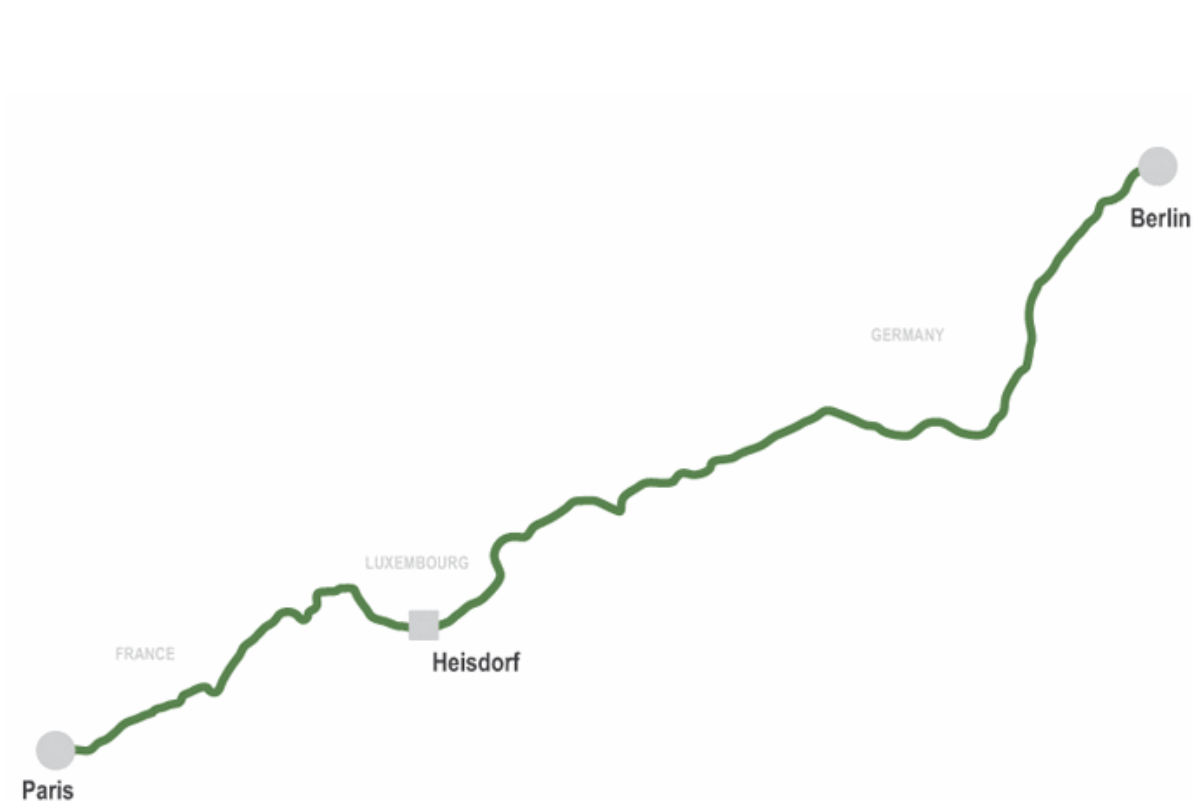**Spatial Foresight Brief 2020:13**

UNDERSTANDING THE TERRITORIALLY DIVERSE IMPLICATIONS OF COVID-19 POLICY RESPONSES

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Understanding the territorially diverse implications
of COVID-19 policy responses

This Spatial Foresight Working Paper derives from internal discussions on what COVID-19 and the various policy responses it has triggered mean for territorial development in Europe and how potential implications differ between territories. The paper offers a spotlight on work in progress and shows the state of play in early May 2020. The team will work further and follow up on this paper in summer 2020.

To a large degree the data collection and analysis presented in this paper builds on preparatory work Flavio Besana is conducting for his PhD on the impacts of European policies on shrinking cities in Europe.[1] In early 2020, he decided to address policy responses to COVID-19 in his PhD.

In this paper, we first provide a quick rationale on why it is important to understand the territorial implications of COVID-19, or rather the policy responses to the pandemic, and why it is important to understand it in a comparative European perspective. Thereafter, we briefly outline our methodological approach on how to get grip on it. This is followed by the presentation of first draft results. Finally, we sketch the next steps to be taken to further develop, nuance and polish the work over the next months. Overall the paper shows the territorially diverse implications of COVID-19 policy responses which may inform discussions about ways forward making best use of the territorial diversity of Europe.

Everything presented in this paper is work in progress and subject to various discussions, as basically everything currently published on the impacts of COVID-19.

Why does the European and territorial dimension of COVID-19 matter?

COVID-19 has a territorial dimension. The pandemic has a huge impact on public health and triggered a large number of policy responses to ensure public health. These policy responses impact economies and labour markets with unprecedented shocks. First estimates show that the crisis is causing the most severe reduction in economic activity and working time since the Second World war (International Labour Organization 2020).

All this comes with a strong territorial dimension. The territorial impacts are highly asymmetric across Europe and within countries in at least two ways:

- The health dimension of COVID-19 has a territorial dimension. This becomes obvious when looking at the hotspots of the outbreak. There are clearly territorial variations, with places with high intensity of infections and death tolls and places which hardly seem affected. These territorial patterns of the outbreak differ from the territorial impacts of COVID-19.

- The policy responses to COVID-19 have a territorial dimension. The socio-economic dimension with the intensity of business disruptions varies between places. Although most policy responses are 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

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(OECD 2020b). The variations of the impacts of policy responses show the territorial impacts of COVID-19.

In order to understand how COVID-19 changes economic development conditions and what policy measures are needed to cushion the impacts and support recovery, we need to understand the territorial diversity of the impacts. In an integrated Europe, where places and territorial development paths are highly interdependent (ESPON 2019), we need to do so in European-wide perspective.

Although COVID-19 clearly has territorial impacts, the pandemic itself ignores territorial borders. Therefore, it is important to understand territorial implications of the pandemic in a larger territorial context acknowledging territorial interdependencies (Böhme 2020). Lähteenmäki-Smith and Böhme (2020) stress that a successful response to COVID-19, which ignores societal or territorial borders, must build on cooperation. To do so also the analysis of impacts of COVID-19 needs to go beyond national borders and take a European approach.

