The effects of the health crisis in the European regions have been more varied during the recovery than in lockdown

Several studies published in INSEE's *Points de Conjoncture* between March and July have looked into the consequences of the health crisis at regional or departmental level for French household consumption and for people's movements. The comparison of these regional effects can be extended to the other four main European economies using the *Google Maps Mobility* report indicators of visitor numbers to public places. The economic effects of the health crisis at regional level appeared to be fairly similar in France, Italy, Spain and the United Kingdom: regions were affected fairly uniformly and to a similar degree during lockdown, in contrast to Germany. Next, it could be seen that the gradual lifting of restrictions on activity differed more from region to region than had the introduction of these restrictions, revealing a considerable variation in economic recovery at regional level in the five main European countries. These results should be interpreted with caution due to the limitations resulting from the representativity and seasonality of the data used. By comparing the *Google* indicators with those used specifically for France in the previous *Points de Conjoncture*, such as aggregated bank card transaction amounts or data from activating Orange mobile phone networks, results appear to be consistent, at least for France.

The economic effects of the health crisis differ considerably between European countries but also between regions within the same country

The *Points de Conjoncture* published since the start of the crisis have reported the wide range of economic consequences of the health crisis in the five main European countries. At the heart of the crisis the decline in activity, measured by the national accounts for Q1 and Q2, was more severe in France, Italy and Spain than in Germany. These differences had already been hinted at before the accounts were published by various high-frequency indicators such as electricity consumption or the concentration of nitrogen dioxide in the air, measured on a day-to-day basis. Thus in Q2 2020, German activity declined by 9.7% (after –2.0% in Q1) against a drop of 12.8% in Italy (after –5.5%), 13.8% in France (after –5.9%), and 18.5% in Spain (after 5.2%). The United Kingdom went into lockdown later and the dip in activity was similar to that in Germany in Q1, at –2.2%, but the later lifting of lockdown resulted in a stronger fall in Q2 to –20.4%. Clearly, these major downturns in activity at country level were strongly correlated both with the lockdown and post-lockdown calendar and with the strength of the restrictive measures adopted by the different countries.[1]

In addition, the rules applied to restrictions on activity and the way the recovery was experienced reveal a dichotomy between, on the one hand the regions of Germany and on the other the regions of France, Italy, Spain and the UK. Whereas in Germany, it was the Länder that were responsible for putting measures in place, in France, Italy and Spain, they were applied via governmental decrees covering the entire national territory, with no regional differentiation. In the United Kingdom, health policies were the responsibility of the four nations but in practice they were very similar during lockdown. Conversely, the gradual upswing in economic activity was much less uniform, not only between countries – with Germany initiating recovery earlier than the other three Eurozone countries, and the United Kingdom later than the European countries– but also between regions in the same country. For example there was a phased process in Spain and colour zones in France, with a slightly different calendar according to zone. Consequently, the disparity in the effects of the health crisis at regional level may partly explain the very different declines in activity observed in the European countries. For example, although some German regions may have experienced a shock on a similar scale to the French regions, others may have escaped it to some extent. On the other hand, the French regions appear to have experienced a similar shock across the country.

Several Focus articles in the *Points de Conjoncture* have adopted this regional perspective for France using high-frequency data, such as the number and the aggregated amounts of bank card transactions and daily trips recorded using indicators provided by the mobile phone networks (Orange). From these studies disparities emerged at departmental level regarding the overall amount of bank card transactions – the least populated departments were where the volume of transactions appeared to be most resistant. Conversely, the most densely populated, urban geographic areas, which had the greatest concentration of office buildings, experienced a stronger decline in morning travel than the less populated and more residential areas.[2] However, it would be complicated for the other European countries to gain access to similar detailed data at regional level.

Nevertheless, in previous *Points de Conjoncture*, *Google Maps Mobility* indicators of visitors to public places were useful for measuring, first, the degree to which people's activity was restricted in terms of mobility, and second the diversity of ways in which recovery was happening in Europe. These

1. See "International developments" sheet, *Point de Conjoncture*, 27 May 2020.

2. "By the end of May, morning commutes had only reached 60% of their usual level", *Point de Conjoncture*, 17 June 2020.

indicators were available at regional level for the five main European countries and were invaluable for assessing, at sub-national level this time, the chronology of events from the start of lockdown right up to the present. Although they only provide information on people's geographic mobility and present a certain degree of bias (*Box 1*), *Google Maps Mobility* indicators can be useful for studying household consumption from trips to non-food retail outlets or for studying teleworking behaviour from numbers visiting the workplace.

