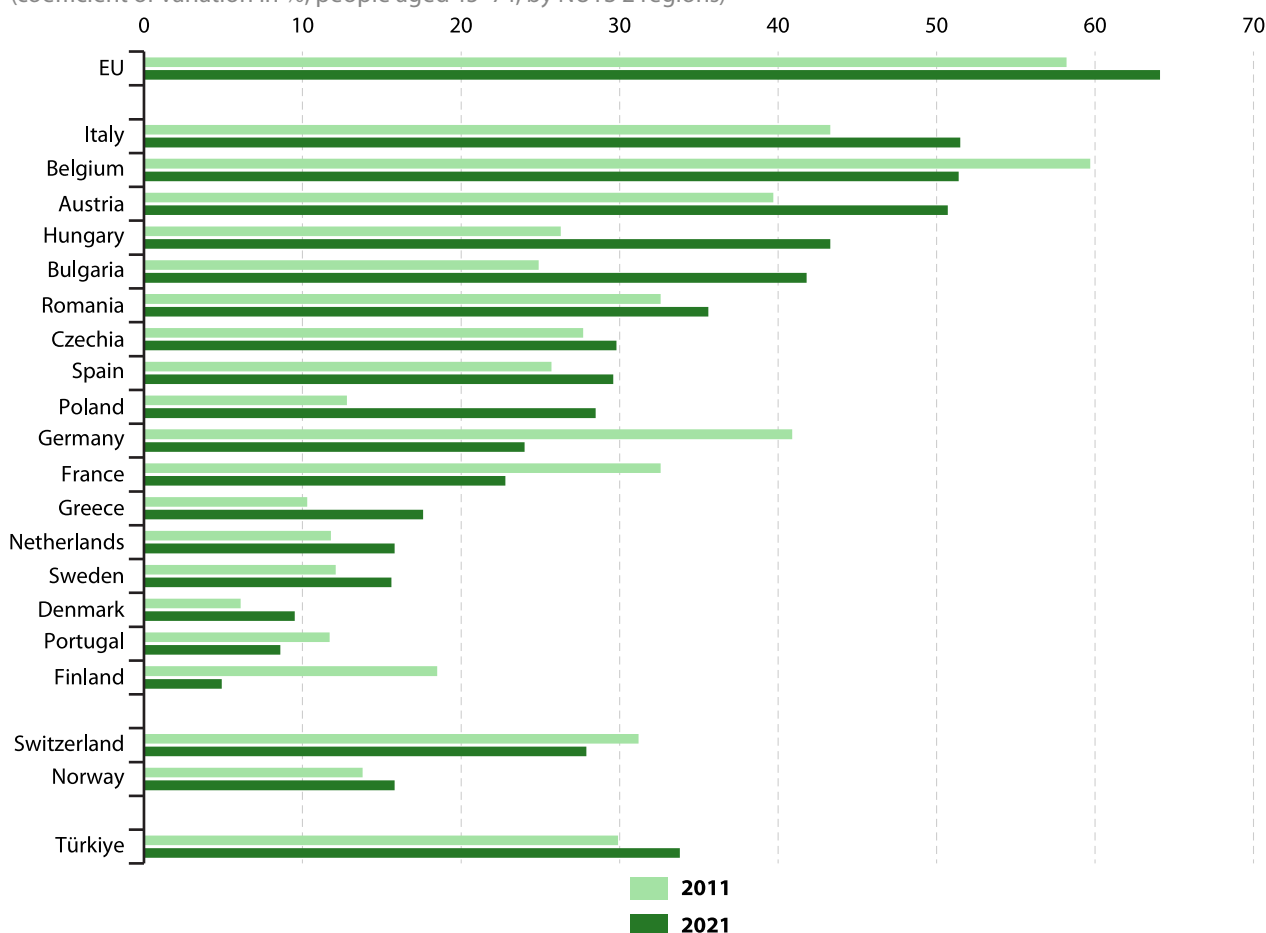
- in Italy, the highest regional unemployment rate was recorded in Campania (17.1 %) and the lowest in Provincia Autonoma di Bolzano/Bozen (2.3 %), with a clear north–south divide in regional unemployment rates;
- in Belgium, the highest regional unemployment rate was recorded in Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (11.4 %) and the lowest in Prov. Oost-Vlaanderen (2.0 %), with a clear divide in regional unemployment rates between the regions of Vlaams Gewest and those of Région wallonne;

- in Austria, the highest regional unemployment rate was recorded in Wien (9.2 %), which was more than twice as high as the next highest rate (4.5 % in Kärnten) and the lowest in Oberösterreich (2.9 %).

It is interesting to note that although the capital regions of Belgium and Austria are among the richest regions in the EU (in terms of GDP per inhabitant), they also paradoxically experienced relatively high unemployment rates and a higher risk of poverty and social exclusion. It should be noted that the data on GDP reflect where the GDP was generated, rather than the place of residence of workers that contributed to that GDP; as such, it is influenced by flows of commuters across regional borders.

At the other end of the range, the lowest regional disparities – with coefficients of variation below 10.0 % – were observed in Denmark, Portugal and Finland. For example, the highest regional unemployment rate in Finland was recorded in Etelä-Suomi (7.6 %) and the lowest in Länsi-Suomi (6.3 %).

**Figure 4.3: Regional disparities in unemployment rates, 2011 and 2021**  
(coefficient of variation in %, people aged 15–74, by NUTS 2 regions)



Note: as measured by population-weighted coefficient of variation for EU Member States with more than four NUTS 2 regions (Estonia, Ireland, Croatia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia: not applicable). Türkiye: 2020 instead of 2021. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [fst\\_r\\_lmdur](#))





## 4 Labour market

Figure 4.3 also shows there was an increase in regional disparities for unemployment rates across the whole of the EU between 2011 and 2021, as the coefficient of variation rose from 58.2 % to 64.1 %. During the period under consideration, double-digit percentage point increases were recorded in Hungary, Bulgaria, Poland and Austria, as their regional disparities widened. By contrast, regional unemployment rates in Germany and Finland converged at a relatively rapid pace.

Unemployment statistics – based on the share of the labour force without work but looking for and being available to work – may underestimate the overall demand for employment, as besides unemployed people, there are other groups who may be interested in extending their working hours or returning to the labour force. To better reflect this potential demand, an indicator for labour market slack has been developed. This takes account of i) unemployed people, ii) underemployed part-time workers (who want to work more), iii) people who are available to work but are not looking for work, and iv) people who are looking for work but are not immediately available to work. While the first two of these subpopulations form part of the labour force, the other two are outside it and may be considered as part of the potential additional labour force. Labour market slack is defined as the total unmet demand for employment, expressed in relation to the ‘extended labour force’, which includes: i) people in the labour force (unemployed and employed), and ii) people in the potential additional labour force (available to work but not seeking, and seeking work but not immediately available).

In 2022, labour market slack among people aged 15–74 across the EU amounted to 12.3 % of the extended labour force. Less than half of this figure (5.9 %; note that the denominator here is the extended labour force, not the labour force) corresponded to unemployed people, while 3.0 % were available to work but not seeking, 2.6 % were underemployed persons working part-time, and 0.8 % were seeking work but not immediately available.

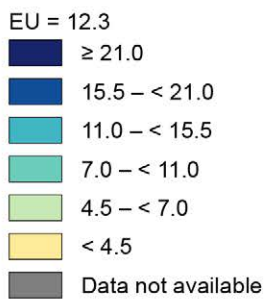
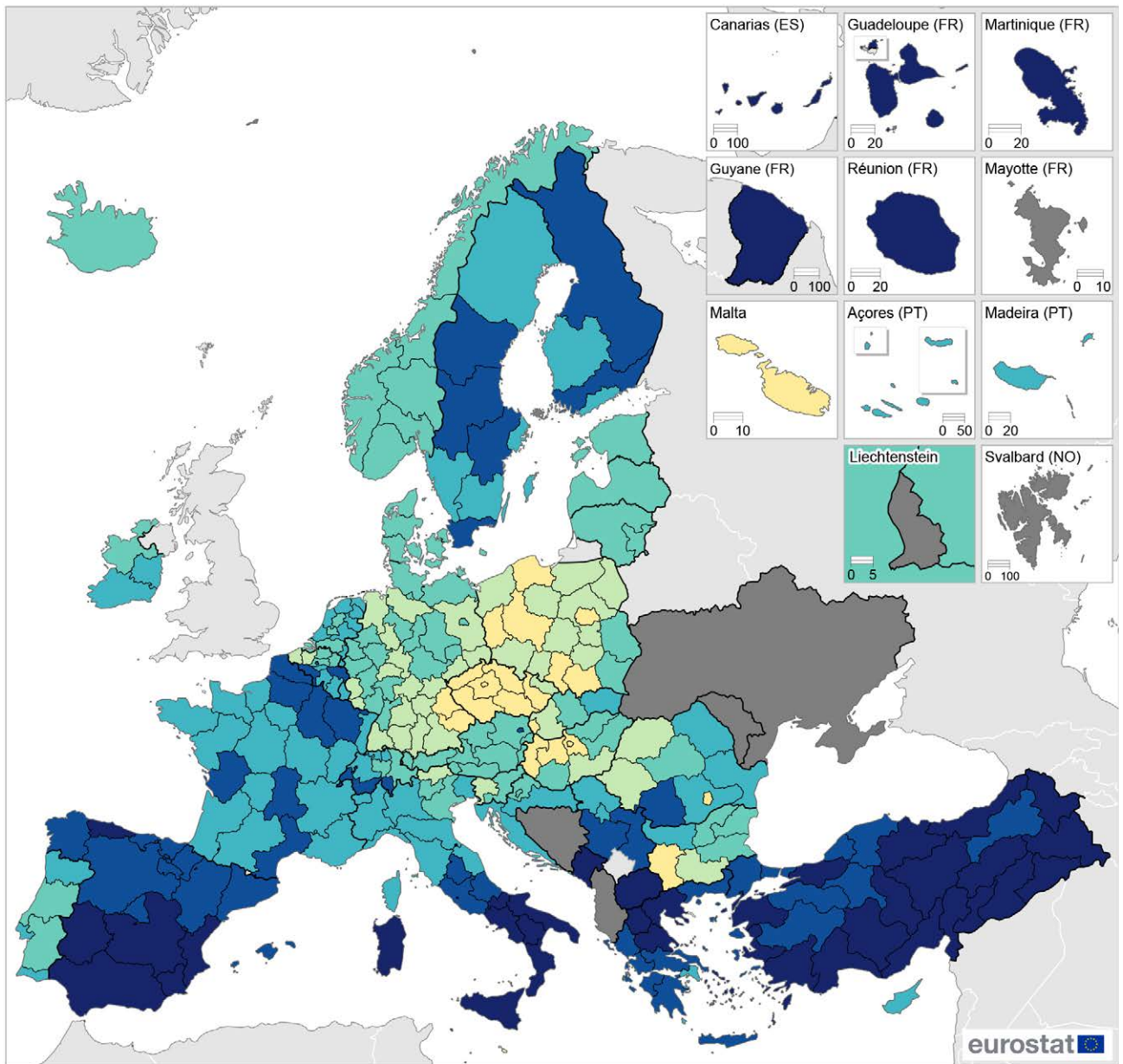
Map 4.8 shows labour market slack for NUTS level 2 regions. As for the unemployment rates shown in Map 4.7, its regional distribution was somewhat skewed, insofar as 140 out of 240 regions (no recent data available for Mayotte in France and Åland in Finland) reported shares below the EU average, with the remainder (41.7 % of all regions) recording shares that were equal to or above the EU average. There was a stark spatial divide: unmet demand for employment accounted for a relatively high share of the extended labour force in several of the southern EU Member States and outermost regions, while labour market slack contributed a relatively low share of the extended labour force in most eastern EU Member States.

The highest shares of labour market slack – at least 21.0 % of the extended labour force in 2022 – are shown by the darkest shade of blue in Map 4.8. They were concentrated in just four of the EU Member States: nine regions in Spain, seven regions in Italy, four regions in Greece, and four outermost regions of France. A peak of 38.9 % was recorded in Guyane (France) and Sicilia (Italy), while two more southern Italian regions – Campania and Calabria – and the autonomous Spanish region of Ciudad de Ceuta also recorded shares that were above 35.0 %.

At the other end of the range, the lowest levels of labour market slack – less than 4.5 % of the extended labour force – are shown in the lightest shade of yellow in Map 4.8. These 23 regions were concentrated across eastern EU Member States and included the capital regions of Bulgaria, Czechia, Hungary, Poland, Romania and Slovakia. This group also included Malta and two regions located in southern Germany – Oberpfalz and Niederbayern. The lowest share was observed in the Czech region of Střední Čechy, at 1.5 %, while there were five other regions where labour market slack accounted for less than 3.0 % of the extended labour force:

- three were located in Czechia, Jihozápad, Jihovýchod and the capital region of Praha;
- the Slovak capital region of Bratislavský kraj;
- the western Polish region of Lubuskie.

**Map 4.8: Labour market slack, 2022**  
 (% of extended labour force, people aged 15–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 05/2023

Note: Montenegro, North Macedonia and Türkiye, 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: [lfst\\_r\\_sla\\_ga](#))

## 5. Living conditions

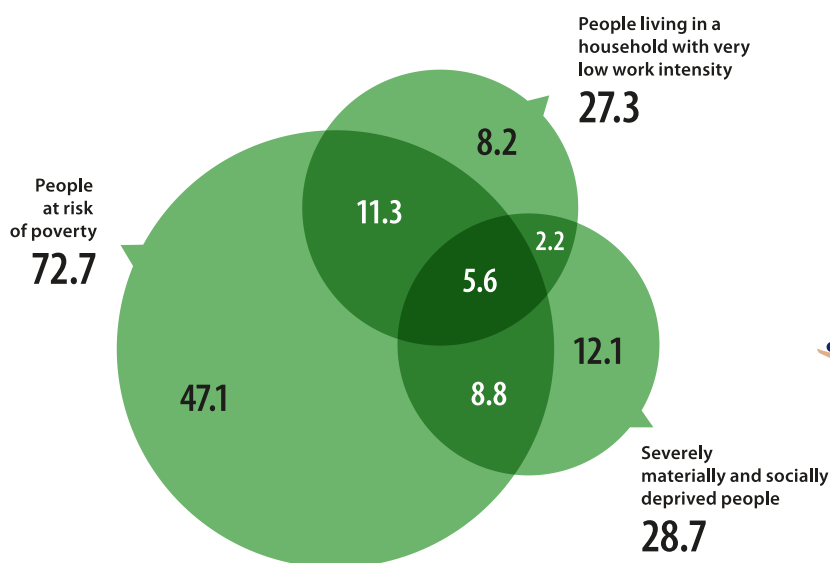
By global standards, most people living in the **European Union (EU)** are relatively prosperous. This likely reflects the EU's high income/wealth levels and its network of established **social protection** systems that provide a safety net for many of the less fortunate. Nevertheless, 95.3 million people in the EU (21.6 % of the population) were **at risk of poverty or social exclusion** in 2022 (see the infographic below for more information).

Sociodemographic characteristics like age, educational attainment, sex, country of birth / citizenship can play an important role in shaping an individual's living conditions. Wider societal developments, such as the impact of globalisation, coupled with unexpected shocks – for example, the global financial and economic crisis, the COVID-19 crisis, the impact of Russian military aggression against Ukraine, or the cost-of-living crisis – can also have a considerable impact. In some cases, these events can rapidly undo long-term decreases in inequality, thereby reinforcing or exacerbating patterns of inequality and exclusion.

Having shown signs of a gradual fall in inequality prior to the COVID-19 pandemic, the crisis reinforced some of the well-established inequalities in living conditions both between and within individual EU Member States. While some people were fortunate enough to continue working full-time from home (and in some cases were even able to save more of their income

than usual), frontline and key workers faced increased health risks. Many people in precarious employment or working in sectors/businesses impacted by successive lockdowns faced reduced wages/earnings, short-time work (furlough schemes / temporary lay-offs / technical unemployment) and unemployment. Indeed, the asymmetric impact of the crisis was such that it may have exacerbated existing inequalities, with vulnerable groups in society being disproportionately impacted.

For more than a year, people in the EU have witnessed a considerable increase in the cost of living. Rising prices for goods like energy and food are felt across all socioeconomic groups. However, they tend to have a greater impact on the poorest individuals in society, as they usually allocate a larger proportion of their disposable income to such 'essential goods'. The EU's annual inflation rate accelerated from 0.7 % in 2020 to 9.2 % by 2022. This surge in prices experienced across the EU can be attributed, at least in part, to Russia's military aggression against Ukraine. For example, the price of natural gas and oil increased as a result of concerns over supply shortages (with international sanctions placed on Russian energy exports), while foodstuffs and fertilisers also saw their prices rise, as the export capacity of Ukraine and Russia was reduced (reflecting, at least in part, the impact of war). Another contributing factor to rising inflation was a post-pandemic surge in demand for a number of relatively scarce products/materials.



(million, EU, 2022)

Source: Eurostat (online data code: ilc\_pees01n)

## People at risk of poverty or social exclusion

There are two ways that poverty can be measured. According to the United Nations, absolute poverty is the deprivation of basic human needs, for example, a lack of food, shelter, water, sanitation facilities, health or education (in other words, where a household's income is insufficient to afford the basic necessities of life). By contrast, relative poverty concerns the situation where a household's income is below a certain percentage of the median household income of the country where they live (in other words, they do not have enough income to enjoy a 'normal' standard of living for the society in which they live).

The indicator for people at risk of poverty or social exclusion is based on a measures of relative poverty, severe material and social deprivation and quasi-joblessness. The number/share of people at risk of poverty or social exclusion (see the infographic at the start of this chapter) combines these three criteria covering people who are in at least one of the following situations:

- **at risk of poverty** – people with an **equivalised disposable income** (after **social transfers**) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income;
- facing **severe material and social deprivation** – people unable to afford at least 7 out of 13 deprivation items (six related to the individual and seven related to the household) that are considered desirable (or even necessary) to lead an adequate quality of life;
- **living in a household with very low work intensity** – where working-age adults (aged 18–64, excluding students aged 18–24 and those who are retired) worked for 20 % or less of their combined potential working time during the previous 12 months.

On 4 March 2021, the [European Commission](#) set out its ambition for a stronger social EU to focus on education, skills and jobs, paving the way for a fair, inclusive and resilient socioeconomic recovery from the COVID-19 crisis, while fighting discrimination, tackling poverty and alleviating the risk of exclusion for vulnerable groups. [The European Pillar of Social Rights Action Plan](#) outlines a set of commitments from policymakers and provides three key targets for monitoring progress. One of these targets is to reduce the number of people in the EU at risk of poverty or social exclusion between 2019 and 2030 by at least 15 million persons (of which, at least five million should be children).

### **Some 21.6 % of the EU population was at risk of poverty or social exclusion in 2022**

Map 5.1 shows the regional distribution of people at risk of poverty or social exclusion for NUTS level 2 regions.

Note that the statistics presented for Belgium and Serbia relate to level 1 regions and that only national data are available for Germany, France, Austria and Türkiye. In 2022, the regional distribution of the share of people at risk of poverty or social exclusion was somewhat skewed, as approximately two fifths of all regions in the EU (66 out of the 163 for which data are available) recorded shares above the EU average. Given that the national averages for Germany, France and Austria are all below the EU average, it is possible that the regional distribution would be even more skewed if regional data were available for these three EU Member States.

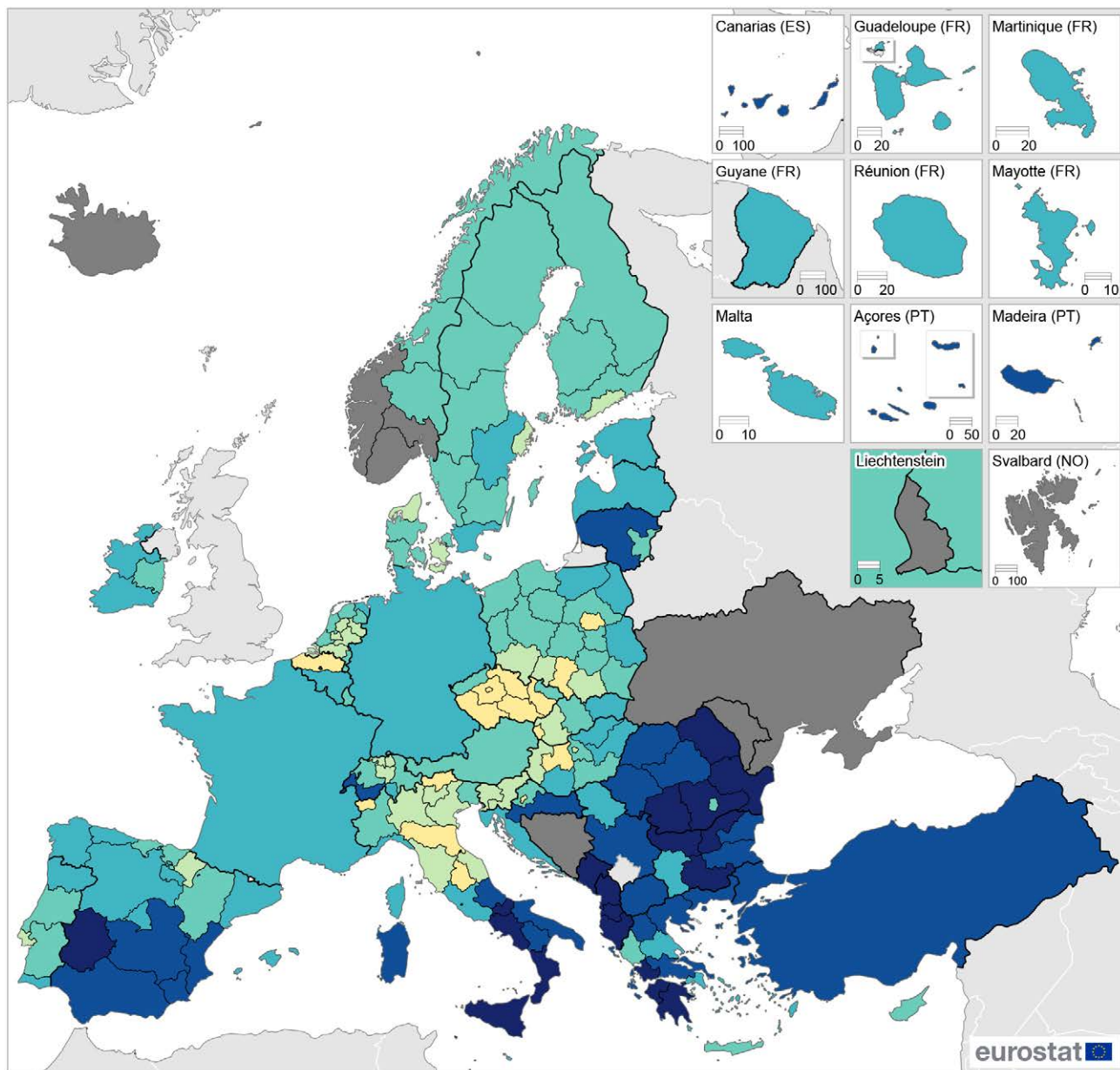
At the top end of the ranking, there were 17 regions across the EU where the share of people at risk of poverty or social exclusion was at least 36.5 % in 2022; they appear in the darkest shade of blue in Map 5.1. Most of this group was composed of regions located in Bulgaria, Greece or Romania, or regions located in southern parts of Spain and Italy. Sud-Est in Romania (46.9 %) and Campania in southern Italy (46.3 %) had the highest shares. They were followed by another Romanian and another southern Italian region, namely, Sud-Vest Oltenia (44.7 %) and Calabria (42.8 %). There were four more regions across the EU – Severozapaden (Bulgaria), Sicilia (Italy) and the two autonomous Spanish regions of Ciudad de Melilla and Ciudad de Ceuta – where more than two fifths of the population were at risk of poverty or social exclusion in 2022. Note that despite being one of the most affluent regions in the EU, more than one third (38.8 %) of the population was at risk of poverty or social exclusion in the Belgian Région De Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (NUTS level 1).

A low proportion of people were at risk of poverty or social exclusion in a cluster of regions principally spread across eastern EU Member States. In 2022, there were 16 regions where less than 12.0 % of the population were at risk of poverty or social exclusion; they are shown in a yellow shade. This group was concentrated in Czechia (six out of eight regions) and also included two regions of Poland, as well as single regions from Slovakia, Croatia and Hungary. The remainder of this group was composed of four regions located in northern and central Italy, as well as single (NUTS level 1) region from Belgium. Looking in more detail, there were five regions within the EU where less than 1 in 10 people were at risk of poverty or social exclusion in 2022:

- the Polish and Czech capital regions of Warszawski stołeczny (7.7 %) and Praha (8.9 %), the former recording the lowest share in the EU;
- the Italian regions of Valle d'Aosta/Vallée d'Aoste (8.6 %) and Emilia-Romagna (9.6 %); and
- Střední Čechy (8.7 %), which surrounds the Czech capital region.



**Map 5.1: People at risk of poverty or social exclusion, 2022**  
(%, by NUTS 2 regions)



- EU = 21.6
- ≥ 36.5
  - 26.5 – < 36.5
  - 20.0 – < 26.5
  - 15.5 – < 20.0
  - 12.0 – < 15.5
  - < 12.0
  - Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: Belgium and Serbia, NUTS level 1. Germany, France, Austria and Türkiye: national data. Länsi-Suomi (FI19) and Åland (FI20) are aggregated (same value for both regions). Switzerland, Montenegro, Serbia and Türkiye: 2021. Inlandet (NO02), Trøndelag (NO06), North Macedonia and Albania: 2020. Nord-Norge (NO07): 2019.

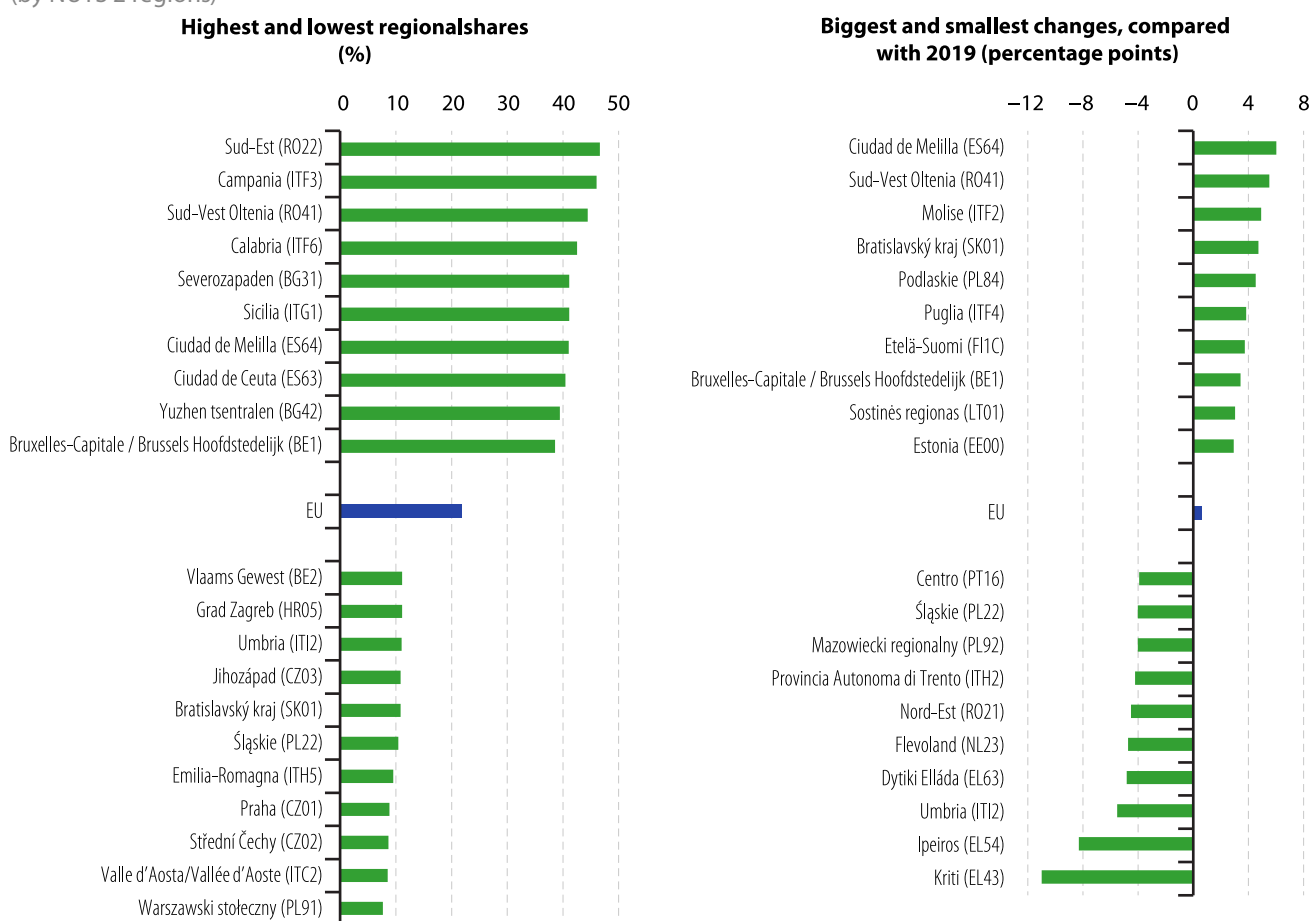
Source: Eurostat (online data codes: [ilc\\_peps11n](#) and [ilc\\_peps01n](#))

While living in a capital region may often appear an attractive proposition – better education and employment opportunities, enhanced infrastructure, improved public services and a broader range of cultural and social experiences – there are also challenges for people living in capital regions, such as higher living costs, increased competition, or a risk of isolation. People living in the capital regions of eastern EU Member States were less likely to be at risk of poverty or social exclusion than their counterparts living in the remainder of the country. For example, the proportion of people at risk of poverty or social exclusion across Poland (15.9 %) in 2022 was 2.1 times as high as the share recorded in its capital region of Warszawski stołeczny. A similar pattern was observed in Romania and in Croatia. In the former, the share of people at risk of poverty or social exclusion was 34.4 %, which was 1.8 times as high as the share recorded in the capital region of București-Ilfov (19.2 %). Almost one fifth (19.9 %) of the population in Croatia was considered to be at risk of poverty or social exclusion,

which was 1.8 times as high as the share recorded in the capital region of Grad Zagreb (11.2 %). This pattern was repeated, although to a lesser extent, in the other eastern EU Member States.

By contrast, the situation was reversed in three Member States. As already noted, the share of people at risk of poverty or social exclusion in the Belgian capital Région De Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (NUTS level 1) was relatively high, at 38.8 %; indeed, it was more than twice as high (2.1 times) as the national average for Belgium. While regional differences across Denmark and the Netherlands were modest, the Danish and Dutch capital regions of Hovedstaden and Noord-Holland also recorded above average shares of people at risk of poverty or social exclusion. Hovedstaden had the second highest share among the five regions of Denmark (behind Syddanmark), while Noord-Holland had the third highest share among the 12 regions of the Netherlands.

**Figure 5.1: People at risk of poverty or social exclusion, 2022**  
(by NUTS 2 regions)



Note: the first part of the figure shows the EU regions with the highest and lowest shares in 2022, while the second part shows the regions with the biggest and smallest changes compared with 2021. The rankings include more than 10 regions if several regions have identical values. Belgium: NUTS level 1. Germany, France and Austria: national data. Länsi-Suomi (FI19) and Åland (FI20) are aggregated (same value for both regions). Luxembourg and Finland: break in series.

Source: Eurostat (online data codes: [ilc\\_peps11n](#) and [ilc\\_peps01n](#))

Figure 5.1 identifies the EU regions with the highest and lowest shares of people at risk of poverty or social exclusion in 2022. It also shows the regions with the biggest changes in their respective shares between 2021 and 2022. Overall, there was no significant change across the EU, as the share of people at risk of poverty or social exclusion fell 0.1 percentage points from 21.7 % to 21.6 % during this period.

Across the 163 NUTS level 2 regions for which data are available (note that the statistics presented for Belgium relate to NUTS level 1 regions and that only national data are available for Germany, France and Austria), the share of people at risk of poverty or social exclusion rose in 71 regions between 2021 and 2022, remained unchanged in two regions and fell in 90. The six regions with the highest increases were all located in eastern or southern EU Member States: two regions in Italy, together with single regions from each of Spain, Romania, Slovakia and Poland. Leaving aside the atypical Spanish region of Ciudad de Melilla, the largest increase was recorded in the Romanian region of Sud-Vest Oltenia (up 5.6 percentage points).

The regions with the biggest falls in their respective shares of people at risk of poverty or social exclusion were (also) largely composed of regions located in eastern and southern EU Member States: three regions in Greece, two in Italy and in Poland, and single regions from each of Portugal and Romania; Flevoland in the Netherlands also had a large fall. The high level of regional variations observed in some eastern and southern EU Member States may reflect, at least to some degree, less comprehensive social safety nets, such that their shares of people at risk of poverty or social exclusion fluctuate more in line with underlying economic fortunes. Between 2021 and 2022, the biggest decrease in the share of people at risk of poverty or social exclusion was recorded in the Greek island region of Kriti, down 11.0 percentage points (from 28.8 % to 17.8 %).

## People at risk of poverty

The at-risk-of-poverty rate (after social transfers) is one of the three criteria used to identify people at risk of poverty or social exclusion. It identifies the proportion of the population who live in a household with an annual equivalised disposable income that is below 60 % of the national median. Note that at-risk-of-poverty rates do not measure poverty itself, rather they provide information on the share of the population with a level of income that is below a threshold which is set separately for each EU Member State.

The at-risk-of-poverty rate before social transfers measures a hypothetical situation where social transfers are absent; note that pensions, such as old-age and survivors' (widows' and widowers') benefits, are

counted as income (before social transfers) and not as social transfers. When comparing at-risk-of-poverty rates before and after social transfers it is possible to assess the impact and redistributive effects of welfare policies. These transfers cover assistance that is given by central, state or local institutional units and include, among other types of transfers, unemployment benefits, sickness and invalidity benefits, housing allowances, social assistance and tax rebates. Note that for statistics on income, the reference period generally refers to the calendar year before the year in which the survey took place.

In 2022, the reduction in the EU's at-risk-of-poverty rate due to the impact of social transfers was 9.0 percentage points, with a rate of 25.5 % before social transfers and 16.5 % after. There was a relatively clear geographical divide in terms of the redistributive impact of social transfers and the extent to which they reduce the risk of monetary poverty. These differences reflect, among other influences, historical, political, economic and cultural factors. Social transfers had a particularly high impact across regions of the **Nordic Member States**, Belgium and Ireland. By contrast, their impact was relatively low – in percentage point terms – across many regions of the **Baltic**, eastern and southern EU Member States.

Figure 5.2 is split into two parts: the left-hand side presents the regions in the EU with the highest and lowest at-risk-of-poverty rates before social transfers. Prior to social transfers, there were seven regions in the EU where upwards of two fifths of the population faced the risk of monetary poverty in 2022. The Italian region of Campania had the highest share (51.0 %) and was the only region in the EU where the risk of monetary poverty prior to social transfers impacted more than half of the population. The other six regions with rates above 40.0 % included four more regions from southern Italy – Sicilia, Calabria, Sardegna and Molise – as well as the capital region of Belgium and the Bulgarian region of Severozapaden.

After taking account of the redistributive impact of social transfers, none of the seven regions mentioned above reported that more than two fifths of their populations were at risk of monetary poverty. Nevertheless, all seven regions featured near the top of the ranking for those regions with the highest at-risk-of-poverty rates after social transfers (see the right-hand side of Figure 5.2). In 2022, Campania (37.1 %) and Sicilia (36.8 %) had the highest rates, while more than 3 in 10 people also continued to experience such a risk after social transfers in Calabria (34.5 %), Severozapaden (33.8 %), Sardegna (30.8 %) and Molise (30.5 %); this was also the case for one other region – Sud-Vest Oltenia in Romania (34.7 %). By contrast, social transfers played a greater role in reducing the risk of poverty in several Irish, Danish and Belgian regions:

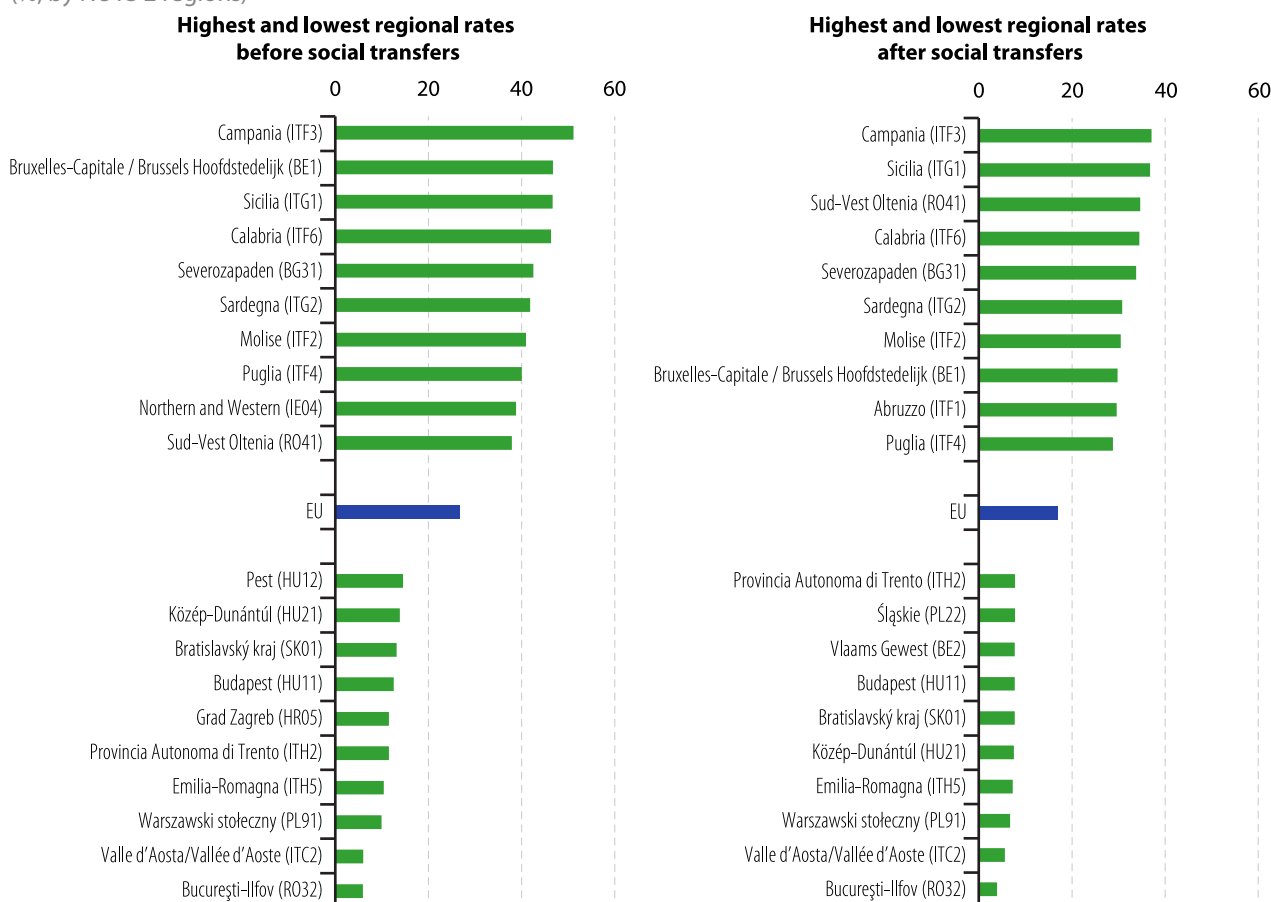
- the biggest reductions – in percentage point terms – were recorded in the Irish regions of Southern (down 21.1 points) and Northern and Western (down 18.9 points), while the capital region of Eastern and Midland also recorded a considerable fall (down 16.0 points);
- large reductions were recorded in two out of the three NUTS level 1 regions of Belgium, as the redistributive impact of social transfers was considerable in Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (down 16.8 percentage points) and in Région wallonne (down 16.3 points);
- in the Danish regions of Nordjylland and Midtjylland, the redistributive impact of social transfers was such that the share of the population facing the risk of poverty was reduced by 16.4 and 15.5 percentage points, respectively.

Looking in more detail at the EU regions with the lowest risks of monetary poverty (as shown in the bottom half of the right-hand chart), most were

characterised by a relatively low risk of monetary poverty both before and after the redistributive impact of social transfers. For example, in the Romanian capital region of Bucureşti-Ilfov, the at-risk-of-poverty rate stood at 5.9 % before social transfers; the impact of social transfers was to reduce the rate by 2.0 percentage points (to 3.9 %). There were four other regions in Romania – Centru, Nord-Vest, Sud-Est and Sud-Vest Oltenia – where the impact of social transfers led to a relatively small reduction in the risk of poverty (2.8–3.1 percentage points). There were six other regions where the redistributive impact of social transfers led to a reduction that was no greater than 3.1 percentage points:

- the Italian regions of Valle d'Aosta/Vallée d'Aoste and Emilia-Romagna;
- the Greek regions of Voreio Aigaio and Dytiki Makedonia;
- the Croatian regions of Grad Zagreb and Sjeverna Hrvatska.

**Figure 5.2: At-risk-of-poverty rate before and after social transfers, 2022**  
(%, by NUTS 2 regions)



Note: the first part of the figure shows the EU regions with the highest and lowest rates before social transfers, while the second part shows the regions with the highest and lowest rates after social transfers. Belgium and the Netherlands: NUTS level 1. Czechia, Germany, Spain, France, Austria and Portugal: national data.

Source: Eurostat (online data codes: [ilc\\_li10\\_r](#), [ilc\\_li41](#), [ilc\\_li10](#) and [ilc\\_li02](#))



## Material and social deprivation

Material and social deprivation refers to the enforced inability (rather than the choice not to do so) for people to afford five (or more) of the following items: to face unexpected expenses; to pay for one week annual holiday away from home; to pay rent, mortgage/house loan or utility bills; to eat meat, fish or an equivalent source of proteins every second day; to keep a home adequately warm; a car/van for personal use; to replace worn-out furniture; to replace worn-out clothes; at least two pairs of properly fitting shoes; to spend a small amount of money each week on themselves; to participate in a leisure activity; to get together with friends or family for a drink or meal at least once a month; an internet connection.

Note that the material and social deprivation rate is not one of the components used to compute the number/share of people at risk of poverty or social exclusion for the EU 2030 target on poverty and social exclusion. For that purpose, the severe material and social deprivation rate is used. It provides information on people experiencing an enforced lack of necessary and desirable items to lead an adequate life (individuals who cannot afford a certain good, service or social activity). It is defined as the proportion of the population experiencing an enforced lack of at least 7 out of 13 deprivation items (six related to the individual and seven related to the household). Regional data for the severe material and social deprivation rate should, in principle, be available for the next edition of the Eurostat regional yearbook.

In 2022, the share of people facing material and social deprivation in the EU stood at 12.7 %. This figure was 0.8 percentage points higher than a year before, which may be linked – at least to some degree – to the onset of the cost-of-living crisis.

***There were five regions in the EU where more than two fifths of the population experienced material and social deprivation: three were located in Romania and the other two in Greece***

Figure 5.3 shows the regional distribution of material and social deprivation rates. Note that the statistics presented in this section for Belgium, Italy and Serbia relate to level 1 regions and that only national data are

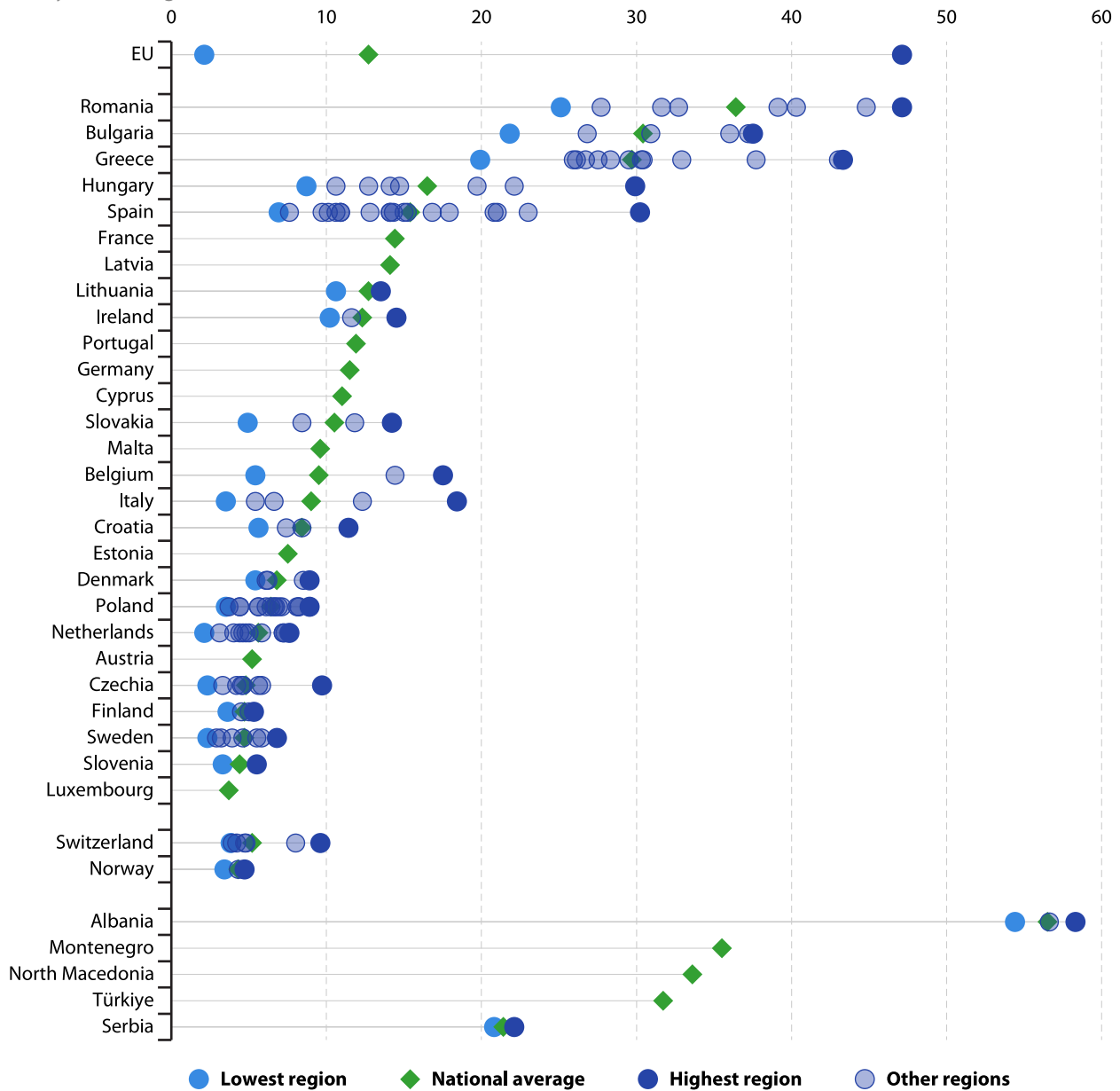
available for Germany, France, Austria, Portugal and Türkiye. Generally, material and social deprivation rates tended to be higher in the south-eastern part of the EU, whereas regions in the Nordic Member States had some of the lowest rates.

In 2022, the highest regional shares of people experiencing material and social deprivation were recorded in Sud-Est in Romania (47.1 %). There were four other regions in the EU where more than two fifths of the population were unable to afford at least five of the material and social deprivation items: Sud-Muntenia and Nord-Est (both in Romania); Dytiki Elláda and Peloponnisos (both in Greece). There were a further 12 regions across the EU where the share of people experiencing material and social deprivation was higher than 30.0 %: they were concentrated in southern and eastern EU Member States, with four regions in each of Bulgaria and Greece, three regions in Romania, and a single region from Spain.

At the other end of the distribution, every region in the Nordic Member States, Czechia, Estonia, Croatia, Cyprus, Luxembourg, Malta, the Netherlands, Poland and Slovenia had a material and social deprivation rate that was less than the EU average of 12.7 % in 2022; this was also the case in Germany, Austria and Portugal (for which only national data are available). There were four regions in the EU where the material and social deprivation rate was less than 3.0 %: Mellersta Norrland and Övre Norrland (both in Sweden), Střední Čechy (Czechia) and Zeeland (in the Netherlands). Zeeland recorded the lowest material and social deprivation rate in the EU, at 2.1 %.

Greece, Spain, Romania and Hungary were characterised by considerable inter-regional differences in material and social deprivation rates. The range between the highest and lowest regional rates in each of these EU Member States was greater than 20.0 percentage points. The largest range was recorded in Greece (23.4 points), with its highest material and social deprivation rate observed in Dytiki Elláda and its lowest in Ipeiros. By contrast, there were six Member States where inter-regional differences were less than 5.0 percentage points: this was the case in Sweden, Ireland, Denmark, Lithuania, Slovenia and Finland. The latter recorded the smallest range (1.7 points), with its highest material and social deprivation rate observed in Helsinki-Uusimaa and its lowest in Pohjois- ja Itä-Suomi.

**Figure 5.3: Material and social deprivation rate, 2022**  
(%, by NUTS 2 regions)



Note: Belgium, Italy and Serbia, NUTS level 1. Germany, France, Austria, Portugal and Türkiye: national data. Länsi-Suomi (F19) and Åland (F120) are aggregated (same value for both regions). Switzerland, Montenegro, Serbia and Türkiye: 2021. Innlandet (NO02), Trøndelag (NO06), North Macedonia and Albania: 2020. Nord-Norge (NO07): 2019. All other regions in Norway: not available.

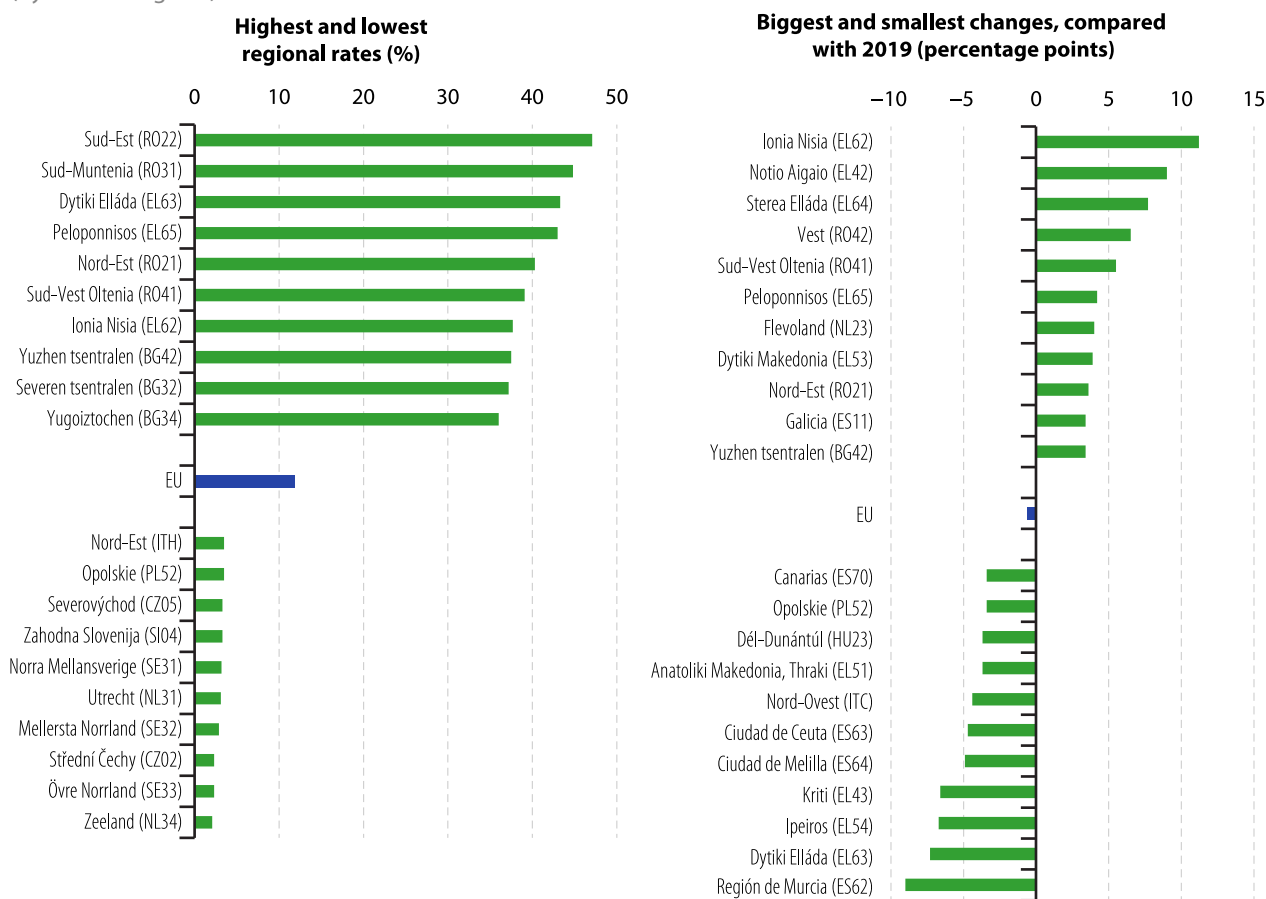
Source: Eurostat (online data codes: ilc\_mdsc08 and ilc\_mdsc07)

The EU's material and social deprivation rate was 0.8 percentage points higher in 2022 than in 2021. During this period, the material and social deprivation rate rose in approximately three fifths of EU regions (80 out of the 141 for which data are available). Among these 80 regions, some of the largest increases in material and social deprivation rates were concentrated in Greece. The biggest was observed in the island region of Ionia Nisia, where the rate increased 11.2 percentage points; it was the only region in the EU to record a double-digit increase. Another popular Greek holiday destination, Notio Aigaio, had the next highest increase (up 9.0 points). There were three more regions in the EU where the material and social deprivation rate increased by at least 5.0 percentage points; this was also the case in the

Greek region of Sterea Elláda, and the Romanian regions of Vest and Sud-Vest Oltenia.

The largest decrease recorded across EU regions for the material and social deprivation rate – down 9.0 percentage points between 2021 and 2022 – was reported in the southern Spanish Región de Murcia, where the rate fell from 21.8 % to 12.8 %. The next largest reduction was recorded in the Greek region of Dytiki Elláda (down from 50.6 % to 43.3 %, a reduction of 7.3 points). There were only two other regions across the EU where the material and social deprivation rate fell by at least 5.0 percentage points between 2021 and 2022 – Ipeiros and Kriti (both in Greece).

**Figure 5.4: Material and social deprivation rate, 2022**  
(by NUTS 2 regions)



Note: the first part of the figure shows the EU regions with the highest and lowest rates in 2022, while the second part shows the regions with the biggest and smallest changes compared with 2021. The rankings include more than 10 regions if several regions have identical values. Belgium and Italy: NUTS level 1. Germany, France, Austria and Portugal: national data. Länsi-Suomi (FI19) and Åland (FI20) are aggregated (same value for both regions). Luxembourg: break in series.

Source: Eurostat (online data codes: [ilc\\_mdsc08](#) and [ilc\\_mdsc07](#))

## Income distribution

Gross domestic product (GDP) per inhabitant has traditionally been used to assess regional divergence/convergence in overall living standards. As well as not accounting for income paid/received across borders, it does not capture the distribution of income within a population and thereby does little to reflect economic inequalities. The unequal distribution of income/wealth has gained increasing importance in political and socioeconomic discourse since the global financial and economic crisis and is also a key issue when analysing regions that have been 'left behind', or the impact of the cost-of-living-crisis. Note that for statistics on income, the reference period generally refers to the calendar year before the year in which the survey took place.

The income quintile share ratio (S80/S20 ratio) measures the inequality of income distribution. It is calculated as the ratio between the share of income received by the 20 % of the population with the highest income (the top quintile) and the share of income received by the 20 % of the population with the lowest income (the bottom quintile). High values for this ratio suggest that there are considerable disparities in the distribution of income between upper and lower income groups. In 2022, the EU's ratio was 4.7 – in other words, the collective income received by the 20 % of people with the highest incomes was 4.7 times as high as the collective income received by the 20 % with the lowest incomes.

Map 5.2 shows the regional distribution of the income quintile share ratio. Note that the statistics presented for Belgium, the Netherlands and Serbia relate to level 1 regions and that only national data are available for Czechia, Germany, Spain, France, Austria, Portugal and Türkiye. In 2022, the regional distribution of the income quintile share ratio was skewed: almost two thirds (78 out of 124) of those regions for which data are available had a ratio that was below the EU average; there were two regions that had the same ratio, while just over one third (44 regions) had income disparities that were greater than the EU average.

### ***The highest income quintile share ratio was recorded in the Romanian region of Sud-Vest Oltenia***

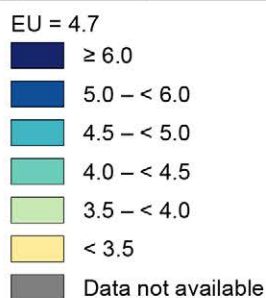
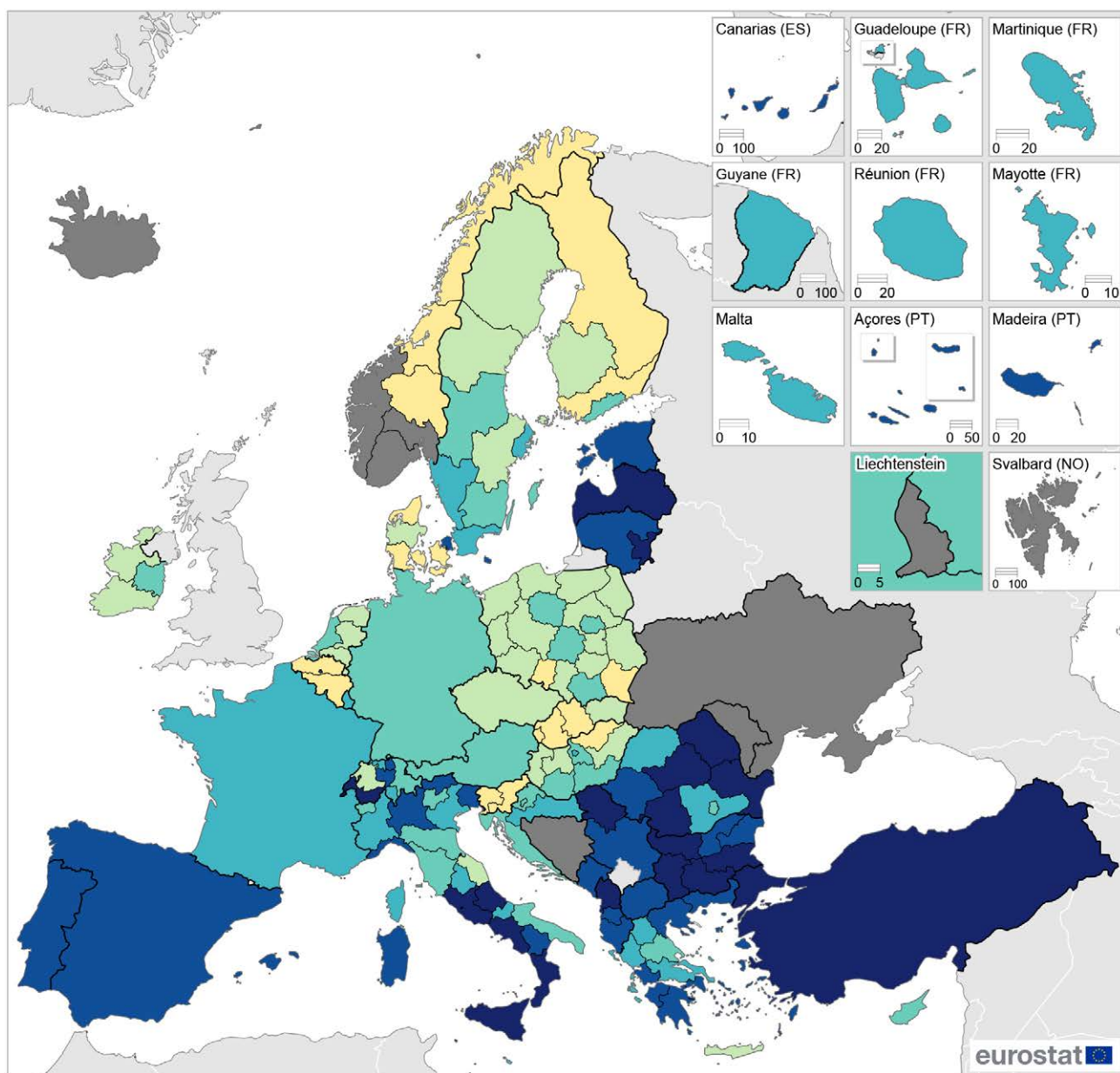
Across the whole of the EU, the highest income quintile share ratios in 2022 were concentrated in Bulgaria, Italy, Romania and the Baltic Member States. A peak was recorded in the Romanian region of Sud-Vest Oltenia, where the income of the top 20 % of earners was 9.6 times as high as the income of the bottom 20 % of earners. The next highest ratios were observed in two regions of Bulgaria – Severozapaden (8.2) and the capital region of Yugozapaden (7.9) – followed by the southern Italian region of Calabria (7.5).

At the other end of the range, the distribution of income was most equitable in three different regional clusters: in 2022, there was a group of regions that spanned several of the eastern EU Member States, a group in the Nordic Member States, and two out of the three NUTS level 1 regions of Belgium (the exception being the capital region). The income shares held by the highest earning 20 % of the population in the Slovak regions of Bratislavský kraj, Stredné Slovensko and Západné Slovensko were 2.7–3.0 times as high as those held by the lowest earning 20 % of the population; these were the lowest income quintile share ratios across the EU.

Within multi-regional EU Member States, the distribution of income often followed a different pattern in the capital region when compared with the rest of each territory. In 2022, it was commonplace to find that the capital region had the highest income quintile share ratio. This was the case in Belgium (NUTS level 1), Denmark, Ireland, Lithuania, Hungary, Slovenia, Finland and Sweden. By contrast, this pattern was reversed in Romania, as its lowest income quintile share ratio was recorded in the capital region of București-Ilfov.



**Map 5.2: Income quintile share ratio (S80/S20), 2022**  
(ratio, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: Belgium, the Netherlands and Serbia, NUTS level 1. Czechia, Germany, Spain, France, Austria, Portugal and Türkiye: national data. Länsi-Suomi (FI19) and Åland (FI20) are aggregated (same value for both regions). Switzerland, Montenegro, Serbia and Türkiye: 2021. Innlandet (NO02), Trøndelag (NO06), North Macedonia and Albania: 2020. Nord-Norge (NO07): 2019.

Source: Eurostat (online data codes: [ilc\\_di11\\_r](#) and [ilc\\_di11](#))

## Consumption expenditure according to the degree of urbanisation

The EU's annual inflation rate was 9.2 % in 2022. At the time of writing, large numbers of people across the EU are facing significant challenges to maintain their standard of living. The cost-of-living-crisis has resulted from rapid price increases for many types of essential goods and services, in particular, energy and food. The high inflation rate may be linked to a number of factors, including (among others) disruptions to supply chains and logistical issues during the COVID-19 pandemic, the impact of Russian military aggression against Ukraine, and a surge in post-pandemic demand. Many people have seen price increases outpace their income growth (in other words, they have become worse-off in real terms). High interest rates, particularly for borrowers, have also heightened the cost-of-living crisis. As a result, the crisis has sparked debate on issues such as income inequality (see above), social welfare and social justice (how to create a fairer and more inclusive society).

Household budget surveys (HBS) are used to collect data on consumption expenditure. The latest data concern 2020 and are therefore likely to have been impacted by the effects of the COVID-19 pandemic. Indeed, the crisis led to widespread economic disruptions and changes in consumer behaviour and household spending/saving (linked, at least in part, to restrictions that forced most people to stay at home). With lockdowns and other forms of restrictions in place, many households reduced their spending on non-essential items (like travel, entertainment or luxury goods) and – with considerable uncertainty about their financial future – some increased their precautionary savings. HBS data are analysed according to the [classification of individual consumption by purpose \(COICOP\)](#) and are presented according to the [degree of urbanisation](#). The latter classifies [local administrative units](#) based on a combination of geographical contiguity and population density to identify [cities, towns and suburbs](#) and [rural areas](#).

Figure 5.5 shows information on the structure of household consumption expenditure for four specific items that have been the closely scrutinised during the cost-of-living crisis: food and non-alcoholic beverages; electricity, gas and other fuels; the operation of personal transport equipment; and catering services. Note that the data shown relate to the overall share of each item in total household expenditure; the figures do not relate to the actual level of spending. A summary of the highest and lowest shares for national data in 2020 (no data available for Ireland, Portugal, Finland and Sweden; incomplete data for Romania) is presented below:

- for food and non-alcoholic beverages, the range was from a low of 9.4 % of household consumption expenditure in Luxembourg up to a peak of 27.6 % in Romania;
- for electricity, gas and other fuels, it was from 2.6 % in Luxembourg up to 10.5 % in Slovakia;
- for the operation of personal transport equipment, it was from 4.7 % in Belgium up to 10.4 % in Slovenia;
- for catering services, it was from 2.1 % in Hungary up to 8.2 % in Cyprus.

An analysis by degree of urbanisation reveals that people living in rural areas usually spent a higher proportion of their total household expenditure on 'essential items'; this may be linked, at least in part, to average incomes being lower in rural compared with urban areas. In 2020, the share of total household expenditure accounted for by food and non-alcoholic beverages was – subject to data availability – generally higher for people living in rural areas than for those living in cities. In several eastern and Baltic Member States, the difference between these two shares was considerable. For example, people living in rural areas of Bulgaria spent, on average, 31.2 % of their total household expenditure on food and non-alcoholic beverages, some 9.8 percentage points higher than the corresponding share for people living in cities (21.4 %). Germany was the only exception, as people living in rural areas spent 11.1 % of their household expenditure on food and non-alcoholic beverages, which was marginally lower than the share for people living in cities (0.2 percentage points less).

A similar pattern was observed for electricity, gas and other fuels and for the operation of personal transport equipment, as people living in rural areas generally spent a higher proportion of their total household expenditure on these items. In 2020, the biggest difference in the structure of expenditure on electricity, gas and other fuel was (once again) recorded in Bulgaria: on average, people living in rural areas spent 13.8 % of their total budget on these items, compared with a 7.1 % share for those living in cities (reflecting, at least in part, differences in average income levels for people living in rural areas and cities). For the operation of personal transport equipment, the situation was similar: the biggest difference in the structure of expenditure was observed in Slovenia, where people living in rural areas spent, on average, 11.7 % on these items, compared with a 7.8 % share for people living in cities. Bulgaria was an exception, insofar as people living in cities devoted a slightly higher share of their total household expenditure to the operation of personal transport equipment than those living in rural areas (5.4 % compared with 5.1 %).

**For more statistics broken down by degree of urbanisation, see:**

**Rural Europe**  
(online publication)



**Urban Europe**  
(online publication)

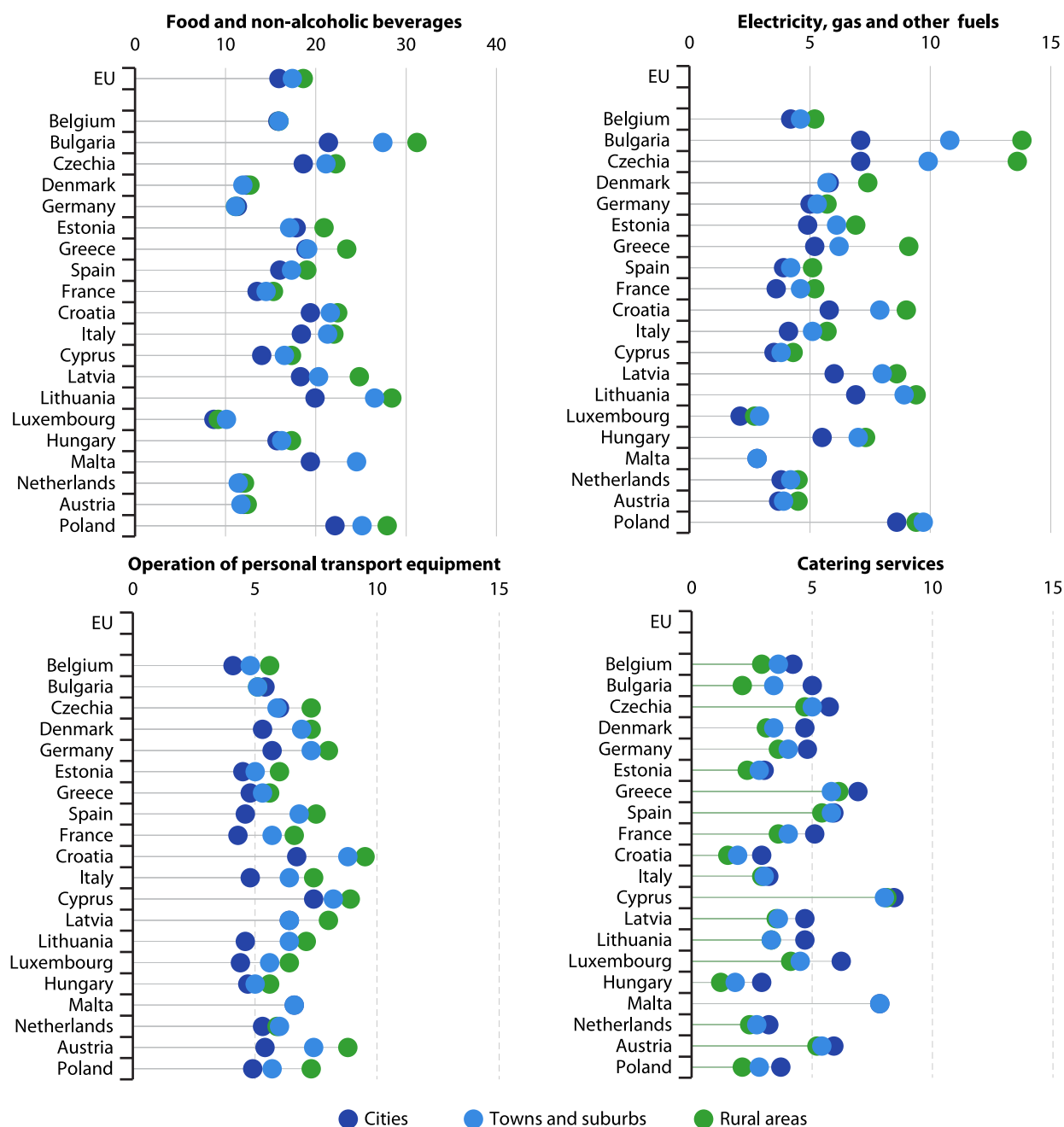


For the final group of items – catering services (restaurants, cafés and canteens) – there was a different pattern. For each of the EU Member States (for which data are available), the share of total household expenditure that was accounted for by catering services was systematically higher for people living in cities than it was for people living in rural areas. For example, city-dwellers living in Luxembourg spent, on average, 6.2 % of their total expenditure on catering services, compared with a 4.1 % share for those living in

rural areas. The higher proportion of total expenditure devoted to catering services by people living in cities may be linked to a variety of factors, among which:

- cities typically offer a greater concentration of restaurants and cafés, providing better accessibility and more choice;
- cities tend to attract a younger demographic, with younger people more inclined to go out and socialise, while they may also be more open to exploring a broader range of catering options.

**Figure 5.5: Structure of consumption expenditure, 2020**  
(%, by degree of urbanisation)



Note: the scale for the x-axis of the first chart is different to that used for the charts that follow. EU and Romania: not available other than for food and non-alcoholic beverages. Ireland, Portugal, Finland and Sweden: not available. Malta: rural areas, not available.

Source: Eurostat (online data codes: [hbs\\_str\\_t221](#) and [hbs\\_str\\_t226](#))

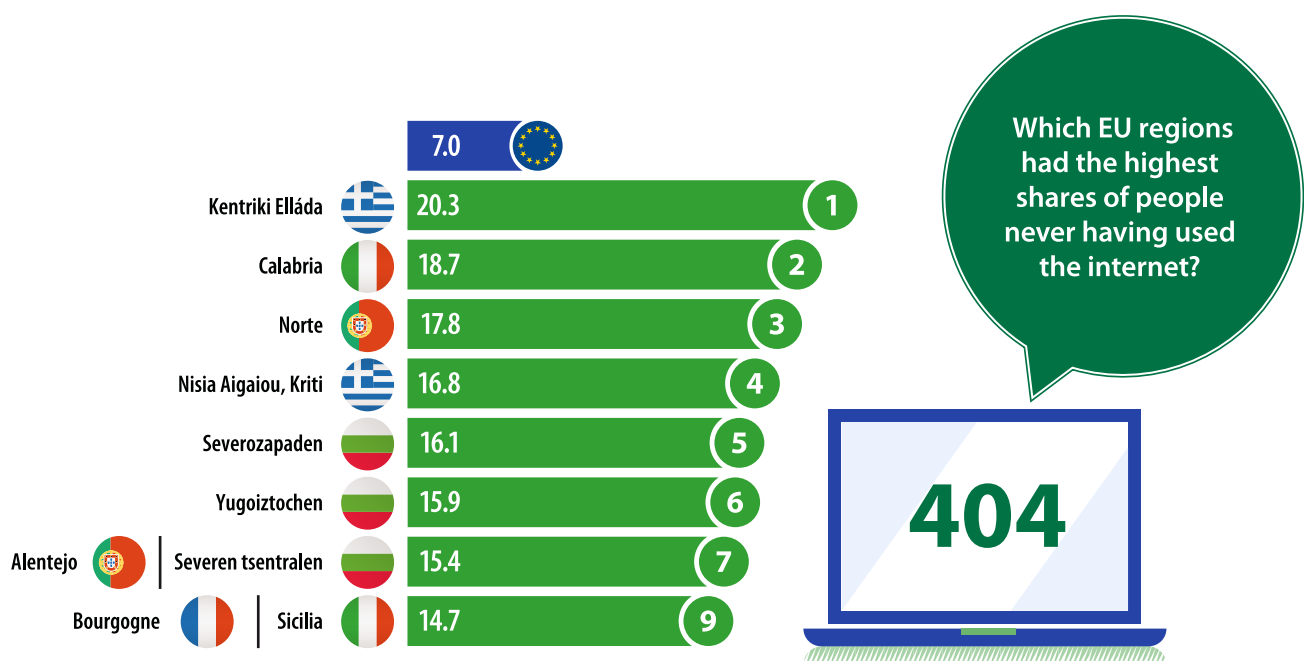
## 6. Digital society

Information and communication technologies (ICTs) affect people's everyday lives in many ways, at work, studying, in the home, on the move and elsewhere – for example, to communicate, keep abreast of news, be entertained, interact with public authorities, pay bills or shop online. In order to be able to benefit from technological innovations, businesses and individuals depend, at least to some extent, on having fast and reliable [internet access](#) (whether fixed or mobile).