This paper is a first attempt to do so, with the aim to complement the richness of international studies comparing national figures (e.g. European Commission 2020; International Labour Organization 2020; OECD 2020b; Smith, Erin McAweeney, and Léa Ronzaud 2020), national studies going more into depths within a specific country (e.g. Ehrentraut, Koch, and Wankmül 2020; OECD 2020a; The three regional assemblies of Ireland 2020; WIFO 2020)), and papers addressing the cross border dimension (e.g. Cyrus and Ulrich 2020).

We are well aware of the difficulties of discussing the impacts of COVID-19 – or rather the policy response to it – at sub-national level in a European-wide approach. Firstly, the amount of comparable regional data to draw on is rather limited as has been shown in various ESPON studies. Secondly, Europe´s immense territorial diversity implies that it is impossible to pay justice to the specific local development conditions in every region. Still, we believe that a European comparative territorial understanding – however rough – is needed to inform discussions about ways forward. To stimulate a larger discussion on this, we decided to make available our draft results while still further developing and improving the analysis.

How to assess the territorial sensitivity in Europe?

The analysis provides preliminary indications on potential territorial impacts that the policy responses to the COVID-19 pandemic have on regions in the EU. Inspired by the Territorial Impact Assessment (ESPON 2013; Essig and Kaucic 2017; Gaugtisch et al. 2020) the methodology applied for the analysis provides a first rough snapshot of the exposure and sensitivity of European regions to COVID-19 policy responses. Exposure and sensitivity are understood as follows (Böhme, Lüer, and Holstein 2020):

- **Exposure:** Taking different components of policy as starting point, exposure is determined by asking: To what degree is a region likely to be subject to the policy addressed (positively or negatively)?
- **Sensitivity:** Taking regional characteristics as starting point, sensitivity is determined by asking: To what degree might regional development be affected due to specific regional characteristics and endowments?

Below we briefly outline the methodological approach and how it has been applied in this first step of the analysis. This is followed by a presentation of preliminary results and an outline of next steps to further develop and improve the analysis.

How to assess exposure to COVID-19 policy responses?

To answer the question to what degree a region is exposed to COVID-19 policy responses, we have brought together two different pieces of information. Firstly, a European overview on the restriction measures which offers a straight forward piece of information on different lock-down features by country. Secondly, the European GDP forecast for 2020 as it offers a proxy to the severeness of the lockdown which varies in terms of length and sectors affected.

Exposure measure I): rigidity of the lockdown restrictions. Lockdowns and related business disruptions, travel restrictions, school closures and other containment measures have had sudden and drastic impacts on workers and enterprises (International Labour Organization 2020; International Organisation of Employers 2020)[2]. Therefore, the exposure to COVID-19 policy responses largely depends on the degree of lockdown, which varies across EU Member States. The first of the two measures for assessing the regional exposure to COVID-19 risks has been elaborated following the JRC assessment of restriction measures per country used in the "Joint European Roadmap towards lifting COVID-19 containment measures" on 15th April 2020.

Map 1   COVID-19 restriction measures across EU Member States
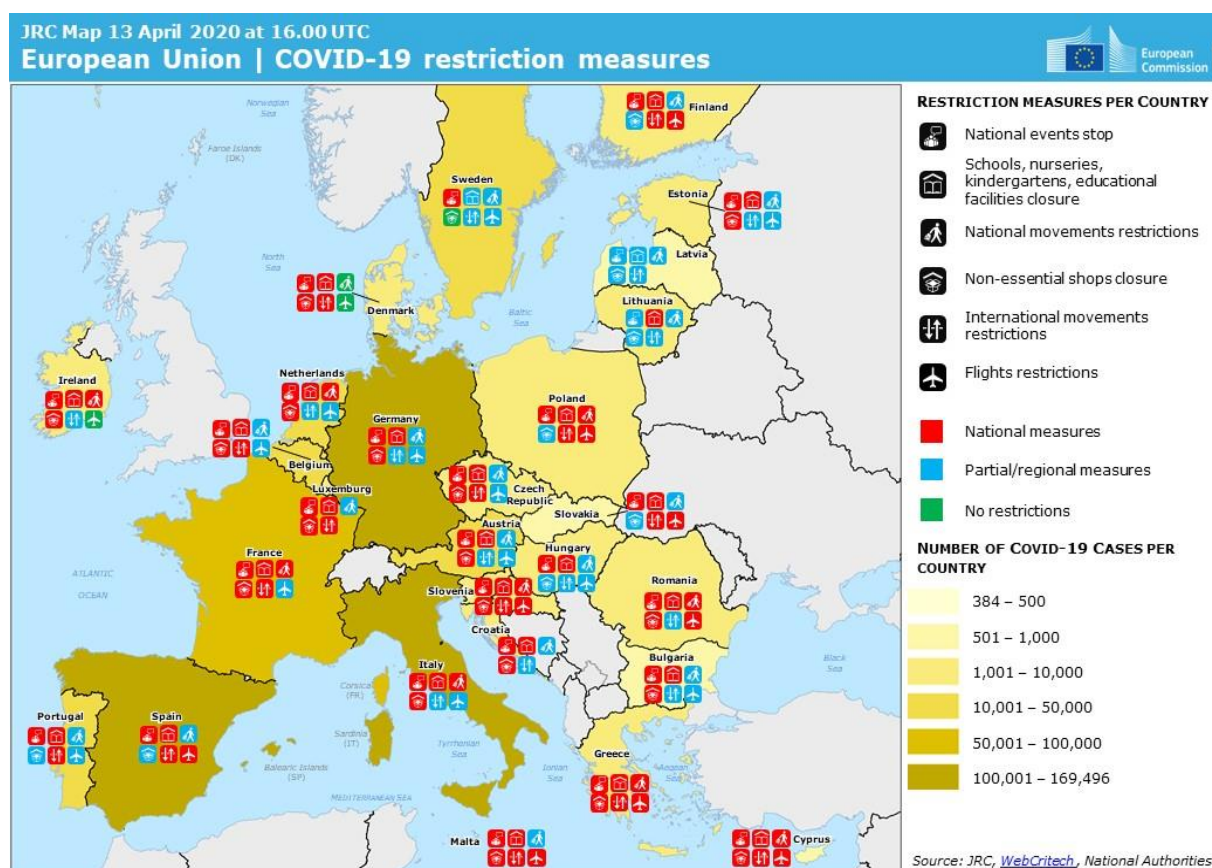
Source: JRC assessment used in the "Joint European Roadmap towards lifting COVID-19 containment measures"