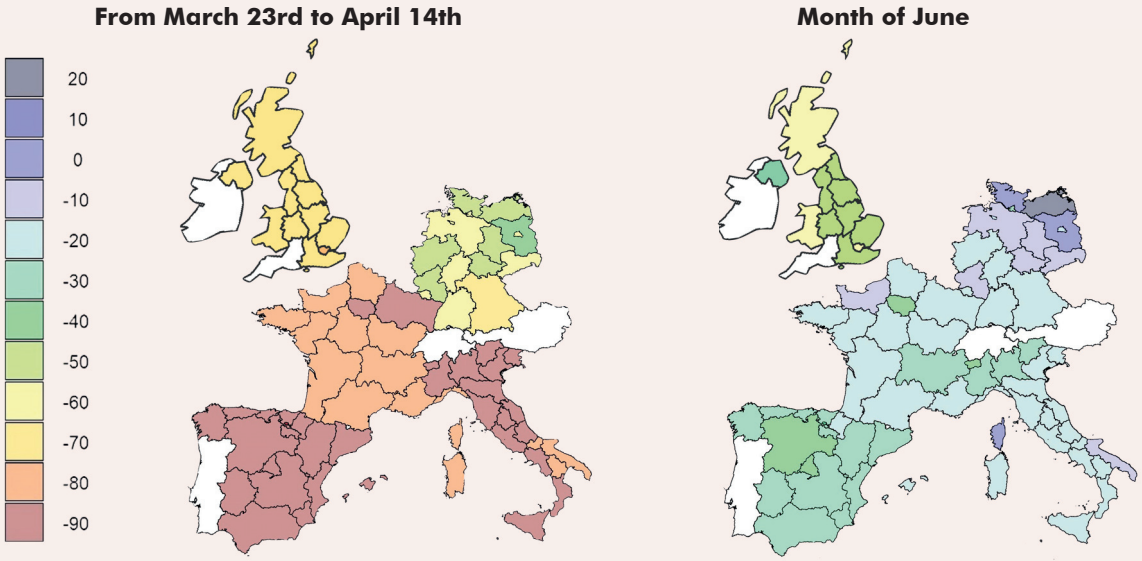
Within each country, the drop in visitors to non-food retail outlets and places of recreation during lockdown in Europe was relatively similar between regions, except in Germany

With the exception of Germany, the decline in numbers visiting public places was fairly similar across the regions of the main European countries during lockdown. From 1st June, however, the upswing in people's mobility and in activity was a little more varied from one region to another.

In France, Italy and Spain, the restrictions on opening shops and leisure activities and on individual mobility were decided at national level. In France, according to the *Google Maps Mobility* data, the average decline in visitors to non-food retail outlets and places of recreation between 23 March and 14 April, compared to pre-lockdown, was between –85% and –83% for all regions (*Box 2*), except the Île-de-France region, which was affected more than the rest (–87%). In Spain too, numbers of visitors to stores decreased at a fairly uniform rate across the country with a slightly more pronounced drop than in France, by between 88% and 91% compared to the reference period (*Map 1*). As in France, the heaviest loss of visitors concerned the region around the capital, with a decline of 91% in the community of Madrid. The drop in visitors to stores was also uniform between the Italian regions. Almost three-quarters of them saw a decline of between 86% and 90%. The regions most badly affected were those in the north, like Valle d'Aosta, Lombardy and Trentino-Alto Adige, which were some of the first regions to be hit by the pandemic. In the United Kingdom, although decisions relating to health are governed by the four nations, in practice health regulations were very similar during lockdown. Visitor numbers to stores and carrying out recreational activities decreased by more than 70% during this period compared to a normal situation. This decline could be seen across all of the country, except in London where, as in France and Spain, mobility around the capital was more affected (–80%).

