

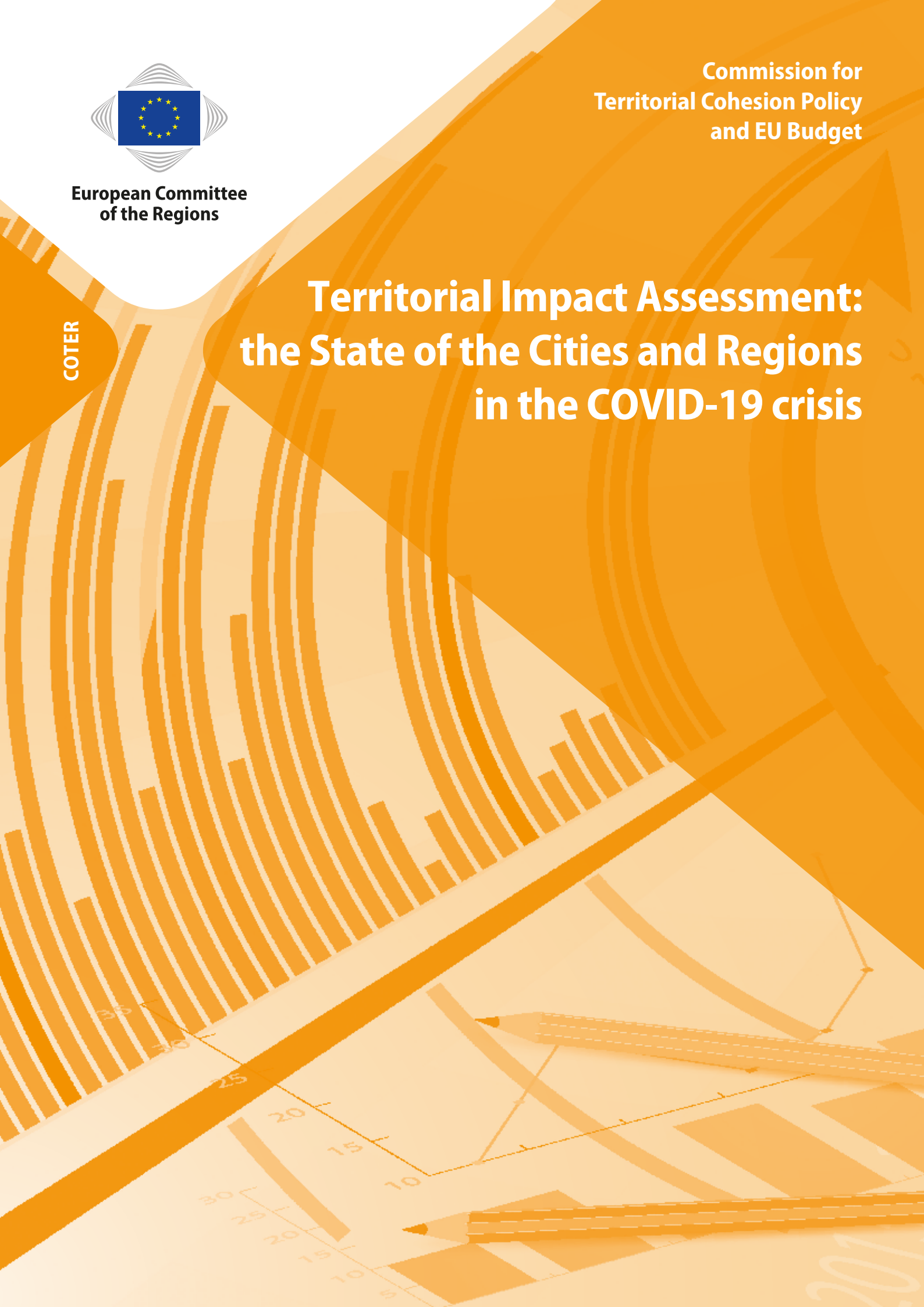


**European Committee
of the Regions**

**Commission for
Territorial Cohesion Policy
and EU Budget**

COTER

Territorial Impact Assessment: the State of the Cities and Regions in the COVID-19 crisis



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Acronyms

COVID-19	Corona Virus Disease 2019
ESI-funds	European Structural and Investment Funds
EU	European Union
GDP	Gross Domestic Product
ICT	Information and Communications Technology
ILO	International Labour Organization
JRC	Joint Research Centre, European Commission's science and knowledge service
NACE	Nomenclature statistique des Activités économiques dans la Communauté Européenne (statistical classification of economic activities in the European Community)
NUTS	Nomenclature des Unités Territoriales Statistiques (Nomenclature of Territorial Units for Statistics)
SME	Small and medium-sized enterprises
TIA	Territorial Impact Assessment

Executive Summary

The COVID-19 pandemic is an unprecedented event for the European Union (EU). While, throughout history, there has been a number of pandemics, national economies were however not as intertwined as they are today. The measures taken by EU Member States to contain the spread of the pandemic have considerably impacted supply chains and markets throughout the Union. Furthermore, for the first time, the enacted lockdown measures¹ severely impeded professional and private life of citizens. The initial measures implemented by the Member States and the EU institutions to contain the pandemic have exerted a strong influence on the European regions, differing widely based on several factors, such as regional demography or employment structure.

Part 1 of this file note presents information on the spread of the pandemic and the regional distribution of indicators, e.g. case numbers and the capacity of healthcare systems to cope with the cases. Existing studies on the territorial impact are reviewed and building on these insights, key indicators to depict the sensitivity of a region towards the influence of the pandemic are identified. This serves as a basis to conduct a Territorial Impact Assessment (TIA) along the ESPON TIA Quick Check methodology in an interactive workshop session. Part 2 of the file note presents the results of the conducted TIA workshop, including the documentation of discussions between experts, the created impact maps as well as the formulated recommendations and policy proposals.

Spread of the pandemic

Across the EU Member States, high numbers of cases were usually concentrated within a few regions. Even in countries which have shown the highest numbers of cases, such as Spain and Italy, several regions have not shown a particularly high incidence. At sub-regional level, conversely, this phenomenon is also visible, e.g. with three Slovenian municipalities accounting for 1.5% of the population but also for 66% of all COVID-19 cases in the country. Conducting analyses of impacts and resilience at a low geographic scale in order to accurately depict regions' situation is critical.

Another factor varying widely between regions is the number of intensive care beds available. Such factor is pivotal considering a region's ability to cope with the immediate outbreak. Per 100,000 inhabitants, the lowest numbers can be found in Portugal with 4.2 intensive care beds, while Germany with 29.2 lies at

¹ Meaning any measure restricting freedom of movement, ability to go to work or social contact in general. While the regional and national strictness of such measures varies across Europe, at least in some form restrictions of this kind have been put in place everywhere within the EU.

the other end of the spectrum. Another important factor contributing to the ability of a region to cope with the immediate effects of the pandemic is the amount of health care workers. Again, this factor shows clear territorial patterns. Generally, higher shares on the workforce are visible in northern European countries and lower shares in eastern European countries.

Territorial Impacts

The pandemic and the immediate response measures have generated a broad spectrum of territorially differentiated impacts, many of which are negative, but also some of which can be considered as positive.

Effects on the economy and labour markets as a whole have been vastly detrimental. However, a strong differentiation between economic sectors should be highlighted. Regions with an economy dependant on sectors that have been strongly negatively affected (e.g. tourism) are particularly sensitive while regions with a more diversified economy or less reliant on such sectors are, in general, better suited to cope with the shock. Furthermore, regions strongly depending on cross-border workers or international trade and international value chains are especially sensitive due to border closure impeding their productive and export capacities.

Connected to the labour market structure, the ability of the population to make use of teleworking depends on prevalent job types. High-skilled jobs are more likely to easily accommodate new teleworking schemes than low-skilled jobs. In the medium term, this increases issues related to inequalities and social exclusion for regions with a predominantly low-skilled labour force.

Digitalisation also plays a large role outside of the labour market, with many aspects of our daily lives such as education (both for children and adults), social gatherings or communication with authorities suddenly taking place online. While this is connected to certain positive aspects (such as the increased abundance of eGovernment services), regional preconditions to benefit from these developments vary. Regions with low availability of high-speed broadband infrastructure, regions where the population has little experience in “digital life” and consequently regions with a higher share of older inhabitants are less likely to gain from the positive aspects of digitalisation.

Territorial patterns emerging from the analysis of these aspects show a rather diverse picture. There are neither regions solely benefiting nor regions solely being disadvantaged, with usually common divides such as eastern-western, urban-rural or northern-southern regions rarely appearing in the impact patterns.

Recommendations

Addressing an issue as ubiquitous and regionally diverse as the COVID-19 pandemic requires a specific approach. Support from the various levels of government to mitigate the negative impacts of the pandemic has to be accordingly carefully designed considering those regional specificities.

The crisis, and especially the resources being available for recovery measures, may be considered as a chance to shape economic, social and environmental development in Europe. Measures supporting developments going hand in hand with European goals can be strengthened.

- The analysis shows that highly specialised regions are heavily hit when their dominant sector is challenged by external shocks. Thus, regional support would need to focus on broadening the economic spectrum of a region in order to increase its resilience.
- Reduced or interrupted import chains lead to market shortages, as e.g. for some medical goods, home office equipment. The European industry policy will need to identify branches that are essential for the daily life of European citizens and consider ways to safeguard the future security of supply.
- National state support is a major driver of the recovery. However, it varies significantly depending on a Member State's financial strength and capacity. In the light of the cohesion goals, EU support should target responses according to the different economic abilities of the Member States.
- Reduced open borders and interrupted supply chains showed the importance of strengthening the regional economic circuits through circular economy approaches. Measures developing regional value chains will help especially weaker regions to increase the regional value added.
- The availability of high-speed internet access within a region determines the ability to work from home and its quality. Broadband access for enterprises and e-government is likewise critical. The access to a broadband network must be treated as a basic service. Investments are required to roll out access to a fast internet throughout Europe. Otherwise, there is a high risk of increasing economic, and consequently, social gaps between regions.

- The different levels of sophistication and availability of tools of e-government, distance learning and e-business across Europe affect the capacity of countries and regions to adapt to the current scenario. In line with the priorities of the German Presidency of the European Union, among which is the expansion of the EU's digital sovereignty and technological competitiveness, EU financial support and the creation of benchmarks are fundamental to use best practices as inspiration for Member States, regions and cities that are lagging behind.
- The availability and accessibility of green space for recreation was reemphasised as a core dimension of quality of life. It will be essential to support cities in developing greener infrastructure and open spaces, and to enable people living in cities unlimited access to green space.
- Cross-border regions are cornerstones of a common Europe. As they are heavily challenged by closed borders, supporting further cooperation across national borders and taking into account regional needs when organising the border regimes will be essential.

Besides the European recovery fund and other measures at the European level, the ESI funds can be drivers to stimulate the resilient development of European regions. As for the period 2021-2027, the operational programmes are currently under development, they can already include the learnings from the consequences of the crisis.

PART 1

Part 1 of the file note presents the rationale for the COVID-19 Territorial Impact Assessment (TIA), summarising health-related data on the spread of the pandemic and reviewing the findings of existing studies on its territorial impact. Based on this, a number of quantitative indicators were identified and collected for the application of the TIA Quick Check, which is detailed in part 2 of the file note.

1. Summary of data on the spread of the pandemic

The COVID-19 pandemic has heavily impacted public health across all European regions. The incidence is highly sensitive to the geography of infection outbreaks and the local healthcare capacity available to counteract the pandemic with efficient sanitary responses.

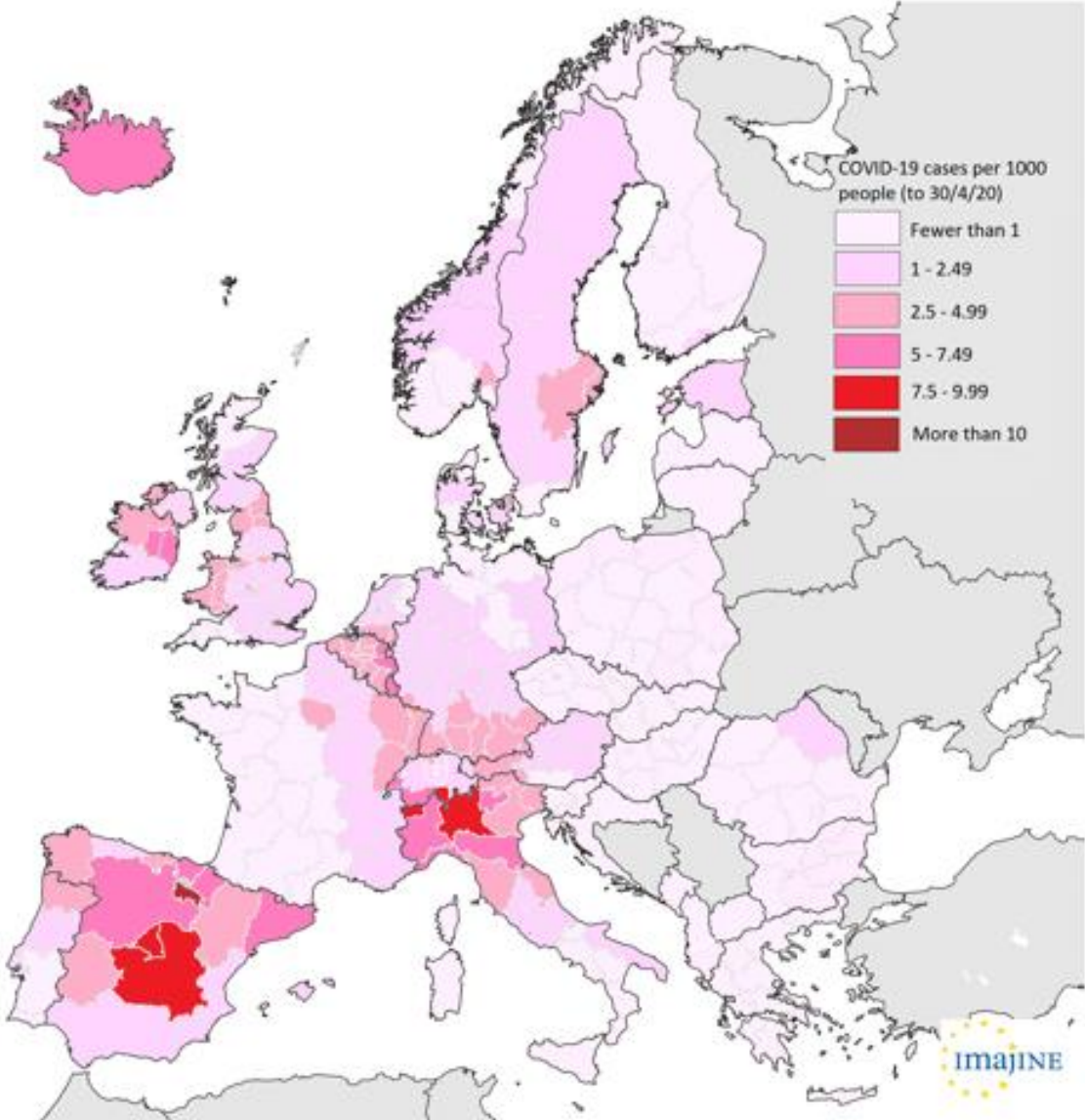
The geography of outbreaks has a very strong regional and local dimension as the number of confirmed cases and death trends is unevenly distributed. In some areas, the virus has circulated more quickly and capillary. Other areas have been hardly affected by the virus, or to a lesser extent, and timely restrictive measures have efficiently contributed to mitigating the risk of similar scale outbreaks.

The concentration of COVID-19 cases is not just a reflection of the distribution of population. Although a number of “hotspots” are in larger cities and populous regions, there are notable exceptions. Two-thirds of COVID-19 related deaths in Slovenia, for example, have occurred in three small municipalities² that have a combined population of fewer than 30,000 people. Some of the most significant concentrations of COVID-19 cases in Germany are in rural districts in Bavaria and Baden-Württemberg, and there are local concentrations of cases in rural municipalities in the southern Netherlands (Woods, 2020). In Italy, the most severe outbreaks have started in small municipalities of Lombardy region and exploded in small- and medium-sized provinces like Bergamo and Brescia. Yet, the metropolitan area of Milan was only minorly affected. While population density does not seem to have a uniform relation with the spread of the pandemic, other demographic factors (e.g. age structure) certainly play a role in determining regional sensitivity to the pandemic risk.

² Ljutomer, Metlika and Smarje pri Jelsah

Map 1 displays the geography of the pandemic outbreaks in Europe by reporting the number of cases per thousand people³. Interactive webtools are available, continuously monitoring the spreading of virus infections and deaths across EU territories⁴. Annex 0 includes a series of maps showing the evolution of COVID-19 infections over time. The emerging territorial pattern displays a scattered distribution of COVID-19 infections across European regions, with pronounced variations within countries and in some cases even between neighbouring regions. Such territorial differences support the need for a regionalised approach.

Map 1: COVID-19 cases per 1000 people to end of April 2020 by NUTS 2 regions



Source: national government dashboards and reports (Woods, 2020).

³ The number of cases may be subject to bias due to different national testing policies that are not directly comparable between countries.

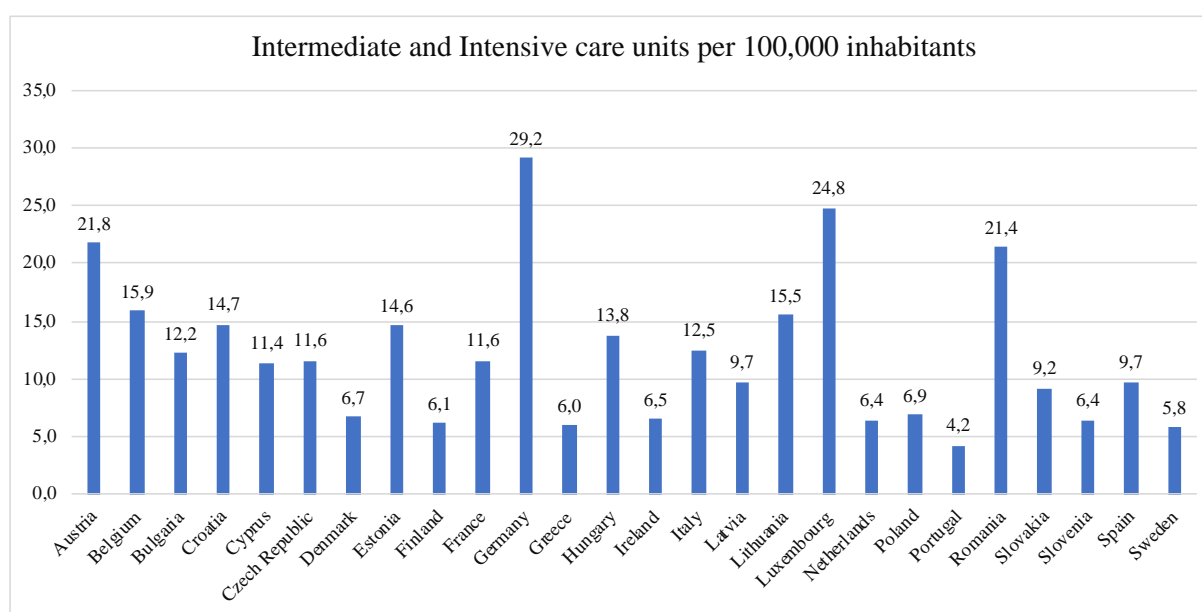
⁴ See JRC COVID-19 monitoring platform at <https://covid-statistics.jrc.ec.europa.eu/> or <https://medium.com/newsworthy-se/a-fraction-of-european-regions-account-for-a-majority-of-covid-deaths-778e546765a9> for data on excess death at regional level.

Healthcare capacity across EU Member States

The number of COVID-19 cases needs to be related to the reactive capacity of European healthcare systems to treat infected people and bear the stress situation with efficient sanitary responses. The number of intensive care beds, which allow for patients needing artificial ventilation to be treated and a country's available health system have emerged as crucial to the success of the response to the outbreak (Furlong and Hirsch, 2020).

The figure below reveals pronounced differences between EU countries regarding intensive care hospital beds' availability, ranging between 4.2 beds per 100,000 inhabitants in Portugal and 29.2 in Germany. Such differences signal profound territorial imbalances that might not manifest strong criticalities in times of "business as usual", but might become extremely important during this pandemic. On average, the number of critical care beds for Europe⁵ was 11.5 per 100,000 inhabitants (Rhodes et al., 2012)⁶.

Figure 1: Healthcare capacity across the EU27⁷



Source: own data presentation based on "The variability of critical care bed numbers in Europe" (Rhodes et al., 2012).