Although the internet is an almost constant part of the lives of many individuals in the EU, some people are excluded to a greater or lesser extent, resulting in a so-called 'digital divide'. The infographic below shows that across the [European Union \(EU\)](#) the share of people aged 16–74 that had never used the internet was 7.0 % in 2022. The highest regional shares were recorded in a number of southern regions: Kentriki Elláda (Greece; 20.3 %), Calabria (Italy; 18.7 %) and Norte (Portugal; 17.8 %). By contrast, less than 1.0 % of people had never used the internet in three Swedish regions – Sydsverige, Stockholm, and Småland med öarna. It should be noted that there are varied reasons which may explain why some people do not use internet services, including – among others – a lack of skills, a lack of opportunity, cost or simply a lack of interest. The importance of such

reasons may vary by socio-demographic characteristic, such as age, education level and income, and also geographically.

Access to ICTs is considered by many as fundamental for improving productivity levels and the competitiveness of regions. As internet and digital technologies continue to transform the world, ICT innovations provide a stream of new business opportunities. It is hoped that this new digital world – encompassing concepts such as the internet of things and artificial intelligence (AI) – will provide tools to automate real-world processes across a range of EU policy objectives in fields as diverse as health, security, climate, transport, energy, or the modernisation of the public sector. Digital solutions can enrich our lives in many ways, but the benefits arising from digital technologies do not come without risks or costs. Some people no longer feel in control over what happens with their personal data and are increasingly overloaded by digital solicitations for their attention. Furthermore, malicious cyberactivity may threaten personal well-being or disrupt critical infrastructures and wider security interests while there is increasing attention on the unregulated development of artificial intelligence (AI).



(%, people aged 16–74, 2022, by NUTS 2 region)

Note: Germany, Greece and Poland, NUTS level 1. Croatia: national data. Mayotte (FRY5) and Åland (FI20): not available.

Source: Eurostat (online data codes: [isoc\\_r\\_iuse\\_i](#) and [tin00093](#))



Household surveys to collect data on ICT usage are usually conducted during the second quarter of each year (although the precise date at which surveys are conducted varies across EU Member States). In general, the data presented here refer to the first quarter of the reference year, while they often concern activities carried out by individuals during the 3 or 12 months prior to the survey. Note: all of the statistics presented below cover people aged 16–74 years. These data are generally presented for NUTS level 2 regions: data for Germany, Greece and Poland relate to level 1 regions; data for Türkiye are presented for level 1 statistical regions.

## Internet users

For the ICT survey of households and individuals, an **internet user** is defined as a person aged 16–74 who makes use of the internet in whatever way: whether at home, at work, or anywhere else; whether for private or professional purposes; regardless of the device (desktop computer, laptop, netbook or tablet, smartphone, games console or e-book reader) or type of connection being used.

### ***Across the EU, some 84.0 % of people made use of the internet on a daily basis***

In 2022, more than four fifths (84.0 %) of the EU's population aged 16–74 reported having used the internet on a daily basis during the three months preceding the survey. This figure was 3.6 **percentage points** higher than a year before and 27.7 points higher than a decade before (note there is a break in series). Internet use was particularly high among younger generations: some 96.4 % of young people in the EU – defined here as those aged 16–29 – made use of the internet on a daily basis in 2022. By contrast, the share for older people – defined here as those aged 65–74 – was considerably lower, at 55.0 %.

With a growing share of day-to-day tasks being carried out online, the ability to use modern technologies becomes increasingly important to ensure everyone can participate in the digital society. As noted above, one such 'digital divide' is in terms of age, with some

older generations not having the necessary **digital skills** or interest to take full advantage of the expanding array of internet services or internet-enabled devices that are on offer. In a similar vein, people aged 16–74 living in **rural areas** of the EU were less likely to make use of the internet on a daily basis (78.4 % during the three months preceding the survey in 2022) than those living in **towns and suburbs** (84.1 %) or in **cities** (87.4 %). Many rural areas have a higher proportion of older people which partly explains this 'digital divide' by **degree of urbanisation**. However, a lack of infrastructure investment may also be a factor, as people living in rural areas may be less likely to use the internet if they are hampered by slower internet speeds, less technological choice, or higher prices. This divide is likely to be further challenged in the coming years, as 5G internet services (the fifth generation of cellular network technology) continue to be rolled out.

### ***In every region of the EU, more than two thirds of the population made use of the internet on a daily basis***

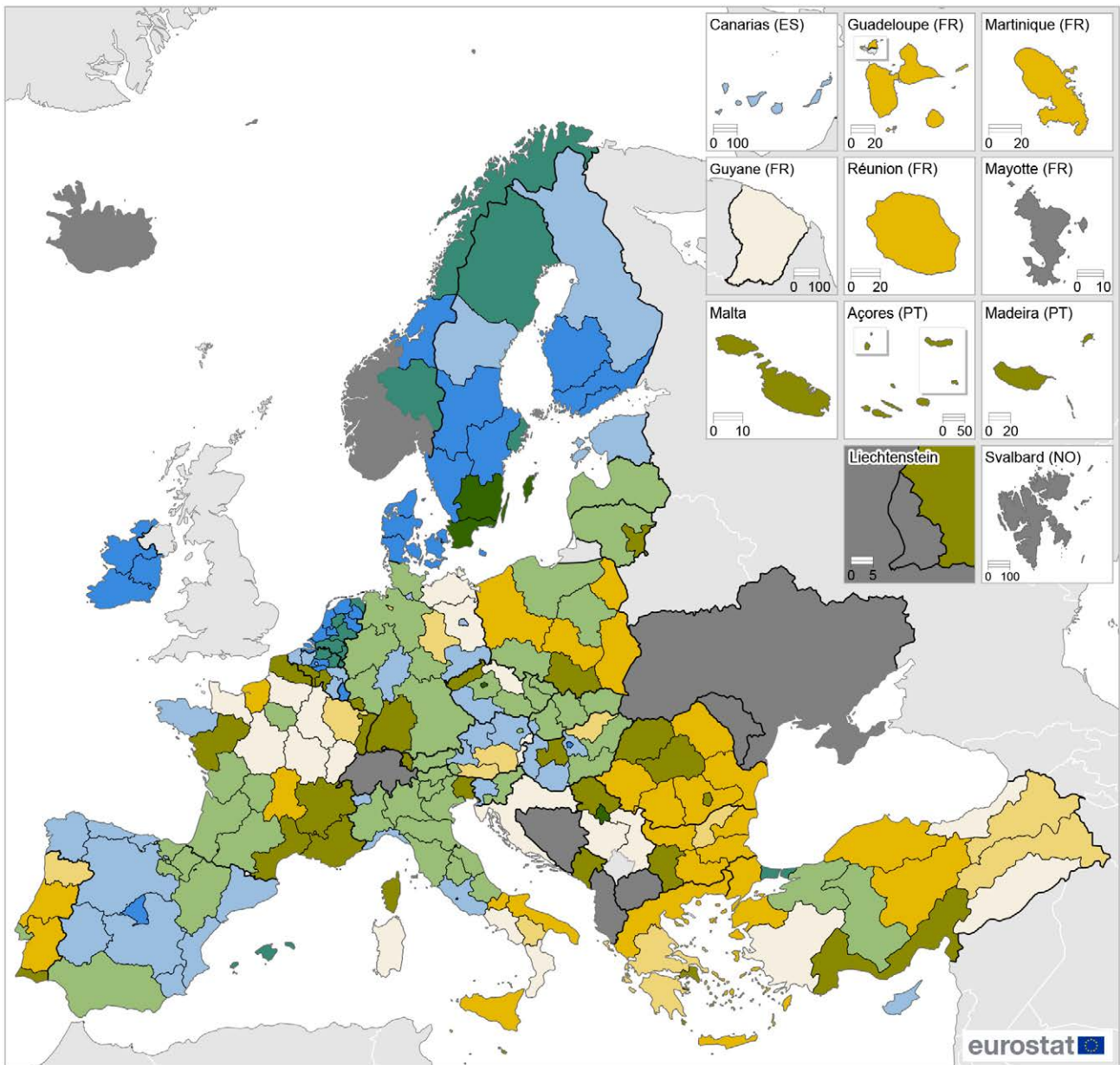
Map 6.1 shows the regional distribution of daily internet use across NUTS level 2 regions; note that data for Germany, Greece, Poland and Türkiye relate to level 1 regions. There were clear disparities between EU regions in terms of daily use of the internet along broad geographical lines: northern and western regions generally recorded higher levels of use than southern or eastern regions.

In 2022, the highest share of people aged 16–74 making daily use of the internet was recorded in the Swedish region of Sydsverige (96.7 %). There were six other regions within the EU where more than 95.0 % of people used the internet on a daily basis:

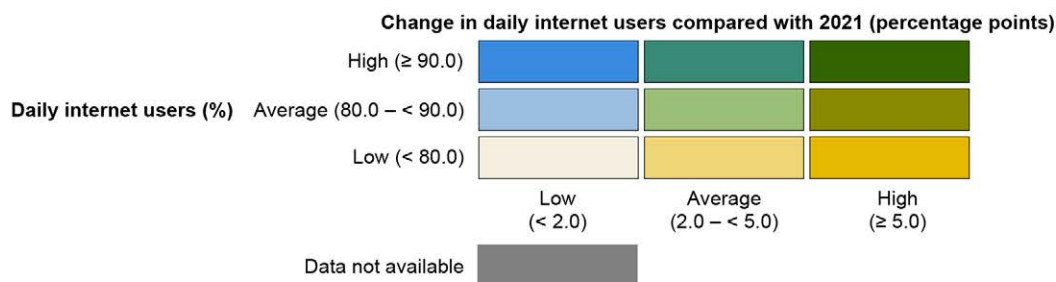
- the capital regions of the three **Nordic** Member States – Stockholm, Helsinki-Uusimaa, and Hovedstaden;
- Småland med öarna (which is also in Sweden), Zeeland (in the Netherlands) and Eastern and Midland (in Ireland).

There were only two NUTS level 2 regions within the EU where fewer than 7 out of 10 people aged 16–74 made daily use of the internet in 2022: the Bulgarian region of Yuzhen tsentralen (68.5 %) and the southern Italian region of Calabria (68.0 %).

**Map 6.1: Daily internet users during the three months preceding the survey, 2022**  
(people aged 16–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023



Note: Germany, Greece, Poland and Türkiye, NUTS level 1. Croatia: national data. Corse (FRM0): low reliability.  
Source: Eurostat (online data codes: isoc\_r\_iuse\_j and isoc\_ci\_ifp\_fu)

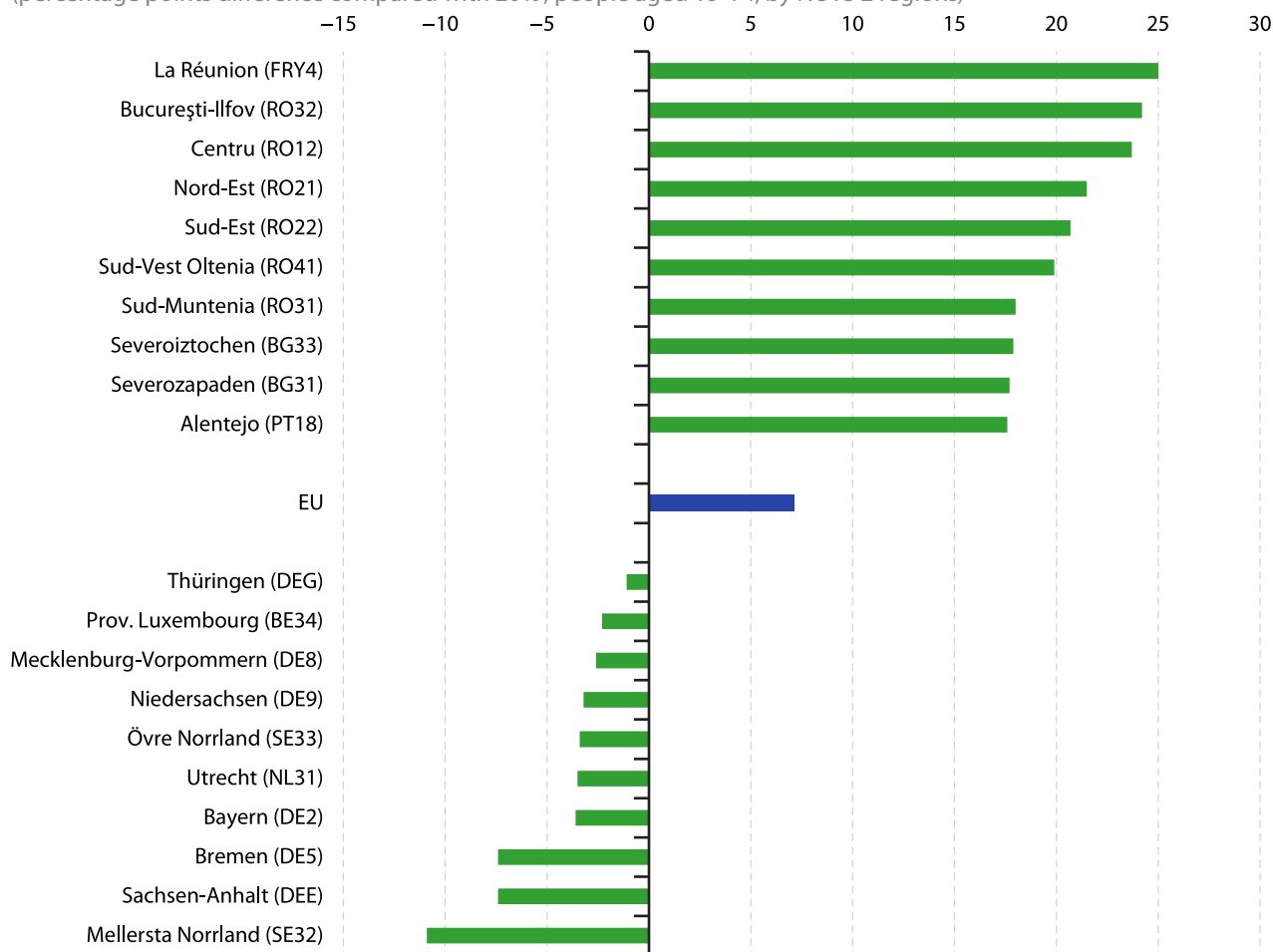
Figure 6.1 provides information on the overall change in the share of daily internet users between 2019 and 2022:

- there were 65 regions (out of 196 for which data are available) in the EU where the share of daily internet users rose by more than 10.0 percentage points during the period under consideration;
- by contrast, there were 18 regions where the share of daily internet users fell.

In the French outermost region of La Réunion, the proportion of daily internet users rose 25.0 percentage points between 2019 and 2022. The highest increases

were otherwise observed for several regions located across Romania and Bulgaria, as well as Alentejo in Portugal. At the other end of the range, among the 18 regions that recorded a fall, it was already common to observe relatively high shares of daily internet users in 2019; most of these regions saw their share of daily internet users decline by a modest amount. However, there were a number of regions – principally across Germany, but also in Sweden, the Netherlands and Belgium – where a more substantial fall was observed. The largest declines were observed in Bremen and in Sachsen-Anhalt (both Germany), as well as Mellersta Norrland (Sweden).

**Figure 6.1: Change in the share of daily internet users during the three months preceding the survey, 2022**  
(percentage points difference compared with 2019, people aged 16–74, by NUTS 2 regions)



Note: the figure shows the regions with the biggest and smallest changes compared with 2019. Germany, Greece and Poland: NUTS level 1. Croatia: national data. Mellersta Norrland (SE32): low reliability. Mayotte (FRY5) and Åland (FI20): not available. EU, Germany and Ireland: break in series.

Source: Eurostat (online data codes: [isoc\\_r\\_iuse\\_i](#) and [isoc\\_ci\\_ifp\\_fu](#))

## Internet activities

With the prolific use in modern society of mobile devices such as smartphones and tablets, the frequency with which people use the internet has grown exponentially. Although it was initially used as a means to exchange information (often in a working environment), the range of activities conducted over the internet has rapidly changed. For example, it is no more than 15 years since commercially successful app stores and streaming services were launched.

### PARTICIPATION IN SOCIAL NETWORKS

Today, one of the most popular activities on the internet is participation in social networks, for example, using Facebook, Instagram, Snapchat, TikTok or Twitter. As with many internet activities, the propensity to make use of such services is closely linked to age. A much higher proportion of younger people use social networks on a regular basis, and young people are also more likely to be early adopters of new apps/services as they seek alternative ways of exchanging text, sound, images, video and other information. Looking generally across the EU population aged 16–74, it was more common for people living in cities (rather than those living in rural areas) to participate in social networks, while people with a high level of educational attainment were more likely to participate in social networks than those with lower levels of attainment.

#### ***Close to three fifths of the EU's population participated in social networks***

In 2022, close to three fifths (58.2 %) of the EU's population aged 16–74 participated in social networks during the three months preceding the survey. At 83.6 %, the participation rate for younger people (aged 16–29) was more than three times as high as the corresponding rate for older people (aged 65–74; 24.2 %). In recent years, there has been little change in the proportion of younger people who participate in social networks; their share was already higher than 80.0 % in 2014 (note there is a break in series; it is also important to bear in mind that the statistics presented here do not provide a measure of the average time spent by each individual interacting with social networks). By contrast, there was relatively rapid growth – from an initially low level – in the proportion of older people participating in social networks: their share more than trebled from 7.2 % in 2013 to 24.2 % by 2022 (note there is a break in series).

#### ***In all five Danish regions, more than four fifths of the population participated in social networks***

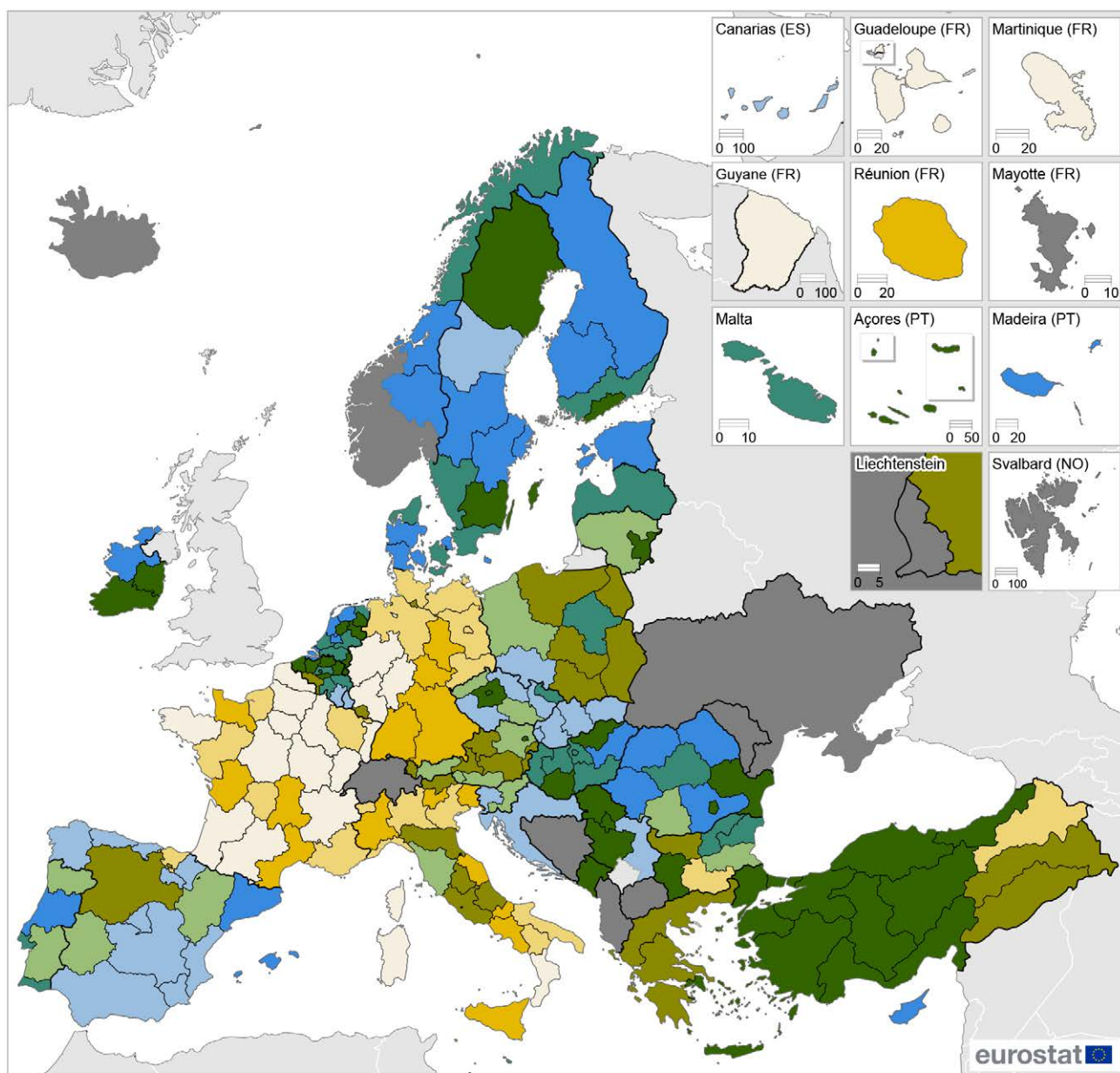
There were eight NUTS level 2 regions across the EU where more than four fifths of the population aged 16–74 participated in social networks during the three months preceding the 2022 survey; note again that data for Germany, Greece and Poland relate to level 1 regions, as do the data for Türkiye. These eight regions were concentrated in Denmark (all five regions) and also included the capital regions of Budapest (Hungary) and Helsinki-Uusimaa (Finland), as well as Drenthe in the Netherlands. The highest share was recorded in Hovedstaden – the Danish capital region – at 86.3 %.

Although many would argue that social networks are ubiquitous, there were 42 regions within the EU where less than half of the population participated in social networks. Among these, there were seven – exclusively located in France (four regions) and Germany (three regions; NUTS level 1) – that had shares of less than 40.0 %. The lowest proportion of people participating in social networks was recorded in the northern German region of Bremen (34.1 %; low reliability due to small case unit), while the other two German regions were the eastern regions of Brandenburg and Mecklenburg-Vorpommern. The lowest proportion of people participating in social networks in France was recorded in the outermost region of Guadeloupe (36.0 %), while three rural regions – Franche-Comté, Limousin, and Centre – Val de Loire also recorded relatively low shares.

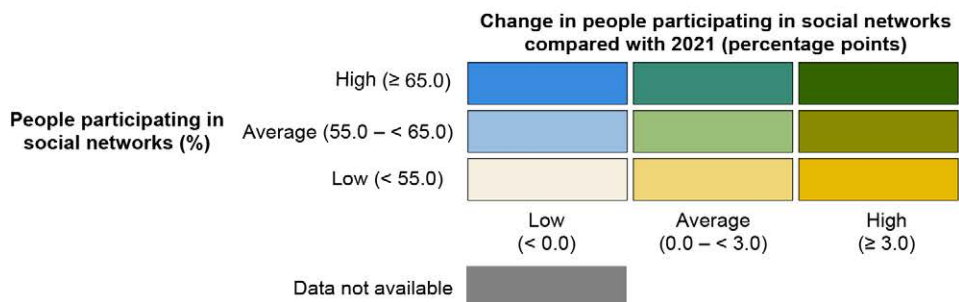
The wide differences in participation rates for social networks may, at least in part, be linked to whether (or not) people are connected to the internet. Relatively low rates of internet access will, by definition, limit the potential use of social networks. However, internet access was generally widespread in much of France and Germany. As such, other factors may be relevant, for example, an ageing population structure in certain regions, or issues linked to privacy and the willingness of individuals to share their data online. By contrast, despite relatively low overall levels of internet access, many eastern regions of the EU recorded relatively high shares of people participating in social networks.



**Map 6.2: People participating in social networks during the three months preceding the survey, 2022**  
(people aged 16–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023



Note: Germany, Greece, Poland and Türkiye, NUTS level 1. Croatia: national data. Bremen (DES) and Corse (FRM0): low reliability. Bremen (DES): small case unit.

Source: Eurostat (online data codes: isoc\_r\_juse\_j and isoc\_ci\_ac\_i)

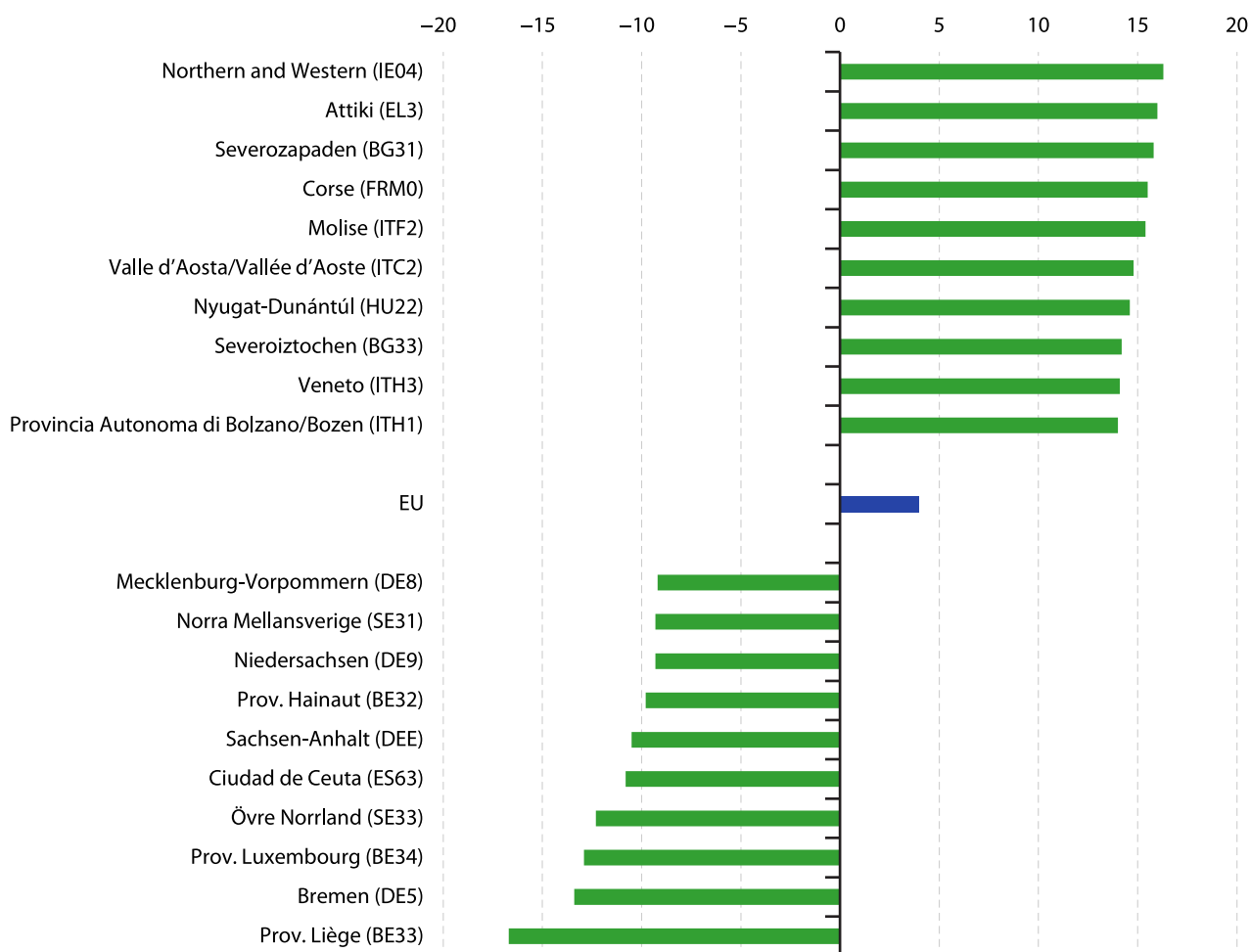
Figure 6.2 provides information about those EU regions with the largest changes in their share of people participating in social networks between 2019 and 2022. In 155 regions out of 196 for which data are available in the EU, the share of people participating in social networks rose during the period under consideration. There were 41 regions that recorded increases of at least 10.0 percentage points, with the largest increases in Northern and Western (Ireland; up 16.3 percentage points) and the capital region of Attiki (Greece; NUTS level 1; up 16.0 points). There were three other regions where the share of people participating in social networks increased by more than 15.0 points: Severozapaden (Bulgaria), Corse (France; low reliability) and Molise (Italy).

At the other end of the range, there were 40 regions across the EU where the proportion of people

participating in social networks fell between 2019 and 2022. Among these, there were six regions that recorded a fall of at least 10.0 percentage points:

- the biggest decline was observed in Prov. Liège (Belgium; down 16.7 points), while another Belgian region, Prov. Luxembourg, also recorded a double-digit reduction;
- there were also relatively large falls in two German regions (NUTS level 1) – Bremen (down 13.4 points; low reliability due to small case unit) and Sachsen-Anhalt (down 10.5 points);
- the other two regions with falls of at least 10.0 points were geographically remote, located at opposite ends of the EU – the Swedish region of Övre Norrland (down 12.3 points) and the Spanish region of Ciudad de Ceuta (down 10.8 points).

**Figure 6.2: Change in the share of people participating in social networks during the three months preceding the survey, 2022**  
(percentage points difference compared with 2019, people aged 16–74, by NUTS 2 regions)



Note: the figure shows the regions with the biggest and smallest changes compared with 2019. Germany, Greece and Poland: NUTS level 1. Croatia: national data. Bremen (DE5), Ciudad de Ceuta (ES63) and Corse (FRM0): low reliability. Bremen (DE5): small case unit. Mayotte (FRY5) and Åland (FI20): not available. EU, Belgium, Germany and Ireland: break in series.

Source: Eurostat (online data codes: *isoc\_r\_iuse\_i* and *isoc\_ci\_ac\_i*)

## INTERNET BANKING

In recent years, one of the main developments within the EU's banking sector has been an expansion of online services. The frequency with which consumers visit their local branch has fallen rapidly, the number of branches has contracted, and online transfers and e-payments have become the norm. Some markets have seen the emergence of internet (or 'virtual') banks that do not have any physical branches. These internet banks eliminate the overheads associated with running local branches and are often in a better position to offer more competitive services than 'bricks and mortar' banks. In response, some traditional banks have expanded their products and diversified their distribution channels ('click and mortar' banks), integrating online banking into their group either through organic growth or the *acquisition* of internet-based competitors.

### ***Almost three fifths of the EU population made use of internet banking***

Almost three fifths (59.7 %) of the EU's population aged 16–74 used the internet for banking during the three months preceding the 2022 survey. As with most internet activities, there were some quite large differences between age groups concerning the use of internet banking. Some young people do not (yet) have a bank account, and therefore by definition, they have no need for internet banking. However, the share of the EU's adult population making use of the internet for banking rises quickly, with around three quarters (75.1 %) of people aged 25–29 making use of these online services. By contrast, just over one third (36.1 %) of persons aged 65–74 used internet banking.

Map 6.3 shows the proportion of people aged 16–74 using internet banking during the three months preceding the 2022 survey for NUTS level 2 regions; note again that data for Germany, Greece, Poland and Türkiye relate to level 1 regions. The use of internet banking across EU regions reflects, to some degree, the availability of broadband internet connections and the nature of internet banking services that are on offer. Nevertheless, an individual's choice as to whether

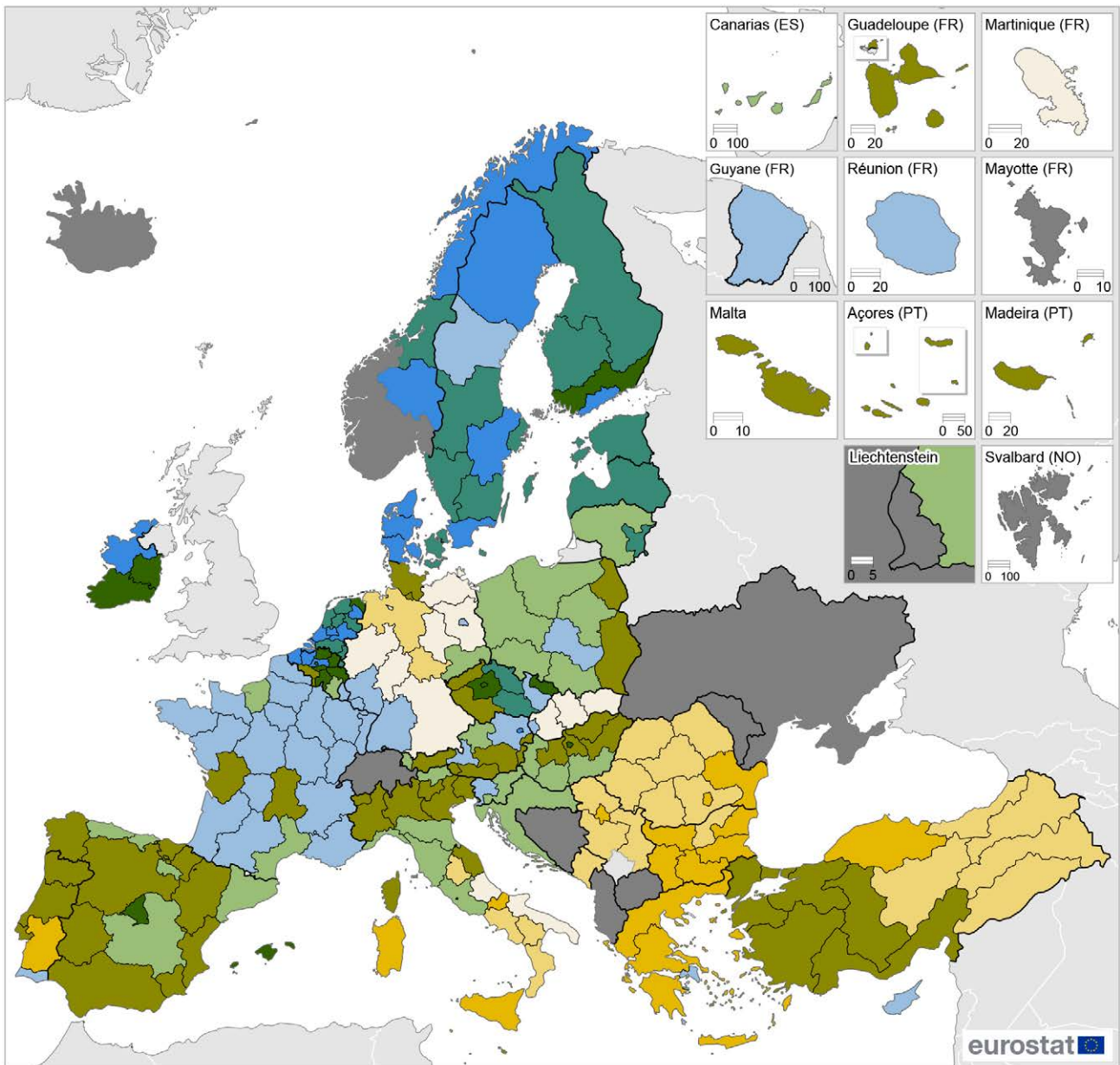
or not they use the internet for banking often comes down to a matter of trust, which may reflect, among other factors, national characteristics. For example in 2022, more than 90.0 % of the population made use of internet banking in every region of Denmark and Finland (no data available for Åland), and in 9 out of the 12 regions in the Netherlands. At the other end of the range, those regions where the use of internet banking was considerably below the EU average were predominantly located in eastern and southern regions of the EU. For example, less than one quarter of the population used the internet for banking in all but one region each of Bulgaria and Romania; the exceptions were their respective capital regions of Yugozapaden and București-Ilfov, where the share of people using internet banking was close to one third. Issues around access to financial services may explain, at least to some degree, these very low figures, as a relatively high proportion of people in Bulgaria and Romania do not possess a bank account.

### ***The highest shares of internet banking were recorded in the Finnish and Danish capital regions***

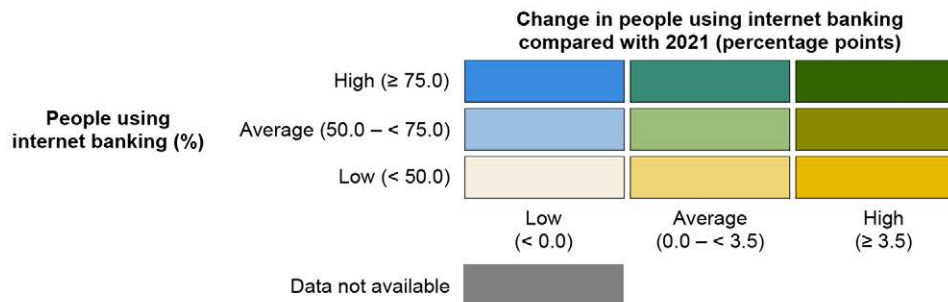
A more detailed analysis of the latest information from Map 6.3 reveals the highest proportions of people making use of internet banking were recorded in the Finnish and Danish capital regions of Helsinki-Uusimaa (95.9 %) and Hovedstaden (95.4 %). By contrast, the lowest proportions were recorded in Romania, where four regions had shares below 15.0 %; the lowest proportion was observed in Sud-Est (12.9 %).

People living in rural regions are more likely to face limited access to a physical branch of their bank; however, the use of internet banking was generally lower in rural and remote regions (than it was in urban regions). Outside of Bulgaria and Romania, some of the lowest penetration rates for online banking were recorded in regions characterised by a low level of internet connectivity and/or an older population age structure. For example, less than one third of people aged 16–74 from the southern Italian regions of Calabria, Campania, Basilicata, Puglia and Sicilia made use of internet banking in 2022.

**Map 6.3: People using internet banking during the three months preceding the survey, 2022**  
(people aged 16–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023



Note: Germany, Greece, Poland and Türkiye, NUTS level 1. Croatia: national data. Corse (FRM0): low reliability.

Source: Eurostat (online data codes: isoc\_r\_iuse\_i and isoc\_ci\_ac\_i)



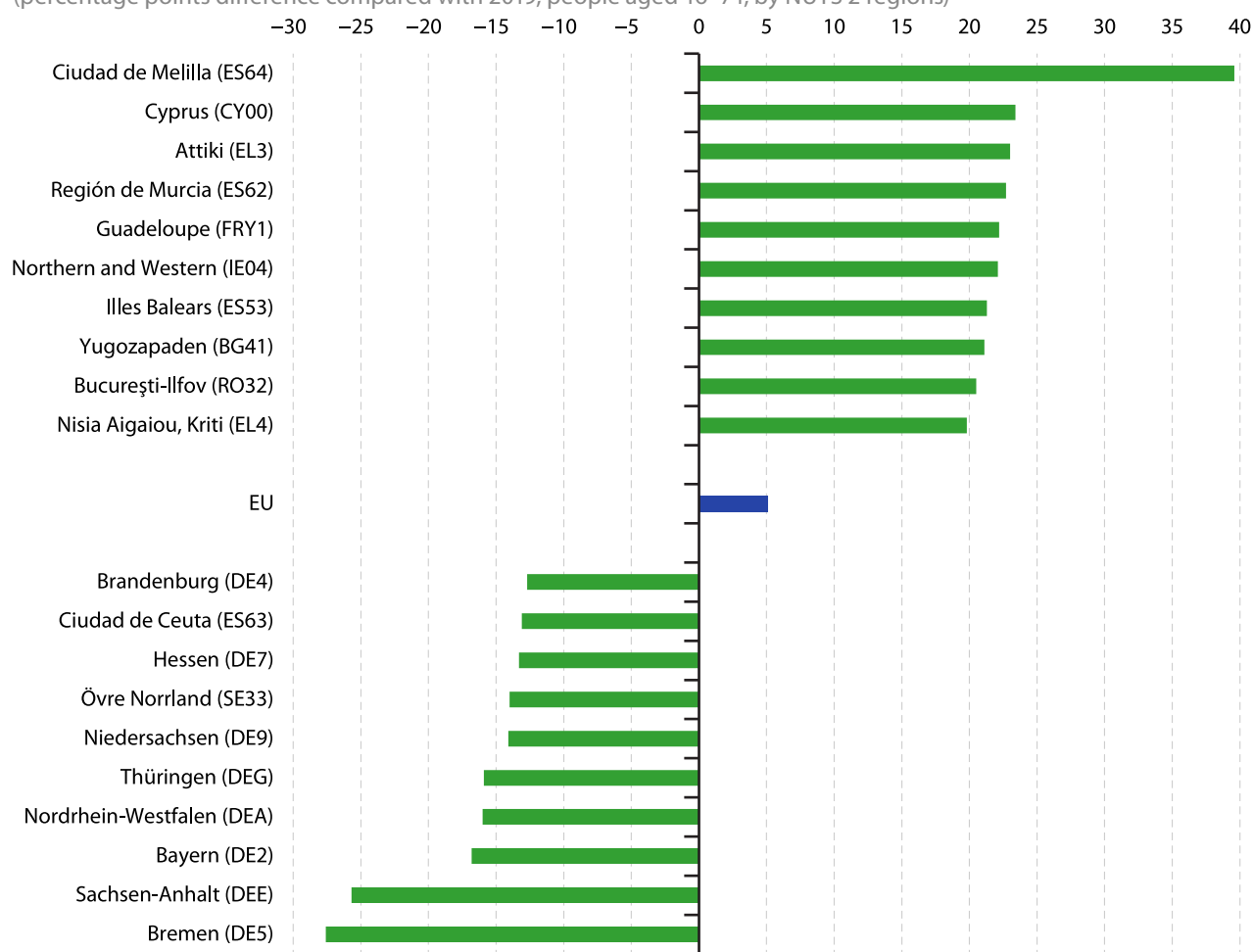
Figure 6.3 provides information for those regions with the largest changes in their share of people making use of internet banking between 2019 and 2022. For the EU as a whole, there was an increase in the use of internet banking, up 5.1 percentage points to 59.7 %. A regional analysis reveals that the proportion of people making use of internet banking rose in more than four fifths of the 196 regions for which data are available across the EU. There were 84 regions that recorded double-digit increases, with the biggest gain, by far, observed for the Spanish region of Ciudad de Melilla (up 39.6 percentage points). This was followed by eight regions that recorded increases within the range of 20.5–23.4 points:

- two more regions in Spain – Región de Murcia and Illes Balears (Spain);
- the capital regions of Attiki (Greece; NUTS level 1), Yugozapaden (Bulgaria) and București-Ilfov (Romania);

- Cyprus, Guadeloupe (France) and Northern and Western (Ireland).

There were 35 regions across the EU where the penetration of online banking declined between 2019 and 2022. Among these, there were 12 regions where the proportion of people aged 16–74 making use of internet banking fell by at least 10.0 percentage points. The vast majority of this group – 10 regions – were located across Germany (NUTS level 1), with the share of people making use of internet banking falling at a particularly fast pace in Bremen (down 27.6 percentage points) and Sachsen-Anhalt (down 25.7 points). Övre Norrland (Sweden) and Ciudad de Ceuta (Spain) were the other two regions across the EU where double-digit falls in the use of internet banking were observed.

**Figure 6.3: Change in the share of people using internet banking during the three months preceding the survey, 2022** (percentage points difference compared with 2019, people aged 16–74, by NUTS 2 regions)



Note: the figure shows the regions with the biggest and smallest changes compared with 2019. Germany, Greece and Poland: NUTS level 1. Croatia: national data. Ciudad de Ceuta (ES63): low reliability. Mayotte (FRY5) and Åland (FI20): not available. EU, Germany and Ireland: break in series.

Source: Eurostat (online data codes: isoc\_r\_iuse\_i and isoc\_ci\_ac\_i)

## E-commerce

E-commerce has the potential to make it easier for consumers to compare different retail offers. It can reconfigure the geography of consumption, for example, extending consumer choice and influencing price competition in remote regions of the EU. At the same time, it may transfer the time and cost burden of travelling to shops from consumers to distributors. The ability to shop 24 hours a day, coupled with the ease of making electronic payments, is gradually leading to a digital transformation of the EU's retail space, disrupting many aspects of shopping behaviour; this development was reinforced during the COVID-19 crisis. Nevertheless, the vast majority of retail sales within the EU continue to take place in shops.

For statistical purposes, e-commerce is defined as 'buying goods or services through electronic transactions, including the placing of orders for goods or services over the internet (payment and the ultimate delivery of the goods or service may be conducted either online or offline); orders via manually typed e-mails are excluded'.

### ***Across the EU, more than two thirds of the population used e-commerce***

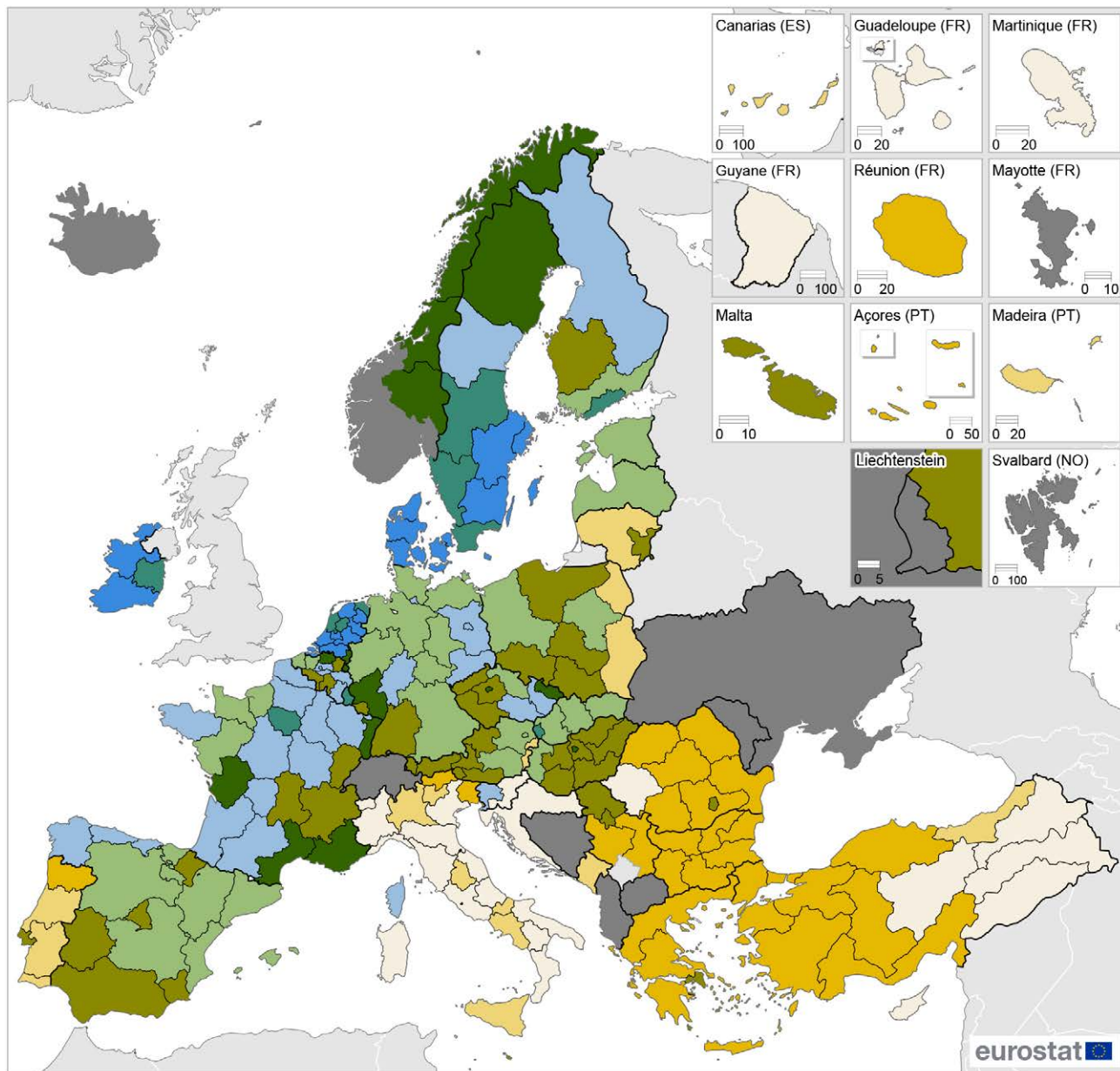
In 2022, more than two thirds (68.0 %) of the EU's population aged 16–74 reported that they had bought/ordered goods or services over the internet in the 12 months preceding the survey. As with many other internet activities, the propensity to make use of e-commerce is closely linked to age. For example, a particularly high proportion (85.3 %) of people aged 25–34 made use of the internet to buy/order goods or services; this was 2.4 times as high as the corresponding share (35.7 %) recorded for older people aged 65–74. The share of people reporting that they had bought/ordered goods or services over the internet was higher among those people living in cities (71.6 %) than it was for people living in rural areas (64.1 %).

### ***More than 90.0 % of people made use of e-commerce in the capital regions of Czechia, Denmark and the Netherlands; this was also the case in another region from the Netherlands, namely Limburg***

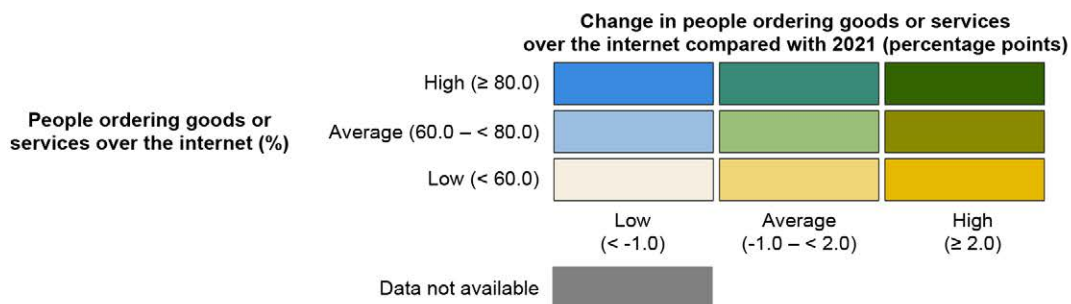
There were 41 regions across the EU where at least four fifths of people aged 16–74 had bought/ordered goods or services over the internet in the 12 months preceding the 2022 survey. Map 6.4 shows these regions were largely concentrated across Denmark, Ireland, France, the Netherlands and Sweden; note again that data for Germany, Greece and Poland relate to NUTS level 1 regions (as do the data for Türkiye). The highest propensities to make use of e-commerce were recorded in three capital regions – Hovedstaden (Denmark; 91.3 %), Noord-Holland (the Netherlands; 90.3 %) and Praha (Czechia; 90.1 %) – as well as a further region in the Netherlands, Limburg (90.9 %).

At the other end of the range, there were 56 regions where less than three fifths of the population made use of e-commerce. The lowest proportions of people using e-commerce were concentrated in eastern and southern regions of the EU, particularly across Bulgaria, Romania, Italy and Portugal; this may reflect, at least in part, relatively low levels of internet access/use and relatively high numbers of people not possessing bank accounts and/or a credit card (thereby making it more difficult to pay online). There was also a relatively low propensity to make use of e-commerce in several of the French, Portuguese and Spanish outermost regions; these low shares may, at least in part, be linked to relatively high shipping costs for goods purchased online. Looking in more detail, there were three regions in the EU where less than one third of all people made an online purchase during the 12 months preceding the 2022 survey. Two of these regions were located in Bulgaria – Yugoiztochen (31.9 %) and Severen tsentralen (29.9 %) – while the third was Calabria in southern Italy (also 31.9 %).

**Map 6.4:** People ordering goods or services over the internet for private use during the 12 months preceding the survey, 2022 (people aged 16–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023



Note: Germany, Greece, Poland and Türkiye, NUTS level 1. Croatia: national data. Corse (FRM0): low reliability.  
Source: Eurostat (online data codes: isoc\_r\_blt12\_i and isoc\_ec\_ib20)



### **Just over one sixth of the EU population reported that they had never made an online purchase**

In contrast to the information presented above, Map 6.5 provides a more detailed analysis of e-commerce insofar as it shows how recently people ordered goods or services over the internet; note that all of the data are presented for NUTS level 1 regions. When surveyed in 2022, some 56.1 % of people aged 16–74 in the EU confirmed that they had made an online purchase during the previous three months. Relatively few people made irregular use of e-commerce:

- 11.9 % had made their last online purchase some 3–12 months prior to the survey (bringing to 68.0 % the share of people having made their last online purchase anytime during the 12 months before the survey);
- 5.8 % had made their last online purchase more than a year before the survey;
- whereas 17.2 % of people reported that they had never made an online purchase.

The overall pattern for the EU was repeated in the vast majority of regions (no data for Åland, Finland): in 2022, there were 82 out of 91 NUTS level 1 regions where the most common response when asked about their latest online purchase was for people aged 16–74 to say that they had made a purchase during the three months preceding the 2022 survey. More than three quarters of all people reported that they had made an online purchase in Denmark and Ireland, as well as all four regions of the Netherlands, and two out of the three regions in Sweden (the exception being Norra Sverige).

By contrast, there were nine NUTS level 1 regions where the most common response when asked about their latest online purchase was for people to say that they had never made an online purchase: two regions in each of Bulgaria, Italy and Romania, as well as island regions in France, Cyprus and Portugal. Looking in more detail, there were five regions where more than one third of all people reported that they had never made an online purchase: Cyprus had the highest share at 36.7 %, closely followed by Região Autónoma da Madeira (Portugal; 36.1 %), Sud (Italy; 34.9 %), Macroregiunea Patru (Romania; also 34.9 %) and Isole (Italy; 34.2 %).

### **Just over one sixth of the EU population reported that they had made an online purchase from a seller in another EU Member State**

The final map in this chapter provides more detailed information in relation to one specific aspect of e-commerce developments. Across the EU, some 17.2 % of people aged 16–74 made online purchases over the internet from sellers in other EU Member States during the three months preceding the 2022 survey; this figure was 1.0 percentage point lower than a year before,

when the impact of the COVID-19 crisis may have led to more people making online purchases from other Member States as a range of restrictions prevented/deterred them from in-store shopping, whether locally or in another country.

There were 23 NUTS level 2 regions where at least 35.0 % of people ordered goods or services over the internet from sellers in other EU Member States during the three months preceding the 2022 survey (as shown by the darkest shade in the map); note again that data for Germany, Greece and Poland relate to level 1 regions (as do the data for Türkiye). These 23 regions were concentrated across Ireland (all three regions), Austria (all nine regions) and Belgium (8 out of 11 regions, the exceptions being in the southern Région wallonne). Relatively high shares were also recorded in Luxembourg and Malta, as well as Hovedstaden (the capital region of Denmark). Note that many of these regions are in Member States which have larger neighbouring Member States that use the same or a similar language, thereby reducing the impact of language barriers for cross-border shopping.

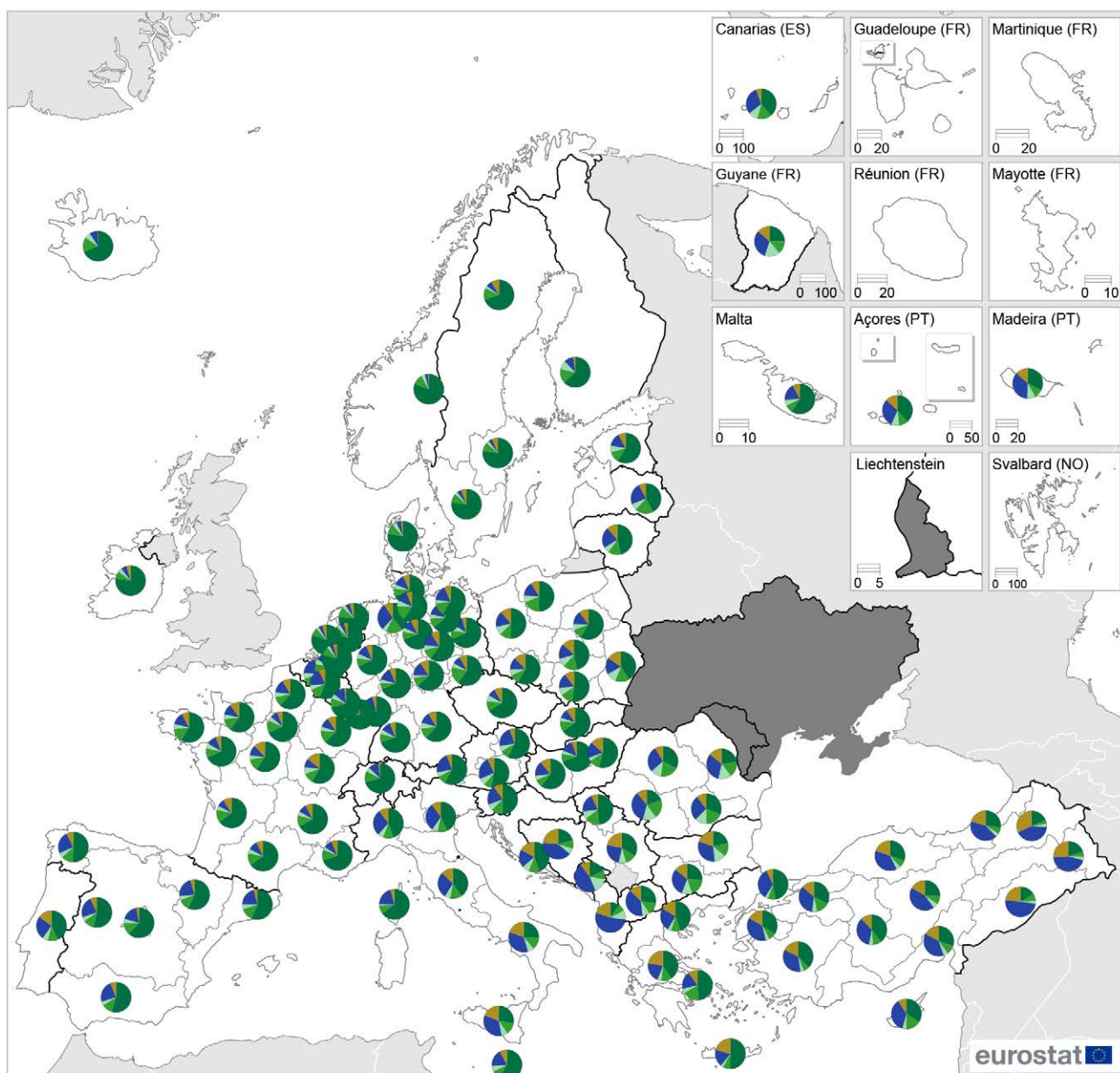
At the other end of the range, there were 11 regions in the EU where the share of people making online purchases from sellers in other EU Member States was less than 5.0 % (as shown by the lightest shade in the map). These regions were, unsurprisingly, characterised by a relatively low propensity to use e-commerce in general and were principally located across Bulgaria and Romania, but also included the northern German region of Mecklenburg-Vorpommern (NUTS level 1), the French outermost region of La Réunion, and the eastern Polish region of Makroregion wschodni (also NUTS level 1).

### **Luxembourg was the only region in the EU where a majority of the population made online purchases from sellers in other EU Member States**

In 2022, Luxembourg had the highest share of people aged 16–74 who made online purchases from sellers in other EU Member States during the three months preceding the survey, some 51.2 %. Almost half (49.9 %) of the population living in the Irish capital region of Eastern and Midland used e-commerce to purchase goods and/or services from sellers in other EU Member States, while relatively high shares – more than 45.0 % – were also observed in three Belgian regions, Prov. Limburg, Prov. Oost-Vlaanderen and Prov. Brabant Wallon. By contrast, there were four regions within the EU where less than 3.0 % of the population made online purchases from sellers in other EU Member States: Severen tsentralen (Bulgaria), Nord-Est, Sud-Muntenia, and Vest (all in Romania). Vest had the lowest regional share in the EU, at 2.4 %.



**Map 6.5: People ordering goods or services over the internet for private use, by most recent online purchase, 2022**  
 (% , people aged 16–74, by NUTS 1 regions)



Most recent online purchase (%)

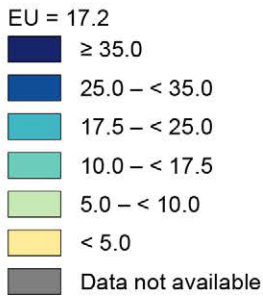
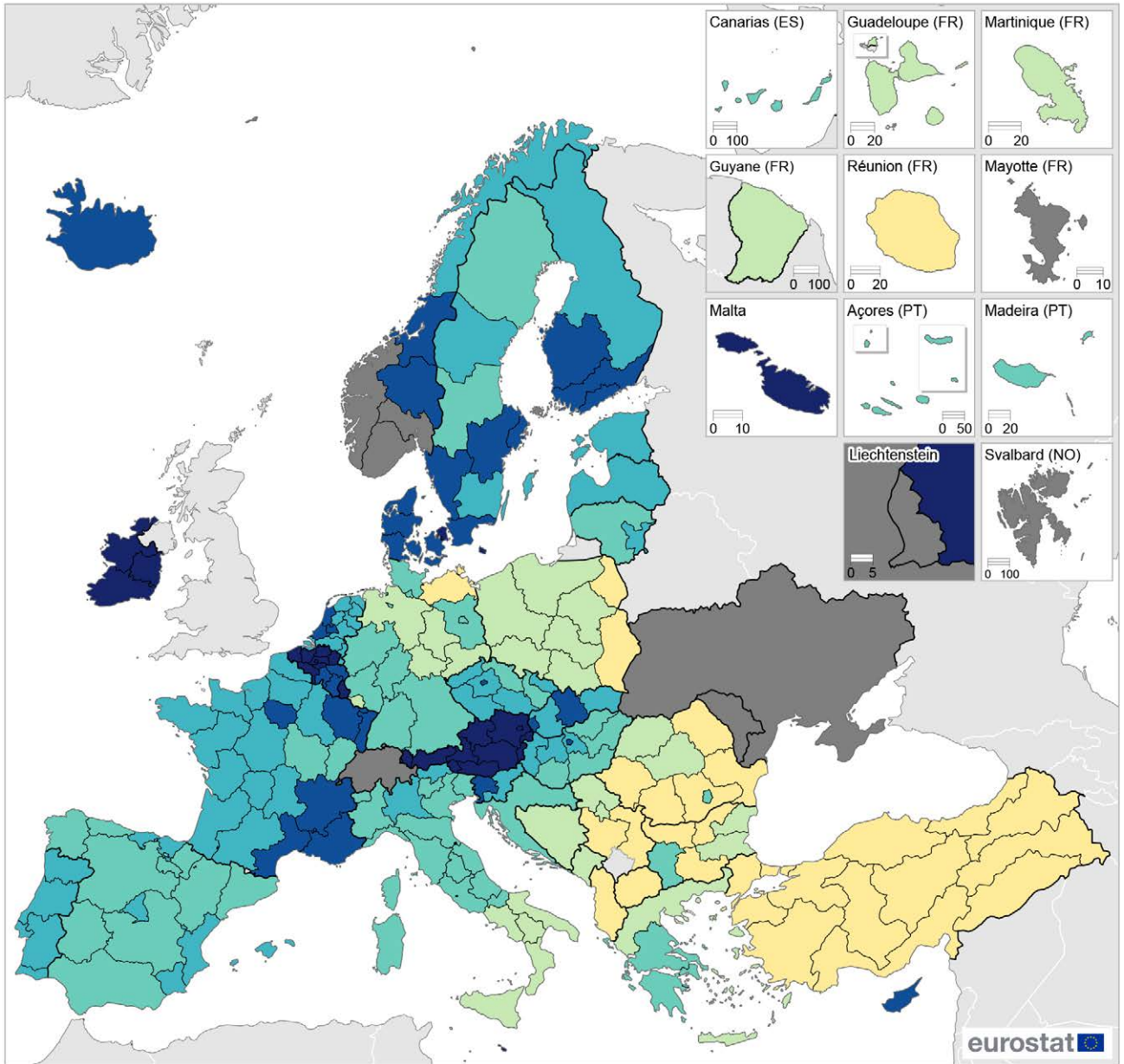
- In last 3 months
- In last 3–12 months
- More than a year ago
- Never made an online purchase
- Other/unknown
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 08/2023

Note: Bosnia and Herzegovina, national data. Iceland, Switzerland, Bosnia and Herzegovina, North Macedonia and Albania, 2021. Corse (FRM0): low reliability. For Régions Ultrapériphériques Françaises (FRY) – composed of Guadeloupe, Martinique, Guyane, La Réunion and Mayotte – the pie chart is displayed within the inset for Guyane.

Source: Eurostat (online data codes: [isoc\\_r\\_blt12\\_i](#) and [isoc\\_ec\\_ib20](#))

**Map 6.6:** People ordering goods or services over the internet for private use from sellers in other EU Member States during the three months preceding the survey, 2022  
(%, people aged 16–74, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

Note: Germany, Greece, Poland and Türkiye, NUTS level 1. Croatia, Bosnia and Herzegovina and Albania: national data. Iceland, Bosnia and Herzegovina, North Macedonia and Albania: 2021. Corse (FRM0): low reliability.

Source: Eurostat (online data codes: [isoc\\_r\\_blt12\\_i](#) and [isoc\\_ec\\_ibos](#))





# B

## Economy and finance





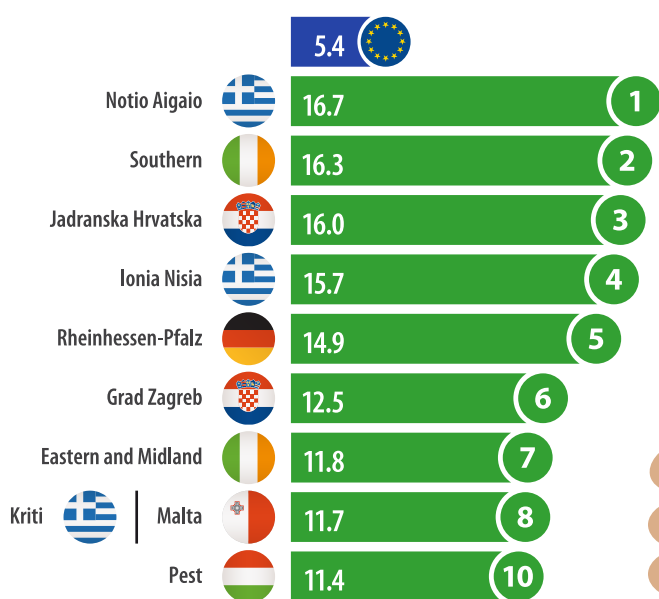
## 7. Economy

The principal focus of **cohesion policy** in the **European Union (EU)** is to help less developed regions converge/catch-up. It also aims to support broader socioeconomic priorities such as the **European Semester** and the **European Pillar of Social Rights**. Regional accounts are important in this context, as they are used, among other purposes, to decide upon the regional allocation of cohesion policy expenditure. As of 2021, the rules for allocating funding became simpler: they were tailored to locally-led development strategies that continue to take account of **gross domestic product (GDP)** per inhabitant, alongside information on the socioeconomic and environmental situation (for example, youth unemployment, low levels of educational attainment, the reception and integration of migrants, or climate change).

The COVID-19 crisis severely disrupted production and trade. Lockdowns closed many factories and offices and there were disturbances to international trade. Among other consequences, this led to difficulties concerning the supply of strategic items used in industrial supply chains such as the automotive or electronics industries. At the onset of the pandemic, the **European Commission** – for the first time – activated a general escape clause in the **Stability and Growth Pact**. By relaxing budgetary rules/requirements,

national governments had more freedom to support their economies and mitigate the pandemic's socioeconomic consequences. Nevertheless, there was a 5.7 % contraction in the real GDP of the EU between 2019 and 2020.

A rebound followed in 2021 – linked to extensive stimulus programmes, vaccine rollouts, the gradual easing of restrictions and a wave of delayed purchases – almost offsetting the losses recorded a year before: the EU's GDP grew 5.4 % in real terms. The infographic below shows those EU regions – at **NUTS level 2** – that experienced the largest increases in economic activity in 2021. Many of these were popular holiday destinations that had been severely impacted by the pandemic and its associated restrictions, with their latest growth rates often inversely proportional to the decline in activity that was registered in 2020. As the impact of the pandemic dissipated, the attention of policymakers and economists (re)turned to a number of longer-term, structural challenges: population ageing, climate change, weak productivity growth, rising income and wealth inequality, as well as territorial disparities within and among EU Member States. Added to this has been a rapid upturn in prices, as inflation rates rose to levels that had not seen during the last four decades.



Which EU regions had the biggest increases in GDP?



(% change in real terms, 2020–2021, by NUTS 2 regions)  
Note: Poland, national data.

Source: Eurostat (online data code: nama\_10r\_2gvagr)



This chapter starts with information on regional GDP, the principal aggregate for measuring economic output (presented as absolute values and per inhabitant ratios). Having looked at GDP from the [output side](#), the focus of the second section switches to the income of households: information is presented for [primary income](#) (from paid work and self-employment, as well as from interest, dividends and rents) per inhabitant, [disposable income](#) per inhabitant, and the [compensation of employees](#) per hour worked. The final section looks at [labour productivity](#) (or gross value added per person employed), a ratio that may be used to assess patterns/developments of regional competitiveness.

## Regional gross domestic product (GDP)

The EU's GDP at market prices was €14.5 trillion in 2021, equivalent to an average of €32 400 per inhabitant. These latest figures marked a considerable rebound in economic activity: having fallen in real terms by 5.7 % in 2020, the EU's GDP increased 5.4 % in 2021. Behind these aggregated figures for the whole of the EU, there were considerable differences in the economic performance of the EU's regions.

In 2021, higher than average levels of GDP per inhabitant were primarily found in a band of regions that ran from the [Nordic Member States](#), down through Germany and the [Benelux](#) countries into Austria and northern Italy. There were also a number of isolated pockets characterised by relatively high regional values for GDP per inhabitant, for example, two out of the three regions in Ireland, specific regions in Spain and France, as well as most of the remaining capital regions.

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## Measuring the size of an economy

The central measure of national accounts, GDP, summarises the economic position of a country or a region. This well-known balance has traditionally been divided by the total number of inhabitants to create a proxy measure for analysing overall living standards, namely GDP per inhabitant.

While GDP continues to be used for monitoring economic developments, playing an important role in economic decision-making, it is complemented by other indicators to inform policy debates on, for example, social and environmental issues. This is because GDP does not take account of externalities such as environmental sustainability or other issues, like income distribution or social inclusion, which are increasingly seen as important drivers for [sustainable development](#) and the overall quality of life.

In order to compensate for price level differences between countries, GDP can be converted using conversion factors known as [purchasing power parities \(PPPs\)](#). The use of PPPs, rather than market [exchange rates](#), results in data being denominated in an artificial common currency unit called a [purchasing power standard \(PPS\)](#). In contrast to euro-based (€) series, a series denominated in PPS tends to have a levelling effect, as countries and regions with very high GDP per inhabitant in euro also tend to have relatively high price levels (for example, the cost of living in Luxembourg is generally much higher than the cost of living in Bulgaria).

Regional economic statistics are generally reported in current (or 'nominal') terms; in other words, their current value during the particular reference year in question. To make comparisons over time, it is usually more revealing to make use of data in constant price (or real) terms, where a series has been adjusted to take account of price changes. During periods of inflationary pressure – such as the current cost-of-living crisis – series that are presented in current price terms will be higher than constant price series. For example, imagine GDP rose from one year to the next from €100.0 billion to €110.0 billion, while inflation was running at 8.0 %. In constant price terms using the prices of the first year, GDP in the second year would be €101.2 billion. This results in a growth rate of 1.2 % in real terms, compared with a 10.0 % growth rate in nominal terms.

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**GDP per inhabitant in Luxembourg was almost 10 times as high as in the French archipelago of Mayotte**

Map 7.1 is based on regional GDP per inhabitant (adjusted for purchasing power and then shown as a percentage of the EU average). The regional distribution of GDP per inhabitant was relatively skewed insofar as less than two fifths of NUTS level 2 regions – or 94 out of 242 regions – reported a level of GDP per inhabitant in 2021 that was equal to or above the EU average (as shown by the teal shades in Map 7.1). There were 18 NUTS level 2 regions across the EU where GDP per inhabitant was at least 50 % above the EU average – as shown by the darkest shade of teal. Among these relatively ‘wealthy’ regions, the highest level of regional GDP per inhabitant was observed in Luxembourg; its ratio was 2.7 times as high as the EU average. There were four other regions where GDP per inhabitant was more than twice as high as the EU average, three of these were capital regions: Eastern and Midland in Ireland, Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest in Belgium, and Praha in Czechia. Note that some of the economic differences between regions may reflect the (sometimes artificial) administrative boundaries that are used to delineate each region. It is often the case that part of the income generated in ‘wealthy’ regions – that are hubs of business activity – may be attributed to labour input from commuters who live in surrounding regions where, among other possible advantages, the price of property and cost of living may be lower. Note also that some regions with high levels of GDP are characterised by a strong presence of multinational enterprises. This may distort their levels of economic activity, especially if assets (for example technology patents) are domiciled in a region. Aside from the four capital regions mentioned above, Southern (Ireland) was the only other region in the EU where GDP per inhabitant was more than twice as high as the EU average in 2021; this region is home to a number of the world’s top technology and pharmaceutical businesses.

