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Editors’ comments: The Covid-19 epidemic in Italy, a European epicenter

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This book analyzes contagion trends and the spread of Covid-19 in Italy in relation to territorial features with a focus on the region of Lombardy, which was the most severely affected. Research began in February 2020, as a group of researchers from the University of Bergamo began monitoring in Italy the first epidemic “wave” of viral infection coming from China, which subsequently spread to Europe and the entire world. Monitoring ceased at the end of June, when the epidemic entered an endemic phase and lockdown measures adopted to contain it were finally lifted.

This initial intense period of health emergency in Italy is crucially important for shedding light on the epidemiological dynamics of the disease, for pinpointing potential flaws in our pattern of urban living in times of Covid-19, and, finally, for assessing measures that were put in place in an attempt to stem infection and safeguard the functioning of the health-care system. As also witnessed at present, subsequent Covid-19 waves provide datasets that differ from first-wave data, since infection monitoring has by now extended to increasingly larger population groups, which also include asymptomatic people. Furthermore, later epidemic waves depend on containment and tracing measures that were adopted as well as on citizens’ acceptance of restrictions over individual freedoms: all that makes it difficult for researchers to examine contagion dynamics in relation to socioterritorial features.

This study should be placed in the context of social research that developed in the course of 2020 alongside biomedical studies, and it is rooted in the influential claims of one of the famous 19th-century progenitors of German pathology, Rudolf Virchow, who stated, “An epidemic is a social phenomenon that involves some medical aspects.” In addition, our research is not so much and not merely an account of the first viral wave that swept across Europe. Rather, it is a territory-focused reflection on a complex issue, an investigation the ultimate goal of which is to derive useful guidelines on how to defend ourselves from subsequent Covid-19 waves or subsequent pandemics.

The initial purpose of this research was to answer the question, “Why in Bergamo?,” that is, to investigate why the contagion spread with such unparalleled virulence and gravity in the

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aIn fact, in the second wave, the word “outbreak,” covering one or more symptomatic subjects testing positive to Covid-19, was replaced by the term “cluster,” that is, a group of asymptomatic subjects who test positive during checks aimed at specific groups, such as tourists returning from holidays.

bThe quote comes from the recent volume by Bernard Henry Lévy, published in English with the title “The Virus in the Age of Madness” (Lévy, 2020).

cReferences to Europe occur in many chapters, but do not amount to a full-scale comparison claim.
province of Bergamo, and later affected much of the region to which this territory belongs, that is, Lombardy.

In order to pursue this goal, besides official infection data made available by the Ministry of Health, we relied on a “toolbox,” which included datasets produced over the years on the socioterritorial aspects of the region and used cartographic and geographic equipment from the CST-DiathesisLab to visualize data and translate datasets into information.\(^d\)

However, we soon came to the realization that we needed to formulate a clear starting hypothesis and to lay out a solid theoretical framework on which our analytical research method could be based. Our hypothesis eventually focused on the existence of a relationship between epidemiological features and physical and social aspects of places. Thus, we embraced the notion that territory affects contagion and that territorial features impinge on the onset, course, intensity, and severity of contagion. This involved assuming territory not exclusively in its localized dimensions, but rather in relation to its physical and/or social features.

In order to address the territorial phenomena of globalization, we needed to adopt a theoretical model, and the reticularity model seemed particularly apposite. A reticular model succinctly states that in the contemporary, mobile and urbanized world, living unfolds along the intertwining nodes and connections produced by the dynamism of inhabitants both locally and globally (Lévy, 2008). Unsurprisingly, in times of a pandemic, reticularity of this kind marks ideal conditions for a viral spread. Under such conditions, a contagion will occur both by proximity, which results from gatherings or crowding around high-connectivity places, such as hyperplaces (public spaces typical of high population density), and by reticularity, which derives from people’s movements on collective public transport (Lussault, 2007, 2017).

Buttressed by recent scientific developments on the role played by spatial dimension in any social phenomenon (in the wake of a spatial turn) and by the novel approach to mapping as a medium for spatial representation, our research pursued a twofold objective, namely, (i) to analyze the contagion in its space–time dimension, highlighting territorial vulnerabilities and envisaging actions for overcoming them under the inevitable aegis of ecological awareness and (ii) to build reflexive maps, which, against an alarmist plan of massive reliance on GIS maps on the epidemic issued at various levels (institutional or otherwise), would instead favor a vision capable of consciously facing challenges the contagion poses.