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2   For references in specific economic sectors see also: https://www.ilo.org/sector/Resources/WCMS_741939/lang--en/index.htm

Based on the JRC study the following drivers are used to judge the lockdown: a) National events stop; b) School, nurseries, kindergarten, educational facilities closure; c) National movements restrictions; d) Non-essential shop closure; e) international movements restrictions. The rigidity of the measures is assessed with the following criteria: 1: no restrictions; 2: partial/regional measures; 3: national measures. A weighting coefficient from 1 to 3 has been assigned to each "driver" based on the rigidity of the measure. After summing up all the drivers, with the related coefficient, for each European country, three types of countries have been identified as regards their exposure to the restrictive measures induced by COVID-19: *Rigid lockdown*: 13 Member States; *Medium lockdown*: 10 Member States; *Light lockdown*: 4 Member States.

Exposure measure II): estimation of the macroeconomic risk. The second of the two measures chosen for assessing the regional exposure to COVID-19 risks is elaborated following the GDP estimations contained in the European Economic Forecast published on 6th of May 2020. The EU Commission (DG ECFIN) estimates quantitatively the GDP for the year 2020, taking into account the crisis induced by the pandemic (European Commission 2020). Based on the hardness of GDP drop, EU Member States have been divided in three categories, thereby assigning a weighting coefficient equal to 1 for the least affected, 2 for the medium affected, and 3 for the most harshly affected.

Combined exposure to COVID-19 policy responses. In order to derive to a unified judgment on the regional exposure to COVID-19 economic risk, the proxy for rigidity of restrictions and the proxy for the macroeconomic risk have been combined with a simple mathematical operation. As a result of the steps outlined above, each EU Member State obtains a score from 1 to 3 for the rigidity of lockdown restrictions, and a score from 1 to 3 for the hardness of the GDP estimated drop. The two scores are summed up, thereby assigning each EU Member State a final score from 2 to 6. Based on the scores distribution, three types of EU Member States have been drawn to reflect their comparative exposure to the economic risk induced by the COVID crisis: **Moderate Exposure**: 5 Member States; **Medium Exposure:** 12 Member States; **Severe Exposure:** 10 Member States.

In the last section of this paper you find additional thoughts on how to further improve and nuance the exposure analysis.

How to assess sensitivity to COVID-19 policy responses?

To answer the question how sensitive a region is to the COVID-19 policy responses requires a wide range of different pieces of information (see also section on next steps). To start with, we have brought together two different pieces of information. Firstly, the share of people working in sectors at particularly high risk due to COVID-19 policy response offers a good proxy currently used also in other studies. Secondly, at European level, the tourism industry is not well captured in these statistics. As the tourism sector is particularly exposed, tourism data has been taken into account separately.

Sensitivity measure I): Employment in risk sectors. We have chosen to start our sensitivity assessment from analysing employment data for two main reasons, of different nature:

- Second to the health dimension, the different job conditions combined with the intensity of repercussions across sectors, are one of the most common proxies of people's wellbeing[3] and aspirations for a successful recovery. The current crisis disrupts every single work routine and burdens businesses and families with financial consequences in the longer term, thereby clouding their serenity with a veil of uncertainty.
- Employment is also a very good proxy to assess the deep economic impacts of the crisis. Employment adjustment typically follows economic contraction with some delay (see, for example the global financial crisis in 2009), while In the current crisis, employment has been impacted directly as a result of lockdowns and other measures and on a greater magnitude than initially predicted. (International Labour Organization 2020; OECD 2020a; WIFO 2020). Moreover, employment allows to assess the relevance of each economic sector in the regional economy, thus allowing to capture the strong territorial dimension underlying this crisis.

The analysis of this first sensitivity measures, builds on a collection of employment data by sector and a categorisation of each sector as regards the risk to be affected by COVID-19 policy responses.

- *Data collection on sectorial employment:* For employment, the indicator "persons employed per sector" has been used to calculate the share of employment in each industry on the total population in working age (15-64). The main data source is the Eurostat "regional structural business statistics" (covering 13 out of the 16 sectors)[4]. This has been complemented with data from the Eurostat "regional labour market statistics" (covering 3 remaining sectors)[5]. The decision to merge two different, though compatible, sources is intended for having the widest possible coverage of sectors. The data is available by NUTS 2 regions and NACE Rev. 2 statistical classification of economic activities. Data from the above-mentioned source refer to 2017[6].
- *Assessment of economic risk by sector:* Each economic sector has been assigned a risk factor following the International Labour Organisation assessment. Their model is based on real-time economic and financial data to assess the impact of the COVID-19 crisis on economic output at sectoral level (International Labour Organization 2020)[7]. The ILO scale on 5 risk levels is intended for a static assessment of the risk at which each sector alone is exposed. However, this is not functional for combining economic sectors and related risks in an aggregate measure: a weighting scale with 5 different coefficients is suspected to generate a significant bias when we intend to produce a final comprehensive assessment that involves statistical calculations. In light of this, the scale has been

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[3] Research indicates that factors such as physical and mental health or having a relationship, or contact to people, friends and family are also important factors of peoples wellbeing, but they cannot easily be measured, or are not so visible through one indicator (European Commission 2013; Nozal LLena and Martin 2019; Rijpma et al. 2017)

[4] Mining and quarrying; Manufacturing - Electricity, gas, steam and air conditioning supply - Water supply, sewerage, waste management and remediation activities – Construction - Wholesale and retail trade, repair of vehicles and motorcycles -Transportation and storage - Accommodation and food service activities - Information and communication - Real estate activities - Professional, scientific and technical activities - Administrative and support service activities.