At the other end of the range, there were 15 NUTS level 2 regions within the EU where GDP per inhabitant was less than 50 % of the EU average in 2021; they are shown by the darkest shade of gold in Map 7.1. These 15 regions were concentrated in Bulgaria (five regions, the only exception being the capital region of Yugozapaden) and Greece (also five regions). The remainder of this group was composed of three regions from eastern EU Member States – Észak-Alföld in Hungary, Nord-Est in Romania, and Panonska Hrvatska in Croatia – and two of the outermost regions in France, Guyane and Mayotte. The lowest level of regional GDP per inhabitant was recorded in Mayotte, at 28 % of the EU average.

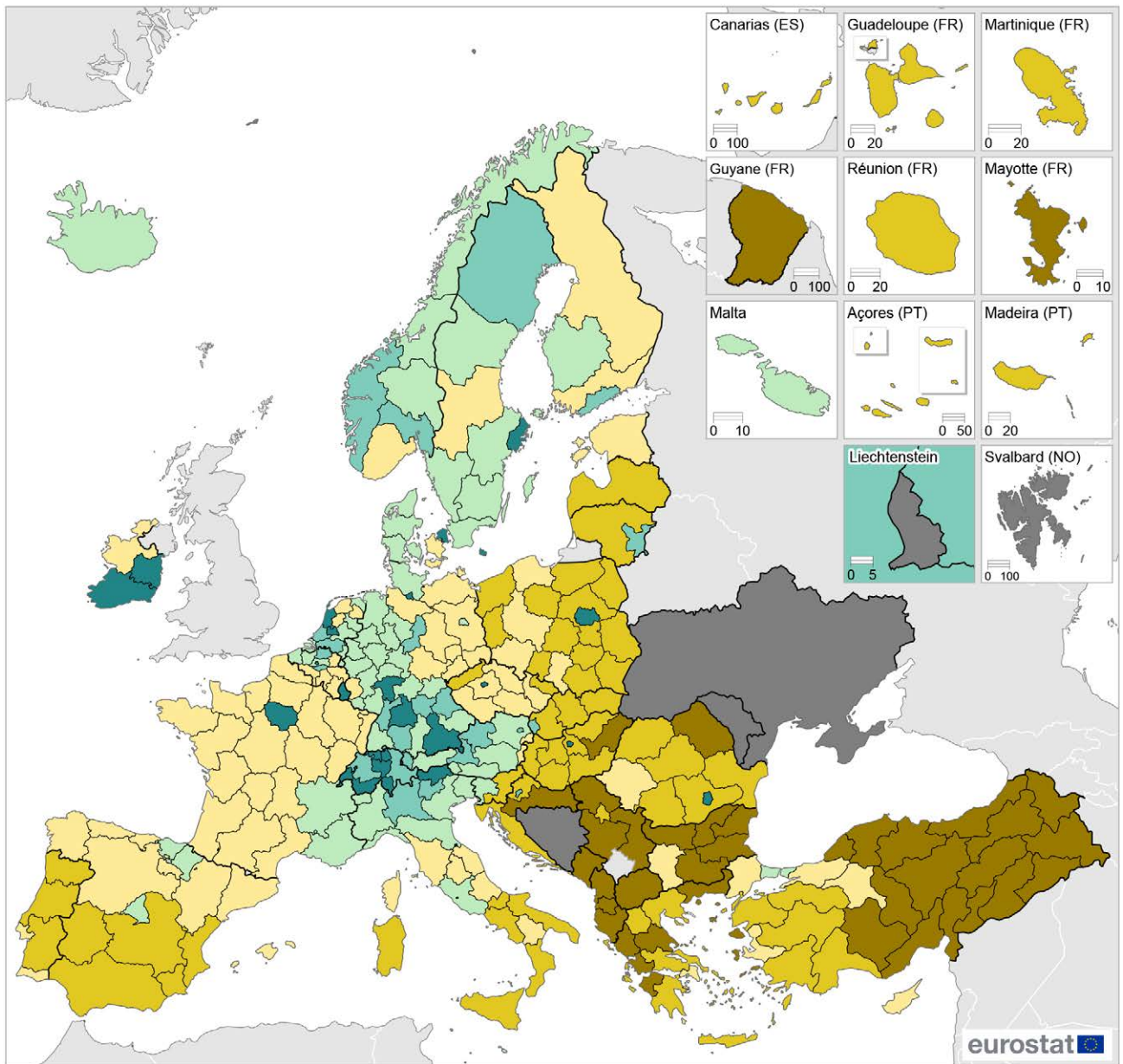
**The EU had 10 regions where the overall level of GDP was in excess of €200 billion; together, they accounted for more than one fifth of the EU’s economic output**

Across the EU in 2021, there were 10 NUTS level 2 regions where GDP was in excess of €200 billion. Ile-de-France – the capital region of France – had, by far, the largest regional economy (€765 billion of GDP), followed by the northern Italian region of Lombardia (€403 billion) and the southern German region of Oberbayern (€297 billion). There were seven more regions within the EU where GDP was higher than €200 billion: three in Germany (Stuttgart, Düsseldorf and Darmstadt); two in Spain (Comunidad de Madrid and Cataluña); and single regions in France (Rhône-Alpes) and Ireland (Eastern and Midland). Together, these 10 regions with the highest levels of GDP collectively accounted for 21.2 % of the EU’s economic output in 2021. Two alternative measures can be used to demonstrate the concentration of economic activity within the EU: the combined output of the smallest 68 regions (in economic terms) was approximately the same as that of Ile-de-France, while the cumulative output of the smallest 141 regions (again in economic terms) was approximately the same as that recorded in the 10 largest regions.

Figure 7.1 presents information on regional disparities in GDP per inhabitant, comparing the period immediately before the COVID-19 crisis (2019) with the latest information available for 2021. The [coefficient of variation](#) is defined, for a particular dataset, as the ratio of the standard deviation divided by the mean; a higher ratio indicates a greater degree of dispersion. In 2021, there were considerable regional disparities for GDP per inhabitant across Hungary and Czechia; they both had coefficients that were greater than 50.0 %. These high values reflected particularly high levels of GDP per inhabitant in capital regions that could be contrasted against the remainder of the territory where GDP per inhabitant was less than the EU average. By contrast, GDP per inhabitant was much more uniformly distributed across the regions of Finland, Austria and Portugal, where the coefficient of variation was below 20.0 %.

The data presented in Figure 7.1 also permit an analysis over time: this may be used to determine whether the COVID-19 crisis resulted in regional GDP per inhabitant being more or less equitably distributed. In most EU Member States, regional disparities were somewhat lower after the initial impact of the pandemic. The largest falls were observed in Finland, Belgium and Romania, where the coefficient of variation was at least 2.0 [percentage points](#) lower in 2021 than in 2019. In Finland and Belgium, this reflected slower or negative developments for GDP per inhabitant in several relatively ‘wealthy’ regions (for example, those regions located around the Belgian capital). In Romania, the picture was somewhat different, insofar as regional divergences narrowed due to faster than average growth in a number of relatively ‘poor’ regions that

**Map 7.1: GDP per inhabitant in purchasing power standards (PPS), 2021**  
 (index in relation to the EU average = 100, by NUTS 2 regions)



- EU = 100
- ≥ 150
- 125 – < 150
- 100 – < 125
- 75 – < 100
- 50 – < 75
- < 50
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: Norway, North Macedonia and Albania, 2020. Switzerland: 2018.  
 Source: Eurostat (online data codes: [nama\\_10r\\_2gdp](#) and [nama\\_10\\_pc](#))



were ‘catching-up’. Between 2019 and 2021, Czechia and Denmark were the only Member States that recorded an increase in regional disparities for GDP per inhabitant. The coefficient of variation rose at a particularly fast pace in Denmark, up 4.2 percentage points, reflecting a rapid increase of GDP per inhabitant in the capital region of Hovedstaden.

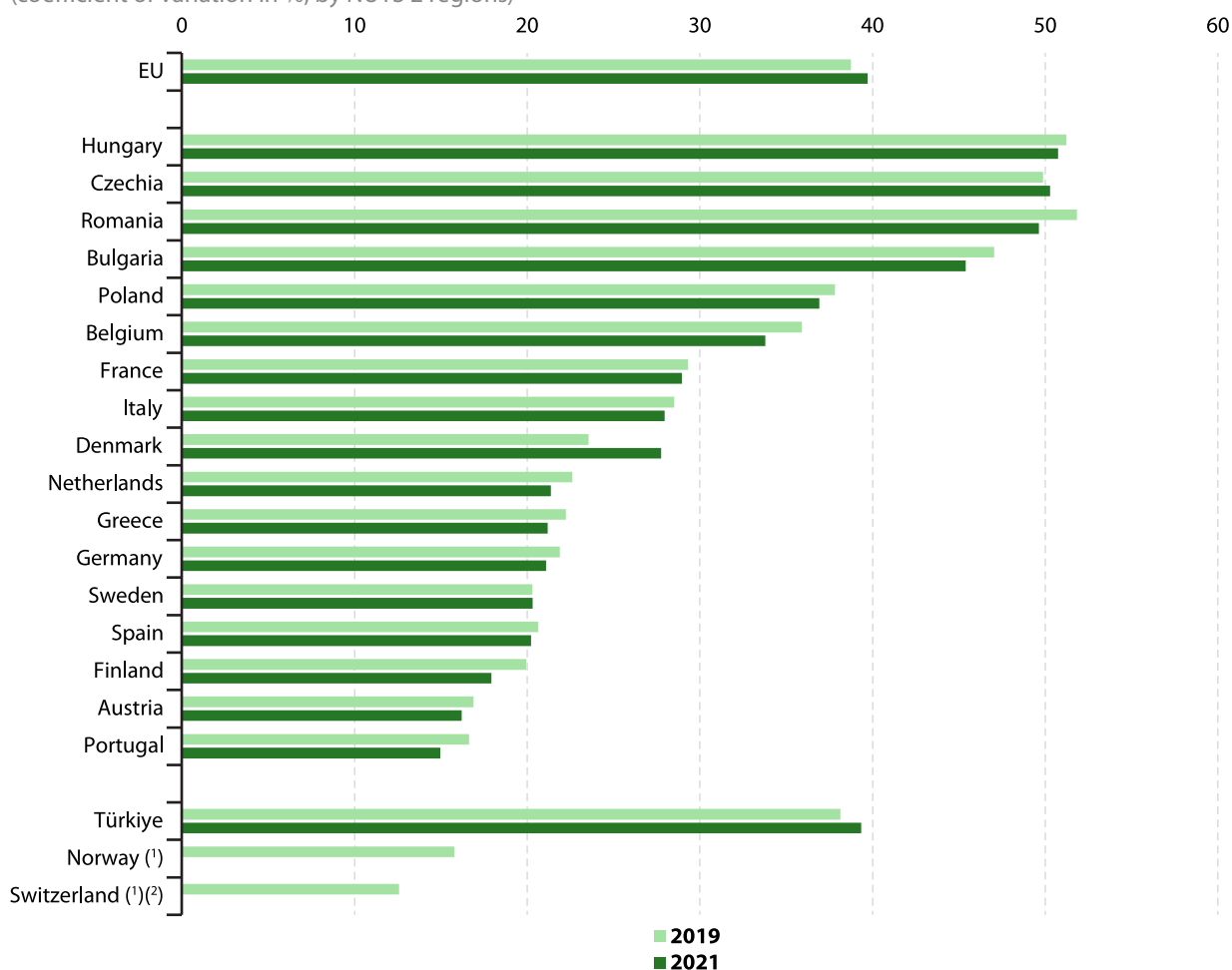
The **urban–rural typology** is a classification based on measuring population density and geographical continuity; it is applied to NUTS level 3 regions, identifying **predominantly rural regions**, **intermediate regions** and **predominantly urban regions**. Figure 7.2 shows predominantly urban regions of the EU had (on average) higher levels of economic development than intermediate or predominantly rural regions. This pattern may be linked to key drivers of economic growth (human and physical capital, technology and natural resources) often being concentrated in urban/built-up areas. While predominantly urban regions tend to have higher standards of living, they often face a

number of distinct challenges (such as higher levels of inequality, crime or pollution).

Predominantly urban regions often play a key role in economic development as they act as an economic hub, providing a broad range of opportunities and services to those living in surrounding regions. With this in mind, the European Commission is seeking to strengthen urban–rural linkages with its **cohesion policy**, promoting integrated territorial development through a coordinated approach that encourages sustainable urban development alongside support for disadvantaged areas.

In 2020, GDP per inhabitant averaged 37 000 PPS across predominantly urban regions of the EU. This was 1.4 times as high as in intermediate regions (26 400 PPS) and 1.6 times as high as in predominantly rural regions (23 200 PPS). Predominantly urban regions consistently recorded a higher level of GDP per inhabitant than predominantly rural regions and they also recorded the

**Figure 7.1: Regional disparities in GDP per inhabitant, 2019 and 2021**  
(coefficient of variation in %, by NUTS 2 regions)



Note: as measured by the coefficient of variation for EU Member States with more than four NUTS 2 regions (Estonia, Ireland, Croatia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Slovakia: not available).

(¹) 2021: not available.

(²) 2018 instead of 2019.

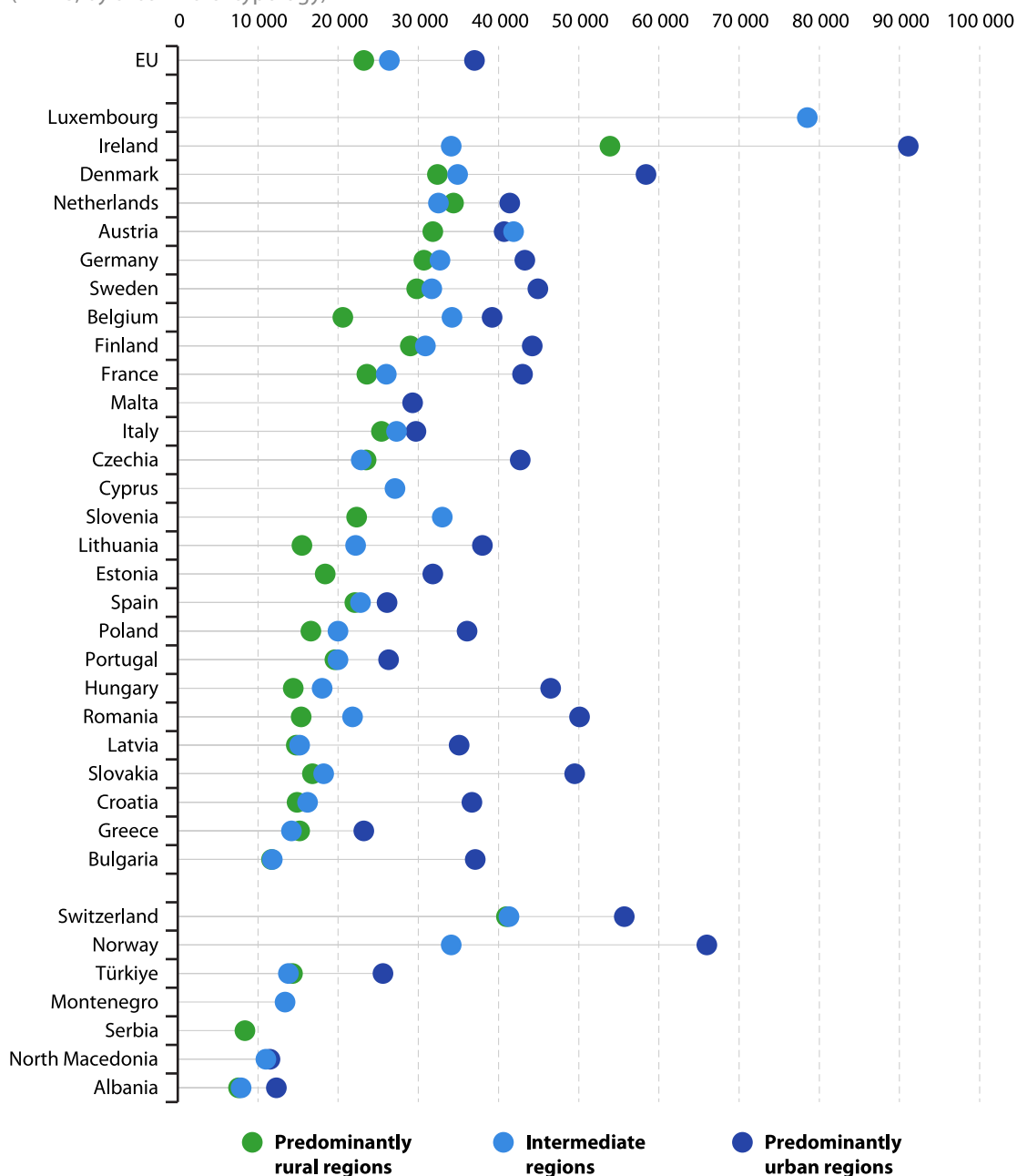
Source: Eurostat (online data code: nama\_10r\_2gdp)

highest levels of GDP per inhabitant in all but one of the EU Member States; note that smaller Member States are covered by just one or two of the three classes within the urban–rural typology. Austria was the only exception, as it recorded a higher standard of living in intermediate regions than in predominantly urban regions. This pattern was most apparent in Romania, Hungary and Bulgaria, where the standard of living in predominantly urban regions was 3.2 times as high as in predominantly rural regions. By contrast, there were

relatively small differences in living standards between predominantly urban and predominantly rural regions in Spain and Italy.

Having posted growth rates close to 2.0 % in both 2018 and 2019, the EU’s economic output contracted 5.7 % in 2020, reflecting the direct and indirect impact of the COVID-19 crisis; these rates of change are presented in real terms, in other words the effects of inflation have been removed. To put the data for 2020 into context:

**Figure 7.2: GDP per inhabitant, 2020**  
(in PPS, by urban–rural typology)

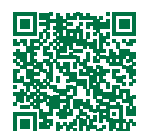


For more statistics broken down by urban–rural typology, see:

**Rural Europe**  
(online publication)



**Urban Europe**  
(online publication)



Note: ranked on the national average. Switzerland: 2018. There are no predominantly urban regions for Cyprus, Luxembourg, Slovenia and Montenegro; there are no intermediate regions for Estonia and Malta; there are no predominantly rural regions for Cyprus, Luxembourg, Malta, Montenegro and North Macedonia. Norway: predominantly urban regions, not available. Serbia: predominantly rural regions and intermediate regions, not available.

Source: Eurostat (online data code: urt\_10r\_3gdp)

- it was the first time that the EU's GDP had fallen since a modest decline of 0.1 % in 2013;
- the downturn in activity associated with the COVID-19 crisis was larger than the decline recorded at the height of the global financial and economic crisis, as GDP fell 4.3 % in 2009.

**Notio Aigaio saw its economic activity rebound in 2021 with the highest rate of GDP growth among EU regions**

During the initial stages of the pandemic, restrictions on the movement of people and goods often led to a disproportionately deep recession in popular holiday destinations and/or border regions. However, there was a considerable rebound in economic activity across the EU in 2021, as GDP increased 5.4 %. This pattern was repeated in almost every NUTS level 2 region, with positive rates of change in 224 out of 226 regions for which data are available; note statistics for Poland are only available at a national level. There were 18 regions in the EU where the annual growth rate for GDP was at least 10.0 % (as shown by the darkest shade of blue in Map 7.2). Several regions characterised by particularly high economic growth rates in 2021 also recorded inversely proportional falls in activity during 2020.

- This was particularly notable for several of the EU's most popular tourist destinations: Notio Aigaio, Ionia Nisia and Kriti in Greece; Illes Balears in Spain; Jadranska Hrvatska in Croatia; Malta; and Corse in France.
- There were also high GDP growth rates in all three regions of Ireland, the three remaining regions of Croatia, two regions in Hungary, as well as Rheinhessen-Pfalz (Germany), Sterea Elláda (Greece), and the archipelago of Åland (Finland).
- Across NUTS level 2 regions, the highest GDP growth rates in 2021 were recorded in Notio Aigaio (16.7 %), Southern (Ireland; 16.3 %) and Jadranska Hrvatska (16.0 %).

At the other end of the range, there were several northern regions of the EU that recorded modest (but positive) growth rates; this was also the case for a band of regions running from northern Germany into Czechia and Slovakia. There were only two NUTS level 2 regions where GDP fell between 2020 and 2021 (as shown by the lightest shade in Map 7.2): Prov. Brabant Wallon in Belgium (–2.4 %) and Tirol in Austria (–0.2 %).

Map 7.3 provides information on the overall change – between 2019 and 2021 – of regional GDP; it therefore presents an analysis of how GDP recovered (or otherwise) from the impact of the COVID-19 crisis. Note the information presented is once again shown for real rates of change, in other words the effects of inflation have been removed.

**There were 142 regions in the EU where the level of economic activity had yet to return to its pre-pandemic level**

In 2021, overall economic activity in the EU had almost returned to its pre-pandemic levels; it was 0.6 % lower than in 2019. Regional performance was relatively skewed insofar as GDP had yet to return to pre-pandemic levels in almost two thirds (142 out of 226) of the regions for which data are available; note statistics for Poland are only available at a national level. Among these, there were 26 regions where GDP in 2021 remained more than 5.0 % below its level from 2019 (as shown by the darkest shade of gold in Map 7.3). These regions were principally located in southern EU Member States, particularly across Italy and the Iberian Peninsula. At the bottom end of the ranking, there were five regions where GDP remained more than 10.0 % below its 2019 level:

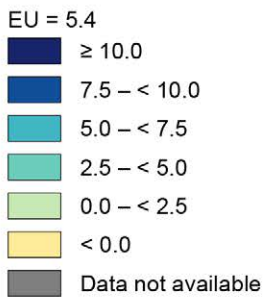
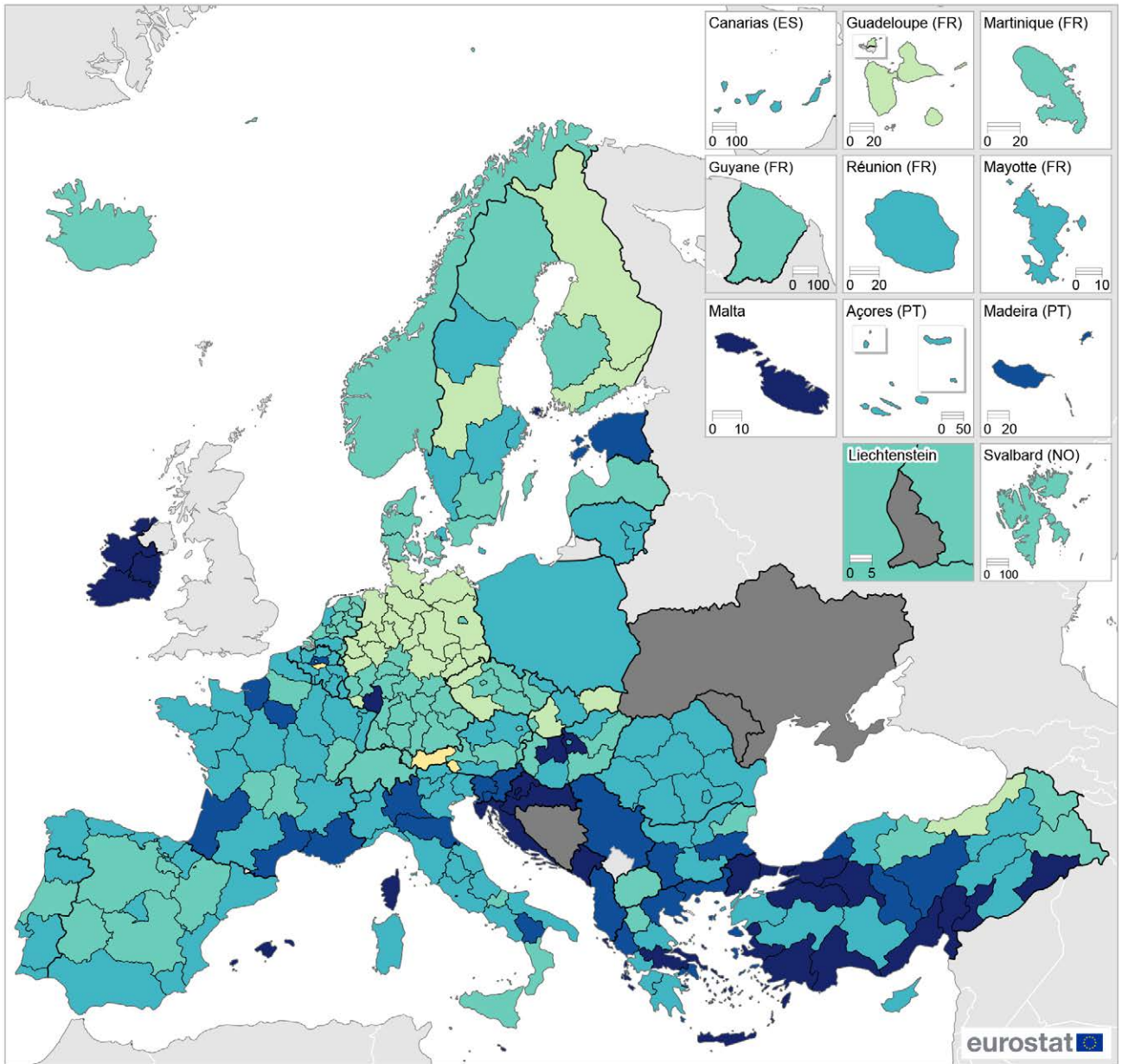
- the popular holiday destinations of Illes Balears (–15.0 %) and Canarias (–13.4 %) in Spain, and Algarve (–13.8 %) in Portugal;
- Prov. Brabant Wallon (–11.6 %) in Belgium; and
- Dytiki Makedonia (–10.6 %) in Greece.

By contrast, there were 83 regions across the EU where the level of economic activity was higher in 2021 than it had been in 2019. These regions were principally located in Ireland, Croatia, Hungary, Slovenia and the [Baltic Member States](#), although there were other pockets of growth. Among them, there were four regions where GDP was more than 10.0 % above its 2019 level.

- All three regions of Ireland – Southern (28.4 %), Eastern and Midland (15.4 %) and Northern and Western (14.1 %) – where GDP continued to grow during the pandemic. Some of the rapid growth in Ireland may be linked to a buoyant pharmaceuticals sector, one of the few sectors in the EU economy that continued to grow during the COVID-19 crisis.
- The western German region of Rheinhessen-Pfalz (10.5 %), where GDP rebounded very strongly in 2021 having fallen in 2020.

Looking in more detail at annual developments over the period 2019–2021, there were six regions across the EU which recorded continuous GDP growth during the pandemic, with positive rates of change for both 2020 and 2021: all three regions of Ireland, the Romanian capital region of București-Ilfov, Vidurio ir vakarų Lietuvos regionas in Lithuania, and Midtjylland in Denmark. At the other end of the range, there were two regions where GDP fell in both 2020 and 2021: Prov. Brabant Wallon in Belgium and Tirol in Austria.

**Map 7.2: Change in GDP, 2021**  
 (% annual change in real terms compared with 2020, by NUTS 2 regions)

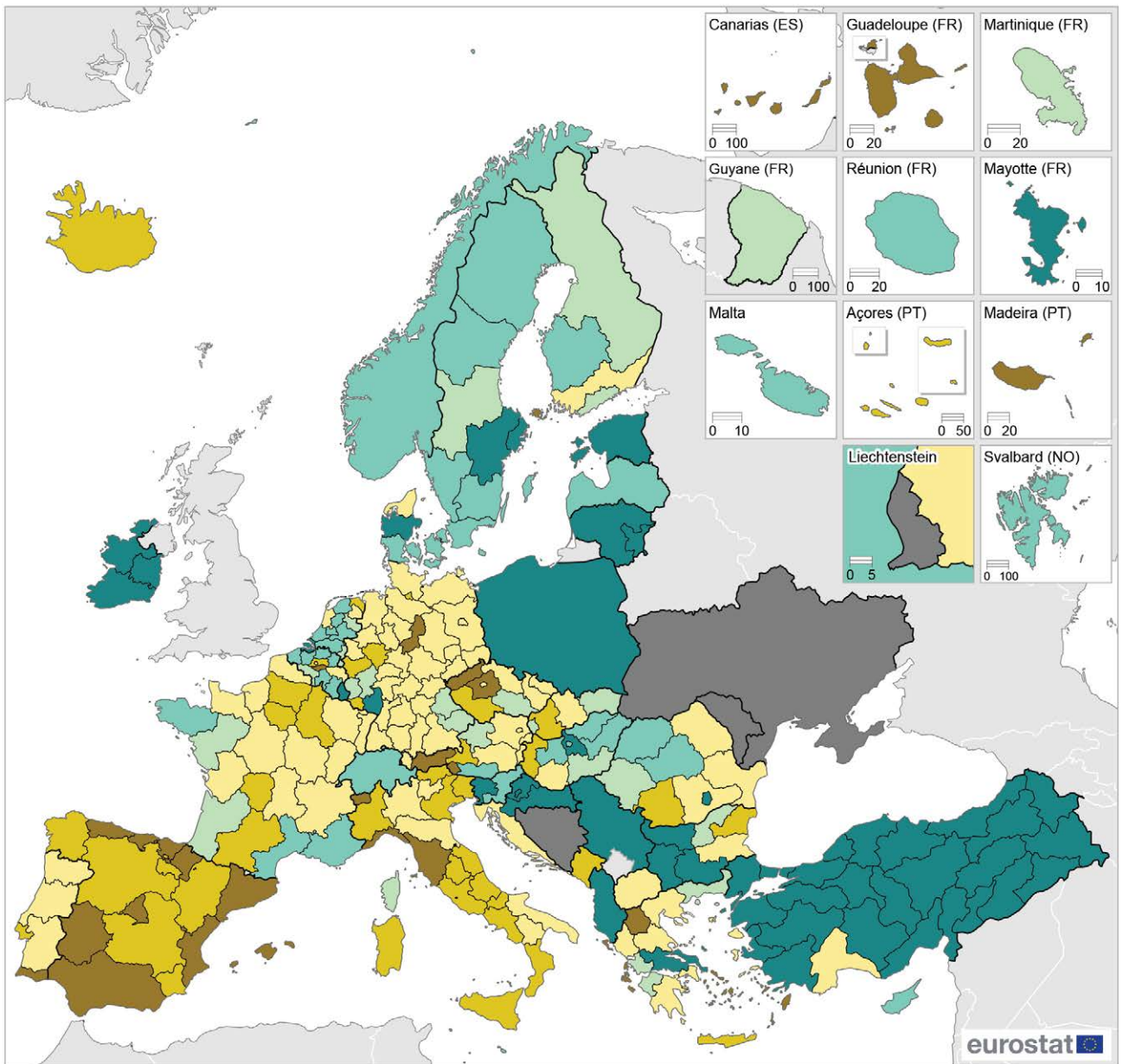


Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: Poland, Norway, Switzerland, Albania and Serbia, national data.  
 Source: Eurostat (online data codes: [nama\\_10r\\_2gvagr](#) and [nama\\_10\\_gdp](#))



**Map 7.3: Change in GDP, 2021**  
 (% , overall change in real terms compared with 2019, by NUTS 2 regions)



- EU = -0.6
- ≥ 3.5
- 1.5 - < 3.5
- 0.0 - < 1.5
- 2.5 - < 0.0
- 5.0 - < -2.5
- < -5.0
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 07/2023

Note: Poland, Norway, Switzerland, Albania and Serbia, national data.  
 Source: Eurostat (online data codes: [nama\\_10r\\_2gvagr](#) and [nama\\_10\\_gdp](#))



## Income

As noted above, wealth creation in the EU is often concentrated in economic hubs (capital regions and other major urban/metropolitan centres), where part of the output generated may be attributed to commuters living in surrounding regions. As a result, income per inhabitant in these surrounding regions tends to be relatively high when contrasted with their economic output (as measured by GDP per inhabitant).

### PRIMARY INCOME PER INHABITANT

Primary income covers income from paid work and self-employment, as well as from interest, dividends and rents. In 2020, EU primary income per inhabitant averaged 19 500 PPS. The use of data in PPS, rather than in euro (€), takes account of price level differences between countries; the conversion to PPS takes into account the fact that household expenditure is predominantly related to consumption.

#### ***Oberbayern had the highest level of primary income per inhabitant***

In 2020, there were 24 regions spread across seven different EU Member States where income per inhabitant was at least 26 500 PPS; these are shown by the darkest shade in Map 7.4. These were concentrated in Germany (16 regions), with the highest income levels predominantly found in western (rather than eastern) regions. Five more regions were in the Benelux countries and the remaining three regions were located in France, Italy and Austria.

At the other end of the range, there were 25 regions spread across eight different EU Member States where primary income per inhabitant was less than 10 750 PPS in 2020 (as shown by the lightest shade in Map 7.4). Other than two of the French outermost regions – Mayotte and Guyane – these regions were concentrated in Greece or eastern Europe and included:

- 8 of the 13 regions that compose Greece,
- five of the six regions that compose Bulgaria (the exception being the capital region of Yugozapaden),
- four of the eight regions that compose Romania,
- three regions in Hungary,
- two regions in Croatia, and
- one region in Slovakia.

In 2020, primary income per inhabitant ranged from a high of 36 800 PPS in Oberbayern (southern Germany) down to 6 100 PPS in Severozapaden (Bulgaria). As such, the average level of income in Oberbayern was approximately six times as high as the level recorded in Severozapaden. Three more German regions featured

at the top of the ranking with the highest levels of primary income per inhabitant – Stuttgart, Hamburg and Darmstadt – followed by Luxembourg. Note that Luxembourg had the highest level of income in euro (€41 700 per inhabitant) – somewhat above the figure recorded for Oberbayern (€39 400 per inhabitant) – although Luxembourg's relatively high cost of living meant that it ranked fifth when analysing the data in PPS.

### DISPOSABLE INCOME PER INHABITANT

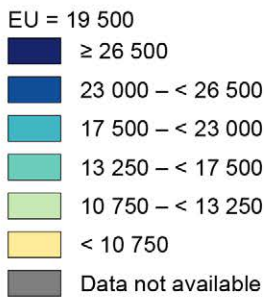
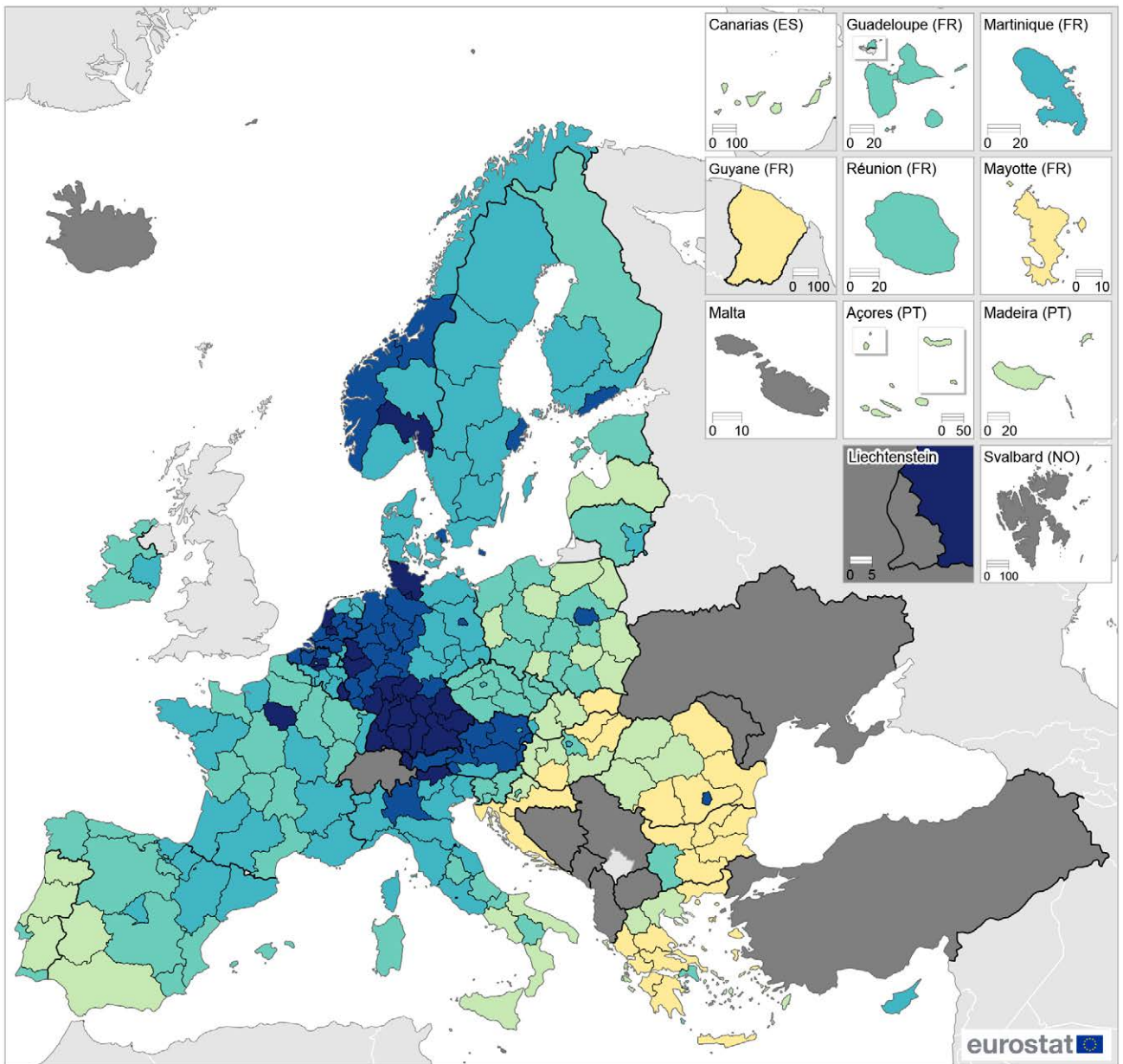
The previous section analysed regional differences in primary income per inhabitant across EU regions. This section focuses on regional income differences within EU Member States. Rather than using net primary income, a more appropriate measure for this purpose is net disposable income, which is calculated by deducting income taxes and net social contributions from primary income while net social benefits and net current transfers are added.

Regional differences in income levels tend to be lower when analysed in terms of disposable (rather than net primary) income, due to the redistributive nature of tax and welfare systems. For example, regions with relatively high levels of income may be expected to pay higher (or a greater share of) taxes and social contributions, whereas regions with higher unemployment, a high share of elderly persons, or a generally more vulnerable population are likely to receive proportionally more unemployment benefits, pensions and other kinds of monetary benefits. As such, the regional distribution of disposable income per inhabitant depends on the inequalities in primary income as well as inequalities in other factors (such as income tax, social benefits and transfer systems, as well as differences in age structure and unemployment rates between regions).

Although Eurostat collects and publishes regional data on net disposable income, it is not recommended to use this information to analyse income differences across the EU; rather, these statistics are used to analyse regional differences within the same EU Member State. This is because most national statistical offices do not compile regional data for social transfers in kind. The latter are goods and services provided by government for free or at prices that are not economically significant; they mainly include education, health and some social security services, as well as housing, cultural or recreational services.

Figure 7.3 shows annual changes in net disposable income per inhabitant and GDP per inhabitant for 2020; the information shown is based on data in euro (€).

**Map 7.4: Net primary income per inhabitant, 2020**  
(in purchasing power standards (PPS), by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: Norway, 2019.

Source: Eurostat (online data code: nama\_10r\_2hhinc)

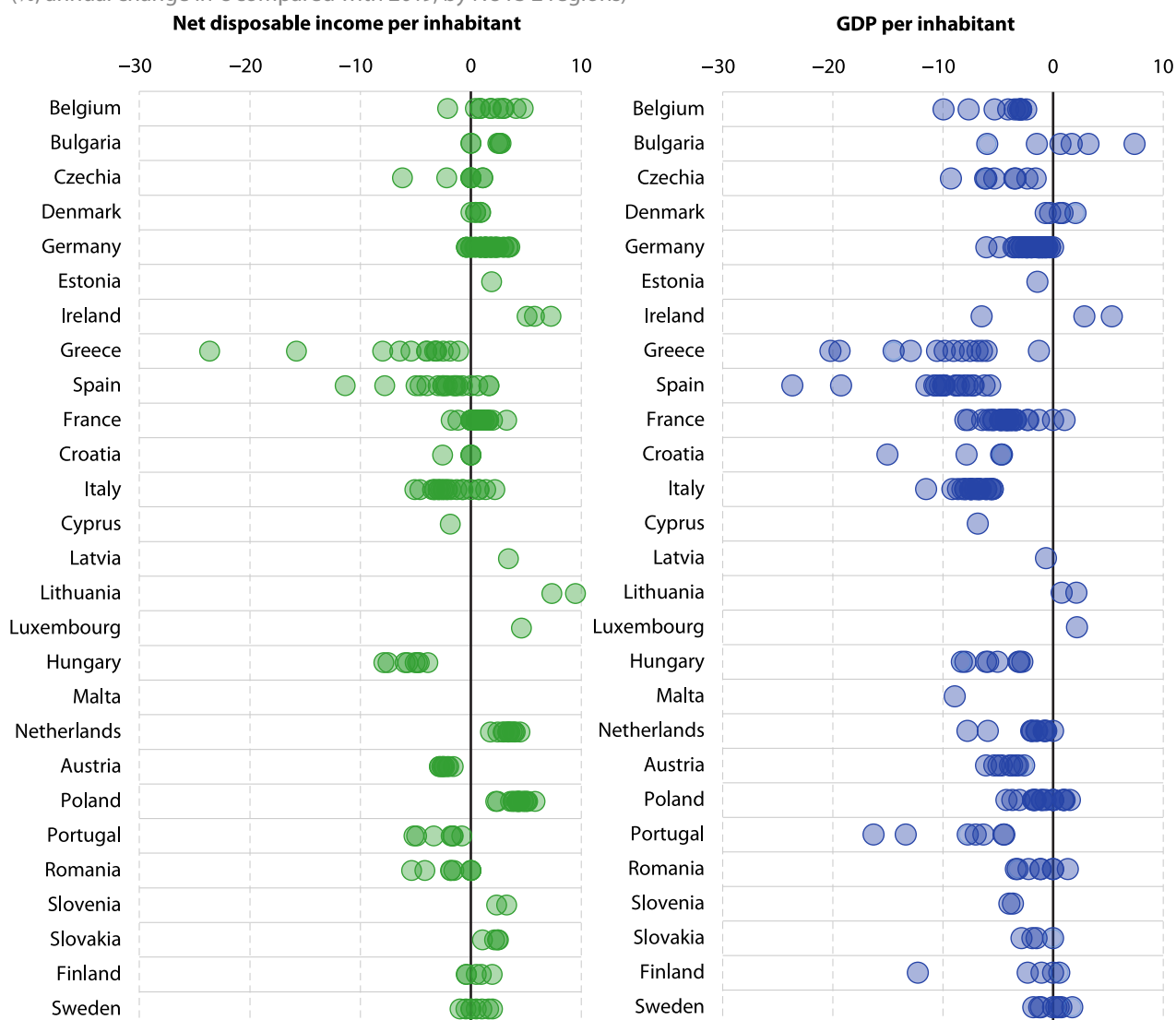
The figure confirms the redistributive nature of tax and welfare systems across EU regions insofar as:

- rates of change for disposable income per inhabitant were usually higher than rates of change for GDP per inhabitant;
- rates of change for disposable income per inhabitant were usually less dispersed than for GDP per inhabitant.

Disposable income in the EU averaged €17 200 per inhabitant in 2020, while GDP per inhabitant averaged €30 000. There were 17 NUTS level 2 regions that

recorded positive rates of change in 2020 for both disposable income per inhabitant and GDP per inhabitant. These regions were principally concentrated in northern or eastern EU Member States: four regions from Poland, three from Bulgaria, two regions each from Denmark, Ireland and Sweden, both regions of Lithuania, a single region from Finland, and Luxembourg. By contrast, there were 85 NUTS level 2 regions that recorded falls for both indicators. This group included every region of Greece, Hungary, Austria and Portugal, as well as the vast majority of regions in Italy (16 out of 21) and Spain (15 out of 19).

**Figure 7.3: Net disposable income per inhabitant and GDP per inhabitant, 2020**  
(%, annual change in € compared with 2019, by NUTS 2 regions)



Note: Malta, not available for net disposable income per inhabitant.  
Source: Eurostat (online data codes: nama\_10r\_2hhinc and nama\_10r\_2gdp)



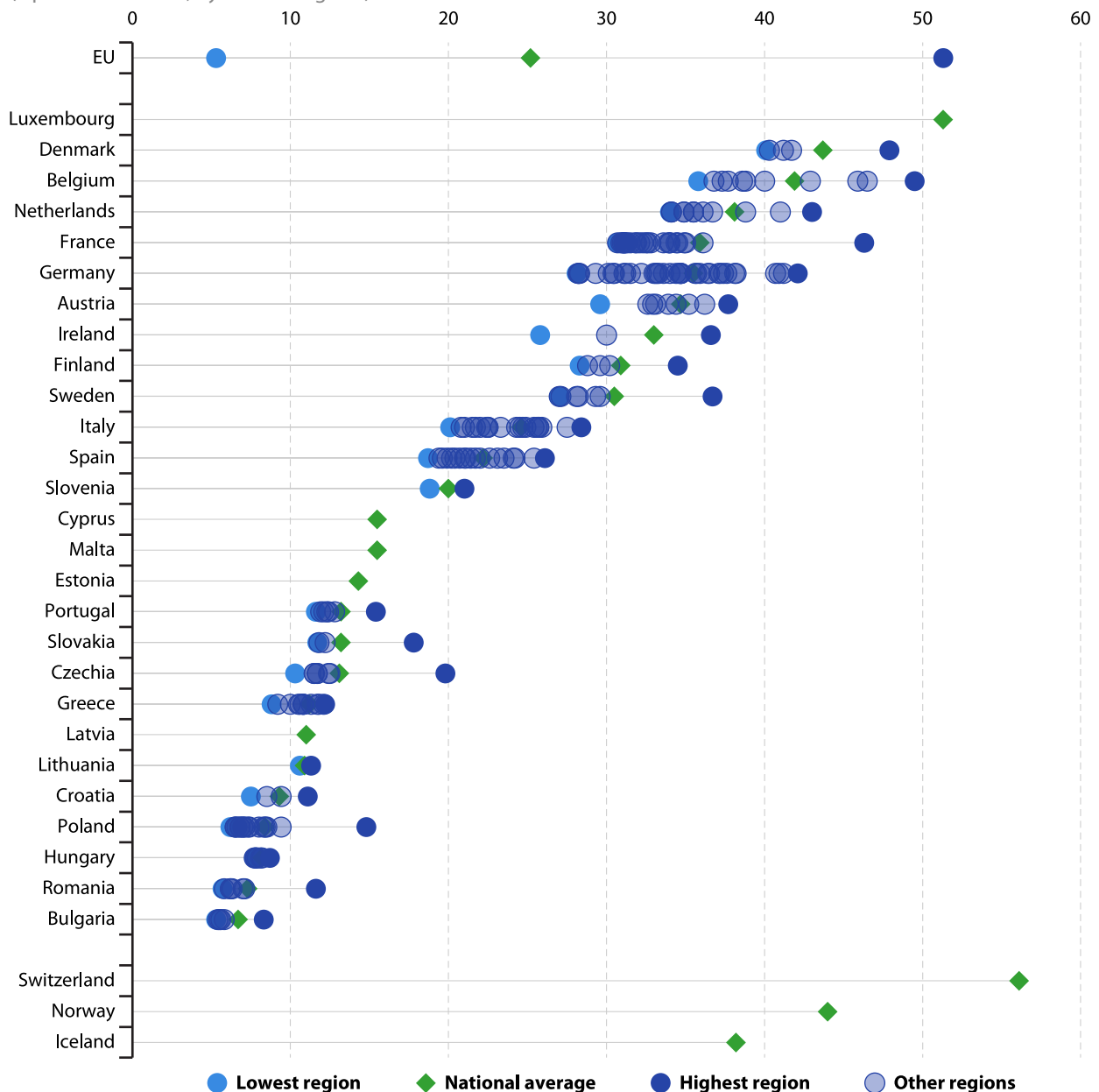
## Compensation of employees

One of the principal areas of interest/concern for many employees is their level of remuneration; this has become an even greater preoccupation during the cost-of-living crisis. Employee compensation is defined (within national accounts) as remuneration, in cash or in kind (such as a company car or vouchers for meals), payable by an employer to an employee in return for work done; it also includes payments linked to social contributions (such as health or pension contributions). The data presented in Figure 7.4 refer to gross (in other words, before tax) hourly compensation in euro (€).

### The highest level of employee compensation was recorded in Luxembourg

In 2020, employees working in the EU received an average gross compensation of €25.2 for each hour that they worked. The highest level of employee compensation was recorded in Luxembourg (€51.3 per hour), while the lowest level was registered in the Bulgarian region of Severen tsentralen (€5.3 per hour). As such, the ratio between the highest and lowest levels of employee compensation was almost 10 : 1.

**Figure 7.4: Compensation of employees, 2020**  
(€ per hour worked, by NUTS 2 regions)



Note: ranked on the national average. Norway and Switzerland: regional data, not available.  
Source: Eurostat (online data codes: nama\_10r\_2lp10 and nama\_10\_lp\_ulc)



There were 18 NUTS level 2 regions in the EU where the average level of employee compensation was at least €40.0 per hour in 2020. These 18 regions were concentrated in a cluster of six western EU Member States, the three Benelux countries, Denmark, Germany and France. In five of these, the highest levels of employee compensation were recorded in the capital region: Luxembourg (€51.3 per hour), Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest (Belgium; €49.5), Hovedstaden (Denmark; €47.9), Ile-de-France (France; €46.3), and Noord-Holland (the Netherlands; €43.0). The only exception was Germany, where the highest level of employee compensation was observed in the southern region of Oberbayern (€42.1), while the capital region of Berlin had a somewhat lower average level, at €37.4.

More generally, it was relatively common for capital regions to have notably higher levels of average employee compensation per hour worked. This is unsurprising given the high cost of living in many capitals, while most also play an important role as the location for company headquarters, financial services and national administrations, which tend to offer above average levels of compensation. Capital regions had the highest levels of employee compensation in a majority of the multi-regional EU Member States in 2020: the only exceptions were Oberbayern (Germany; as mentioned above), Sterea Ellada (Greece), País Vasco (Spain) and Provincia Autonoma di Bolzano/Bozen (Italy). In several Member States, the regional distribution of employee compensation was heavily skewed, as the capital was the only region to report a level of compensation that was above the national average. The largest regional variations in employee compensation were observed in Poland and Romania. For example, someone working in the capital regions of Warszawski stoleczny or Bucuresti - Ilfov could expect to earn more than twice as much as an employee working in Warminko-Mazurskie or Sud - Muntenia (where the lowest levels of compensation in Poland and Romania were recorded). There was a relatively low level of regional variation in the compensation paid to employees across Finland, Denmark and Hungary, as well as Slovenia and Lithuania (note the latter are both composed of just two regions).

## Labour productivity

Labour productivity can be defined as GDP (or gross value added) divided by a measure of labour input, typically the number of persons employed or the total number of hours worked. The information presented in Map 7.5 is based on labour productivity per hour worked, which reflects, at least to some degree, changes in the structure of the employment market. For instance, the ratio falls if there is a shift from full-time to part-time work, or if working hours are curtailed due to restrictions such as those imposed during the COVID-19 crisis.

High labour productivity may be linked to the efficient use of labour and/or reflect the skills and experience of the labour force. These in turn may result from the specific mix of activities present in each regional economy as some activities: for example, knowledge-intensive industrial activities, business or financial services tend to be characterised by higher levels of labour productivity (as well as higher levels of employee compensation).

In 2020, an average of €42.5 of value was added for each hour worked in the EU. This figure can be used as the basis for deriving a set of nominal labour productivity indices, which are presented relative to the EU average = 100. Labour productivity was not particularly skewed across the EU regions, insofar as 129 (out of 242) NUTS level 2 regions had an index that was equal to or above the EU average, while 113 regions had indices that were below the EU average.

There were 23 regions where regional levels of labour productivity were at least 50 % above the EU average in 2020 (as shown by the darkest shade in Map 7.5). They were concentrated in western and Nordic regions of the EU:

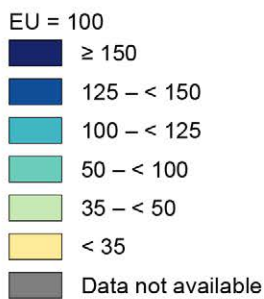
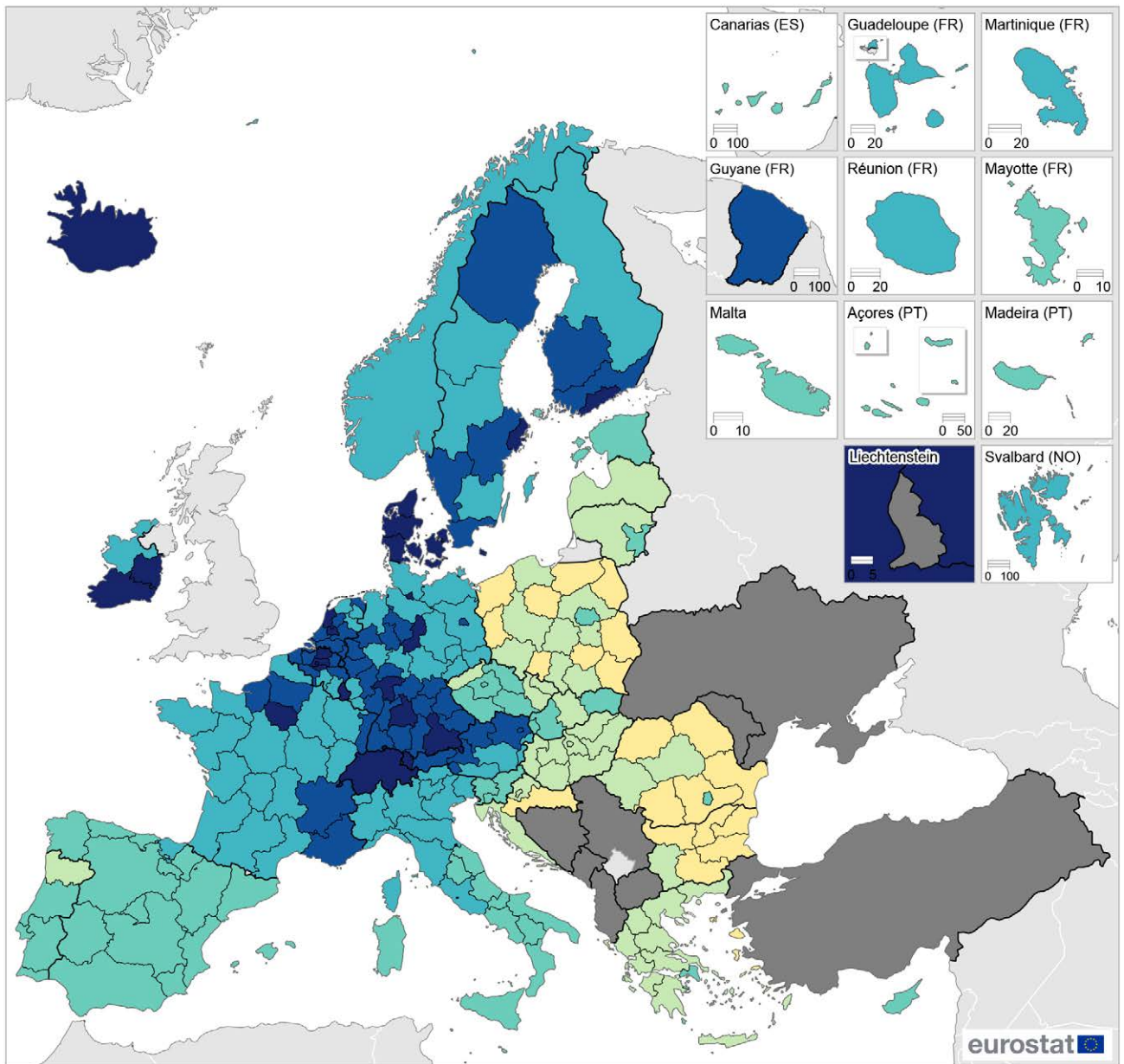
- two or more regions from Belgium, Denmark, Germany, Ireland and the Netherlands had labour productivity indices above this threshold;
- as did the capital regions of the Benelux and Nordic countries, and the capital regions of Ireland and France.

At the top end of the distribution, there were five regions where labour productivity was more than twice as high in 2020 as the EU average: Southern (Ireland; 3.2 times as high), Eastern and Midland (Ireland; 2.3 times), Luxembourg (also 2.3 times), Hovedstaden (Denmark; 2.1 times) and Prov. Brabant Wallon (Belgium; 2.0 times). As already noted, the relatively high levels of GDP or value added in Irish regions may be linked to the presence of multinational enterprises, which may result in high levels of labour productivity (especially when capital assets are domiciled in a region).

At the other end of the range, there were 21 regions where labour productivity was less than 35 % of the EU average in 2020 (as shown by the lightest shade in Map 7.5). These regions were clustered in eastern EU Member States: nine regions from Poland, five regions from each of Bulgaria and Romania, and one region from Croatia; there was also one region from Greece with an index below this threshold. The lowest levels of labour productivity were recorded in Bulgaria and Romania:

- five out of the six regions in Bulgaria – the exception being the capital region of Yugozapaden – had labour productivity indices that were less than one quarter of the EU average, with the lowest ratio recorded in Severen tsentralen (19 % of the EU average);
- Nord-Est in Romania was the only other region in the EU to record a labour productivity ratio that was less than one quarter of the EU average (at 22 %).

**Map 7.5: Nominal labour productivity, 2020**  
 (index based on € per hour worked in relation to EU average = 100, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 04/2023

Note: Norway and Switzerland, national data.

Source: Eurostat (online data codes: nama\_10r\_2nlp, nama\_10\_gdp and nama\_10\_a10\_e)

## 8. Business

The European Union's (EU's) **business and industrial policy** is designed to improve the business environment, promote entrepreneurship and job creation, give small businesses easier access to finance and markets, and support innovative enterprises. Enhanced trade agreements open up markets for EU businesses, while action may be taken to prevent unfair competition from outside the EU. The EU seeks to:

- strengthen its industrial base and promote a transition to a zero-carbon economy;
- promote innovation as a means to generate new sources of growth;
- encourage small businesses and promote an entrepreneurial culture;
- guarantee an EU-wide market for goods; and
- maximise the benefits of the EU's investment in space technologies.

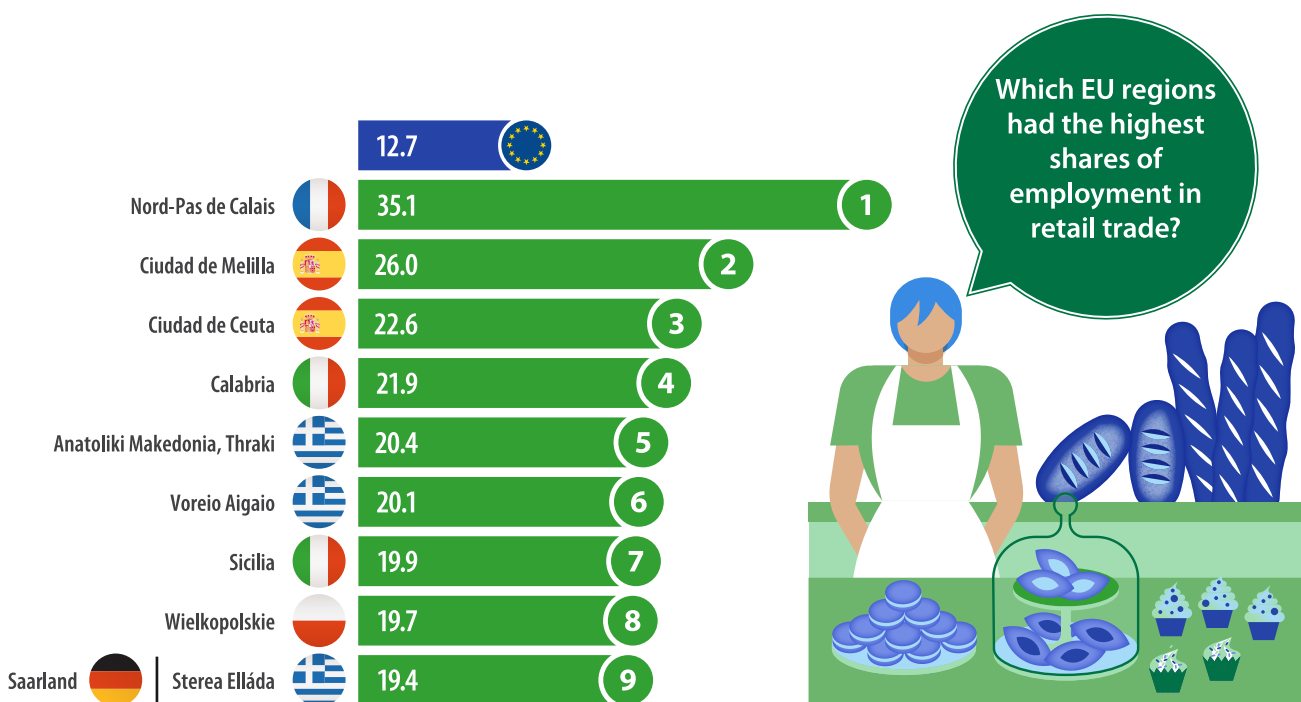
Businesses in the EU are leaders in many industrial, construction-related and service sectors. However, the global business environment continues to undergo rapid change. This may take the form of technological change, developing patterns of trade and investment, increased awareness of environmental responsibilities, the introduction of new and more flexible working practices, or sudden economic shocks (such as the COVID-19 crisis or the effects of the Russian military aggression against Ukraine). Changes such as these may disrupt markets and supply chains, impacting how

businesses work. To remain competitive, EU businesses will likely need to: innovate; embrace technological change; adopt methods that use less energy, reduce waste and avoid pollution; invest in skills.

Presented according to the activity classification **NACE**, the first part of this chapter is based on a selection of regional **enterprise demography** statistics, including **enterprise birth** and **death** rates, as well as the share of **high-growth enterprises**.

The second and third parts of this chapter present **structural business statistics (SBS)** for **manufacturing** and for **non-financial services**; these analyses provide information on regional patterns of specialisation and concentration.

Within the third part, a special focus is provided for retail trade, for transportation and storage, and for accommodation services – three activities that were particularly impacted by the COVID-19 crisis and its associated restrictions. The latest available data for SBS generally concern 2020: as such, this is the first edition of the *Eurostat regional yearbook* where it has been possible to highlight the impact of the pandemic on detailed economic activities at a regional level. The infographic below shows the 10 EU regions where retail trade accounted for the highest share of **non-financial business economy** (defined here as NACE Sections B to J and L to N and Division 95) employment.



(% share of regional non-financial business economy employment, 2020, by NUTS 2 regions)  
Note: NACE Division 47. Basse-Normandie (FRD1): 2019.

Source: Eurostat (online data codes: sbs\_r\_nuts06\_r2 and sbs\_na\_sca\_r2)



## Enterprise demography

Enterprise demography statistics describe the population of enterprises: they cover, among other things, the birth of new enterprises, the growth and survival of existing enterprises (with particular interest centred on their employment impact), and enterprise deaths. These indicators provide an important insight into business dynamics, as new enterprises / fast-growing enterprises tend to be innovators that may improve the overall level of efficiency and productivity in an economy.

Note that throughout this section on enterprise demography the ‘business economy’ is generally defined as NACE Sections B to S, excluding the activities of holding companies (NACE Group 64.2). Note that for the analyses of enterprise birth and death rates, a narrower range of activities – excluding Sections O to S – has been used for the EU total/average and Belgium, as well as for Iceland and Serbia.

### BIRTHS AND DEATHS

#### *The EU's enterprise birth rate was 8.85 %*

The enterprise birth rate measures the number of new enterprises born during the course of a year in relation to the total population of active enterprises in the same year. In 2020, the enterprise birth rate in the EU's business economy was 8.85 %. This latest figure was 1.16 [percentage points](#) lower than in 2019, highlighting the impact of the COVID-19 crisis, which likely made some entrepreneurs reluctant to start new businesses during 2020.

In 2020, close to one in five (19.57 %) enterprises active in the business economy of Utenos apskritis in Lithuania were newly born; this was the highest enterprise birth rate among NUTS level 3 regions. The next highest rates were also recorded in Lithuania: Alytaus apskritis (18.81 %) and Klaipėdos apskritis (18.37 %). All three of these regions had very high levels of ‘business churn’ – a measure of how frequently new enterprises are created and existing enterprises closed down – indicating a high degree of business dynamism (which is often linked to productivity growth).

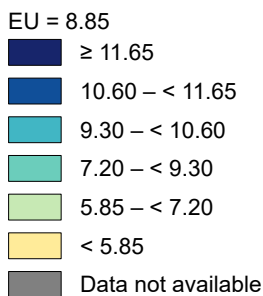
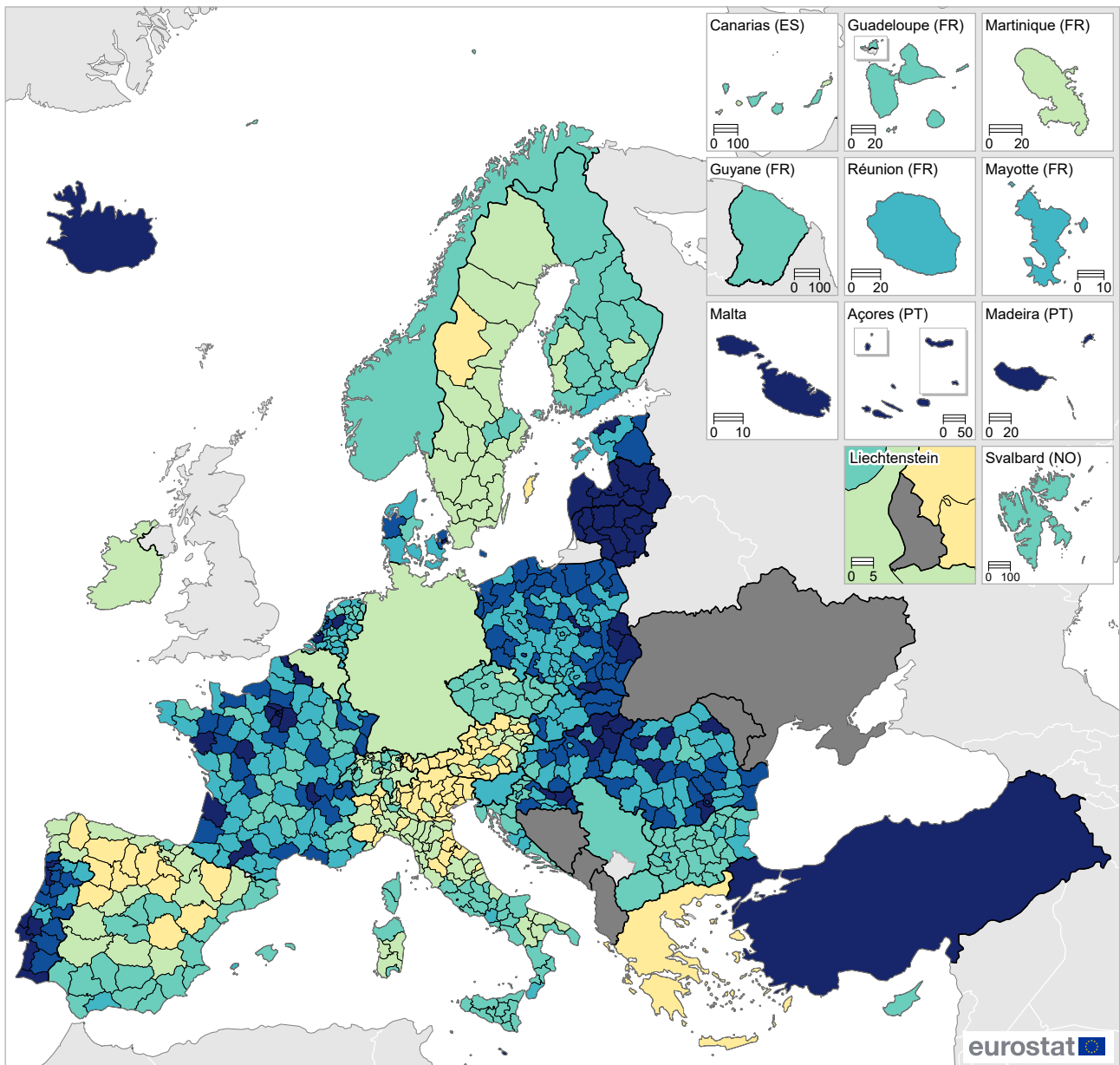
There were 65 NUTS level 3 regions (out of 654 for which data are available; note that several EU Member States are unable to provide a regional breakdown for these statistics, see Map 8.1 for more details) where the enterprise birth rate for the business economy in 2020 was at least 11.65 %, as shown by the darkest shade of blue. This group included:

- all six regions of Latvia;
- all 10 regions of Lithuania;
- both regions in Malta;
- the capital regions of Denmark, Estonia and Portugal;
- a number of regions within close proximity of capitals – as was the case for the seven regions that encircle the French capital of Paris, or the single regions that encircle the Danish and Romanian capitals;
- high enterprise birth rates were also recorded in eight additional regions of Portugal, seven additional regions of France, five additional regions of Romania, as well as in five regions each from Hungary and Poland (Żyrdowski; 2018 data), three regions from the Netherlands, and two regions from Croatia.

Summarising the above, there were two main patterns observed. Enterprise birth rates tended to be relatively homogeneous across different regions of individual EU Member State, highlighting that societal values, the underlying national business environment, administrative, macro- and socioeconomic conditions likely play an important role. By contrast, in some Member States there was evidence to suggest that enterprise birth rates were higher in predominantly urban regions, particularly in and around the capital city.

At the other end of the range, there were 65 NUTS level 3 regions where the enterprise birth rate in 2020 was below 5.85 %. Most of these were concentrated in the southern EU Member States of Italy (29 regions), Spain (12 regions) and Greece (national data). Otherwise, a majority of regions in Austria (21 regions) had relatively low enterprise birth rates, as was the case for two regions of Sweden. The lowest rates were recorded in three popular Alpine destinations, Tiroler Oberland (3.90 %) and Bludenz-Bregenz Wald (4.32 %) in western Austria, and Sondrio (4.56 %) in northern Italy. Note these relatively low figures are likely to reflect the particular circumstances in 2020 of the COVID-19 pandemic and related restrictions.

**Map 8.1: Enterprise birth rate, 2020**  
 (% of active enterprises in the business economy, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 04/2023

Note: the business economy is defined as NACE Sections B–S excluding the activities of holding companies (NACE Group 64.2). EU, Belgium, Iceland and Serbia: NACE Sections B–N excluding the activities of holding companies (NACE Group 64.2). Belgium, Germany, Ireland, Greece, Slovenia, Iceland, Norway, Switzerland, North Macedonia, Serbia and Türkiye: national data. Switzerland: 2019. Zyrardowski (PL926): 2018.