It is interesting to look at how the healthcare capacity relates with the actual number of COVID-19 cases across EU Member States. However, their comparison should be taken carefully to avoid a potential misleading

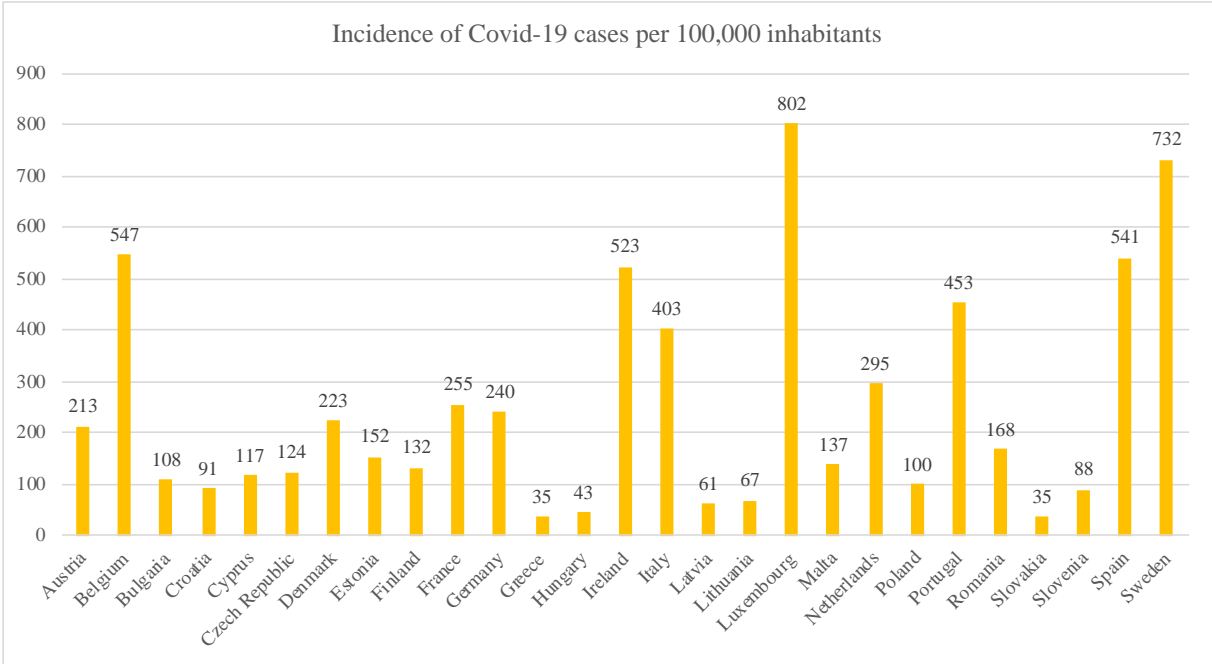
⁵ EU 28 plus Norway, Switzerland, Iceland and Andorra. No data available for Malta.

⁶ A lot may have changed in the intervening period but these appear to be the most recent data available for this specific indicator covering the EU27.

⁷ No data available for Malta.

interpretation or an oversimplification of a complex matter. More indicators (e.g. deaths and further information on healthcare systems⁸) are needed to enrich the analysis and increase the explanatory value of a comparison between COVID-19 outbreaks and healthcare capacities⁹. With this in mind, Figure 2 reveals a profound variety of the incidence ratio, with values ranging between just 35 cases per 100,000 inhabitants in Slovakia and Greece, up until 802 in Luxembourg. When taking graphs 1 and 2 together, it emerges that often the most affected countries are not the ones with higher healthcare capacities. Whereas Luxembourg is high both in incidence and capacities, thus suggesting that the situation should be maintained under control, Sweden, Portugal and Spain show high infections but lie in the lower spectrum for healthcare capacity. Countries with a more balanced picture are Belgium and Italy. On the other end, countries like Hungary, Lithuania and Austria excel for healthcare capacity, and managed also to keep the incidence of COVID-19 infections low.

Figure 2: Incidence of COVID-19 cases across the EU27, 13 July 2020



Source: Statista¹⁰

In Map 2, a regional dimension to the analysis of healthcare capacity across the EU is introduced. The share of employment in the healthcare sector is a useful indicator to get an idea on the preparedness of healthcare systems to face emergency situations and still hold up to the treatment needs of the population. In

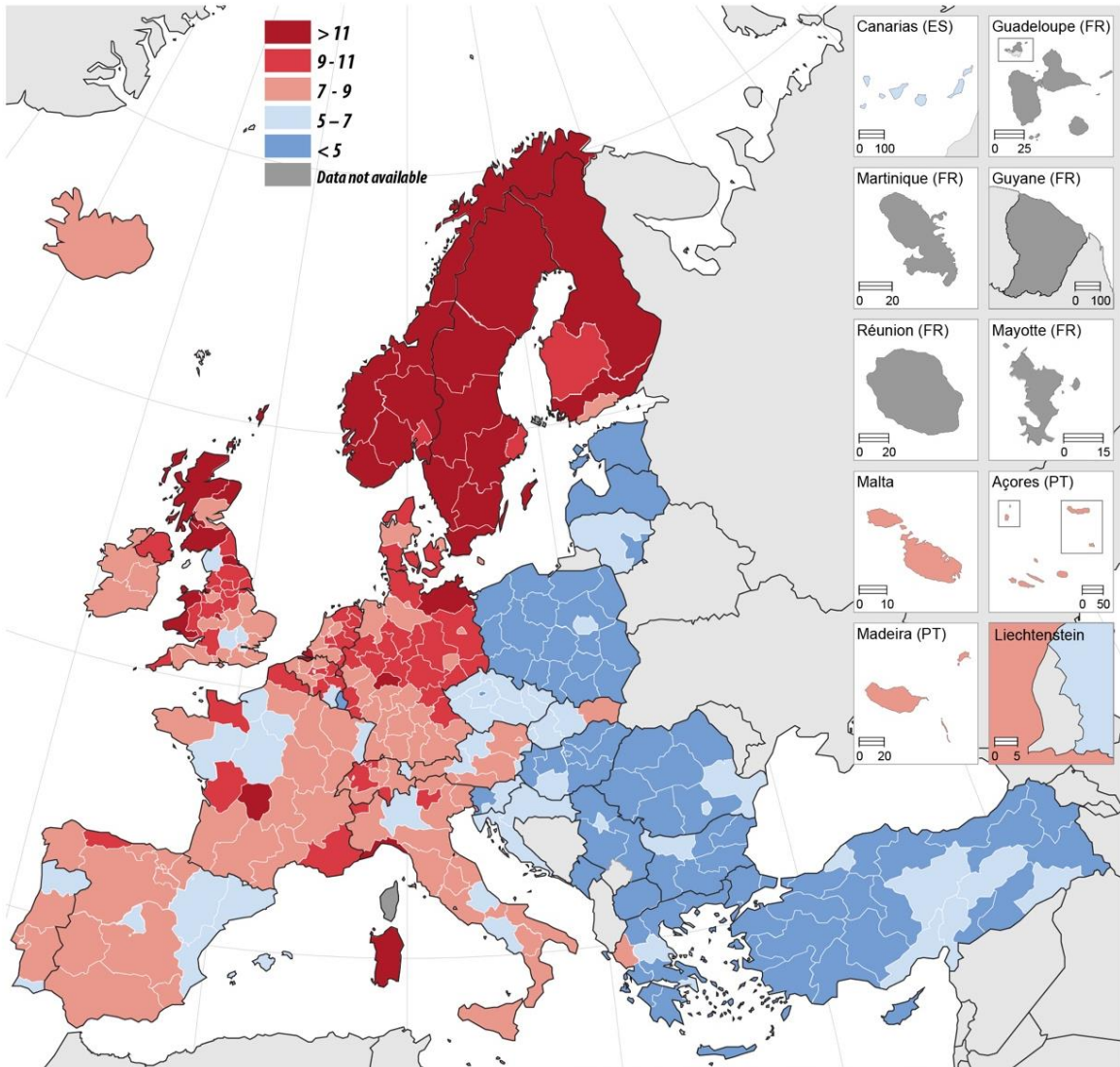
⁸ The intensive care hospital beds’ indicator captures only a very specific aspect of a country’s healthcare capacity that does not reflect the full complexity and possibilities of healthcare systems across the EU.

⁹ Also, one should keep in mind that the results presented report data are from different reference years (2012 and 2020) and in the meantime something might have changed in the availability of care beds across the EU.

¹⁰ <https://www.statista.com/statistics/1110187/coronavirus-incidence-europe-by-country/>

the current pandemic, the availability of healthcare workers¹¹ has become a crucial aspect as this was the most severely exposed occupation to being infected with the virus (Lombardi et al., 2020). COVID-19 has therefore put unusual pressure on healthcare services, thus resulting in staff shortages. Having an adequate number of healthcare workers has been and will continue being a critical factor in facing the ongoing pandemic crisis (International Labour Organization, 2020a, p.)

Map 2: Healthcare workers across EU regions – in %



Source: Eurostat¹²

Compared to the distribution of intensive care units, the distribution of healthcare workers is more distinct and geographically homogeneous. Northern European countries, and Nordic countries especially, clearly stand out in contrast to Eastern

¹¹ Healthcare workers considered in the sample are doctors and physicians (including extra mural ones), nurses and midwives, healthcare assistants, technicians and clerical workers.

¹² <https://ec.europa.eu/eurostat/en/web/products-eurostat-news/-/DDN-20200409-2>

European countries. In the central European and Mediterranean areas, the wider territorial variations within countries can be noticed, with an average share of healthcare workers overall, though with several high and low peaks in specific regions.

The pandemic has led to a situation where some healthcare systems of European regions have been heavily over-burdened, with more patients to treat than they have capacity for (European Parliamentary Research Service, 2020).

2. Review of existing studies on the territorial impact of the pandemic

First studies indicate that the socio-economic dimension of the impacts of the COVID-19 pandemic varies strongly between places. Beyond the geography of infections and government responses, the assessment of diverse territorial impacts is closely linked to the analysis of sectorial employment structures, social conditions (e.g. unemployment, people at risk of poverty, young workers etc.) and economic indicators such as GDP (aggregated and sectorial), firms liquidity and the overall loan accessibility, both for countries and firms. Moreover, the concepts of regional vulnerability and sensitivity to policy responses have also started to gain pace in this debate to highlight the need for territorialised policy measures.

Although most policy responses have been coordinated at national level and with a national coverage, once restrictive measures have been put in place, they resulted in very different regional situations. Some regions will face more intense and/or longer-lasting consequences than others. The socio-economic asymmetry of consequences across Europe, countries and regions is largely shaped by the diversity of regional socio-economic characteristics (Böhme and Besana, 2020).

Regions' production processes are in fact exposed to both external and internal vulnerabilities caused by COVID-19 disruptions. External vulnerabilities depend on the complexity and international exposure of regional value chains. Internal vulnerabilities arise mainly in the production function as a result of new safety and sanitary standards. Indeed, the possibility to comply varies depending on the nature of jobs and workplaces and their exposure to social contacts and aggregation (Altomonte et al., 2020).

The aggregate picture of disruptions in terms of work and production already implies significant pressure for the regions. The latest estimates display a reduction in hours worked of more than 14% globally for the second quarter of 2020, with some degree of macro-areas differentiation for European areas, as depicted in Table 1 (International Labour Organisation, 2020). The differentiation between the first and second quartal of 2020 illustrates the immediate effects of lock-down rules as of different weeks in March as well as the medium-term and follow-up effects since April, under varying conditions for economic recovery. The latter provides first indications on further impacts due to bankruptcies in the wake of the pandemic.

Table 1: Working-hour losses in percentage, first and second quarters of 2020

Macro area	Hours lost Q1 2020	Hours lost Q2 2020
Northern Europe	3.1%	15.3%
Southern Europe	5.3%	18.0%
Eastern Europe	2.6%	11.6%
Western Europe	4.0%	14.3%

Source: ILO Monitor: COVID-19 and the world of work. Fifth edition (International Labour Organisation, July 2020)

Despite the fact that the current crisis has disrupted most work routines, the shock is far from being uniform across different sectors. On the one hand, some economic sectors have been hit harder and longer by government restrictions impeding the business as usual working arrangements. On the other hand, shrinking demand threatens the financial sustainability of companies in uneven ways across sectors.

Preliminary assessments, based on first real impacts and simulations, have identified business sectors and branches that are likely to face severe job losses: arts, entertainment and recreation; transport, storage and communication; accommodation and food services; real estate; wholesale, retail and retail trade; repair of vehicles; manufacturing (International Labour Organization, 2020b). Among these, the automotive industry can be considered an interesting example as it suffers from work disruptions (partial factory closures¹³), international value chain disruptions (supply side), and drops in demand (Boston Consulting Group, 2020). The automotive industry also represents a good example as it embeds significant territorial variations deriving from regional specialisation, thereby underlining the importance of regional economic structures. Also, the data availability allows for a meaningful analysis that would not be possible in other, even more impacted, sectors, due to lack of statistical sources.

Small and medium-sized enterprises (SMEs), which account for the bulk of employment in the sector and provide intermediate inputs and services to multinational carmakers, are expected to be severely affected (International Labour Organization, 2020c). Furthermore, other sectors are likely to be indirectly affected by the crisis of the automotive industry: transportation (e.g. freight, ground passenger transport, charter buses) and services (e.g. passenger car rental and car repair).

The pandemic has resulted in an unprecedented surge in unemployment in the automotive industry across its supply chains and it is estimated that about 42 per cent of direct automotive manufacturing jobs in the EU are impacted (ACEA, 2019; International Labour Organization, 2020c).

¹³ Depending on each Member State's approach, there might be significant variations in the restrictiveness of measures affecting the automotive industry.

From sectorial to territorially diverse impacts

The differentiated impact across industrial sectors generates multiple socio-geographical implications. As a result, the economic impact of the crisis differs across regions, depending on their exposure to tradable sectors and sectoral specialisations. For example, regions which heavily depend on the tourism industry are likely to be more affected than other regions with a more diverse economic structure. Due to varying economic sector structures within countries, the impact on regional employment and GDP may vary significantly across regions within countries (OECD, 2020). Two core factors, amongst others, are a region's reliance on international trade and the importance of the tourism industry for its socio-economic fabric, which will shape the diversity of territorial impacts in the EU.

Reliance on trade and international value chains

The interconnectedness of the European and global economy is amplifying the impact of the pandemic, which has spread quickly through travel and transport routes. The pandemic has directly affected international trade and global supply chains that link production in multiple locations across the world. Value chains often rely on specialised suppliers, sometimes clustered in specific locations. Thus, production disruptions related to COVID-19, emanating originally in one location, are having multiplied effects throughout supply chain networks (International Labour Organization, 2020d).

The restrictions on border controls, air and road transport, and unequal occurrence of enterprise closures have a significant impact on European industrial value chains. The reliance on international trade, for the import and export of goods and services, highly depends on regional specialisation and industrial fabrics. The more a region's economy relies on international trade, the more its industries are expected to suffer from the restrictions imposed by the outbreak of COVID-19, thereby threatening employment and social aspects even in the longer term.

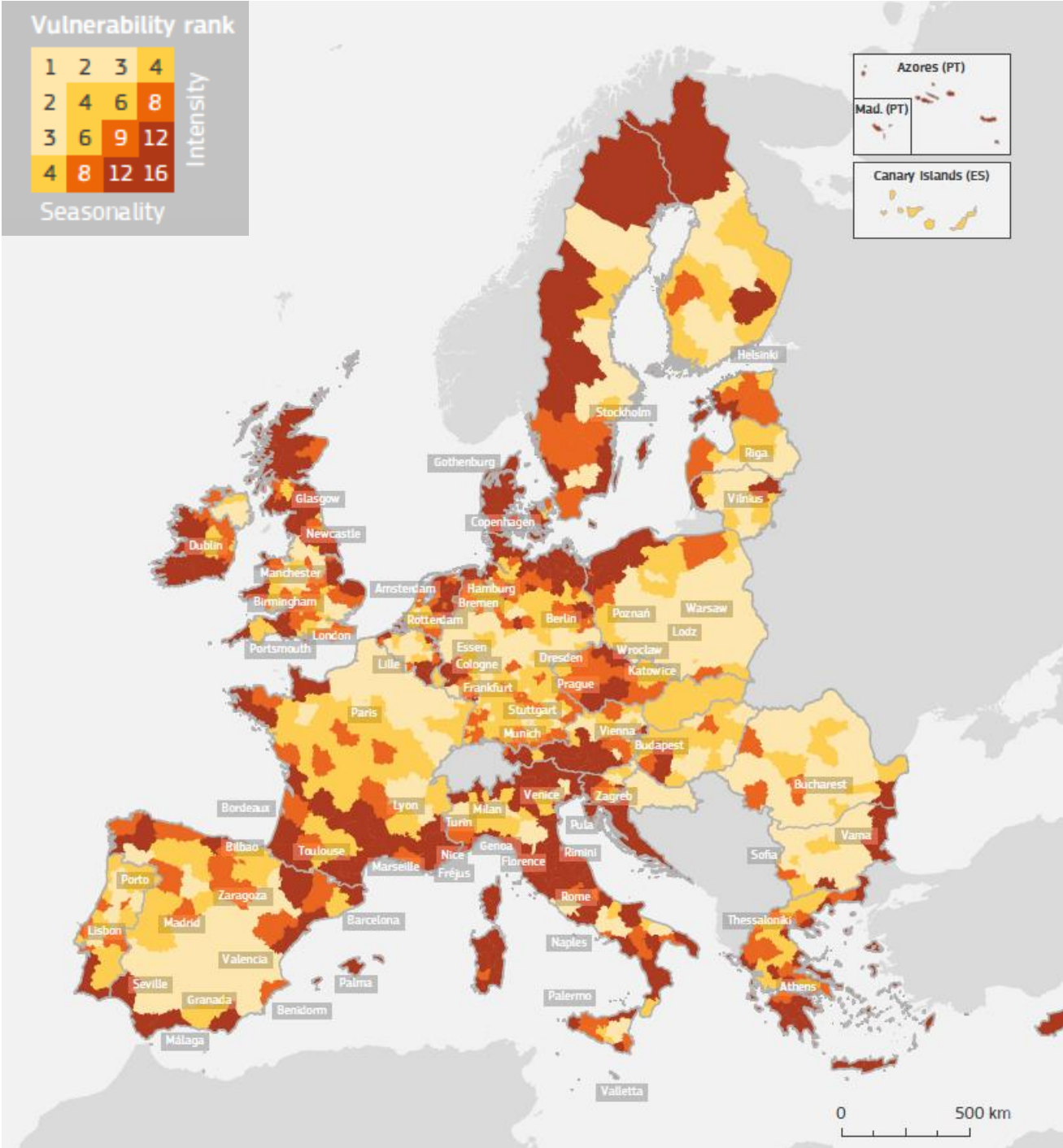
Tourism

Tourism is an important economic sector in Europe, contributing significantly to employment and added value creation in many countries and regions¹⁴. The sector has a strong territorial dimension, as it is unevenly distributed in Europe and within countries. This is due to geographic and socio-economic factors (Batista e

¹⁴ In 2016, one in ten enterprises in the European non-financial business economy belonged to the tourism industries. These 2.4 million enterprises employed an estimated 13.6 million persons. Enterprises in industries with tourism related activities accounted for 9.5 % of the persons employed in the whole non-financial business economy and 21.7 % of persons employed in the services sector (Eurostat, 2020).

Silva et al., 2019). The tourism industry and related activities have been identified as one of the economic sectors most severely affected by the measures triggered by the health emergency. For regional economies relying heavily on tourism, 2020 will most likely be the most challenging year in decades.

Map 3: Regional vulnerability to tourism per NUTS-3 in Europe



Source: JRC

The map above displays regional intensity to tourism combined with seasonality, under the assumption that regions with both high tourism intensity and high

seasonality are deemed to be more vulnerable to tourism related shocks (economic crises, terrorism, environmental or socio-economic disruptions). In the current multifaceted and rapidly evolving pandemic, the traditional role of seasonality might not automatically translate in higher impacts as tourism might be subject to unconventional peaks and trends. Nevertheless, the map clearly unveils a high degree of variation that results in a scattered territorial pattern, thereby suggesting to address the challenges of tourism with careful territorial thinking and assessments¹⁵.

It clearly emerges that the restrictions and socio-economic disruptions may embed a strong geographical dimension where different regional and local characteristics play a role in determining diverse territorial impacts. The emerging literature stresses the value and the need for analytical and geographical understanding of the pandemic as it transitions from corona virus to corona crisis (Brinks and Ibert, 2020). In light of this, the investigation of regional sensitivities is of high interest for better interpreting the implications of the crisis and preparing more effective responses.

¹⁵ The relative impact of tourism and its seasonality vary greatly from country to country and, even more so, between different territories. Cities, as well as islands, coastal areas and the Alps, tend to be major hotspots for tourism in Europe. However, cities are less susceptible to shocks in the tourism sector as compared to other tourist destinations because their dependence on tourism is relatively low and they are less affected by seasonality (Batista e Silva et al., 2019)

3. Reflection on dimensions determining regional sensitivity and resilience to the pandemic

The assessment of health-related data on the spread of the pandemic and the review of existing studies reveal a set of key territorial indicators that are relevant to determining regional sensitivity and resilience towards the pandemic. The two most important groups of indicators are:

- demographic and social conditions of the region and
- labour market characteristics and the structure of the regional economy.

Having these theoretical considerations and empirical observations in mind, a Territorial Impact Assessment (TIA) has been performed applying the ESPON TIA Quick Check methodology (for further refer to part 2 of the File Note). To conduct this TIA, indicators which are able to depict a regions sensitivity towards the pandemic as well as its resilience capacity were collected. The ESPON TIA Quick Check provides a list of 91 standard indicators to analyse the impact of EU policies or “shocks” that are introduced to the EU territory (The list of standard indicators can be found in annex 1).