Map 1 - Visitor numbers to non-food retail outlets and places of recreation were more affected in the regions of Southern Europe

difference in visitor numbers (%) compared to January and February 2020



Note: The *Google Maps Mobility* indicator corresponds to the numbers of visitors to non-food retail outlets and places of recreation (restaurants, cafés, shopping centres, theme parks, museums, libraries and cinemas). No data are available for South-West England, where the index does not cover all infra-regional zones, and represents less than 95% of the region's population. Each colour on the legend represents a range of 10 percentage points (e.g. –20 represents a drop in visitors to stores and places of recreation of between –15% and –25% compared to the reference period).
How to read it: in Île-de-France, visitors to retail outlets and places of recreation fell by 87% between 22 March and 15 April, compared to January and February.
Source: Google, INSEE calculations

Box 1: the usefulness of *Google Maps* Community Mobility indicators despite some biases

Given the severity of the economic crisis triggered by the measures to restrict activity, high-frequency information sources were mobilised to measure economic activity. Of these, data from the *Google Maps* Community Mobility Reports on visitors to certain types of location (non-food retail outlets and places of recreation, workplaces, public transport) are available at geographic levels NUTS-1 and NUTS-2,[1] and are comparable for European countries. The daily time series are available from 13 February to the present and therefore cover the pre-lockdown period and also the return to activity. These series also highlight the various consequences of the restrictive measures and the lifting of these measures by estimating changes in visitor numbers to non-food stores and places of recreation, as well as workplaces and public transport.[2]

However, the *Google Maps Mobility* data are neither exhaustive in their field nor representative of the national or regional population. In fact, these data are collected only when users opt to activate a setting in their *Google* account called "location history" which is disabled by default. It is activated when the user updates his geographic position. The available documentation[3] also states that in a given area, if the quality and confidentiality threshold of the data is not reached, the information collected for this area is not published. Lastly, the data are aggregated with a statistical noise to provide anonymity. According to the *Google* methodology, the indicator for visiting non-food retail outlets and places of recreation includes places such as restaurants, cafés, shopping centres, theme parks, museums, libraries and cinemas.

However, the other data available for France that are used as a point of comparison for consumption or travel are also restricted as to the scope covered and to problems of representativity: for example, regional data for bank card transactions[4] do not include online purchases, while purchases using other payment methods (cash, cheque, etc.) and mobile phone data[5] are based only on the movements of people using the services of the operator even though statistical adjustments are made subsequently.

Lastly, the raw data for the number of individuals visiting the places targeted by *Google Maps* are not available. Only indicators for differences in visitor numbers compared to a reference period are published. For example, the indicator for public transport use on Tuesday 30 June 2020 corresponds to the difference in use between this day and the average public transport use on Tuesdays during the five weeks between 3 January and 6 February 2020. The absence of any variations in these frequentations for previous years, especially 2019, means that the indicators cannot be adjusted for seasonality. For these two reasons, representativity and seasonality, the results obtained with *Google Maps Mobility* data, must be interpreted with caution. ■

1. The Nomenclature of Territorial Units for Statistics (or NUTS) is a nomenclature at three levels of aggregation, which serves as a reference for a social, economic and demographic analysis of territories and to define European Union regional policies. The first level of aggregation, called NUTS-1, corresponds to regions in the case of France, Länder in the case of Germany, groups of regions in Italy (e.g. Northwest Italy, Northeast Italy etc.) and Groups of autonomous communities in Spain. Level NUTS-2 corresponds to a more disaggregated level, like departments in France, regions in Italy and autonomous communities in Spain. As mentioned above, the *Google Maps Mobility* data are available at level NUTS-1 or NUTS-2 depending on the country. In the case of the four main Eurozone countries, the data are available at level NUTS-1 for France and Germany, and at level NUTS-2 for Italy and Spain. This difference in the breakdown according to country is mainly because of the relative importance of the administrative bodies at these geographic scales. For example, the Länder in Germany and the autonomous communities in Spain are, from a political and administrative point of view, the most relevant geographic levels (unlike the canton level, or the group of communities).

2. "'High- frequency' data are especially useful for economic forecasting in periods of devastating crisis", *Point de Conjoncture*, 17 June 2020.

3. Documentation on the construction of *Google Maps Mobility* indicators is available via the following link: https://www.google.com/covid19/mobility/data_documentation.html?hl=en

4. These data result from aggregating individual anonymised data daily at departmental level, and provide both the total amount of transactions and the number of transactions made per day.

