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3.1

Commuting in Europe and Italy

Alessandra Ghisalberti

3.1.1 Commuting between proximity and reticularity

Commuting is a mobility factor that may have impacted the speed and intensity of the spread of Covid-19 in spring 2020.^a As they display the reticular nature of inhabitants' movements, commuting patterns attest to the intense social interaction which characterizes some territories. They also determine crowding in specific time slots, especially on mass transport.^b As amply noted in the literature,^c mass transport entails close contact between the inhabitants and turns them into vectors of contagion, which facilitates propagation. Specifically, as it innervates the urbanized clusters of globalization, inhabitants' mobility may have favored contagion both by proximity, or via contact between people who inhabit contiguous places, and by reticularity, that is via the multiple flows of people who commute daily between distant sites, thereby circulating the virus through the use of collective means of transport (Casti and Adobati, 2020).

Along these lines, the present study illustrates commuting practices in Europe, and then focuses on the Italian territory, which saw the emergence of a major Covid-19 epicenter between the months of February and June 2020. In fact, it is precisely in the northern regions of Italy that severe viral outbreaks can be traced back to mass transport commutes, a salient

^aThis study embraces the theoretical underpinnings and the methodological approach developed by Emanuela Casti and illustrated in the introduction to this volume. Specifically, Casti emphasizes that the different modes of contagion are attributable to the inherent fragility of contemporary habitation patterns, which are mobile and urbanized. This fragility calls for a radical rethinking of future territorial policies. See also: Casti (2020a,b), especially page 75.

^bCommuting is a form of mobility that characterizes the contemporary world and makes for ever greater acceleration. Its outcomes are "hyper-mobile" societies based on the endless movement of inhabitants. It involves temporary and recursive changes of place, via movements inhabitants perform for work or study reasons. For an in-depth discussion of globalization, see: Lussault and Stock (2003); Urry (2007).

^cAmong the many studies that focus on the relation between Covid-19 and commuting, the following investigate the relation between public transport and health care and zero in on Italy's case: Laverty et al. (2020); Carteni et al. (2020).

feature throughout the Po Valley which may have facilitated overcrowding. In this study, this form of mobility is rendered via reflexive cartography which relies on a range of techniques to show commuters distribution by cross-referencing it to demographics.^d What results is a composite picture of Europe, made up of more densely populated areas heavily affected by commuting, especially across various states of central-western Europe. In some cases—such as Northern Italy—these areas were severely affected by the SARS-CoV-2 epidemic.

3.1.2 The European context of mobility

Commuting is a significant phenomenon in Europe, since it involves over 18 million inhabitants who move for work, equal to approximately 8.3% of its 220 million inhabitants. Commuting has increased in recent years, due to changes in the organization of production systems that have led to greater flexibility in worker mobility, but also due to enhancements in transport and communication infrastructures, which has in turn streamlined the movement of goods and services and has led to an expansion of commuter routes.^e

Specifically, we may investigate this form of mobility in Europe by analyzing two Eurostat indicators: (1) a *commuter index* calculated on active population members who, for work reasons and at least once a week, move inside or outside European regions, otherwise known as level-2 European Territorial Units for Statistics (NUTS2), which delineate the administrative boundaries of regions; and (2) work-related *mobility areas* characterized by dynamics which include commuting along with other forms of work mobility exceeding 15% of active population members. This indicator identifies areas which surround cities and on which cities are heavily dependent, for reasons related to the labor market. Although such datasets fall short of conveying individual commuter routes and, consequently, also the rhizome-like aspect of commuting, they enable us to pinpoint European regions with the largest number of commuting inhabitants, highlighting their distribution within individual countries and recording their significant presence in metropolitan areas.

With regard to the first indicator,^f mosaic map (Fig. 3.1) displays the commuters' index among active population members in the European regions by color-coding in various shades of blue, as well as on the basemap anamorphically distorted to reflect the number of residents. By cross-referencing multiple datasets, this map provides an effective visualization of discontinuity across Europe's territory in terms of demographics and commutes. As regards the first indicator, the basemap highlights the most densely populated areas such as, for example,

^dThis study adopts the notion of “reflexive cartography” established by Emanuela Casti, to envisage maps that include indices, integrate wider datasets or use anamorphic representation in order to bring out social and territorial dynamics; see: Casti (2015).