Additionally, based on desk research, another 20 specific indicators with relevance for assessing the impact of COVID 19 on the development of regions were identified. These indicators have to fulfil a number of criteria such as the availability on a sufficient spatial resolution (i.e. ideally NUTS2 or 3), the availability for most European regions and (ideally) a value independent of a region’s size (i.e. relative rather than absolute numbers). This limits the number of indicators in fact available and applicable to the TIA. The next subchapters describe the specific indicators and the sensitivity rationale in the context of the TIA Quick Check methodology. (For a description of the method refer to section 4.1).

The 20 specific indicators and the 91 standard indicators served as input to the TIA workshop to approximate the effects of COVID 19 on the development of regions. Out of this pool of indicators, during the TIA workshop, the experts choose the indicators that they judged as being most relevant for describing the effects of COVID 19 (further details are provided in part 2).

3.1 Indicators for demographic and social conditions

- **Population aged 65 years or more**
Analyses have shown that persons aged 65 years or more are at increased risk of severe symptoms, as they are more likely to have weakened immune system due to e.g. previous diseases. Therefore, regions with a high share of persons in this age group are more sensitive towards the COVID-19 crisis.
- **Youth unemployment rate**
Young people are one of the vulnerable groups as they are more likely to have temporary contracts, informal contracts or no jobs at all. If a firm is forced to reduce personnel, mostly new employees or persons without family responsibility are more likely to be dismissed. Both cases mostly apply to young people. Due to the COVID-19 crisis the job market disruption will have fewer opportunities, which results in a more difficult situation for young people to find an occupation. Therefore, regions with a high youth unemployment rate are expected to be influenced more negatively by the pandemic.
- **Gini index for disposable income**
The COVID-19 crisis has exacerbated the financial situation. People with lower income work more frequently in sectors that are stronger hit by the crisis than people with higher income. In lower-income sectors, employees may more often reduced working hours or even face job loss, resulting in a decreased disposable income. Therefore, regions with a high degree of inequality in terms of disposable income are more sensitive towards the crisis.

3.2 Indicators for labour market characteristics and regional economy

- **Regional export volumes as share of GDP**
The pandemic has a large impact on the economy, e.g. due closed down productions, restricted supply or production chains or border closures. Furthermore, the demand of goods has also decreased. As a result, export activities are affected. The more a regional economic fabric relies on international trade schemes, the more sensitive is its industry towards export restrictions.
- **Regional import volumes as share of GDP**
Closed borders affect import activities and interrupt existing supply or production chains. As a result, regions with high import volumes are more sensitive to border controls or closures than more autonomous and self-sufficient regions.
- **Cross-border employment**
The closures of the borders were one of the measures to prevent the spread of the pandemic. Persons who work in a foreign country were particularly affected. Even though (most) borders have been opened again, in some cases there are still travel warnings and restrictions (e.g. quarantine) that could have an impact on people working abroad. Depending on the development of the infections, border closures could be reintroduced or travel restrictions could be tightened by a country at any time. Therefore,

regions with a high share of cross-border employment are more sensitive towards the pandemic.

- **Total overnight stays per thousand inhabitants**
Travel restrictions have been introduced. The tourism sector has been also suffering from cancelled events such as congresses, exhibitions or concerts. The individual's perception of security or a decreased purchasing power can inhibit from travel activities as well. Therefore, regions with a high share of overnight stays in relation to the number of inhabitants are more sensitive towards the pandemic crisis.
- **Employment in high risk sectors**
According to a risk assessment based on input from the ILO, the following sectors are at high risk: manufacturing, wholesale and retail trade, repair of motor vehicles and motorcycles accommodation and food service activities, real estate activities, arts, entertainment and recreation (...) and administrative and support service activities. For example, the manufacturing sector will suffer from short- and long-term value chains disruptions with on average rigid work restrictions. The accommodation and food service sectors face very strong disruptions on the demand side due to travel restrictions and social distancing in the short- and long-terms. Therefore, regions with a high share of high-risk sectors are more sensitive towards the pandemic.
- **Employment in medium risk sectors**
According to a risk assessment based on input from the ILO, the following sectors are at medium risk: mining and quarrying, construction, transportation and storage financial and insurance activities. The reasons are e.g. short-term value chain disruptions (mining and quarrying) or negatively affected demand in the longer term (construction), but with less rigid work restrictions in both sectors. The transportation and storage sector suffers from a negatively affected air and water transport demand, but the demand for postal and courier services are stable or even rising. Therefore, regions with a high share of medium risk sectors are more sensitive towards the pandemic.
- **Employment in manufacturing of wearing apparel**
Due to the decreased purchasing power, not immediately required purchases such as for wearing apparel will be avoided. Therefore, regions with a high share employment in manufacturing of wearing apparel are more sensitive towards the pandemic crisis.
- **Employment in manufacturing of pharmaceutical products**
Pharmaceutical companies are trying to develop a vaccine against the virus. Federal funding as well as donations support these activities. Not only the development of a vaccine, but also some medical products that help to mitigate the symptoms of the infection and the manufacture of virus tests lead to strengthening of the pharmaceutical sector. As a result, this could lead to an increase of employment in this industry. Therefore, regions with a high share employment in manufacturing of pharmaceutical products are more sensitive towards the pandemic crisis, potentially benefiting more from the situation than other regions.
- **Employment in the automotive industry**
Due to their insecure financial situation many households as well as many firms cannot afford larger investments such as buying a car or these intentions are postponed for the

time being. Furthermore, in some cases the automotive supply chain is restricted because of various reasons such as a slow ramping up of production or cross-border restrictions. Therefore, regions with a high share of employment in the automotive industry are more sensitive towards the pandemic crisis.

- **Employment in the construction sector (buildings)**
Due to lockdown and various other measures, the construction activities of buildings were stopped. Furthermore, due to the insecure financial situation it is likely that larger investment projects will not be realised for the time being. Therefore, regions with a high share employment in the construction sector (buildings) are more sensitive towards the pandemic crisis.
- **Employment repairing motor vehicles**
Due to their insecure financial situation many households as well as many firms cannot afford larger investments such as buying a car or these intentions are postponed for the time being. As a result, this could lead to an increase of employment in this sector. Consequently, it is more likely that cars will be repaired instead of buying a new one. Therefore, regions with a high share employment repairing motor vehicles are more sensitive towards the pandemic crisis, potentially benefiting more from the situation than other regions.
- **Employment in the water transport sector**
Travel restrictions have been introduced. The individual's perception of security or a diminished purchasing power can inhibit from travel activities. Due to the decrease or disruption of the activities in some sectors, the freight transport of goods decreased as well. Therefore, regions with a high share employment in the water transport sector are more sensitive towards the pandemic crisis.
- **Employment in the air transport sector**
Travel restrictions have been introduced. The individual's perception of security or a decreased purchasing power can inhibit from travel activities. The freight transport by air is affected to some extent as well. Therefore, regions with a high share employment in the air transport sector are more sensitive towards the pandemic crisis.
- **Employment in the tourism sector**
Travel restrictions have been introduced. The individual's perception of security or a decreased purchasing power can inhibit from travel activities as well. The tourism sector has been also suffering from cancelled events such as congresses, exhibitions or concerts. Therefore, regions with a high share employment in the tourism sector are more sensitive towards the pandemic crisis.
- **Employment in the catering sector**
There are strict requirements for the catering sector. E.g. the number of restaurants guests has to be limited due to social distancing. The event catering branch suffers from the fact that events and congresses are not allowed to take place or only under certain conditions. Due to the lockdown, companies in the catering sector have financial problems and employees have lost their job. Therefore, regions with a high share employment in the catering sector are more sensitive towards the pandemic crisis.

- **Employment in real estate activities**
It is expected that there is strong disruption on the demand in the real estate market both in the short, but especially in the medium- to long-term due to decreasing purchasing power in view of the expected decrease of GDP. Therefore, regions with a high share employment in real estate activities are more sensitive towards the pandemic crisis.

3.3 Other indicators

- **Preparedness for online interactions with public authorities**
Due to the lockdown online activities have increased in many countries. Also, many people worked from home to prevent an infection at work or were prohibited to work in the offices. This indicator is used as a proxy for the preparedness for home office as a better one is not available. Regions with a high preparedness for online interactions with public authorities are more sensitive towards the pandemic.

PART 2

4. Explanation of the methodology and summary of the preliminary discussions of experts

The core task of the File Note at hand is the assessment of the territorial impact of COVID-19. In Part 1, contextualisation of the crisis with health-related data and already existing studies on the topic has been presented. Furthermore, indicators to depict the regional sensitivity and resilience have been identified. Part 2 presents the actual Territorial Impact Assessment applying the ESPON TIA Quick Check methodology.

4.1 The approach of the ESPON TIA quick check

The concept of territorial impact assessment (TIA) aims at showing the regional differentiation of the impact of EU policies or “shocks” that are introduced to the EU territory. The “ESPON TIA quick check” approach combines a workshop setting for identifying systemic relations between a policy or any type of “shock” and its territorial consequences with a set of indicators describing the sensitivity of European regions. It helps to steer an expert discussion about the potential territorial effects of an EU policy proposal by checking all relevant indicators in a workshop setting. The results of the guided expert discussion are judgements about the potential territorial impact of an EU policy considering different thematic fields (economy, society, environment, governance) for a range of indicators. These results are fed into the ESPON TIA Quick Check web tool.

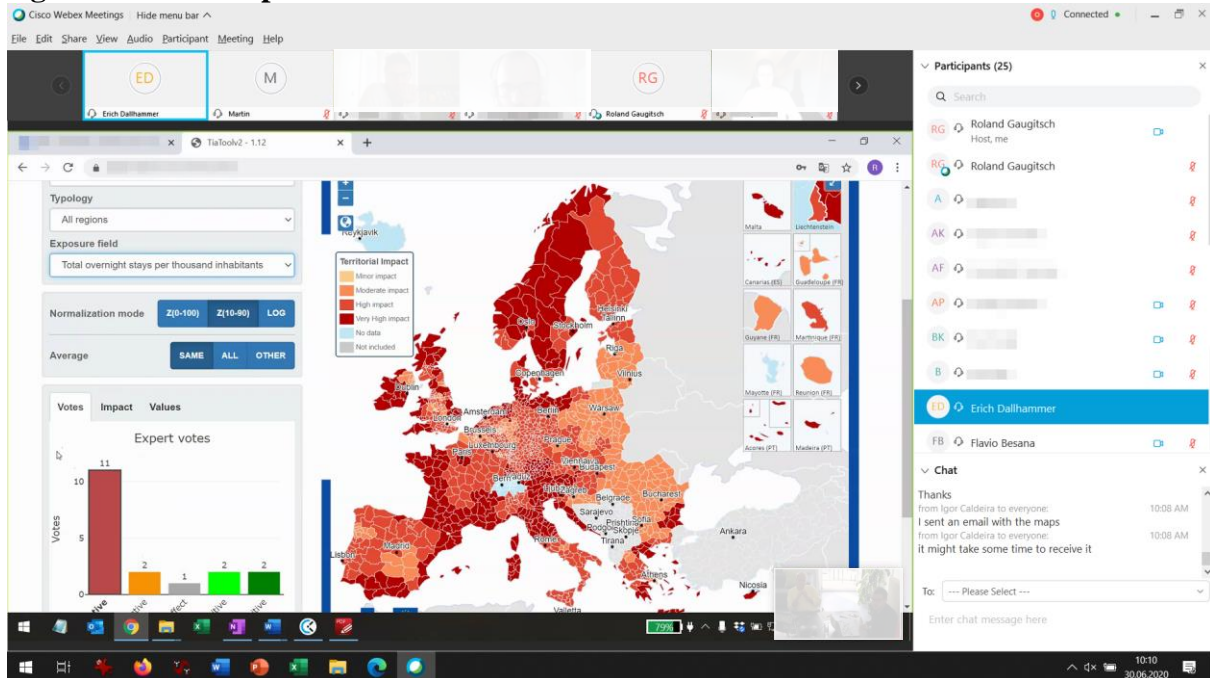
For each indicator, the web tool merges the expert judgements on the strength of the effect of the COVID-19 crises with the provided values picturing the sensitivity of each region. This results in an impact-value for each region and each indicator which is further depicted on maps showing the potential territorial impact of COVID-19 at the regional level. These maps serve as starting point for further discussions on consequences and recommendations for policy decisions.

The workshop was held on 29th and 30th of July 2020 via video conference and brought together over 30 experts¹⁶ representing various local and regional

¹⁶ for a list see Annex A.5

authorities, interest groups, associations and organisations from the EU level. Three moderators from ÖIR prepared and guided the workshop and handled the ESPON TIA web tool.

Figure 3: Workshop Discussion



Source: Territorial impact assessment expert workshop, 30th July 2020, video conference

4.2 Preliminary discussion

After setting the scene with introductory presentations on the frame of the assessment and an overview of activities and studies conducted on the topic so far, the experts reflected on potential impacts of COVID-19 on the regional level. The focus of the discussion was laid on medium-term effects expected in the coming 2-3 years in the fields of economy, society, environment and governance. The result of this first discussion was a comprehensive systemic picture of effects, which have shown the following highlights¹⁷:

Digitalisation was emphasised across thematic fields and mainly connected with positive effects. Availability of remote working tools and high readiness of the regions in terms of digital infrastructure such as broadband access allowed many economic sectors to continue working with minimum impediment during lockdown. It is expected that positive experience of companies will lead to a larger uptake of remote working in the future furthering digitalisation in professional environments. As a medium-term effect, this can lead to a reduction in commuting for work with positive secondary effects on the environment (due to a reduction

¹⁷ for the full picture see Annex A.6

in traffic volumes) and the society (especially related to care of elderly and children).

For public authorities on all levels of government, the immediate need to increase their focus on digital media led to a quick professionalisation of communication and is expected to move them closer to citizens in the medium-term as well. Furthermore, services related to eGovernment developed as an immediate crisis response are unlikely to be abolished but may lead to further improvement and development of such services.

In the education sector, digitalisation through the use of online learning platforms and emerging new forms of teaching was discussed in terms of positive and negative effects. It is an opportunity for increasing flexibility for children and students but it is also connected with increased pressure on parents and teachers alike. Furthermore, the need for social contacts, especially for children, in a learning environment was stressed by the experts.

Social exclusion and the **fragmentation of the society** in general are considerable risks in the medium-term following the crisis. Not only in relation to health related “risk groups” but also in relation to socially vulnerable people. Remote working, for example, mainly concerns the more high-skilled labour force. Consequently, such jobs were less affected by the immediate crisis and may not suffer from negative medium-term effects to the same extent as low-skilled, low-income jobs. Pre-crisis inequalities are likely to persist or even increase in the medium-term.

The **differentiation of effects between economic sectors** was deemed highly relevant by the participants. While apparent challenges are faced by the tourism, culture and entertainment sectors, other sectors (e.g. productive industries, groceries or health) have not been as negatively affected. In some cases, a sector can even be influenced positively, most notably the IT and communication sector which sees a substantial rise in demand for their products.

Largely independent of the sector, **cross-border employment** challenges individuals and companies. Due to border closures people commuting across a national border and companies with a high share of such employees will in many cases have suffered even harder and/or longer than others of the same economic sector. This increases the risk of bankruptcy of these companies in the medium-term. The discussions on the medium-term consequences of COVID 19 on **cross-border cooperation** were quite divergent. Opinions ranged from increasing obstacles due to tendencies of re-nationalisation and re-centralisation to a new emphasis on cross-border cooperation and thus future improvements associated with a higher awareness of the sensitivity and importance of cross-border relations.

Finally, the experts identified potentially lasting trends in the **transport sector**. While overall traffic volumes might be reduced due to a reduction of business travel and commuting, potentially lasting shifts in the modal split are expected. A distrust in public transport based on consideration of health risks has led to an increase in the share of bicycles, cars and even walking on the modal split, with public transport shares being reduced. Furthermore, scepticism to travel abroad for vacation purposes and, additionally, the replacement of a considerable share of in person business meetings with video conferences will lead to a decrease in aviation traffic in the coming years.

The preliminary discussion between the experts and the identified effects served as a basis for selecting the statistical indicators used to assess the territorial impacts of the COVID-19 crisis in the EU27.

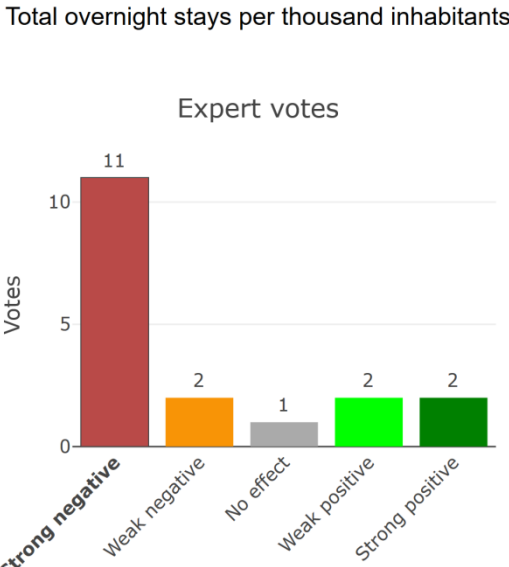
5. Potential economic, social, governance and environmental impacts

Out of the 91 standard indicators and the 20 specific indicators, the workshop participants selected 13 indicators that were deemed most relevant to depict the impact of the COVID-19 pandemic on the EU’s regions. Out of these, the impact on the five most relevant and most discussed indicators during the workshop are presented in detail in this section, while an overview of all regional impacts and corresponding expert votes are included in the annex.

5.1 Overnight stays

Tourism is one of the sectors that has been affected strongly negatively so far. Travel restrictions have been introduced in the short-term and are only slowly being reduced over time. The tourism sector has been also suffering from cancelled events such as congresses, exhibitions or concerts. The individual’s perception of security or a decreased purchasing power can inhibit from travel activities as well. While domestic tourism is likely to increase for the coming 1-2 years at least, international and especially multiple day tourism will only slowly pick up again and thus create detrimental effects in regions depending on this type of tourism.

Figure 4: Result of the expert judgement: overnight stays affected by the COVID-19 crisis

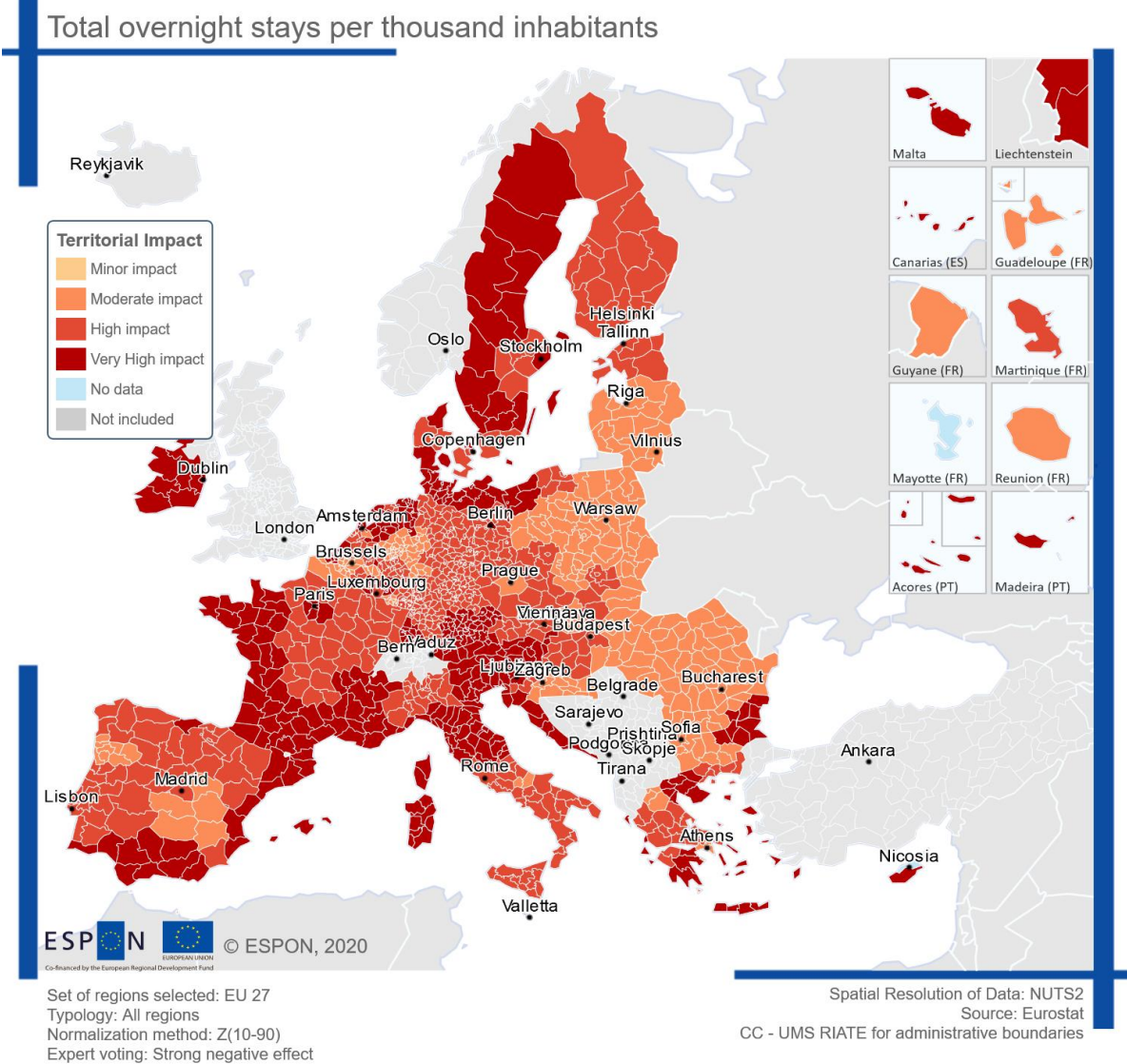


Source: Territorial impact assessment expert workshop, 30th July 2020, Videoconference

The experts agreed to choose the total overnight stays to show the regional impacts of the COVID-19 crisis on the tourism sector. This indicator depicts the total nights spent at tourist accommodation establishments per thousand inhabitants. It comprises hotels, holiday and other short-stay accommodation, camping grounds, recreational vehicle parks and trailer parks. Most experts expected that negative impacts will last for the next 2-3 years. Eleven experts voted for a strong negative effect and two for a weak negative effect. On the other hand, two experts saw a strong positive effect and two a weak positive effect. One expert assumed that there would not be any effects anymore.