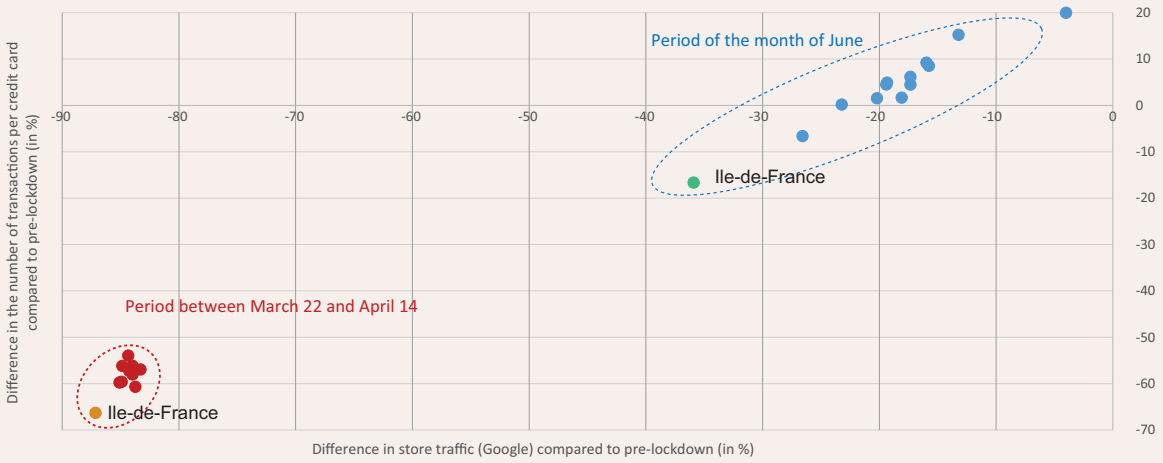
5. In Flux Vision, data from Orange's mobile phone networks measure the distance travelled by Orange mobile phone users when they move from one spatial unit (EPCI) to another. Only morning trips that formed part of a return trip to the workplace were retained. The data were then adjusted to make them representative of the resident population. The two sources could only be compared for the period when activity was at its lowest from 22 March to 14 April as the Flux Vision data were available only up to 31 May 2020. The raw data were available at a very detailed level of spatial unit, which groups several municipalities together and is called an EPCI (inter-municipality cooperation institution). These data were aggregated at regional level by place of origin of the users. There is very little change in results at regional level when these data are aggregated by place of arrival.

Box 2: The decline in visitors to non-food retail outlets and places of recreation according to *Google* seems to be correlated with the drop in the number of bank card transactions

The findings based on *Google* mobility indicators for France are relatively consistent with those from bank card transactions. In fact, there is a relatively strong positive correlation between, on the one hand, the loss of visitors to non-food retail outlets and places of recreation measured in the *Google Maps Mobility* reports, and on the other hand, the fall in the number of bank card transactions compared to the start of 2020 (*Graph 1*). These two data sources reveal a decline in activity associated with the similar magnitude of consumption for all the French regions between the end of March and mid-April, except for the Île-de-France region which was more affected in terms of visitors to shops and number of transactions. In June, both indicators recorded the rebound in activity. The upswing in visitors to shops and number of transactions differed according to the regions, but those where visitor numbers remained most affected were also the most affected in terms of transactions. This was notably the case for the Île-de-France, Grand-Est and Auvergne-Rhône-Alpes regions. These results must be interpreted with caution, because neither data source has been adjusted for seasonality, especially tourist seasonality. In fact, the French Metropolitan regions are affected differently by summer tourism, resulting in a greater dispersion in the indicators for June.[1] There is also a difference in scope between the two indicators. Bank card transactions are not necessarily linked to visitor numbers to non-food retail stores and places of recreation since the data are not able to distinguish types of product. ■

1. In addition, there are several explanations for the contrast in June between, on the one hand, the difference in visitors to these places and on the other hand, the difference in the number of transactions, as simultaneously one can be negative and the other positive, particularly when linked to a difference of scope: numbers of visitors to these places according to *Google* include places of recreation characterised in part by a low rate of return for leisure centres, but also to a representativity bias, as mentioned in *Box 1*.