[5] Agriculture, forestry and fishing - Public administration, defence, education, human health and social work activities - Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies.

[6] In case data is missing for 2017, the latest available year has been used. The principle of taking the latest year available has been adopted under the assumption that the yearly changes in sectorial employment shares cannot become statistically significant in the context of a European comparative study. The non-significance is also due to the fact that the methodology adopts a relatively low number of typologies, which makes a small share change in one specific sector not incisive on the overall regional picture.

[7] See annex 3 of the document for the details on the risk assessment methodology: ILO report.

simplified to 3 risk levels following the ILO judgment and polished with the analysis of sub-sectors included in the relative NACE classification. The analysis of sub-sectors has also allowed to identify one potentially benefitting sector, which will be treated in a separate analysis (see Map 3).

The sectors analysed (NACE rev. 2 classification) and the assessment of their economic risk are shown in the table below.[8] The judgment for the risk assessment is made in comparative terms, relatively to the other sectors analysed, and based on ILO sources and sub-sector analyses.

Table 1   Selected economic sectors and their risk assessment

Economic Sectors (NACE)	Category assigned	Assessment
Agriculture, forestry and fishing	**Neutral**	Works restrictions are comparatively less rigid, and demand can be considered stable compared to other goods. *Low risk for ILO.*
Mining and quarrying	**Medium**	Work restrictions are less rigid, but demand can be negatively affected already in the short term by value chains disruptions. *Medium risk for ILO.*
Manufacturing	**High**	Work restrictions stay on an average rigidity, but demand will suffer both in the short and long term by value chains disruptions. *High risk for ILO.*
Electricity, gas, steam and air conditioning supply	**Neutral**	Works restrictions are comparatively less rigid, and demand can be considered stable compared to other goods. *Low risk for ILO.*
Water supply; sewerage, waste management and remediation activities	**Neutral**	Works restrictions are comparatively less rigid, and demand can be considered stable compared to other goods. *Low risk for ILO.*
Construction	**Medium**	Work restrictions are less rigid, but demand can be negatively affected in the longer term. *Medium risk for ILO*
Wholesale and retail trade; repair of motor vehicles and motorcycles	**High**	Very strong disruptions on the demand side caused by shop closures in the short term and social distancing in the long term**.** *High risk for ILO*
Transportation and storage	**Medium**	Very strong negative impact on air, and water transport demand both in short and medium term, but stable or even rising demand for postal and courier services. *Medium-high risk for ILO.*
Accommodation and food service activities	**High**	Very strong disruptions on the demand side caused by travel restrictions and social distancing both in the short and long terms. *High risk for ILO*
Information and communication	**Positive**	Demand of services has sharply increased in the short terms and is suspected to consolidate benefits in medium-long term. *Not classified in ILO*
Financial and insurance activities	**Medium**	Financial sector has suffered strong negative impacts in the short term, while insurance is shall be considered relatively stable. *Medium risk for ILO.*

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8   The risk judgment has been derived and discussed in relation to the ILO assessment and adapted to the methodology here applied with 3 risk levels instead of 5. For some sectors, such as e.g. agriculture, the categorisation may vary considerably between countries or regions. The categorisation might also be subject to change, as we learn more about the actual impacts of COVID-19 policy responses.

Real estate activities	**High**	Strong disruption on the demand in real estate market both in the short, but especially in the medium-long term. *High for ILO.*
Professional, scientific and technical activities	**Neutral**	Smart working has allowed to partly neutralise work disruption. Demand considered stable for now. *Low for ILO*
Administrative and support service activities	**High**	Sub-sectors rely heavily on providing services for physical gatherings, strong negative effects on the demand in the medium term at least. *Not classified in ILO.*
Public administration, defence, education, human health and social work activities	**Neutral**	Online services and learning has allowed to partly neutralise work disruption. Health *Low for ILO*
Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations	**High**	Recreation sector will suffer the longest lasting restrictions, with extremely negative consequences on the demand in the short to medium term. *Medium for Brussels and Luxembourg due to the high presence of extra territorial organization. *Medium-high for ILO*

Source: Spatial Foresight

To calculate the sensitivity, the shares of employment per sector in each European NUTS 2 region have been regrouped according to the risk factor of each of economic sector. As a result, each region has a share of people working in neutral, medium, high (and positive) sectors. A simple weighting factor has been assigned to the negative risk categories: 1 for medium risk and 2 for high risk. The neutral economic sectors are not influencing the regional sensitivity, and the positive sector will be treated as a separate case. Different weighting systems have also been tested, but the results are always very similar in comparative terms, considering that only two categories are currently considered in the analysis. A weighted score has been calculated by summing up the share of people working is medium risk sectors and the share of people working in high risk, each one with their relative weight coefficient (1 or 2). Based on the normalised distribution of the scores, three different categories of risk have been drawn. To distribute the regions in one of the categories the following rule has been applied: the medium category comprehends the interval between the average score and +/- half of the standard deviation: $\overline{X} - \frac{ST.DEV}{2} \ \overline{X} + \frac{ST.DEV}{2}$. As a result, the three types of risk for the regional economy are: *Higher risk*: 83 regions; *Medium risk*: 75 regions; *Lower risk*: 81 regions. Depending on the risk category all European regions are attributed a score: 1 for lower risk, 2 for medium risk and 3 for higher risk.

Sensitivity measure II): Regional reliance on tourism industry. 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 situation. Tourism as such has been explicitly banned until further notice and this has disrupted holiday plans, business travels and economic activities in the tourism sector. For those regional economies that rely heavily on tourism, 2020 is likely to be the most challenging year experienced in decades. Unfortunately, the sensitivity by employment does allow to cover the tourism sector appropriately. Tourism can be considered an atypical sector from an employment perspective (accommodation and food services in NACE Rev. 2), as it very often relies on seasonal, temporary and family workers that are more likely to be downplayed in employment statistics. In light of this an alternative has been searched that better captures the reliance on tourism of regional economies in an EU

comparative perspective. For tourism, the indicator "capacity of collective tourist accommodation"[9] has been used to calculate the comparative reliance of European regions on the tourism industry. The data source is the Eurostat "regional tourism statistics"[10].