Regions with higher levels of tourism are likely to be influenced more strongly by the COVID-19 crisis. Sensitivity is thus directly proportional to the total number of nights related to inhabitants.

Figure 5: Overnight stays affected by the COVID-19 crisis – expert judgement: strongly negative effect



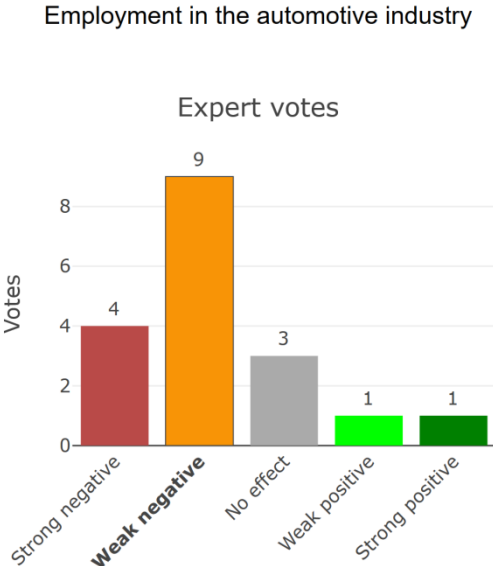
Source: Territorial impact assessment expert workshop, 30th July 2020, video conference

The map above shows the potential territorial impact of the COVID-19 crisis based on the overnight stays. It combines the expert judgement of a strongly negative effect (exposure) with the given sensitivity of regions resulting from the importance of overnight stays for the regional economy. 33% of the regions are expected to be still very highly negatively affected in the next years. These regions are located in Ireland, Sweden, Denmark, the Netherlands, Cyprus and Croatia as well as in some parts of Poland, Bulgaria, Greece, Italy, Austria, Germany, Belgium, France, Spain and Portugal. 44% of the regions would be highly negatively and 23% only moderately negatively impacted.

5.2 Employment in the automotive industry

The automotive industry is another sector that has been negatively affected. Due to their insecure financial situation, many households and firms cannot afford larger investments such as buying a car or these intentions are postponed for the time being. Furthermore, in some cases, the automotive supply chain has been restricted because of various reasons, such as a slow ramping up of the production or cross-border restrictions. At least in the short-term, production in factories has also directly been impeded in some cases, however these restrictions are being decreased steadily.

Figure 6: Result of the expert judgement: employment in the automotive industry affected by the COVID-19 crisis



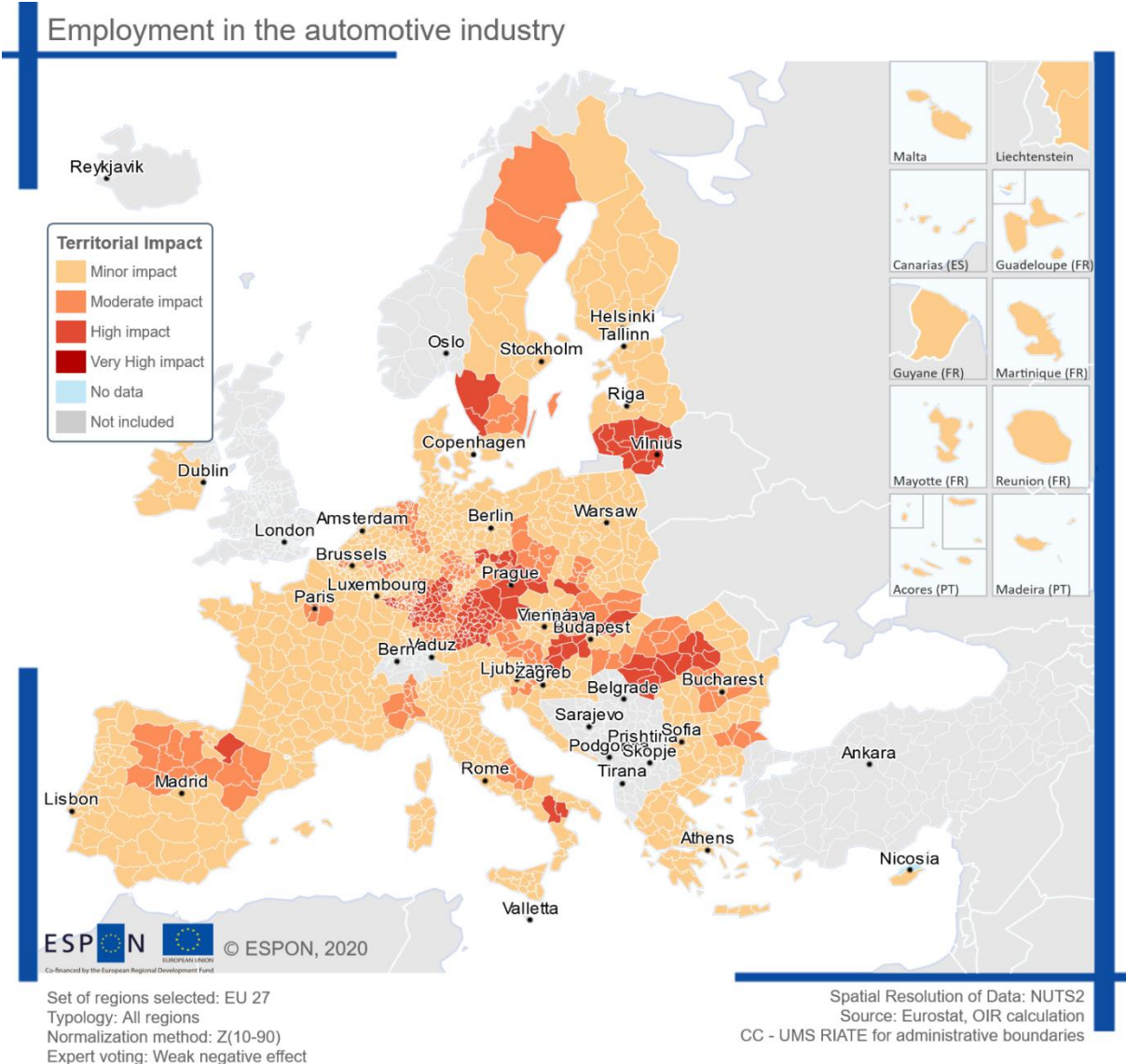
Source: Territorial impact assessment expert workshop, 30th July 2020, video conference

This indicator measures the share of employment in the automotive industry (manufacture, wholesale and retail) on total employment. Most of the experts assumed that the COVID-19 crisis has a negative impact on the employment in

the automotive industry. Four experts voted for strongly negative and nine for weakly negative. One expert saw a strong positive and one weak positive effect. Three experts expected that there will not be any positive nor negative impacts on the automotive sector.

Regions with a greater share of employment in the automotive industry are considered to be more sensitive to the COVID-19 crisis. Sensitivity is therefore directly proportional.

Map 4: Employment in the automotive industry affected by the COVID-19 crisis – expert judgement: weak negative effect



Source: Territorial impact assessment expert workshop, 30th July 2020, Videoconference

The map above shows the potential territorial impact of the COVID-19 crisis based on the employment in the automotive industry. It combines the experts’

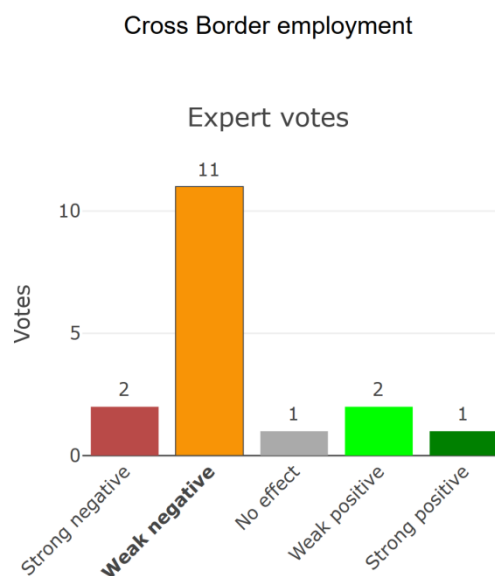
judgement of a weak negative effect with the given sensitivity of regions. 12% of the regions would face a highly negative impact in the next years. In these regions, large automotive manufacturers (e.g. Germany) or suppliers (e.g. Eastern Europe) are located. 20% of the regions are expected to have a moderately negative impact and 68% only a minor negative impact.

5.3 Cross-border employment

Borders were closed to prevent the spread of the pandemic. People working in a foreign country were particularly affected, so as the regions which are employing a considerable amount of their workforce from another country. Even though (most) borders have been opened again, in some cases, there are still travel warnings and restrictions (e.g. quarantine) that could impact people working abroad. Depending on the development of the infections, border closures could be reintroduced, or travel restrictions could be tightened by a country at any time.

This indicator shows the share of employed persons living in the region but working in a foreign country in relation to the total population. Most experts expected that the pandemic crisis would negatively influence people working in a foreign country. In this regard, two experts saw a strongly negative impact and eleven a weakly negative impact for medium term period. One expert voted for strongly positive and two for weakly positive. One expert deemed that the situation would normalise.

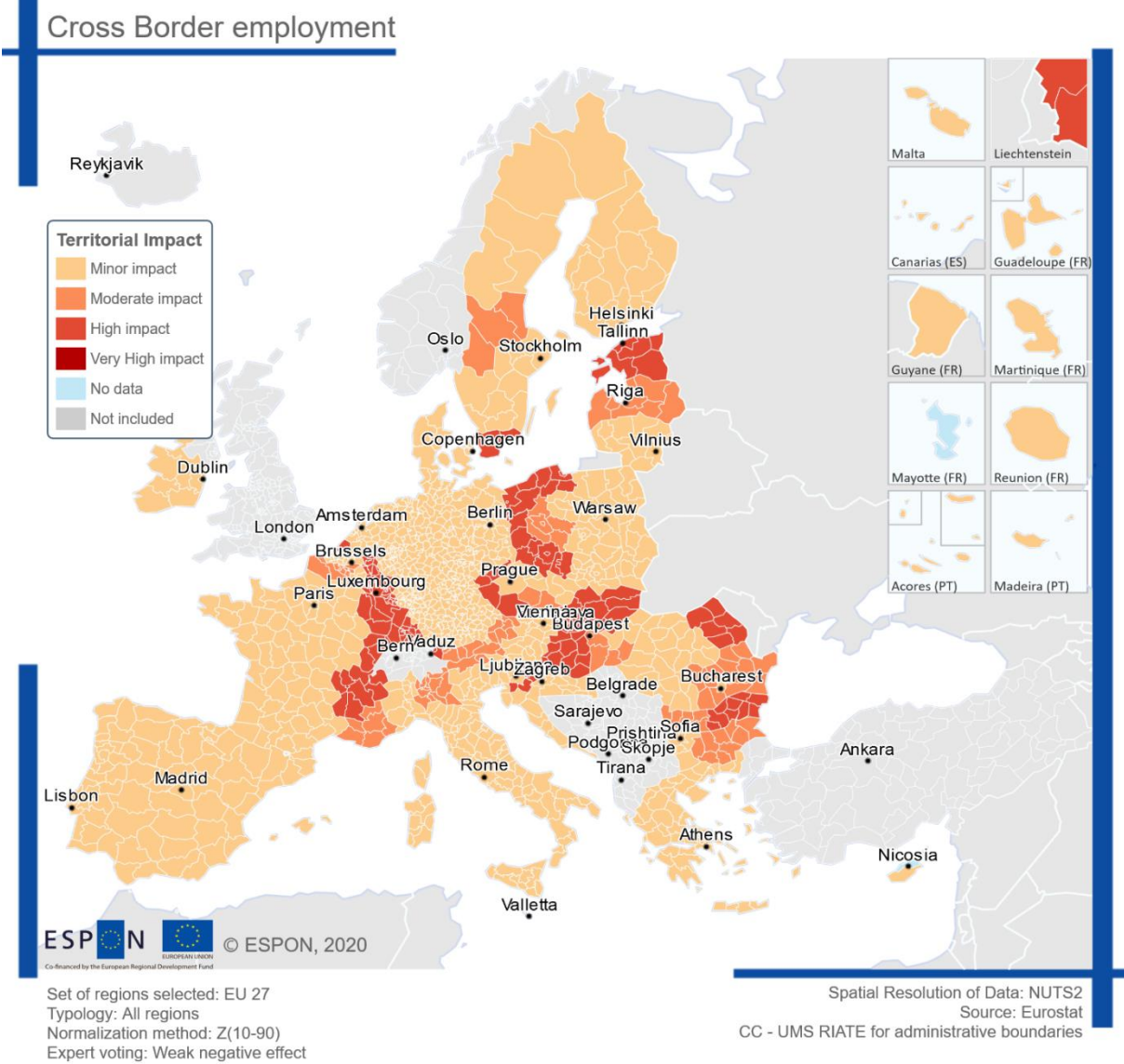
Figure 7: Result of the expert judgement: cross-border employment affected by the COVID-19 crisis



Source: Territorial impact assessment expert workshop, 30th July 2020, Videoconference

Regions with a high share of employees working abroad are expected to be influenced more by the COVID-19 crisis. Sensitivity is thus directly proportional to the share of employed persons working abroad.

Map 5: Cross-border employment affected by the COVID-19 crisis – expert judgement: weak negative effect



Source: Territorial impact assessment expert workshop, 30th July 2020, Videoconference

The map above shows the potential territorial impact of the COVID-19 crisis with respect to cross-border employment. It combines the experts’ judgement of a weak negative effect with the given sensitivity of regions. Unsurprisingly, 11% of the regions facing a highly negative impact are in border areas between, e.g. Germany and its neighbouring countries, between France and Italy or Austria and its eastern neighbouring countries. Further regions with the highest impact are notably located in Romania and Bulgaria, where many people work in a foreign

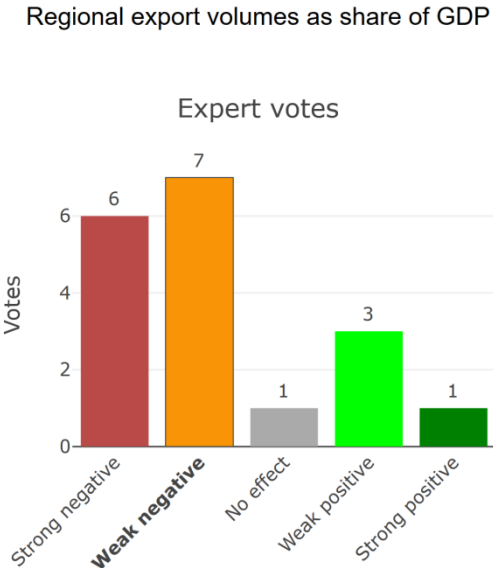
country (e.g. Germany, Austria) in the, inter alia, nursing, elderly care or agricultural sector. Another 8% of the regions are expected to be moderately negatively affected. The majority of the regions would only have a minor negative impact.

5.4 Regional export volumes

The pandemic has a strong impact on the economy due to the aforementioned reasons. Furthermore, an increased movement towards “buy regional” approaches supported by national advertising campaigns can be identified in several Member States. As a result, export activities are also affected.

This indicator measures the exports to foreign countries as share of regional GDP. Most experts expected that the export transactions will be influenced negatively in the next years. Six experts voted for strongly negative and seven for weakly negative. On the other hand, one expert expected a strongly positive effect and three a weakly positive effect. One expert assumed that the COVID-19 crisis would not have any impacts on the export activities.

Figure 8: Result of the expert judgement: regional export volumes affected by the COVID-19 crisis



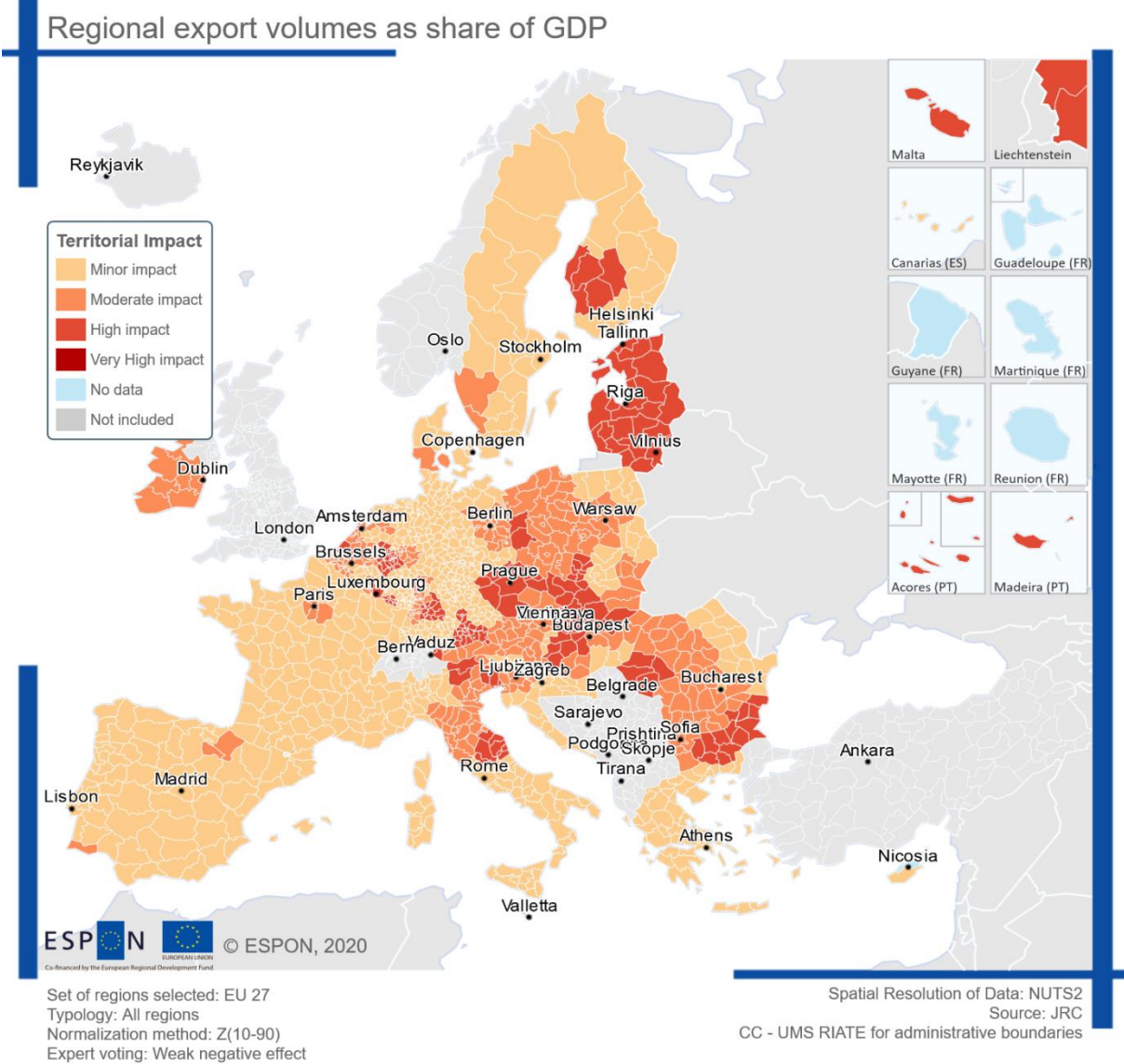
Source: Territorial impact assessment expert workshop, 30th July 2020, video conference

Regions with a high share of exports are expected to be more influenced by the COVID-19 crisis. Sensitivity is thus directly proportional to the share of exports.

The following map shows the potential territorial impact of the COVID-19 crisis based on regional export volumes. It combines the experts’ judgement of a weak

negative effect with the given sensitivity of regions. 15% of the regions are expected to have a highly negative impact. Most of these regions are located in Eastern Europe as well as in Finland, Germany, the Netherlands, Belgium, Italy and Austria. 26% of the regions would have a moderate negative impact and the majority a minor negative impact.