The resulting analytical method was a real-time monitoring of infection across various territories analyzed at multiple scales (municipal, provincial, regional, national) with a view to pinpointing epidemic differences. Such data were presented using a cartographic model that cross-referenced them to socioterritorial data with the aim to facilitate interpretation and process new information, subsequently laid out in written form. In fact, cross-referencing of territorial aspects (population distribution and composition; citizen mobility; distribution of production facilities and pollution; and reaction capacity of the health-care and welfare

\(^d\)Over the years, the Diathesis Cartographic Lab, within the Territorial Studies Center at the University of Bergamo, has experimented with new forms of digital mapping for diagnostic research at local, national, and international levels. These were aimed at not only territory and landscape designs but also at urban and environmental governance. They applied innovative theoretical models (Casti, 2000, 2015), methods that tapped data from multiple sources (for instance, land surveys and observations, statistical and archival analyses, as well as social media and big data), and digital platforms for data collection, processing, interpretation, and disclosure (www.unibg.it/diathesis).
systems) and epidemic features has made information more complete and more reflexive, as envisioned by the paradigm of cybertcartography (Fraser Taylor et al., 2019).

The coupling of maps and textual descriptions is also a distinctive feature of this book, which combines written and drawn text to explicitly put forth a model of “unlimited semiosis,” an additive text-map relationship. This model complies with the conventional ranking of text over map, without however excluding the possibility of a mutual implication between the two: text and figure not only refer to each other but also mutually support each other, thus legitimizing the overall relevance of the information they convey via such a dense network of cross-references.

Data obtained through field surveys, multiple information sources, and interdisciplinary meetings aimed at broadening our view of the phenomenon we were experiencing were systematized. They showed that in its first wave, the Covid-19 contagion in Italy struck and spread differently in relation to the physical and social factors of the territory. The epidemic epicenter was located in the north, in the Po Valley, where it remained throughout the entire spring wave of Covid-19. On the contrary, there was, a tripartite zoning of the country into what we named the Three Italies: the first included the greatest part of northern provinces, where infection intensity and gravity were the highest; the second included most of the remaining provinces of the Po Valley and some neighboring areas, where contagion intensity ranged from medium to high; and the third comprised the rest of the nation, which was only mildly affected.

This consolidated our research approach and confirmed what also seems to emerge from data on international contexts, namely, epidemic features delineate an anisotropic space that differs locally, regionally, and nationally.

The fact that Italy, like the rest of Europe, is currently experiencing a second pandemic “wave” does not diminish but rather increases the relevance of these observations. They can be applied comparatively, and thus encourage a reflection on how we may act to consciously address the challenges posed by what some authors have named our entry into the Anthropocene. Outlined as a new geological era, the Anthropocene is characterized by the environmental crisis currently affecting earth. In that context, the SARS-CoV-2 virus pandemic marks the first global increase in awareness of the need to seek a new model of life and living (Lussault, 2020). In times of the pandemic, there emerged, on the one hand, the need to rethink the spatial practices of our urban and mobile living (i.e., the spatiality of social phenomena), the relationship between individuals (the interspatiality of inhabitants), and the modes of cohabitation (the way in which societies spatially organize coexistence between individuals). On the other hand, social policy has shown that even though they possess the knowledge and technological and organizational skills to stem contagion while...

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guaranteeing basic needs, complex societies such as western democracies have in fact exacerbated social disparities that are typical of a capitalist model.\(^8\)

In light of this, our book sets out to propose a generalizable reflection on how to face contemporary challenges without neglecting ethical and social challenges.

At this point, we should mention where and when the study was carried out. We clarified above that it all started as a field analysis carried out in Bergamo, the epidemic “eye of the storm,” at the beginning of the pandemic. Geography was summoned from the start as a connecting discipline among the many others called upon to act in the resolution of complex social phenomena.

As evidence of this, it should be remembered that this study was initially conceived and coordinated by the geographer Emanuela Casti, at the Territorial Studies Center, and was later picked up by other cocordinators, such as Fulvio Adobati, an urban planner, and Ilia Negri, a statistician, both tied to the University of Bergamo. While preserving the core of research, that is, a geographical investigation of Covid-19 infection, Adobati and Negri broadened its interdisciplinary perspective with the aim to better detail the relevance attributed to the spatial dimension of social phenomena. Thus, interdisciplinarity is a core value attested by the results achieved and the intertwining of aspects under investigation.

Another qualifying feature is the presence of two generations of researchers in the research team: the first set up the group, thanks to experience in the field, critical acumen, and theoretical reflection, and the second, or “digital generation,” contributed a more competent mastery of IT tools, and, thanks to this unforeseen experience, learned that a knowledge of means does not suffice in order to reach a goal.\(^h\)

The volume cohesively unfolds in chapters written by different authors around one major research proposition, namely, the intensity and severity of epidemic spread are influenced by territory and precisely by the presence/absence of some geophysical and/or social aspects. We iterate these once more: population density and composition, mobility and commuting, air pollution, and health-care and welfare systems.