1 - A positive correlation between Google Maps Mobility data and aggregated bank card transaction amounts



Note: An indicator of visitors to shops and places of recreation was therefore calculated from CB bank card data, considering the total number of bank card transactions and relating it to the same reference period as that used by Google, as mentioned above. Each point establishes a link between the average loss of visitors measured from *Google* data and that measured using CB bank card data for each of the thirteen regions in Metropolitan France.

How to read it: The average decline in visitors to retail stores in Île-de-France between 22 March and 14 April was –87% according to *Google* data, against –66% according to CB bank card data. This loss of visitors in June stood at –36% according to the Google data against –17% with CB data.

Source: Cartes Bancaires CB, *Google Maps Mobility*, INSEE

Finally, in Germany, where the healthcare sector comes under regional government, mobility behaviour was much more varied than elsewhere in Europe. In particular, numbers visiting shops and places of recreation declined more in the Southern Länder than in those in the North. The Southern Länder, with the highest proportion of Covid-19 patients, adopted much stricter lockdown measures, much earlier and for much longer. Whereas in the Northern Länder, the drop in visitors to stores was between –43% and –49%, in the Southern Länder it was between –56% and –66%. In Bavaria in particular, where the closure of restaurants and non-essential businesses was decreed as of 16 March, the number of visitors to shops during lockdown tumbled by 66% on average between 23 March and 14 April compared to the beginning of the year. During the same period, in the Brandenburg Land which surrounds Berlin, visitors to retail stores and places of recreation tumbled by "only" 43%, as the Land did not decide until 22 March to close its restaurants and shops, apart from DIY stores and garden centres, unlike some of the other Länder where these shops were closed. In the city-state of Berlin, on the other hand, and following the same pattern as the other European capitals, visitor numbers to shops and places of recreation dropped by 63%.

In the five main European countries, the lifting of lockdown happened gradually and was even differentiated according to the regions. In France, this lifting of restrictions was organised according to departments moving from the red zone to the green zone via the orange zone. As the Île-de-France region was one of the last to move into the green zone, the decline in visitors to shops was still the most significant in June at –36% according to *Google Mobility*, unlike Normandy, which came out of lockdown earlier and therefore experienced a drop of only 13% on average for that month. In Spain, lockdown was lifted at regional level in line with health criteria defining three successive phases of easing restrictions. Visitor numbers to shops and places of recreation were still affected in June, down more than 30% compared to a normal situation in the community of Madrid, in Castile-and-León and Catalonia, which are among the regions where lockdown was lifted latest, against 20% in the Balearic Islands, which moved into the last phase of the lifting of lockdown more quickly.

In Italy, regional decrees allowed the lifting of restrictions to be differentiated by region. In June, the regions of northern Italy recorded lower numbers of visitors to shops and places of recreation than the rest of the country.

Numbers of visitors to shops and places of recreation rose sharply in the Italian and Spanish regions from 1st June, reflecting a partial recovery in consumption. In Germany, just as restrictions had been put in place in a variety of ways in the Länder, the lifting of these restrictions varied too, with the Länder in the south relaxing them relatively late compared to those in the north. Numbers of visitors to shops surged in the north-east regions, overtaking their level at the beginning of the year, while in the regions in the south, they remained lower at around 20%. Conversely in the United Kingdom, the partial upswing in activity in June occurred in a relatively homogeneous way depending on the regions, probably associated with a more widespread excess mortality rate than in Spain or Italy. On average, visitors to shops and places of recreation only fell by half in the British regions, suggesting a partial recovery after lockdown. However, the mobility associated with consumption was affected more in London, as in June it was still two-thirds below its pre-crisis level.

This comparison of results between European regions, notably in relation to the German regions, should still be examined with caution, as there may be seasonality effects that partly skew the results for some regions. For example, in Corsica, the very small difference in visitors to shops in June is due mainly to a level of activity that is structurally low at the beginning of the year, but was selected here as the reference situation.