Map 6: Regional export volumes affected by the COVID-19 crisis – expert judgement: weak negative effect



Source: Territorial impact assessment expert workshop, 30th July 2020, Videoconference

6. Conclusions and recommendations

Discussing the above maps and looking at the individual indicators, the experts agreed that there are very different patterns emerging throughout Europe. Neither regions are solely benefiting nor solely being disadvantaged as a result of the pandemic. Impact patterns of the COVID-19 pandemic do not follow “common” dividing lines such as urban-rural, North-South, East-West dichotomies but show a much more differentiated picture. “Common knowledge” patterns have to be rethought for targeting the regions that are the most strongly affected by the crisis.

Different types of regions that are highly affected can be identified:

- On the one hand, a group of rather economically high performing regions where highly negatively affected sectors play an important role can be identified. These sectors are often embedded in international supply and demand chains as, for example, the automotive industry, tourism, culture or air transport.
- On the other hand, lower economically performing regions often characterised by a lower GDP per capita, higher rates for people at risk of poverty and lower accessibility, face severe consequences of the COVID 19 crisis. Often, they are handicapped by lower rates of broadband access and consequently, the reorganisation of some services through digitalisation is challenging.
- Additionally, there are many “in-between-regions” with different economic and structural characteristics. These regions may be found between the highly performing, often industrial or urban areas and the remote rural areas.
- Cross-border regions are especially challenged. In addition to the problems other regions have to deal with, restrictions of the cross-border traffic (e.g. closed borders and quarantine rules) further hinder these regions. Long existing economic and social relations such as, in particular commuting, are shut down or restricted. Whereas in other regions, interregional linkages are still existing, they are heavily reduced in cross-border regions.

COVID 19 is changing people’s behaviour patterns influencing urban and regional development. During the “lockdown”, the availability of (private) green space was seen as an important part of quality of life. People tended to move to “greener” environs of the cities and to rural area, and shift to home office. Trips to the cities were undertaken in personal vehicles, considered as a “safer” option instead of public transport. Within cities, the share of bicycle transport increased. These behavioural changes are different for teleworkers than for manual workers

and people employed in the personal service sector. Nevertheless, these changes will have consequences on the future urban and rural development.

The consequences of the COVID 19 crisis on the development of a region also depends on its characteristics and on the dominant economic sectors. Accordingly, a standard solution will not meet the different challenges.

In terms of short-term policy reaction, it was important to support the survival of the enterprises by the safeguarding the liquidity of enterprises, ensuring that employment is maintained by offering short-time work options and supporting the venerable people who may have lost their jobs and income.

From a mid-term perspective, the public support measures are concentrating on the recovery of the economy and restoring social life. The results of the TIA show very clearly that the effects on the different sectors are depending on the regional situation. Consequently, measures supporting the recovery of regions need to take into account the existing conditions.

- Additional evidence of regional effects is required. Data and maps showing regional dependencies on highly affected sectors and other regional data of the effects of COVID 19 can help adjust the support measures to the territorially differentiated needs.
- Regional and local knowledge is important to effectively shape recovery measures. In order to safeguard that the funding measures reach the ones who are in need, funding agencies should be very aware of the regional challenges and of who the potential beneficiaries are. Consequently, regional bodies should be involved to handle the allocation of aid to safeguard high absorption rates, which are a precondition for a fast recovery.

The crisis and especially the high amount of money that is available for recovery measures is also a chance to shape economic, social and environmental development in Europe. Measures supporting developments going hand in hand with European goals can be strengthened.

- The analysis shows that highly specialised regions are heavily hit when their dominant sector is challenged by external shocks. Thus, regional support would focus more on broadening the economic spectrum of a region in order to increase its resilience.
- Import chains were reduced or partly interrupted. In some fields, market shortages were observed, as e.g. for some medical goods, home office

equipment, etc. The European industry policy will need to identify branches that are essential for the daily life of European citizens and consider ways to safeguard the security of supply in the future.

- National state support was and is still a major driver of the recovery. However, it varies significantly depending on a Member State's financial strength and capacity. In the light of the cohesion goals, EU support policies should take into account these differences and target responses according to the different economic abilities of the Member States.
- Considering issues linked to reduced open borders and the interruption of supply chains, the concept of circular economy gains momentum, strengthening the regional economic circuits. Measures developing regional value chains will not only increase the regional security of supply, but also help especially weaker regions to increase the regional value added.
- The degree of availability of high-speed internet access within a region determines the ability to work from home and its quality. Broadband access for enterprises and e-government is likewise critical. Currently, especially rural, less accessible regions are lagging behind. This is reducing their development opportunities. The access to a broadband network must be treated as a basic service. Investments are required to roll out access to a fast internet throughout Europe. Otherwise, there is a high risk of increasing economic and consequently social gaps between regions.
- The different levels of sophistication and availability of tools of e-government, distance learning and e-business across Europe affect the capacity of countries and regions to adapt to the current scenario. In line with the priorities of the German Presidency of the European Union, among which is the expansion of the EU's digital sovereignty and technological competitiveness, EU financial support and the creation of benchmarks are fundamental to use best practices as inspiration for Member States, regions and cities that are lagging behind.
- The availability and accessibility of green space for recreation was reemphasised as a core dimension of quality of life. It can be observed that people living in cities are increasingly asking for houses with garden in the vicinities of the cities. In the long term, this would lead to an increase in urban sprawl with its negative consequences on commuting and land take. In order to avoid these negative spatial trends, it will be essential to support cities in developing greener infrastructure and open spaces, and to enable people living in cities unlimited access to green space.

- Cross-border regions are one of the cornerstones of a common Europe. As they are heavily challenged by the anti-COVID-19-measures, it is essential to invest further into cross-border projects and to further support cooperation across national borders. This could help improve the situation for the whole region. For instance, considerable improvements can be made for cross-border healthcare services. The exchange of capacity, personnel and knowledge may become a key resource, and not only in terms of fighting similar pandemics in the future. Additionally, it would be favourable to take into account regional interdependencies when organising the border regimes. The involvement of regional authorities could help better address the needs of the regions.

Besides the European recovery fund and other measures at the European level, the ESI funds can be drivers to stimulate the resilient development of European regions. As for the period 2021-2027, the operational programmes are currently under development, they can already include the learnings from the consequences of the crisis. The existing framework already enables to stimulate circular economy, support digitalisation and sustainable urban development. Furthermore, the ESI funds provide a system of shared responsibilities and supporting structures enabling sufficient flexibility to adapt to regional and local needs.

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Annex

A.1 Meta information of indicators used in the workshop

This annex provides the meta information of the indicators described in Chapter 3.

Indicators for demographic and social conditions

Population aged 65 years or more

Description	Share of population aged 65 years or older
Source	Eurostat
Reference year	2019
NUTS level	NUTS 3

Disposable Income

Description	Disposable income in purchasing power standard, Euro per inhabitant
Source	Eurostat
Reference year	2014
NUTS level	NUTS 2

Perceived social network support

Description	Percentage of people that replied "Yes" with respect to all respondents to the following question: If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?
Source	OECD - Regional Well-Being dataset
Reference year	2014
NUTS level	NUTS 1 & 2

Indicators for labour market characteristics and regional economy

Economic performance (GDP/capita)

Description	Gross domestic product (GDP) at current market prices in Euro; Purchasing Power Standard per inhabitant
Source	Eurostat
Reference year	2014
NUTS level	NUTS 3

Regional export volumes as share of GDP

Description	Exports to foreign countries as share of regional GDP
Source	JRC
Reference year	model simulation based on 2018 data
NUTS level	NUTS 2

Cross-border employment

Description	Share of employed persons living in the region but working in a foreign country on total population of the region.
Source	Eurostat
Reference year	2019 or latest available
NUTS level	NUTS 2

Total overnight stays per thousand inhabitants

Description	Total nights spent at hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks per thousand inhabitants.
Source	Eurostat
Reference year	2015
NUTS level	NUTS 2

Employment in the automotive industry

Description	Share of employment in the automotive industry (manufacture, wholesale and retail) on the total population in working age (15-64)
Source	Eurostat
Reference year	2015
NUTS level	NUTS 2

Indicators for characteristics related to governance

Quality and accountability of government services

Description	This indicator is computed based on the results of a survey and the national estimates from the World Bank Governance Indicators. In the survey, people were asked to rate the quality of the government services health care, education and law enforcement in their area.
Source	DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, The World Bank Group
Reference year	2017
NUTS level	NUTS 2

Quality of the public health care system

Description	People were asked to rate the quality of the health care system on a scale of "1" (extremely poor quality) to "10" (extremely high quality) in their area.
Source	Charron, Nicholas, Lewis Dijkstra and Victor Lapuente (European Quality of Government Index), ESPON M4D, OIR calculation
Reference year	2013
NUTS level	NUTS 1 & 2

Indicators for environmental characteristics

Urban population exposed to PM10 concentrations

Description	Share of urban population exposed to PM10 concentrations exceeding the daily limit value (50 µg/m ³) on more than 35 days in a year
Source	JRC
Reference year	2020 (projection)
NUTS level	NUTS 2

Emissions of CO2 per capita (tonnes)

Description	CO2 (Carbon dioxide) emissions in tonnes/year/capita
Source	JRC
Reference year	2020 (projection)
NUTS level	NUTS 2

Other indicators

Regional ICT infrastructure

Description	The availability of broadband is measured by the percentage of households that are connectable to an exchange that has been converted to support xDSL-technology, to a cable network upgraded for internet traffic, or to other broadband technologies.
Source	ESPON Core indicators 2017 based on EUROSTAT
Reference year	2016
NUTS level	NUTS 2

A.2 Standard indicators in the TIA tool

Name	Year	NUTS	Source
Economic performance (GDP/capita)	2014	3	Eurostat
Economic performance (GVA/capita)	2014	3	Eurostat
GVA in industry (secondary sector)	2015	3	Eurostat/OIR calculation
GDP loss due to cross-border obstacles	2017	3	Politecnico di Milano (publisher: European Commission)
Entrepreneurship (share of private enterprises)	2014	2	Eurostat LFS
Total overnight stays per thousand inhabitants	2015	2	Eurostat
Patent applications/Mio inhabitants	2012	3	Eurostat
Employment in technology and knowledge-intensive sectors	2015	2	Eurostat LFS
Share of R&D personnel and researchers	2013	2	Eurostat
Employment in agriculture, forestry and fishing	2013	3	Eurostat ESA 2010, OIR Calculation
Employment in industry and construction	2013	3	Eurostat ESA 2010, OIR Calculation
Employment in services	2013	3	Eurostat ESA 2010, OIR Calculation
Employment in industry	2015	2	Eurostat SBS/OIR calculation
Employment in tourism	2016	2	Eurostat, DG REGIO
Share of full-time employments	avg. 2014-16	2	Eurostat, OIR Calculation
Share of part-time employments	avg. 2014-16	2	Eurostat, OIR Calculation
Female employment ratio	2016	2	Eurostat, OIR Calculation
Population density	2015	3	Eurostat
Economically active population per km ²	2016	3	Eurostat, OIR Calculation
Old age dependency ratio	2016	3	Eurostat, OIR Calculation

Young age dependency ratio	2016	3	Eurostat, OIR Calculation
Average age of population	2017	3	Eurostat
Net migration	2015	3	Eurostat
Gender balance employment	2014	2	Eurostat/DG Regio RCI 2016
Unemployment rate	2014	2	Eurostat LFS
Disposable Income	2014	2	Eurostat
People at risk of poverty or social exclusion	2015	2	Eurostat
Crimes recorded by the police	2010	3	Eurostat, OIR calculation
Housing: Number of rooms per person	2014	1/ 2	OECD - Regional Well-Being dataset
Perceived social network support	2014	1/ 2	OECD - Regional Well-Being dataset
Self-evaluation of life satisfaction	2014	1/ 2	OECD - Regional Well-Being dataset
Educational attainment of 30-34 year olds, primary education (levels 0-2)	2016	2	Eurostat
Educational attainment of 30-34 year olds, secondary education (levels 3-4)	2016	2	Eurostat
Educational attainment of 30-34 year olds, tertiary education (levels 5-8)	2016	2	Eurostat
Share of pupils in Youth Education system	avg. 2014/15	1/ 2	Eurostat, OIR calculation
Number of students in tertiary education	2014	2	Eurostat, OIR calculation
Early leavers from education and training	avg. 2011- 15	2	Eurostat LFS
Quality of public education	2013	1/ 2	Charron, Nicholas, Lewis Dijkstra and Victor Lapuente (European Quality of Government Index), ESPON M4D, OIR calculation
Corruption	2013	2	DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, The World Bank Group
Quality and accountability of government services	2017	2	DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, The World Bank Group
Impartiality of government services	2013	2	DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, The World Bank Group
Quality of law enforcement	2013	1/ 2	Charron, Nicholas, Lewis Dijkstra and Victor Lapuente (European Quality of Government Index), ESPON M4D, OIR calculation
Trust in the political system	2013	1/ 2	EU-SILC ad-hoc Quality of Life module (publisher: SPI 2016)
Trust in the legal system	2013	1/ 2	EU-SILC ad-hoc Quality of Life module (publisher: SPI 2016)
CB lower: Quality and accountability of government services	2013	2	DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, OIR calculation
CB difference: Quality and accountability of government services	2013	2	DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, OIR calculation
EAGF & EAFRD: Expenditure in share of GDP	avg. 2004- 2008	3	DG Agri, OIR calculation

ERDF & CF Expenditure in Million Euro	2014	3	wiiw, Ismeri Europa (Data: EU Commission, DG Regio), OIR calculation
Potential accessibility by road	2014	3	S&W Spiekermann & Wegener, Urban and Regional Research
Potential accessibility by rail	2014	3	S&W Spiekermann & Wegener, Urban and Regional Research
Potential accessibility by air	2014	3	S&W Spiekermann & Wegener, Urban and Regional Research
Potential accessibility multimodal	2014	3	S&W Spiekermann & Wegener, Urban and Regional Research
CB lower: Potential accessibility multimodal	2014	3	S&W Spiekermann & Wegener, Urban and Regional Research, AC, OIR calculation
Regional ICT infrastructure	2016	2	ESPON Core indicators 2017 based on EUROSTAT
Regional transport infrastructure: navigable canals	2015	2	Eurostat
Regional transport infrastructure: navigable rivers	2015	2	Eurostat
Regional transport infrastructure: motorways	2015	2	Eurostat
Regional transport infrastructure: total railway lines	2015	2	Eurostat
Land cover: Share of agricultural areas	2012	2	Eurostat, LUCAS Land Use and Cover Area frame Survey
Land use: Share of agriculture	2012	2	Eurostat, LUCAS Land Use and Cover Area frame Survey
Land use: Share of irrigated land	2013	2	Eurostat
Protected areas (NATURA 2000)	2012	3	EEA, DG REGIO
CB product: Protected areas (NATURA 2000)	2012	3	EEA, DG REGIO, OIR calculation
Land cover: Share of Woodland, Shrubland and Wetland	2012	2	Eurostat, LUCAS Land Use and Cover Area frame Survey
Relative size of built-up areas	2012	3	JRC European Human Settlement Map based on GHSL automatic extraction of built-up areas from satellite imagery of 2.5m resolution.
Land use: Share of heavy environmental impact	2012	2	Eurostat, LUCAS Land Use and Cover Area frame Survey
Urban population exposed to PM10 concentrations	2020 (projection)	2	JRC
Emissions of CO2 per capita (tonnes)	2020 (projection)	2	JRC, GAINS model
Emissions of NOx per capita (kilotonnes)	2020 (projection)	2	JRC, GAINS model
Land cover: Share of Water areas	2012	2	Eurostat, LUCAS Land Use and Cover Area frame Survey
Water Consumption	2020 (projection)	2	JRC, water use model
Structural Green Infrastructures	2020 (projection)	2	JRC, LUISA
Urban wastewater	2010	2	EEA, DG Regio 6th Cohesion Report
Municipal waste generated	2013	2	Eurostat
Exposure to heat waves	1995	2	E-OBS

Solar energy potential	2012	3	ESPON LOCATE
Wind energy potential	2012	3	ESPON LOCATE
Soil erosion by water	2010	3	JRC
Capacity of ecosystems to avoid soil erosion	2020 (projection)	2	JRC, LUISA
Soil retention	2020 (projection)	2	JRC, LUISA
Landslide susceptibility	2012	3	ESPON based on JRC European Soil Portal
Sensitivity to floods	2012	3	ESPON on Dartmouth Flood Observatory
Sensitivity to avalanches	2012	3	ESPON on USGS and DLR
Probability of forest fire hazard	1997 - 2003	2	ESPON 1.3.1., GTK
Life expectancy at birth	2015	2	Eurostat
Total fertility rate	avg. 2014- 15	3	Eurostat, OIR Calculation
Birth rate	avg. 2014- 15	3	Eurostat, OIR Calculation
Quality of the public health care system	2013	1/ 2	Charron, Nicholas, Lewis Dijkstra and Victor Lapuente (European Quality of Government Index), ESPON M4D, OIR calculation
Health personnel	2014	2	Eurostat
Hospital beds	2014	2	Eurostat
CB difference: Hospital beds	2014	2	Eurostat, OIR Calculation

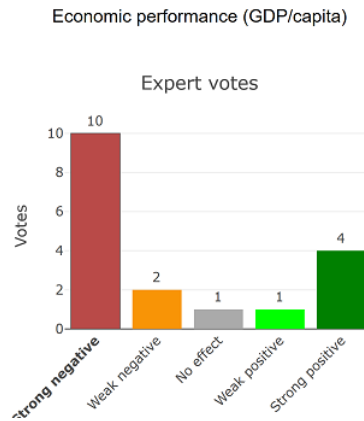
A.3 Indicators

This annex includes the indicators that were considered as relevant by the experts in respect of the COVID-19 crisis but were not assessed in detail in Chapter 5. It comprises a description of the indicators, the results of the expert judgement and the map with the highest number of votes of each indicator.