^eWe rely on Eurostat data on commuting, understood as infra-regional or inter-regional movement which occurs at least once a week, from places of residence to workplaces, and involves employed individuals aged 15–64 in European countries. See: Eurostat (2019).

^fAs mentioned above, data have been issued by Eurostat and focus on commuter mobility among active population members. They may be accessed at: https://ec.europa.eu/eurostat/databrowser/view/LFST_R_LFE2ECOMM_custom_135338/default/table?lang=en.

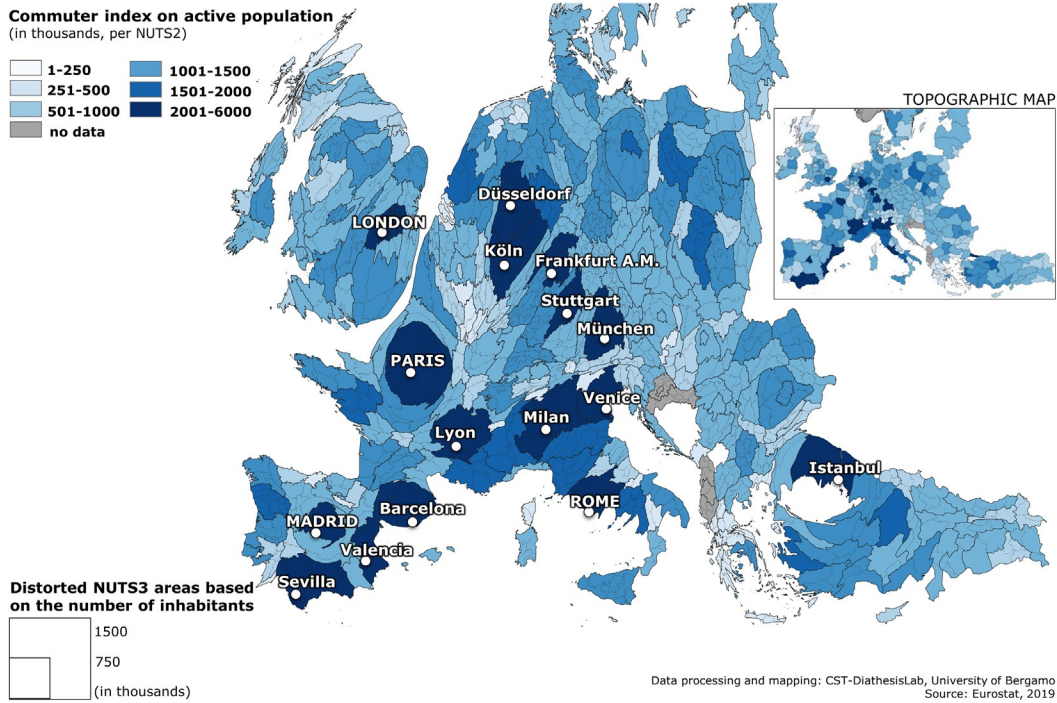


FIG. 3.1 Commuter index on active population members and anamorphic map of residents in Europe.

the central-northern regions of Italy, the central-southern regions of the United Kingdom or those of the southern coast of Spain. These are matched by various metropolitan clusters such as Paris and Lyon in France, Madrid in Spain or Düsseldorf-Köln and München in Germany. This situation is offset by the less densely populated areas such as, for example, the northern United Kingdom, western France, northern Spain or southern Italy.

If, on the other hand, we wish to consider the commuter index, color-coding in dark blue on the map highlights the European regions where this form of mobility is most frequent. Regions surrounding various capitals may be noticed first, along with major European cities: the areas of London and Paris/Ile-de-France in the central-northern European territory; those of Madrid and Rome, respectively in the western and southern territories of Europe; and finally, the Istanbul area to the east. There are also several areas characterized by a high commuting index around cities which, while not attached political capitals, are densely inhabited and may be highly attractive for work reasons, on account of multiple productive or economic infrastructures. This is the case for the regions of: Düsseldorf, Köln, Frankfurt am Mein, Stuttgart, and München, the beating hearts of German industry; Lombardy, with the Milan conurbation, and the Italian north-east, all the way to Venice, leading regions of the Italian economy; the south-eastern French region of Rhône-Alpe, which extends around Lyon and forms the second major center of economic activity in the country after the capital; finally, the regions of Barcelona, Valencia, and Sevilla in Spain.