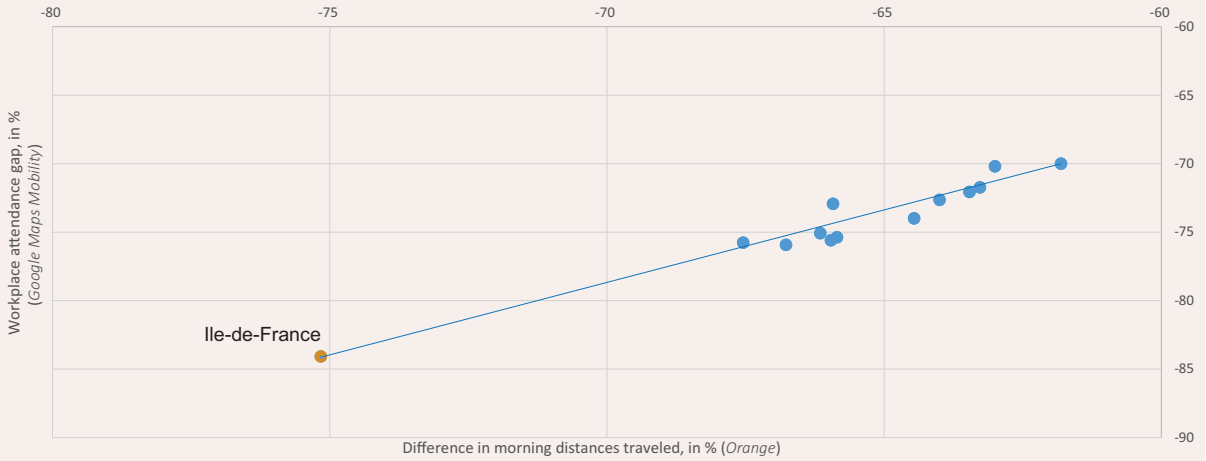
Numbers in the workplace are lower in the regions where activity is higher

Unlike the numbers visiting non-food retail outlets and places of recreation, numbers in the workplace during lockdown declined slightly differently between regions, especially in France and Spain (*Map 2*). In France, according to the *Google* indicators, there was a drop in numbers in the workplace of a little over 60% in six of the thirteen regions between the end of March and mid-April, against a decline of almost 70% in the other six, excluding Île-de-France. In fact the Île-de-France region was affected most negatively with a fall in visitors to these places and in home-work travel of 75% and 84% respectively (*Box 3*). Next come the Grand-Est, Auvergne-Rhône-Alpes, Haut-de-France, Provence-Alpes-Côte d'Azur and Pays de la Loire regions, where, according to *Google*, the drop in numbers in the workplace was around 66% to 68%. In Spain, the decline was a little more uniform, with two out of eighteen autonomous communities experiencing a decline close to 60%. In the other communities, except Madrid, there was a decline of around 70%. In both countries, the region around the capital was most affected, with a drop in numbers in the workplace of over 75%. In the case of Italy and the United Kingdom, their situation was very similar to that in Spain. In the United Kingdom in particular, during March-April, numbers in the workplace were about 60% below normal, apart from in London where face-to-face work had fallen back even further (–72%). In Germany, numbers in the workplace were more varied than in the other countries, with once again a disparity between North and South. In the city-states of Berlin, Hamburg and Bremen, and in Southern Länder like Bavaria and Baden-Württemberg, numbers in the workplace fell dramatically by almost half during lockdown.

Box 3: The decline in numbers in the workplace in France according to Google is very strongly correlated with the drop in morning travel distances according to data obtained by activating mobile phone networks

A similar observation can be made to that described in *Box 2* by comparing numbers travelling to the workplace according to *Google* with home-work travel as measured by the data obtained by activating mobile phone networks, in this case those provided by Orange. These two data sets produce rankings that are fairly similar to those of the French regions (*Graph 2*). Thus the Île-de-France region appears to be most severely affected, followed by the Grand-Est, Auvergne-Rhône-Alpes, Haut-de-France, Provence-Alpes-Côte d'Azur and Pays de la Loire regions. ■