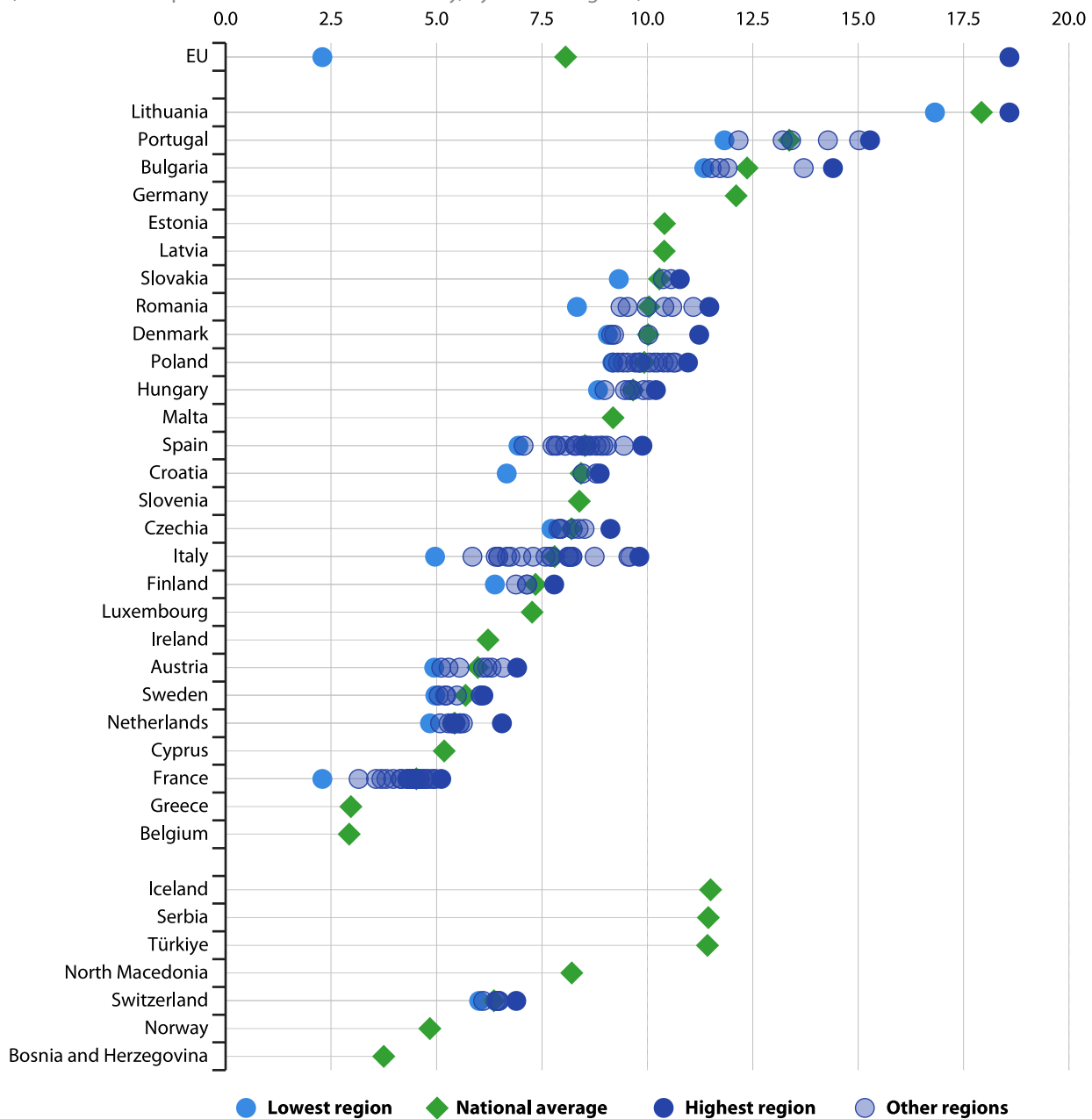
Source: Eurostat (online data codes: [bd\\_size\\_r3](#) and [bd\\_9bd\\_sz\\_cl\\_r2](#))

**The EU's enterprise death rate was 8.06 %**

Note the reference year for enterprise death rates generally lags that for enterprise births as, when compiling statistics on deaths, it is necessary to ensure that enterprises have remained inactive during a period of two years (without being reactivated). The latest data for the enterprise death rate are therefore for 2019 and do not yet reflect the impact of the COVID-19 crisis. In 2019, the enterprise death rate across the EU's business economy was 8.06 %. It was relatively

common for regions with high enterprise birth rates to also record high enterprise death rates. This is perhaps not surprising, as dynamic and innovative enterprises entering a market may be in a position to drive less productive incumbents out of the market ('creative destruction'). Figure 8.1 shows there was a relatively narrow range of regional enterprise death rates across most of the EU Member States. Indeed, there tended to be (even) less variation in enterprise death rates between regions of the same Member State than was the case for enterprise birth rates.

**Figure 8.1: Enterprise death rate, 2019**  
(% of active enterprises in the business economy, by NUTS 2 regions)



Note: ranked on the national average. The business economy is defined as NACE Sections B–S excluding the activities of holding companies (NACE Group 64.2). EU, Belgium, Iceland and Serbia: NACE Sections B–N excluding the activities of holding companies (NACE Group 64.2). Belgium, Germany, Ireland, Greece, Slovenia, Norway, Serbia and Türkiye: national data. Ireland, the Netherlands, Switzerland and Türkiye: 2018.

Source: Eurostat (online data codes: *bd\_size\_r3* and *bd\_9bd\_sz\_cl\_r2*)



Across the business economies of NUTS level 2 regions in 2019, the highest enterprise death rates were recorded in the two Lithuanian regions – Vidurio ir vakarų Lietuvos regionas (18.59 %) and Sostinės regionas (16.82 %). High rates were also recorded for all seven regions of Portugal, the two highest Portuguese rates being 15.28 % in the capital region of Área Metropolitana de Lisboa and 15.02 % in Algarve. There were also high enterprise death rates in two regions of Bulgaria – Yugoiztochen (14.40 %) and Severoiztochen (13.71 %).

By contrast, very low enterprise death rates were observed across the business economies of Greece (2.97 %) and Belgium (2.93 %); note that only national data are available for both of these EU Member States and that the Belgian business economy is defined as NACE Sections B to N excluding Group 64.2. Leaving these national values aside, the 24 lowest regional rates were all concentrated in France (which is composed of 27 NUTS level 2 regions; the only exceptions with somewhat higher death rates were Nord-Pas de Calais, Centre – Val de Loire and La Réunion). It is also interesting to note that while all French regions had enterprise death rates that were lower than the EU average, their enterprise birth rates were generally much higher (suggesting that the total number of enterprises was growing at a relatively rapid pace). Outside of France, the lowest enterprise death rate was observed in the Dutch region of Friesland (4.84 %; 2018 data).

## HIGH-GROWTH ENTERPRISES

High-growth enterprises are of particular interest to policymakers insofar as they can improve the economic performance of a region, create employment opportunities and, if sustained, change its economic structure. For the purpose of this analysis, high-growth enterprises are defined as those:

- born before 2017 which had survived up to 2020;
- with at least 10 employees in 2017; and
- with average employee growth of more than 10.0 % per year between 2017 and 2020.

The threshold of at least 10 employees is designed to exclude very small enterprises where employment increases could be very high in relative terms, but with little economic impact in absolute terms. This indicator

should be analysed with caution as it fails to capture potential downsides, insofar as high-growth enterprises may displace incumbents and/or disrupt markets, possibly lowering overall economic performance. Note that in this section, the business economy for the EU, Belgium, Germany, Ireland, Greece, Cyprus, Luxembourg and Slovenia (as well as Iceland, Norway, North Macedonia and Türkiye) is defined as NACE Sections B to N excluding Group 64.2.

High-growth enterprises accounted for approximately 1 out of every 10 enterprises active in the EU's business economy, some 9.43 % in 2020. There was a relatively even distribution of high-growth enterprises across the 180 NUTS level 2 regions for which data are available: 48.3 % (or 87 out of 180 regions) recorded shares that were equal to or above the EU average; 51.7 % (or 93 regions) had shares below the EU average.

The darkest shade of blue in Map 8.2 shows those NUTS level 2 regions where high-growth enterprises accounted for 12.40 % or more of all active enterprises in 2020; there were 19 regions at or above this threshold. The existence of high-growth enterprises reflects, at least in part, the business enterprise structure of each region: it is generally easier for a relatively small enterprise (compared with a relatively large enterprise) to grow at a rapid pace; this pattern is often referred to as the 'catch-up' process. The 19 regions with a relatively high proportion of high-growth enterprises were largely concentrated in the [Nordic](#) and southern EU Member States:

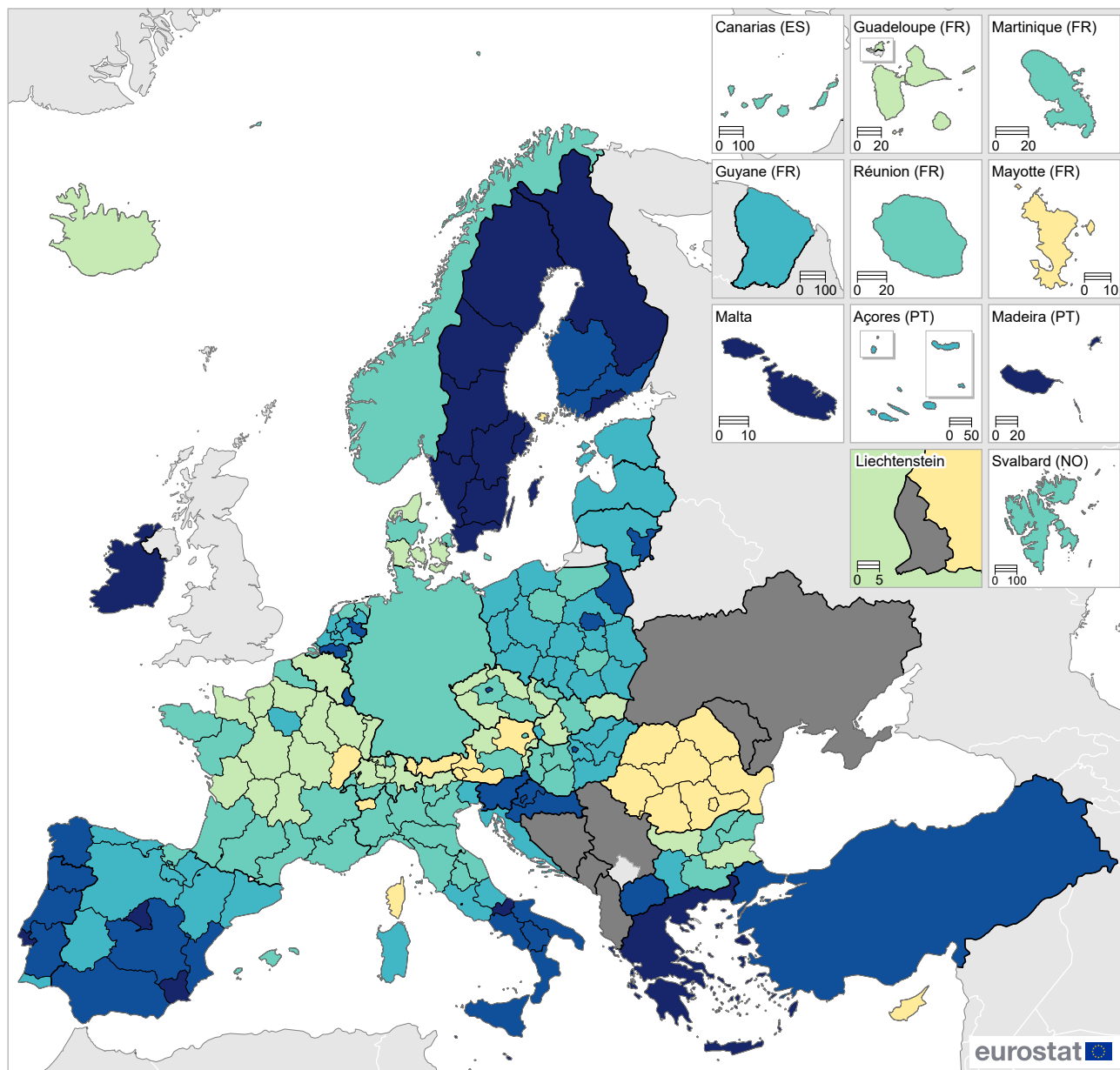
- all eight regions of Sweden and two regions from Finland;
- three regions in Spain, two regions in Portugal, one region in southern Italy, Greece (national data for 2018) and Malta;
- the only other region with a share above 12.40 % was Ireland (national data for 2018).

The capital regions of Bulgaria, Czechia, Denmark, Lithuania, Hungary, Austria, Poland, Romania, Slovakia and Finland recorded the highest proportions of high-growth enterprises on their national territories. This bias towards capital regions might reflect, among other factors, the availability of: capital for business start-ups; highly-qualified people to staff rapidly growing enterprises; a critical mass of potential business and/or consumer clients for new businesses.



**Map 8.2: High-growth enterprises, 2020**

(%, share of total number of enterprises in the business economy measured in employment terms, by NUTS 2 regions)



- EU = 9.43
- $\geq 12.40$
- 10.80 – < 12.40
- 9.35 – < 10.80
- 8.15 – < 9.35
- 6.60 – < 8.15
- < 6.60
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 04/2023

Note: high-growth enterprises are defined as those with employment growth of more than 10 %; rates of change are calculated as average annualised rates over a three-year period for the number of (paid) employees for the business economy (NACE Sections B–S excluding the activities of holding companies (NACE Group 64.2)). To be classified as high growth, an enterprise must have had at least 10 employees at the beginning of the period. EU, Belgium, Germany, Ireland, Greece, Cyprus, Luxembourg, Slovenia, Iceland, Norway, North Macedonia and Türkiye: NACE Sections B–N excluding the activities of holding companies (NACE Group 64.2). Belgium, Germany, Ireland, Greece, Slovenia, Norway and Türkiye: national data. Switzerland: 2019. Ireland and Greece: 2018.

Source: Eurostat (online data codes: [bd\\_hgnace2\\_r3](#) and [bd\\_9pm\\_r2](#))



## Regional patterns of employment specialisation and concentration in manufacturing

Structural business statistics (SBS) can be analysed at a very detailed sectoral level (several hundred economic activities), by enterprise size class (for micro, small, medium and large-sized enterprises) or, as here, by region. They provide data covering issues such as labour input, wealth creation, productivity, investment and profitability. This information can be used to analyse (among other issues) structural shifts in an economy, national or regional specialisations, and sectoral patterns.

In 2020, there were 23.4 million enterprises active in the EU's non-financial business economy; together, their **gross value added** was €6 496 billion and they **employed** 127.6 million persons. The COVID-19 crisis disrupted many enterprises across the EU's non-financial business economy. During 2020, most governments introduced temporary support schemes to offset the impact of the pandemic (often with a focus on protecting jobs). This may explain, at least in part, the resilience of the total number of enterprises in the EU, up 0.9 % between 2019 and 2020. By contrast, the corresponding rate of change for the number of persons employed was a fall of 3.0 %, while the decrease for value added (in current price terms) was even greater, at 5.2 %.

### **The EU's manufacturing base has migrated eastwards**

Manufacturing (NACE Section C) produces goods and provides industrial services. These may be for domestic use (investment, further processing or consumption) and for export. It has traditionally been considered a cornerstone of economic prosperity within the EU. However, over several decades this sector has experienced wide-ranging transformations, through outsourcing, globalisation, changes to business paradigms (such as just-in-time manufacturing), the growing importance of digital technologies, or concerns linked to sustainable production and the environment.

There has been an eastward shift in the EU's manufacturing base during the last two to three decades, reflecting, among other factors, differences in: labour costs; taxes and subsidies; flows of **foreign direct investment (FDI)** and the presence of **multinational enterprises**; natural resource endowments; environmental standards. Eastern EU Member States have been increasingly used as manufacturing bases by enterprises from other Member States, in particular neighbouring countries such as Germany, and enterprises from non-EU countries that would like to

establish a manufacturing base within the **EU's single market**. These enterprises often form an integral part of international supply chains, with a relatively highly-skilled workforce.

In 2020, manufacturing employed close to one quarter (23.0 %) of the EU's non-financial business economy workforce, while its share of value added was 6.0 percentage points higher, at 29.0 %. The three largest manufacturing subsectors in the EU – in employment terms and as defined by NACE divisions – were the manufacture of food products (3.2 % of the non-financial business economy total), the manufacture of fabricated metal products, except machinery and equipment (2.8 %), and the manufacture of machinery and equipment not elsewhere classified (2.4 %). There were only three other manufacturing subsectors which accounted for at least 1.0 % of the EU's non-financial business economy workforce: the manufacture of motor vehicles, trailers and semi-trailers (1.9 %), the manufacture of rubber and plastic products (1.3 %) and the manufacture of electrical equipment (1.2 %).

Figure 8.2 shows information for 24 different manufacturing activities (as defined by NACE divisions). The bars show the number of persons employed in a specific manufacturing activity as a share of the non-financial business economy workforce, with the right- and left-hand ends of each bar providing information on the regions with the highest/lowest regional shares; the point where the blue and green parts of each bar meet indicates the EU average. For example, in the French region of Pays de la Loire, the manufacture of food products employed 11.6 % of the non-financial business economy workforce in 2020; this was 3.6 times as high as the EU average (3.2 %).

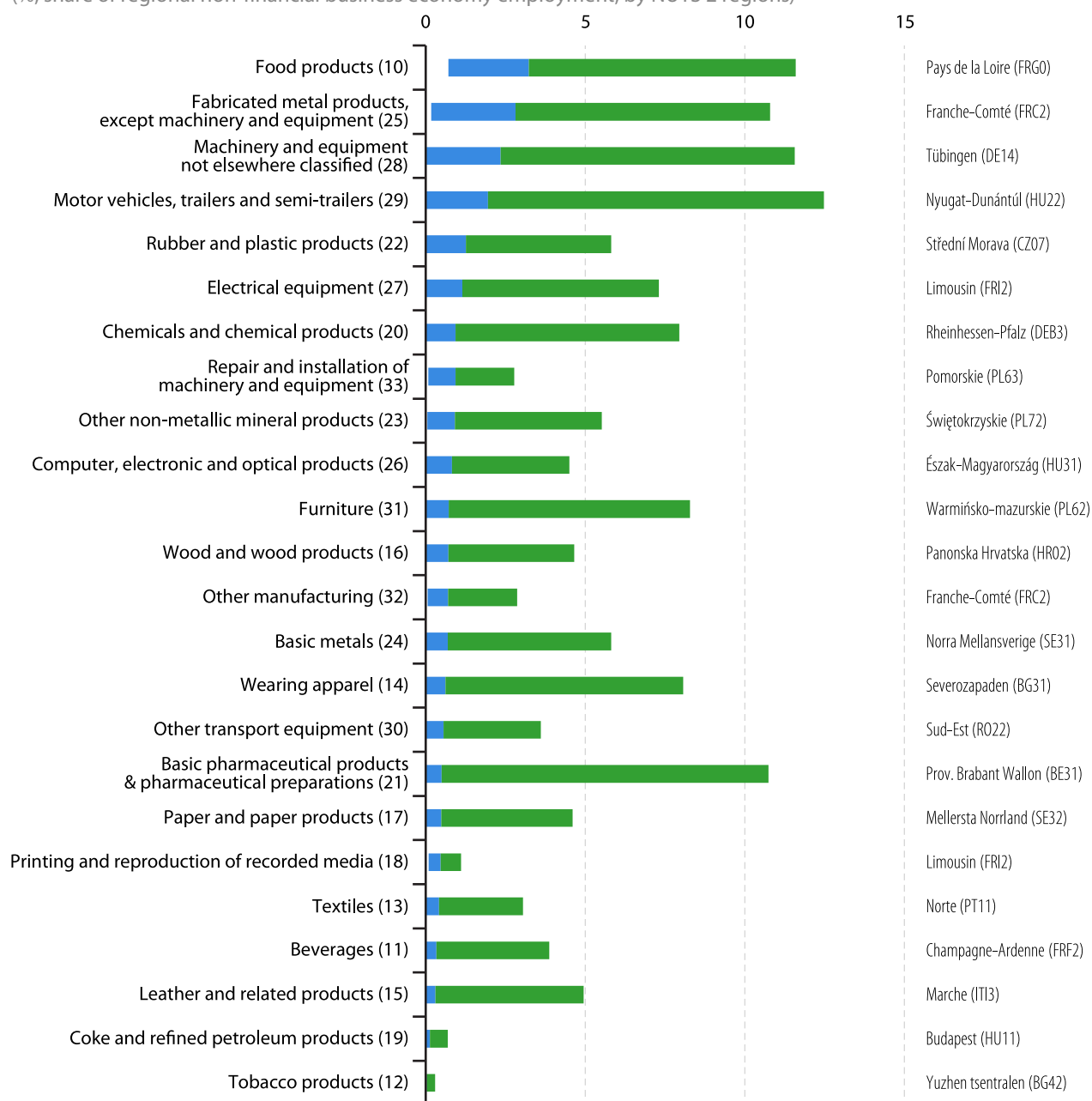
### **Primary processing activities are often located close to the source of raw materials**

Figure 8.2 also shows that the distribution of employment across the various manufacturing divisions was often highly skewed. In some activities, particularly high levels of employment were concentrated in a handful of regions. Activities that involve the primary processing stages of agricultural, fishing or forestry products were often located close to the source of their raw materials. This was the case for the manufacture of food products in Pays de la Loire (as mentioned above). There were four agricultural regions where the manufacture of food products accounted for 9.0–10.6 % of employment within the non-financial business economy in 2020, namely Ipeiros and Thessalia (both in Greece), Bretagne in France, and Mazowiecki regionalny in Poland. Champagne-Ardenne (France; 3.9 %) had the highest employment share for the manufacturing of beverages (NACE Division 11). Regions specialised in the manufacture of textiles (NACE Division 13) were often located close to an abundant supply of water;

Norte (Portugal; 3.0 %) had the highest regional share in the EU. Norra Mellansverige (Sweden) had the highest employment share for the manufacture of basic metals (NACE Division 24; 5.8 %), while the neighbouring region of Mellersta Norrland had the highest share for

the manufacture of paper and paper products (NACE Division 17; 4.6 %). The Croatian region of Panonska Hrvatska had the highest employment share for the manufacture of wood and wood products, except furniture (NACE Division 16; 4.7 %).

**Figure 8.2: Regional specialisation among manufacturing activities, 2020**  
(%, share of regional non-financial business economy employment, by NUTS 2 regions)



Note: the EU average is shown by the point within each bar where the green and blue parts of each bar meet; the range of regional values across NUTS level 2 regions is shown by the bar (above/below the EU average in green/blue); the name of the region with the highest value is also shown. NACE codes are given in brackets after each of the activity labels. The figure is based on non-confidential data (some activities are not available for a limited number of regions, while data for reference year 2019 were used to replace some of the missing information). Guadeloupe (FRY1), Guyane (FRY3) and Mayotte (FRY5): not available.

Source: Eurostat (online data codes: sbs\_r\_nuts06\_r2 and sbs\_na\_sca\_r2)



### **German regions often specialise in export-orientated subsectors**

Exports make it possible for enterprises to maintain or increase production when faced with stagnating domestic demand. Germany exports a high proportion of its manufacturing output; this is particularly the case for its motor vehicles, electrical, engineering and chemical subsectors. In 2020 and among NUTS level 2 regions of the EU, Tübingen in south-west Germany had the highest employment share for the manufacture of machinery and equipment not elsewhere classified (NACE Division 28; 11.6 %), while Rheinhesen-Pfalz in western Germany had the highest employment share for the manufacture of chemicals and chemical products (NACE Division 20; 7.9 %).

### **The manufacture of transport equipment is characterised by clusters of economic activity**

Over time, some production has moved abroad, to exploit efficiency gains in global value chains. For example, this has included an expansion in production in some eastern EU Member States. The manufacture of transport equipment is characterised by clusters of economic activity and highly-integrated production chains. In 2020, the westernmost Hungarian region of Nyugat-Dunántúl had the highest degree of employment specialisation for the manufacture of motor vehicles, trailers and semi-trailers (NACE Division 29; 12.5 %). Vest (Romania; 11.8 %) and Střední Čechy (Czechia; 11.6 %) also reported double-digit employment shares for this activity. Another Romanian region, Sud-Est, was the most specialised for the manufacture of other transport equipment (NACE Division 30; 3.6 %).

## **Regional patterns of employment specialisation and concentration in services (other than finance)**

Non-financial services (NACE Sections G to J and L to N and Division 95) provided work to 82.1 million persons across the EU in 2020. This equated to slightly less than two thirds (64.3 %) of the total number of persons employed in the non-financial business economy. Among NUTS level 2 regions, the contribution of non-financial services to the non-financial business economy workforce was less than 45.0 % in eight regions that were predominantly located in eastern EU Member States: four of these were in Czechia (where the capital region of Praha was alone in having more than half of its non-financial business economy workforce employed in non-financial services), while the others included Vzhodna Slovenija (Slovenia), Közép-Dunántúl

(Hungary) and Sjeverna Hrvatska (Croatia). There were also one region in eastern Germany – Chemnitz – with a relatively low proportion of its non-financial business economy workforce employed in non-financial services.

At the other end of the range, there were 14 NUTS level 2 regions in the EU where the contribution of non-financial services to the non-financial business economy workforce was higher than four fifths in 2020. This group included:

- the capital regions of Noord-Holland (the Netherlands), Région de Bruxelles-Capitale/Brussels Hoofdstedelijk Gewest (Belgium), Área Metropolitana de Lisboa (Portugal), Comunidad de Madrid (Spain) and Wien (Austria);
- the popular holiday destinations of Notio Aigaio, Kriti (both Greece), Canarias (Spain) and Algarve (Portugal);
- as well as Ciudad de Melilla (Spain), Utrecht and Flevoland (both in the Netherlands), Hamburg (Germany) and Prov. Vlaams-Brabant (Belgium).

### **Some service activities are commonly spread across the EU territory, whereas others are concentrated within close proximity of a mass of potential clients**

Figure 8.3 provides information for 31 different non-financial service activities, presenting those NUTS level 2 regions with the highest degree of employment specialisation (based on regional shares for each activity in the non-financial business economy workforce). Some of the variations in employment specialisation may reflect, among other issues: access to skilled employees; the adequate provision of infrastructure; climatic and geographic conditions; proximity to a critical mass of customers; access to markets; or legislative constraints.

A number of different service activities are ubiquitous, frequently appearing across every region of the EU, for example, retail trade, wholesale trade, or food and beverage services. These three activities were among the largest employers in the EU: retail trade (NACE Division 47) accounted for 12.7 % of the EU's non-financial business economy workforce in 2020, followed by wholesale trade (NACE Division 46; 7.4 %) and food and beverage service activities (NACE Division 56; 5.7 %). The French region of Nord-Pas de Calais had the highest employment share (35.1 %) for retail trade among NUTS level 2 regions, which may reflect, at least to some degree, its location – providing ease of access to cross-border shoppers from Belgium or the United Kingdom. The highest employment share for wholesale trade was observed in Región de Murcia (Spain; 15.9 %) – with a high level of fruit and vegetables transported out of this region. In regions traditionally associated with tourism, it was commonplace to find that a relatively high share of the non-financial business economy workforce was employed within

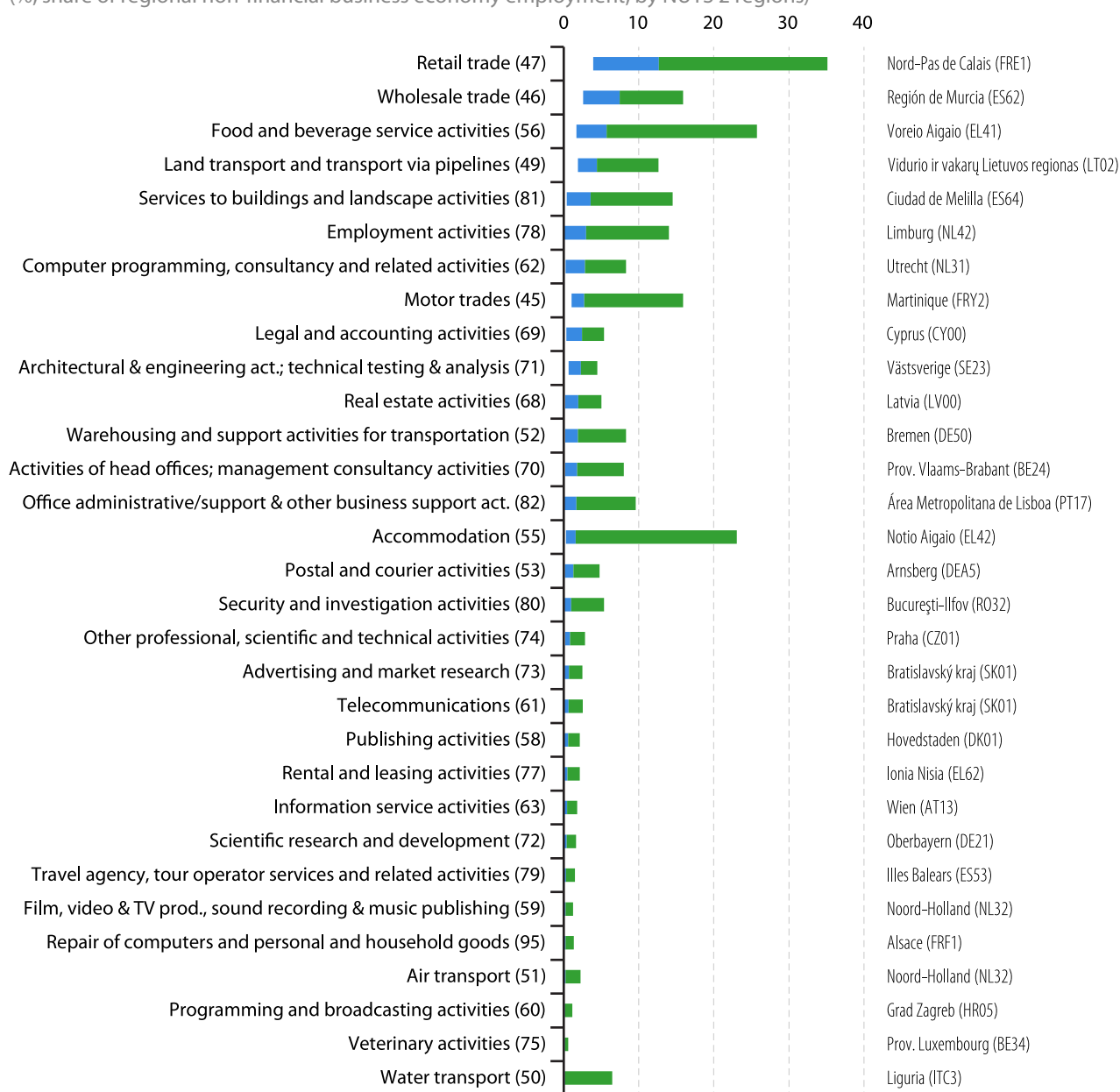


food and beverage service activities. The 12 highest regional shares were all observed in Greece, peaking in the island regions of Voreio Aigaio and Notio Aigaio (both 25.7 %). The only Greek region not to feature in the top 12 was the capital region of Attiki, although its share of employment within food and beverage service activities was the 14th highest, surpassed by that of Algarve (Portugal).

Capital regions were among some of the most specialised regions for a range of activities that rely

on the close proximity of a large number of potential clients (be these other businesses, households or governments). For example, in 2020 the Área Metropolitana de Lisboa (Portugal) had the highest employment share for office administrative/support and other business support activities (9.6 %), Bucureşti-Ilfov (Romania) for security and investigation activities (5.4 %), Praha (Czechia) for other professional, scientific and technical activities (2.8 %) and Bratislavský kraj (Slovakia) for advertising and market research (2.5 %).

**Figure 8.3: Regional specialisation among non-financial services, 2020**  
(%, share of regional non-financial business economy employment, by NUTS 2 regions)



Note: the EU average is shown by the point within each bar where the green and blue parts of each bar meet; the range of regional values across NUTS level 2 regions is shown by the bar (above/below the EU average in green/blue); the name of the region with the highest value is also shown. NACE codes are given in brackets after each of the activity labels. The figure is based on non-confidential data (some activities are not available for a limited number of regions, while data for reference year 2019 were used to replace some of the missing information). Guadeloupe (FRY1), Guyane (FRY3) and Mayotte (FRY5): not available.

Source: Eurostat (online data codes: sbs\_r\_nuts06\_r2 and sbs\_na\_sca\_r2)



The final part of this chapter provides a special focus for three activities that were particularly impacted by the COVID-19 crisis and its associated restrictions. The information presented below for retail trade, transportation and storage, and accommodation services refers to the early stages of the pandemic in 2020 (the latest reference period for which structural business statistics are available).

### FOCUS ON RETAIL TRADE

Retail trade (NACE Division 47) uses a range of formats to supply consumers, mainly through specialised or unspecialised stores (the latter often distinguished between those with food dominating and others); retail trade also includes retailing outside of stores, through traditional forms – such as outdoor markets or via mail order – and increasingly via online sales, which became more popular during the pandemic.

With the onset of the COVID-19 crisis, most governments in the EU took the decision to close large parts of their retail trade activities in March 2020; the principal exceptions were food retailers and pharmacies. By May 2020, some governments started to remove or dilute the measures/restrictions that had been put in place; retail outlets re-opened, often with a limit on the number of persons allowed to enter a shop. Despite further relaxation during the summer months, a second wave of the virus led to some governments re-introducing restrictions towards the end of the year.

The EU's retail trade sector employed 16.2 million persons in 2020; this represented 12.7 % of the non-financial business economy workforce. In absolute terms, the highest numbers of persons employed in retail trade were recorded in:

- the French capital region of Ile-de-France, at over half a million (542 000);
- Düsseldorf (Germany; 338 500); and
- Lombardia (Italy; 309 700).

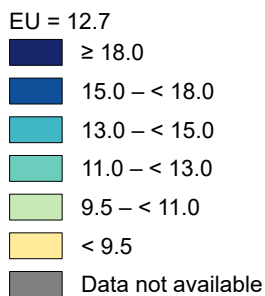
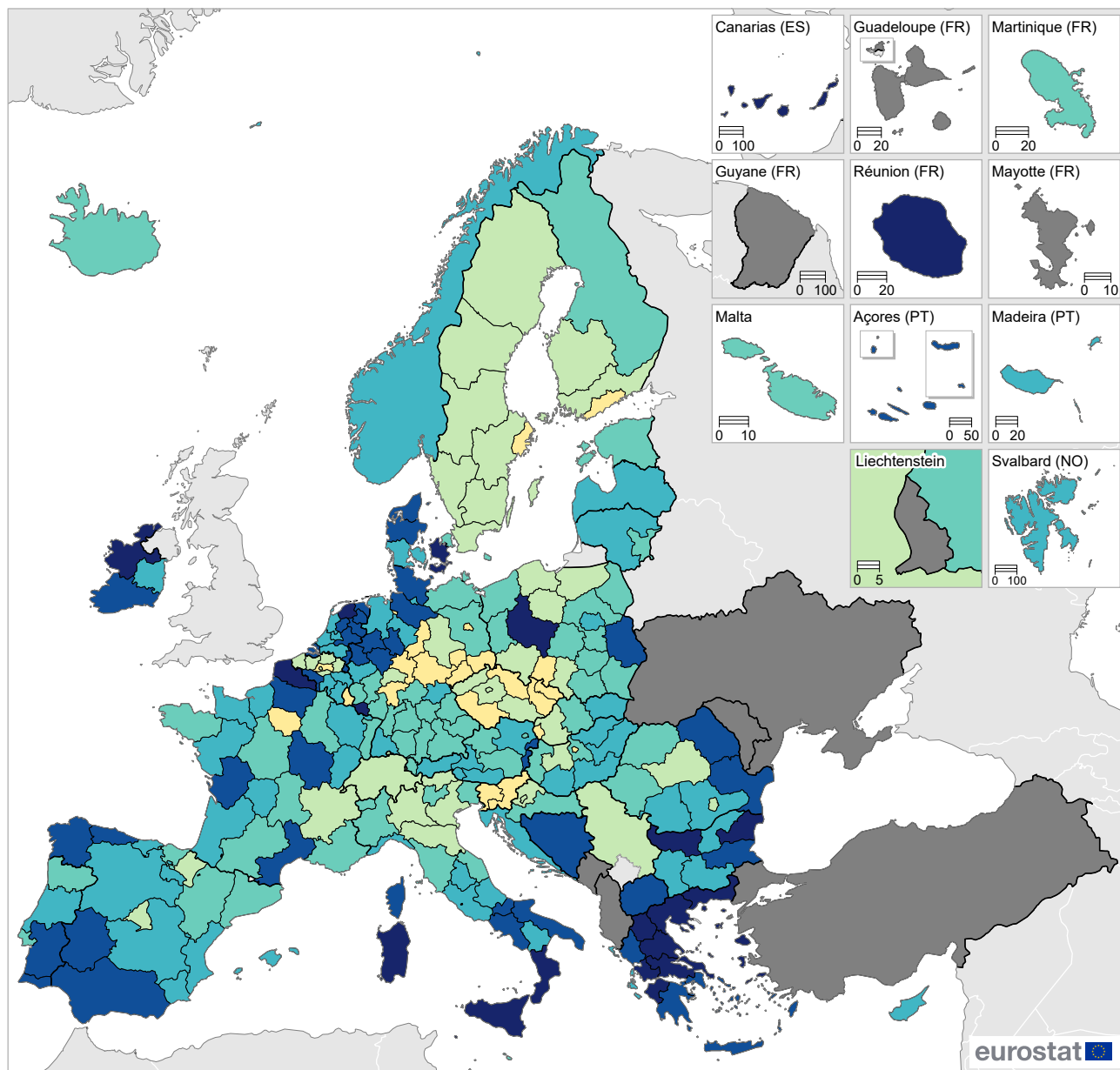
In 2020, the regional distribution of retail trade employment was relatively uniform insofar as there were 126 out of 239 NUTS level 2 regions for which data are available (or 52.7 % of all regions) where this share was equal to or above the EU average. Retail trade provided work to 18.0 % or more of the non-financial business economy workforce in 22 EU regions (as shown by the darkest shade of blue in Map 8.3). These relatively high employment shares were concentrated in:

- three southern EU Member States – Greece, Spain and Italy;
- several regions that were sparsely-populated and/or relatively isolated;
- several regions characterised by industrial decline, including the French region of Nord-Pas de Calais, where more than one third (35.1 %) of the non-financial business economy workforce was employed within retail trade – this was, by far, the highest regional share in the EU.

In 2020, the retail trade sector employed less than 9.5 % of the non-financial business economy workforce across 23 different NUTS level 2 regions (as shown by the lightest shade). They were concentrated in Czechia, Germany and Slovenia, and included the capital regions of Germany, France, Hungary, Slovenia, Slovakia, Finland and Sweden, as well as Luxembourg. Many of these regions were characterised as densely-populated, urban regions, including Berlin and Bremen (both in Germany), which had the lowest shares (7.5 % and 7.1 %, respectively).

**Map 8.3: Employment in retail trade, 2020**

(%, share of regional non-financial business economy employment, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 04/2023

Note: NACE Division 47. Norway, Switzerland, Bosnia and Herzegovina and Serbia: national data. Basse-Normandie (FRD1): 2019. Iceland: 2018.  
Source: Eurostat (online data codes: sbs\_r\_nuts06\_r2 and sbs\_na\_sca\_r2)



## FOCUS ON TRANSPORTATION AND STORAGE

Transportation and storage (NACE Section H) includes:

- the provision of passenger or freight transport by road, rail, pipeline, air (including space) and water;
- the operation of transport facilities (bus and train stations, harbours, airports, parking facilities) and transport infrastructure (roads, bridges, tunnels, rail networks, air traffic control);
- cargo handling and warehouse storage;
- the renting of transport equipment with a driver/operator; and
- postal and courier activities.

There were 10.2 million persons employed in the EU's transportation and storage sector in 2020, equivalent to 8.0 % of the non-financial business economy total. In absolute terms, there were four NUTS level 2 regions where the transportation and storage sector employed more than 200 000 persons: Ile-de-France (the French capital region; 821 800), Lombardia (Italy; 225 500), Düsseldorf (Germany; 221 600) and Darmstadt (also Germany; 215 200).

The transportation and storage sector was among a number of activities particularly impacted by the COVID-19 crisis. Passenger transport services were temporarily shutdown or reduced to a minimum (for example, for air or rail travel), while the flow of goods was disrupted, impacting supply chains and deliveries to consumers. Although some restrictions were lifted during the course of 2020, further waves of the virus led governments to re-introduce controls, for example, with constraints on travel to specific destinations and/or requiring arrivals to spend time in quarantine. Overall, there was a dramatic reduction in the number of passengers transported during 2020, as services were cut and demand fell, with some people working from home and others having fears of contracting/spreading the virus when using public modes of transport.

Nevertheless, in employment terms the transportation and storage sector was relatively resilient during 2020, as the total number of persons employed across the EU fell at an annual rate of 2.0 %; this was a smaller contraction than that experienced for the whole of the non-financial business economy (down 3.0 %).

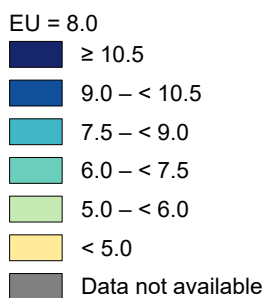
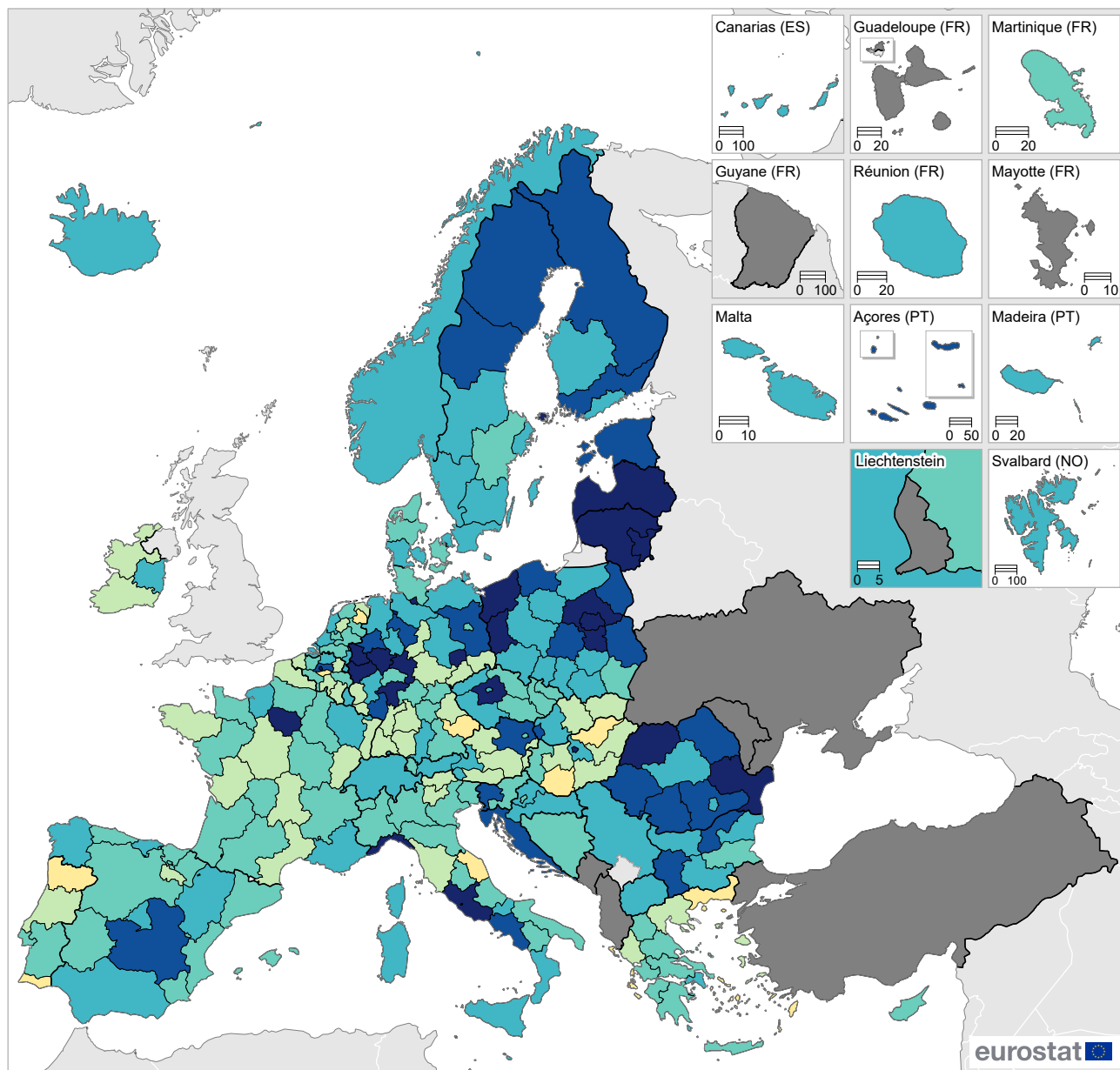
During 2020, many governments introduced temporary support schemes to offset the impact of the pandemic: the impact of these job-retention schemes was apparent, insofar as value added in the EU's transportation and storage sector fell at a much faster pace, down 15.0 % (in current price terms). It is also interesting to note that the main economic indicators for postal and courier activities followed an upward trajectory in 2020, suggesting that this may have been one of the few activities to benefit from the pandemic. Growth may be linked to increased demand for parcel services (as consumers made greater use of e-commerce and/or mail-order shopping during the period that traditional retail formats were closed) and new services arising out of the pandemic (for example, self-testing COVID-19 kits that had to be sent to laboratories).

The regional distribution of employment in the transportation and storage sector was skewed, insofar as there were 93 NUTS level 2 regions where this share was equal to or above the EU average (8.0 %) in 2020, compared with 146 regions that recorded lower than average shares. Transportation and storage provided work to at least 10.5 % of the non-financial business economy workforce in 25 regions across the EU (as shown by the darkest shade of blue in Map 8.4). These relatively high employment shares were unsurprisingly concentrated in urban regions where demand for transportation and postal/courier activities was concentrated; they included the capital regions of Belgium, France, Italy, Lithuania, Hungary and Poland. Together, these 25 regions accounted for more than one quarter (28.7 %) of the total number of persons employed in the EU's transportation and storage services sector.

In 2020, the highest employment shares within the transportation and storage sector were recorded in the Finish archipelago of Åland and the northern German region of Bremen. More than one third (35.1 %) of the total number of persons employed in the non-financial business economy of Åland worked in the transportation and storage sector, with a particular specialisation in water transport services. Transportation and storage accounted for approximately one fifth (20.2 %) of those employed in non-financial business economy of Bremen, a port city with a highly-developed logistics sector.



**Map 8.4: Employment in transportation and storage, 2020**  
 (% share of regional non-financial business economy employment, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 04/2023

Note: NACE Section H. Norway, Switzerland, Bosnia and Herzegovina and Serbia: national data. Iceland: 2018.  
 Source: Eurostat (online data codes: sbs\_r\_nuts06\_r2 and sbs\_na\_sca\_r2)

## FOCUS ON ACCOMMODATION SERVICES

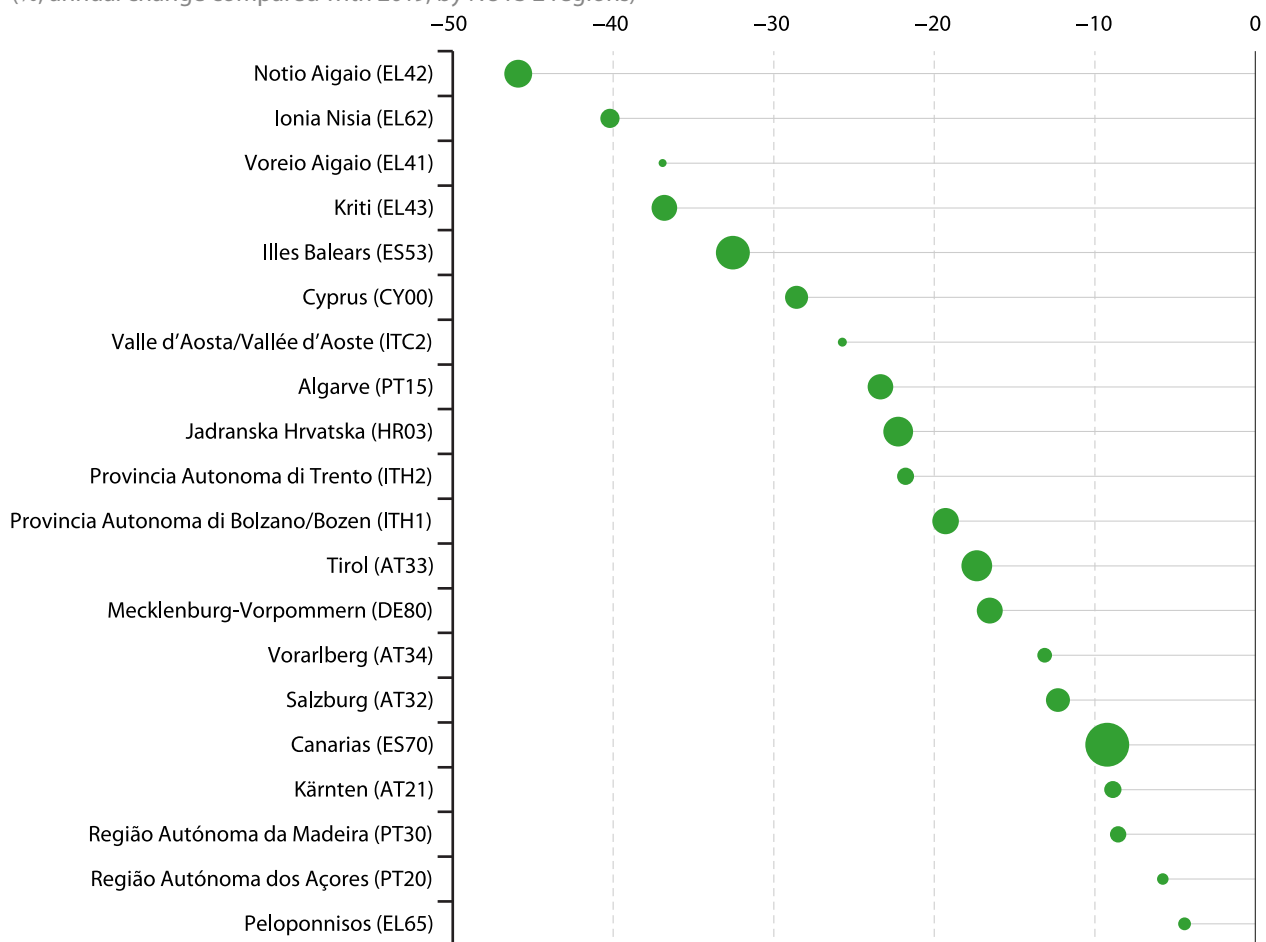
Accommodation service activities (NACE Division 55) include: hotels and similar accommodation such as apartment hotels or motels; holiday and other short-stay accommodation, such as self-contained apartments, chalets, villas and cabins rented on a daily or weekly basis; camping and caravanning sites; other accommodation, such as residences for students and workers or railway sleeping cars.

The COVID-19 crisis had an unprecedented impact on accommodation service activities, with most EU

governments closing or strictly limiting access to hotels and other forms of accommodation in March 2020.

Despite the gradual re-opening of accommodation services and the roll-out of vaccination programmes, many hoteliers faced weak demand. Tourists were often reluctant to book foreign travel and business travel also remained below pre-pandemic levels with trade fairs / conferences slow to restart (after restrictions were lifted) and some business people choosing to favour online meetings. Note that more detailed information on tourism statistics at a regional level is presented in Chapter 10.

**Figure 8.4: Employment in accommodation services, 2020**  
(%, annual change compared with 2019, by NUTS 2 regions)



Note: the figure shows the 20 EU regions where accommodation services (NACE Division 55) accounted for the highest share of non-financial business economy employment (among regions with at least 1 000 persons employed in accommodation services). The figure is ranked on the change in employment between 2019 and 2020. The area of each circle represents the number of persons employed in accommodation services in 2020; the highest level (among those regions shown) was in Canarias (ES70) with 60 927 persons employed. Guadeloupe (FRY1), Guyane (FRY3) and Mayotte (FRY5): only partial data available.

Source: Eurostat (online data codes: [sbs\\_r\\_nuts06\\_r2](#) and [sbs\\_na\\_sca\\_r2](#))

In 2020, accommodation service activities across the EU employed 2.0 million persons; this represented 1.6 % of the non-financial business economy workforce. The regional distribution was relatively skewed insofar as accommodation service activities accounted for at least 1.6 % of the non-financial business economy workforce in less than two fifths (93 out of 239) of EU regions. There were nine NUTS level 2 regions across the EU where the employment share of accommodation service activities in the non-financial business economy was at least 10.0 %. These regions with high employment shares were concentrated in regions notable for tourism, particularly southern coastal or Alpine regions of the EU. The highest shares were recorded in three Greek island regions – Notio Aigaio (23.0 %), Ionia Nisia (17.3 %) and Kriti (13.8 %).

Figure 8.4 shows the 20 NUTS level 2 regions in the EU where accommodation services accounted for their highest share of non-financial business economy employment in 2020; note that only regions with at least 1 000 persons employed in accommodation services were taken into consideration. The information is ranked on the decline in employment between 2019 and 2020, highlighting the considerable impact of the COVID-19 crisis. Indeed, unlike some other sectors of

the economy where job-retention schemes resulted in relatively minor job losses, there were often quite large annual contractions for the number of persons employed in accommodation services. This may reflect, among other factors, the dramatic fall in demand for accommodation services and the relatively insecure nature of work (for example, among young people and/or those with temporary employment contracts).

Based on information for the 20 regions presented in Figure 8.4, the number of persons employed in accommodation services fell by more than one third across four different regions of Greece in 2020 – Notio Aigaio, Ionia Nisia, Voreio Aigaio and Kriti. The biggest decrease was observed in Notio Aigaio, down 45.9 %. The number of persons employed in accommodation services also fell by more than one quarter in Illes Balears (Spain), Cyprus and Valle d'Aosta/Vallée d'Aoste (Italy). Figure 8.4 also provides information on the relative size of the accommodation services workforce. In 2020, the highest numbers of persons employed in accommodation services were recorded in two Spanish island regions – Canarias and Illes Balears (60 900 and 35 900, respectively) – they were followed by the Alpine region of Tirol (Austria; 30 300 persons).

## 9. Research and development

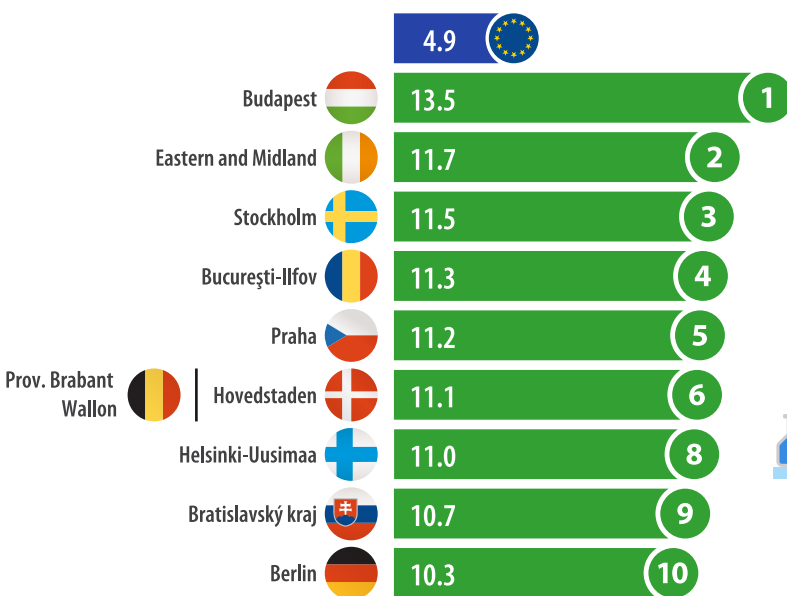
Research and development (R&D) has the potential to improve the daily lives of millions of people, both within the European Union (EU) and elsewhere, by helping to solve some of the world’s largest societal and generational challenges. For example, the European Commission’s six priorities for the period 2019–2024 include a target to become the world’s first climate-neutral continent by 2050. These guidelines are backed-up by a commitment to invest in innovation and research through the European Green Deal Investment Plan and Just Transition Mechanism, to help facilitate a transition towards a climate-neutral, competitive and inclusive European economy. Research and innovation policy also plays a key role in responding to the challenges brought about by the COVID-19 crisis: helping to deliver Europe’s recovery plan, paving a way out of the crisis, through ‘economic growth that delivers a sustainable, safe, fair and prosperous future for people and planet, based on solidarity and respect for common European values’.

It is often claimed that Europe faces an innovation deficit. Indeed, a European Commission communication adopted in January 2018 *Horizon 2020 interim evaluation: maximising the impact of EU research and innovation* (COM(2018) 2 final) identified that the innovation deficit was not due to an absence of new ideas or discoveries, but instead reflected a lack of success in diffusing/

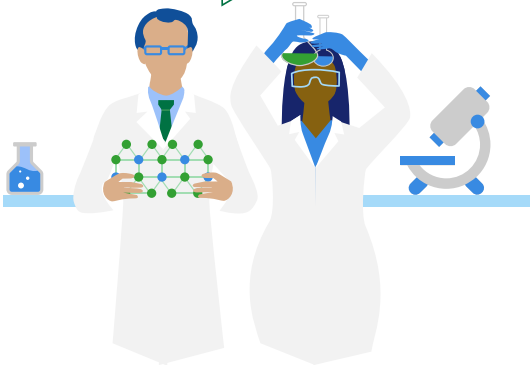
commercialising inventions. This may, in part, be linked to the willingness of EU businesses and financial systems to accept risk, which may impinge upon their ability to identify disruptive research.

Nevertheless, the EU is one of the leading global producers of scientific knowledge: it welcomes researchers from all over the world. In May 2021, the European Commission adopted a communication on a *Global Approach to Research and Innovation – Europe’s strategy for international cooperation in a changing world* (COM(2021) 252 final). It underlines the EU’s desire to play a leading role in supporting international research and innovation partnerships.

Regional research, knowledge and innovative capacity depends on a range of factors — business culture, workforce skills, education and training institutions, innovation support services, technology transfer mechanisms, regional infrastructure, the mobility of researchers, sources of finance and creative potential. Education, training and lifelong learning are considered vital to developing a region’s capacity to innovate, with universities across the EU increasingly implicated in the commercialisation of research and collaboration with regional businesses. To develop and expand its *knowledge-based economy*, the EU requires a consistent supply of highly-skilled/qualified people. The infographic below shows the 10 NUTS level 2 regions



Which EU regions had the highest shares of persons employed in high-technology sectors?



(% of total employment, 2022, by NUTS 2 regions)  
 Note: Guadeloupe (FRY1) and Sud-Est (RO22), 2021. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability. Several regions not available (too many to document).

Source: Eurostat (online data code: htec\_emp\_reg2)



with the highest shares of employment within high-technology sectors. A peak of 13.5 % was recorded in the Hungarian capital region of Budapest.

This chapter presents statistical information analysing regional developments for a range of research and development-related indicators within the EU, including the following topics: R&D expenditure, human resources in science and technology (HRST) (including an analysis by sex), and R&D personnel and researchers.

## R&D expenditure

R&D – creative and systematic work undertaken to increase the stock of knowledge or to devise new applications of existing knowledge – tends to be concentrated in clusters. Research-intensive regions are often situated around academic institutions, high-technology industrial activities and/or knowledge-based services, which attract new start-ups and highly qualified personnel. [Gross domestic expenditure on R&D \(GERD\)](#) includes research expenditure made by business enterprises, higher education institutions, government and private non-profit organisations. In 2020, GERD was valued at €310.0 billion across the EU. Despite the considerable economic impact of the COVID-19 crisis, it can be noted that there was only a modest reduction (down 0.6 %) in the level of expenditure on R&D compared with 2019. In 2021, there was a rebound in activity, as GERD increased 5.9 % to €328.5 billion.

***R&D activity was clustered in a small number of regions across the EU; more than three quarters of all regions had an R&D intensity below the EU average***

The regional distribution of R&D expenditure underlines the significance of clusters of scientific and technological excellence. Indeed, the skewed nature of R&D activity was such that 30 NUTS level 2 regions (out of 194 for which data are available) accounted for more than two thirds (68.5 %) of the EU's intramural R&D expenditure in 2020. Note the information for Belgium and the Netherlands relates to NUTS level 1 regions, while only national data are available for Ireland and France (as well as Switzerland and Türkiye) and that these different territorial levels are included in the analyses presented. The inclusion of these less detailed data – particularly for France – contributes to the skewed nature of R&D activity. In 2020, there were 19 regions across the EU which recorded in excess of €4.0 billion of R&D expenditure. Leaving aside the national data for France, the two regions with the highest levels of R&D expenditure were both located in Germany (2019 data): Stuttgart (€16.5 billion) and Oberbayern (€12.6 billion).

[R&D intensity](#) is frequently used as a measure to determine an economy's creative/innovative capacity.

It is the ratio of R&D expenditure to [gross domestic product \(GDP\)](#). Despite modest annual increases over most of the last decade, R&D intensity in the EU in recent years remained below its long-established target of 3.00 %. It stood at 2.22 % in 2019 and jumped to 2.30 % in 2020 (reflecting a larger downturn in GDP associated with the COVID-19 crisis than the above-mentioned decrease in R&D expenditure). In 2021, R&D intensity fell back to 2.26 %, reflecting faster growth for GDP than for R&D expenditure.

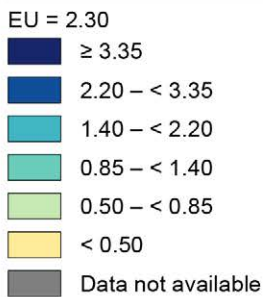
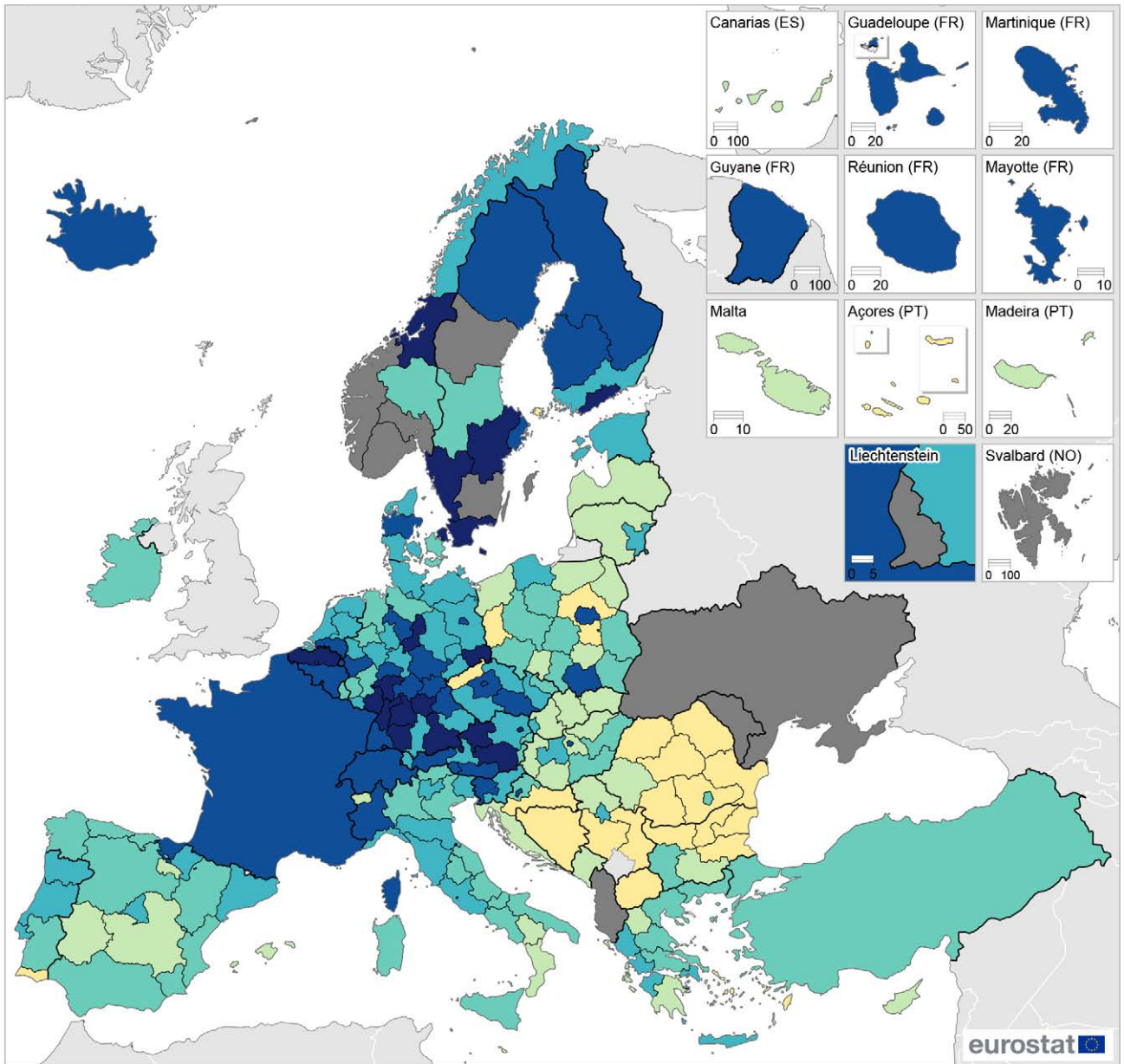
An analysis of the regional distribution of R&D intensity is less influenced than the analysis of R&D expenditure by the use of NUTS level 1 and national data for some EU Member States. However, the regional distribution of R&D intensity was also heavily skewed: less than one quarter (46 out of 194) of all regions had a ratio equal to or above the EU average of 2.30 % in 2020. There were 18 regions that recorded ratios of at least 3.35 % – as shown by the darkest shade of blue in Map 9.1. They were concentrated in Germany (nine regions), while the remainder were located in Austria and Sweden (both three regions), along with single regions from each of Belgium (NUTS level 1), Denmark and Finland. Within this group of 18 there were three capital regions, namely Hovedstaden in Denmark, Helsinki-Uusimaa in Finland and Wien in Austria. Note that the latest data available for this group of 18 regions relates to 2019, except for Helsinki-Uusimaa (2020 data).

The four highest ratios for R&D intensity were recorded in Germany (2019 data): a peak of 7.79 % was observed in Braunschweig, followed by Stuttgart (7.33 %), Karlsruhe (5.33 %) and Tübingen (5.20 %). These regions are characterised by clusters of innovative automotive manufacturers, engineering and component suppliers, as well as companies specialising in bio and nanotechnologies and artificial intelligence. For example, the Braunschweig region includes Wolfsburg (which is headquarters to the Volkswagen Group), the Stuttgart region is home, among others, to the headquarters of Bosch, Mercedes-Benz and Porsche, while Tübingen has research institutes attached to its university, the Max Planck Institute and technology parks specialising in, among other fields, bio- and nanotechnologies and artificial intelligence. There were two other regions in the EU where R&D intensity was higher than 5.00 %: Steiermark (5.15 %; 2019 data) in Austria, and Västsverige (5.10 %; 2019 data) in Sweden.

At the other end of the scale, there were 18 regions in the EU where R&D intensity was less than 0.50 % (they are shown in a yellow shade). This group was concentrated in eastern EU Member States: Romania (six regions), Bulgaria (four regions), Poland (two regions), Czechia and Croatia (single regions). It also included two regions from Portugal, as well as a single region in each of Greece and Finland. Many of these regions with very low R&D intensity were islands or rural regions.

**Map 9.1: R&D intensity, 2020**

(%, based on gross domestic expenditure on R&D (GERD) relative to gross domestic product (GDP), by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

Note: Belgium and the Netherlands, NUTS level 1. Ireland, France, Switzerland, Bosnia and Herzegovina and Türkiye: national data. Belgium, Denmark, Germany, Austria, Sweden, Norway and Switzerland: 2019. Montenegro: 2018.

Source: Eurostat (online data code: rd\_e\_gerdreg)

### **R&D expenditure in the EU averaged €693 per inhabitant**

An alternative measure for the regional importance of R&D expenditure is given by the ratio of expenditure to the population size. In 2019, R&D expenditure across the EU averaged €699 per inhabitant. With the onset of the COVID-19 crisis, it fell slightly to €693 per inhabitant in 2020, before rebounding the following year to €735 per inhabitant.

There were 19 regions with a ratio of at least €1 465 of R&D expenditure per inhabitant (as shown by the darkest shade of blue in Map 9.2); note the data presented in this section for Belgium and the Netherlands relate to NUTS level 1 regions, while only national data are available for Ireland, France and Croatia (as well as Switzerland and Türkiye). These regions with high ratios were concentrated in Germany (nine regions), with others located in Austria and Sweden (both three regions), and single regions from each of Belgium (NUTS level 1), Denmark, the Netherlands (NUTS level 1) and Finland. Many of the regions with high R&D expenditure per inhabitant were also present among the group of regions that recorded the highest levels of R&D intensity. Stuttgart (€3 972 per inhabitant) and Braunschweig (€3 902 per inhabitant) in Germany (2019 data) had the highest ratios of R&D expenditure per inhabitant (as was the case for R&D intensity – see above). Stockholm (the Swedish capital region), Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (the Belgian capital region; NUTS level 1), Bremen (Germany) and Zuid-Nederland (the Netherlands; NUTS level 1) were the only regions that featured in the group of regions with high R&D expenditure per inhabitant but did not feature among those regions with the highest ratios of R&D intensity. Note that the latest data available for this group of 19 regions relates to 2019, other than for regions in the Netherlands and Finland (both 2020 data).

In 2020, R&D expenditure per inhabitant was lower than the EU average in every region of Bulgaria, Greece, Spain, Lithuania, Portugal, Romania, Slovenia and Slovakia, as well as all but one of the regions in Czechia, Italy, Hungary and Poland (the exceptions being their capital regions, except for Italy where it was Emilia-Romagna). R&D expenditure per inhabitant was also

lower than the EU average in Estonia, Cyprus, Latvia and Malta, where regional data concern a single region and in Croatia (national data). There were 20 regions where R&D expenditure per inhabitant was less than €70 (as shown by the yellow shade in Map 9.2). They were concentrated in Romania (six regions), Bulgaria (five regions) and Poland (also five regions), while this group also included two regions from Greece and single regions from each of Czechia and Portugal. The two lowest ratios were recorded in Romania: Sud-Vest Oltenia (€9 per inhabitant) and Sud-Est (€8 per inhabitant). The skewed nature of R&D expenditure can be underlined by the fact that R&D expenditure per inhabitant in Stuttgart was almost 500 times as high as it was in Sud-Est.

## **Human resources in science and technology**

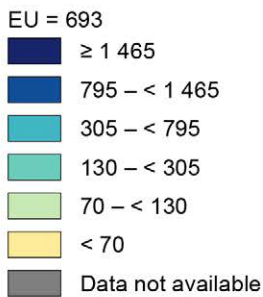
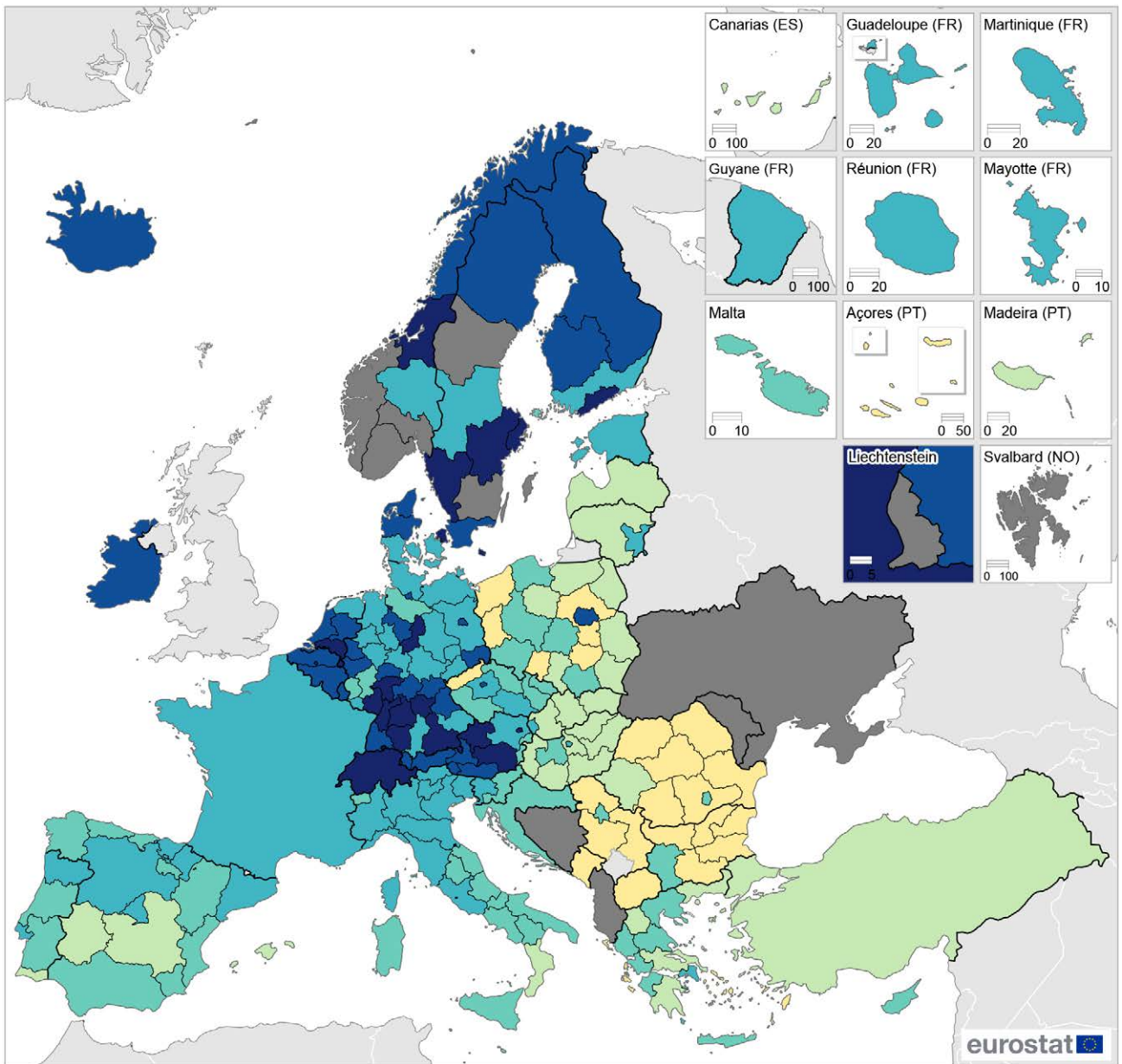
Human resources in science and technology (HRST) are defined as persons who fulfil at least one of the following two criteria:

- have successfully completed a *tertiary education*, as defined by the *international standard classification of education (ISCED)* levels 5–8;
- are employed in a science and technology occupation where the above qualifications are normally required; in other words, people not formally qualified but working as professionals, technicians and associate professionals – as defined by the *international standard classification of occupations (ISCO)* major groups 2–3 – are also included.

As such, the concept of HRST can relate to a person's level of education, irrespective of their actual professional occupation. By contrast, the concept of R&D personnel relates specifically to occupations, namely if a person is directly engaged in R&D (creative and systematic work undertaken to increase the stock of knowledge or to devise new applications of existing knowledge). Therefore, the criteria for HRST are broader, with the number of HRST considerably higher than the number of R&D personnel.