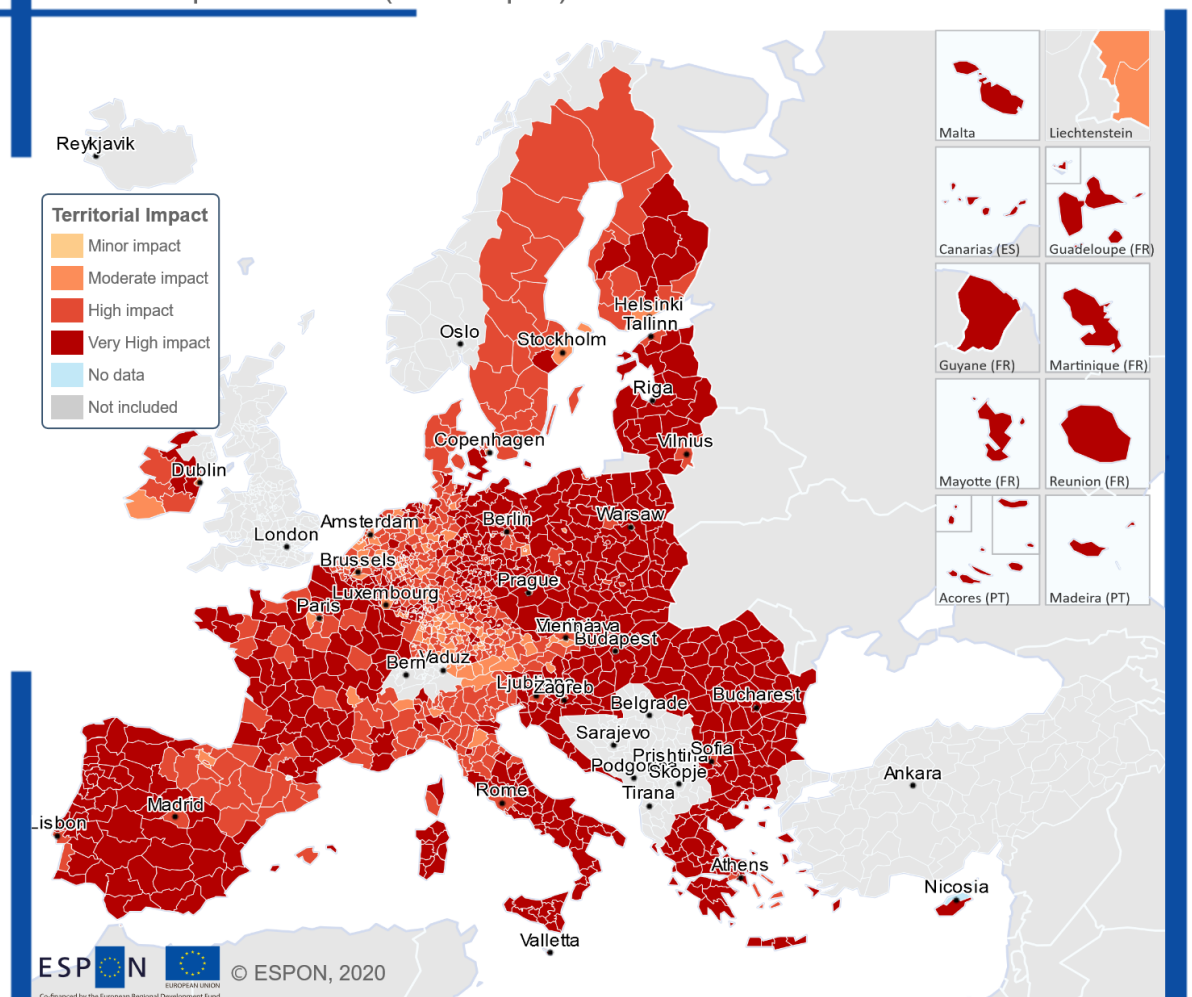
Source of all results of the judgement and maps: Territorial impact assessment expert workshop, 30th July 2020, Videoconference

Economic performance (GDP/capita)

Gross domestic product (GDP) at current market prices; Purchasing Power Standard per inhabitant; *Source: Eurostat*



Economic performance (GDP/capita)

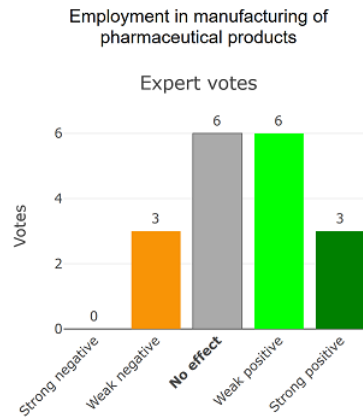


Set of regions selected: EU 27
 Typology: All regions
 Normalization method: Z(10-90)
 Expert voting: Strong negative effect

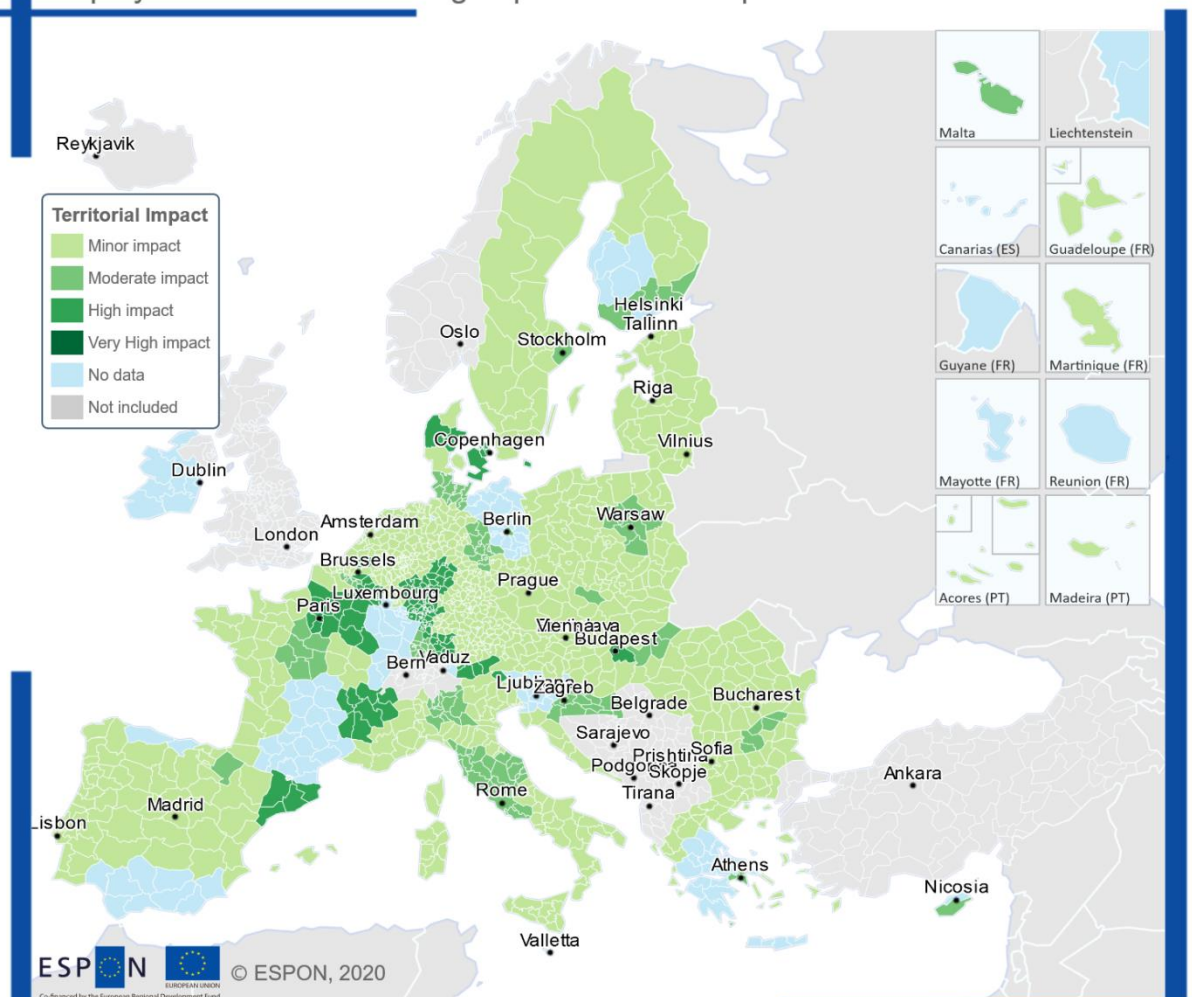
Spatial Resolution of Data: NUTS3
 Source: Eurostat
 CC - UMS RIATE for administrative boundaries

Employment in manufacturing of pharmaceutical products

Share of employment in manufacturing of pharmaceutical products on the total population in working age (15-64); *Source: Eurostat, OIR calculation*



Employment in manufacturing of pharmaceutical products



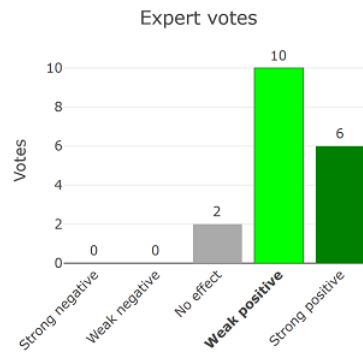
Set of regions selected: EU 27
Typology: All regions
Normalization method: Z(10-90)
Expert voting: Weak positive effect

Spatial Resolution of Data: NUTS2
Source: Eurostat, OIR calculation
CC - UMS RIATE for administrative boundaries

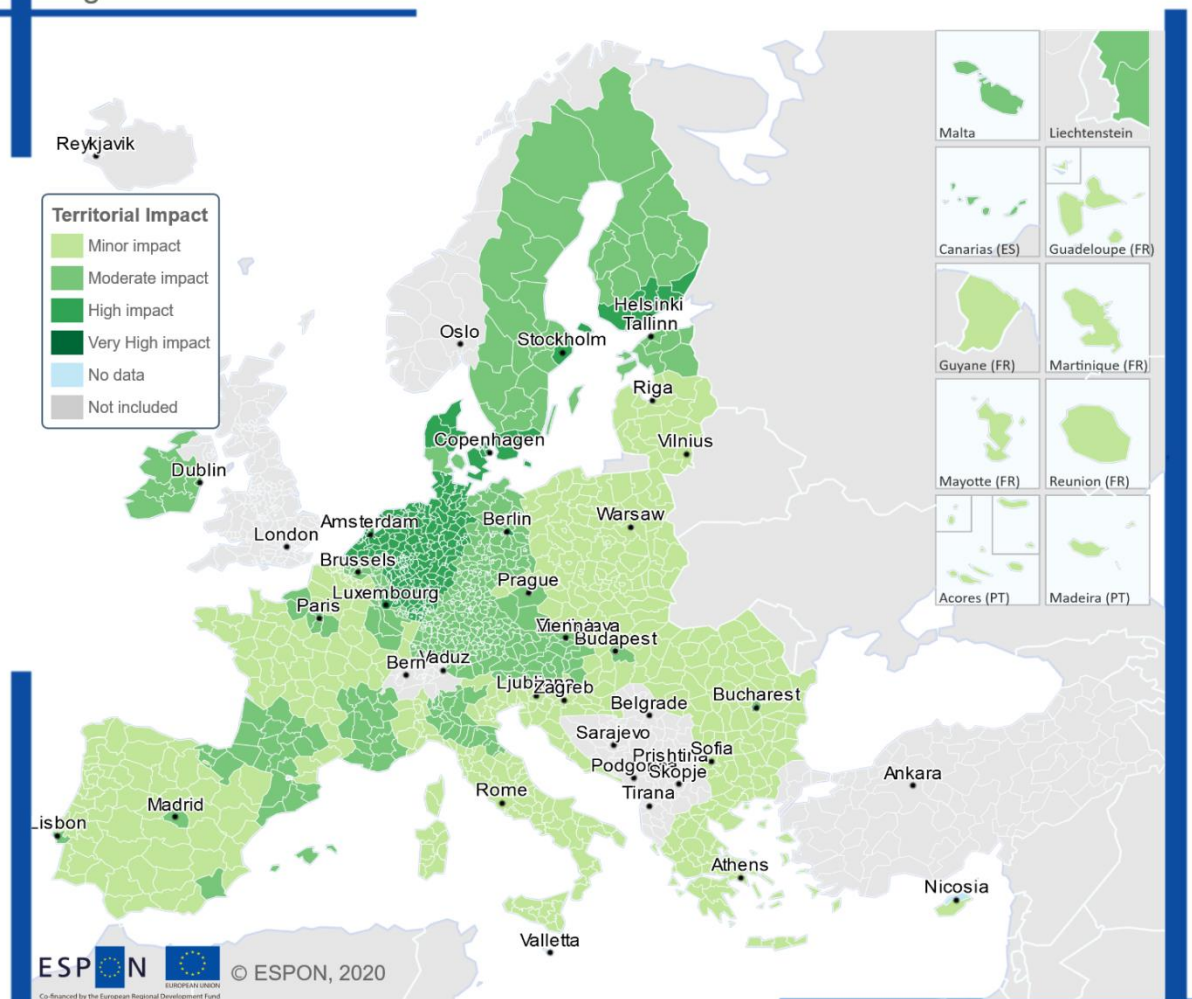
Regional ICT infrastructure

The availability of broadband is measured by the percentage of households that are connectable to an exchange that has been converted to support xDSL-technology, to a cable network upgraded for internet traffic, or to other broadband technologies. *Source: ESPON Core indicators 2017 based on EUROSTAT*

Regional ICT infrastructure



Regional ICT infrastructure



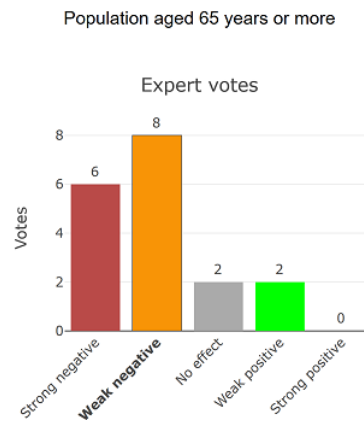
ESPON © ESPON, 2020
Co-financed by the European Regional Development Fund

Set of regions selected: EU 27
Typology: All regions
Normalization method: Z(10-90)
Expert voting: Weak positive effect

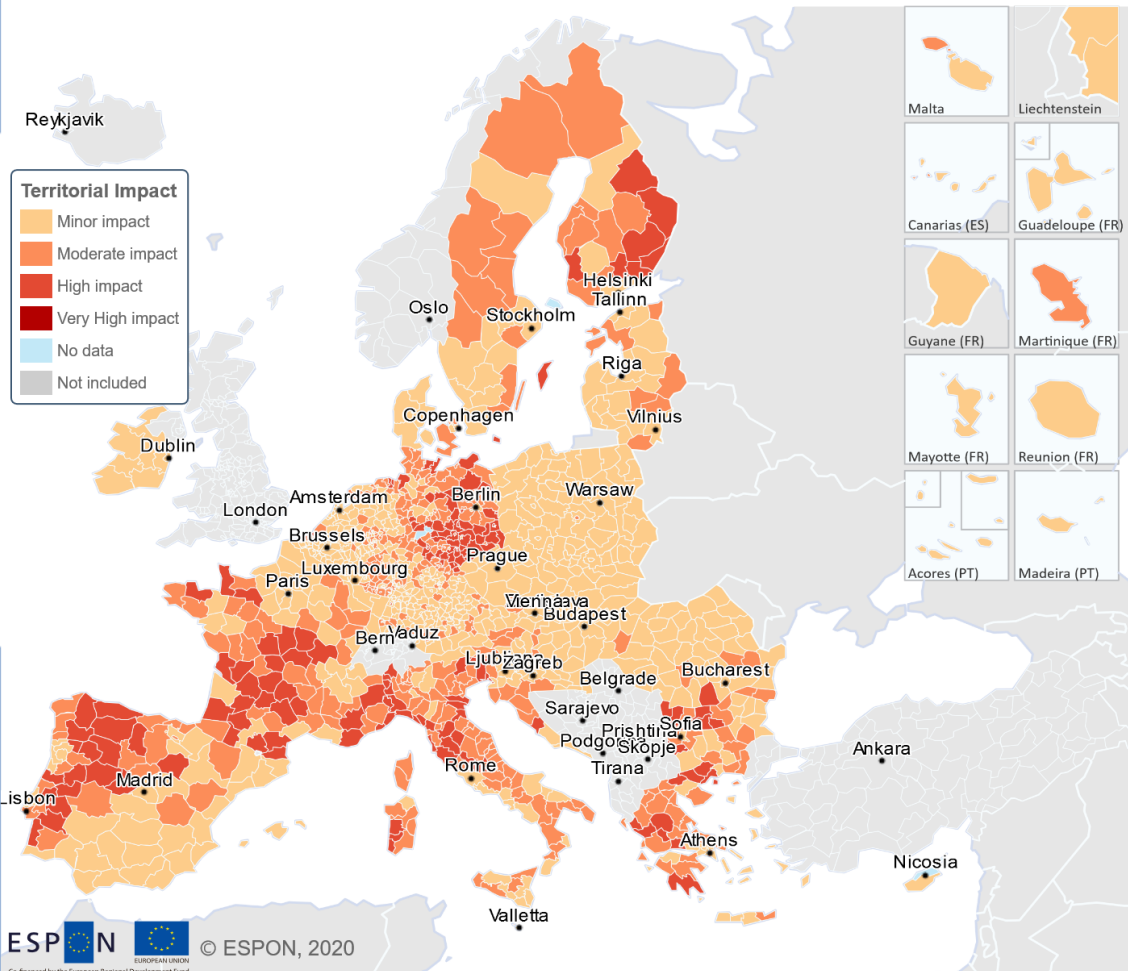
Spatial Resolution of Data: NUTS2
Source: ESPON Core indicators 2017 based on EUROSTAT
CC - UMS RIATE for administrative boundaries

Population aged 65 years or more

Share of population aged 65 years or older; *Source: Eurostat*



Population aged 65 years or more



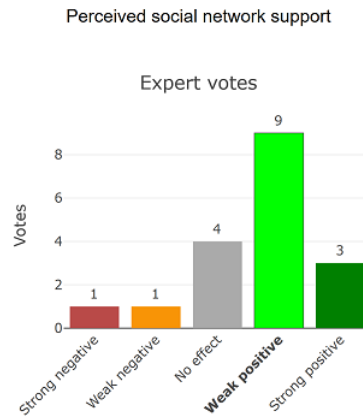
ESPON
 Co-financed by the European Regional Development Fund

Set of regions selected: EU 27
 Typology: All regions
 Normalization method: Z(10-90)
 Expert voting: Weak negative effect

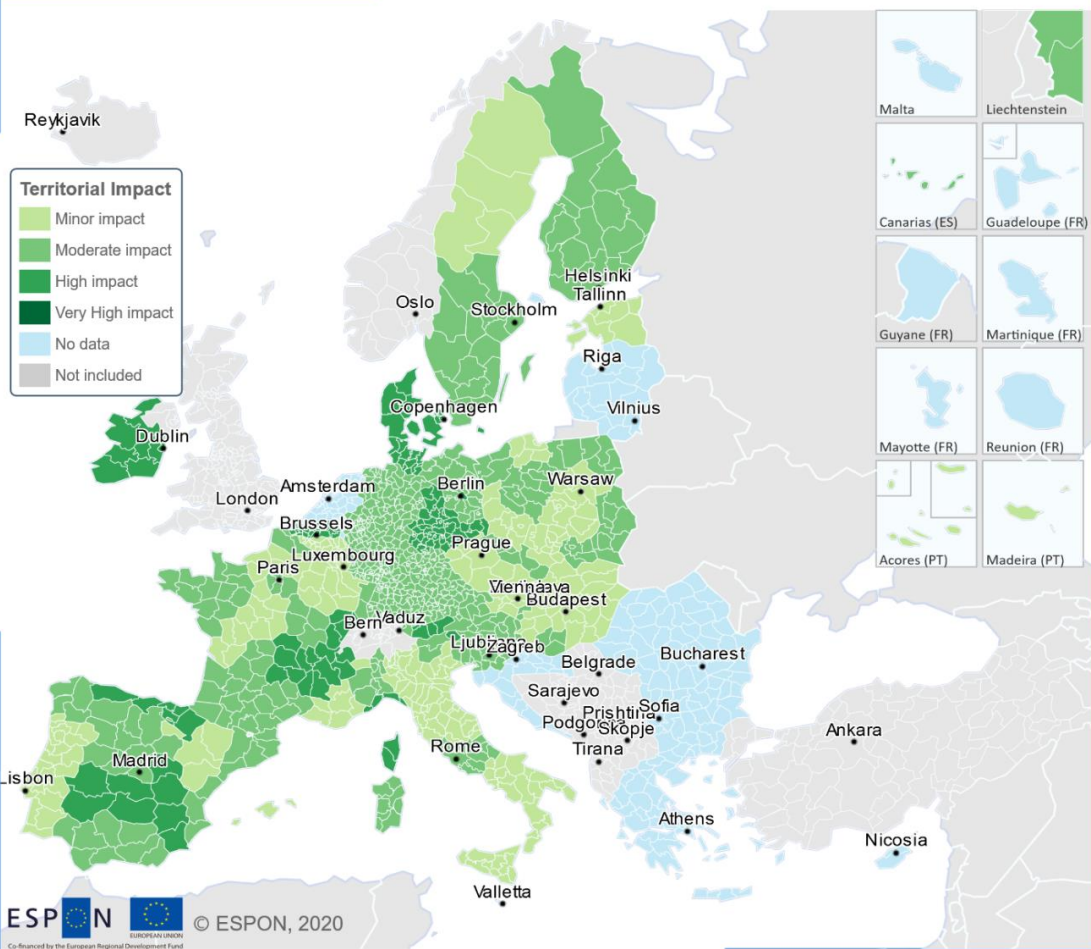
Spatial Resolution of Data: NUTS3
 Source: Eurostat
 CC - UMS RIATE for administrative boundaries

Perceived social network support

Percentage of people that replied “Yes” with respect to all respondents to the following question: If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not. *Source: OECD*