Besides recording significant commuter flows and substantial demographics, these areas, as highlighted elsewhere in this volume,⁸ also record high levels of air pollution tied to dense urbanization. Also, they feature notable levels of relational intensity between inhabitants and facilitate crowding on mass transport systems in specific time slots. As a result, such areas may have influenced the speed and severity of Covid-19 outbreaks.

Conversely, several less densely populated regions are relatively unaffected by commuting: for example, north-central Spain, western France, central-southern Italy or western Germany. The same applies to some countries in Western and Eastern Europe, such as Portugal, Belgium, Luxembourg or Holland and Poland, Belarus or Ukraine. In absolute terms, these countries were also less affected by contagion in spring 2020.

As we turn to the second indicator, namely *work-related mobility areas*, Fig. 3.2^h shows that are over 700 such areas of varying extension in Europe.

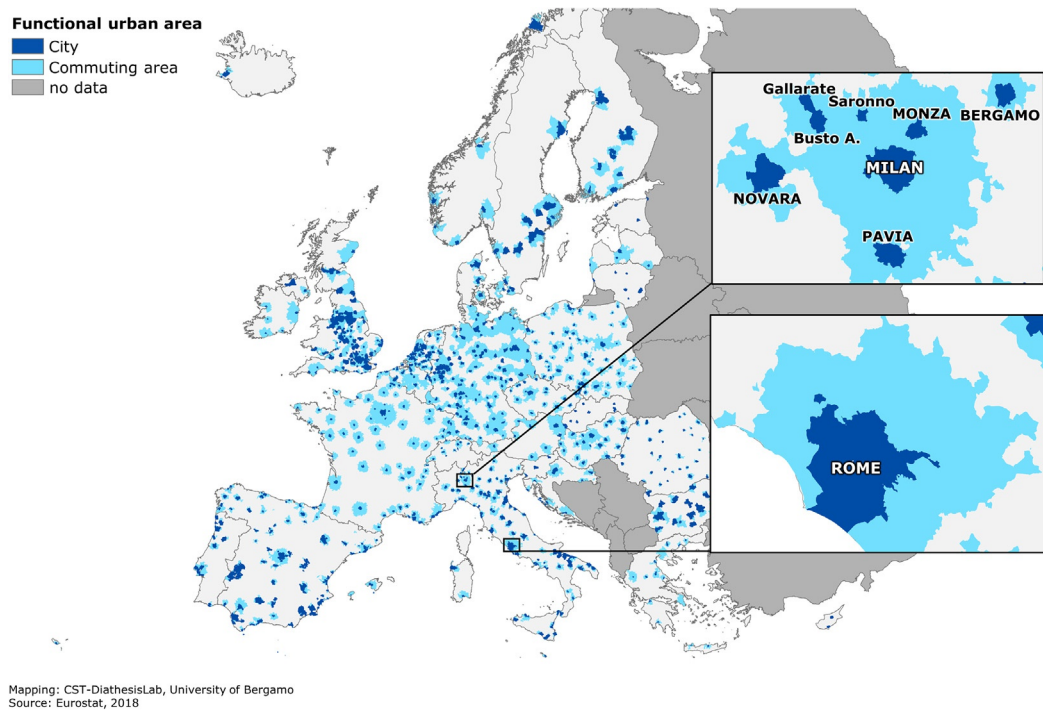


FIG. 3.2 European cities and areas of work-related mobility, with a detailed cut-out view of Milan and Rome.

⁸See Chapters 1 and 4 in this volume.