**Map 9.2:** R&D expenditure per inhabitant, 2020  
(€, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 04/2023

Note: Belgium and the Netherlands, NUTS level 1. Ireland, France, Croatia, Switzerland and Türkiye: national data.  
Belgium, Denmark, Germany, Austria, Sweden and Switzerland: 2019. Montenegro: 2018.  
Source: Eurostat (online data code: [rd\\_e\\_gerdreg](#))



In 2022, there were 119.8 million persons in the EU classified as HRST; among these, there were 95.4 million persons who met the educational criterion, 75.9 million who met the occupational criterion, and 51.5 million who met both the educational and occupational criteria (this latter group constitutes what is often referred to as the HRST 'core' group).

Map 9.3 shows the distribution of HRST across NUTS level 2 regions. In 2022, the highest counts of HRST were, unsurprisingly, recorded in some of the most populous regions of the EU: Ile-de-France (4.8 million HRST) and Rhône-Alpes (2.2 million) in France; Comunidad de Madrid (2.4 million), Cataluña (2.3 million) and Andalucía (2.1 million) in Spain; and Lombardia in Italy (2.1 million). These were the only regions in the EU to record in excess of 2.0 million HRST.

There were 24 regions where more than one million persons were classified as HRST (as shown by the largest circles in Map 9.3). Apart from the six regions mentioned above, the remaining 18 regions in this group were principally located in Germany (six regions) and France (four regions), although it also included regions in six other Member States. As well as the capital regions of France and Spain (mentioned above), there were six additional capital regions – those of Germany, Italy, Poland, the Netherlands, Greece and Sweden – where more than one million persons were classified as HRST.

Map 9.3 also shows the share of HRST in the [labour force](#) (sometimes referred to as the economically active population). In 2022, the share of HRST in the EU labour force was 47.5 %. Unlike other science and technology indicators, the regional distribution for this indicator was not highly skewed. Rather, there was a fairly equal split in the number of regions with shares above (111 regions or 46.1 % of the total) and below (130 regions) the EU average.

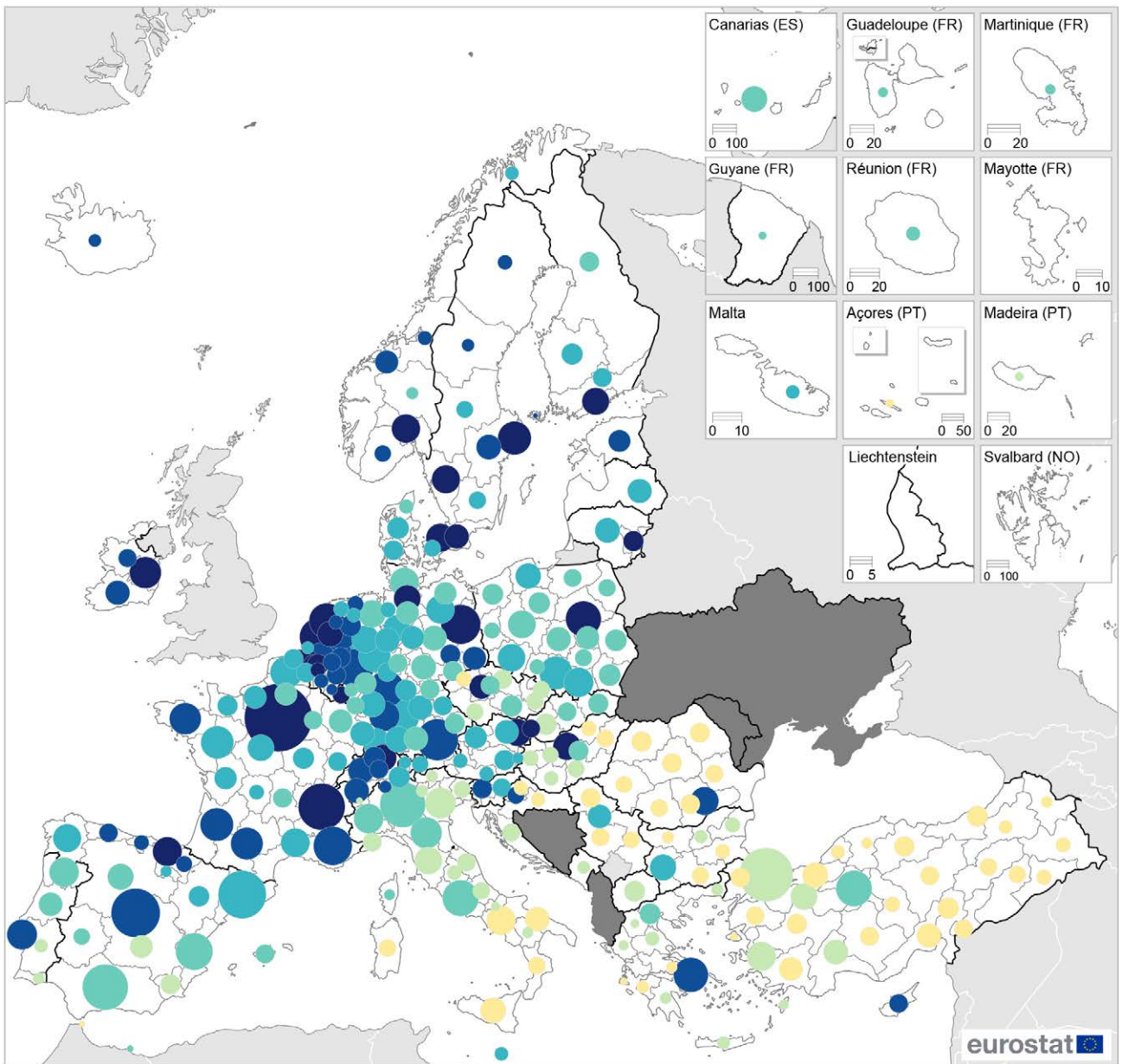
In 2022, there were 25 NUTS level 2 regions in the EU where HRST accounted for at least 58.0 % of the labour force (as shown by the darkest shade of blue in Map 9.3). These regions were widely dispersed across the EU territory, with their highest concentration in Belgium (four regions), the Netherlands and Sweden (both three regions), Germany and France (both two

regions); there were 11 EU Member States where a single region met this criterion. HRST accounted for a particularly high share (71.2 %) of the labour force in Prov. Brabant Wallon in Belgium, while the capital regions of Warszawski stołeczny (Poland), Stockholm (Sweden), Sostinės regionas (Lithuania), Budapest (Hungary), Praha (Czechia) and Luxembourg (a single region at this level of detail) were the only other NUTS level 2 regions where HRST accounted for more than two thirds of the labour force.

The group of 25 regions with the highest shares of HRST in their respective labour forces were generally concentrated in capital regions and other urban regions. Prov. Brabant Wallon in Belgium, Utrecht in the Netherlands and País Vasco in Spain were atypical insofar as they attracted a higher share of HRST to their regional labour forces than their capital regions. The non-capital urban regions in this group were principally located in western EU Member States, the only exceptions being País Vasco (in Spain), Sydsverige and Västsverige (both in Sweden). To a large degree – given that a majority of HRST meet the education rather than occupation criterion – the regional distribution of HRST in the labour force that is shown in Map 9.3 closely resembles the distribution of people with a tertiary level of educational attainment (for more details, see Map 3.5 of the chapter on [education and training](#)). Regions with high shares of HRST in their labour force are likely to experience a number of benefits, such as: higher productivity, higher wage levels and clusters of research and technology activity. Factors such as these, in turn, are likely to reinforce their attractiveness to graduates and to (new) businesses, thereby generating spillover effects.

At the other end of the range, there were 26 regions in the EU where the share of HRST in the labour force was less than 32.0 % (as shown by the yellow shade). Generally, they were characterised as rural and peripheral regions and they were all in eastern and southern EU Member States. Ionia Nisia in Greece (23.9 %), together with three regions from Romania – Sud-Est (24.3 %), Sud-Muntenia (23.6 %) and Nord-Est (21.7 %) – had the lowest regional shares of HRST in the labour force; they were the only regions where HRST accounted for less than one quarter of the labour force.

**Map 9.3: Human resources in science and technology, 2022**  
(by NUTS 2 regions)



Human resources in science and technology (% of the labour force)  
EU = 47.5

- ≥ 58.0
- 52.0 – < 58.0
- 46.5 – < 52.0
- 38.0 – < 46.5
- 32.0 – < 38.0
- < 32.0

Human resources in science and technology (1 000)  
EU = 119 814



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

Note: Montenegro, North Macedonia and Türkiye, 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: hrst\_st\_rcat)

## R&D personnel and researchers

R&D personnel consists of all individuals employed directly in the field of R&D. Included are not only researchers, but also technicians and equivalent staff as well as supporting staff (such as managers, administrators and clerical staff). R&D personnel are employed in public and private sectors (in business enterprises, government, higher education and private non-profit organisations) to create new knowledge, products, processes and methods, as well as to manage and support the projects concerned.

Across the EU in 2020, 3.0 million people in **full-time equivalents (FTEs)** were categorised as R&D personnel; this figure rose to 3.1 million a year later. To put these figures on the size of the R&D workforce into context, R&D personnel (measured in FTEs) accounted for a 1.56 % share of the total number of persons employed in the EU in 2020 and 1.62 % a year later. As with many science and technology indicators, the regional distribution of R&D personnel was highly skewed. In 2020 (the latest reference year for regional statistics), there were 60 NUTS level 2 regions in the EU (out of 191 regions for which data are available) that had shares equal to or above the EU average, leaving more than two thirds (or 68.6 %) of all regions recording shares below the EU average. Note the data presented in this section for Belgium and the Netherlands relate to NUTS level 1 regions, while only national data are available for Ireland, France and Croatia (as well as Switzerland and Türkiye) and that these different territorial levels are included in the counts of regions.

In 2020, there were 20 EU regions where R&D personnel (measured in FTEs) accounted for at least 2.20 % of the total number of persons employed; they are shown with the darkest shade of blue in Map 9.4. They were spread across 13 different EU Member States, with the highest concentration recorded in Germany (six regions; 2019 data). Half of this group of 20 regions was capital regions, while the remaining four regions outside of Germany included Steiermark in Austria (2019 data), Västsvrige in Sweden (2019 data), Zuid-Nederland in the Netherlands (NUTS level 1) and Emilia-Romagna in Italy. At the top end of the distribution, the Czech capital region of Praha (4.15 %), the German region of Braunschweig (4.03 %; 2019 data), the Hungarian capital region of Budapest (4.01 %) and the Danish capital region of Hovedstaden (4.00 %; 2019 data) were the only regions in the EU where R&D personnel accounted for at least 4.00 % of the total number of persons employed in 2020.

By contrast, there were 22 regions across the EU where the share of R&D personnel (measured in FTEs) in the total number of persons employed was less than 0.45 %

in 2020 (as shown by the yellow shade in Map 9.4). This group was concentrated in eastern EU Member States, principally across Romania (seven out of eight regions, the only exception being the capital region of Bucureşti-Ilfov) and Poland (five regions). At the lower end of the distribution, Mazowiecki regionalny in Poland (which surrounds the capital region of Warszawski stołeczny; 0.19 %), and two Romanian regions – Sud-Est (0.13 %) and Sud-Vest Oltenia (0.08 %) – were the only regions in the EU where the share of R&D personnel in the total number of persons employed was less than 0.20 %.

### **There were 2.8 million researchers in the EU, equivalent to 1.35 % of the labour force**

**Researchers** are persons engaged in R&D activities. They are defined as ‘... professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, as well as in the management of the projects concerned ... They conduct research and improve or develop concepts, theories, models, techniques instrumentation, software or operational methods’.

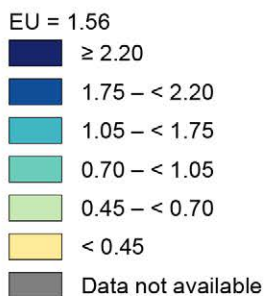
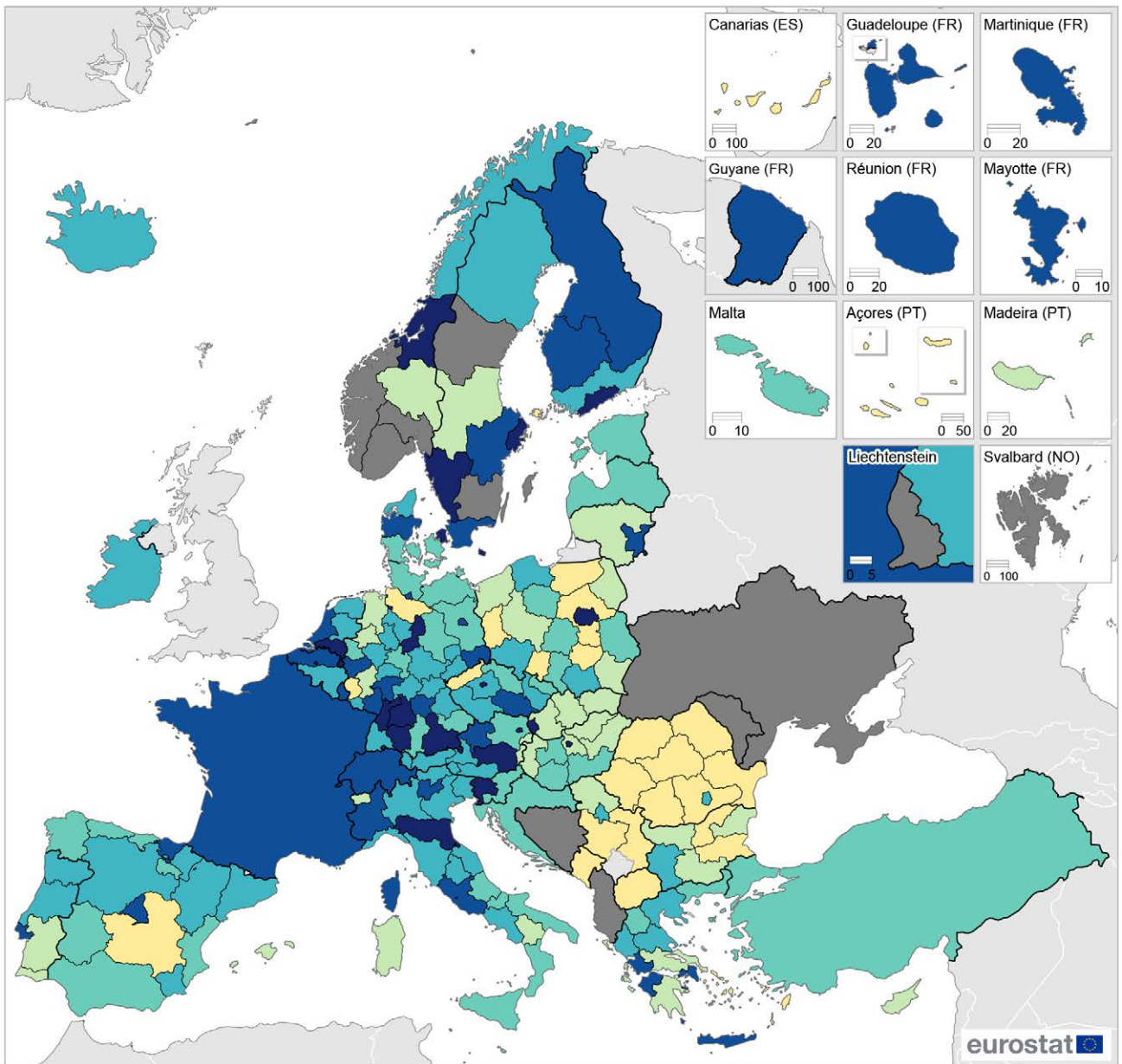
In 2019, the total number of researchers in the EU was 2.8 million; note this figure is a head count (data are not expressed in terms of FTEs). Map 9.5 shows the regional distribution of researchers across NUTS level 2 regions, detailing the total number of researchers as well as the relative share of researchers in the labour force. Note the data presented in this section for Belgium and the Netherlands relate to NUTS level 1, while only national data are available for Ireland, France and Croatia (as well as Switzerland and Türkiye).

In 2020 – the latest reference year for which regional statistics on researchers are available in most EU Member States – the highest numbers of researchers were, unsurprisingly, recorded in some of the most populous regions of the EU. The distribution of researchers was relatively concentrated in a few clusters, principally in those regions where R&D intensity was high. The main difference was that the number of researchers tended to be somewhat more concentrated in regions characterised as having higher education establishments and research institutes (often capital city regions). The skewed nature of research activity was such that 23 regions (out of 190 for which data are available) accounted for half of all researchers in the EU; note this calculation includes less detailed data for France and Ireland (for which only national data are available), as well as West-Nederland and Zuid-Nederland in the Netherlands and Vlaams Gewest in Belgium (NUTS level 1). By contrast, at the other end of the distribution there were 80 regions where the number of researchers was less than 5 000.



**Map 9.4: R&D personnel, 2020**

(% of total number of persons employed (numerator measured in full-time equivalents), by NUTS 2 regions)



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 Cartography: Eurostat — GISCO, 04/2023

Note: Belgium and the Netherlands, NUTS level 1. Ireland, France, Croatia, Switzerland and Türkiye: national data. Belgium, Denmark, Germany, Austria, Sweden, Switzerland and Montenegro: 2019. Kujawsko-pomorskie (PL61), Warmińsko-mazurskie (PL62) and Iceland: 2018.  
 Source: Eurostat (online data code: rd\_p\_persreg)



There were 19 regions that had at least 33 500 researchers in 2020 (as shown by the largest circles in Map 9.5). This group was concentrated in Germany (five regions), with the remaining 14 regions spread across 12 different EU Member States; Spain and Portugal both had two regions. These 19 regions with a relatively high number of researchers were concentrated in capital regions (of which there were eight) and other urban regions. The latter included West-Nederland in the Netherlands (NUTS level 1), Oberbayern, Stuttgart, Köln and Karlsruhe in Germany (2019 data), Vlaams Gewest in Belgium (NUTS level 1; 2019 data) and Lombardia in Italy; each of these was atypical insofar as they reported a higher number of researchers than in their capital regions.

Leaving aside France – for which only national data are available (430 000 researchers; 2018 data) – the highest regional count of researchers was observed in the Dutch region of West-Nederland (NUTS level 1) with 74 800 researchers in 2020. There were five other regions which reported upwards of 50 000 researchers: Oberbayern and Stuttgart in Germany (both 2019 data), the Spanish capital region of Comunidad de Madrid, Vlaams Gewest in Belgium (NUTS level 1; 2019 data) and the Polish capital region of Warszawski stołeczny.

In 2019, researchers accounted for 1.35 % of the EU labour force. By normalising the data – in other words, expressing the number of researchers relative to the size of the labour force – it is possible to reduce the influence of those territories for which only national or NUTS level 1 data are available. There were 18 regions in the EU where the share of researchers in the labour force was at least 2.25 % in 2020 (as shown by the darkest shade of blue in Map 9.5); they were widely distributed, principally across *Nordic*, eastern and western EU Member States.

Looking in more detail, the highest shares of researchers in the labour force were concentrated in capital regions. In 2020, 9 out of the 10 regions with the highest shares were capital regions. A peak of 4.16 % was recorded in the Hungarian capital region of Budapest, with the next highest proportions observed in the Slovak capital region of Bratislavský kraj (3.91 %) and Austrian capital region of Wien (3.62 %; 2019 data). This group of 10 also included the capital regions of Poland, Czechia, Denmark (2019 data), Belgium (NUTS level 1; 2019 data), Finland and Portugal. The only non-capital region was Steiermark in Austria, where the share of researchers in the labour force stood at 3.03 % (2019 data); Steiermark

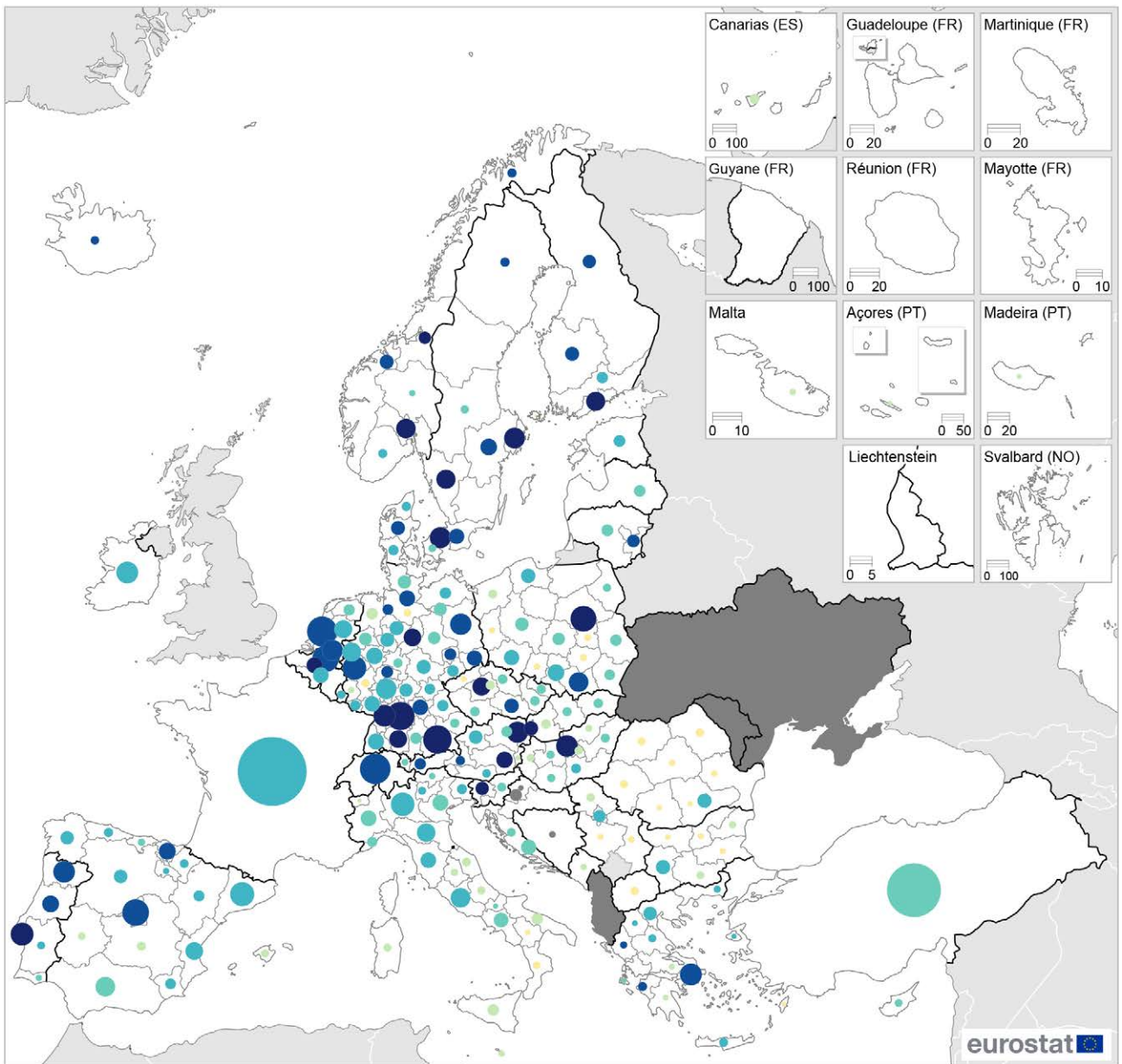
has high level of research activity in disciplines such as mechanical and automotive engineering, metallurgy and materials science, or industrial chemistry. The high concentration of research activity in EU capital regions may be attributed to several reinforcing factors including, among others: a concentration of research institutions, universities, and scientific organisations; state-of-the-art research infrastructure and equipment; high levels of funding for research and innovation; collaborative and networking opportunities; a broad range of job opportunities for researchers.

In 2020, there were 21 regions across the EU where the share of researchers in the labour force was less than 0.45 % (these regions are shaded in yellow in Map 9.5). They were principally concentrated in eastern EU Member States, in particular across Romania (seven regions; the only exception was the capital region of București-Ilfov), but also in Poland (four regions), Bulgaria (three regions) and Czechia (a single region). This group also included the southern Italian regions of Basilicata and Calabria, the German regions of Koblenz and Lüneburg (both 2019 data), the Greek island region of Notio Aigaio and the Finnish archipelago of Åland. The lowest shares – where researchers accounted for less than 0.20 % of the labour force – were recorded in the Polish region of Mazowiecki regionalny and the Romanian regions of Centru, Sud-Est, Sud-Vest Oltenia and Sud-Muntenia.

The number of researchers across the EU has steadily increased over time. Despite the impact of the COVID-19 crisis, there were 1.8 % more researchers in 2020 than the year before. This was followed by a considerably faster growth rate in 2021, as the number of EU researchers increased 6.2 %.

The total number of researchers in the EU stood at 1.89 million full-time equivalents (FTEs) in 2020 and rose to 2.0 million FTEs a year later. An analysis of researchers can be extended by introducing an additional dimension to the dataset, the sector of performance. Statistics are compiled for four institutional sectors: business enterprises, government, higher education and private non-profit. In 2021 (note that 2020 is the latest reference year for which regional statistics are generally available in most EU Member States), the business enterprise sector accounted for 56.3 % (55.3 % in 2020) of all researchers employed in the EU. The higher education sector had the next highest share at 31.9 % (32.7 % in 2020), followed by the government sector with 11.0 % (11.3 % in 2020).

**Map 9.5: Researchers, 2020**  
(by NUTS 2 regions)

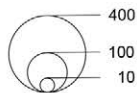


**Researchers**  
(% of the labour force)

EU = 1.35

- ≥ 2.25
- 1.60 – < 2.25
- 0.95 – < 1.60
- 0.65 – < 0.95
- 0.45 – < 0.65
- < 0.45
- Data not available

**Researchers (1 000)**  
EU = 2 798



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Cartography: Eurostat — GISCO, 08/2023

Note: Belgium and the Netherlands, NUTS level 1. Ireland, France, Croatia, Switzerland, Bosnia and Herzegovina and Türkiye: national data. EU, Belgium, Denmark, Germany, Ireland, Luxembourg, Austria, Sweden, Switzerland and Montenegro: 2019. France and Iceland: 2018.

Source: Eurostat (online data code: [rd\\_p\\_persreg](#))

Figure 9.1 shows that the relative importance of these different sectors varied considerably across EU regions. Most of the regions reporting relatively high shares of researchers working within the business enterprise sector were located in western and Nordic EU Member States. The number of researchers (measured in FTEs) in the business enterprise sector as a share of the total number of persons employed peaked at 2.29 % in the German region of Stuttgart (2019 data). The next highest shares – within the range of 1.57–1.85 % – were recorded in the Hungarian capital region of Budapest (2020 data), the Danish capital region of Hovedstaden (2019 data) and the Swedish region of Västsverige (which includes the city of Gothenburg; 2019 data).

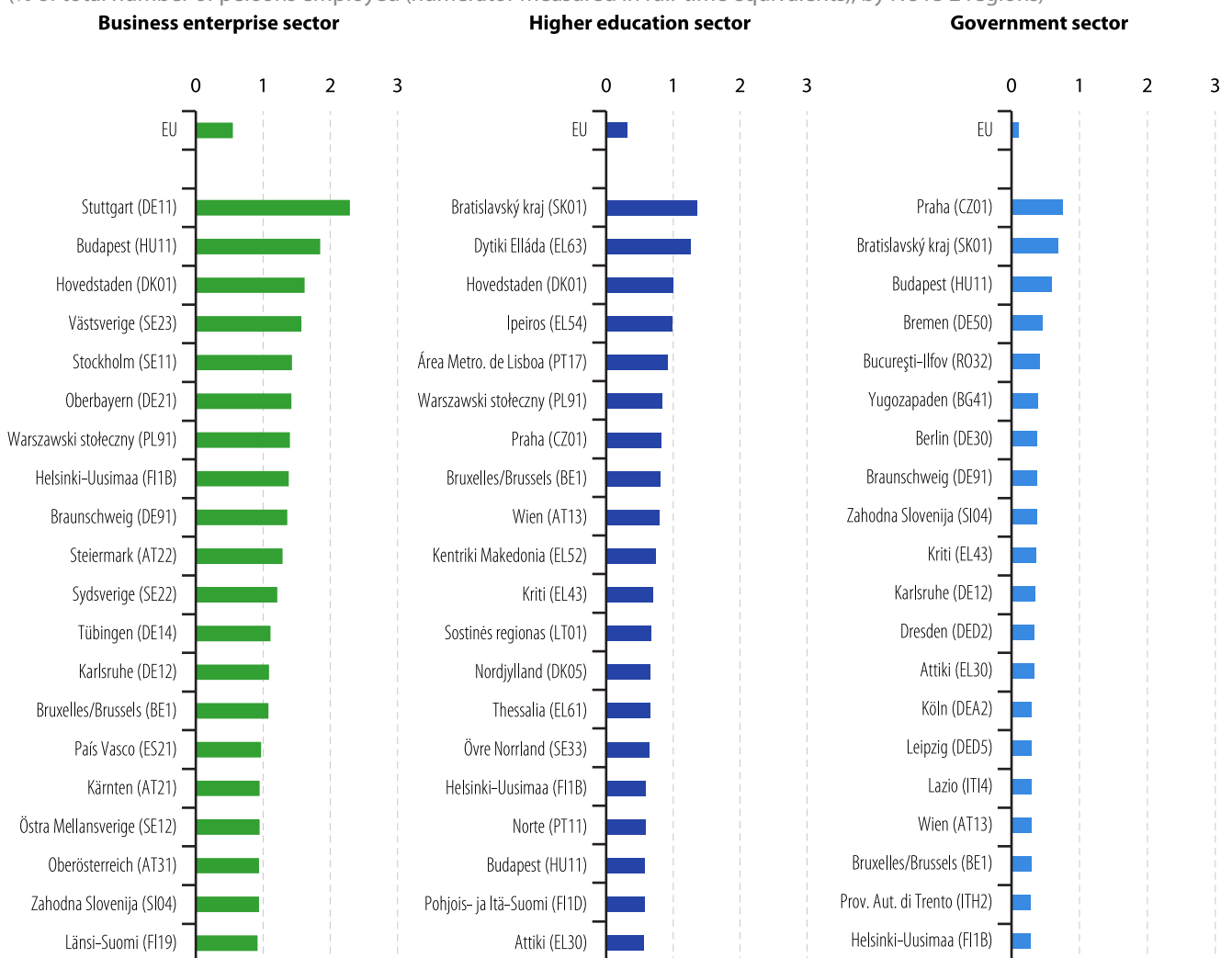
In 2020, the Czech capital region of Praha reported the highest share of researchers (measured in FTEs) working in the government sector, equivalent to 0.77 % of its total number of persons employed. Relatively high

shares were also recorded in the Slovak capital region of Bratislavský kraj (0.70 %) and the Hungarian capital region of Budapest (0.60 %).

In contrast to the other sectors of performance, there was a greater degree of regional variation for the number of researchers employed within the higher education sector. In 2020, the highest share was recorded in the Slovak capital region of Bratislavský kraj, where researchers (measured in FTEs) in the higher education sector as a share of the total number of persons employed peaked at 1.34 %; this was more than four times as high as the EU average. The Greek region of Dytiki Elláda had the second highest share (1.25 %) and was the only other region in the EU where researchers in the government sector accounted for more than 1.00 % of the total number of persons employed.

**Figure 9.1: Researchers, by sector of performance, 2020**

(% of total number of persons employed (numerator measured in full-time equivalents), by NUTS 2 regions)



Note: the figure shows the EU regions with the highest shares for each sector of performance. Belgium: NUTS level 1. Ireland, France, Croatia and the Netherlands: national data. Belgium, Denmark, Germany, Luxembourg, Austria and Sweden: 2019. Several regions are not available (too many to document).

Source: Eurostat (online data code: [rd\\_p\\_persreg](#))

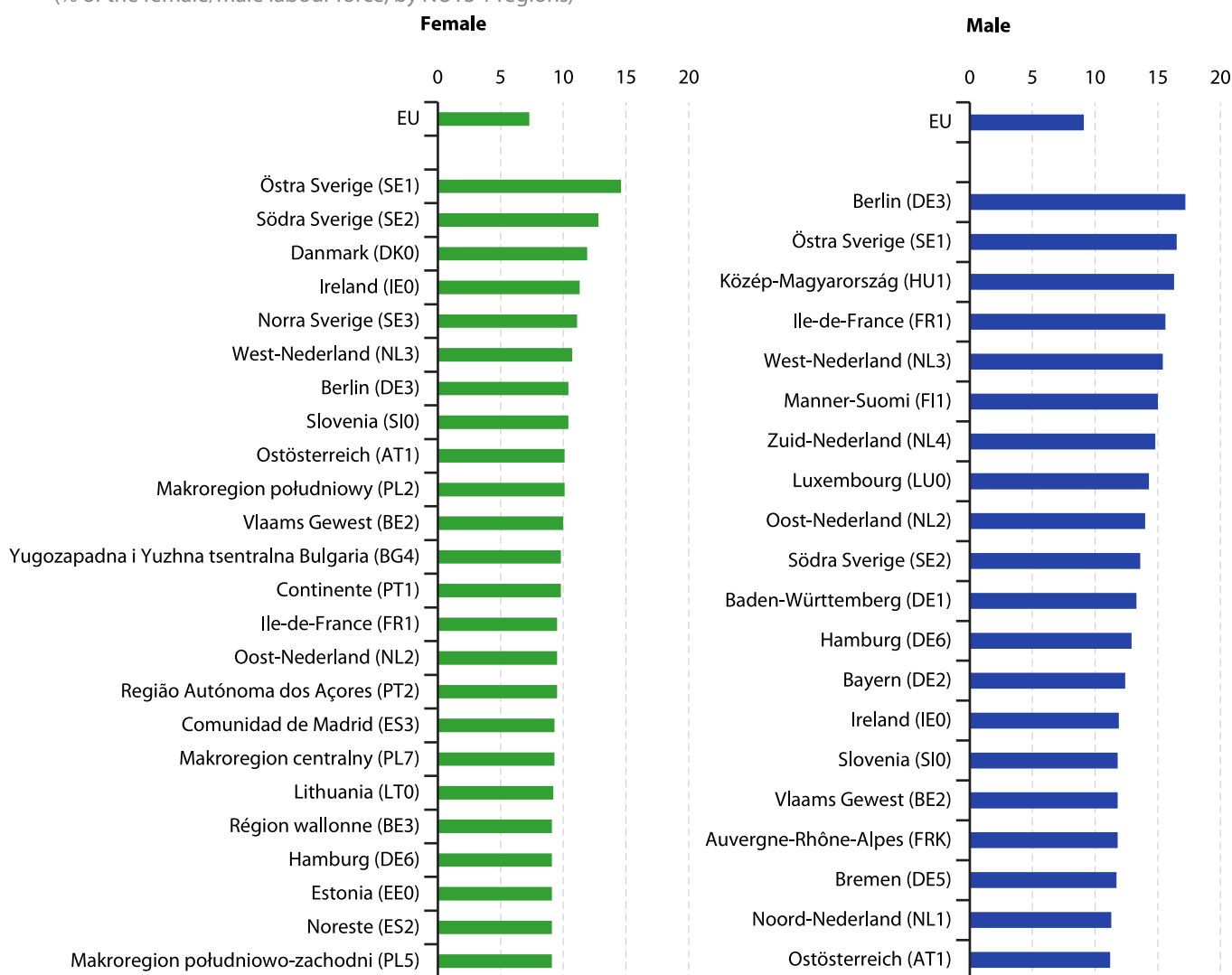
## Focus on human resources in science and technology

The final part of this chapter provides a regional analysis of human resources in science and technology by sex. The EU actively promotes gender equality in the fields of science, technology, engineering, and mathematics, through a broad range of policies/initiatives, including gender equality plans within the EU’s research framework programme called *Horizon Europe*. The *European research area* and the *European Institute for Gender Equality* both promote initiatives such as gender mainstreaming, training programmes, and networking opportunities for female scientists and engineers.

In 2022, there were 17.8 million *scientists and engineers* in the EU; their number increased 3.6 % between 2021 and 2022. A majority (59.1 %) of the scientists and engineers in the EU were male.

Figure 9.2 shows the share of scientists and engineers in the female/male labour force. In 2022, female scientists and engineers in the EU accounted for 7.3 % of the female labour force; the share among males was higher, at 9.1 %. Two Swedish regions had the highest shares of female scientists and engineers in the female labour force – Östra Sverige (14.6 %) and Södra Sverige (12.8 %). There were nine other regions across the EU that recorded double-digit shares for female scientists and engineers. By contrast, the lowest shares were recorded in the Italian region of Isole (3.2 %) and two Hungarian regions – Dunántúl and Alföld és Észak (3.2 % and 3.1 %, respectively).

**Figure 9.2: Scientists and engineers, by sex, 2022**  
(% of the female/male labour force, by NUTS 1 regions)



Note: the figure shows the EU regions with the highest shares for each sex. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability. Bremen (DES) and Saarland (DEC): females, not available. Região Autónoma dos Açores (PT2): males, not available. Corse (FRM) and Åland (FI2): not available.

Source: Eurostat (online data code: hrst\_st\_rsex)



A similar analysis for male scientists and engineers reveals that there were 31 NUTS level 1 regions where the share of male scientists and engineers in the male labour force was at least 10.0 %. In 2022, the highest shares were recorded in the German capital region of Berlin (17.2 %), Östra Sverige in Sweden (16.5 %) and Közép-Magyarország in Hungary (16.3 %). The lowest shares were recorded in the Italian regions of Sud and Isole (both 4.0 %) and the Bulgarian region of Severna i Yugoiztochna Bulgaria (3.5 %).

In 2022, scientists and engineers accounted for a higher proportion of the male rather than female labour force in 62 out of the 87 NUTS level 1 regions for which data are available. The biggest gender gap in favour of men was recorded in the Hungarian capital region of Közép-Magyarország, where the share of male scientists and engineers was 8.4 percentage points higher than the corresponding share for women. Relatively large gender gaps in favour of men were also observed in Manner-Suomi in Finland (7.4 points) and the German capital region of Berlin (6.8 points). By contrast, there were 23 NUTS level 1 regions where the share of scientists and engineers in the labour force was higher among women than men; as such, there were two regions in the EU – the Spanish capital region of Comunidad de Madrid and the Polish region of Makroregion południowo-zachodni – where the relative shares of men and women were equal. The largest gender gaps in favour of women were recorded in Poland: Makroregion wschodni and Makroregion centralny had gender gaps of 3.3 and 3.4 percentage points, respectively.

### **There were 9.8 million people employed in high-technology sectors across the EU**

High-technology sectors are considered key drivers of economic growth and productivity, and often provide well-paid employment opportunities. This final section highlights gender imbalances in high-technology sectors, defined here as [high-technology manufacturing sectors](#) (the manufacture of basic pharmaceutical products and pharmaceutical preparations; the manufacture of computer, electronic and optical products) and [knowledge-intensive high-technology services](#) (motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities; telecommunications; computer programming, consultancy and related activities; information service activities; scientific research and development). The distinction between manufacturing and services is made due to the existence of two different methodologies. While R&D intensities are used to distinguish between high, medium-high, medium-low and low-technology manufacturing industries,

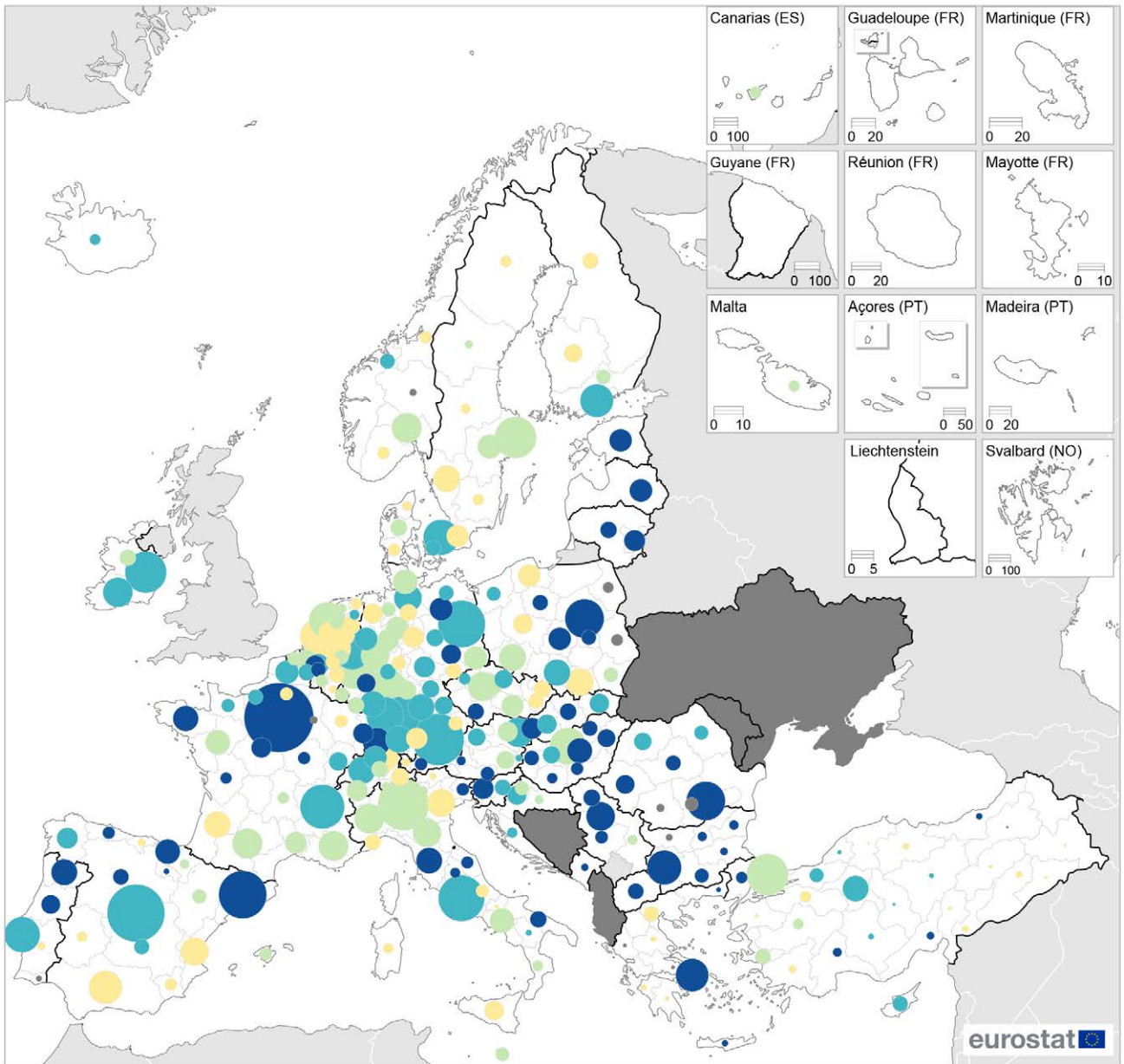
for services the proportion of the workforce that has completed a tertiary education is used to distinguish between knowledge-intensive services and less knowledge-intensive services. The statistics presented on employment in high-technology sectors cover all persons (including support staff) who work in these enterprises, and as such will overstate the number of highly-qualified workers.

In 2022, there were 9.8 million people employed in high-technology sectors across the EU; men accounted for just over two thirds (67.2 %) of the total. There were 23 NUTS level 2 regions where at least 100 000 people were employed in high-technology sectors; these regions are shown by the largest circles in Map 9.6. In keeping with most science and technology indicators, they were concentrated in some of the largest capital/urban regions of the EU. This group contained 13 capital regions, including the French (Ile-de-France) and Spanish (Comunidad de Madrid) capital regions, where the highest numbers of people employed in high-technology sectors were observed (420 000 and 289 000, respectively). There were three other regions in the EU which recorded more than 200 000 persons employed in high-technology sectors: Oberbayern in southern Germany, Lombardia in northern Italy and Cataluña in eastern Spain.

To give some idea of the skewed nature of the distribution, the 23 regions that employed at least 100 000 people in their high-technology sectors together employed 3.9 million persons in 2022, equivalent to around two fifths (39.3 %) of the EU total. This was similar to the cumulative share of the 169 regions with the lowest numbers of persons employed in high-technology sectors. At the bottom end of the distribution, there were 24 regions in the EU where less than 7 500 persons were employed in high-technology sectors; these regions are shown by the smallest circles in Map 9.6. This group included five regions where less than 3 000 persons were employed in high-technology sectors, the southern Italian region of Molise, together with four Greek regions – Anatoliki Makedonia, Thraki; Peloponnisos; Ipeiros; and Sterea Elláda.

Women accounted for almost one third (32.8 %) of the total number of persons employed in the EU's high-technology sectors in 2022. The female share of high-technology employment ranged across NUTS level 2 regions from a high of 50.2 % in the Hungarian region of Nyugat-Dunántúl down to 8.3 % in the Greek region of Thessalia. In fact, Nyugat-Dunántúl was the only region in the EU (at this level of detail) where there were more women than men employed in high-technology sectors. The next highest shares of female employment were recorded in the Italian region of Marche (48.6 %) and another Hungarian region, Észak-Magyarország (48.1 %).

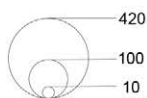
**Map 9.6: Employment in high-technology sectors, by sex, 2022**  
(by NUTS 2 regions)



Female workforce (% of total number of persons employed in high-technology sectors)  
EU = 32.8

- ≥ 36.0
- 32.5 – < 36.0
- 27.5 – < 32.5
- < 27.5
- Data not available

Number of persons employed in high-technology sectors (1 000)  
EU = 9 804



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

Note: high-technology sectors are defined as high-technology manufacturing and knowledge-intensive high-technology services. Mecklenburg-Vorpommern (DE80): 2021. Montenegro, North Macedonia and Türkiye: 2020. Spain and France are still in the process of implementing the Integrated European Social Statistics Framework Regulation for the labour force domain which may impact geographical comparability.

Source: Eurostat (online data code: htec\_emp\_reg2)

## 10. Tourism

**Tourism**, in a statistical context, refers to the activity of visitors taking a trip to a destination outside their usual environment, for less than a year. It is important to note that this definition is wider than the common everyday definition, insofar as it encompasses not only private leisure trips but also visits to family and friends, as well as business trips.

Tourism has the potential to play a significant role in many regional economies and can be of particular importance in remote/peripheral regions, such as the [European Union \(EU's\) coastal, mountain or outermost regions](#). Infrastructure that is created for tourism purposes contributes to local and regional development, while jobs that are created or maintained can help counteract industrial or rural decline. By contrast, tourism can have negative consequences/externalities, as excess demand may put a strain on local infrastructure and be a nuisance to local communities. Furthermore, tourism can impact the environment locally through noise, pollution, waste and wastewater, habitat loss and globally through transport-related emissions.

During the early months of the COVID-19 crisis in spring 2020, virtually all EU Member States implemented containment measures and restrictions on non-essential travel internally and/or internationally;

some partially or completely closed their borders. Where international travel continued, it was generally accompanied by a requirement to go into quarantine. As well as travel-related restrictions, many governments also imposed restrictions on the way that tourism-related businesses could operate, in some cases closing them altogether. These restrictions had an immediate impact on the EU's tourism supply and demand.

There was a partial recovery during summer 2020, as some travel/tourism-related restrictions were lifted. Nevertheless, many tourists were reluctant to travel and/or feared: the risk of further lockdown measures; the reintroduction of specific (travel) restrictions; catching/or spreading the virus when staying at their destination or travelling. This partial recovery was principally driven by domestic demand, as large numbers of people decided to stay in their home country and take a 'staycation' rather than crossing borders for a foreign holiday. Subsequent waves of the pandemic led many EU Member States to reintroduce restrictions, often with major consequences for winter tourism, while there was more commonly a relaxation/removal of restrictions during summer seasons, albeit with various constraints still in place (for example, wearing masks in confined spaces and/or providing proof of vaccination status).



(million nights, 2021, by NUTS 3 regions)

Note: the total number of nights spent in EU tourist accommodation during 2021 was 1 832 million.

Source: Eurostat (online data code: tour\_occ\_nin3)

At the time of writing (April 2023), life has returned to some form of pre-COVID-19 normality as the vast majority of restrictions linked to the pandemic have been lifted, including those on international travel. Despite the virus continuing to circulate with successive variants and waves of infection, there has been a general downward development in the height of the associated peaks for reported cases, hospitalisations, and deaths.

Overall there were 1 832 million **nights spent** in EU **tourist accommodation** during 2021. The infographic above shows the 10 NUTS level 3 regions with the highest numbers of nights spent. Two Italian regions – Venezia and Bolzano-Bozen – had the largest counts, with 27.1 and 23.8 million nights respectively. The number of nights spent in tourist accommodation exceeded 20.0 million in three additional regions: the French capital of Paris and the coastal regions of Mallorca (Spain) and Istarska županija (Croatia). Among the 1 166 regions for which data are available, these 10 regions made a substantial contribution to the overall number of nights spent in tourist accommodation; their cumulative share accounted for more than one tenth (10.8 %) of the EU total.

This article presents information on regional patterns of tourism across the EU. Its main focus is the provision of tourist accommodation services as measured by the number of nights spent. The chapter concludes with a set of experimental statistics on guest nights spent in short-term accommodation, collected from online booking platforms.

## Number of nights spent in tourist accommodation

Tourism statistics are traditionally collected from suppliers of tourism services through surveys of tourist accommodation establishments or from administrative data. These establishments include all types of accommodation which provide, as a paid service, accommodation for tourists. They are defined according to the activity classification NACE and include:

- hotels and similar establishments (NACE Group 55.1);
- holiday and other short-stay accommodation (NACE Group 55.2); and
- camping grounds, recreational vehicle parks and trailer parks (NACE Group 55.3).

### ***The number of nights spent in EU tourist accommodation remained 36.3 % below pre-pandemic levels***

In 2021, there were 1.83 **billion** nights spent in all forms of tourist accommodation across the EU. This figure reflects both the length of stay and the number of tourists and is considered a key indicator for analysing tourism, even if it does not cover stays at non-rented accommodation nor same-day visits. Although there was a partial recovery in the total number of nights spent in EU tourist accommodation during 2021 (up 28.8 % compared with 2020), this figure should be put into context. Prior to COVID-19, the total number of nights spent had reached 2.87 billion in 2019; as such, the latest annual figure for 2021 remained more than one third (36.3 %) below its pre-pandemic peak.

Map 10.1 shows information on the total number of nights spent in tourist accommodation for NUTS level 3 regions; note that the data for Belgium and Türkiye are presented at level 2. Aside from presenting information on the total number of nights spent by tourists (the size of each circle), the map also provides details as to their origin – whether they were domestic or international tourists. In 2021, this distribution was heavily skewed, as many tourists remained in their country of residence due to uncertainties associated with the COVID-19 crisis. There were 87 regions across the EU (out of 1 102 for which data are available) where the number of nights spent by international tourists was higher than the number spent by domestic tourists. Put a different way, less than 1 in 10 (or 7.9 % of EU regions) had a higher number of nights spent by international (rather than domestic) tourists.



International tourists tend to cluster in a very small number of regions that are among the most frequented destinations, which may lead to additional tourism pressures and have implications for sustainable development. In 2021, there were 52 NUTS level 3 regions where international tourists accounted for at least 65.0 % of the total nights spent (they are shown in a blue shade within Map 10.1). The vast majority (45 out of these 52 regions) recorded at least 1.0 million nights spent in tourist accommodation. These heavily frequented international tourist destinations could be split into three principal groups:

- capital regions (as was the case in Belgium, Czechia, Greece, Croatia, Luxembourg, Hungary and Austria);
- coastal regions that are traditionally popular beach holiday destinations (for example, Varna in Bulgaria; Kalymnos, Karpathos, Kasos, Kos, Rodos in Greece; Mallorca, Tenerife and Gran Canaria in Spain; Istarska županija, Splitsko-dalmatinska županija and Primorsko-goranska županija in Croatia; Cyprus; Malta; or Região Autónoma da Madeira in Portugal); and
- mountain regions that are popular winter (and sometimes summer) holiday destinations (for example, Tiroler Unterland and Pinzgau-Pongau in western Austria).

Overall, international tourists accounted for less than one third (32.1 %) of the total nights spent in EU tourist accommodation during 2021. However, as noted above, some of the EU's most frequented tourist regions are characterised by a high proportion of international tourists. The two most frequented NUTS level 3 regions (in terms of nights spent) – Venezia and Bolzano-Bozen in northern Italy – both reported a majority of nights spent by international tourists (60.8 % and 62.1 % respectively). The relative importance of international tourists was even greater elsewhere: for example, international tourists accounted for 88.5 % and 95.3 % respectively of the total nights spent in the EU's fourth and fifth most frequented regions, namely, Mallorca (Spain) and Istarska županija (an Adriatic region in Croatia). Looking in more detail, the concentration of international tourists was also very high in several other NUTS level 3 regions: alongside Istarska županija (Croatia), international tourists accounted for at least 19 out of every 20 nights spent in 2021 in: Irakleio and Rethymni (both on the island of Crete in Greece) and Außerfern (an Alpine region that forms part of Tirol in Austria).

Domestic tourists accounted for more than two thirds (67.9 %) of the total nights spent in EU tourist accommodation during 2021. This figure was considerably higher than before the COVID-19 crisis, underlining a shift from foreign destinations to 'staycations' during the pandemic. In 1 015 out of 1 102 NUTS level 3 regions for which data are available (92.1 % of EU regions), domestic tourists accounted for a majority of the nights spent in tourist accommodation.

Based on 2021 data for NUTS level 3 regions, the French capital of Paris recorded the highest number (14.3 million) of nights spent in tourist accommodation by domestic tourists. As such, almost two thirds (62.3 %) of the total number of nights spent in the French capital – the third most frequented tourist region in the EU (see the infographic above for more details) – were accounted for by domestic tourists. Along with Paris, there were three more of the 10 most frequented regions in the EU that reported a higher proportion of domestic (rather than international) tourists, all in Spain – Madrid (where the share of domestic tourists was 64.3 %), Alicante/Alacant (58.0 %) and Málaga (50.4 %).

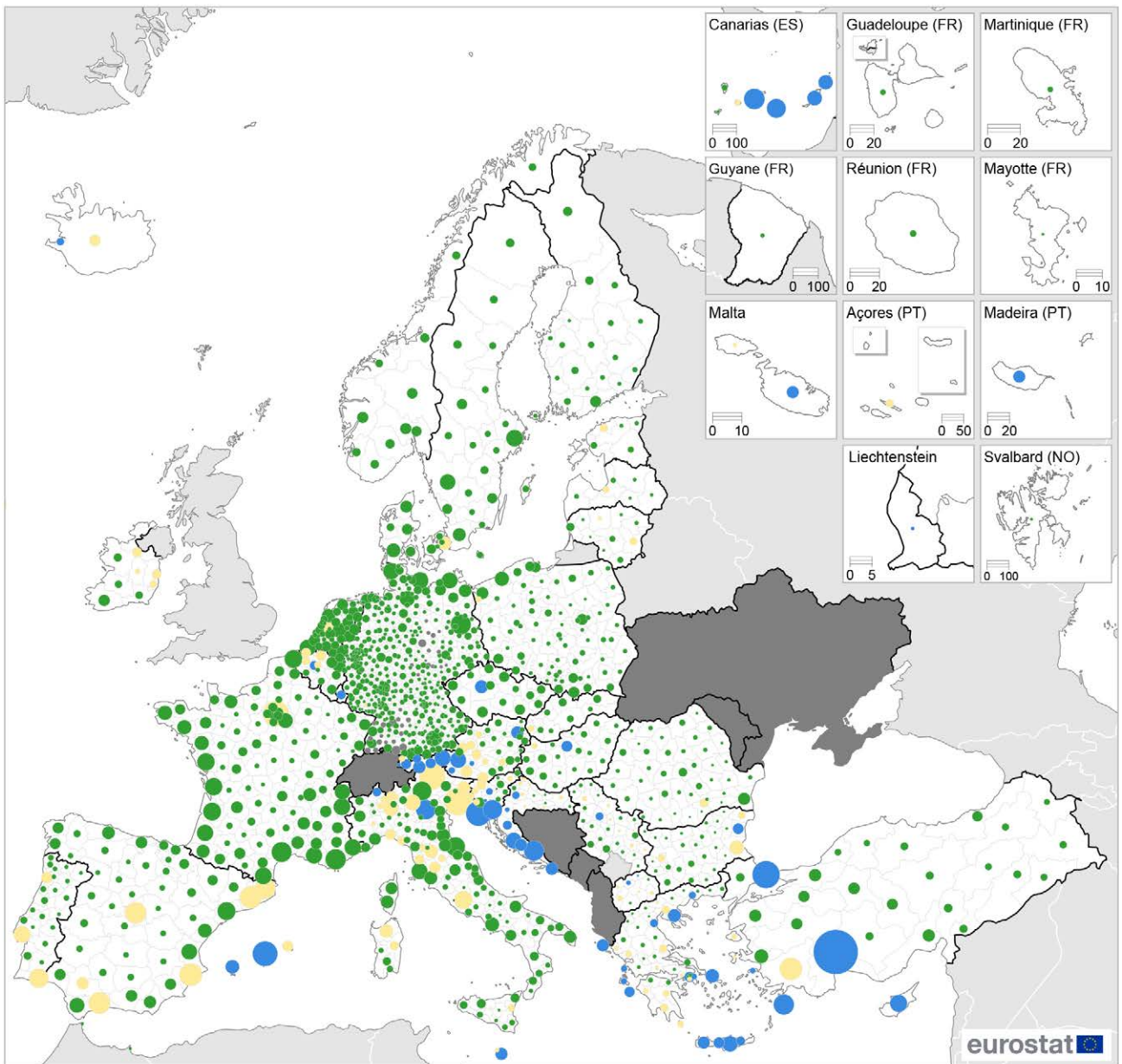
Domestic tourists accounted for at least 95.0 % (19 out of 20) nights in 121 different regions across the EU; note, however, that these very high shares were often recorded in regions characterised by relatively low tourist numbers. Looking in more detail, a subset of 38 regions had an overall total of at least 1.0 million nights spent in tourist accommodation and at least 95.0 % of all nights accounted for by domestic tourists (they form part of the group identified by the biggest green circles in Map 10.1). These regions tended to be in relatively large EU Member States (where domestic demand was likely to be higher) and included: 22 regions from Germany; nine regions from Poland; three regions from the Netherlands and from Romania; and a single region from Sweden. Within this group of 38 regions, the share of nights spent by domestic tourists peaked at 99.5 % in Wittmund (a coastal region in northern Germany) and Włocławski (in central Poland).

***Paris had the highest count of nights spent in tourist accommodation by domestic tourists, while the Adriatic region of Istarska županija (Croatia) had the highest number of nights spent by international tourists***

Figure 10.1 presents the EU's most frequented tourist destinations in 2021: it is based on NUTS level 3 regions with the highest number of nights spent in tourist accommodation by domestic tourists (left-hand side of the figure) and by international tourists (right-hand side of the figure).

The French capital region of Paris (14.3 million) had the highest count of nights spent in tourist accommodation by domestic tourists in 2021. It was followed by two more French regions, as domestic tourists spent 11.6 million nights in each of the Mediterranean regions of Var and Hérault. There were four other regions in the EU where domestic tourists spent at least 10.0 million nights in tourist accommodation: the Adriatic regions of Venezia and Rimini (both Italy), the Mediterranean region of Alicante/Alacant (Spain) and the Spanish capital region of Madrid.

**Map 10.1: Nights spent in tourist accommodation by domestic and international tourists, 2021**  
(by NUTS 3 regions)



Origin of tourists (% of total)  
EU = 67.9 % of domestic tourists

Nights spent (million)  
EU = 1 832

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

- Mainly domestic tourists (≥ 65.0 %)
- Mixed domestic and international tourists (> 35.0 % and < 65.0 %)
- Mainly international tourists (≥ 65.0 %)
- Data not available



Note: Belgium and Türkiye, NUTS level 2.

Source: Eurostat (online data code: tour\_occ\_nin3)

In 2021, the Adriatic region of Istarska županija in Croatia (which includes, among others, the popular holiday destinations of Poreč, Pula and Rovinj) had the highest count of nights spent in tourist accommodation by international tourists, at 20.7 million. It was followed by the Spanish island region of Mallorca (19.3 million nights), while the third most frequented region in the EU for international tourists was Venezia (Italy; 16.5 million nights). There were five additional regions across the EU which recorded more than 10.0 million nights spent by international tourists: the mountainous region of Bolzano-Bozen in northern Italy; the Greek island region of Kalymnos, Karpathos, Kasos, Kos, Rodos; Splitsko-dalmatinska županija and Primorsko-goranska županija (two more Adriatic regions in Croatia); and another Spanish island region, Tenerife.

Figure 10.2 extends the analysis by showing, within each EU Member State, the most frequented region for domestic and for international tourists (based on the share of the total number of nights spent in tourist accommodation in each Member State). Note that these relative shares reflect, to some degree, the number of regions in each Member State and that Cyprus and Luxembourg are single regions at NUTS level 3 (and

hence are not shown), while data for Belgium is at NUTS level 2.

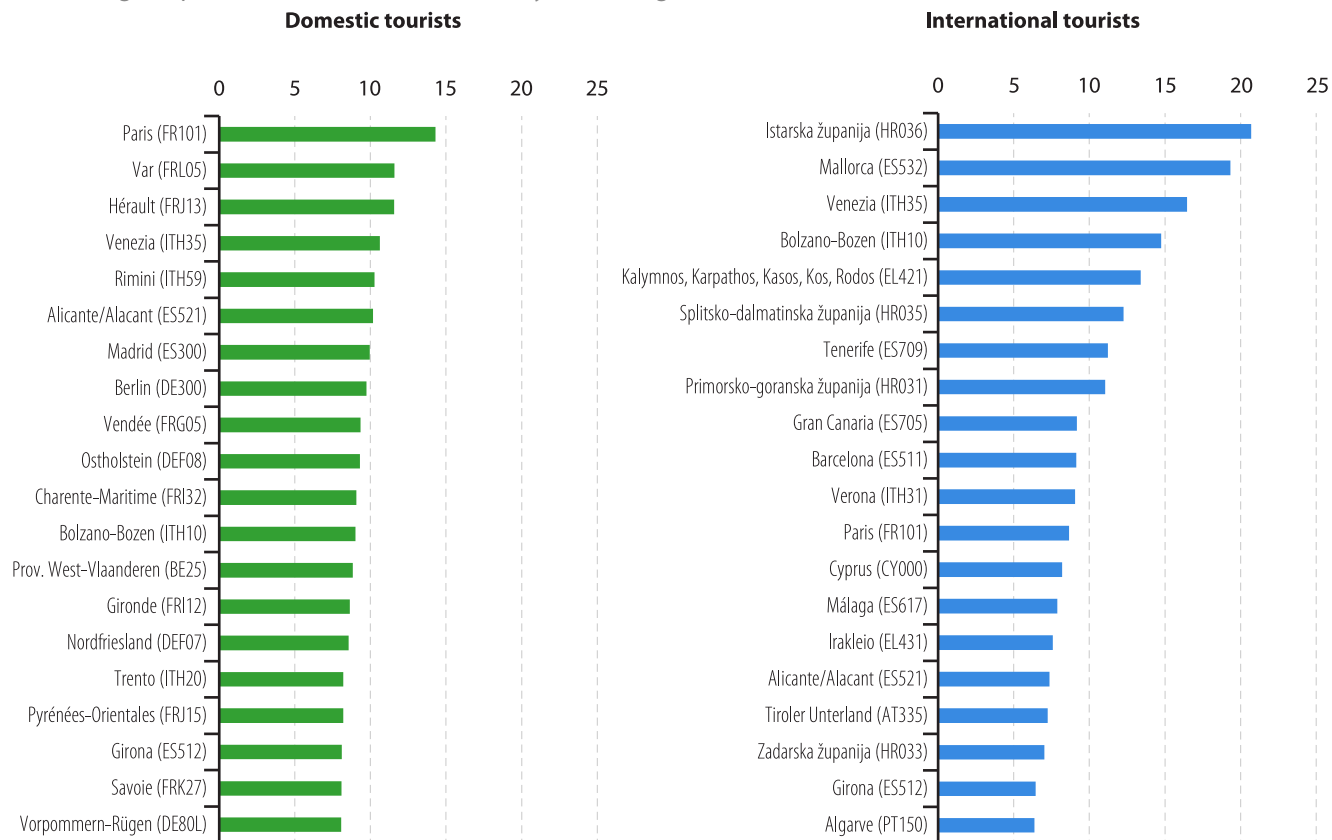
There were nine EU Member States (out of 25 for which data are presented) where the same region was the most frequented among both domestic and international tourists:

- in Germany, France, Malta, Finland and Sweden this was the capital region – Berlin, Paris, the island of Malta, Helsinki-Uusimaa and Stockholms län;
- in Belgium, Bulgaria, Italy and Portugal this was a region other than the capital – Prov. West-Vlaanderen, Burgas, Venezia and Algarve.

In 10 of the 16 remaining EU Member States, the capital region was the most frequented among international tourists; this was the case in Czechia, Denmark, Estonia, Ireland, Latvia, Lithuania, Hungary, the Netherlands, Romania and Slovakia. In the other six Member States, the most frequented regions for international tourists were:

- the coastal regions of Kalymnos, Karpathos, Kasos, Kos, Rodos in Greece, Mallorca in Spain and Istarska županija in Croatia;

**Figure 10.1: Top tourist regions in the EU, 2021**  
(million nights spent in tourist accommodation, by NUTS 3 regions)



Note: the figure shows the EU regions with the highest numbers of nights spent by domestic tourists and by international tourists. Belgium: NUTS level 2. Several regions in Germany are not available (too many to document).

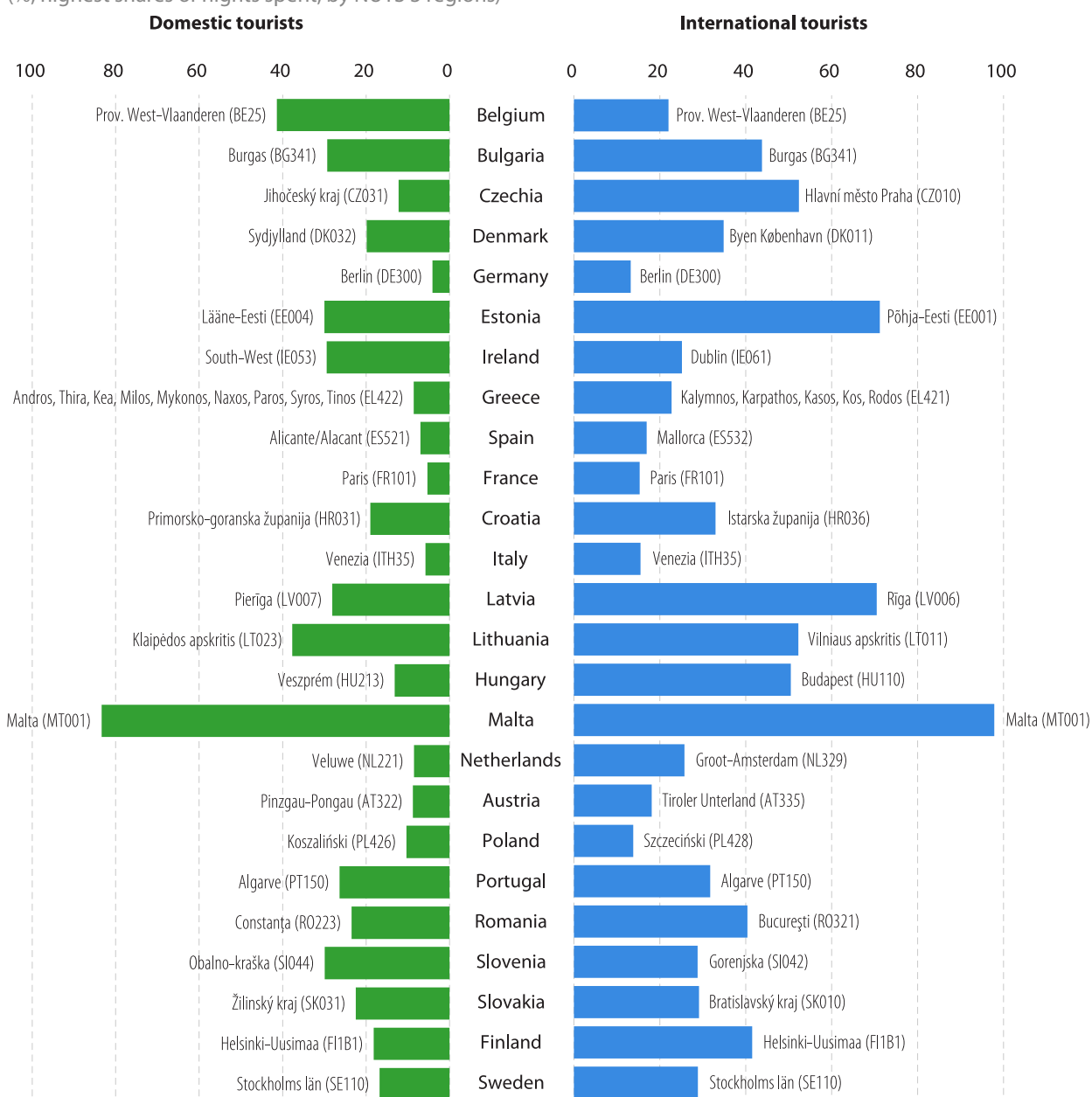
Source: Eurostat (online data code: [tour\\_occ\\_nin3](#))

- the mountainous regions of Tiroler Unterland in Austria and Gorenjska in Slovenia (which includes the popular tourist attraction of Lake Bled); and
- Szczeciński in north-west Poland (which is located close to the German border and on the Baltic coast).

Among the same 16 EU Member States, the most frequented regions for domestic tourists were often less well-known internationally. Leaving aside the four landlocked Member States for which data are available – Czechia, Hungary, Austria and Slovakia – the

most frequented regions for domestic tourists shared a common characteristic insofar as all but one was a coastal region: Syddjylland (Denmark); Lääne-Eesti (Estonia); South-West (Ireland); Andros, Thira, Kea, Milos, Mykonos, Naxos, Paros, Syros, Tinos (Greece); Alicante/Alacant (Spain); Primorsko-goranska županija (Croatia); Pierīga (Latvia); Klaipėdos apskritis (Lithuania); Koszaliński (Poland); Obalno-kraška (Slovenia); and Constanța (Romania). The only exception was Veluwe in the centre of the Netherlands (that contains a national park).

**Figure 10.2: Regional concentration of nights spent in tourist accommodation in each EU Member State, 2021** (% , highest shares of nights spent, by NUTS 3 regions)



Note: the figure shows the regions which recorded the highest shares in each EU Member State of the number of nights spent by tourists (separately for domestic and international tourists). Cyprus and Luxembourg: single regions at NUTS level 3. Several regions in Germany are not available (too many to document).

Source: Eurostat (online data code: [tour\\_occ\\_nin3](#))



***Impact of COVID-19: the number of nights spent in EU tourist accommodation by domestic tourists was 17.9 % lower in 2021 than it had been in 2019***

Note that the detail of the analyses in the final two maps of this section has been reduced, as regional statistics at NUTS level 2 (rather than NUTS level 3) are available for a longer time series.

Prior to the onset of the COVID-19 crisis in 2019, the highest number of nights spent in tourist accommodation by domestic tourists across NUTS level 2 regions was recorded in the French capital region of Ile-de-France (40.7 million). Rhône-Alpes and Provence-Alpes-Côte d'Azur (also in France), Andalucía (Spain) and Schleswig-Holstein (Germany) were the only other regions in the EU where domestic tourists spent more than 30.0 million nights. In 2021, the same five regions continued atop the ranking for the number of nights spent by domestic tourists. Provence-Alpes-Côte d'Azur (34.3 million) was the most frequented region, passing Ile-de-France that fell to second place (32.1 million), while domestic tourists spent at least 28.5 million nights in Rhône-Alpes, Andalucía and Schleswig-Holstein.

The total number of nights spent in EU tourist accommodation by domestic tourists was 17.9 % lower in 2021 than it had been in 2019. The regional distribution of this change was somewhat skewed insofar as there were 134 regions (equivalent to 56.8 % of all NUTS level 2 regions for which data are available) where the decline in the number of nights spent by domestic tourists between 2019 and 2021 was more substantial than the EU average. Some of the biggest reductions in nights spent by domestic tourists were observed in capital regions and urban regions, with tourists likely favouring more rural locations during the pandemic and lower levels of professional travel. The largest reduction was recorded in the Irish capital region of Eastern and Midland, with a fall of 72.0 %; it is shaded in yellow in Map 10.2. The number of nights spent by domestic tourists fell by close to half between 2019 and 2021 in the following:

- the capital regions of Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (Belgium), Berlin (Germany), Wien (Austria) and Bratislavský kraj (Slovakia);
- the German regions of Darmstadt, Düsseldorf and Stuttgart; and
- Notio Aigaio in Greece.