Perceived social network support



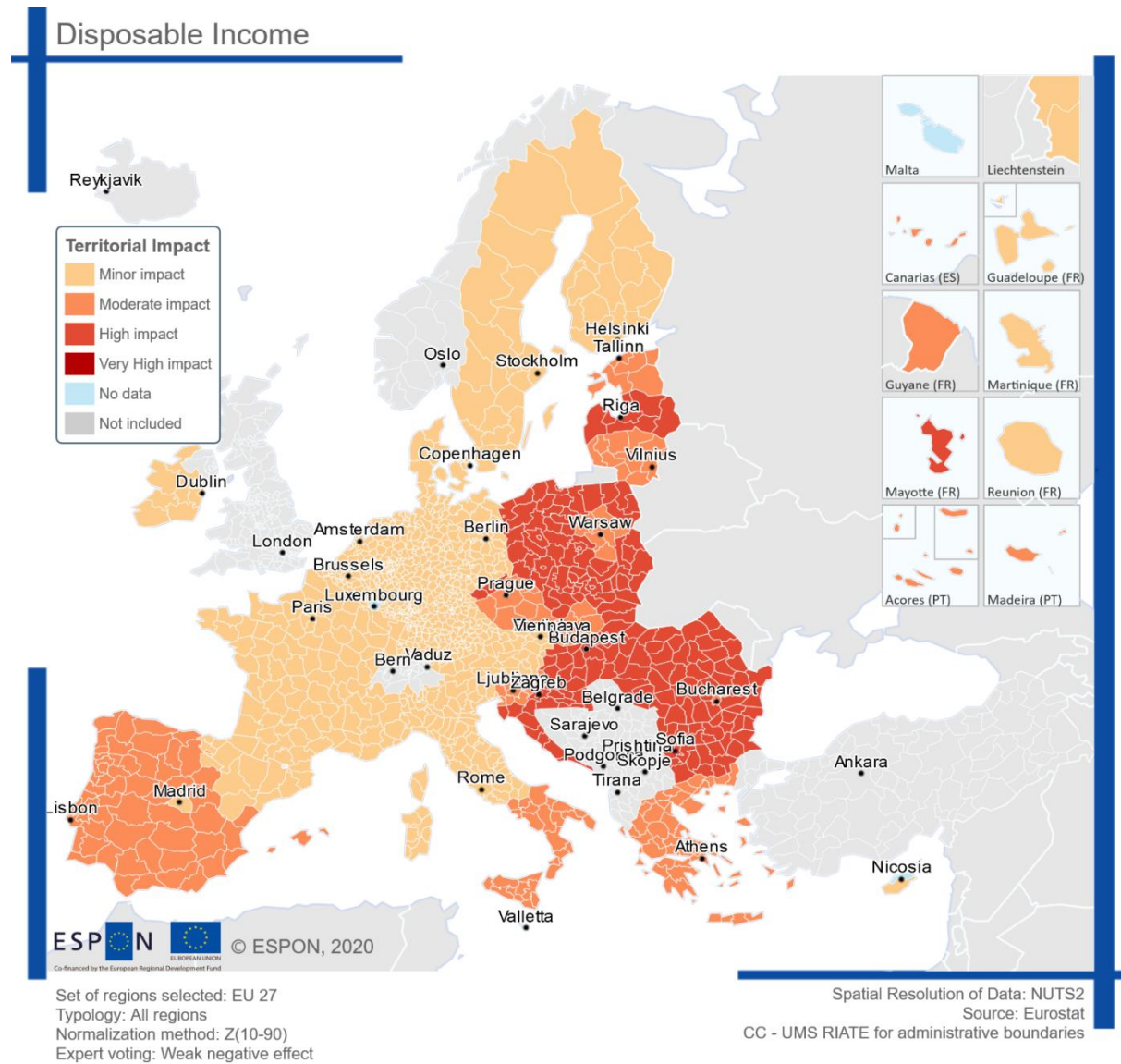
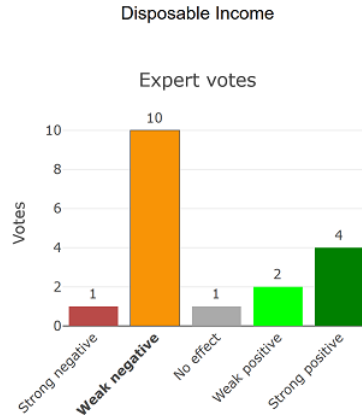
ESPON © ESPON, 2020
 Co-financed by the European Regional Development Fund

Set of regions selected: EU 27
 Typology: All regions
 Normalization method: Z(10-90)
 Expert voting: Weak positive effect

Spatial Resolution of Data: NUTS1/2
 Source: OECD - Regional Well-Being dataset
 CC - UMS RIATE for administrative boundaries

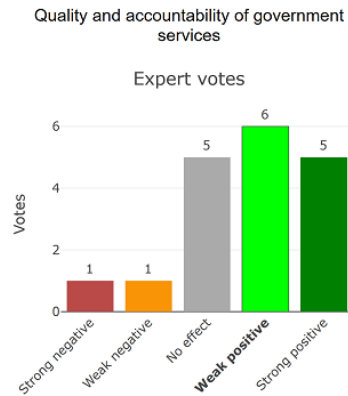
Disposable income

Disposable income in purchasing power standard, Euro per inhabitant; *Source: Eurostat*

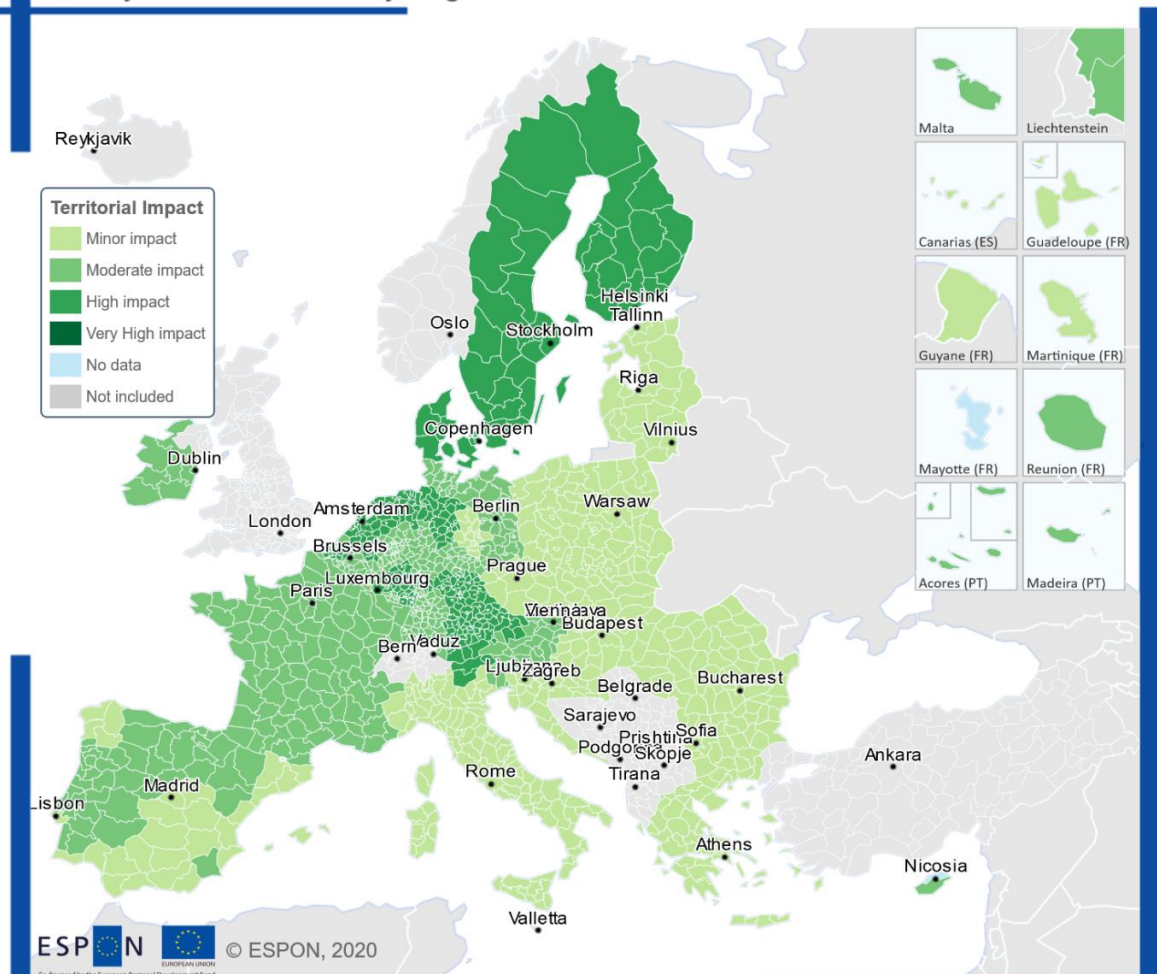


Quality and accountability of government services

This indicator is computed based on the results of a survey and the national estimates from the World Bank Governance Indicators. People were asked to rate the quality of the government services health care, education and law enforcement in their area. *Source: DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index*



Quality and accountability of government services



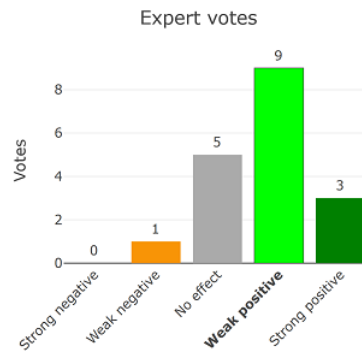
Set of regions selected: EU 27
Typology: All regions
Normalization method: Z(10-90)
Expert voting: Weak positive effect

Spatial Resolution of Data: NUTS2
Source: DG Regio RCI 2016 on University of Gothenburg, European Quality of Institutions Index, The World Bank Group
CC - UMS RIATE for administrative boundaries

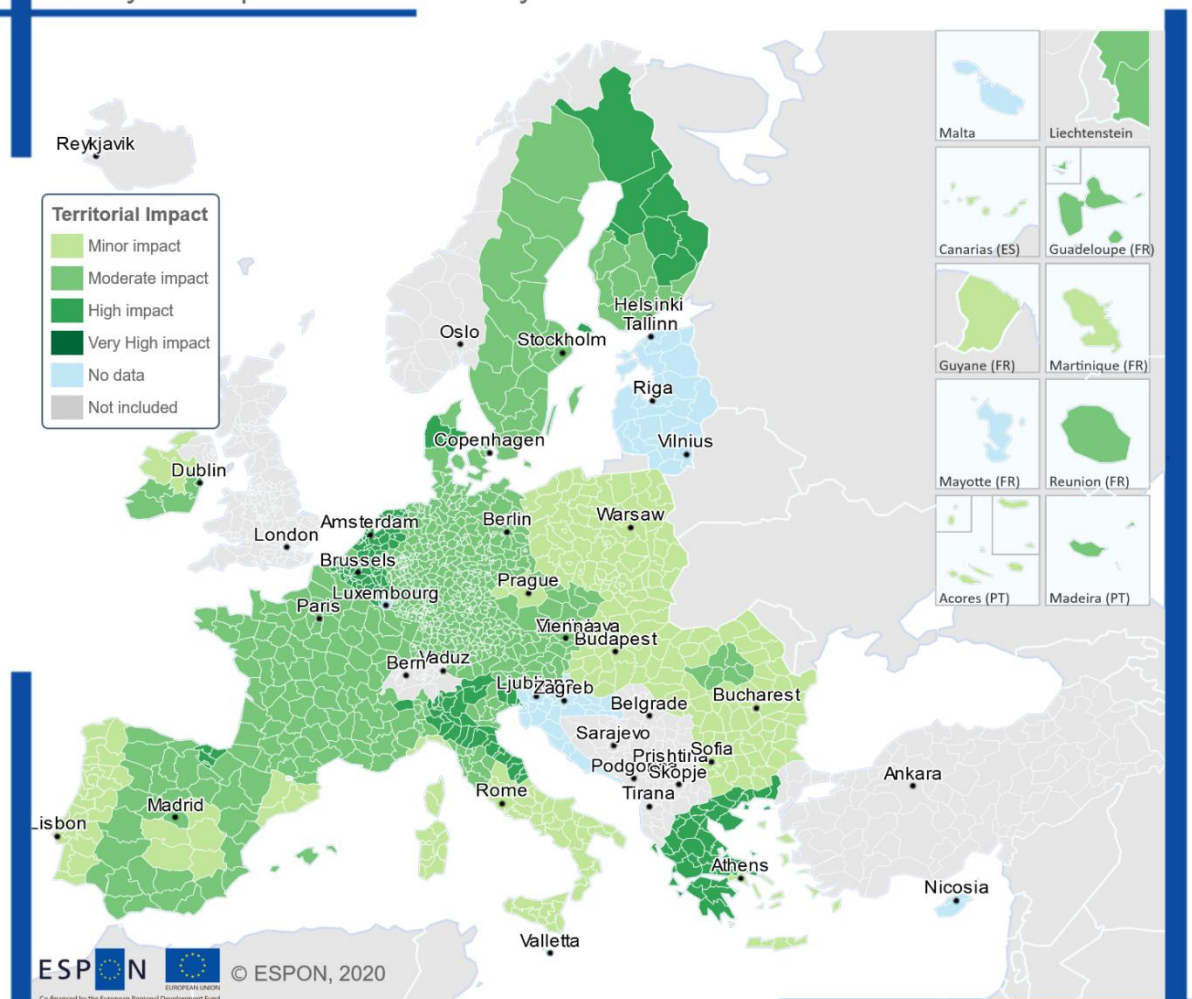
Quality of the public health care system

People were asked to rate the quality of the health care system on a scale of “1” (extremely poor quality) to “10” (extremely high quality) in their area. *Source: Charron, Nicholas, Lewis Dijkstra and Victor Lapuente (European Quality of Government Index), ESPON M4D, OIR calculation*

Quality of the public health care system



Quality of the public health care system

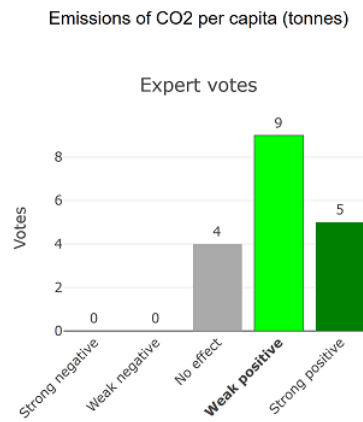


Set of regions selected: EU 27
Typology: All regions
Normalization method: Z(10-90)
Expert voting: Weak positive effect

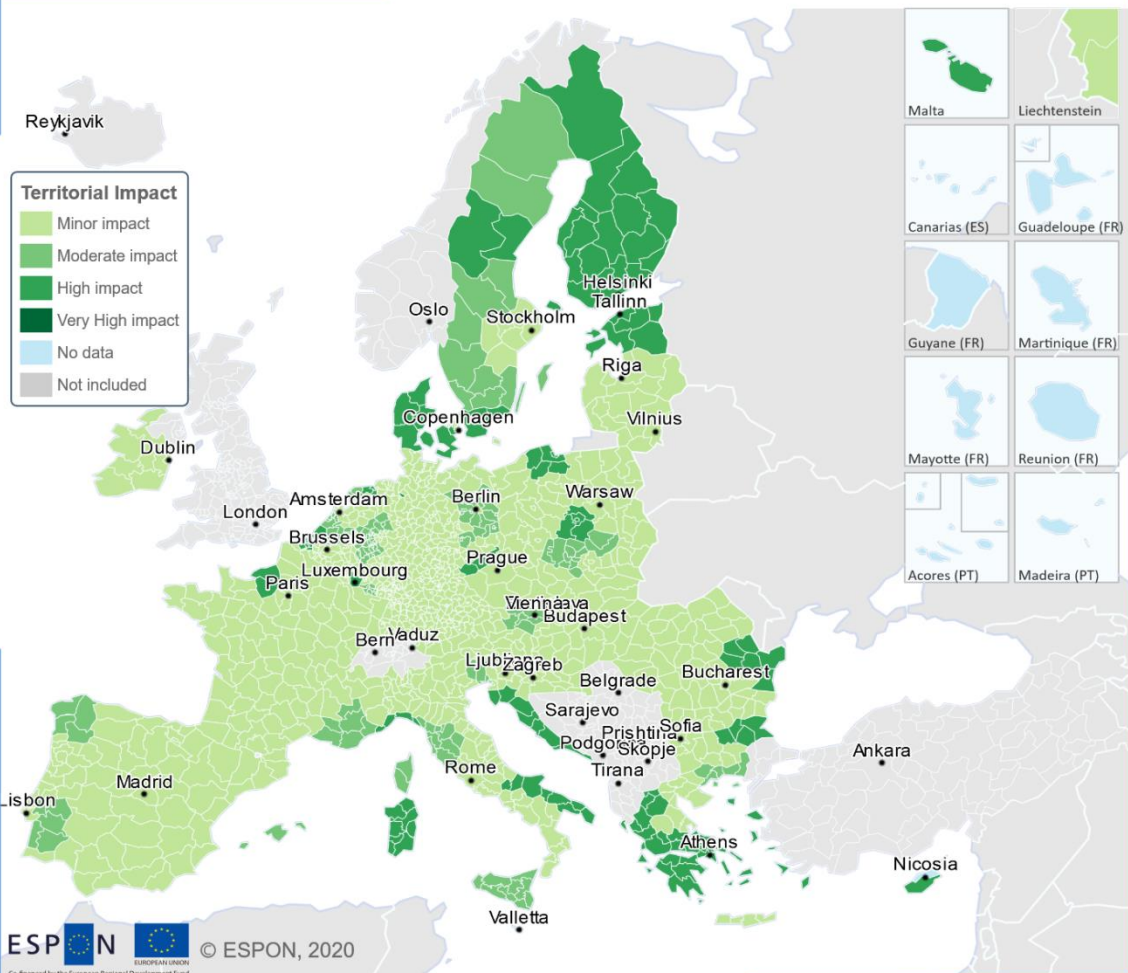
Spatial Resolution of Data: NUTS1/2
Source: Charron, Nicholas, Lewis Dijkstra and Victor Lapuente (European Quality of Government Index), ESPON M4D, OIR calculation
CC - UMS RIATE for administrative boundaries

Emissions of CO₂ per capita (tonnes)

CO₂ (Carbon dioxide) emissions in tonnes/year/capita; *Source: JRC*



Emissions of CO₂ per capita (tonnes)

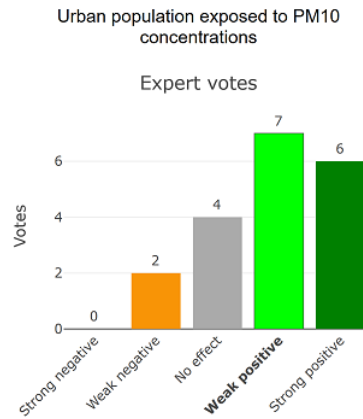


Set of regions selected: EU 27
 Typology: All regions
 Normalization method: Z(10-90)
 Expert voting: Weak positive effect

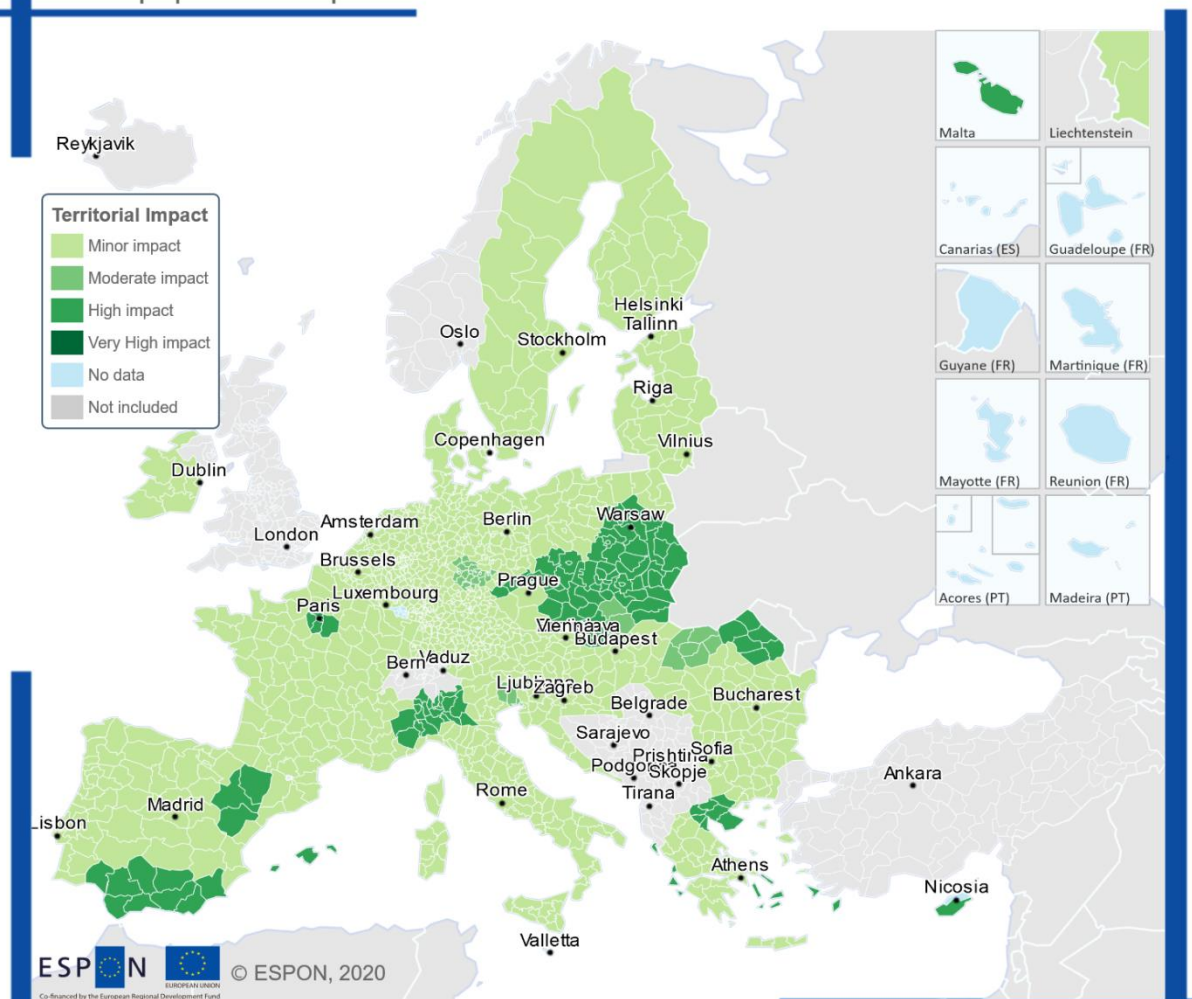
Spatial Resolution of Data: NUTS2
 Source: JRC, GAINS model
 CC - UMS RIATE for administrative boundaries

Urban population exposed to PM10 concentrations

% of urban population exposed to PM10 concentrations exceeding the daily limit value ($50 \mu\text{g}/\text{m}^3$) on more than 35 days in a year; *Source: JRC*