^hThe study of urban commuting was conducted by Eurostat, based on research carried out by the OECD (Dijkstra and Poelman, 2012). It refers to cities in the EU member states and the countries of Iceland, Norway, Switzerland and Turkey. It is aimed at identifying *functional urban areas* in Europe, that are areas which feature a densely populated city and a commute zone around it, with a local labor market tightly connected to the city (Eurostat, 2018b).

In some cases, they highlight the centripetal role played by a single urban cluster; in others, they outline a polycentric setup of territory that involves different urban clusters surrounded by the same commuting area.

In the Italian case, we have a dual configuration: Rome belongs to a monocentric work-related mobility area, unlike Milan which presents instead a polycentric kind of mobility layout. The latter, as a political capital, relies on the functional attraction of only on one central core. The second, Italy's "economic capital"ⁱ is tightly connected with other urban clusters precisely through work-related mobility, which characterize this functional urban area as polycentric. In fact, this commuting area covers an urbanized *continuum* between Milan and the other provincial capitals of Lombardy, such as Monza, Bergamo or Pavia, but also of Piedmont, such as Novara; as well as between Milan and smaller urban centers such as Busto Arsizio, Gallarate or Saronno. This is the main commuting area in Italy, which involves over five million inhabitants in a tight network of inter-regional and inter-provincial connections, where administrative boundaries tend to blur and are relatively insignificant, as amply discussed in Chapter 3.2. The area features a tightly connected territorial fabric which, because of its reliance on mass transport, produces overcrowding. This may well have contributed to the severity of SARS-CoV-2 outbreaks in the northern territory of Italy in the early months of 2020.

3.1.3 A focus on commuting in Italy

Sharper focus in the analysis of commuting in the Italian context, which is the subject of our study, may be achieved by tapping census data published by ISTAT, the Italian Office for National Statistics. Also in this case, we would rely on reflexive cartography for cross-referencing population data with commuting data, with a view to bringing out and emphasizing the social dimension of territory (Casti, 2000, 2015).

Specifically, the map in Fig. 3.3 uses mosaic-like color-coding to visualize a commuter index on active population members and relies on basemap anamorphosis to display areas of Italian municipalities distorted on the basis of the resident population. That makes it possible to zero in on commuting and to note that it affects mostly peri-urban areas. As a matter of fact, clusters such as Milan, Naples or Rome are visually highlighted via anamorphic distortion, which enlarges and foregrounds them on account of their substantial demographics. However, commuting in these metropolitan cities—color-coded in blue—remains limited. Conversely, an area which surrounds urban clusters, color-coded in darker shades of blue, are marked by high levels of commuting.

More specifically, analysis of commuter indices in Italy finds more significant figures in the northern regions, with a definite prevalence of very high levels (between 4001 and 7000) and high (between 2001 and 4000) level of commutes. Conversely, commuting tends to be more restrained—with most average levels between 1001 and 2000, and low levels between 0 and

ⁱWith regard to the setup of cities in the Italian territory and to Milan's urban reticularity, tied to its multifunction role as the driving force of Italian economy, see: Dematteis (2008).