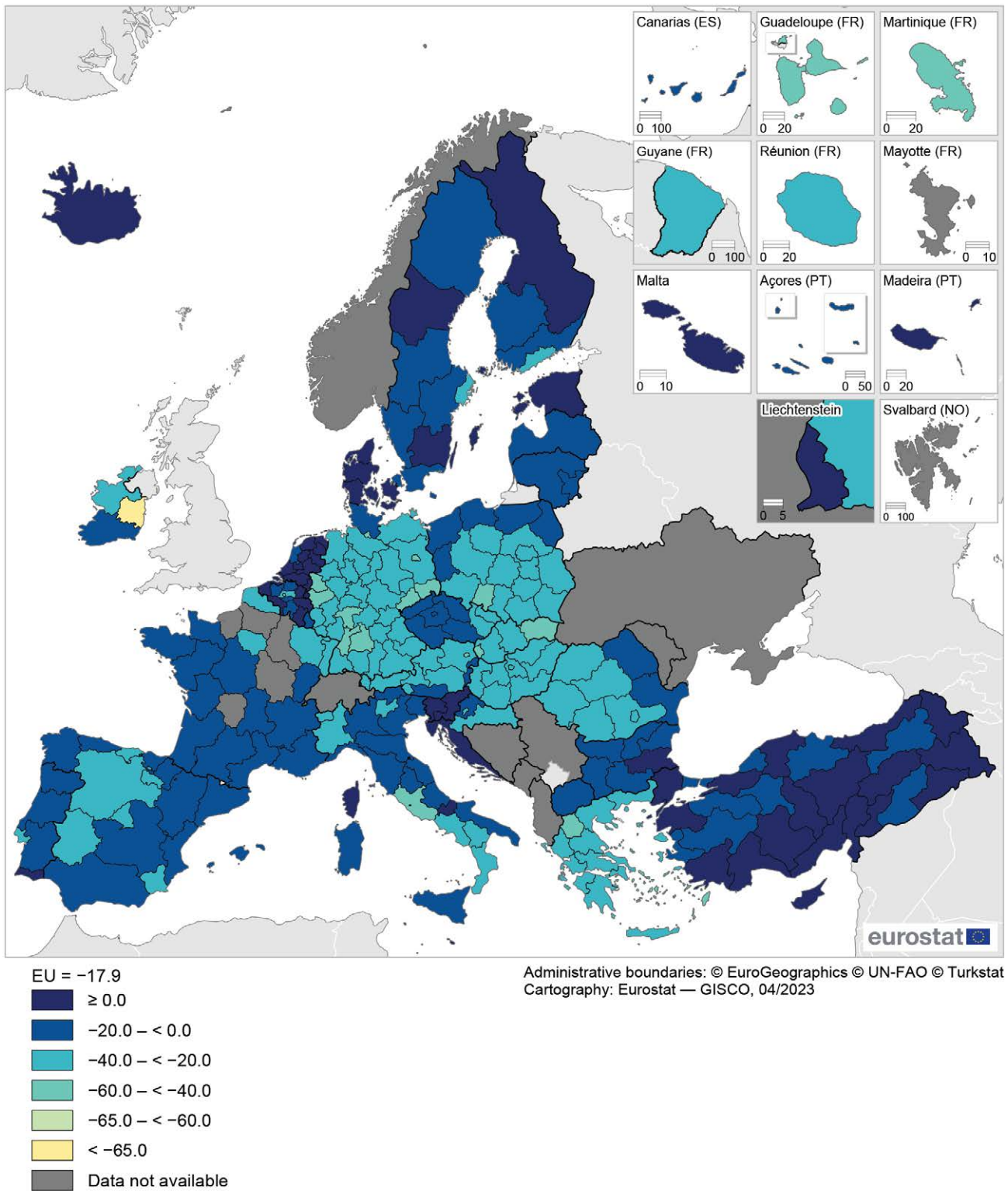
At the other end of the range, there were 34 NUTS level 2 regions across the EU where the number of nights spent by domestic tourists was higher in 2021 than it had been in 2019; Algarve (Portugal) was the only region in the EU to record almost the same number in both years (0.0 % rate of change). Together, these 35 regions are shown in the darkest shade of blue in Map 10.2. Looking in more detail, the biggest increases in nights spent by domestic tourists were observed in:

- the Slovenian capital region of Zahodna Slovenija (up 65.8 %);
- Zeeland in the Netherlands (up 56.9 %); and
- Cyprus (up 52.9 %).

***Impact of COVID-19: the number of nights spent in EU tourist accommodation by international tourists was 56.8 % lower in 2021 than it had been in 2019***

The total number of nights spent in EU tourist accommodation by international tourists was 56.8 % lower in 2021 than it had been in 2019 (compared with a fall of 17.9 % for the number of nights spent by domestic tourists). The downturn in international tourist activity could be linked to national governments introducing travel bans and/or quarantine restrictions that stopped or dissuaded many people from travelling to an international destination (particularly when using air transport that could be cancelled at short notice due to a change in rules/regulations). Furthermore, at least during the initial stages of the pandemic, national, regional or local governments often imposed restrictions on a range of activities to prevent the spread of the virus (for example, closing hotels completely, reducing access to bars and restaurants, or banning large groups of people).

**Map 10.2:** Change in nights spent in tourist accommodation by domestic tourists, 2021  
 (% , overall change compared with 2019, by NUTS 2 regions)



Source: Eurostat (online data code: tour\_occ\_nin2)

Prior to the onset of the pandemic, the highest number of nights spent in tourist accommodation by international tourists across NUTS level 2 regions was recorded in the Spanish island region of Canarias (83.9 million in 2019), while large numbers of international tourist nights – within the range of 48.2–80.6 million – were recorded in Jadranska Hrvatska (Croatia), Illes Balears, Cataluña (both Spain) and Veneto (Italy). In 2021, these five regions were also at the top of the ranking, although the impact of the pandemic on international tourist nights was much greater in the Spanish regions. Jadranska Hrvatska (61.0 million nights spent by international tourists) was the most frequented region, followed at some distance, by Canarias (32.1 million). In Jadranska Hrvatska, the number of nights spent by international tourists between 2019 and 2021 was 24.3 % lower than it had been in 2019. This was the smallest fall recorded for any NUTS level 2 region of the EU and could be contrasted with decreases of 61.7 % and 66.9 % in Canarias and Cataluña, respectively.

The asymmetric impact of the COVID-19 crisis is apparent when studying Maps 10.2 and 10.3; note that these two maps use a common scale to aid comparison. EU regions that traditionally attracted high numbers of international tourists were generally far more affected by the pandemic than regions principally frequented by domestic tourists:

- the overall number of nights spent in tourist accommodation by international tourists was lower in 2021 than in 2019 in all 236 NUTS level 2 regions for which data are available;
- there were 66 regions where the number of nights spent by international tourists was more than 65.0 % lower in 2021 than in 2019 (in contrast to a single region for domestic tourists);

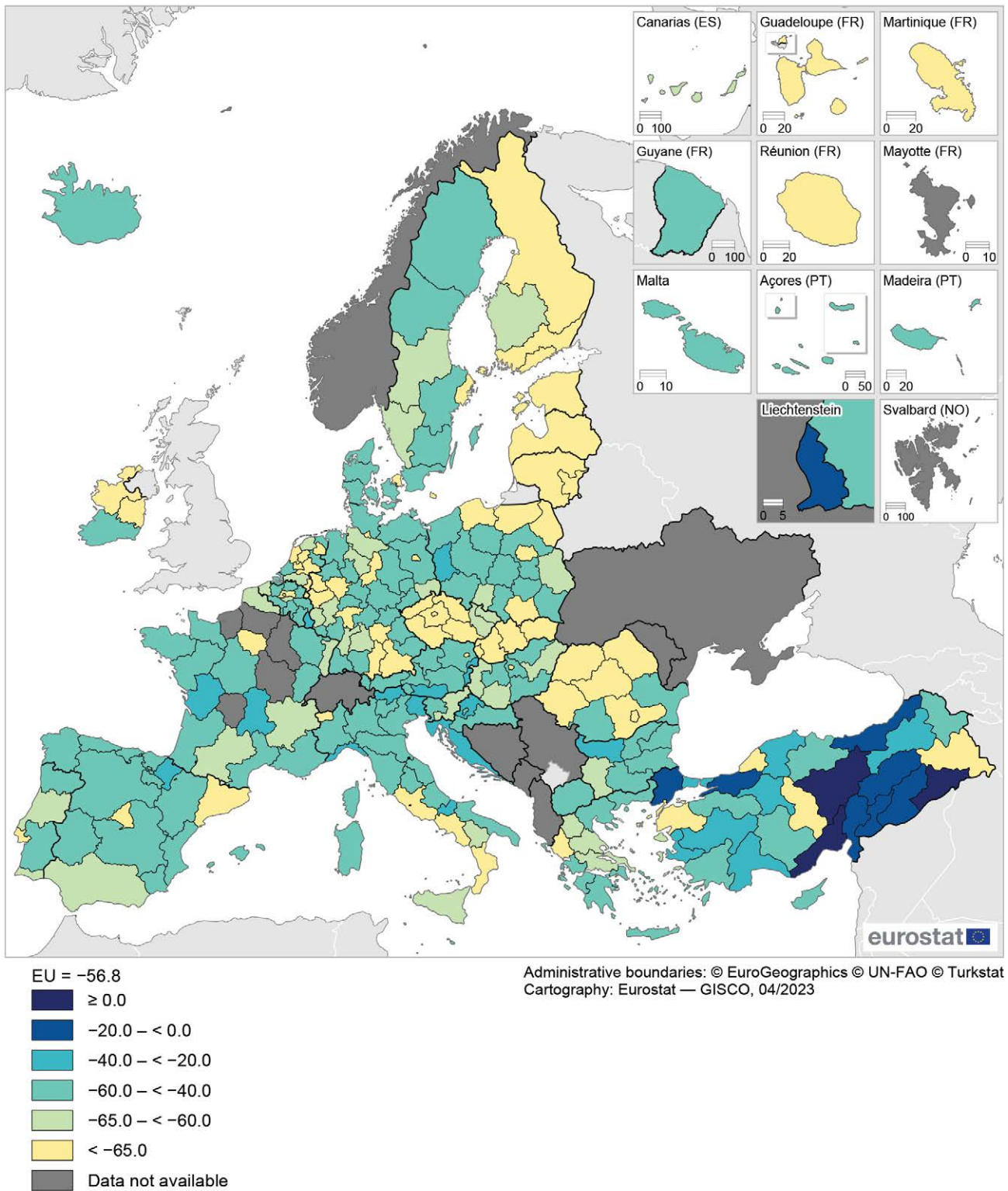
- only two regions reported a smaller decrease in the number of nights spent by international (rather than domestic) tourists between 2019 and 2021 – Notio Aigaio (Greece) and Chemnitz (Germany).

Map 10.3 shows that the regional distribution of the overall change in nights spent by international tourists between 2019 and 2021 was somewhat skewed insofar as there were 138 regions (equivalent to 58.5 % of all regions) where the decrease in total nights spent was more substantial than the EU average. Among these, the biggest falls – where the number of nights spent fell by more than 65.0 % (as shown by the lightest shade of yellow in Map 10.3) – were primarily concentrated in:

- capital regions – those of Belgium, Czechia, Denmark, Germany, Ireland, Spain, France, Italy, Lithuania, Hungary, the Netherlands, Austria, Poland, Portugal, Romania, Slovakia, Finland and Sweden;
- other urban regions (which may have been impacted, among others, by a downturn in business travellers);
- island regions (that are typically reached by air transport, which was significantly curtailed during the pandemic).

Looking in more detail, three of the five NUTS level 2 regions with the biggest decreases in their number of nights spent in tourist accommodation by international tourists between 2019 and 2021 were capital regions: Lazio (Italy; down 82.0 %), Praha (Czechia; down 79.1 %) and Bratislavský kraj (Slovakia; down 78.1 %). There were also very large contractions observed in Ciudad de Ceuta (Spain; down 87.1 %) and Etelä-Suomi (Finland; down 79.7 %) although both these regions received relatively few international tourists (even prior to the pandemic).

**Map 10.3: Change in nights spent in tourist accommodation by international tourists, 2021**  
 (% , overall change compared with 2019, by NUTS 2 regions)



Source: Eurostat (online data code: tour\_occ\_nin2)



## Seasonality

Seasonality can have a considerable impact on tourism: it is linked to a range of environmental factors such as climate or geographical location, as well as socioeconomic factors like public and school holidays or factories closing down for annual leave. During the COVID-19 pandemic, traditional patterns of seasonality were overlaid with the impact of peaks/troughs in infection rates and changes to travel and/or quarantine restrictions. As a result, many people had to reassess their holiday plans, choosing different types of accommodation, changing their preferred mode of transport, travelling at different periods of the year, and/or considering alternative destinations; some chose not to travel at all.

With COVID-19 infection rates generally lower in the summer (than the winter) months, the traditional dominance of July and August was amplified in 2020. There was a partial return to 'normality' in 2021, as seasonality patterns returned somewhat closer to those displayed pre-pandemic, albeit at a lower overall level.

There were 358 million and 431 million nights spent in EU tourist accommodation during the months of July and August 2021. As such, they were the two busiest months for tourism in the EU, together accounting for more than two fifths (43.1 %) of all nights spent in tourist accommodation during the course of 2021. Note that tourist arrivals are generally more evenly spread than the number of nights spent across the calendar year, due to a higher concentration of longer stays in the summer months. Domestic tourists were the main contributors to this summer peak, as they accounted for approximately two thirds of all nights spent in July and August 2021 (67.7 % and 66.6 % respectively); these shares were considerably higher than before the pandemic, when international tourists had accounted for approximately half of the total nights spent in the EU during the summer months.

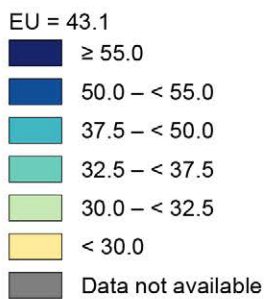
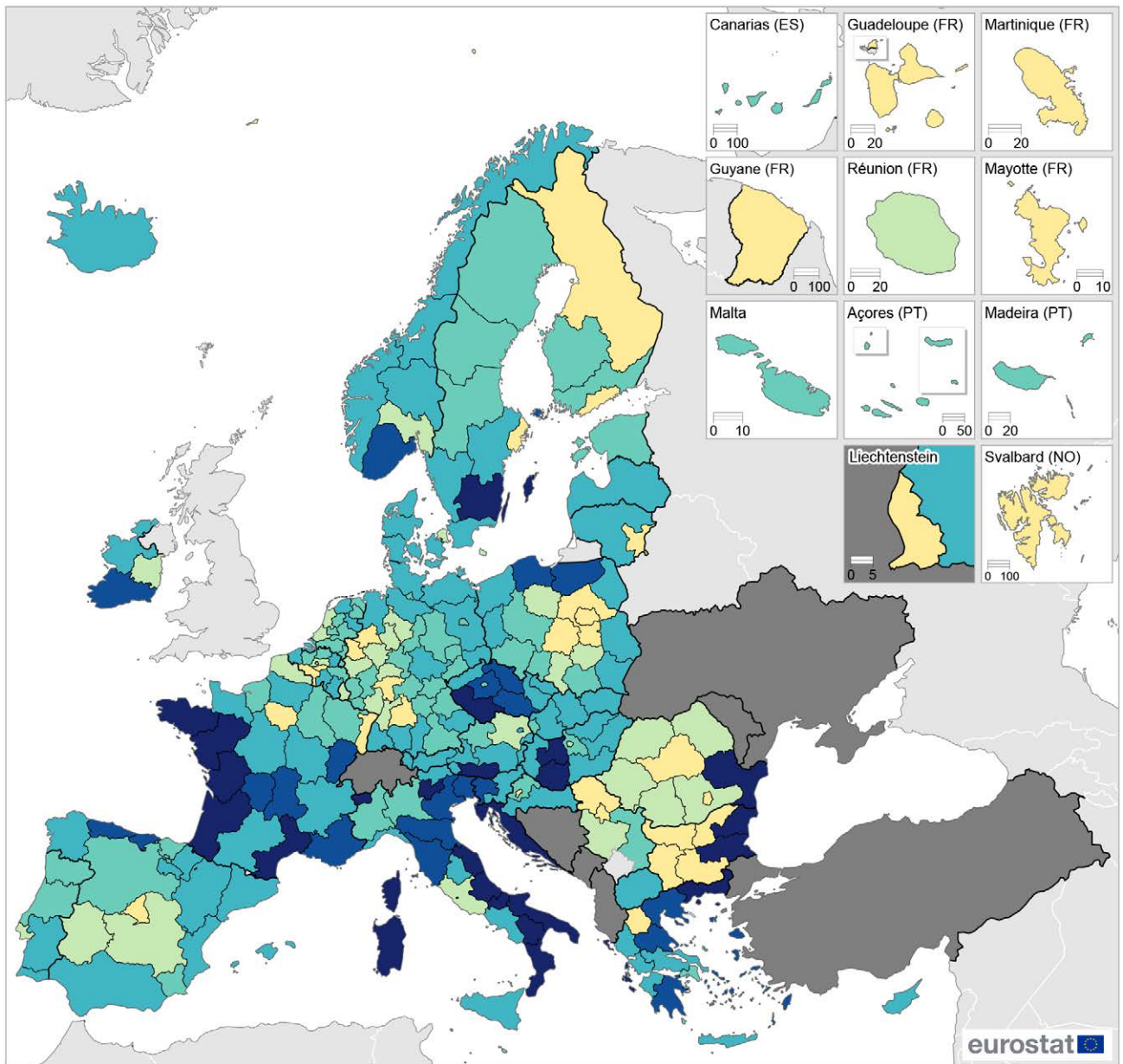
Map 10.4 shows for each NUTS level 2 region the share of the two busiest months in the total number of nights spent in tourist accommodation during 2021. In approximately three quarters of EU regions (185 out of the 242 for which data are available), July and August had the highest numbers of nights spent. In

those regions where July and August were not the two busiest months, it was generally the case that one or both were replaced by autumn or winter months (towards the end of the year). Note there were a considerable number of lockdowns in place at the start of 2021 and hence most traditional winter resorts did not receive very high numbers of tourists during the first few months of 2021. The exceptions – where July and August were not the two busiest months – were observed among capital regions or urban regions, which may receive a relatively high number of tourists for professional reasons and are popular destinations for short/weekend breaks. For example, October and November were the two busiest months in 2021 in the Belgian, French, Spanish and Hungarian capital city regions. It is also interesting to note that some popular coastal destinations also had peaks in seasonality towards the end of the year that could be linked, at least in part, to their favourable climates. This was the case, for example, in Canarias (Spain) where October and November were the two busiest months, or the French outermost regions of Guadeloupe, Martinique and La Réunion where December was one of the two busiest months.

There were 49 NUTS level 2 regions across the EU where the two busiest months of the year accounted for at least half of all nights spent in tourist accommodation during 2021. These regions with a high degree of seasonality are shown by the darkest two shades of blue in Map 10.4. Looking in more detail, there were five regions where the two busiest months of the year accounted for at least two thirds of the total nights spent. In all five cases, this high degree of seasonality could be linked to a dramatic increase in tourist activity during the summer months of July and August 2021, as seen in:

- the two main tourist regions of Bulgaria – Yugoiztochen and Severoiztochen – where July and August accounted for 70.9 % and 67.8 %, respectively, of the total nights spent in tourist accommodation during 2021;
- the most frequented tourist region in the EU (at NUTS level 2) – Jadranska Hrvatska (Croatia; 68.7 %);
- Sud-Est in Romania (68.5 %); and
- Calabria in southern Italy (66.6 %).

**Map 10.4:** Nights spent in tourist accommodation during the two busiest months of the year, 2021  
 (% of total number of nights spent during the year, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 05/2023

Source: Eurostat (online data code: tour\_occ\_nin2m)

The lowest levels of concentration in the two busiest months were generally observed either in capital/urban regions or in more rural, sparsely populated regions that had relatively low levels of tourism; in both cases, demand was more evenly spread over the year. In 2021, there were 31 NUTS level 2 regions where the two busiest months accounted for less than 30.0 % of the total nights spent in tourist accommodation (as shown by the lightest shade of yellow in Map 10.4). This group included:

- the capital regions of Bulgaria, Spain, France, Croatia, Lithuania, Poland, Romania, Finland and Sweden;
- several German regions with relatively large cities – Darmstadt, Stuttgart, Münster, Düsseldorf and Bremen;
- four out of the five outermost regions of France (while the fifth region, La Réunion, had a share of 30.0 %).

The lowest levels of seasonality during 2021 were observed in:

- the Spanish autonomous region of Ciudad de Melilla (which had a very low overall number of tourists), where August and September accounted for 22.6 % of the total number of nights spent in 2021;
- the French capital region of Ile-de-France, where October and November accounted for 24.4 % of all nights spent; and
- the Bulgarian capital region of Yugozapaden, where July and August accounted for 25.5 % of all nights spent.

## Tourism pressures

Sustainable tourism involves the preservation and enhancement of cultural and natural heritage, including the arts, gastronomy or biodiversity. The success of tourism is, in the long-term, closely linked to its sustainability, with the quality of destinations often influenced by their natural and cultural environment and/or integration into the local community. Since the advent of mass tourism in the 1950s and 1960s, EU regions have been affected by tourism in different ways: while some regions continue to receive very few visitors, others have seen their numbers of tourists grow considerably. Although some regions in the EU receive a steady flow of tourists year-round, most receive the vast majority of their visitors during a single season.

Tourism intensity, defined here as the number of nights spent in tourist accommodation per 1 000 inhabitants, is shown in Map 10.5. Note that the statistics presented are likely to underestimate the true extent of tourism pressures, given the numerator for the ratio does not include same-day visitors or tourists staying in non-rented accommodation (such as second homes, or stays with friends/relatives). Across the whole of the EU, there were 4 096 nights spent in tourist accommodation per 1 000 inhabitants in 2021. The regional distribution of tourism pressures was heavily skewed, highlighting that mass tourism tends to be concentrated in relatively few regions and those outside of capital cities and other major urban areas, often have a relatively small resident population. Indeed, the ratio of tourist nights spent per 1 000 inhabitants was higher than the EU average in less than 3 out of every 10 NUTS level 3 regions (339 out of 1 116 for which data are available). Map 10.5 shows where tourism pressures were concentrated in 2021: there were 117 regions where at least 11 200 nights were spent in tourist accommodation per 1 000 inhabitants (as shown by the darkest shade of blue). These regions could be divided into two groups:

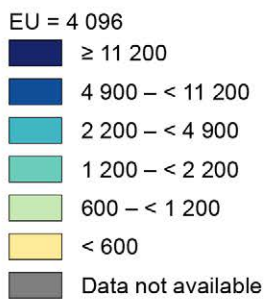
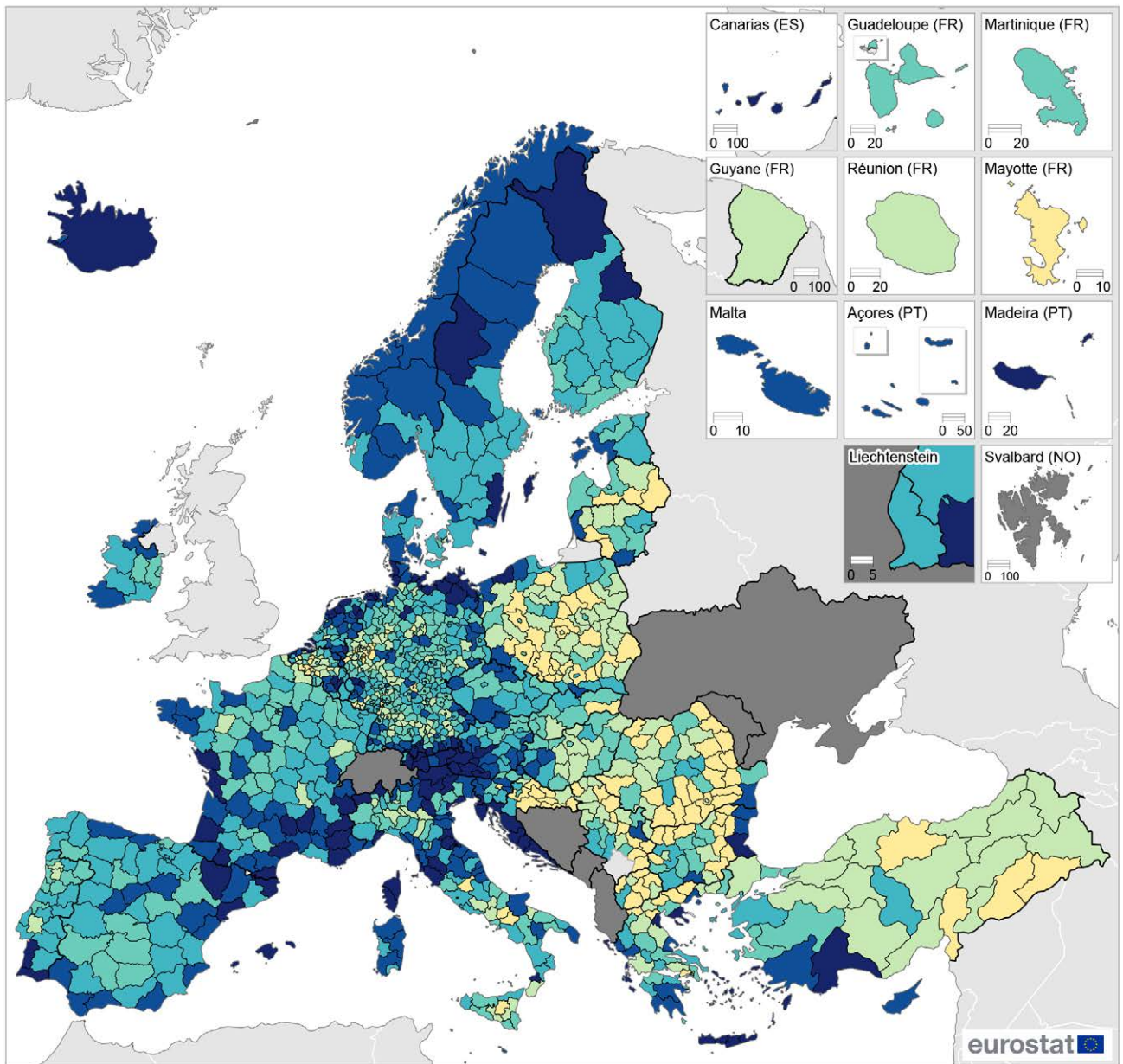
- regions characterised by mass tourism, that are relatively well equipped to receive large numbers of tourists in heavily frequented resorts at the same time of year;
- other destinations that were relatively sparsely populated, where even quite small numbers of tourists might place a considerable strain on the local infrastructure.

Looking in more detail, there were eight NUTS level 3 regions where the number of nights spent in tourist accommodation per 1 000 inhabitants was greater than 50 000 in 2021:

- the Adriatic regions of Istarska županija and Ličko-senjska županija (in Croatia) – the former had the highest ratio of tourism intensity across the EU, at 103 137 nights spent per 1 000 inhabitants;
- the Greek island regions of Zakynthos and Kalymnos, Karpathos, Kasos, Kos, Rodos.
- the Spanish island region of Fuerteventura (that is part of Canarias);
- the western Austrian region of Außerfern;
- the Belgian coastal region of Arr. Veurne; and
- the northernmost German region of Nordfriesland (also a coastal region).



**Map 10.5:** Nights spent in tourist accommodation relative to resident population, 2021  
(per 1 000 inhabitants, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Note: Türkiye, NUTS level 2.

Source: Eurostat (online data code: tour\_occ\_nin3)



## Guest nights spent at short-stay accommodation offered via online collaborative economy platforms

Developments in information and communication technologies have had a major impact on the tourist accommodation market. The emergence of online platforms has made it easier for small-scale service providers to advertise/offer their rooms, apartments and holiday homes to potential guests, with a rapid expansion of this market.

As with other areas of the tourism sector, the COVID-19 crisis had a considerable impact on the number of guest nights spent at short-stay accommodation reserved through online booking platforms. Prior to the pandemic in 2019, some 511.9 million guest nights were spent at short-stay accommodation across the EU. This number fell dramatically to 271.2 million in 2020 (down 46.9 %), before recovering somewhat during 2021, when 363.9 million guest nights were spent at short-stay accommodation reserved through online booking platforms. As such, the number of guest nights spent at short-stay accommodation in the EU remained 28.9 % lower in 2021 than it had been pre-pandemic. However, a more detailed analysis reveals an interesting contrast insofar as the number of nights spent by domestic guests rose 19.9 % between 2019 and 2021, whereas the number of nights spent by international guests fell 53.1 %. Across the 1 166 NUTS level 3 regions for which data are

available, there were 821 regions that recorded an increase in the number of nights spent by domestic guests between 2019 and 2021. By contrast, there were only 95 regions where the number of nights spent by international guests rose during the period under consideration. Those regions that did report an increase in their number of nights spent by international guests were usually rural regions; they were generally characterised by a relatively low initial number of international guests (in 2019).

***The Mediterranean coastal region of Alicante/Alacant (Spain) was the most frequented region in terms of nights spent by domestic guests in short-stay accommodation offered via selected online booking platforms***

At the time of writing (April 2023), the latest annual data for short-stay accommodation reserved through online booking platforms concern 2021. Across NUTS level 3 regions, the most frequented tourist regions for domestic guests – in absolute terms – were coastal regions in two of the largest EU Member States:

- the Spanish regions of Alicante/Alacant (that had the highest count, at 3.7 million guest nights) and Málaga; and
- the southern French regions of Var, Bouches-du-Rhône and Alpes-Maritimes.

The most frequented tourist region for domestic guests that was not coastal was the French region of Haute-Savoie in the Alps.

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## Experimental statistics on short-stay accommodation offered via online platforms

The information presented so far in this chapter has been based on official tourism statistics, compiled according to [Regulation \(EU\) No 692/2011](#). Those statistics provide only limited coverage of holiday and short-stay accommodation, as data for holiday homes, apartments and rooms in otherwise private buildings are often outside the scope of tourism registers and surveys. Official statistics on holiday and short-stay accommodation are generally underestimated, given that several EU Member States limit the scope of observations to establishments with, for example, at least 10 bed places. In recent years, this coverage issue has been further compounded by the emergence of online platforms that provide relatively simple methods for private individuals and small enterprises to offer short-stay accommodation; this has led to a surge in the provision of this type of accommodation.

For this reason, Eurostat embarked on an experimental data collection exercise aimed at improving the completeness of tourism statistics. It is based on a previously unexplored channel, namely data on listings/bookings obtained directly from four major online platforms (Airbnb, Booking.com, Tripadvisor and Expedia Group). The exercise was restricted to the collection of information on holiday and short-stay accommodation (NACE Group 55.2), reflecting the principal type of accommodation for service providers within the collaborative economy.

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**The Adriatic region of Splitsko-dalmatinska županija (Croatia) was the most frequented region in terms of nights spent by international guests in short-stay accommodation offered via selected online booking platforms**

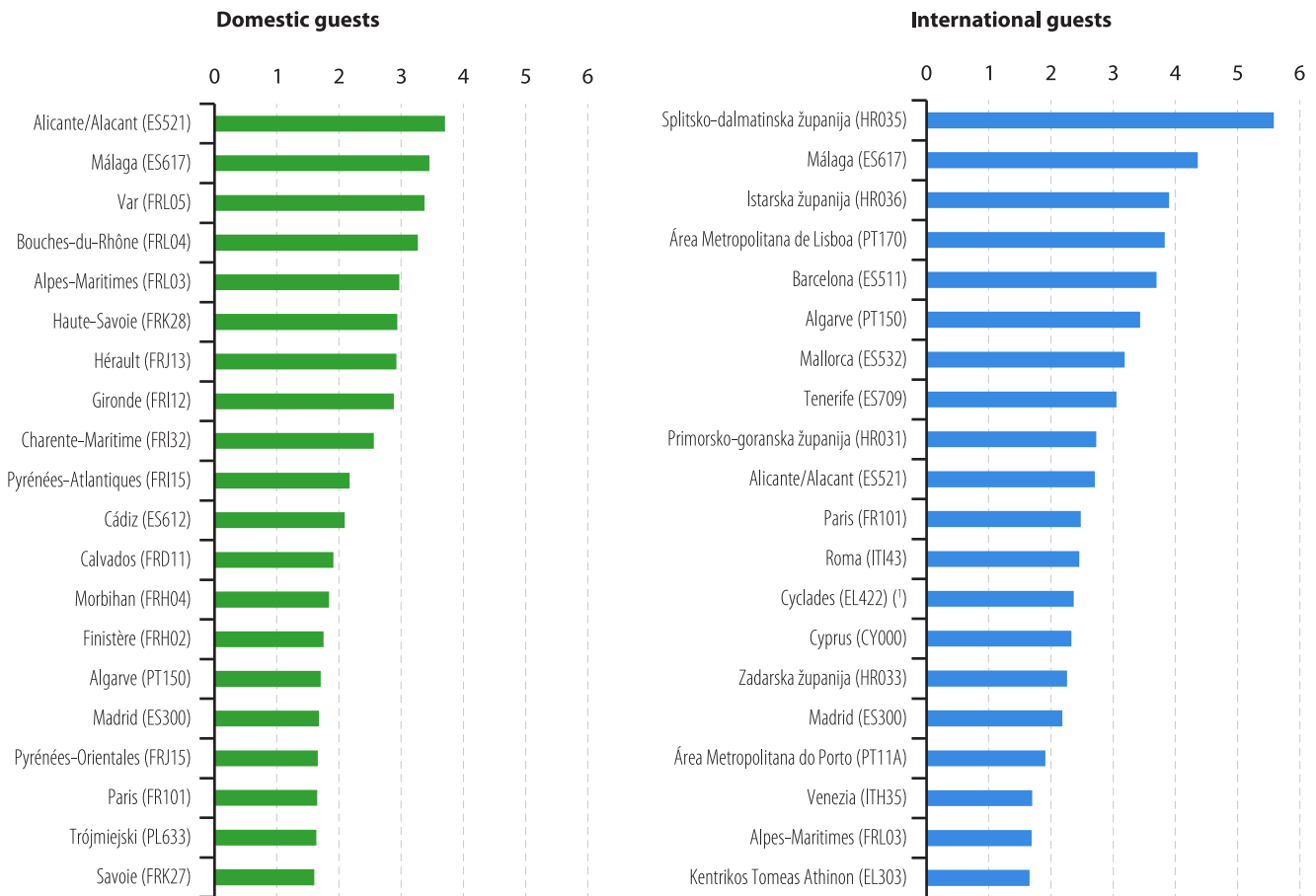
- four of these were located in Spain – Málaga, Barcelona, Mallorca and Tenerife;
- two in Portugal – Área Metropolitana de Lisboa and Algarve;
- with one (additional) region in Croatia – Istarska županija.

Figure 10.3 also shows those NUTS level 3 regions that recorded the highest number of nights spent by international guests at short-stay accommodation offered via online booking platforms. In 2021, the highest count was recorded in the southern Croatian coastal region of Splitsko-dalmatinska županija (5.6 million nights). There were seven other regions across the EU where upwards of 3.0 million nights were spent by international guests:

Comparing the two lists – the 20 most frequented regions for domestic and for international guests – there were six regions that featured in both rankings:

- the Spanish regions of Málaga, Alicante/Alacant and Madrid;
- the Portuguese region of Algarve;
- the French regions of Alpes-Maritimes and Paris.

**Figure 10.3: Top tourist regions in the EU for short-stay accommodation offered via selected online booking platforms, 2021**  
(million guest nights, by NUTS 3 regions)



Note: the figure shows the EU regions with highest numbers of nights spent by domestic guests and by international guests.

(\*) Andros, Thira, Kea, Milos, Mykonos, Naxos, Paros, Syros, Tinos.

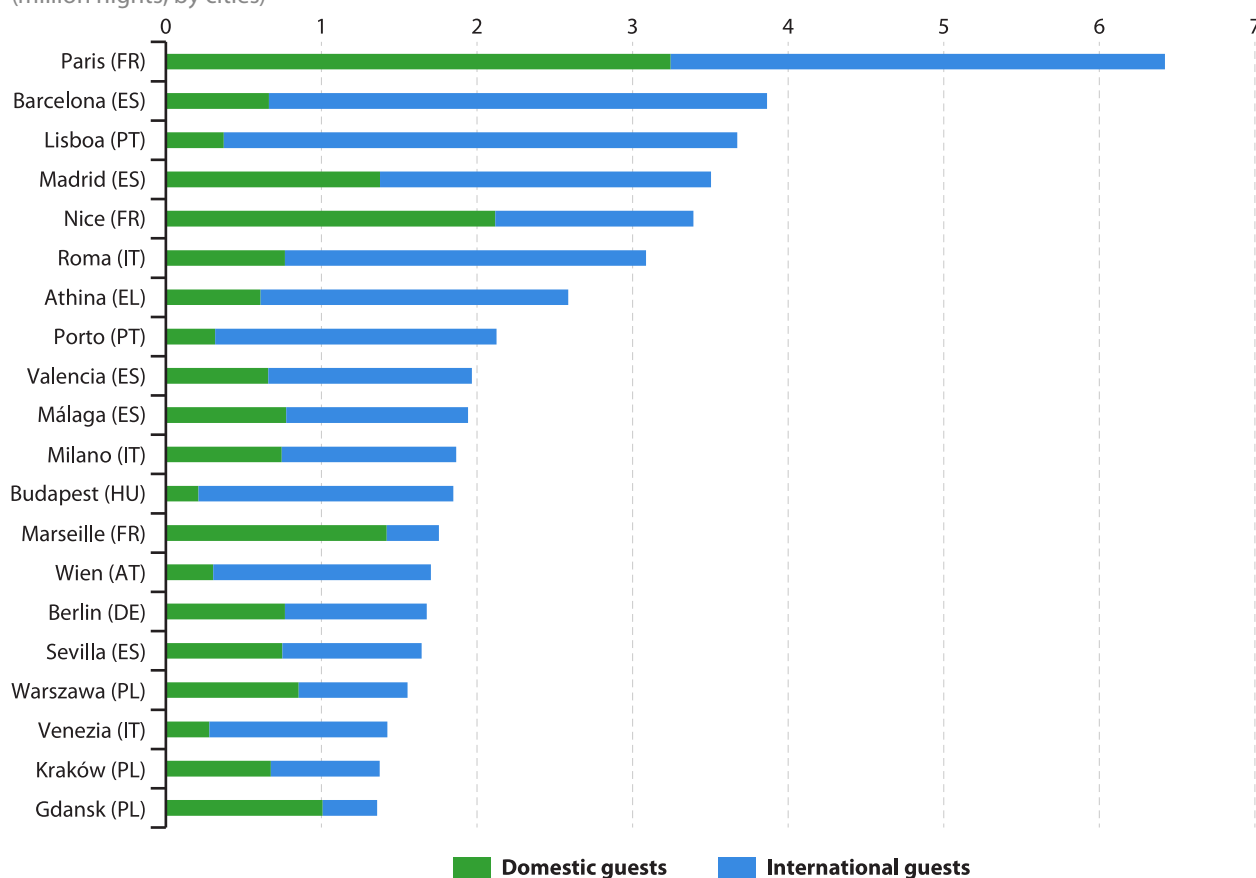
Source: Eurostat (online data code: tour\_ce\_oan3)

The analysis presented in Figure 10.4 focuses on *cities*. It shows those EU cities with the highest number of guest nights spent at short-stay accommodation offered via selected online booking platforms in 2021 (with a split between domestic and international guests).

Figure 10.4 shows the 20 most frequented cities in the EU as measured by the number of guest nights spent at short-stay accommodation offered via selected online booking platforms in 2021. The impact of the COVID-19 crisis was particularly hard on city destinations, likely reflecting a downturn in business as well as personal travel. Among these 20 most frequented cities, a majority reported that their overall number of guest nights was at least 50 % lower in 2021 than it had been in 2019. The largest decreases were recorded in Budapest (Hungary; down 72.9 %), Roma (Italy; down 69.5 %), Wien (Austria; down 66.3 %), Barcelona (Spain; down 65.0 %) and Lisboa (Portugal; down 64.1 %). Marseille (France) was the only city – among the top 20 in 2021 – to report a higher number of guest nights spent at short-stay accommodation offered via selected online booking platforms in 2021 than in 2019 (up 0.9 %).

In 2021, Paris was the most frequented city in the EU in terms of guest nights spent at short-stay accommodation offered via selected online booking platforms (a total of 6.4 million nights). This was considerably higher than in Barcelona (3.9 million), while Lisboa, Madrid, Nice and Roma also reported more than 3.0 million guest nights. Figure 10.4 also provides information as to the origin of guests staying at short-stay accommodation offered via selected online booking platforms. The relative importance of domestic and international guests to each city varied considerably. For example, while more than four out of every five nights spent in Marseille could be attributed to domestic guests, almost 9 out of every 10 nights spent in Lisboa could be attributed to international guests. In 2021, domestic guests accounted for more than half of all nights spent at short-stay accommodation offered via selected online booking platforms in Marseille, Gdansk, Nice, Warszawa and Paris. International guests accounted for more than three quarters of all nights spent in Lisboa, Budapest, Porto, Barcelona, Wien, Venezia, Athina and Roma.

**Figure 10.4: Guest nights spent at short-stay accommodation offered via selected online booking platforms, 2021** (million nights, by cities)



Note: the figure shows the EU cities with the highest total number of guest nights spent at short-stay accommodation offered via selected online booking platforms. Several cities in France are not available (too many to document).

Source: Eurostat (online data code: [tour\\_ce\\_oarc](#))

The final analysis in this section based on data from online booking platforms concerns a timelier dataset. At the time of writing (April 2023), information for the first three quarters (January to September) of 2022 is available at NUTS level 2, which allows for a more profound analysis of the recovery from the COVID-19 crisis.

During the first three quarters of 2022 (which include the peak months of July and August), the number of guest nights spent at EU short-stay accommodation offered via selected online booking platforms was 450.4 million. This was 6.3 % higher than the value recorded during the first three quarters of 2019 (423.7 million), suggesting that the online bookings market had recovered from the impact of the pandemic.

The Adriatic coastal region of Jadranska Hrvatska (Croatia) recorded, by far, the highest number (25.7 million) of guest nights spent at short-stay accommodation offered via selected online booking platforms during the first three quarters of 2022. Note that most regions have their guest nights concentrated in the summer months (and hence their peak season is included in the data presented here). However, tourist demand in some regions may be spread more evenly across the year and so the final quarter (for which data are not yet available) may account for a greater share of the annual total. The Spanish region of Andalucía had the second highest number of guest nights (20.4 million), followed by Provence-Alpes-Côte d'Azur (France; 18.9 million), and two more Spanish regions – Cataluña (14.8 million) and Comunitat Valenciana (13.2 million). Together these five regions accounted for more than one fifth of the total number of guest nights spent at EU short-stay accommodation during the first three quarters of 2022.

The number of guest nights spent at short-stay accommodation offered via selected online booking platforms during the first three quarters of 2022

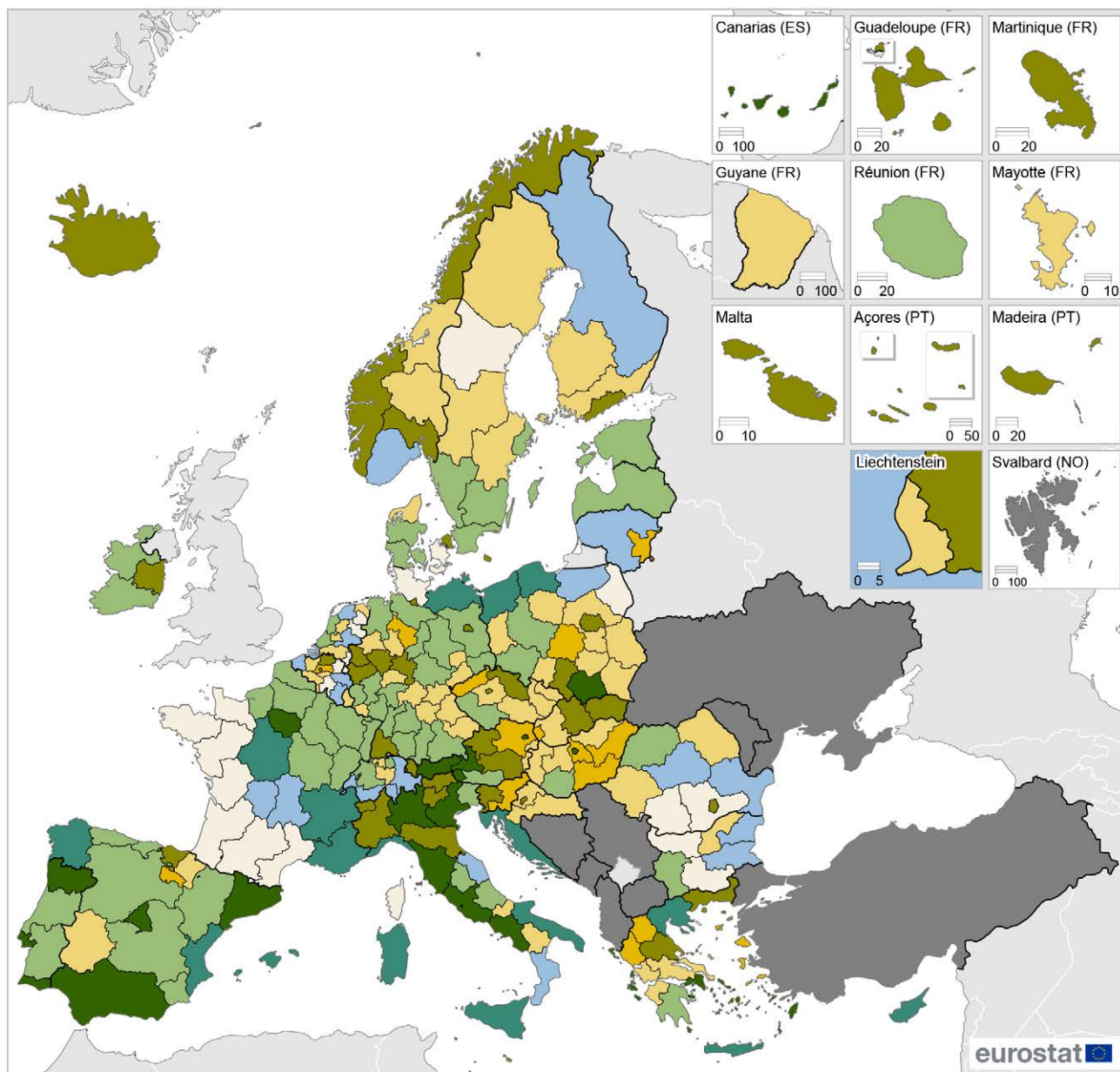
increased in the vast majority of NUTS level 2 regions when compared with the equivalent period in 2021. The number of guest nights increased in 239 out of 242 regions for which data are available. Two of the three exceptions were located in the Netherlands, with no change in the number of guest nights recorded in Friesland and a modest fall in Drenthe. The only other region in the EU to record a fall (also modest) in its number of guest nights was Sud-Est (Romania). At the other end of the range, there were 26 regions where the number of guest nights spent at short-stay accommodation offered via selected online booking platforms at least doubled between the first three quarters of 2021 and 2022. This group included the capital regions of Belgium, Czechia, Ireland, Spain, France, Italy, Hungary, Austria, Poland, Portugal, Slovenia and Slovakia. Among these, there were two regions – Budapest (Hungary) and Praha (Czechia) – where the number of guest nights more than trebled during the period under consideration.

Map 10.6 can be used to identify those regions with: i) at least 2.5 million guest nights spent at short-stay accommodation offered via selected online booking platforms during the first three quarters of 2022; and ii) at least 66.6 % growth in the number of guest nights between the first three quarters of 2021 and 2022. There were 21 NUTS level 2 regions that met both of these criteria, and they are shown using the darkest shade of green. This group of 21 regions was composed principally of regions located in traditional holiday destinations across southern EU Member States – in Greece, Spain, Italy and Portugal. However, it also included:

- three regions in Austria – Wien, Salzburg and Tirol;
- the French and Hungarian capital regions of Ile-de-France and Budapest;
- Małopolskie in Poland (whose provincial capital is Kraków).

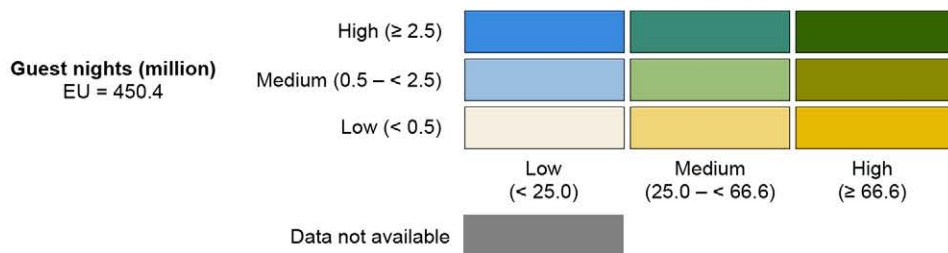


**Map 10.6:** Guest nights spent at short-stay accommodation offered via selected online booking platforms, first to third quarters 2022 (by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 08/2023

**Change in guest nights spent (% , compared with first to third quarters 2021)**  
 EU = 57.4 %



Source: Eurostat (online data code: tour\_ce\_omn12)





# Environment and natural resources





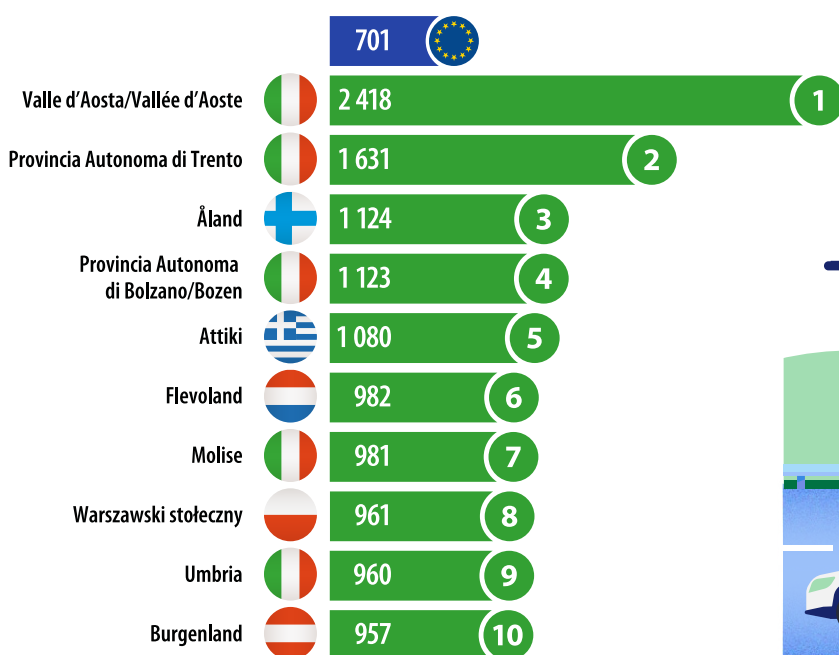
## 11. Transport

European Union (EU) transport policy aims to promote environmentally friendly, safe and efficient travel, by means of integrated networks using all modes of transport (land, water and air). Mobility is an enabler of economic and social life: for example, functioning global supply chains and logistical services, travel to a place of work or study, visiting family and friends, or spending time away from home for business, leisure or other purposes. The free movement of people and goods across its internal borders is one of the fundamental freedoms of the EU and its [single market](#).

In spring 2020, during the early months of the COVID-19 pandemic, virtually all EU Member States implemented containment measures and restrictions on non-essential travel internally and/or internationally. Some partially or completely closed borders. Where international travel continued, it was in some cases accompanied by a requirement to go into quarantine. These travel-related restrictions had an immediate and substantial impact on nearly all modes of passenger transport. As the pandemic continued into 2021, waves of travel restrictions were imposed and lifted. The number of international travellers remained low, as did the number of people making use of public transport as some people avoided travel or used private transport instead.

The infographic below provides information on EU regions with the highest motorisation rates. There were five regions where this rate was higher than 1 000 vehicles per inhabitant in 2021: three of these were located in northern Italy – Valle d'Aosta/Vallée d'Aoste, Provincia Autonoma di Trento, and Provincia Autonoma di Bolzano/Bozen – the other two were the Finnish archipelago of Åland and the Greek capital region of Attiki.

This chapter focuses on regional statistics for road transport, rail, air and maritime traffic. The latest available data relate to the 2021 reference period; as such, they cover a period characterised by a partial recovery from the impact of the COVID-19 crisis. The first section presents information concerning road transport, more specifically for the motorisation rate, [road freight transport](#), as well as the incidence of [road fatalities](#) and road crashes. The second section provides statistics on passenger and freight train movements on trans-European rail networks. The third focuses on air traffic: it presents the number of air passengers carried at a regional level. The final section looks at maritime traffic, detailing the busiest [ports](#) in the EU in terms of freight handled.



Which EU regions had the highest motorisation rates?



(number of vehicles per 1 000 inhabitants, 2021, by NUTS 2 regions)

Note: includes all motor vehicles and motorcycles. France: NUTS level 1. Portugal: national data. Denmark and Italy: 2020. Greece: 2019. France: excluding motorcycles. Portugal: excluding motorcycles and special vehicles. EU estimate made for the purpose of this publication (based on available data).

Source: Eurostat (online data codes: tran\_r\_vehst and demo\_r\_d2jan)



The selection of information presented for regional transport statistics within the *Eurostat regional yearbook* changes on an annual basis (covering different modes of transport and focusing on passenger/freight indicators). Previous editions of the publication can be found by following this link: <https://ec.europa.eu/eurostat/web/regions/publications>.

## Road transport and accidents

Roads are by far the most common transport mode in the EU for passenger and inland freight transport. Policy objectives for road transport include, among other issues: ensuring mobility on an ever more congested road network; reducing road fatalities; lowering air pollution (emissions of carbon dioxide and other pollutants) and the carbon footprint to which road transport contributes; decreasing the reliance on fossil fuel use and promoting the use of electric vehicles; as well as reviewing the working conditions of professional drivers.

### MOTORISATION RATE

In 2021, there were 313 million motor vehicles registered in the EU; these vehicles include passenger cars – which accounted for approximately four out of every five motor vehicles – as well as lorries, road tractors, motorcycles, motor coaches, buses, trolley buses and special vehicles. In absolute terms, the highest count of motor vehicles across NUTS level 2 regions of the EU was in the northern Italian region of Lombardia (8.1 million vehicles; 2020 data). The next highest regional figures were observed in the southern Spanish region of Andalucía (6.0 million) and the French capital region of Ile-de-France (5.9 million; excluding motorcycles).

The EU's motorisation rate — the average number of motor vehicles per inhabitant — stood at 701 per 1 000 inhabitants (see Map 11.1). Note that the statistics presented for France relate to NUTS level 1 regions and that only national data are available for Portugal. The use of motor vehicles generally and passenger cars in particular is often relatively low in regions characterised by efficient and extensive public transport systems with frequent services. In these regions, people may be less inclined to own a vehicle (or multiple vehicles within one household), especially if the regions where they live/work suffer from congestion and/or difficulties to find a place to park. This pattern was particularly apparent in capital and urban regions of western and Nordic Member States. By contrast, in several eastern and southern EU Member States it was more common to find the highest motorisation rates recorded in capital regions. Motorisation rates were also relatively high in several regions that receive a large number of tourists (likely reflecting their rental fleets).

Berlin – the capital region of Germany – had one of the lowest motorisation rates in the EU, at 400 motor vehicles per 1 000 inhabitants in 2021. Vehicle ownership in Berlin was considerably lower than in any other part of Germany, with the next lowest motorisation rates being recorded in Bremen and Hamburg (506 and 507 motor vehicles per 1 000 inhabitants, respectively). Other capital regions to report relatively low motorisation rates — less than 500 motor vehicles per 1 000 inhabitants — were those of Austria, France (NUTS level 1), Sweden and Hungary; Latvia (a single region at this level of detail) also had a similarly low rate.

Higher motorisation rates are often found in suburban, rural and peripheral regions, possibly reflecting a lack of alternative modes of inland passenger transport. The highest motorisation rates in the EU — at least 900 motor vehicles per 1 000 inhabitants in 2021 — are shown by the darkest shade of blue in Map 11.1. The 23 regions in this group were principally concentrated in Italy (nine regions), Poland (five regions) and Finland (four regions). It also included two regions from Austria – Burgenland and Niederösterreich – as well as Attiki and Praha, the capital regions of Greece and Czechia, and Flevoland in the Netherlands, which is located within commuting distance of the Dutch capital.

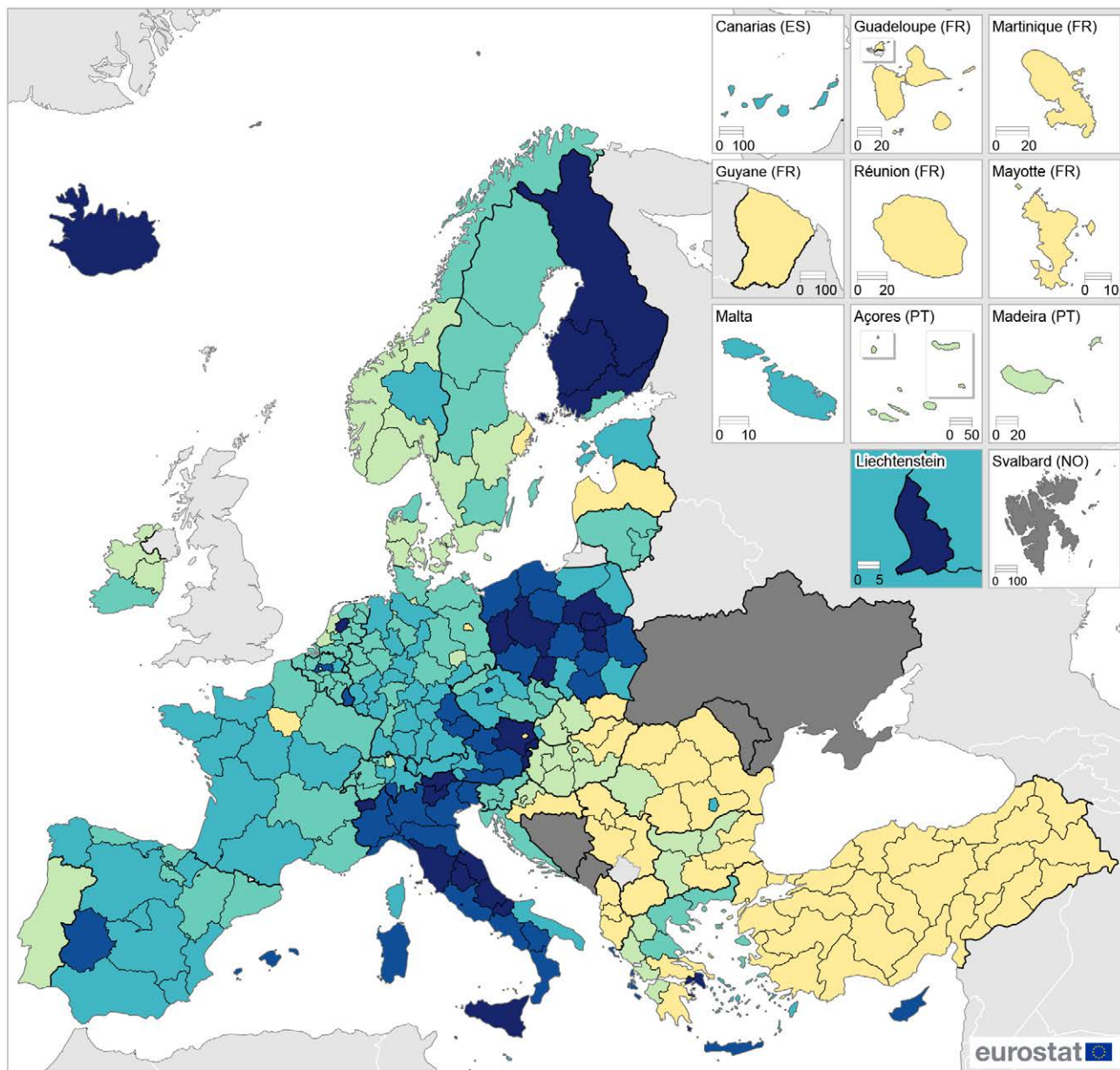
#### ***The motorisation rate in Valle d'Aosta/Vallee d'Aoste (Italy) was 6.7 times as high as that recorded in Nord-Est (Romania)***

Some of the highest motorisation rates across NUTS level 2 regions were recorded in northern Italy (2020 data): Valle d'Aosta/Vallée d'Aoste (2 418 motor vehicles per 1 000 inhabitants), Provincia Autonoma di Trento (1 631) and Provincia Autonoma di Bolzano/Bozen (1 123). Note that these statistics may reflect specific circumstances: for example, the high rate in Valle d'Aosta/Vallee d'Aoste is, at least in part, attributed to lower taxation on new vehicle registrations. There were also relatively high rates reported in the Finnish archipelago of Åland (1 124; 2021 data) and the Greek capital region of Attiki (1 080; 2019 data). This group of five were the only regions within the EU to report an average of more than one motor vehicle per inhabitant.

The lowest motorisation rate was recorded in the Romanian region of Nord-Est (362 motor vehicles per 1 000 inhabitants in 2021). Together with Berlin, it was the only other region in the EU to report no more than 400 motor vehicles per 1 000 inhabitants. There were 20 other regions with motorisation rates that were below 500 motor vehicles per 1 000 inhabitants (as shown by the yellow shade in Map 11.1); a majority were located in eastern EU Member States, with a particularly high concentration in Romania (six out of eight regions).



**Map 11.1: Motorisation rate, 2021**  
(number of vehicles per 1 000 inhabitants, by NUTS 2 regions)



- EU = 701
- ≥ 900
- 800 – < 900
- 700 – < 800
- 600 – < 700
- 500 – < 600
- < 500
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: includes all motor vehicles and motorcycles. France: NUTS level 1. Portugal: national data. Denmark, Italy, Albania and Türkiye: 2020. Greece: 2019. France, Albania and Serbia: excluding motorcycles. Portugal: excluding motorcycles and special vehicles. Iceland: excluding road tractors and special vehicles. Switzerland and North Macedonia: excluding special vehicles. EU estimate made for the purpose of this publication (based on available data).

Source: Eurostat (online data codes: [tran\\_r\\_vehst](#) and [demo\\_r\\_d2jan](#))



## ROAD FREIGHT TRANSPORT

The road freight transport sector plays an essential role in transport markets and is an important component of modern economic systems, providing services that connect producers, traders and consumers. This became particularly apparent with the onset of the COVID-19 crisis, as there was a shortage of supply for some goods, while an increasing proportion of consumers shopped online and received deliveries at home.

In 2021, the total weight of goods transported by road by vehicles registered in the EU was 13.5 billion tonnes, equivalent to 30 tonnes per inhabitant. There was only a relatively modest contraction in the weight of goods transported by road during the COVID-19 crisis compared with the impact of the pandemic on other transport activities. Road freight decreased 3.9 % in 2020 before rebounding with growth of 5.0 % in 2021. This may, at least in part, be explained by the [European Commission](#) and EU Member States taking rapid actions to mitigate the impact of the crisis (for example, recognising transport employees as key workers and introducing schemes such as [upgrading the transport Green Lanes to keep the economy going during the COVID-19 pandemic resurgence](#) (COM(2020) 685 final)).

Across NUTS level 2 regions, the weight of goods transported by road peaked in 2021 in two Spanish regions: Cataluña and Andalucía (242.3 million and 241.9 million tonnes of goods unloaded, respectively). There were two other regions within the EU where the weight of goods unloaded was higher than 200.0 million tonnes: Lombardia in northern Italy (237.5 million tonnes) and Comunitat Valenciana (also in Spain; 224.8 million tonnes). Regional statistics for road freight transport and in particular, absolute values (such as those just presented), should be interpreted with care as the data may reflect, to some extent, the size of each region (either in terms of its area or population), with larger and less densely populated regions often transporting more freight per inhabitant. In a similar vein, those regions that are characterised by transporting bulk products that tend to weigh a lot (such as raw materials) are also likely to report higher values.

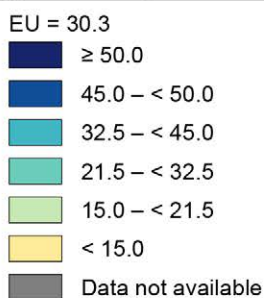
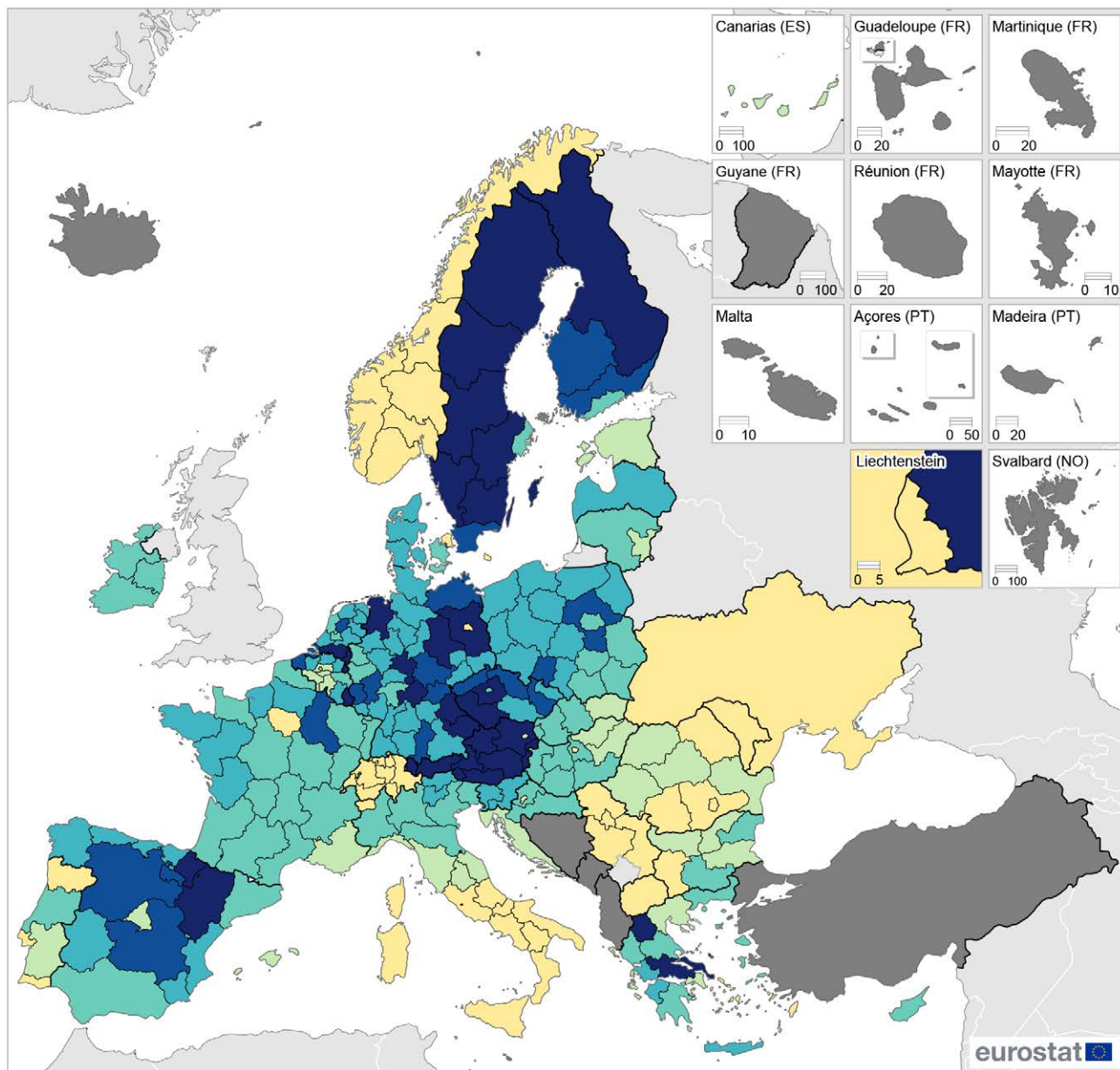
To better compare the transport performance of EU regions, information on road freight transport can

be adjusted, dividing the weight of goods unloaded in each region by its number of inhabitants. In 2021, there were 31 NUTS level 2 regions where at least 50.0 tonnes of road freight was unloaded per inhabitant (as shown by the darkest shade of blue in Map 11.2). A majority of these regions were concentrated in Austria (eight out of nine regions; the only exception being the capital region of Wien), Germany (seven regions) and Sweden (six out of eight regions; one of the exceptions being the capital region of Stockholm). However, the highest ratio was recorded in the north-western Greek region of Dytiki Makedonia, where – for each inhabitant – 96.6 tonnes of goods were unloaded after having been transported by road. The next highest values were recorded in three northern Swedish regions – Övre Norrland (89.9 tonnes per inhabitant), Norra Mellansverige (69.9 tonnes per inhabitant) and Mellersta Norrland (68.6 tonnes per inhabitant) – as well as the eastern Finnish region of Pohjois- ja Itä-Suomi (65.3 tonnes per inhabitant). All of these regions are relatively sparsely populated and have relatively few alternative modes of transport.

By contrast, there were 27 NUTS level 2 regions where less than 15.0 tonnes of road freight was unloaded per inhabitant in 2021. This group of regions was predominantly located in southern EU Member States or in capital regions. The relatively low level of road freight transport in capital regions may reflect, at least in part, their large populations and the high cost of land, with freight ports, logistical and distribution centres more often located on major transport networks/arteries that tend to be in less densely populated regions. The capital regions of Denmark, France, Croatia, Romania, Bulgaria, Germany, Portugal, Hungary and Italy were all present among this group of 27 regions with the lowest ratios of road freight transport. At the bottom end of the distribution, there were nine regions that reported less than 10.0 tonnes of road freight unloaded per inhabitant, they included:

- five central or southern Italian regions (including the capital region of Lazio);
- the Greek island region of Notio Aigaio (where the bulk of goods are transported by sea);
- the Romanian region of Nord-Est (that had the lowest motorisation rate in the EU);
- the atypical Spanish autonomous regions of Ciudad de Melilla and Ciudad de Ceuta.

**Map 11.2: Road freight transport, 2021**  
(tonnes per inhabitant, by NUTS 2 region of unloading)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 07/2023

Note: road freight transport performed on goods unloaded in each region by vehicles registered in any of the EU Member States. Moldova: ratio based on population data for 1 January 2021.  
Source: Eurostat (online data codes: [road\\_go\\_ta\\_ru](#) and [demo\\_r\\_d2jan](#))





## ROAD ACCIDENTS

Road safety in the EU has improved in recent decades and EU roads are among the safest in the world. To address the issue of road safety, the European Parliament adopted a resolution in October 2021 on an *EU Road Safety Policy Framework 2021–2030 – Recommendations on next steps towards ‘Vision Zero’* (2021/2014), which reaffirmed the EU’s commitment to reduce the number of deaths on the EU’s roads to almost zero by 2050. Vision Zero provides a strategic plan and monitoring of key safety performance indicators, for example on vehicle safety, seat belt wearing rates, speed compliance or post-crash care. The strategy has set an initial goal of cutting in half the number of road fatalities and serious injuries by 2030.

Nevertheless, road safety remains a major societal issue. *Road fatalities* concern persons who are killed immediately in a traffic accident or who die within 30 days as a result of an injury sustained in a road accident. In 2021, there were 19 917 road fatalities and no fewer than 998 824 injuries on the EU’s roads; this latter figure is an estimate that includes 2020 data for Ireland and Italy.

Pre-pandemic, the trend for EU road accidents was a steady downward development. However, the COVID-19 crisis led to a considerable reduction in road travel with, among other factors, restrictions on personal movement and fewer people driving to work. This contributed to a marked fall in the total number of road fatalities in the EU, down 17.2 % between 2019 and 2020. As many of the restrictions linked to the pandemic were relaxed or removed during 2021, the number of road journeys started to pick-up and the number of road fatalities increased 5.8 %.

***Nord-Est in Romania had the highest number of road fatalities (322), while Guadeloupe in France had the highest incidence (159 road fatalities per million inhabitants)***

In 2021, there were 45 road fatalities per million inhabitants within the EU. These fatalities were quite evenly distributed insofar as 125 out of 242 NUTS level 2 regions (or 51.7 % of all regions) recorded an incidence of road fatalities that was below the EU average, while 115 had a value that was above; there were two regions that had the same number of road fatalities per million inhabitants as the EU average.