In order to represent the region's reliance on tourism, the indicator "capacity of collective tourist accommodation" is considered. The number of bed-places available in each NUTS 2 region has been considered as proxy. Based on the normalised distribution of the indicator, three different categories have been drawn. To distribute the regions in the respective category the same rule outlined above has been applied ($\overline{X} - \frac{\text{ST.DEV}}{2} \quad \overline{X} + \frac{\text{ST.DEV}}{2}$). European regions are thus distributed as follows: *low reliance*: 97 regions; *medium reliance*: 87 regions; *high reliance*: 55 regions. However, for tourism we have only attributed the score of 1 to the high reliance category, and 0 to the medium and low. Such decision is made in a balanced exercise trying not to overestimate the importance of tourism with respect to the full spectrum of each region's economic fabric. Still, the 55 European regions (roughly all those regions well known for being highly tourist attractive) more reliant on this industry will have a sourer score to reflect their specific circumstances.

Combined sensitivity to COVID-19 policy responses. In order to derive a unified judgment on the regional sensitivity to COVID-19 economic risk, the sector employment has been integrated with the reliance on tourism. As a result of the steps outlined above, each EU region obtains a score from 1 to 3 depending on the sensitivity of each economy structure, to which the eventual tourism reliance point is added. The two scores are summed up, thereby assigning each European region a final score from 1 to 4. Based on the normalised distribution of the scores, three types of regions have been identified, reflecting their comparative sensitivity to the economic risk induced by the COVID-19 crisis: **Lower risk:** 66 regions; **Medium risk:** 78 regions; **Higher risk:** 95 regions.

What does the territorial diversity look like?

In order to assess the potential territorial impact of COVID-19 policy responses, the exposure and sensitivity assessment – as described above – need to be brought together. This can be done through a cross-analysis resulting in 9 categories.

The three types of risk for the regional economy are crossed with the three types of exposure. This allows for a more comprehensive view on the territorial diversity reflecting both exposure and risk, without however pre-empting a discussion on whether high or low exposure affects a regions sensitivity. The methodology conveys into 9 types of sensitivity and exposure as shown on the below table.

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[9] Among the Eurostat's "capacity of collective tourist accommodation" measures, the indicator bed-places has been preferred as it offers the best coverage of NUTS 2 regions, and it is considered equivalent, after a comparison, to nights spent in assessing the importance of tourism in regional economies.

[10] Regional tourism data is missing for Ireland. The estimation provided by Eurostat regional yearbook 2018 have been used in this study (Eurostat 2018:145)

Table 2   Combined regional exposure and sensitivity categories

Moderate exposure & higher risk: 12 regions	*Medium exposure & higher risk:* 48 regions	*Severe exposure & higher risk:* 35 regions
Moderate exposure & medium risk: 14 regions	*Medium exposure & medium risk:* 23 regions	*Severe exposure & medium risk:* 41 regions
Moderate exposure & lower risk: 5 regions	*Medium exposure & lower risk:* 27 regions	*Severe exposure & lower risk:* 34 regions

Source: Spatial Foresight

Following the above approach, a preliminary mapping of the potential territorial impacts of COVID-19 policy responses is shown in Map 2. The map reveals first insights on the territorial diversity of expected negative impacts across European regions and the need for place sensitive approaches to policy supporting recovery processes. One-size-fits-all approaches will not be able to help all regions in their recovery, nor to utilise the diverse potential for recovery in Europe.

Sectors which are less affected by COVID-19 policy responses might play a crucial role for the recovery processes. Indeed, the disruptions we are experiencing also bring opportunities to some economic operators. Therefore, we explored possibilities to also map the territorial diversity of potential economic opportunities arising from COVID-19 policy responses. Map 3 is mainly meant to stimulate debate and ensure that foresight and future policies also consider opportunities and potential. The assessment underlying this map follow the same methodology outlined above. However, this time for the sector identified as positively impacted by the current situation: Information and Communication. Three types have been drawn to assess each region concentration of workers in the benefitting sector, resulting in: I) lower benefit: 89 regions; II) medium benefit: 108 regions; III) higher benefit: 42 regions. The exposure is provocatively inverted: the more rigid the measures, the higher the benefit, and vice versa. The methodology conveys into 9 types of sensitivity and exposure, and the results are show in Map 3.

The two maps focus on illustrating the territorial diversity of the topics addressed in the respective maps. Therefore, it is advised to read them separately rather than cross-reading the two maps. Although it appears that some regions probably face comparably high negative impacts while at the same time they might benefit from comparable high positive impacts, these will not balance out each other. It can be assumed that the negative impacts outweigh the positive ones. The positive impacts consider only a limited number of sectors and their share of employment does not exceed 10% in the best case, and averages below 2% across EU regions.

Both maps display considerable and territorially diverse implications of COVID-19 policy responses. These may not be overlooked when assessing the impacts of COVID-19 and discussing measures to mitigate impacts and support recovery.

As outlined in the next section, these maps are preliminary findings reflection work in progress and various additional assessments are envisaged to further nuance and polish the analysis.