Urban population exposed to PM10 concentrations

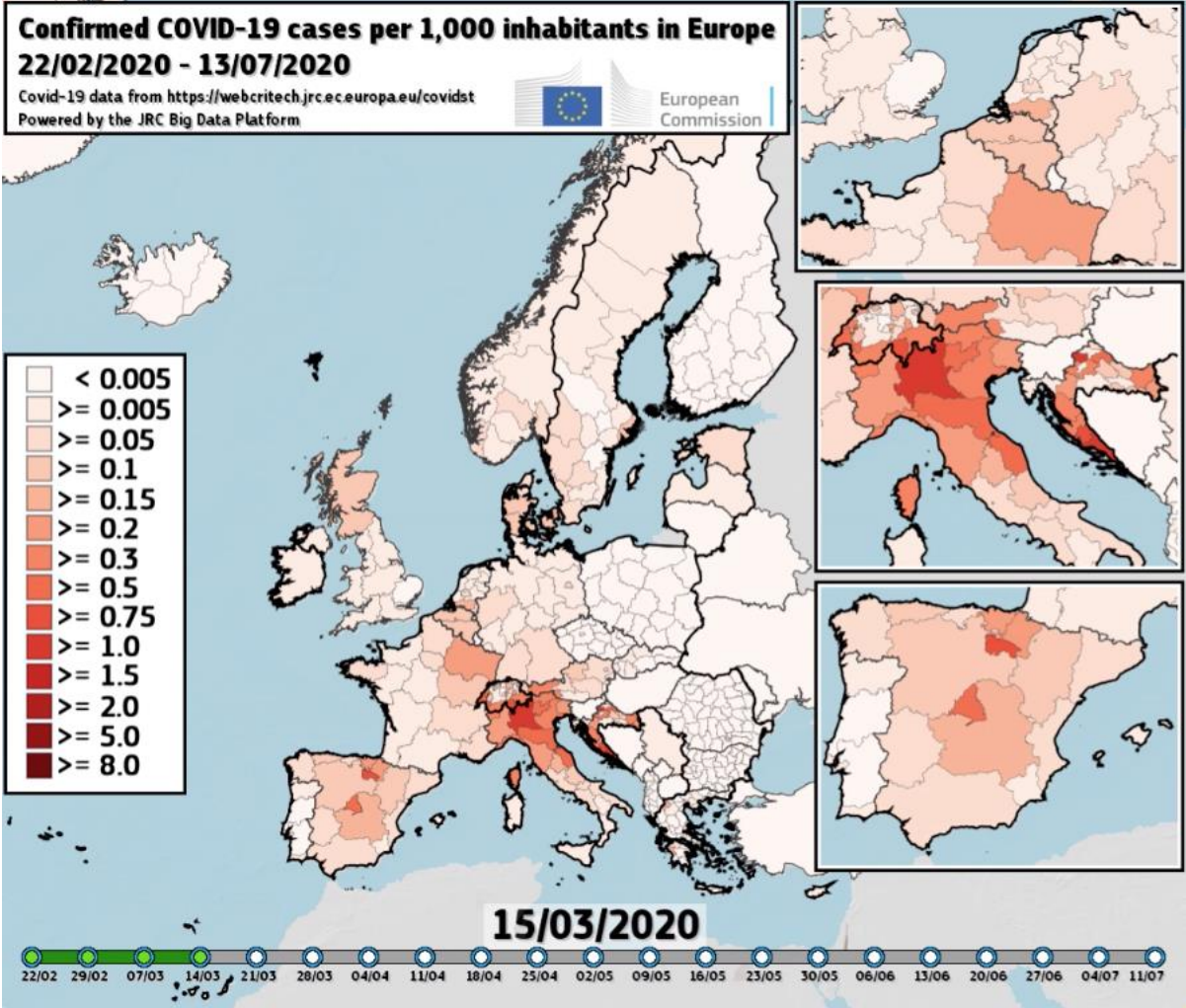


Set of regions selected: EU 27
 Typology: All regions
 Normalization method: Z(10-90)
 Expert voting: Weak positive effect

Spatial Resolution of Data: NUTS2
 Source: JRC
 CC - UMS RIATE for administrative boundaries

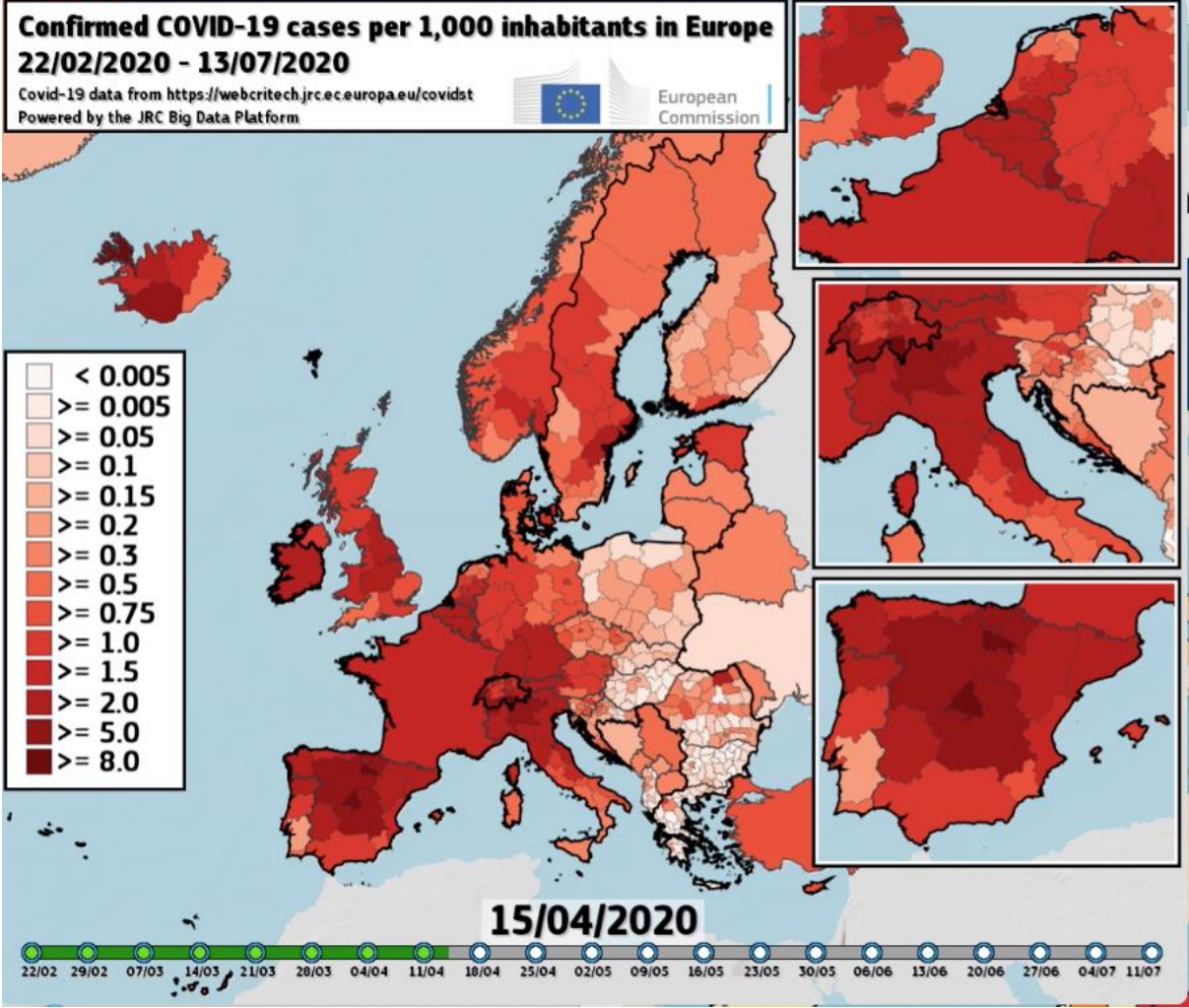
A.4 Evolution of COVID-19 infections

Confirmed COVID-19 cases per 1,000 inhabitants – 15th March 2020



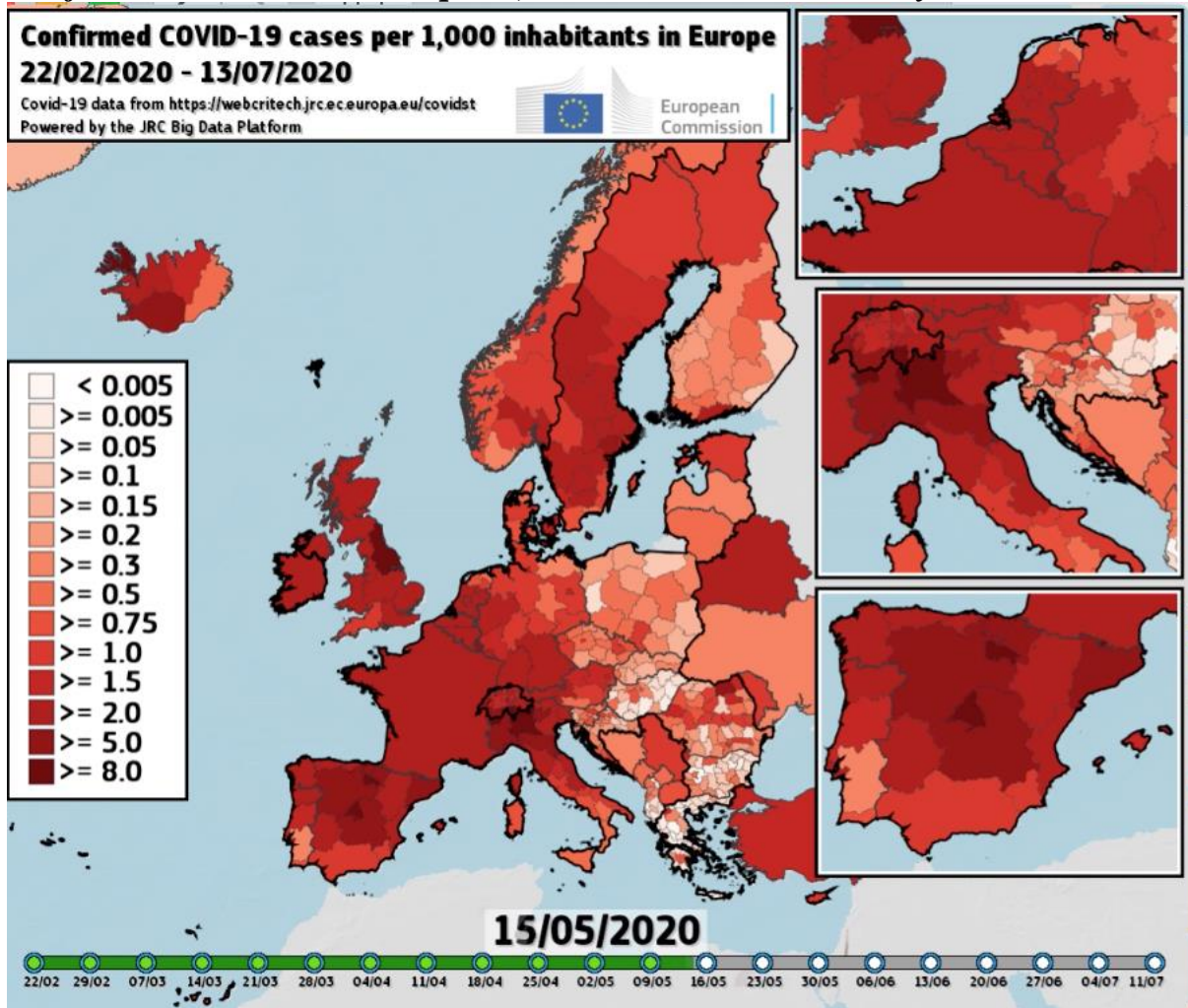
Source: JRC

Confirmed COVID-19 cases per 1,000 inhabitants – 15th April 2020



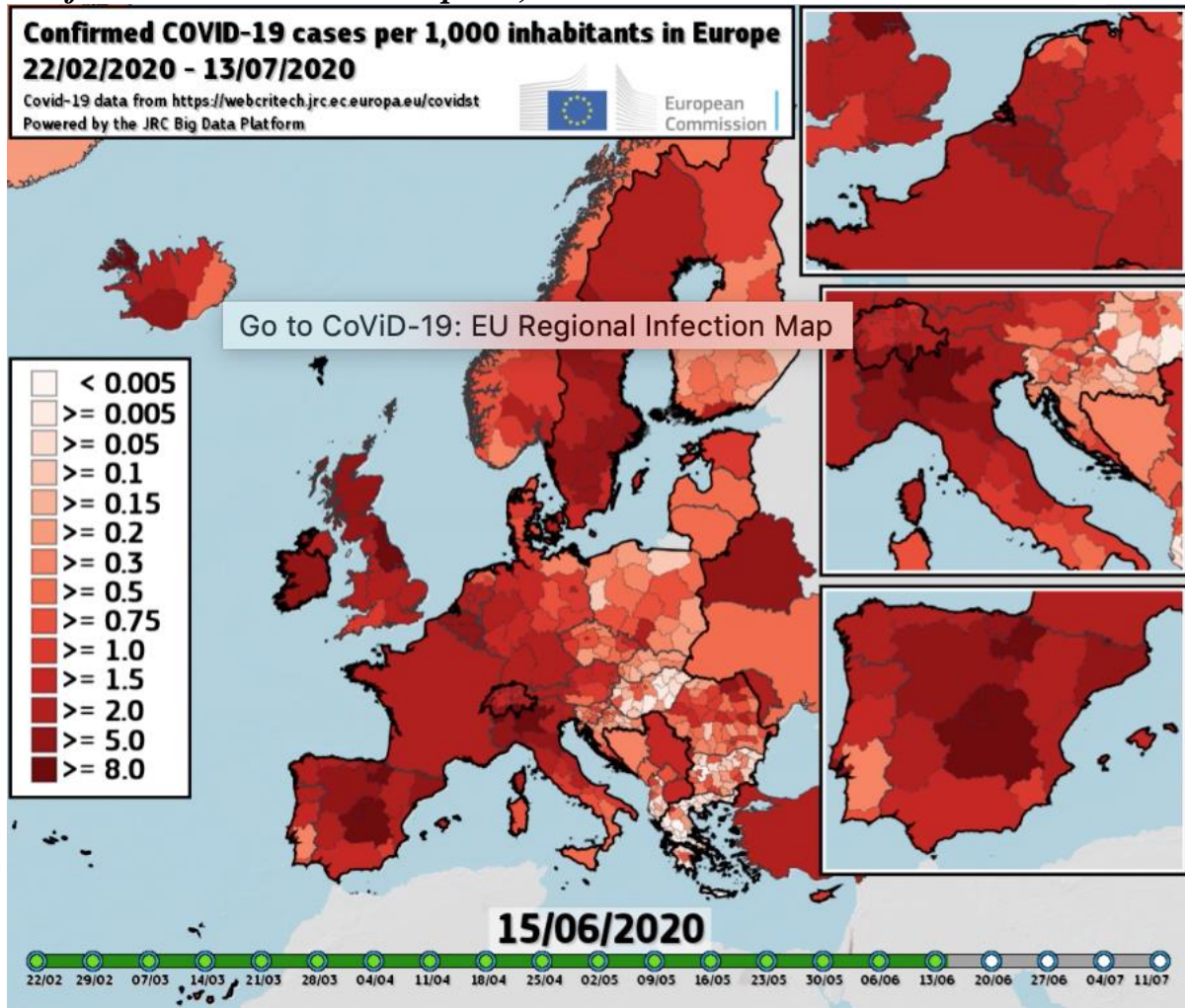
Source: JRC

Confirmed COVID-19 cases per 1,000 inhabitants – 15th May 2020



Source: JRC

Confirmed COVID-19 cases per 1,000 inhabitants – 15th June 2020

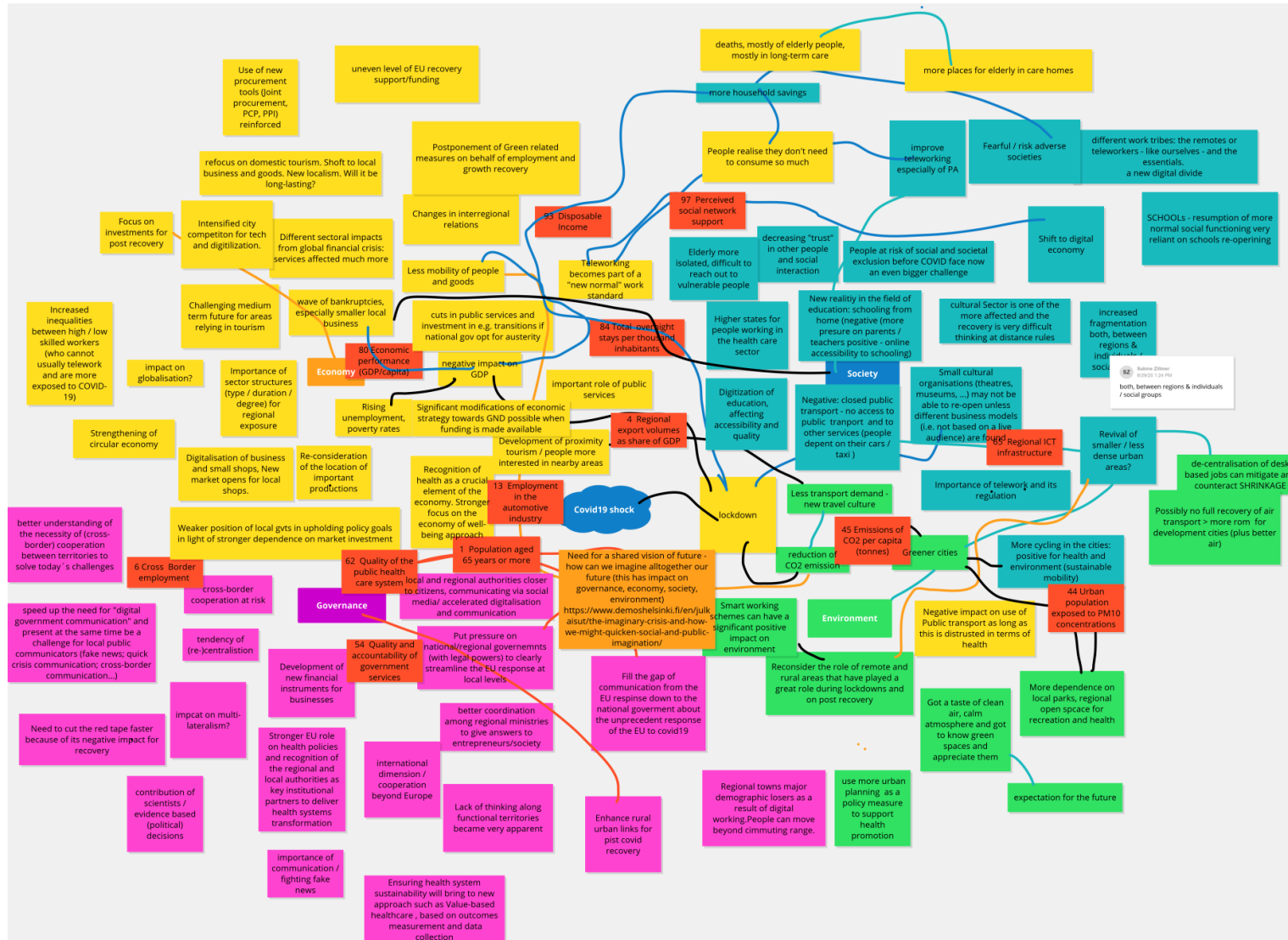


Source: JRC

A.5 List of participants

Anna Alvezzola, CEMR
Mikel Irujo Amezaga, Navarra Region
Flavio Besana, Spatial Foresight
Patrick Bisciari, National Bank of Belgium
Pedro Bizarro, CEMR
Kai Böhme, Spatial Foresight
Igor Caldeira, Committee of the Regions
Erich Dallhammer, ÖIR
Valentin Deniaud, CEMR
Valentijn Ebbers, Dutch Ministry of the Interior
Xabier Velasco Echeverria, Territorial Observatory of Navarra
Annabelle Favreau, Regional Government of Extremadura
Ana Vega Fernández, Regional Government of Extremadura
Aleksandra Gancarz, Lower Silesian Voivodeship
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Martin Hutter, City of Vienna
Carmen Sillero Illanes, Agency of Innovation and Development of Andalusia
Jouni Kaipainen, University of Jyväskylä
Agnès Koreska, Lower Austria
Bert Kuby, Committee of the Regions
Ines Lupše, Directorate for Spatial Planning, Slovenia
Marnix Mohrmann, Committee of the Regions
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Miguel Morcillo, Climate Alliance
Roberta Negriolli, Lombardy Region
Audrey Parizel, Committee of the Regions
Wolfgang Petzold, Committee of the Regions
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Marine Siva, Committee of the Regions
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Tina Weber, Eurofound
Agnieszka Wieczorek Jetha, ERRIN
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Johan van Zoest, Amsterdam Metropole Region

A.6 Systemic picture



EN

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**European Committee
of the Regions**

Created in 1994 following the signing of the Maastricht Treaty,
the European Committee of the Regions is the EU's assembly of 329 regional and
local representatives from all 27 Member States, representing over 447 million Europeans.

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