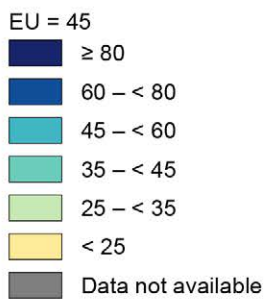
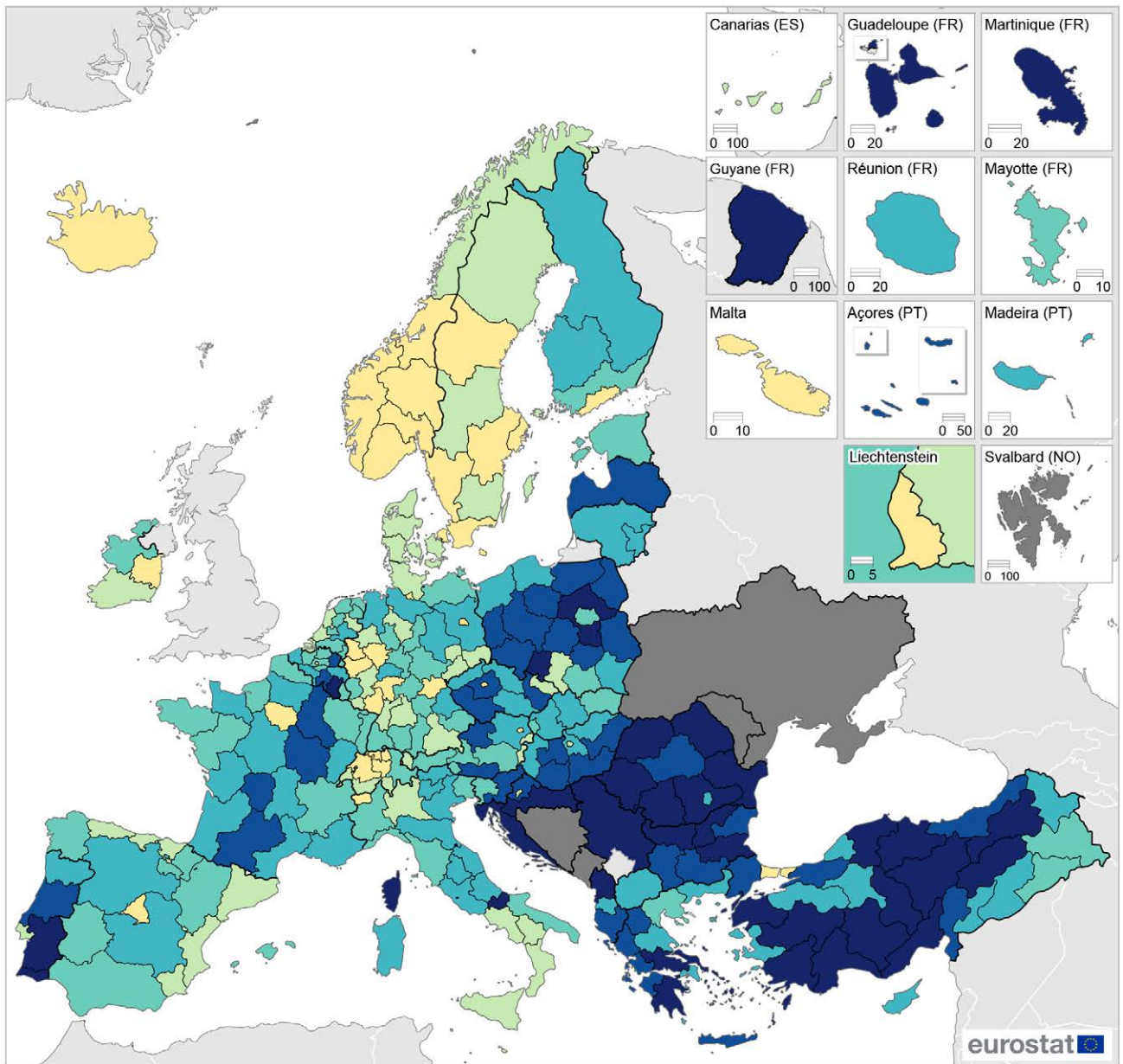
Map 11.3 confirms that some of the highest incidence rates for road fatalities were recorded in rural regions. In 2021, there were 24 NUTS level 2 regions with at least 80 road fatalities per million inhabitants (as shown by the darkest shade of blue in the map). This group was concentrated in Romania (six regions), outermost and island regions of France (four regions), Bulgaria and Greece (three regions each), with the remaining regions located across Belgium, Croatia, Italy, Poland and Portugal. At the top end of the distribution, there were 12 NUTS level 2 regions with more than 100 road fatalities per million inhabitants. The peak was recorded in the French outermost region of Guadeloupe (159 road fatalities per million inhabitants), while the next highest incidences were observed in Severozapaden (north-west Bulgaria; 133) and Guyane (also a French outermost region; 120). The remaining nine regions where there were more than 100 road fatalities per million inhabitants were all located in eastern or southern EU Member States.

Urban and capital regions tended to report a much lower incidence of road fatalities. This may be linked to lower average speeds: for example, there may be lower speed limits in built-up areas while motorway networks in and around major conurbations may be frequently congested. It should be noted that road accident statistics include fatalities and injuries in vehicles which are in transit through a region as well as fatalities and injuries of non-residents staying in a region on holiday, for business or other reason. As such, and other things being equal, regions that have transit corridors or regions with high numbers of visitors may well experience a higher incidence of injuries and fatalities.

There were 26 NUTS level 2 regions in the EU where the incidence of road fatalities was less than 25 deaths per million inhabitants in 2021 (as shown by the yellow shade in Map 11.3). Among these, there were two regions that reported no road deaths: Valle d’Aosta/ Vallée d’Aoste in northern Italy (2020 data) and the relatively small, autonomous region of Ciudad de Ceuta in Spain. However, a majority of this group of 26 were urban areas, including 10 that were capital regions. Leaving aside the two regions for which there were no fatalities, the next lowest incidence rates were recorded in the Belgian capital Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (7 road fatalities per million inhabitants), the Austrian capital region of Wien (8), the Swedish capital region of Stockholm (9) and the northern German region of Bremen (also 9).



**Map 11.3: Number of road fatalities, 2021**  
(per million inhabitants, by NUTS 2 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 09/2023

Note: Serbia, national data. Italy: 2020.

Source: Eurostat (online data codes: tran\_r\_acci, tran\_sf\_roadse and demo\_r\_d2jan)



The information presented in Map 11.4 comes from an alternative source, the [Community database on road accidents \(CARE\)](#), which is managed by the European Commission's [Directorate-General for Mobility and Transport](#). This database contains information on road crashes that lead to death or injury; as such, it does not contain information on damage-only crashes (where there are no fatalities or injuries). Its main purpose is to provide evidence to identify and quantify road safety problems throughout the EU, to evaluate the efficiency of road safety measures, to determine the relevance of EU actions and to facilitate the exchange of experiences in this field.

In 2020, there were 731 600 crashes on the EU's roads that resulted in a death or injury. When expressed in relation to the size of the population, this equated to 1 696 crashes per million inhabitants. Note that both of these figures exclude Ireland, Malta and Sweden, for which no data are available.

Map 11.4 shows the incidence of road crashes for NUTS level 3 regions; note that the statistics presented for the Netherlands relate to NUTS level 2 regions and that the statistics presented for Germany relate to NUTS level 1 regions. In 2020, the regional distribution of road crashes was skewed insofar as approximately two thirds of all regions (470 out of the 703 for which data are available) had an incidence that was below the EU average, while there were 233 regions where the incidence was higher. The range was from a peak

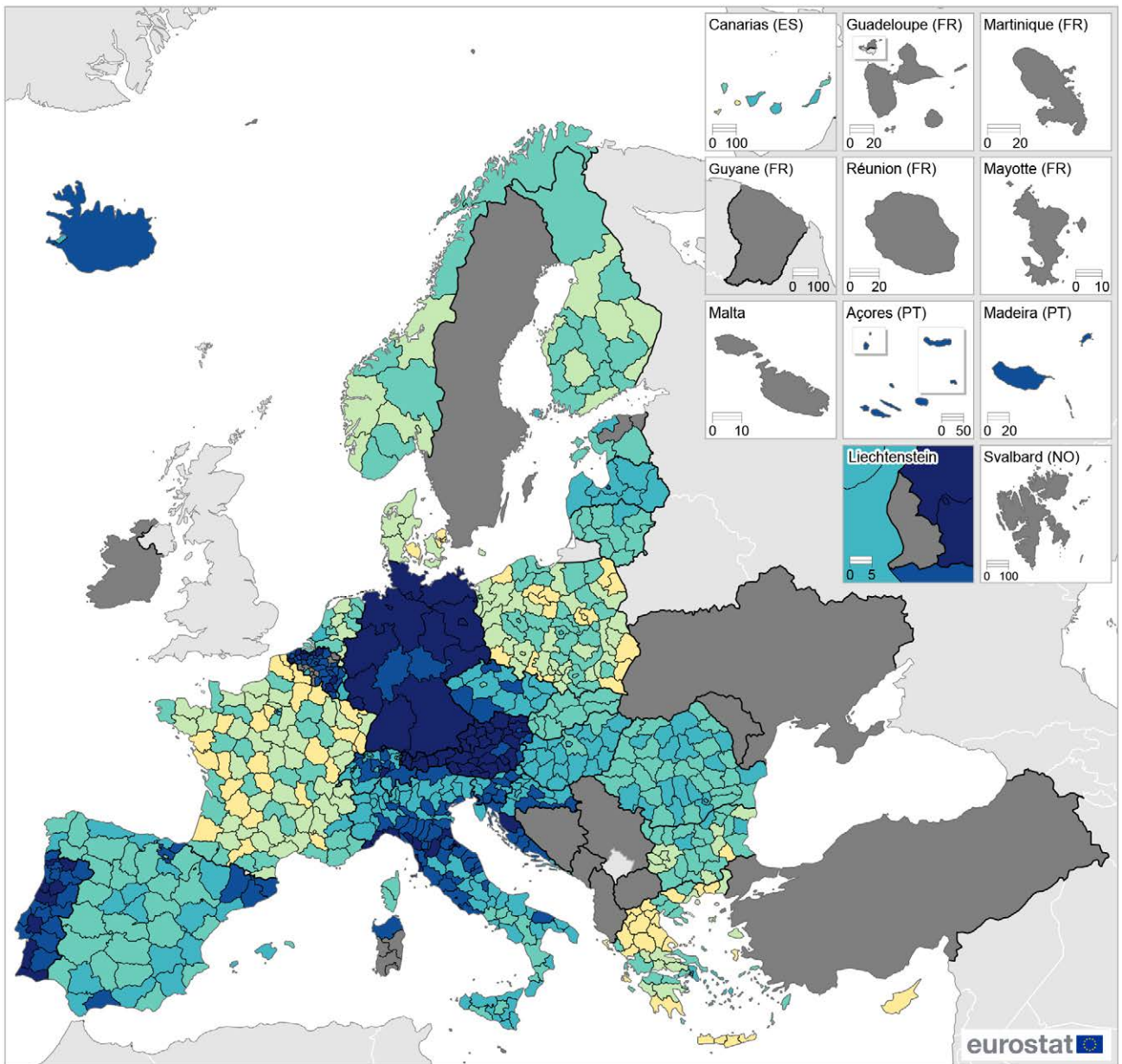
of 5 342 road crashes per million inhabitants in the north-western Austrian region of Außerfern (an Alpine region with a large amount of transit traffic), down to a low of 61 crashes per million inhabitants in the northern Greek region of Florina. As such, the likelihood of having a road crash that resulted in a fatality or injury in Außerfern was 88 times as high as it was in Florina.

In 2020, there were 71 regions in the EU which recorded at least 2 900 road crashes per million inhabitants (they are shaded in the darkest shade of blue in Map 11.4). Austrian and German regions had the highest incidence of road crashes:

- in Austria, 30 out of 35 NUTS level 3 regions had an incidence above this value;
- in Germany, 14 out of 16 NUTS level 1 regions had an incidence above this value (the only exceptions being Hessen and Thüringen).

The remainder of this group of 71 regions was largely composed of regions located in Italy, Belgium or Portugal, although it also included the Croatian coastal region of Ličko-senjska županija. Looking in more detail, 9 out of the 10 NUTS level 3 regions with the highest incidence of road crashes were concentrated in Austria; the other region at the top of the distribution was the northern Italian region of Genova. These were the only regions in the EU with more than 4 000 road crashes per million inhabitants in 2020. By contrast, the lowest 12 regions with the lowest incidence of road crashes were all located in Greece.

**Map 11.4:** Number of road crashes, 2020  
(per million inhabitants, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 04/2023

Note: only covers road crashes resulting in death or injury (no information on crashes that only resulted in damage to vehicles). The Netherlands: NUTS level 2. Germany: NUTS level 1. EU: estimate based on available data (excluding Ireland, Malta and Sweden).

Source: Eurostat (online data codes: tran\_sf\_roadnu and demo\_r\_pjanaggr3)



## Rail traffic

The [trans-European transport network \(TEN-T\)](#) creates an EU-wide network of [railways](#), inland waterways, short sea shipping routes, and roads. It links major cities, ports, airports and terminals, presenting a coherent, efficient, multimodal, and high-quality transport infrastructure to foster the efficient transportation of people and goods. TEN-T policy is based on [Union guidelines for the development of the trans-European transport network](#) (Regulation (EU) No 1315/2013). It is currently being [revised/amended](#), with a new version proposed in July 2022, including amendments to take account of Russia's aggression against Ukraine (with four transport corridors extended to Ukraine and Moldova).

The trans-European transport network consists of two layers:

- the core network includes the most important connections, that meet the highest infrastructure quality standards, linking major cities and transport nodes – the EU aims to complete this part of the network by 2030;
- the comprehensive network connects all EU regions to the core network, with plans to complete this part of the network by 2050;
- TEN-T policy also foresees core network corridors being merged with the rail freight corridors to become European transport corridors.

The TEN-T is designed to make the EU's transport network greener, more efficient and more resilient. Within the specific domain of rail, there remain a number of challenges for international services that are linked to different national standards being employed for electrification, signalling, driver certification or the gauge of track. For example, the [Baltic Member States](#), Ireland, Spain, Portugal and Finland use a broader gauge than in most EU Member States. The [European Railway Traffic Management System \(ERTMS\)](#) is a single, interoperable system designed to replace more than 20 different national train control and command systems that are currently in operation. Its deployment should enhance cross-border interoperability, creating a seamless, Europe-wide railway system.

The regional distribution of railway infrastructure is shaped by specific historical developments, economic developments and the geographical characteristics of regions. For example, some large EU Member States that have considerable distances between major cities have developed high-speed rail infrastructure (for example, Germany, Spain, France or Italy). Some of the Member States that are more densely-populated, such

as Belgium or the Netherlands, have a higher frequency of (generally less rapid) trains. Several eastern Member States have relatively extensive rail networks, reflecting a legacy from the communist or Soviet era when there was often a greater reliance on rail (compared with road) for transporting passengers and/or goods.

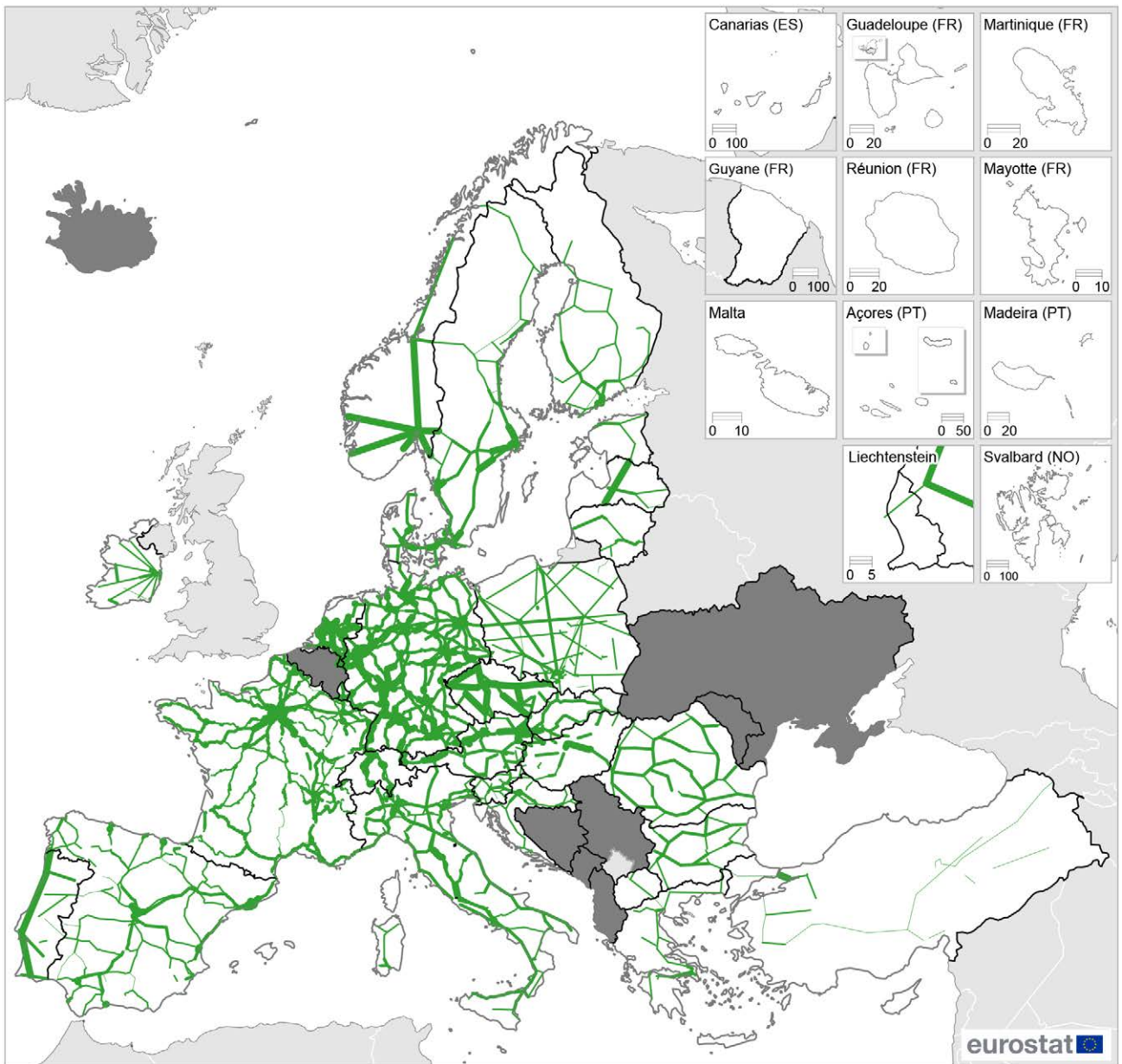
In 2021, there were 202 600 km of railway lines across the EU; note there are no railways in Cyprus and Malta (this is also the case in Iceland). The core trans-European rail network consisted of 64 600 km of railway lines, while the comprehensive network measured 119 100 km.

Map 11.5 presents passenger train movements on the trans-European rail network; each segment of the network is identified in the data record, with traffic movements quantified in both directions. In 2020 – a year that was heavily impacted by the COVID-19 crisis (the total number of [passenger-kilometres](#) on the EU's rail network fell 46.0 % between 2019 and 2020) – the highest numbers of passenger train movements were generally recorded in some of the most densely populated areas of the EU, as well as along transport arteries that link major cities (both nationally and internationally). There were more than 400 000 passenger train movements on rail network segments in the Czech and French capitals (the latter principally on rail segments to/from Paris-Nord). Very high counts of passenger train movements were also recorded in/around the Dutch, Austrian, Finnish and Swedish capitals.

Map 11.6 presents a similar set of information (to that shown in Map 11.5) but for freight train movements. The impact of the COVID-19 pandemic on rail freight was less marked than for passenger services, as the total weight of goods transported by rail in the EU fell 8.3 % between 2019 and 2020 (note this figure excludes Belgium and Greece for which no data are available). In 2020, the highest numbers of freight train movements on the trans-European rail network were principally recorded on rail segments that formed part of the principal freight corridors (for example, the Rhine-Alpine corridor, the North Sea-Baltic corridor, or the Baltic-Adriatic corridor). The highest number of freight train movements was recorded in Maschen (Germany), located to the south of Hamburg; it is the site of the EU's largest rail freight facility. Particularly high numbers of freight train movements were also observed for several rail segments in the German region of Nordrhein-Westfalen (for example, in/around Oberhausen, Duisburg and Köln), as well as in/around the Polish capital.



**Map 11.5:** Passenger train movements on the trans-European rail network, 2020  
(number of passenger trains)



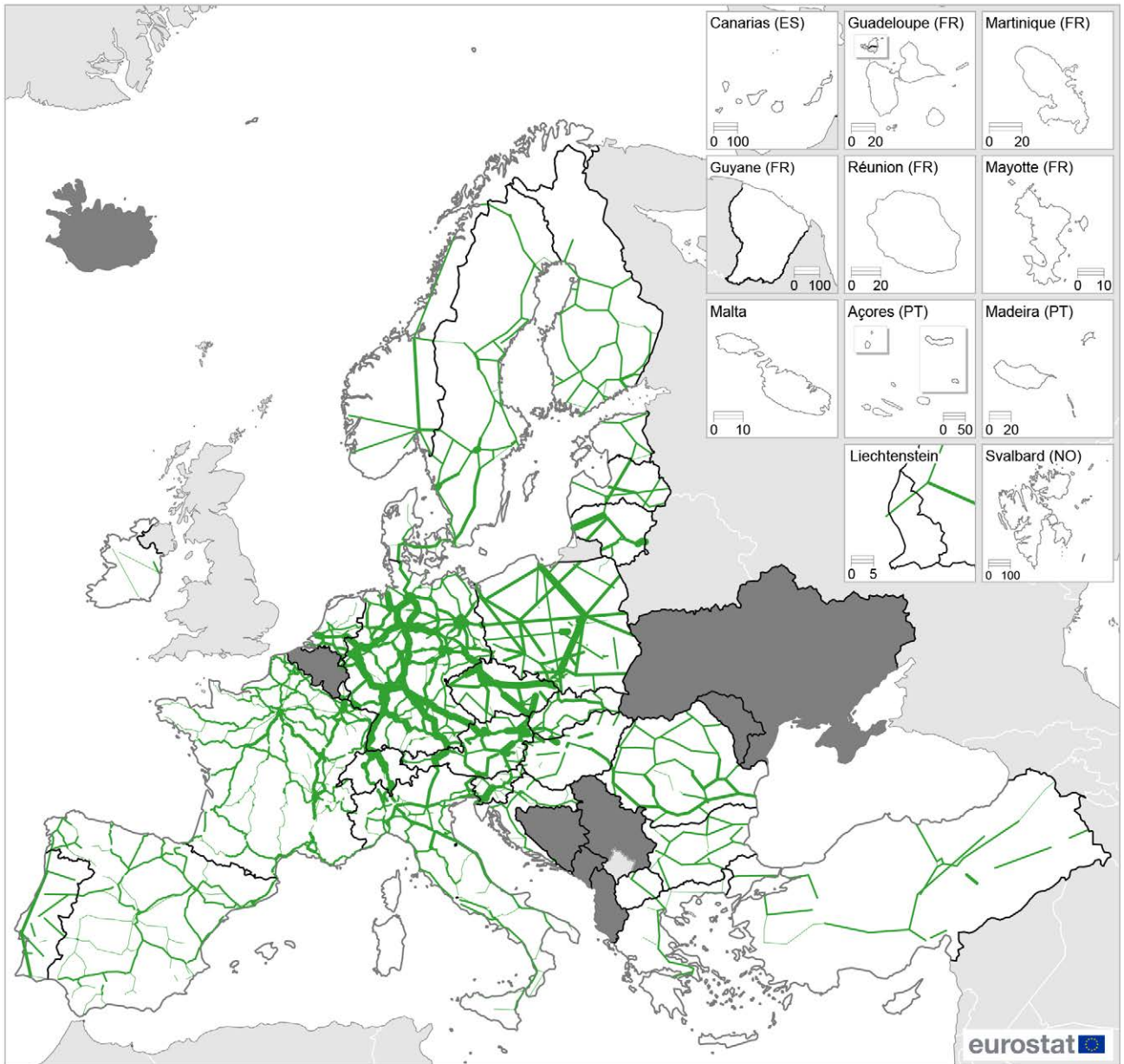
Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

- ≥ 50 000
- 10 000 – < 50 000
- 1 000 – < 10 000
- < 1 000
- Data not available

Source: Eurostat (transport statistics)



**Map 11.6:** Freight train movements on the trans-European rail network, 2020  
(number of freight trains)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

- ≥ 25 000
- 10 000 – < 25 000
- 1 000 – < 10 000
- < 1 000
- Data not available

Source: Eurostat (transport statistics)

## Air traffic

Air passenger services were particularly hard hit by the COVID-19 crisis; the initial impact of the crisis can be seen in the latest information available. In 2019, there had been 1.0 billion air passengers carried (arrivals plus departures) in the EU; this figure slumped in 2020, falling by almost three quarters (down 73.3 %) to 277 million passengers. There was a partial recovery in 2021, as the number of passengers grew 35.1 % to 374 million, with higher growth for domestic and short-haul travel, while the number of inter-continental air travellers remained depressed.

In recent decades, liberalisation measures have led to the (rapid) growth of low-cost airlines and an expansion of smaller regional airports which are generally less congested and charge lower landing fees than main international airports. Map 11.7 provides information for the number of air passengers carried in each NUTS level 2 region; note that these regional statistics (unlike the data for the total number of air passengers presented above) generally cover only airports with more than 150 000 passenger units each year. Note also that several regions, at this level of detail, may have more than one main airport, while others do not have any. Based on this subpopulation, the number of air passengers carried in the EU rose by 41.4 % between 2020 and 2021 (somewhat higher than the rate for all air travellers (35.1 %)).

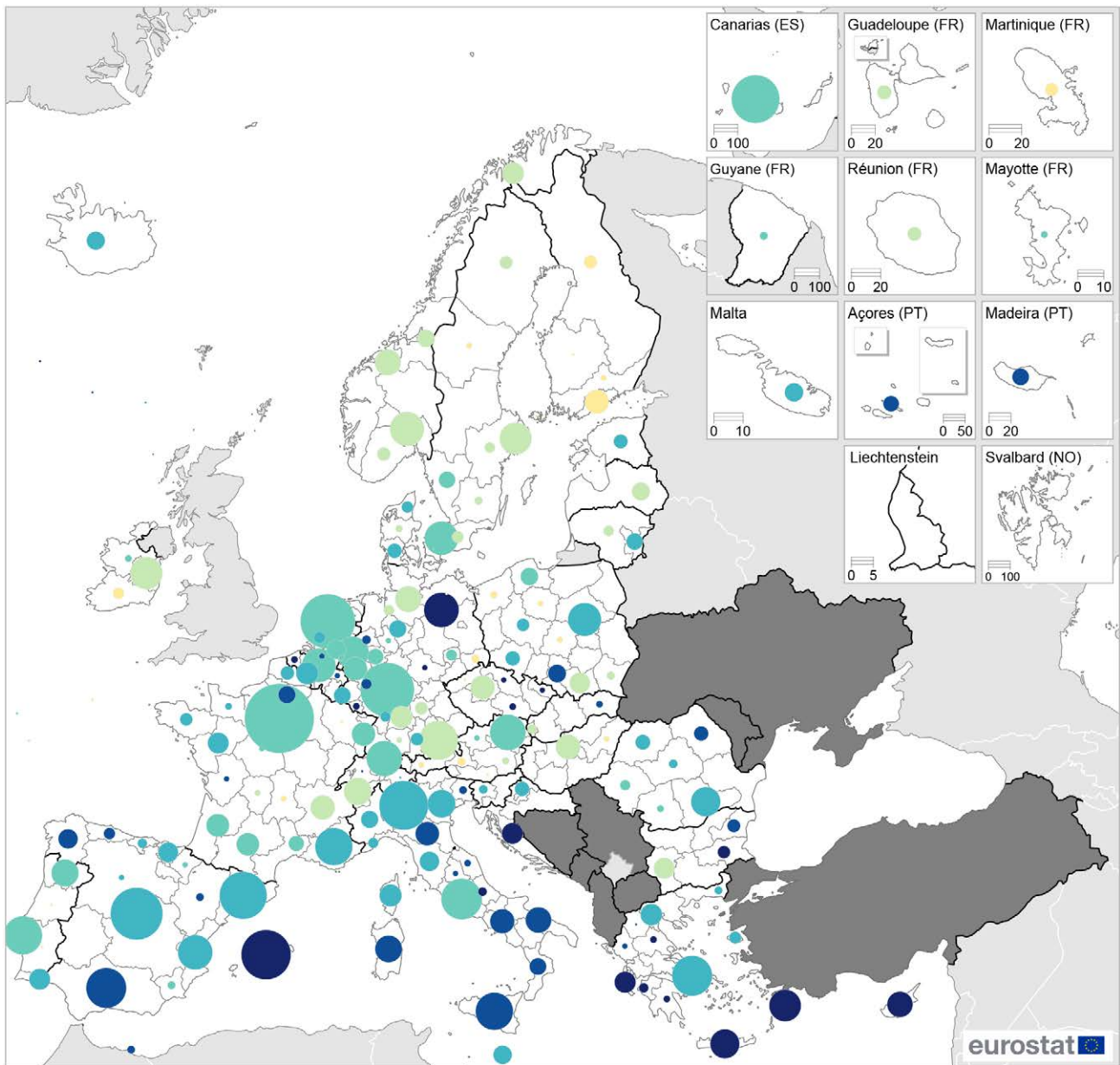
In 2021, there were 16 NUTS level 2 regions (out of 170) with at least 10.0 million air passengers carried. They were principally located in capital regions and other major economic centres across some of the EU's largest Member States, as well as popular holiday destinations. The highest count was recorded in the French capital region of Ile-de-France – which is home to Paris-Charles

de Gaulle and Paris-Orly airports – with 41.9 million air passengers. The Dutch capital region of Noord-Holland – which is home to Amsterdam/Schiphol airport – had the second highest number of air passengers, at 25.5 million, followed by the German region of Darmstadt – which is home to Frankfurt/Main airport – with 24.8 million passengers. Within this group of 16 regions, there were five regions located in Spain: the capital region of Comunidad de Madrid; three regions that are major tourist destinations – Illes Balears, Canarias and Andalucía; and Cataluña (which has a high number of tourists, but is also an economic hub). Italy (three regions), Germany and France (both two regions) were the only other EU Member States that reported more than one region with at least 10.0 million air passengers in 2021.

As noted above, the number of air passengers carried to/from EU airports with generally more than 150 000 passenger units increased by 41.4 % in 2021. The regional distribution was relatively normal, insofar as there were 84 NUTS level 2 regions out of 170 for which data are available (or 49.4 %) where the number of air passengers grew at a faster rate than the EU average. Some of the fastest increases in passenger numbers were reported for several regions characterised by relatively small regional airports. For example, in Moravskoslezsko in Czechia and Saarland in Germany the number of air passengers more than trebled; it also more than trebled in the German region of Brandenburg, which is – since 2020 – home to Berlin's main airport. Restricting the analysis to those regions with at least 1.0 million air passengers carried, as well as in Brandenburg the number of passengers more than doubled between 2020 and 2021 in the popular tourist destinations of Ionia Nisia, Kriti and Notio Aigaiio (all in Greece), Cyprus, Illes Balears (Spain) and Jadranska Hrvatska (Croatia).



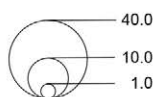
**Map 11.7: Air passengers carried, 2021**  
(by NUTS 2 regions)



Change in the number of air passengers carried, compared with 2020 (%)  
EU = 41.4

- ≥ 100.0
- 60.0 – < 100.0
- 40.0 – < 60.0
- 20.0 – < 40.0
- 0.0 – < 20.0
- < 0.0
- Data not available

Number of air passengers carried (million)  
EU = 581.6



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023



Note: generally covers main airports with more than 150 000 passengers each year. EU estimates made for the purpose of this publication (based on available data, excluding Berlin (DE30) and Sud-Est (RO22) for which data are incomplete).

Source: Eurostat (online data code: tran\_r\_avpa\_nm)



## Maritime traffic

Maritime freight services facilitate trade within the EU and also between the EU and the rest of the world. Along with other products, they contribute towards the security of supply of energy and food, while providing EU exporters with a means of reaching international markets; indeed, the vast majority (in tonnage) of the EU's international freight is transported by sea.

The quality of life on many European islands and in peripheral maritime regions depends, to a large extent, upon the provision of maritime transport services — providing a means for passengers and freight to arrive/leave. After six consecutive years when the total quantity of maritime freight handled (inwards and outwards) in EU ports had risen to a relative peak of 3.59 billion tonnes in 2019, the onset of the COVID-19 crisis led to a decline in activity. The downturn experienced was relatively modest in comparison with the impact of the crisis on maritime passenger services. In 2020, the quantity of maritime freight handled fell 7.3 %, before a partial rebound the following year, rising 4.1 % to 3.46 billion tonnes.

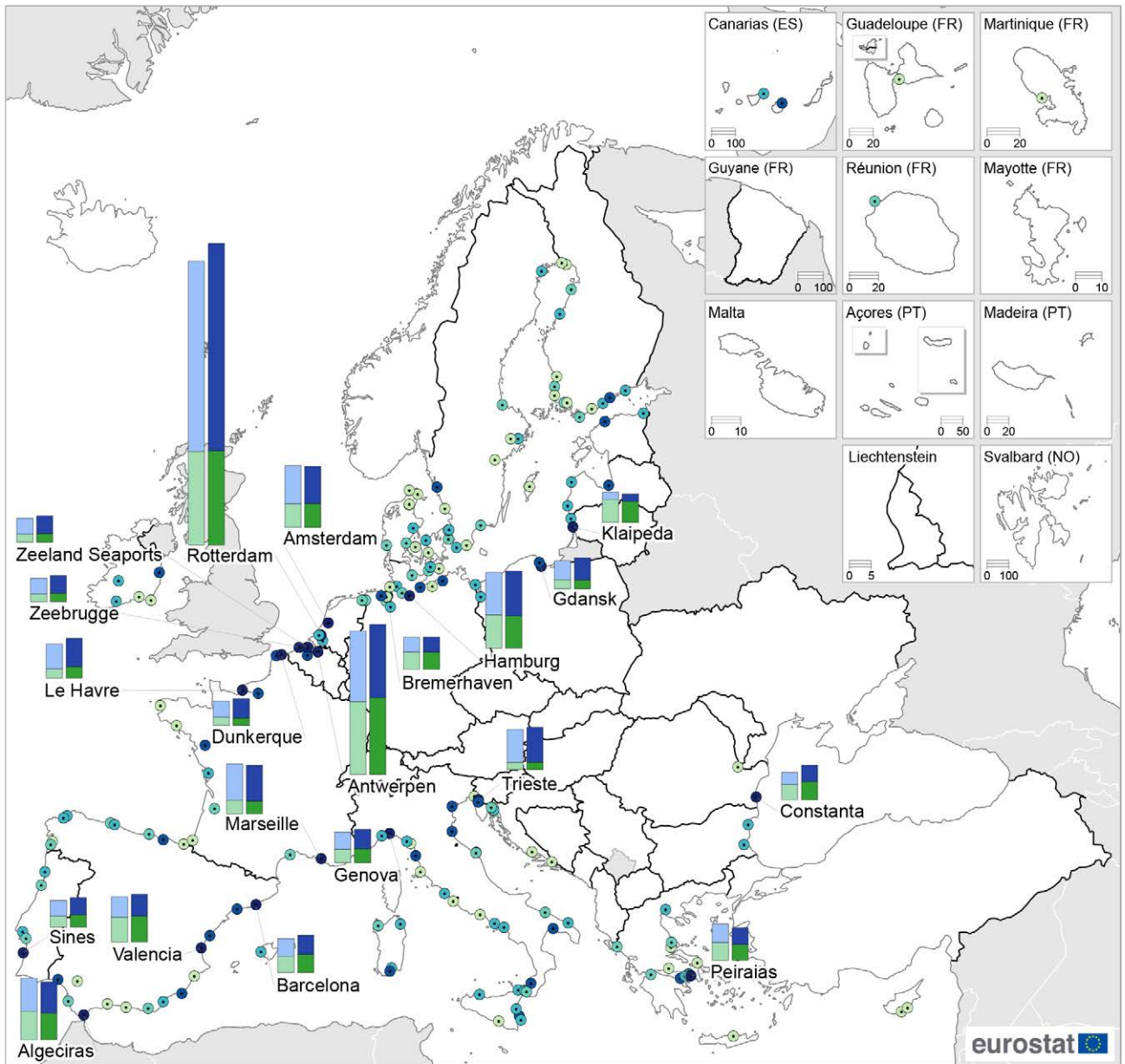
Map 11.8 shows information for the top 20 EU ports for maritime freight in 2021 (as well as data for 2020 to highlight the impact of the COVID-19 crisis). The map also shows – as coloured circles – those EU ports with at least 2.0 million tonnes of freight handled in 2021.

The distribution of ports around the EU's coastline reflects a range of influences including (among others) historical trade routes, geographic features, resource endowment, economic activities and political considerations. A large number of the EU's main ports are concentrated along North Sea coastlines, close to some of the most densely populated regions of the EU that are served by an extensive network of motorways, railways, rivers and canals.

Rotterdam in the Netherlands was, by far, the largest port in the EU. With 434.8 million tonnes of maritime freight loaded and unloaded in 2021, it accounted for more than one tenth (12.6 %) of the total goods handled in EU ports. The position of Rotterdam as the EU's leading freight port is clearly evident, as it loaded/unloaded almost twice as much freight as any of the other port in the EU. The next largest freight ports were all located within relatively close proximity of Rotterdam: the Belgian port of Antwerpen (215.9 million tonnes of maritime freight), the German port of Hamburg (111.2 million tonnes), and another Dutch port, in the capital city of Amsterdam (88.0 million tonnes). Away from the North Sea, the next largest ports in the EU were located in the Mediterranean Sea: the Spanish ports of Algeciras (83.1 million tonnes) and Valencia (69.1 million tonnes) as well as the French port of Marseille (70.1 million tonnes).

Although the overall level of freight handled in EU ports increased 4.1 % in 2021, some of the top 20 EU ports experienced a decrease in their quantity of freight handled. The largest fall – down 10.4 % – was recorded in the Greek port of Peiraias, while there were also notable reductions in Algeciras (down 6.2 %) and the Lithuanian port of Klaipeda (down 5.2 %). By contrast, the fastest growth rate – again among the top 20 EU ports in 2021 – was recorded in the Belgian port of Zeebrugge, where the quantity of freight handled rose 26.5 % in 2021, closely followed by the Romanian Black Sea port of Constanta (up 26.4 %). There were six other ports that recorded double-digit increases: Le Havre and Dunkerque (both in France), Gdansk (Poland), Zeeland Seaports (the Netherlands), Sines (Portugal) and Barcelona (Spain).

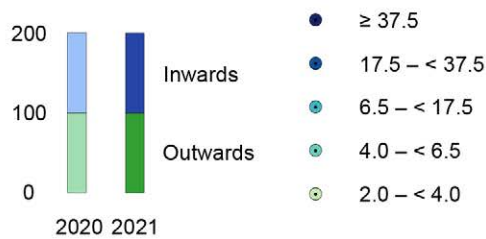
**Map 11.8: Maritime freight handled, 2020 and 2021**  
(million tonnes of goods)



Freight handled, 2020 and 2021

Freight handled, 2021  
EU = 3 462.6

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023



Note: the map shows data for 2020 and 2021 in the form of column charts for the 20 ports with the highest levels of maritime freight handled in the EU (based on data for 2021). It also shows as coloured circles those EU ports with at least 2.0 million tonnes of freight handled (inwards and outwards combined) in 2021.

Source: Eurostat (online data codes: [mar\\_mg\\_aa\\_pwhd](#) and [mar\\_go\\_aa](#))

## 12. Environment

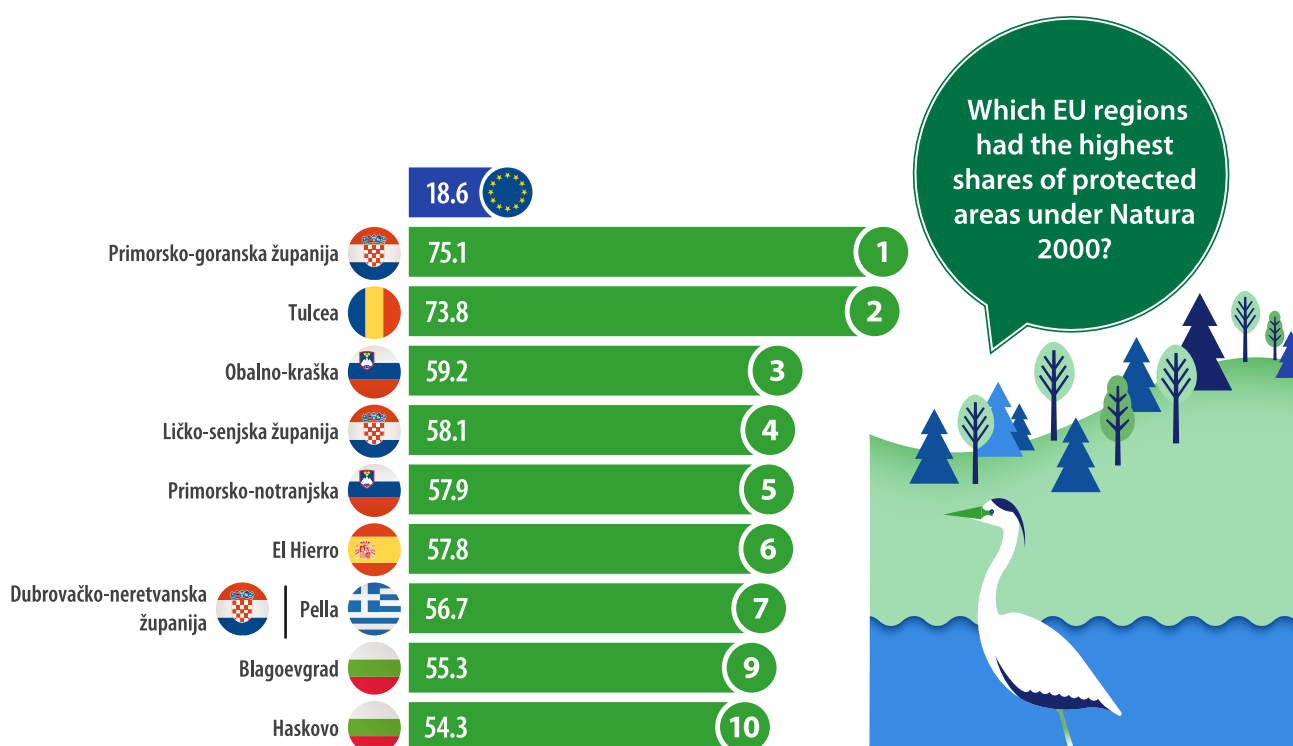
Historically, many people held a common belief that nature could restore or replenish itself. The identification of certain phenomena – rising temperatures, increases in the frequency and severity of extreme weather-related events, species loss or growing marine and terrestrial pollution – have contributed towards increasing awareness of long-term environmental damage.

Climate change and environmental degradation are two of the most serious threats to the [European Union \(EU\)](#) and the world and represent major global risks. They are interrelated: climate change affects biodiversity, while healthy ecosystems provide services that are critical for climate change mitigation (carbon sinks and stocks) and adaptation (water retention, protection against floods and desertification, urban heat reduction, protection against air pollution, and so on). The [United Nations \(UN's\) 2030 Agenda for Sustainable Development](#) is a long-term strategy that aims to achieve a range of socioeconomic and environmental goals. From an environmental perspective, the aim is to protect the Earth from environmental degradation, for example by supporting sustainable consumption and production, combined with urgent action on climate change, amongst others. The agenda introduced a set of 17 [Sustainable Development Goals \(SDGs\)](#); to monitor progress towards these goals the UN has adopted a list of [indicators](#). The [European Green Deal](#) is the EU's

response to the three interlinked environmental crises (climate change, biodiversity loss and pollution, all driven by natural resources depletion). It contributes to achieving the climate and environmental objectives of the 2030 Agenda.

SDG 14 and SDG 15 concern 'life below water' and 'life on land'. They seek to conserve and sustainably use the oceans, seas and terrestrial ecosystems. The [EU Biodiversity Strategy for 2030 – Bringing nature back into our lives](#) (COM(2020) 380 final) sets legally binding nature restoration targets to protect a minimum of 30 % of the EU's land and sea area, with specific commitments to protect nature and reverse the degradation of ecosystems. The Birds and Habitats Directive are the oldest environmental laws in the EU: they provide a legal basis for [Natura 2000](#), which is designed to ensure the long-term survival of Europe's most valuable and threatened species and habitats. The infographic below and the first section in this chapter provide statistics on protected areas under Natura 2000.

Forests are the most biologically diverse ecosystems on land. They play a crucial role in mitigating and adapting climate change through carbon sequestration and other ecosystem services. Forest fires have human consequences (fatalities and injuries/illnesses), economic costs (asset losses, reduced tourism/forestry/agriculture, control and rehabilitation costs) and ecological impacts. The ecological impact of fires



(% of total area, by NUTS 3 regions, 2021)

Source: European Environment Agency (EEA)



is twofold: controlled fires can promote biodiversity and regeneration, while uncontrolled fires result in biodiversity loss and degradation (with carbon dioxide emissions and the loss of carbon sinks). The second section in this chapter provides information on forest fires and related carbon dioxide emissions.

SDG 11 'sustainable cities and communities' focuses on making cities and human settlements inclusive, safe, resilient and sustainable, reducing their environmental impact by, among other actions, improving air quality as well as municipal and other waste management. Air pollution is a major cause of premature death and disease in the EU, with fine particulate matter (PM<sub>2.5</sub>) deemed to have the most severe impacts on human health. The EU's zero pollution action plan sets a goal of reducing the number of premature deaths caused by fine particulate matter by at least 55 % by 2030 (relative to 2005 levels). The third section in this chapter provides statistics on the magnitude of the health impacts of air pollution resulting from exposure to fine particulate matter.

SDG 7 on 'affordable and clean energy' seeks to ensure access to affordable, reliable, sustainable and modern energy for all. Most buildings in the EU require heating in the winter months and an increasing number make use of air-conditioning during the summer. Following Russian military aggression against Ukraine, the EU accelerated its plans for an energy transition away from fossil fuels alongside plans for energy efficiency savings (for example, through proposals to renovate millions of buildings so that they waste less energy). In March 2023, the Council and European Parliament adopted new EU legislation setting an energy savings target in the EU, namely, to cut 11.7 % of final energy consumption by 2030 (in addition to reduction targets already agreed in 2020). The use of energy in buildings forms part of final energy consumption. The concept of 'degree days' measures how much (in degrees) and for how long (in days) outside temperatures are below/above a fixed room temperature (at which there is no need for heating/cooling); this information can be used to model energy consumption in buildings. The fourth section in this chapter presents statistics on heating and cooling degree days.

## Land

Ecosystems and the services they provide are under pressure from urban sprawl, intensive agriculture, pollution, invasive species and climate change. The EU's biodiversity strategy for 2030 includes specific commitments and actions to protect nature and reverse the degradation of ecosystems.

The world's largest network of protected areas – Natura 2000 – was established in 1992 and is made up

of 27 000 sites across the EU covering 1.2 million km<sup>2</sup>. This network of protected areas extends over 18.6 % of the EU's land area and 9 % of its marine territory. It aims to ensure the long-term survival of the EU's most valuable and threatened species and habitats. While it includes strictly protected nature reserves, most of the land covered by Natura 2000 areas is privately owned. The approach to conservation and sustainable use of these areas is largely centred on people working with nature. EU Member States must ensure that their protected sites are managed in a sustainable manner, both ecologically and economically.

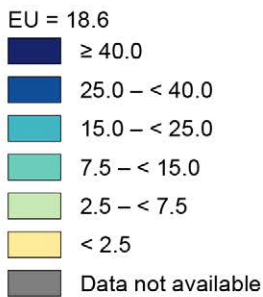
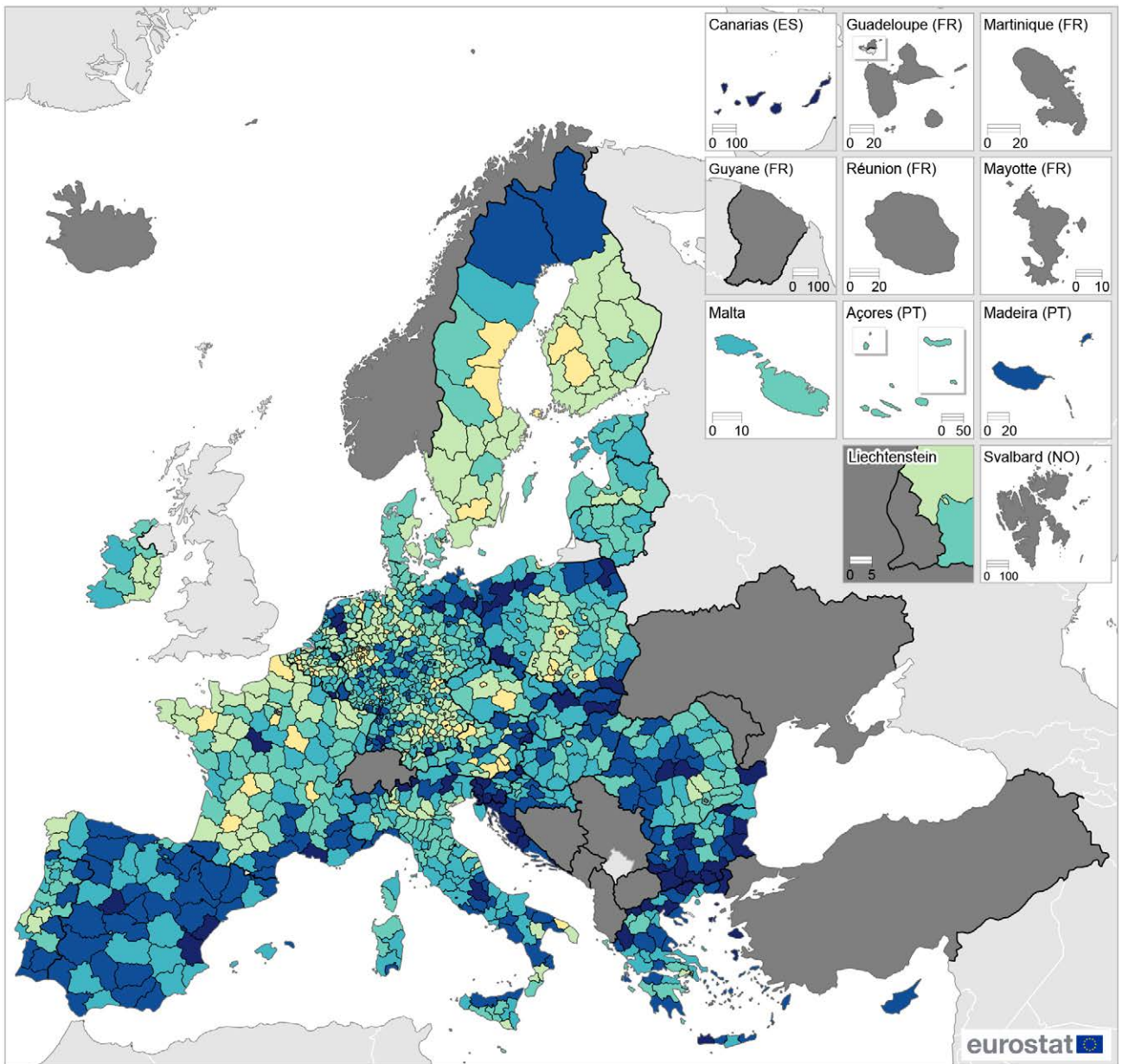
In 2021, the two NUTS level 3 regions with, by far, the largest Natura 2000 protected areas were the Finnish region of Lappi (30 000 km<sup>2</sup>) and the Swedish region of Norrbottens län (29 700 km<sup>2</sup>); the protected areas in both of these regions were mainly forest and semi natural areas, but they also had quite large wetlands and water bodies. The next largest protected areas – with between 5 000 km<sup>2</sup> and 11 000 km<sup>2</sup> – were observed in Västerbottens län and Jämtlands län (Sweden), Cáceres, Badajoz and Jaén (Spain) and Tulcea (Romania).

The figures above reflect, to a large extent, the size of various administrative units – with the relatively sparsely populated regions of northern Finland and Sweden being particularly large when measured in terms of area. Map 12.1 provides an alternative analysis, detailing the share of Natura 2000 protected areas in each NUTS level 3 region. Among the 1 148 regions for which data are available, there were 67 where at least 40.0 % of the total area was protected (as shown by the darkest shade of blue in the map). Natura 2000 sites covered approximately three quarters of the total area of Primorsko-goranska županija in Croatia (75.1 %) and Tulcea in Romania (73.8 %): in the former, most of the protected areas were forest and semi natural areas; in the latter, a relatively large share of the protected area was composed of wetlands. These were, by far, the highest regional shares: Natura 2000 sites covered around three fifths (59.2 %) of the total area in the eastern Slovenian region of Obalno-kraška, which was the third highest share.

The regional distribution of protected sites was relatively skewed insofar as close to one third of NUTS level 3 regions – or 417 out of 1 148 regions – reported that the share of Natura 2000 sites in their total area was higher than the EU average of 18.6 %. There were three regions that had the same share and 728 regions where a lower than average share was recorded. At the bottom end of the distribution, there were 76 (mainly urban) regions where less than 2.5 % of the total area was designated as a Natura 2000 site (they are shown in a yellow shade in Map 12.1); the lowest regional shares were recorded in Graz (Austria) and Gliwicki (Poland).



**Map 12.1:** Natura 2000 protected areas, 2021  
 (% of total area, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 06/2023

Source: European Environment Agency (EEA)

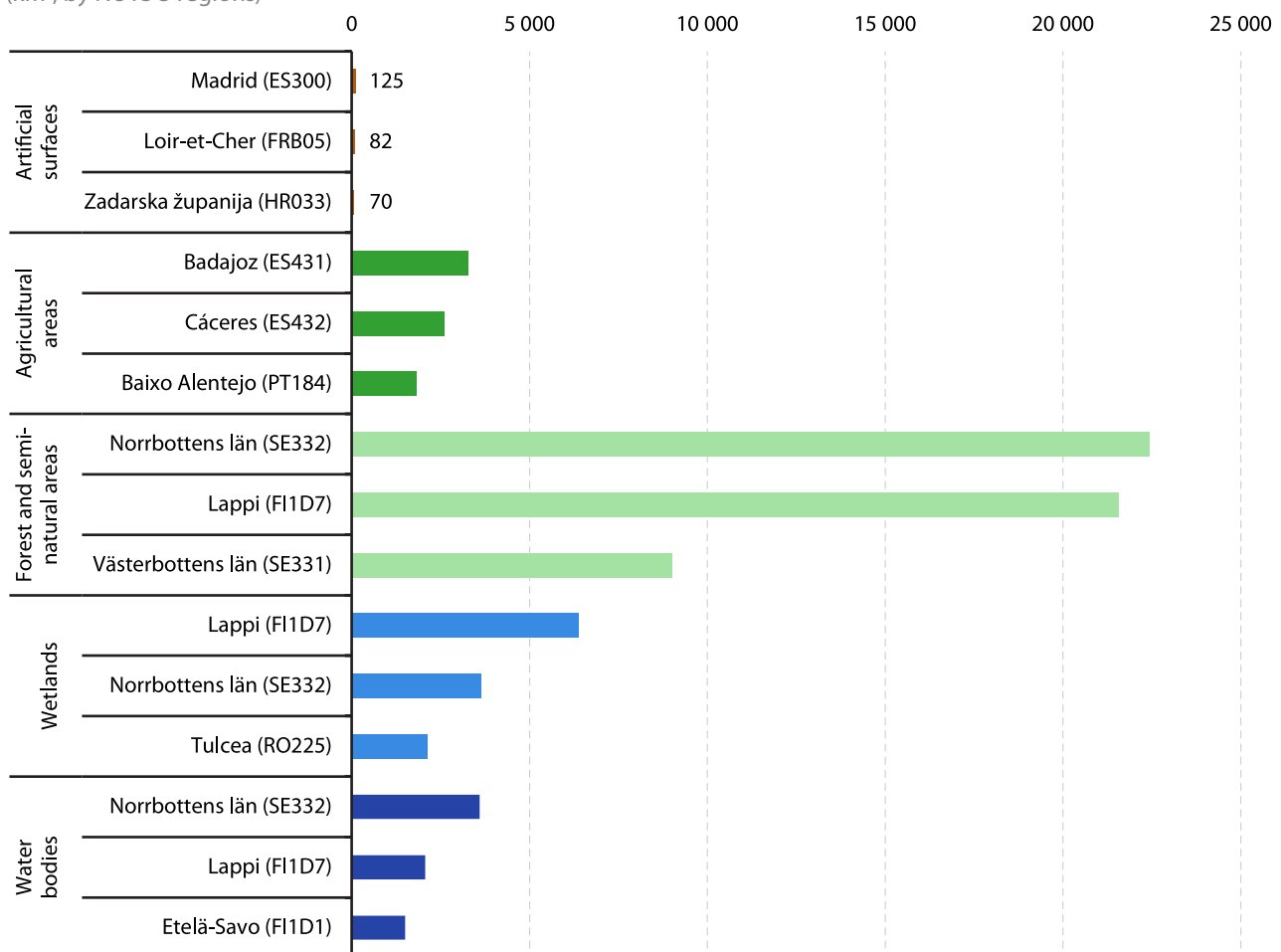


Figure 12.1 presents further information on Natura 2000, listing the largest protected areas across NUTS level 3 regions for five different land cover categories. As noted above, this information reflects, at least to some degree, the size of individual administrative units. Forest and semi-natural areas was the most common type of land cover for Natura 2000 sites. In 2021, the two regions that had the largest overall protected areas – Norrbottens län in Sweden and Lappi in Finland – also had the largest protected areas covered by forest and semi-natural areas, both with more than 21 000 km<sup>2</sup>. Their protected areas covered by forest and semi-natural areas were more than twice as large as in Västerbottens län (also in Sweden), where forest and semi-natural areas covered 9 000 km<sup>2</sup> of protected area. Lappi and

Norrbottens län also recorded the largest Natura 2000 protected areas covered by wetlands and by water bodies. In the case of the former, Tulcea in Romania had the third largest area, while Etelä-Savo in Finland had the third largest area covered by water bodies.

The situation was different for the other two categories shown in Figure 12.1. Three Iberian regions – Badajoz and Cáceres in Spain and Baixo Alentejo in Portugal – recorded the largest Natura 2000 protected areas covered by agricultural areas in 2021, while the largest protected areas covered by artificial surfaces were reported in the Spanish capital region of Madrid, followed by Loir-et-Cher in France and Zadarska županija in Croatia.

**Figure 12.1: Natura 2000 protected areas by land cover, 2021**  
(km<sup>2</sup>, by NUTS 3 regions)



Note: the figure shows, for five different types of land cover, the EU regions with the largest Natura 2000 protected areas.

Source: European Environment Agency (EEA)

## Forests

Forests are biologically diverse ecosystems that play a considerable role in reducing the risk of natural disasters, including floods, droughts, landslides and other extreme events. Globally, forests are essential in the fight to mitigate climate change given their function as a carbon sink. However, forests are not only important for the health of the planet, they also promote the health and well-being of individuals, as well as providing a recreational escape.

A *New EU Forest Strategy for 2030* (COM(2021) 572 final) is a flagship initiative of the European Commission that forms part of the European Green Deal. It builds on the EU's biodiversity strategy and includes objectives/targets for reforestation and afforestation of biodiverse forests, including a [pledge to plant an additional 3 billion trees by 2030](#), ensuring the right mix of tree species not only in forests, but also in agroforestry, agricultural and urban areas.

In recent years, forest fires have repeatedly blazed across large swathes of many EU Member States, particularly in southern Europe. While controlled fires can maintain biodiversity and promote regeneration (for example, clearing underbrush and creating open spaces for new growth), severe and uncontrolled fires lead to extreme degradation and biodiversity loss, killing or displacing wildlife and destroying habitats. These large fires may also pollute the air and water, alter the local climate and/or contribute to global warming.

Since 2000, the [European Forest Fire Information System \(EFFIS\)](#) has been recording fires detected with the use of satellite images; this service is since 2017 part of the EU Copernicus observation program. This information can be used to analyse the scale and magnitude of burnt areas. The EFFIS time series identifies all fires that are larger than 30 hectares for the period 2000–2022.

Statistics on forest fires vary considerably from one year to the next, reflecting seasonal meteorological and drought conditions, as well as other factors. According to the EFFIS, there were 8 813 km<sup>2</sup> of burnt areas by wildfires across the EU in 2022; the second highest area since records began. Of particular concern was the fact that 44 % of area burnt by wildfires in 2022 concerned Natura 2000 sites and therefore had a direct impact on biodiversity.

Map 12.2 presents information on forest fires, detailing burnt areas for NUTS level 3 regions; it compares the burnt area in 2022 with the average burnt area during the period 2008–2021 (which is the base value for an index = 100). Across the EU, the burnt area from forest fires in 2022 was 2.55 times as high (index of 255) as the average level recorded during the period 2008–2021. The considerable area covered by wildfires in 2022 was principally concentrated in southern and south-eastern EU Member States – in particular, across Spain and Romania – as well as in southern France and areas close to the Mediterranean Sea. The skewed nature of the distribution was such that there were 177 NUTS level 3 regions where the index of burnt areas was higher than the EU average in 2022, compared with 989 regions which had lower indices.

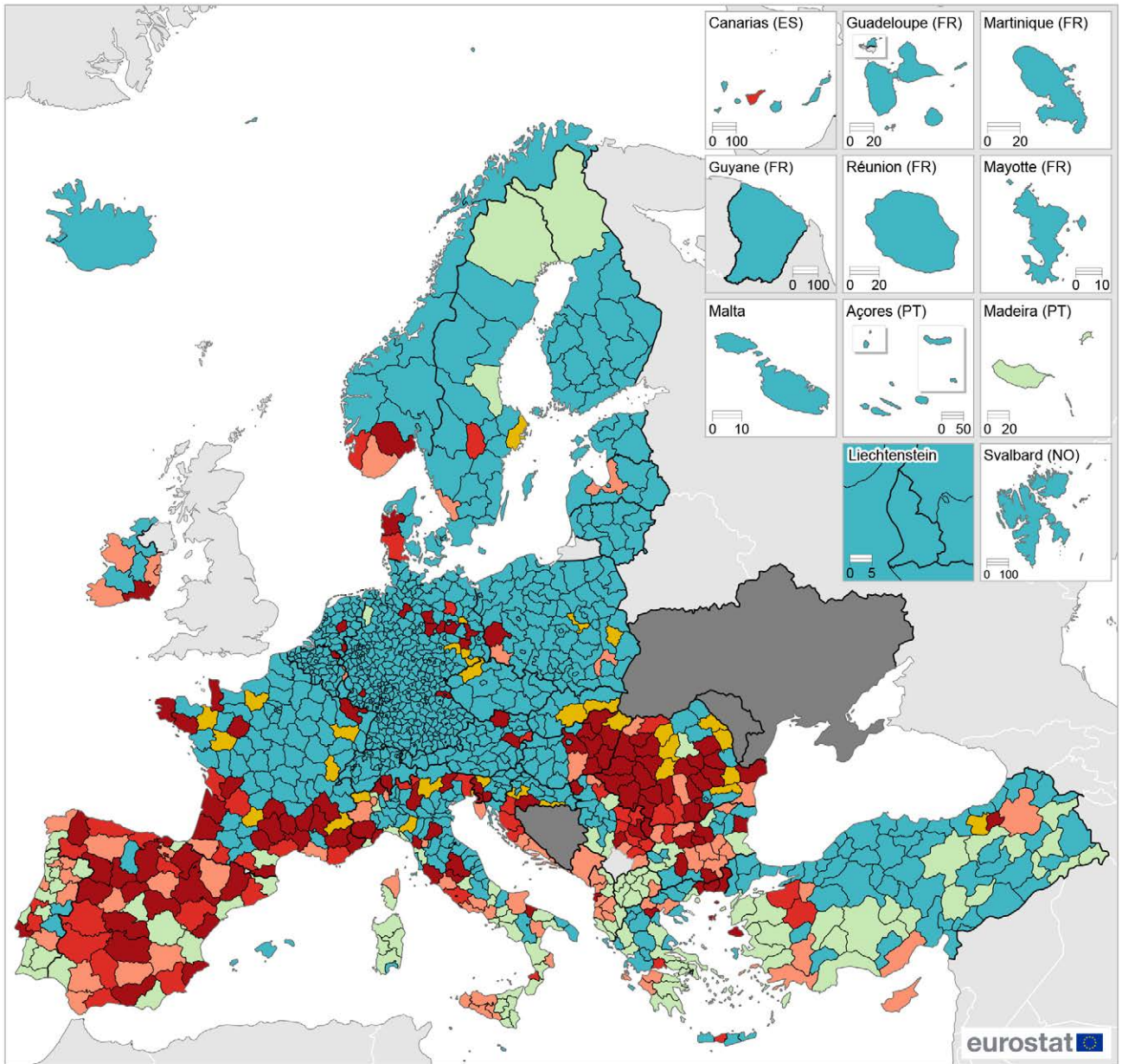
The danger of forest fires is linked to a range of climatic factors, although weather conditions alone cannot predict where wildfires will be ignited. Other than weather conditions, other factors such as the type of forests and fuel types (monoculture plantations of eucalyptus or pines are more prone to forest fires than primary and old-growth forests) and topography also determine the conditions of fire spread, while the vast majority of fires are linked to human actions. The weather – particularly high temperatures, low relative humidity and strong winds, as well as the type of forest – may however be used to predict the potential spread and intensity of fires.

The average number of days with high to extreme fire danger can be computed by using the [Canadian forest fire weather index system](#) to derive a fire weather index (FWI) that estimates weather-driven fire danger. This combines temperature, wind speed, relative humidity and precipitation to give a quantitative value of fire danger on a certain day. Daily projections for a spatial grid of approximately 20 km by 28 km are summarised according to six different classes of fire danger (from low danger up to extreme danger).

Map 12.3 presents information on the average annual number of days with high to extreme fire danger (based on those days when the FWI was greater than or equal to 30) for the period 2013–2022. The data from this model confirm that the highest risk of fire danger is generally recorded on the Iberian Peninsula, as well as in southern Italy and Greece.



**Map 12.2: Forest fires – burnt areas, 2022**  
 (index, based on 2008–2021 = 100, by NUTS 3 regions)



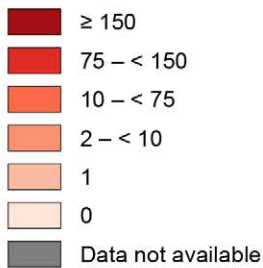
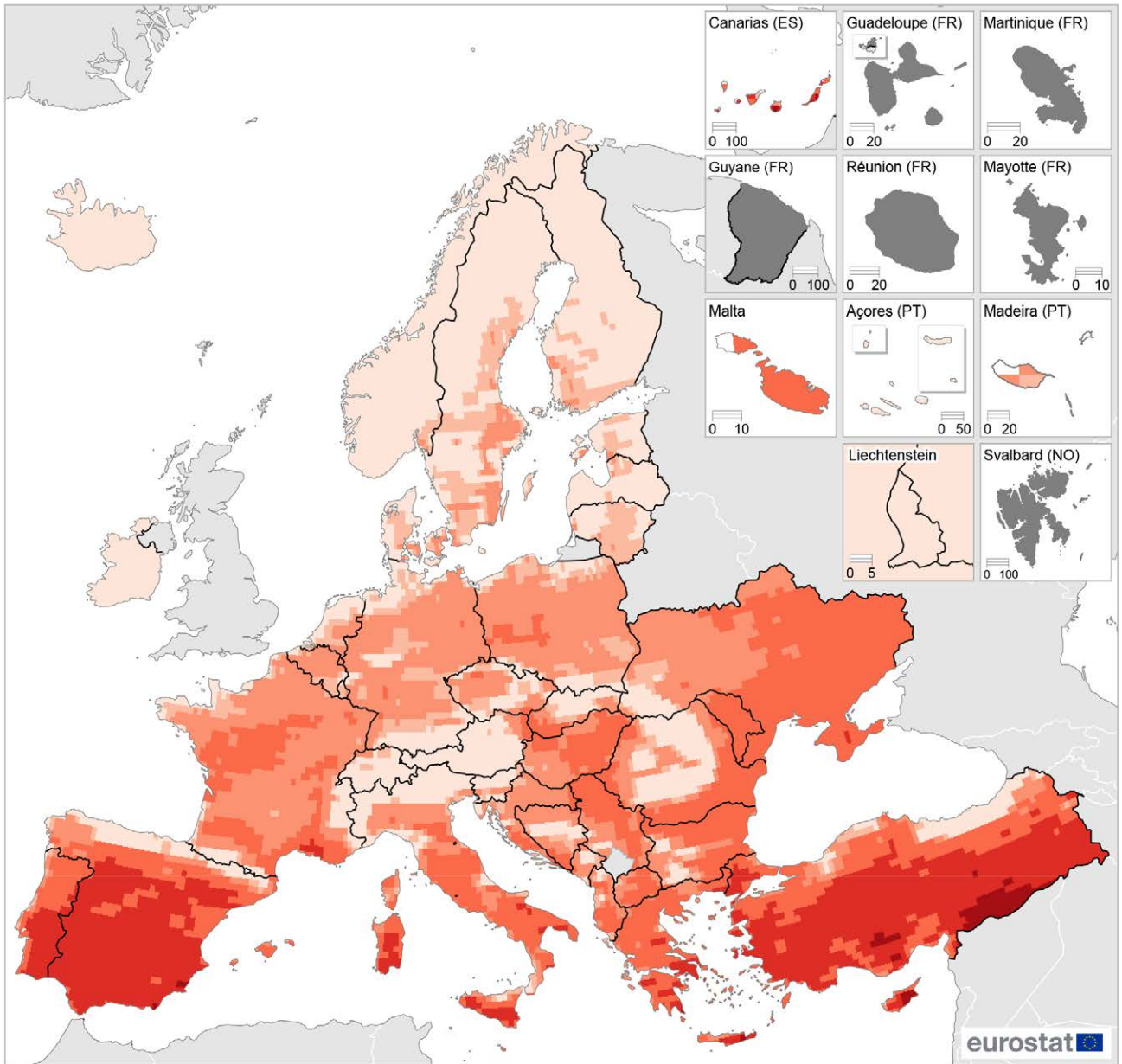
- EU = 255.0
- ≥ 500.0
- 250.0 – < 500.0
- 100.0 – < 250.0
- 0.1 – < 100.0
- 0.0
- Burnt area in 2022, but no burnt area during 2008–2021
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 09/2023

Source: European Forest Fire Information System (EFFIS), Joint Research Centre



**Map 12.3:** Average annual number of days with high to extreme fire danger by weather, 2013–2022 (days)



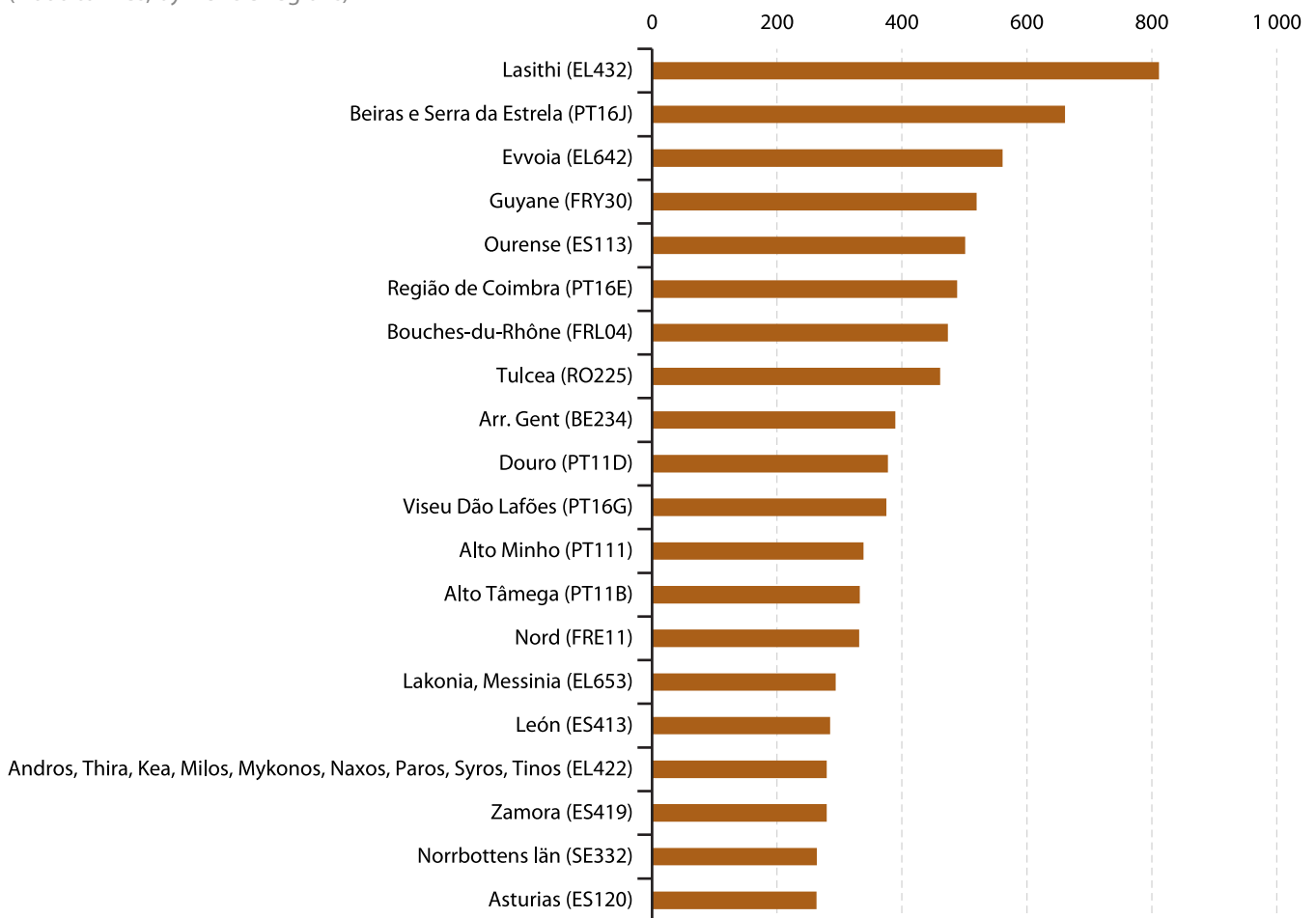
Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 09/2023

Note: the map provides information on the number days each year with high to extreme fire danger by weather, defined here as those days when the Fire Weather Index (FWI) is  $\geq 30$ .  
 Source: Joint Research Centre

The final part of this section looks at a related issue, namely, carbon dioxide emissions resulting from wildfires. This information is sourced from the European Forest Fire Information System (EFFIS). Emissions data for wildfires are derived from the Copernicus Atmosphere Monitoring Service, Global Fire Assimilation System, operated by the European Centre for Medium-Range Weather Forecast (ECMWF). It produces daily estimates of wildfire and biomass burning emissions by assimilating observations from the Terra and Aqua satellites. Note that the information presented excludes emissions produced by La Palma volcano during 2021 (as these emissions did not result from burnt biomass).