Map 2   Potential territorial impacts of COVID-19 policy responses – a preliminary assessment
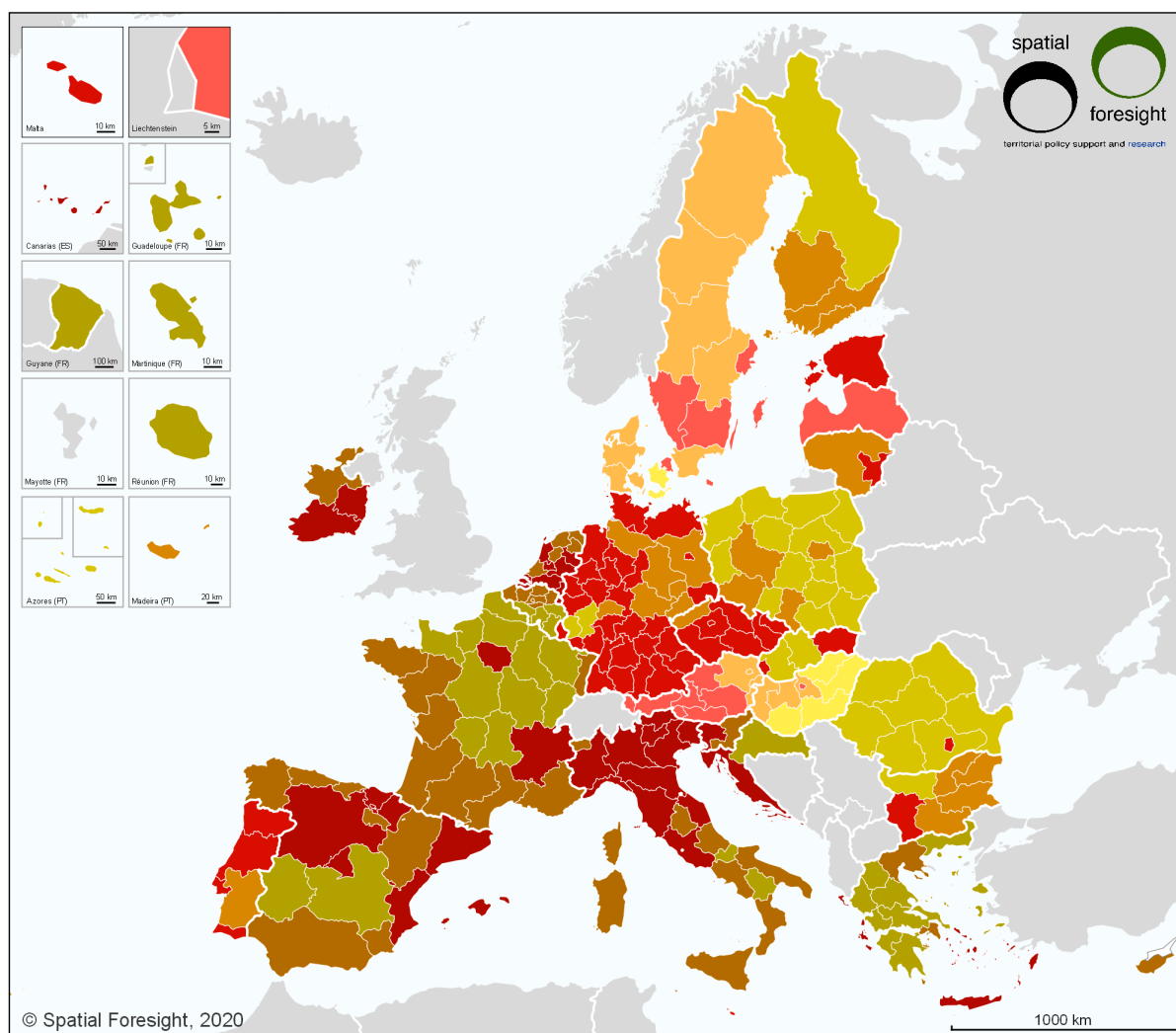
Administrative boundaries: Eurostat GISCO, NUTS 2 (2016)
Source: own elaboration on Eurostat data

Cross-classification of exposure and sensitivity
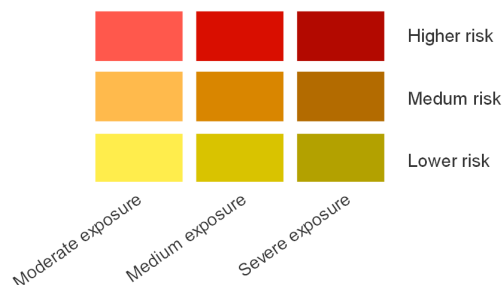
The map summarises: sensitivity and exposure of European regions to the economic crisis induced by Covid-19. The sensitivity is calculated combining a) I) employment per sector and related risk and II) comparative reliance on tourism sector. The exposure is calculated combining I) rigidity of restriction measures per country II) estimated effects on GDP for 2020.