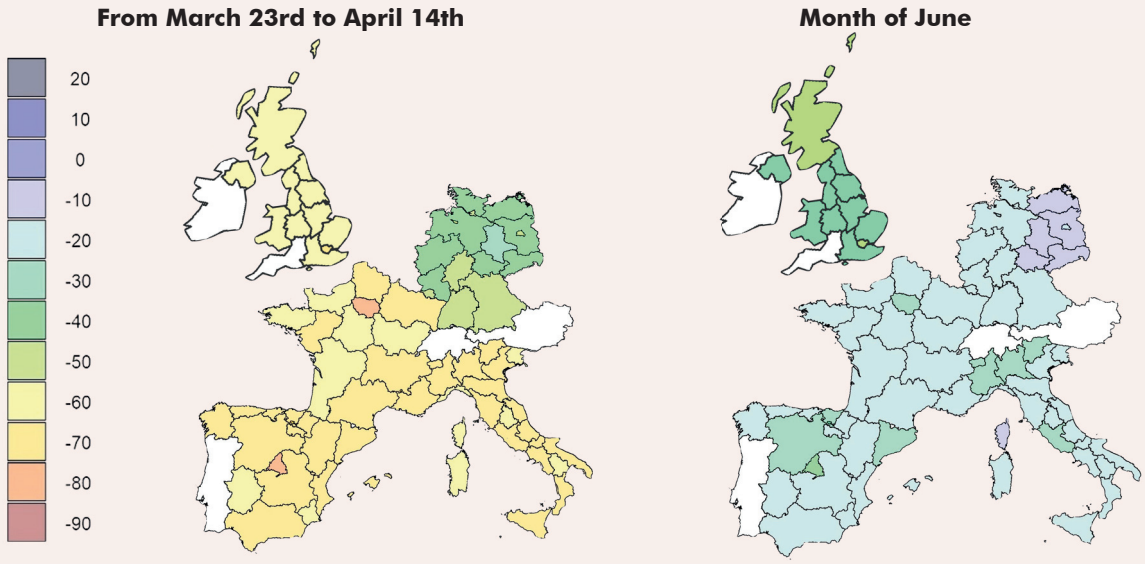
2 - A strong positive correlation between the decline in numbers in the workplace and the drop in home-work travel at the heart of lockdown



Note: The indicator showing the decline in morning distances travelled by Orange mobile phone users was calculated using the same methodology as that applied by *Google* to data on visitors to public places. In other words, the values on the y-axis correspond to the average decline in morning distances travelled at the peak of lockdown, compared to the distances travelled during the reference period from 3 January to 6 February. As in *Figure 1*, each point represents the correlation between the decline in numbers in the workplace according to *Google* and the decline in morning distances travelled for each region.
How to read it: The average decline in numbers in the workplace in Île-de-France between 22 March and 14 April was –75% according to *Google* data, whereas the average drop in morning travel distances was –84%.
Source: Orange, Google Maps Mobility, *INSEE calculations*

Map 2 - The fall in numbers at the workplace was more diversified between regions after 1st June

difference in visitor numbers (%) compared to January and February 2020



Note: The *Google Maps Mobility* indicator corresponds to numbers in the workplace. No data are available for South-West England, where the index does not cover all infra-regional zones, representing less than 95% of the region's population.
LHow to read it: in Île-de-France, numbers declined by 75% between 22 March and 15 April, compared to January and February.
Source: Google, *INSEE calculations*

This decline was less severe in the regions further to the North (about –35% decline in Saxony-Anhalt and Mecklenburg-Western Pomerania). This fall in numbers in the workplace in Europe may be due to a large extent to the number of people working from home, but this is not the only reason. The use of short-time working in some activities is also a factor to account for the fact that fewer people were travelling to work.

In June, the upturn in numbers in the workplace mostly smoothed out the disparities noted at regional level in the different countries. In Germany, it increased across the entire country, gaining 23 points in the regions in the South and returning almost to the January level in the Länder in the North, suggesting that activity was recovering. In France, the decline in these numbers became uniform once again across the whole country, apart from Île-de-France, at between 15% and 20%. Thus there appears to have been a catch-up in the regions that had experienced the heaviest losses. Once again, the Île-de-France region, like the community of Madrid and the region of Rome, were differentiated in June by having fewer people in the workplace than the other regions. In addition, in some regions of Italy (North and Latium) and Spain (the community of Madrid, Catalonia, the Basque Country), which represent the most densely populated regions, the numbers in the workplace in June were relatively low compared to their neighbouring regions. In the United Kingdom, the upswing in mobility associated with the return to work could be seen in similar proportions across the regions, with the exception of the capital and Scotland. In fact, Scotland had more restrictions still in place than England in June, hence the more gradual recovery than the rest of the country regarding, in particular, face-to-face work.