Figure 12.2 shows those NUTS level 3 regions with the highest annual carbon dioxide emissions due to wildfires. During the period 2013–2022, there were five EU regions that reported, on average, more than 500 000 tonnes of carbon dioxide emissions each year. Unsurprisingly, given the location of most wildfires, the highest quantities were predominantly recorded in southern EU Member States. A peak was observed in the southern Greek region of Lasithi (812 000 tonnes of carbon dioxide emissions due to wildfires), followed by Beiras e Serra da Estrela in Portugal, Evvoia in Greece, Guyane in France and Ourense in Spain.

**Figure 12.2: Average annual carbon dioxide emissions due to wildfires, 2013–2022**  
(1 000 tonnes, by NUTS 3 regions)



Note: excluding emissions produced by La Palma volcano during 2021, as these emissions were not resulting from burnt biomass. Several regions are not available (too many to document): 15 regions in Germany, two regions in Greece and one region in France.

Source: European Forest Fire Information System (EFFIS), Joint Research Centre

## Air pollution

Air pollution harms both human health and the environment. It concerns the release into or the presence in the air of pollutants (particles or gases). Human-induced activities can lead to a considerable deterioration in air quality, for example, through industrial processes (including electricity generation), the burning of any solid fuel – whether of fossil or biogenic origin – transport, agriculture and the generation or treatment of waste. Naturally occurring air pollution can result, among other sources, from volcanic eruptions, desert dust or forest fires.

Fine particulate matter covers particles with a diameter of 2.5 micrometres or less (otherwise referred to as PM<sub>2.5</sub>). The WHO established new [global air quality guidelines](#) to protect public health in September 2021: 5 µg/m<sup>3</sup> for PM<sub>2.5</sub>, measured as an annual mean, reflecting new scientific evidence showing that air pollution harms human health even at relatively low concentrations.

Air pollution can cause serious illnesses as fine particulate matter can be carried deep into the lungs where it can cause inflammation. Some of the most common causes of premature death attributed to air pollution include heart disease, stroke, lung disease, lung cancer, and asthma; note these illnesses also have an associated economic cost through lost working days and healthcare expenditure.

While air quality in the EU has generally improved in recent decades, some urban populations remain exposed to high concentrations of air pollutants, for example, as a result of residential combustion, industrial and transport activities. An increasingly ageing and urbanised European population counteracts some of the health gains associated with reductions in ambient air pollution concentrations. Firstly, older people and children are more sensitive to air pollution. Secondly, a higher rate of urbanisation typically means that more people are exposed to PM<sub>2.5</sub> concentrations, which tend to be higher in cities.

The EEA estimates that across the EU around 238 000 premature deaths can be attributed to fine particulate matter in 2020. To tackle air pollution and achieve the EU's zero pollution vision for 2050, the European Commission has set an intermediate target to reduce premature deaths from exposure to air pollution by at least 55 % by 2030 (as compared with 2005) and has proposed a [revision](#) (COM(2022) 542 final) of its air quality standards to align them more closely with the recommendations of the WHO.

Unsurprisingly, the highest absolute counts of premature deaths associated with fine particulate matter were often observed in some of the most populous (predominantly urban) NUTS level 3 regions; many of these were located in southern and south-eastern EU Member States. In each of these, anthropogenic emissions, meteorological and other

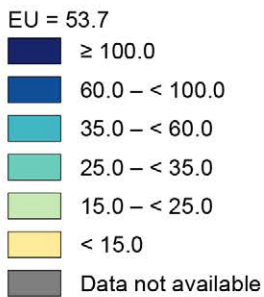
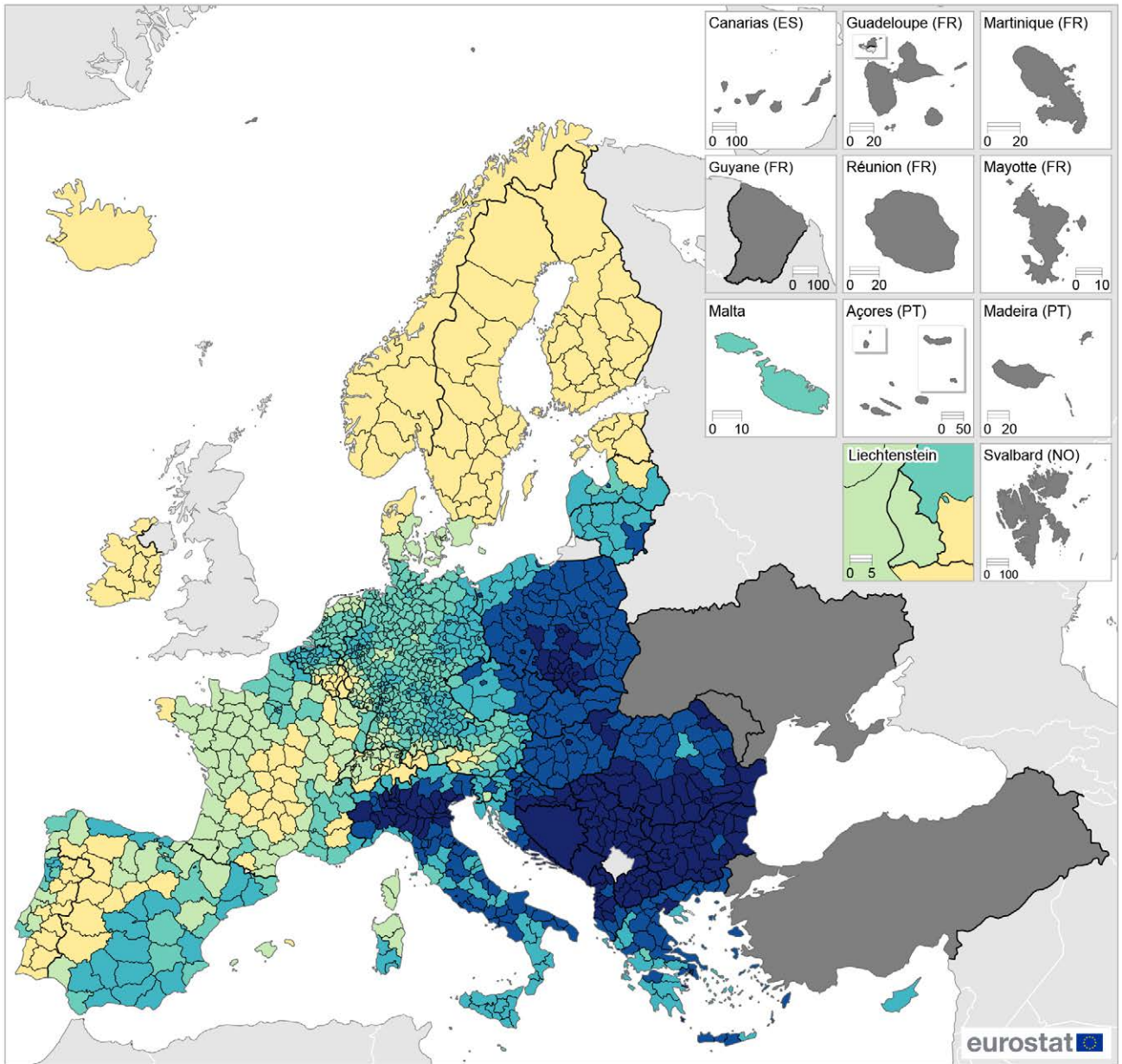
conditions (such as orography) favour the accumulation of air pollutants in the atmosphere. In 2020, the highest number of premature deaths attributed to fine particulate matter was recorded in the northern Italian region of Milano (4 537), followed – at some distance – by Barcelona in Spain (3 320) and two more Italian regions – Roma (3 309) and Torino (3 163). There were relatively few regions at the upper end of the distribution, with only five more regions where 2 000–3 000 premature deaths were attributed to air pollution. Four of these were capital regions – Bucureşti in Romania, Sofia (stolitsa) in Bulgaria, Madrid in Spain and Miasto Warszawa in Poland – the other region in this group was Napoli in Italy.

In 2020, the number of premature deaths attributed to exposure to fine particulate matter averaged 53.7 per 100 000 inhabitant across the EU. The regional distribution was skewed: of the 1 152 NUTS level 3 regions for which data are available (no information for Canarias in Spain, the French outermost regions, or the Portuguese Regiões Autónomas da Madeira e dos Açores), there were 825 – or 71.6 % of all regions – where the number of premature deaths attributable to air pollution per 100 000 inhabitants was below the EU average.

While the absolute number of premature deaths attributed to exposure to fine particulate matter was highest in some of the most populous NUTS level 3 regions of the EU, the most significant impacts of air pollution when normalised by population were generally observed in eastern EU Member States. When expressed per 100 000 inhabitants, Sofia (stolitsa) and Vidin in Bulgaria were the only regions to record a rate of more than 200 premature deaths in 2020. There were 19 regions where the number of premature deaths per 100 000 inhabitants was within the range of 150–176: this group included eight additional regions located in Bulgaria, as well as four in Romania, three in Poland and two from each of Italy and Croatia. Extending the analysis, there were 113 NUTS level 3 regions across the EU where the number of premature deaths attributable to air pollution was at least 100.0 per 100 000 inhabitants (these regions are shown in the darkest shade of blue in Map 12.4).

At the other end of the range, there were 116 NUTS level 3 regions where the number of premature deaths attributed to exposure to fine particulate matter was less than 15.0 per 100 000 inhabitants in 2020 (as shown by the yellow shade). This group – where air pollution had a very low impact on human health – included every region of Finland and (20 out of 21) regions in Sweden (Hallands län was the exception). At the bottom end of the distribution, there were 32 regions with rates that were less than 1.0 premature death per 100 000 inhabitants; this group was principally composed of regions located in Finland and Sweden, with the Portuguese regions of Alto Alentejo and Beiras e Serra da Estrela the only exceptions.

**Map 12.4: Premature deaths attributed to exposure to fine particulate matter (PM<sub>2.5</sub>), 2020**  
(per 100 000 inhabitants, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 08/2023

Note: Bosnia and Herzegovina, national data.  
Source: European Environment Agency (EEA)



## Energy

In recent decades, changes in the weather and better insulated housing have modified the demand for heating and cooling. While warmer temperatures reduce the need for heating in winter, very hot summers lead to greater use of air conditioning, especially in southern Europe and increasingly in south-eastern Europe. Heating and cooling degree days are indices based on the weather: they are designed to describe heating/cooling energy requirements in buildings. The indices are derived from meteorological observations of air temperature, interpolated to regular grids at 25 km resolution. The results are subsequently aggregated to a regional level, based on the NUTS classification. Heating degree days are evaluated when the daily mean air temperature is equal to or below 15°C, while cooling degree days are evaluated when the daily mean air temperature is equal to or above 24°C.

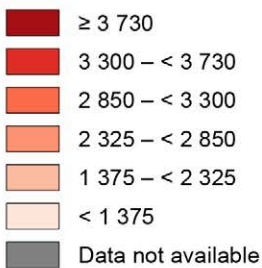
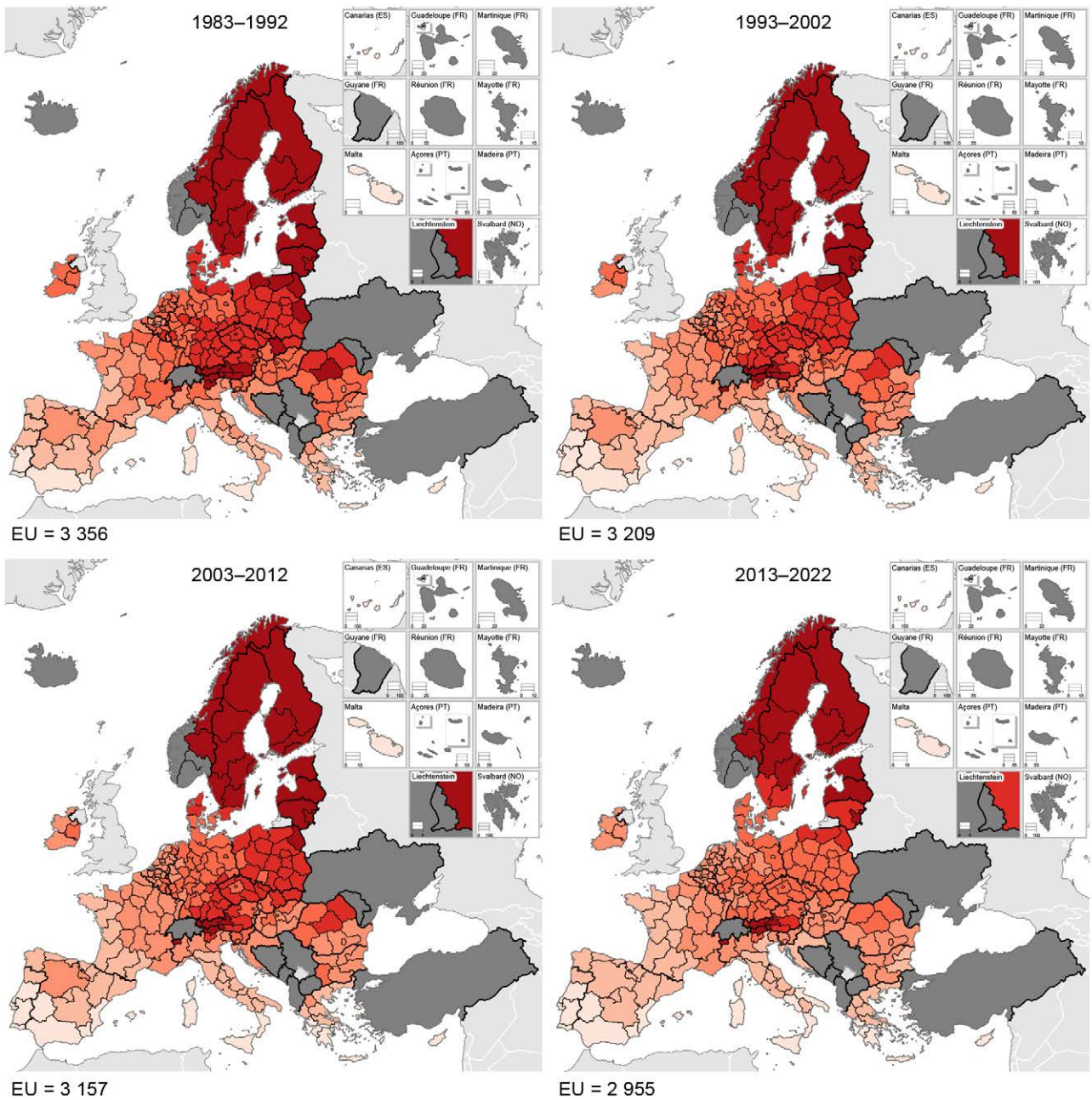
Heating degree days have decreased over time: across the EU, values fell overall by 14 % between 1982 and 2022. By contrast, cooling degree days in 2022 were almost three times as high in 2022 (140 degree days) as they were in 1982 (48 degree days), suggesting that the demand for air conditioning increased at a rapid pace. As may be expected the highest numbers of heating degree days were recorded in northern regions of the EU, while the highest numbers of cooling degree days were recorded in southern regions of the EU. In 2022, the peak values across NUTS level 2 regions were recorded in:

- Övre Norrland and Mellersta Norrland in northern Sweden and Pohjois- ja Itä-Suomi in Finland for heating degree days;
- Malta, Cyprus and Extremadura in Spain for cooling degree days.

Map 12.5 provides an analysis of developments for heating degree days during the period 1983–2022. It is split into four separate parts to show developments over recent decades, with the number of heating degree days falling in every NUTS level 2 region during this period. The largest reductions between 1983 and 2022 were recorded in southern EU Member States (Greece, Spain, Italy, Cyprus, Malta and Portugal). The number of heating degree days fell overall by more than 30.0 % in Canarias, Ciudad de Ceuta, Illes Balears and Andalucía (all in Spain), as well as Área Metropolitana de Lisboa and Algarve (both in Portugal).

Map 12.6 shows a similar analysis for the development of cooling degree days (again for the period 1983–2022). The largest relative increases in cooling degree days between 1983 and 2022 were recorded in Vidurio ir vakarų Lietuvos regionas (Lithuania); Latvia (a single region at this level of detail) and three regions located in Poland – Pomorskie, Świętokrzyskie and Lubelskie; in all five regions, the overall number of cooling degree days remained relatively low. In absolute terms, the number of cooling degree days increased by a very large margin – more than 300 additional cooling degree days across six regions of Spain, five regions in each of Greece and Italy, as well as Cyprus and Malta (both single regions at this level of detail). The highest increases were recorded in Illes Balears (Spain) and Ionia Nisia (Greece), where the number of cooling degree days increased by more than 400 during the period under consideration.

**Map 12.5:** Average annual number of heating degree days, 1983–2022  
(by NUTS 2 regions)

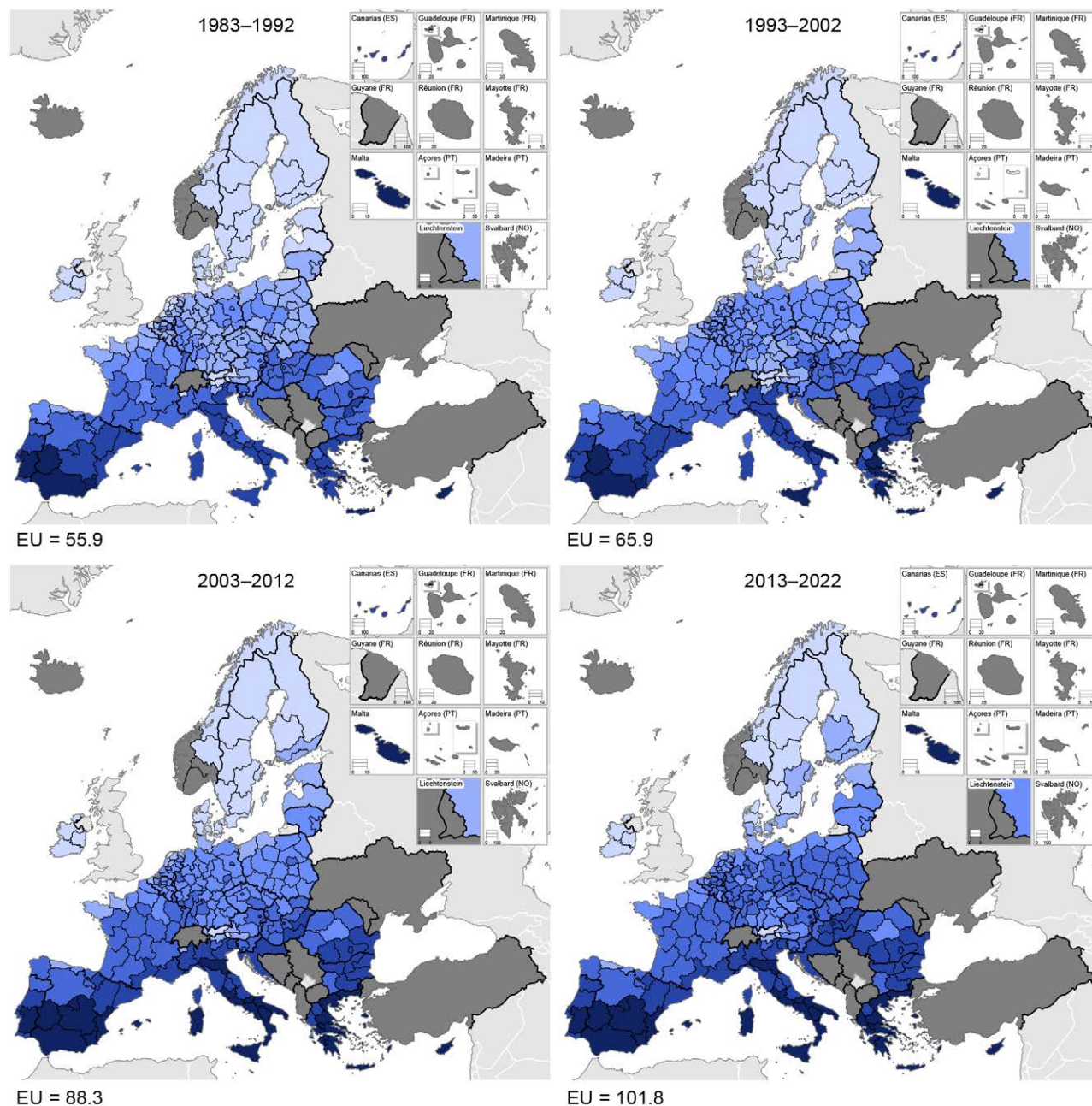


Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 09/2023

Note: only days with a daily mean air temperature equal to or below 15°C are considered. Croatia: national data.  
Source: Eurostat (online data code: nrg\_chddr2\_a)



**Map 12.6:** Average annual number of cooling degree days, 1983–2022 (by NUTS 2 regions)



- $\geq 250.0$
- 100.0 – < 250.0
- 25.0 – < 100.0
- 10.0 – < 25.0
- 2.5 – < 10.0
- < 2.5
- Data not available

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Note: only days with a daily mean air temperature equal to or above 24°C are considered. Croatia: national data.  
Source: Eurostat (online data code: nrg\_chddr2\_a)



## 13. Agriculture

In 2020, there were approximately 9.1 million farms in the [European Union \(EU\)](#). Together, they used 1.55 million km<sup>2</sup> of land, almost two fifths (37.8 %) of the EU's total land area. These headline figures underline the important impact that farming can have on natural environments, natural resources and wildlife. Indeed, farm managers within the EU are increasingly being encouraged to manage the countryside as a public good, so that the whole of society may benefit.

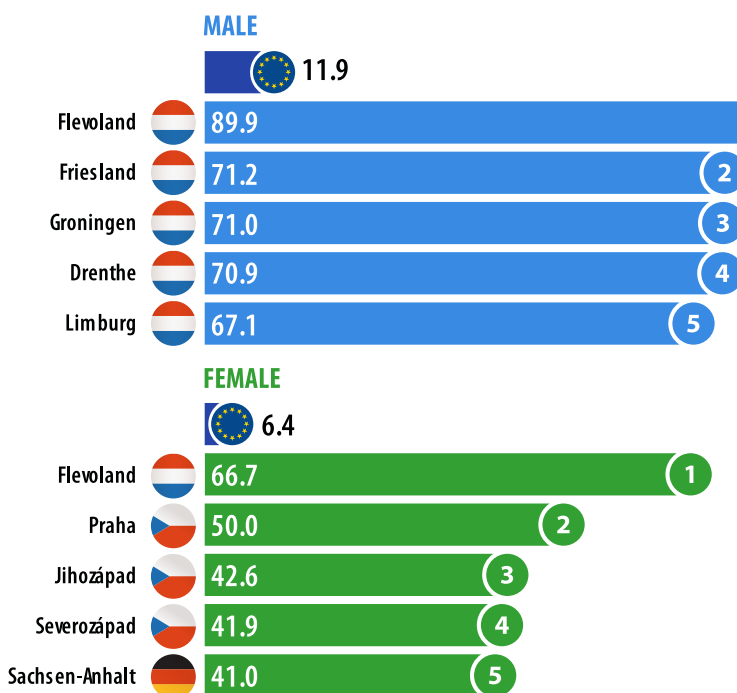
Farms in the EU fulfil a vital role in providing safe and affordable food. Agricultural products, food and culinary traditions are a major part of the EU's regional and cultural identity. This is, at least in part, due to a diverse range of natural environments, climates and farming practices that feed through into a wide array of agricultural products.

From a statistical perspective, this edition of the *Eurostat Regional Yearbook* marks a milestone insofar as it publishes data from the latest [agricultural census](#). Every 10 years, in accordance with the [Food and Agriculture Organization of the United Nations \(FAO\)](#), EU Member States carry out an agricultural census. The latest of these was conducted in 2020/2021. It covers approximately 300 variables, with the information collected spanning a broad range of topics, including:

general characteristics of the farm and the farm manager; land use and livestock; the agricultural labour force; animal housing and manure management; and support measures for rural development. Data from the census may help frame policy debates, answering questions such as:

- Who will farm in the future given the large share of older farm managers?
- How many women are farming?
- Is agriculture becoming dominated by big business?
- Is organic farming expanding?

It is important to note that the agricultural census took place during the COVID-19 crisis. While this had a direct impact on various aspects of data collection (for example, the preparation and running of data collection instruments or the selection of human resources to carry out the census), many statistical offices rapidly adapted their working practices to make use of alternative methods (telephone or online surveys; additional use of administrative sources). While these changes undoubtedly brought benefits and ensured the census was conducted according to schedule, they may have impacted on the quality of results when compared with 'normal' circumstances (for example, due to lower response rates or more room



Which EU regions had the highest shares of male/female farm managers with full agricultural training?



(% of male/female farm managers, 2020, by NUTS 2 regions)

Note: Ciudad de Ceuta (ES63) and Ciudad de Melilla (ES64), not available. Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest (BE10), Berlin (DE30), Bremen (DE50), Dytiki Makedonia (EL53), Malta (MT00) and Åland (FI20): not available for female farm managers.

Source: Eurostat (online data code: ef\_mp\_training)



for misunderstanding complex technical questions). Finally, the pandemic – as with practically all sectors of society – had a direct impact on the agricultural sector and farming communities. Given the vast majority of variables collected in an agricultural census refer to the structure of farms (rather than the annual output of crops and livestock), it is likely that COVID-19 had a relatively small impact on most of the results. Nevertheless, this is something to bear in mind when interpreting results from the 2020 census, in particular those for variables that are related to labour force or to other gainful activities.

Within the context of the 2023 European Year of Skills, the infographic above depicts EU regions with the highest proportions of female and male farm managers having undertaken full agricultural training. On average, some 6.4 % of female farm managers in the EU met this criterion, while a somewhat higher share was recorded for male farm managers (11.9 % had undertaken full training). An analysis of NUTS level 2 regions reveals that Flevoland in the Netherlands had the highest share of farm managers with full agricultural training. This was the case for female farm managers (two thirds or 66.7 % had undertaken full agricultural training) and for male farm managers (nine tenths or 89.9 % had undertaken full agricultural training).

The final chapter in this publication presents regional agricultural statistics. It focuses on three principal subjects:

- the [agricultural labour force](#), with a special focus on [farm managers](#) (analysed by sex and age);
- farms, analysed by size and by specialisation;
- the [economic accounts for agriculture](#) that provide information on the performance of agricultural activity, through the ratio of intermediate consumption to output and the share of total value added from agriculture in all economic activities across the EU economy.

## Farm managers and the agricultural labour force

In 2020, some 4.5 % of the EU's total employment – an estimated 9.4 million people – worked within the agriculture, forestry and fishing sector. The vast majority of these, 4.2 % of total employment, worked in agriculture. Data at the most detailed regional level (NUTS level 3 regions) are only available for the aggregate covering the whole of agriculture, forestry and fishing.

For many, working on a farm is a part-time or seasonal activity. These people – often family members of the holder – provide help during peak periods of activity that are generally linked to the harvest. As such, the

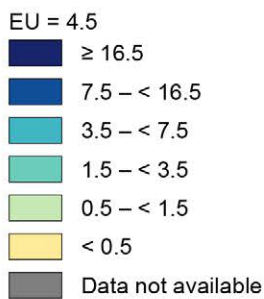
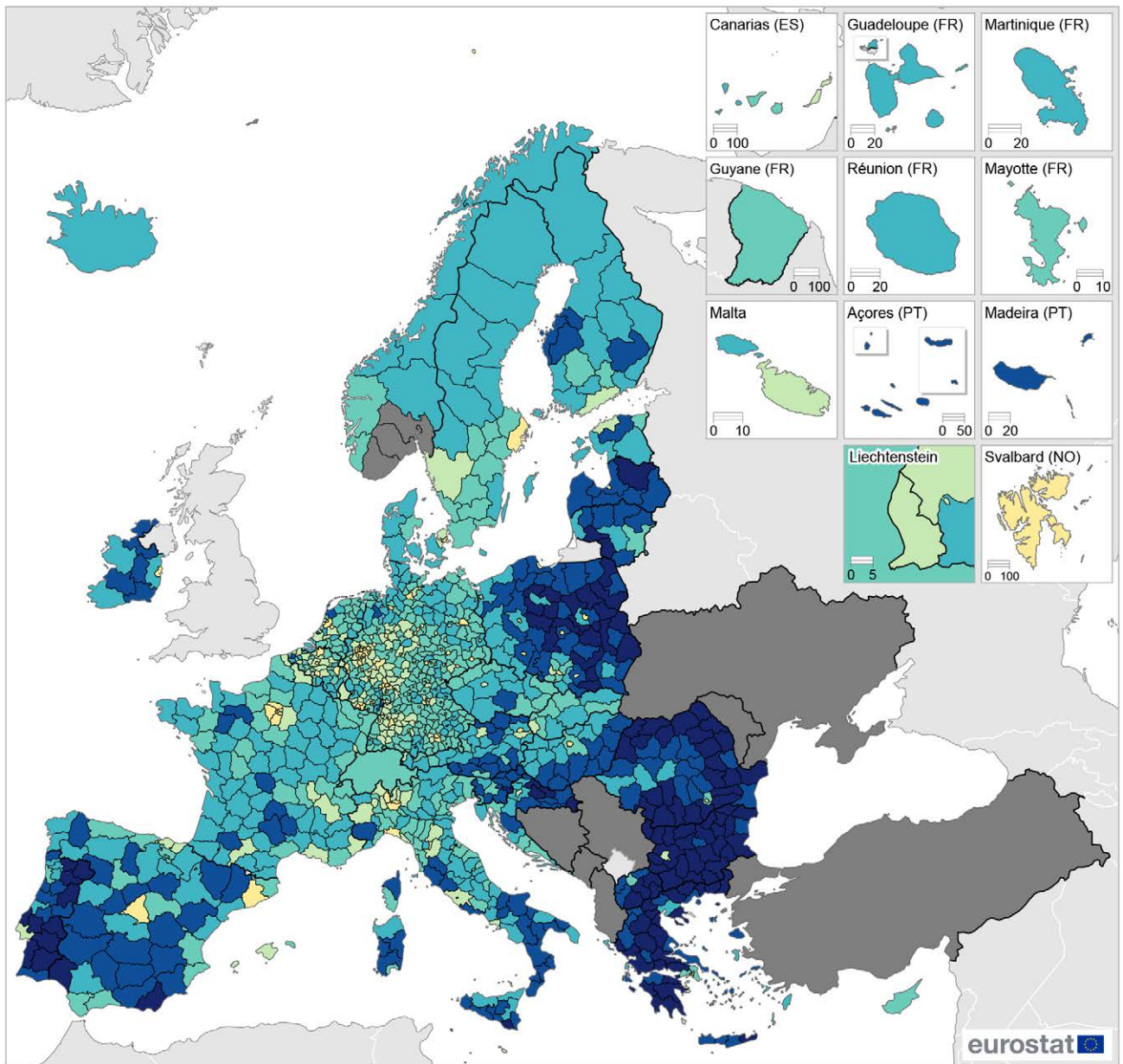
formal count of employment – based on the number of employees and self-employed persons – may be considerably lower than the total number of agricultural workers (which may include family members of the holder, part-time and seasonal workers, or casual labour).

Leaving aside these caveats, the agriculture, forestry and fishing sector was an important source of employment for a large number of regions across eastern and southern EU Member States; this was particularly the case in Bulgaria, Greece, Poland, Portugal and Romania (see Map 13.1). There were 114 NUTS level 3 regions where at least 16.5 % of people employed were working within the agriculture, forestry and fishing sector in 2020 (as shown by the darkest shade in the map). This group included all but three of the 28 regions in Bulgaria – the exceptions being the capital region of Sofia (stolitsa), Varna and Gabrovo. It also included a large concentration of regions in neighbouring Romania, where 24 out of 42 regions reported at least 16.5 % of total employment in the agriculture, forestry and fishing sector. A closer analysis reveals there were several regions in Romania where agriculture, forestry and fishing provided work to almost half of the workforce, with this share reaching a peak in the eastern regions of Neamţ (51.4 %) and Vaslui (61.7 %); these were the only NUTS level 3 regions to report that more than half of employed persons worked in the agriculture, forestry and fishing sector.

In absolute terms, the highest regional counts for persons employed within the agriculture, forestry and fishing sector were principally located in Romania. There were five NUTS level 3 regions in eastern Romania where upwards of 100 000 persons were employed in this sector – the only regions in the EU above this level, peaking at 146 200 persons in Iași. Sandomiersko-jędrzejowski (south-east Poland) and Almería (southern Spain) were the only regions outside of Romania to feature among the 10 NUTS level 3 regions with the highest employment counts within the agriculture, forestry and fishing sector. Almería is characterised by intensive agriculture: it has the highest concentration of greenhouses in the world, primarily growing out-of-season vegetables with hydroponic technology.

The regional distribution of employment within the agriculture, forestry and fishing sector was relatively skewed insofar as more than three fifths of NUTS level 3 regions – or 706 out of 1 166 regions – reported a share below the EU average. At the bottom end of the range, there were 137 regions in 2020 where less than 0.5 % of the total number of persons employed were working in the agriculture, forestry and fishing sector. They included 13 predominantly urban regions where the share was 0.0 %, including the capital regions of Belgium, Denmark and Germany, as well as three regions within close proximity of the French capital.

**Map 13.1: Employment in agriculture, forestry and fishing, 2020**  
 (% of total employment, by NUTS 3 regions)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 04/2023

Note: Iceland and Switzerland, national data. Liechtenstein: 2019.  
 Source: Eurostat (online data codes: [nama\\_10r\\_3empers](#) and [nama\\_10\\_a64\\_e](#))

## FARM MANAGERS

Farm managers are the people responsible for the normal daily financial and production routines of running a farm, such as what and how much to plant or rear and what labour, materials and equipment to employ. Often the farm manager is also the owner (otherwise referred to as the 'holder') of the farm but this need not be the case, especially when the farm has a separate legal identity.

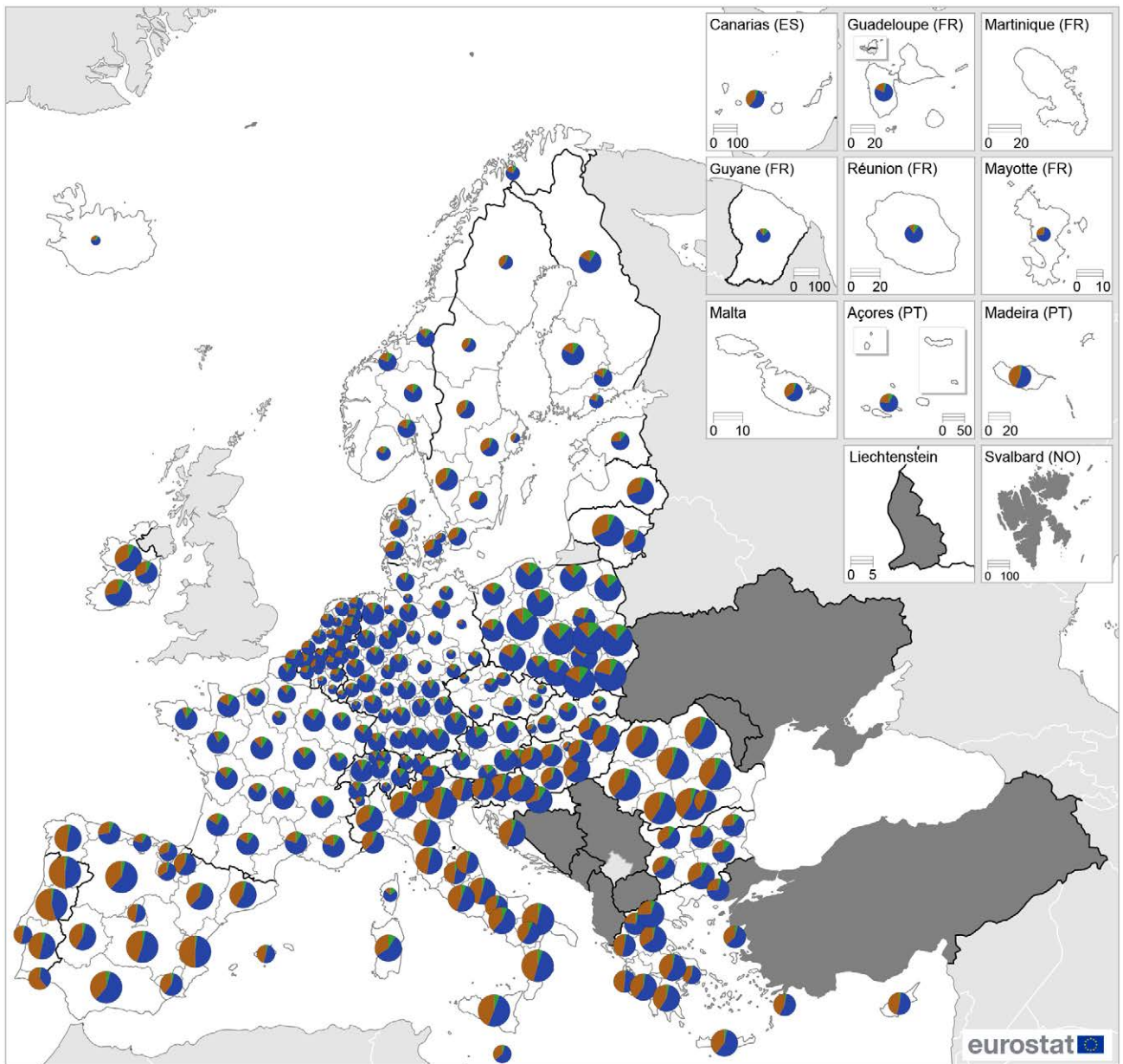
The vast majority of farms in the EU are small, semi-subsistence farms. Often the farm managers of these agricultural holdings continue to work part-time long after the normal retirement age, to provide in part for their own needs. Some older farm managers may face difficulties in encouraging younger generations to take over family farms, as they may have negative perceptions concerning careers in agriculture and prefer to look elsewhere for work in other sectors. As a result, the agriculture sector is characterised by slow generational renewal and a relatively high average age of farm managers; these characteristics are widespread across most EU Member States.

### ***Some 6.5 % of farm managers in the EU were aged less than 35 years***

Access to finance, land, capital and knowledge are particular concerns for many young people considering working in agriculture. With this in mind, the EU is stepping up its efforts to encourage younger people into farming, by providing help to get their business off the ground with start-up grants, income support and benefits such as additional training. Map 13.2 provides information on the number of farm managers across NUTS level 2 regions, detailing the share of farm managers for three broad age groups. In 2020, 6.5 % of farm managers in the EU were young farmers – defined here as those under the age of 35 years. By contrast, approximately one third (33.2 %) of farm managers were at least 65 years of age.

The highest proportions of young farm managers were recorded in regions across France, Austria and Poland. In 2020, the French island region of Corse had the highest share, with 14.5 % of its farm managers under the age of 35; it was closely followed by Oberösterreich in northern Austria (14.4 %). At the other end of the scale, there were three regions in Portugal – Algarve, Centro and Norte – where more than half of all farm managers were aged 65 years or over; the highest share was observed in Algarve (60.7 %). Comunitat Valenciana in Spain was the only other region in the EU to record a majority (50.1 %) of its farm managers aged 65 years or over.

**Map 13.2: Farm managers, 2020**  
(by NUTS 2 regions)



Farm managers  
(% of all farm managers)

- < 35 years
- 35–64 years
- ≥ 65 years
- Data not available

Number of farm managers  
EU = 9 067 300

- ≥ 81 250
- 37 000 – < 81 250
- 12 750 – < 37 000
- 5 250 – < 12 750
- 2 500 – < 5 250
- < 2 500

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat — GISCO, 05/2023

Source: Eurostat (online data code: ef\_m\_farmang)



### FARM MANAGERS WITH FULL AGRICULTURAL TRAINING

Agricultural holdings take many different forms across the EU: from large-scale, intensive farms that cover large swathes of land to very small, semi-subsistence holdings. There is often a difference in the ownership and management of these different types of farm: the former may be owned by large enterprises that install professionally-trained managers, whereas the latter are more likely to be family-owned and run.

Generational renewal among farm managers has become a crucial issue. It is often compounded by labour shortages in the wider farm labour force that are increasingly apparent at harvest time across many regions of the EU. A new generation of farm managers may be expected to have the necessary skills to: produce more efficiently, while protecting the environment; contribute to efforts related to climate change; meet society's demands regarding healthy, balanced diets and animal welfare; keep up with increasingly rapid scientific and technological progress. With a more qualified workforce, the agriculture sector may be in a position to increase its productivity and income-generating capabilities. To do so, some farm managers and members of the wider farm labour force will likely need to increase their skill levels, for example learning how to use emerging digital technologies, becoming data analysts, or rural innovators.

A farm manager is considered to have full agricultural training if they have taken and completed a training course for the equivalent of at least two years full-time training after the end of compulsory education. The course – in agriculture, horticulture, viticulture, silviculture, pisciculture, veterinary science, agricultural technology or an associated subject – should be at an agricultural college, university or other institute of higher education. The common agricultural policy places strong emphasis on knowledge sharing and

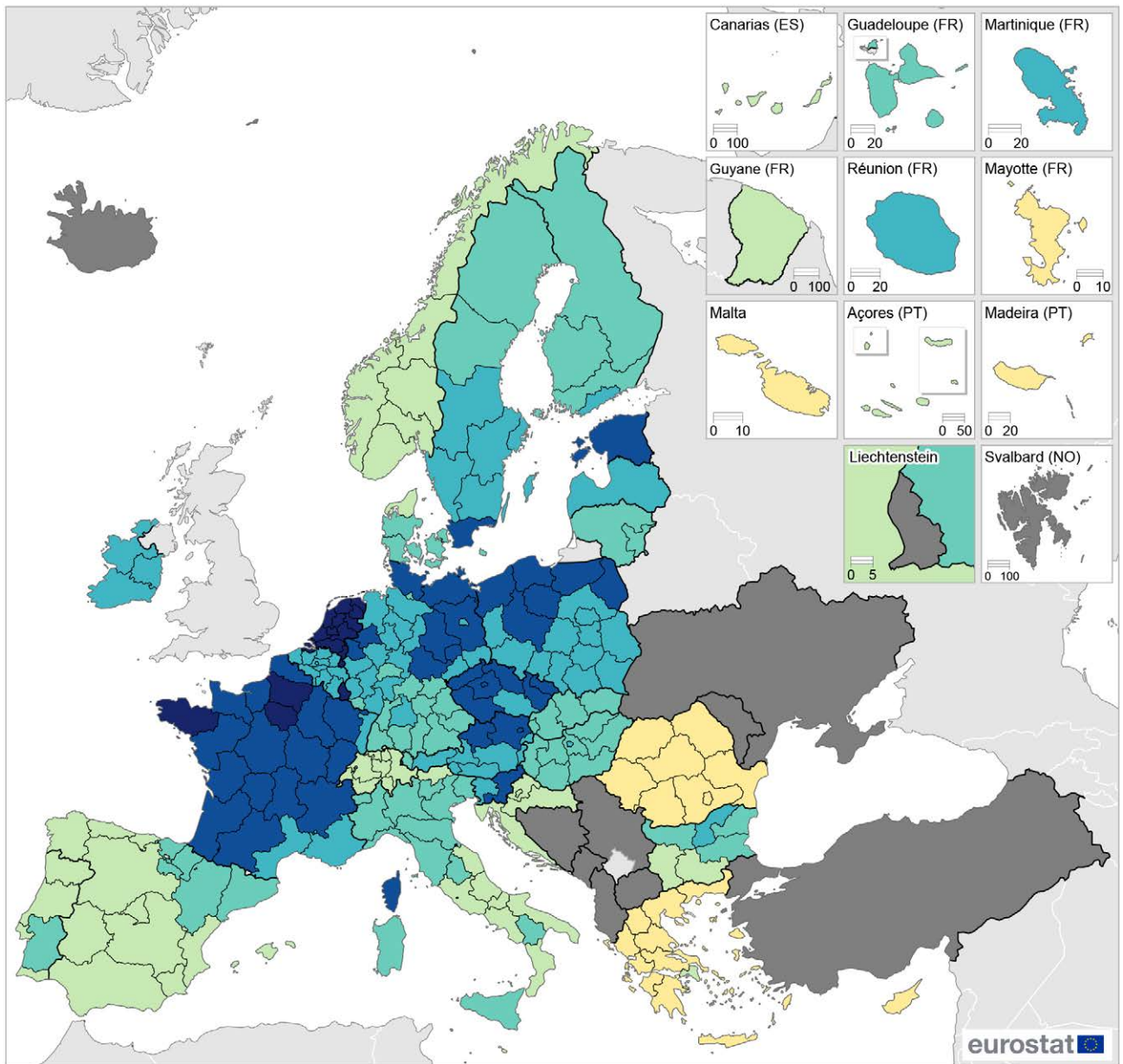
innovation. It provides for specific measures to help farm managers access advice and training throughout their working lives. Support is also provided for innovation via the European innovation partnership network.

In 2020, some 923 000 (or 10.2 %) of the EU's 9.1 million farm managers had received full agricultural training. By contrast, 17.5 % had followed a basic level of training, with an overwhelming majority (72.4 %) relying on practical experience. A more detailed analysis for NUTS level 2 regions shows there were substantial regional variations in the share of farm managers with full agricultural training. More than half of all farm managers had received full agricultural training across every region of Luxembourg and the Netherlands. By contrast, this share was no higher than 1.5 % for every region of Greece and Romania.

There were 16 NUTS level 2 regions across the EU where at least 50.0 % of farm managers had received full agricultural training in 2020 (as shown by the darkest shade in Map 13.3). The highest regional share (89.1 %) was recorded in the Dutch region of Flevoland; there were also particularly high shares recorded in three other regions from the (north of the) Netherlands – Friesland, Groningen and Drenthe. The rest of this group was composed of the eight remaining regions in the Netherlands, Luxembourg, as well as three regions in France – Bretagne, Picardie and Ile-de-France.

At the other end of the scale, there were 24 NUTS level 2 regions where fewer than 1.5 % of farm managers in 2020 had received full agricultural training (as shown by the lightest shade in Map 13.3). This group included: all eight regions of Romania; 12 out of the 13 regions in Greece (the exception being the capital of Attiki; with a share that was narrowly higher, at 1.5 %); four island regions, namely, Região Autónoma da Madeira (Portugal), Mayotte (France), Cyprus and Malta.

**Map 13.3: Farm managers with full agricultural training, 2020**  
 (% of all farm managers, by NUTS 2 regions)



- EU = 10.2
- ≥ 50.0
  - 30.0 – < 50.0
  - 15.0 – < 30.0
  - 6.5 – < 15.0
  - 1.5 – < 6.5
  - < 1.5
  - Data not available

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 Cartography: Eurostat — GISCO, 04/2023

Source: Eurostat (online data code: ef\_mp\_training)

## Farms

### ***Close to one third of all the EU's farms were located in Romania***

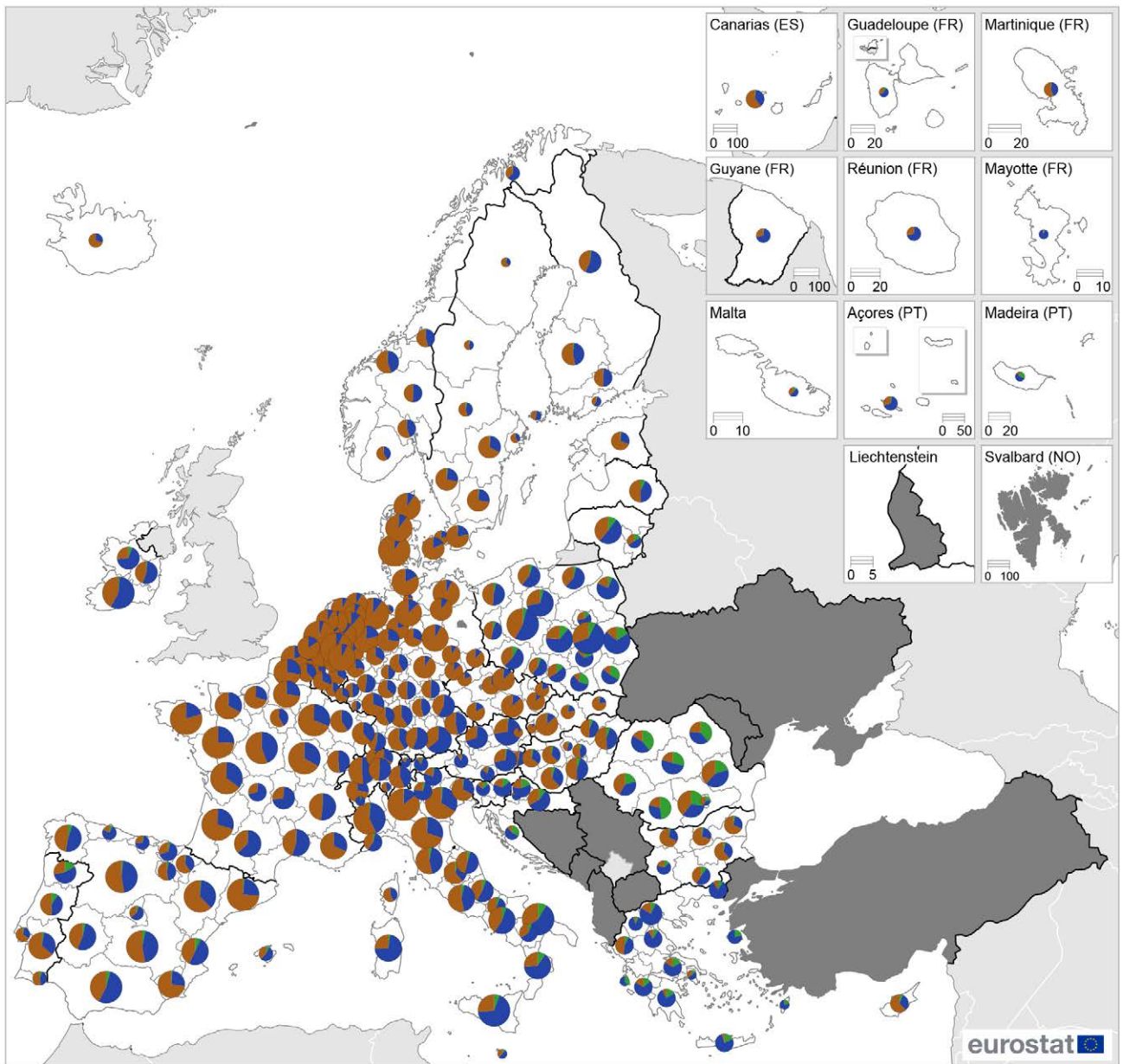
In 2020, there were 9.1 million agricultural holdings in the EU. Romania had, by far, the largest number of farms among EU Member States, at 2.9 million; it accounted for almost one third (31.8 %) of the total number of farms in the EU. This share was more than twice the share recorded in Poland (14.4 % of the EU total), while there were also double-digit shares in Italy (12.5 %) and Spain (10.1 %). These figures underline the structural differences in agricultural holdings, with small, semi-subsistence and family farms predominating, particularly in eastern and southern Member States.

**Standard output** is an economic measure, defined as the average value of agricultural output at farm-gate prices. In 2020, 5.9 million farms in the EU had a standard output that was below €8 000, accounting for almost two thirds (65.6 %) of all farms. Almost one third of EU farms (2.8 million or 31.2 %) had a standard output within the range of €8 000–€250 000. By contrast, there were relatively few (294 200) farms with a standard output of at least €250 000; they accounted for 3.2 % of the total number of farms in the EU.

The size of each circle in Map 13.4 is related to the standard output of each NUTS level 2 region. In 2020, Andalucía in southern Spain had the highest level of standard output, at €11.2 billion. It was followed by the northern Italian region of Lombardia (€9.4 billion) and the western French region of Bretagne (€7.5 billion). There were 25 regions within the EU that had a standard output of at least €3.4 billion – as shown by the largest circles in the map. These were principally located in France (seven regions), Italy (six regions) and Spain (five regions), with two regions from each of the Netherlands and Poland, and single regions from each of Denmark, Germany and Ireland.

Map 13.4 provides an alternative analysis based on standard output. In 2020, the relatively small number of large farms – with a standard output of at least €250 000 – accounted for almost three fifths (58.6 %) of the EU's total agricultural output. This pattern was repeated in a majority of EU regions, as a relatively small number of large farms often accounted for more than half of each region's agricultural output (as shown by the brown pie slices). At the other end of the scale, the high number of small farms – with a standard output of less than €8 000 – together accounted for just 3.7 % of the EU's total agricultural output. It should be noted that these small (often semi-subsistence) farms can play a key role in reducing the risk of rural poverty, for example, providing food and additional sources of income to farming families.

**Map 13.4: Economic size of farms, 2020**  
(by NUTS 2 regions)



Standard output by economic size of farm (% of all farms)

- < €8 000
- €8 000 – < €250 000
- ≥ €250 000
- Data not available

Standard output of farms (€ million)  
EU = 359 767

- ≥ 3 400
- 2 000 – < 3 400
- 950 – < 2 000
- 450 – < 950
- 175 – < 450
- < 175

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Cartography: Eurostat — GISCO, 06/2023

Source: Eurostat (online data code: ef\_m\_farmleg)



### **Almost three fifths of the EU's farms were specialist crop farms**

Historically, small family-run farms were largely diversified units with a mix of livestock, fruit, vegetables and other crops. With the introduction of machinery and equipment, there was a general move towards greater specialisation, with an increasing number of hectares being farmed in an efficient manner to provide food for rapidly expanding populations, with a particular focus on maximising yields. Farm managers continue to use their knowledge of the climate and agronomic factors (like the soil), among others, to determine what to grow or what animals to rear, increasingly assisted by information and communication technologies. While this lends itself to a certain concentration of dominant farm types, greater emphasis has been placed on farm owners as custodians of the countryside and sustainability. The sustainable development of agriculture aims to optimise yields and farm income, while minimising resource consumption and environmental impact (for example, improving the quality of soils or water, or increasing biodiversity). Farm managers today increasingly explore alternative production methods and a range of other gainful activities, such as forestry, tourism, or environmental services.

A *farm typology* may be created from the classification of agricultural holdings based on their standard output, calculated for each crop and animal. Farm specialisation describes those holdings that have a single dominant activity: an agricultural holding is said to be specialised when a particular activity provides at least two thirds of its production. Farm diversification is the opposite: it refers to a situation when an agricultural holding gains income from diverse activities. At its most simple level, this typology may be used to identify the following general types of farm<sup>1</sup>:

- agricultural holdings where crop production is the dominant activity – crop specialists;
- agricultural holdings where livestock production is the dominant activity – livestock specialists;
- agricultural holdings where neither crop nor livestock production is the dominant activity – mixed farms.

In 2020, almost three fifths (58.2 %) of EU farms were categorised as specialist crop farms. The most common forms included: general field cropping (18.5 % of all

farms); specialist cereals, oilseed and protein crops (15.9 %); and specialist olives (8.9 %). Slightly more than one fifth (21.7 %) of the EU's farms were specialist livestock farms, with specialisation in dairying (5.2 %) and cattle-rearing and fattening (4.3 %) being the most common forms. Mixed farms, comprising farms with crops and livestock or various types of crops or various types of livestock, accounted for just under one fifth (19.3 %) of all farms in the EU. A small number of farms (0.8 % of the total) could not be classified because they are subsistent in nature or because they produce goods for which no standard output can be calculated.

Map 13.5 confirms that a majority of the farms in the EU were crop specialists. In 2020, there were 156 NUTS level 2 regions (out of 240 for which data are available) where crop specialists accounted for at least 50.0 % of all farms. By contrast, there were 37 regions where livestock specialists accounted for at least half of all farms and no regions where mixed farms did so.

A more detailed analysis reveals there were several NUTS level 2 regions in the EU where almost all (or indeed all) farms were classified as crop specialists in 2020. Several of these were capital regions characterised by very small agricultural sectors, often with a high degree of specialisation in horticulture. Leaving these aside, there were four regions in southern EU Member States where crop specialists accounted for more than 9 out of 10 farms (each of which had a relatively high number of farms that were specialist olive producers):

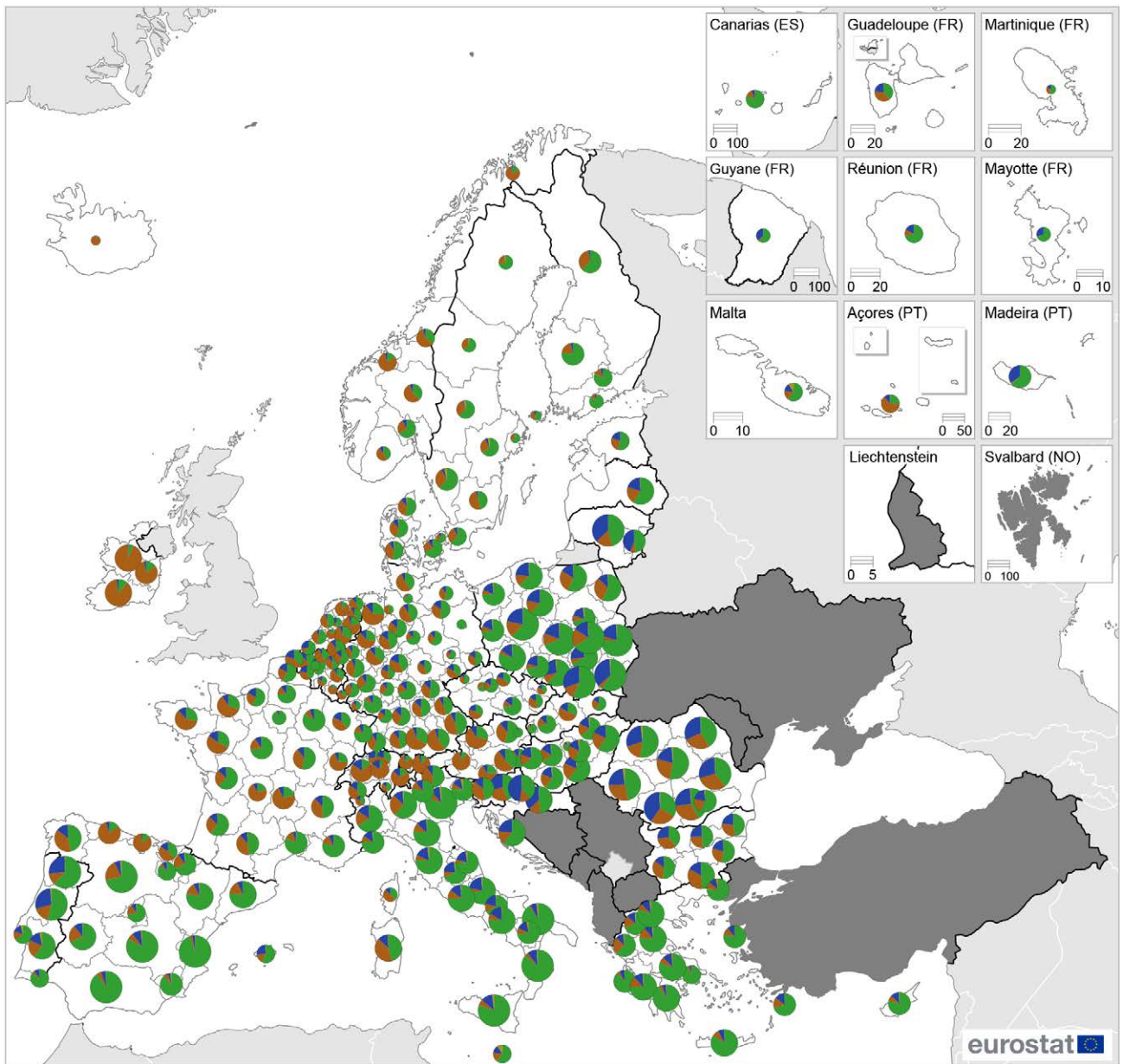
- Comunitat Valenciana and Andalucía in Spain;
- Peloponnisos in Greece; and
- Puglia in Italy.

Regions with a high share of livestock specialists are often characterised by a temperate climate and relatively high levels of rainfall (favouring the production of grassland/pasture). There were nine NUTS level 2 regions in the EU where livestock specialists accounted for at least four fifths of all farms in 2020:

- all three regions of Ireland;
- three Alpine regions in westernmost Austria – Salzburg, Tirol and Vorarlberg;
- Cantabria in north-west Spain;
- Friesland in the Netherlands; and
- Prov. Luxembourg in Belgium.

<sup>(1)</sup> These statistics may be further disaggregated, for example looking in more detail at crop specialists to identify those farms that specialise in cereals, root crops, field vegetables, permanent crops, fruit, horticulture and so on.

**Map 13.5: Farm specialisations, 2020**  
(by NUTS 2 regions)



Farm specialisation  
(% of all farms)

- Crop specialist
- Livestock specialist
- Mixed farming
- Non-classified farms
- Data not available

Number of farms  
EU = 9 067 300

- $\geq 81\ 400$
- $37\ 000 - < 81\ 400$
- $12\ 800 - < 37\ 000$
- $5\ 300 - < 12\ 800$
- $2\ 500 - < 5\ 300$
- $< 2\ 500$

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Cartography: Eurostat — GISCO, 08/2023

Source: Eurostat (online data code: ef\_m\_farmleg)

## Economic accounts for agriculture

The economic accounts for agriculture provide an overall picture of the performance of agricultural activity. The performance of farming matters as it is often the cornerstone of rural communities, upon which 'upstream' sectors (such as animal healthcare providers and wholesalers of agricultural inputs) and 'downstream' sectors (such as food processing, packaging and transport businesses) may depend.

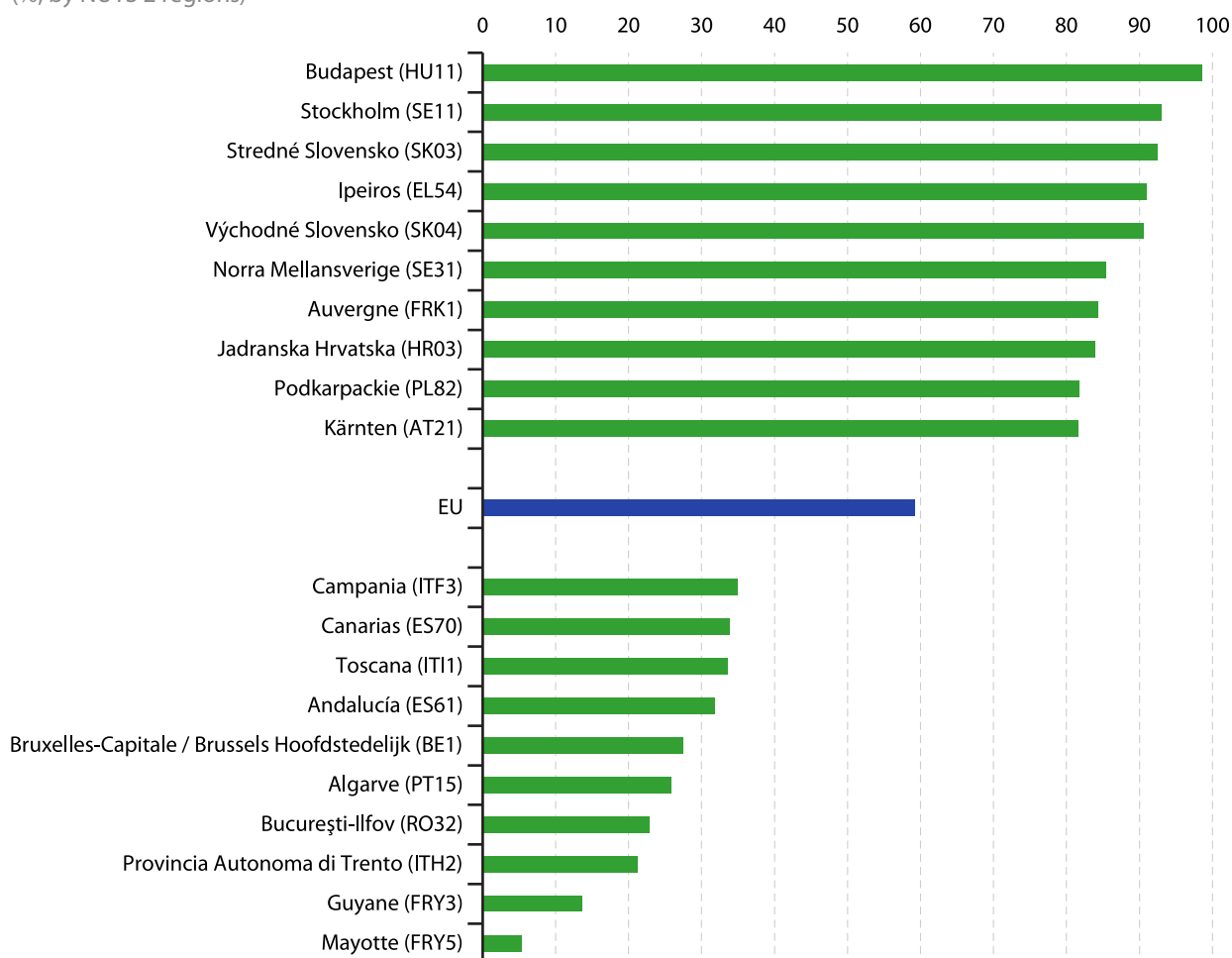
### INTERMEDIATE CONSUMPTION

At the start of the production process, agricultural holdings generally have to make purchases of goods and services that are used as inputs; among other products, they buy goods such as fuel, seeds, fertilisers,

plant protection products and animal feedingstuffs or services such as veterinary services. The expenditure on these non-labour inputs is termed 'intermediate consumption' expenditure. Across the EU, agricultural intermediate consumption was valued at €236.4 billion in 2020. This was equivalent to 59.2 % of the gross value of agricultural output.

Figure 13.1 shows the ratio of intermediate consumption to agricultural output, highlighting the 10 NUTS level 2 regions with the highest and lowest ratios. Excluding the atypical cases of the French outermost regions of Mayotte and Guyane, most of the regions with the lowest ratios of intermediate consumption to output in 2020 were located in southern EU Member States. The only exceptions were the Belgian and Romanian capital regions (where agriculture plays an inconsequential role in the local economy). The relatively low ratios observed for the southern regions shown in the bottom half of Figure 13.1 likely reflect

**Figure 13.1: Ratio of intermediate consumption to output in agriculture, 2020**  
(%, by NUTS 2 regions)



Note: the figure shows the EU regions with the lowest and highest shares. Belgium: NUTS level 1. Greece and Poland: 2018. Praha (CZ01), Estonia, Ciudad de Ceuta (ES63), Ciudad de Melilla (ES64), Cyprus, Latvia, Lithuania, Luxembourg, Malta, Warszawski stołeczny (PL91), Slovenia and Finland: not available.

Source: Eurostat (online data codes: agr\_r\_accts and aact\_eaa01)



the nature of their agricultural practices, with small (often semi-subsistence) farm holdings predominating, whereby farms operate with little capital and tend to be labour intensive. This group included Provincia Autonoma di Trento, Toscana and Campania (all in Italy), Andalucía and Canarias (both in Spain), as well as Algarve (in Portugal).

In 2020, the ratio of intermediate consumption to agricultural output peaked in the Hungarian and Swedish capital regions of Budapest (98.6 %) and Stockholm (93.0 %); as mentioned above, agriculture accounts for a tiny proportion of overall economic activity in most capital regions. The ratio of intermediate consumption to output was also very high in two Slovak regions – Stredné Slovensko (92.5 %) and Východné Slovensko (90.6 %) – while Ipeiros in Greece (91.0 %; 2018 data) was the only other region to record a ratio of more than 86 %.

### GROSS VALUE ADDED FROM AGRICULTURE

**Gross value added** is the difference between the value of output and intermediate consumption, adjusted for taxes less subsidies on products. In 2020, the gross value added of the EU's 9.1 million farms was €178.5 billion. To put this figure into context, it was equivalent to 1.5 % of total value added from all activities in the EU economy.

Agriculture's contribution to regional value added has been falling over a relatively lengthy period of time. That said, there were a number of rural regions across the EU where the economic importance of farming in 2020 was considerably higher than the EU average (see Map 13.6; note that data for Belgium relate to NUTS level 1 regions). These regions were usually located in southern and eastern regions of the EU and were often

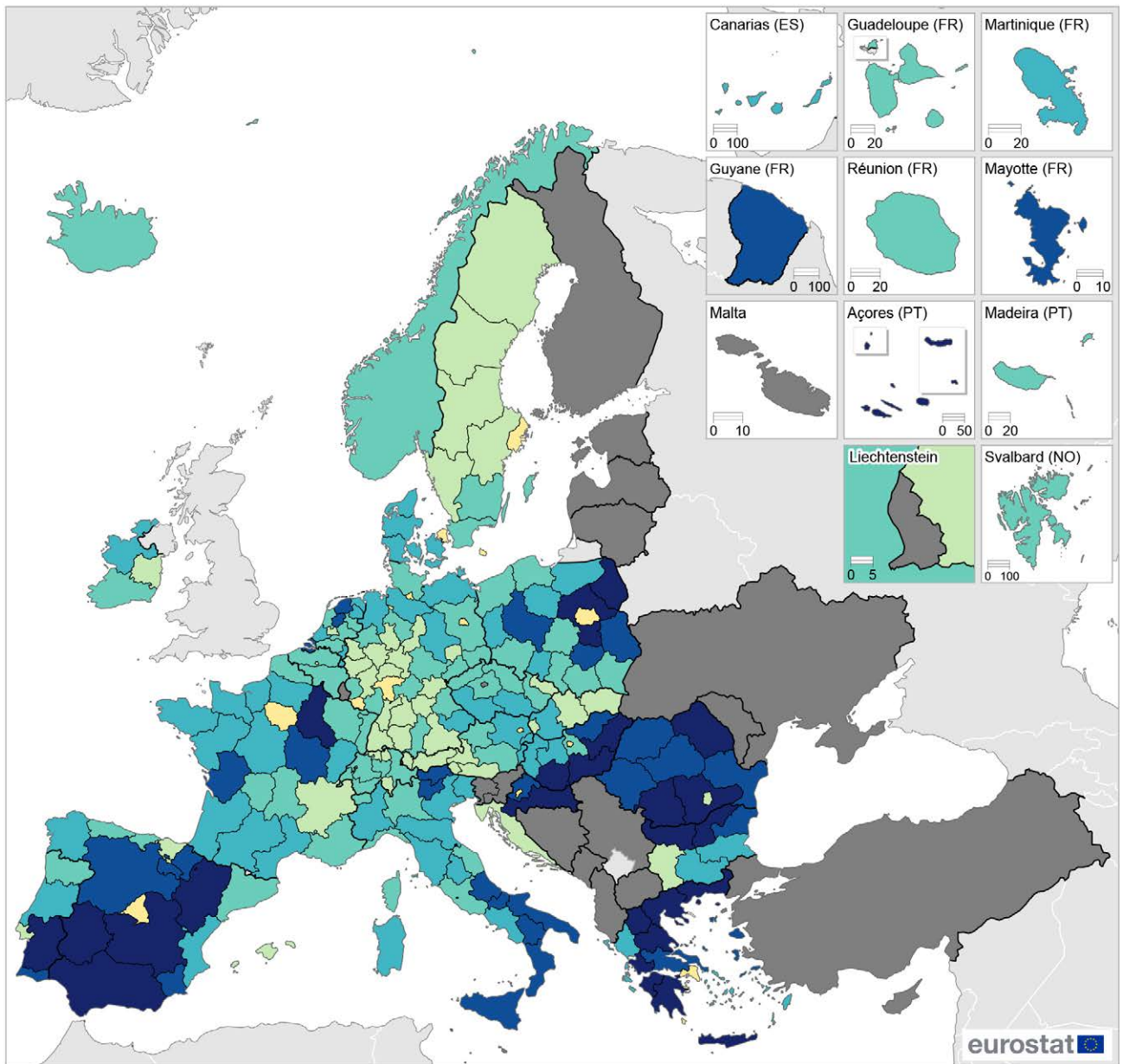
characterised by fertile plains that are suited to growing crops.

In 2020, there were 25 NUTS level 2 regions where gross value added from agriculture accounted for at least 6.2 % of total economic performance (as shown by the darkest shade). The relative economic importance of agriculture was particularly high in the Bulgarian region of Severozapaden (where farming accounted for 13.4 % of total value added); it was followed by two regions from Greece (2018 data): Thessalia (12.4 %) and Peloponnisos (11.4 %). Within this group of 25 regions, there were three more where agriculture had a double-digit share of regional economic performance: Severen tsentralen (Bulgaria; 10.2 %), Alentejo (Portugal; 10.2 %) and Panonska Hrvatska (Croatia; 10.1 %). Note that Champagne-Ardenne in France – which is a major producer, among other products, of cereals, sugar beet, grapes and vegetables – was the only region from western or northern EU Member States to be present within this group as agriculture contributed 6.6 % of its regional gross value added.

In 2020, there were 15 regions where gross value added from agriculture accounted for less than 0.2 % of total economic performance (as shown by the lightest shade in Map 13.6). The economic importance of agriculture was usually very low in capital regions, as land is at a premium. This pattern may also be influenced, at least to some degree, by the administrative boundaries used to demarcate regions, as capitals tend to cover relatively small areas of land. The group of 15 regions where agriculture accounted for less than 0.2 % of regional value added included the capital regions of Belgium (NUTS level 1), Denmark, Germany, Greece, Spain, France, Croatia, Hungary, Austria, Poland (2018 data) and Sweden; it was completed by four German regions – Bremen, Hamburg, Darmstadt and Saarland.



**Map 13.6: Gross value added from agriculture, 2020**  
 (% of the economy's value added, by NUTS 2 regions)



Note: Belgium, NUTS level 1. Norway: national data. Greece, Poland and Switzerland: 2018.  
 Source: Eurostat (online data codes: agr\_r\_accts, nama\_10r\_3gva and aact\_eaa01)

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