a) Number of persons employed as a share of the total population in the age group 15-64; Statistical Classification of Economic Activities in the European Community: NACE rev 2 Assessment of impact per sector: own elaboration based on International Labour Organization (ILO) monitor: "COVID-19 and the world of work"; II) Capacity of collective tourist accommodation: bed-places from Eurostat regional tourism statistics by NUTS classification
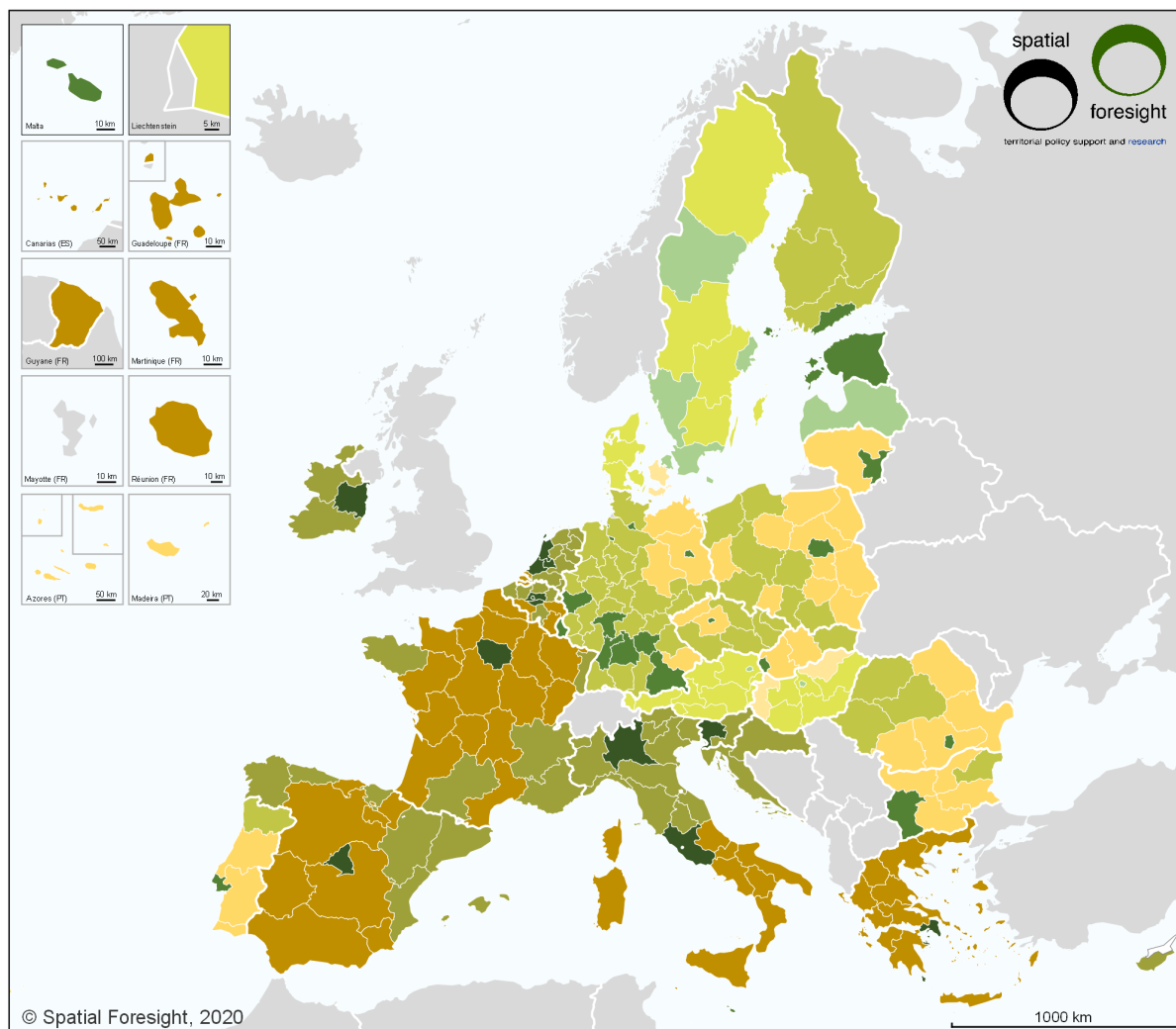
b) I) JRC assessment of restriction measures per country used in the "Joint European Roadmap towards lifting COVID-19 containment measures" on 15th April 2020. II) European Economic Forecast published by the EU Commission (DG ECFIN) on 6th May 2020.
No data for Mayotte

Source: Spatial Foresight based on Eurostat data and JRC and EU Commission studies
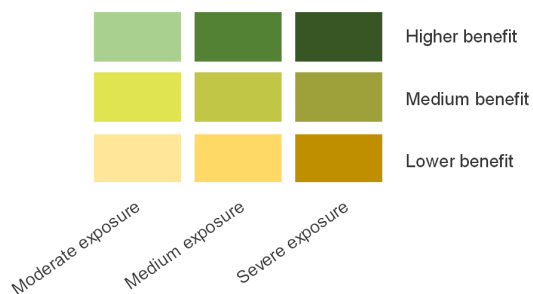
Map 3   Possible positive impacts of COVID-19 policy responses – a preliminary assessment

Administrative boundaries: Eurostat GISCO, NUTS 2 (2016)
Source: own elaboration on Eurostat data

Cross-classification of exposure and sensitivity

			Higher benefit
			Medium benefit
			Lower benefit

Moderate exposure   Medium exposure   Severe exposure

The map summarises: sensitivity and exposure of European regions to the economic effects induced by Covid-19. The sensitivity is calculated combining a) employment in information and communication sector. The exposure is calculated combining I) rigidity of restriction measures per country II) estimated effects on GDP for 2020.

a) Number of persons employed as a share of the total population in the age group 15-64; Statistical Classification of Economic Activities in the European Community: NACE rev 2; Assessment of impact per sector: own elaboration based on International Labour Organization (ILO) monitor: "COVID-19 and the world of work".

b) I) JRC assessment of restriction measures per country used in the "Joint European Roadmap towards lifting COVID-19 containment measures" on 15th April 2020. II) European Economic Forecast published by the EU Commission (DG ECFIN) on 6th May 2020.
No data for Mayotte

Source: Spatial Foresight based on Eurostat data and JRC and EU Commission studies

How will the research be further developed?

Analysing territorial impacts of COVID-19 – or rather the policy response to it – at sub-national level in a European-wide perspective is a troublesome piece of work as it needs to reflect the complexity of territorial development processes and the territorial diversity of Europe. Therefore, the above presents only a first starting point for more thorough work to be carried out.

In the months to come, we plan to further nuance and polish the work both as regards the sensitivity and exposure assessment.

The aim is to enrich the sensitivity assessment with a number of additional features which are relevant to better understand the diversity of how Europe´s regions are affected. At present, we are testing following additional pathways to be included in the sensitivity analysis:

- **Share of Small and Medium-Sized Enterprises (SMEs):** Current debates around Europe suggest that SMEs as well as freelancers and self-employed people are particularly challenged by the economic development and considerable numbers of them risk to phase out. Therefore, the importance of SMEs in a regional economy might provide additional insights on the territorial diversity of impacts.

- **Resilience on international trade:** Complex international value chains and client relationships have been put to a test by the lockdowns and might need considerable time to recover. Therefore, the exposure of regional economies to global value chains (e.g. in terms of international trade volumes) might help to further nuance the understanding of differences between regions in Europe.

- **Cross-border relations:** Also within the EU many cross-border value chains have been disrupted by the closure of national borders. Weighing in the importance of open borders in particular for border regions might add to the picture. Going beyond simply accounting for the presence of a national border, the extent of cross-border services might provide helpful insights.

- **Regional endowment:** How cities and regions can cope with external shocks also depends on their capacity to react. This is not at least reflected by the economic wealth of a region, i.e. the potential it holds to afford measures which might be more challenging in poorer regions. Therefore, we discuss whether and how to also include indicators such as regional GDP or GVA.

- **Quality of governance and government:** Regional development research shows that the quality of government is an important development factor. The marginal utility of an investment in infrastructure, human capital and technology for regional economic development is lower in areas with poor quality of government. As government quality has been one of the most consistent predictors of economic growth and resilience, it will also help to understand the territorial impacts of the disruptive COVID-19 pandemic.