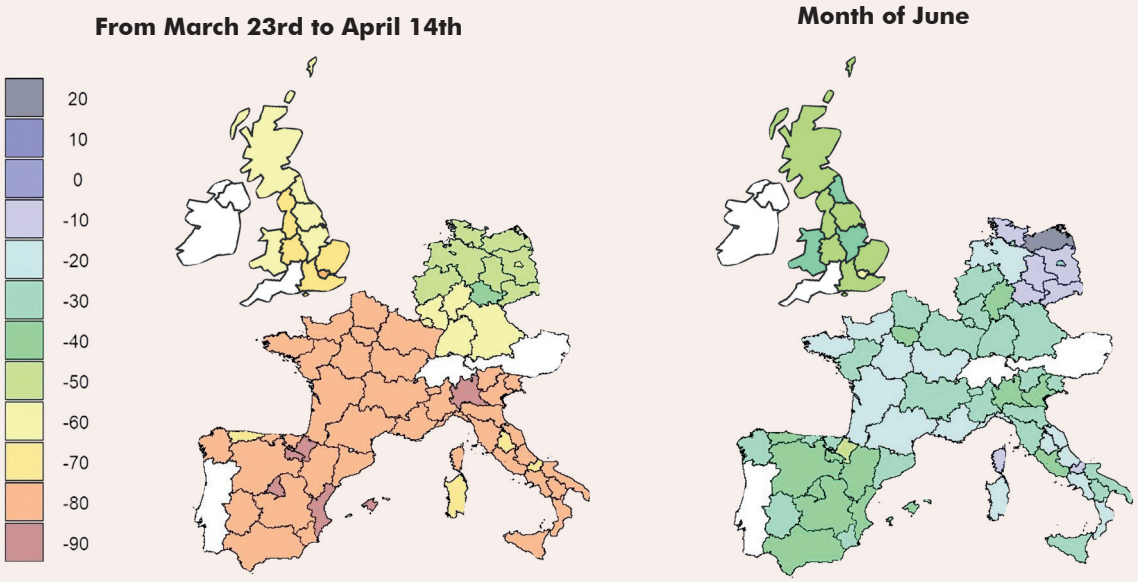
In France, Spain and Italy, work-related mobility declined more than in the rest of Europe in March and April. After lockdown, however, it was the United Kingdom that appeared to be most hesitant to return to face-to-face work: lockdown was lifted later and more gradually here than in the other European countries. Germany is the country where the numbers in the workplace remained closest to their normal level, both during and after lockdown.

When lockdown was lifted, public transport passenger numbers remained lower than at the beginning of the year, by 20% to 40% in Spain and France, and 9% to 43% in Italy, depending on the region. This wide difference during lockdown of at least 40 percentage points suggests that the return to public transport use was very gradual. Although Germany followed the behaviour of the other European countries more closely regarding public transport use in June, the Northern regions again proved to be more mobile. While transport passenger numbers in the Southern Länder were 30% down on the beginning of 2020, the people of Mecklenburg-Western Pomerania used public transport 17% more than before lockdown. Lastly, in the United Kingdom the decline in public transport passenger numbers was still –62% in London, while elsewhere in the country, the recovery was relatively uniform.

In Germany, lockdown affected public transport passenger numbers less than elsewhere. In France, Spain and Italy, mobility associated with public transport declined more sharply, but their recovery appears to be more marked than that of the United Kingdom. ■

Map 3 - The use of public transport was higher in the North than in the South

difference in visitor numbers (%) compared to January and February 2020



Note: The *Google Maps Mobility* indicator corresponds to public transport passenger numbers. No data are available for South-West England and Ireland, where the index does not cover all infra-regional zones, and represents less than 95% of the population of these regions.

How to read it: in France, public transport passenger numbers decreased by about 80% across the entire country between 22 March and 15 April, compared to January and February.

Source: Google, INSEE calculations

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Senior editors: J. Pouget, O. Simon, F. Tallet **Sub-editor: F. Hillaireau** **Layout: S. Clément, J-P. Catan** **Translator:Hancock Hutton**

INSTITUT NATIONAL DE LA STATISTIQUE ET DES ÉTUDES ÉCONOMIQUES
Head office: 88 avenue Verdier – CS 70058 –92541 MONTROUGE CEDEX – FRANCE
Editorial director: Jean-Luc Tavernier