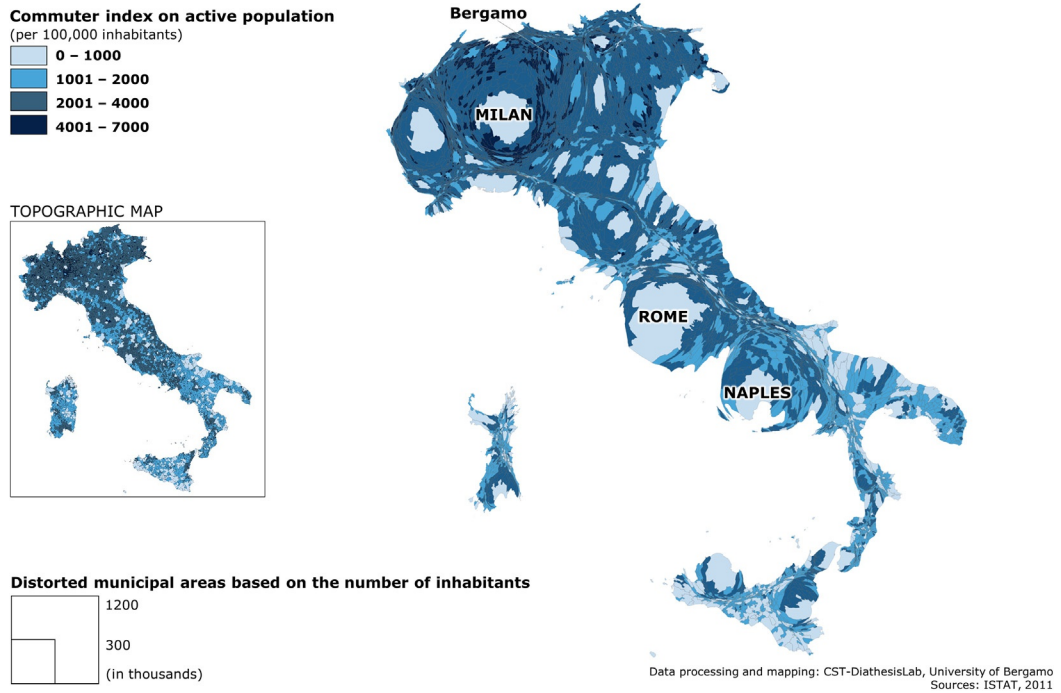


FIG. 3.3 Commuter index on active population members and anamorphic map of municipalities based on resident population in Italy.

1000—in the central and, above all, southern areas. This trend makes it possible to envision initial cross-referencing with Covid-19 infection data in Italy and to detect distributive similarities. As discussed in the previous chapters of this volume,^j outbreaks were considerable in the northern regions of the peninsula, which our analysis shows are mostly involved in commutes, while they tended to be decidedly less extensive in the central-southern regions which record lower commuter numbers.

Also, if we zero in on areas color-coded in dark blue, corresponding to a commuter index on active population members that varies between 4001 and 7000, we find that it involves almost exclusively the conurbation around Milan. We do find a ring around the capital city of Milan, but we also record marked commuting in areas located to the north of the regional capital, especially in the north-eastern area which includes large swathes of the Bergamo province. These are closely-knit areas due to inhabitant mobility, which causes overcrowding on the mass transport network. And these are also areas severely affected by the epidemic, as we underlined earlier.

^jSee especially Chapter 1.2 on the spatial-temporal spread of contagion in Italy. The maps there outlined suggest a tripartite model of Italy's territory that could be named "Three Italies."

3.1.4 Conclusions

Our study has addressed commute data in Europe with a focus on Italy, with the aim to underline how commuting may have affected the severity of Covid-19 outbreaks, since a high-commute region such as Lombardy was the most seriously affected. As the lockdown period showed, however, this type of mobility can be inhibited, via political measures aimed for instance at implementing online technology. This enables residents to carry out work or training activities from home, as well as to organize meetings, manage remote contacts or stagger access to mass-transport. From a political viewpoint, the European Commission is already intervening in the mobility field and has been adopting measures that seek to improve commuting by regulating the transport sector^k and financing new infrastructure.^l The Commission also invests in innovation in the mobility sector by promoting technological research.^m Starting from this political vantage point, we can envisage systematic interventions for managing crowding and contain outbreaks across Europe. Above all, however, we can design new territories to support a novel habitation model based on the enabling potential of smart technologies and on the reduction and staggering of commuter mobility.

^kWith regard to commuter protection, namely via legislation on passenger rights for rail transport (EC-regulation no. 1371/2007 of the European Parliament and Council, dated 23 October 2007, concerning the rights and obligations of rail transport passengers), see: <https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=celex:32007R1371>).

^lThere exist many projects funded by the European Union to make transport more efficient and sustainable even at a local scale. These include the construction of the second subway line in Warsaw; the introduction of methane-driven buses in Bologna through ERDF (European Regional Development Fund); the promotion of public rail transport against individual car transport; and the reduction of urban pollution, to be achieved by requiring that local authorities purchase new.

^mThink, for instance, of real-time travel information or of projects for eco-friendly commutes such as the “Bike 2 Work - smart choice for commuters,” discussed here: <https://ec.europa.eu/energy/intelligent/projects/en/projects/bike2work>.

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