- **Risk of poverty:** COVID-19 and the policy responses do not affect all groups of society in the same way. Indeed, the current debate suggests that the more disadvantaged groups of our society are disproportionally affected. This concerns in e.g. people working in low-income sectors and minorities. Statistics on the share of people at risk of poverty in a region may help to account for the social fragmentation accelerated by the pandemic.

The above are a few additional lines to be considered in the further development of the territorial sensitivity assessment to COVID-19 and its policy responses.

In addition, also the analysis of the exposure can be further developed and nuanced. At present we are testing the feasibility of additional pieces of information to describe the exposure to COVID-19 policy responses:

- ○○ **Length of the lock-down:** Between countries but also between regions in the same country, the length of the lock-down varies. This basically implies variations in the length of the exposure which can be decisive for the territorial impact.

- ○○ **Lock-down by sector:** Which sectors effectively have been locked down varies considerably. In most countries restaurants and bars had to close, but not in all. The same goes e.g. for the building sectors and some other sectors. Therefore, mapping which sectors have been locked-down in which regions would help to finetune the territorial understanding of exposure.

Integrating the above points in the analysis will provide a much more nuanced picture on the potential territorial impacts of COVID-19 policy responses and help to better design place-sensitive recovery policies and measures.

Still one has to be aware, that a European-wide comparative analysis at regional level will only help to better understand the differences of territorial impacts and interventions needed to support recovery. Such an analysis cannot replace nuanced detailed assessments of individual regions, their specificities and needs. Therefore, a quick reminder:

- ○○ The amount of European-wide available comparable regional data to draw on is rather limited as has been shown in various ESPON studies.

- ○○ Europe´s immense territorial diversity implies that it is impossible to pay justice to the specific local development conditions in every region.

- ○○ For understanding individual regions, one needs deepening case studies, incl. more precise information on the lockdown and greater detail for the economic sectors etc.

Nevertheless, we believe that a European comparative territorial understanding – however rough – is needed to inform discussions about ways forward making best use of the territorial diversity of Europe.

References

Böhme, Kai. 2020. "Territory Matters in Times of Corona: Spatial Reflections on a Disruptive Challenge." *KREMER - Territorial Thinkers*. Retrieved (https://territorialthinkers.eu/id-2020-03-kremer.html).

Böhme, Kai, Christian Lüer, and Frank Holstein. 2020. "From Territorial Impact Assessment to Territorial Foresight." in *Territorial Impact Assessment: The Handbook*, *Advances in Spatial Science Book Series*, edited by E. Medeiros. Springer.

Cyrus, Norbert, and Peter Ulrich. 2020. "Das Corona-Virus Und Die Grenzforschung." *Viadrina Centre B/ORDERS IN MOTION*. Retrieved (https://bordersinmotion-coronablog.com/2020/05/04/das-corona-virus-und-die-grenzforschung/).

Ehrentraut, Oliver, Tobias Koch, and Bernhard Wankmül. 2020. *Auswirkungen Des Lockdown Auf Die Regionale Wirtschaft. Welche Branchen Und Regionen Trifft Der Ausnahmezustand Besonders?* Berlin: Prognos.

ESPON. 2013. *Territorial Impact Assessment of Policies and EU Directives*. Luxembourg: ESPON.

ESPON. 2019. *European Territorial Reference Framework. Final Report.* Luxembourg: ESPON EGTC.

Essig, Stephanie, and Jiannis Kaucic. 2017. "ESPON TIA: Balancing between Policy Orientation, Practicability and Scientific Ambition." Pp. 184–201 in *Uncovering the territorial dimension of*

European Union Cohesion Policy, *Routledge advances in European politics*, edited by E. Medeiros. Abingdon, Oxon: Routledge.

European Commission. 2013. "Progress on 'GDP and beyond' Actions."

European Commission. 2020. *European Economic Forecast. Spring 2020*. Luxembourg: Publications Office of the European Union.

Eurostat. 2018. *Eurostat Regional Yearbook, 2018 Edition*. Luxembourg: Eurostat.

Gaugtisch, Roland, Erich Dallhammer, Chien-Hui Hsiung, Frank Holstein, Flavio Besana, Sabine Zillmer, Dubravka Kruljac, and Andreu Ulied. 2020. *State of the Art and Challenges Ahead for Territorial Impact Assessements*. QG-04-19-758-EN-N; ISBN: 978-92-895-1031-8; doi:10.2863/797486. European Committee of the Region, Commission for Territorial Cohesion Policy and EU Budget.

International Labour Organization. 2020. "ILO Monitor 2nd Edition: COVID-19 and the World of Work."

International Organisation of Employers. 2020. "Joint Statement on COVID-19 by International Organisation of Employers and International Trade Union Confederation."

Lähteenmäki-Smith, Kaisa, and Kai Böhme. 2020. "Corona Crisis - the End of Hypermobility and Its Territorial Repercussions?" *Phenomenal Finland*. Retrieved (https://phenomenalfinland.blog/).

Nozal LLena, Ana, and Neil Martin. 2019. "The Economy of Well-Being Creating Opportunities for People's Well-Being and Economic Growth."

OECD. 2020a. "Coronavirus (COVID-19)From Pandemic to Recovery: Local Employment and Economic Development."

OECD. 2020b. "The Territorial Impact of COVID-19: Managing the Crisis across Levels of Government."

Rijpma, Auke, Moatsos, Michail, Blair, Martijn, Stegeman, and Hans. 2017. "Netherlands beyond GDP: A Wellbeing Index."

Smith, Melanie, Erin McAweeney, and Léa Ronzaud. 2020. *The COVID-19 "Infodemic". A Preliminary Analysis of the Online Conversation Surrounding the Coronavirus Pandemic 04 •*. Graphika.

The three regional assemlies of Ireland. 2020. *COVID-19 Regional Economic Anlaysis*. The three regional assemblies of Ireland.

WIFO, Österreichisches Institut für Wirtschaftsforschung. 2020. "Regionale Unterschiede Der Ökonomischen Betroffenheit von Der Aktuellen COVID-19-Krise in Österreich."