Theoretical grounding is discussed in the Introduction, and issues of theory are subsequently picked up in turn by each chapter, in focused analyses of the spatiotemporal evolution of a multiscale epidemic in Italy, visualized via reflexive mapping. In detail, the Introduction lays out the theoretical and methodological grounds of research and the role taken up by cartography in communicating contagion aspects in an interdisciplinary context. The new reflexivity paradigm in digital mapping and the communicative implications of digital constructs are outlined in order to pinpoint, in our specific case, territorial fragilities on which to act to counter the epidemic crisis.

The first chapter deals with the distribution of the infection in relation to population. It comprises four sections and initially proposes a Europe-wide overview of infection by

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\(^8\)Street riots that are taking place in various parts of the western world bear witness to social unease: we need to consider that in times of crisis those who are the most disadvantaged are precisely the weakest sectors of the population.

\(^h\)Since the beginning, the latter have taken part in research on a voluntary basis, driven by a concern for ethics and convinced that research was not detached from the events of life, but rather was a defense tool for understanding and improving it. Their names are Fulvio Adobati, Andrea Azzini, Andrea Brambilla, Elisa Consolandi, Emanuele Garda, and Marta Rodeschini.
cross-referencing epidemic data with those on population distribution and composition of the population. Subsequently, it examines the evolution of the contagion in Italy, highlighting how Lombardy was the only region to be severely hit. The third section deals with epidemic analysis in Lombardy from both a quantitative and an evolutionary point of view, identifying the “backbone” of maximum contagion in the eastern part of the region, which connects the two epidemic outbreaks of Lodi and Bergamo. Finally, the fourth section zeroes in on the local level, recalling physical and socioterritorial factors in the Seriana Valley, which made headlines worldwide for its sad record as the most devastating outbreak in Italy.

From a purely statistical perspective, but always with special attention to spatial features, the second chapter investigates mortality and contagion severity in Italy and in Lombardy. It highlights the inadequacy of publicly issued data on the outcomes of infection and demonstrates that during the most serious and critical phase, official deaths due to Covid-19 were in fact lower than the actual number of people who died of the disease. It then sets forth an estimation method based on excess mortality observed in the area. What emerges is that deaths due to an implicit Covid-19 cause or Covid-related illness hit Italy harder than other European nations, struck the region of Lombardy more severely than other Italian regions, and that, among the provinces, Bergamo is the one that paid the most in terms of mortality. That confirms the hypothesis of an anisotropic territory outlined by the disease and of a subdivision into three macroareas both nationally and regionally.

The third chapter outlines the European scenario in relation to major mobility corridors and addresses the Italian situation. It identifies Lombardy as the region with rhizome-like commute patterns, which affect the spread of infection by facilitating reticular contact and interaction between people. The use of Big Data related to mobility flows makes it possible to process reflexive mapping, which conveys their reticularity and their spatial and temporal concentration, a condition which proved to be particularly dangerous with regard to collective public transport.

The fourth chapter analyzes atmospheric pollution, carrying out a detailed mapping at the regional level for Lombardy, also in relation to the Italian national context and the European context. The analysis is based on the assumption that there exists a relationship between the degree of salubrity of settled environments and possible vulnerabilities in the health of inhabitants. Specifically, the diffusion of two major atmospheric pollutants, nitrogen dioxide and atmospheric particulate matter (PM10 and PM2.5), is analyzed. The purpose of this section is to provide assessment criteria by collecting clues (with the aid of relevant cartographic representations), which may serve to verify potential correlations between levels of environmental pollution and the intensity and virulence of territorial contagion.

The fifth chapter explores the dynamics of viral diffusion and addresses territorial factors that facilitated contagion, starting with outbreaks initially recorded in the Po Valley and moving on to the later epidemic phase. Diffusion dynamics (both by reticularity and by proximity) are evaluated on sporting events data that involved communities in the period prior to the discovery of outbreaks. The chapter also examines the health-care and welfare systems in Italy, looking for factors in their setup or management that may have affected the intensity and severity of the viral spread. Finally, the analysis zeroes in on Lombardy to show that both the health-care and the welfare systems rely on centralized facilities that have made it difficult to control the virus.
The sixth chapter provides a review of contagion-containment measures adopted by EU institutions and by various European states. It then develops an analysis of the Italian national context, also as played out at the regional level, with comparative references to provisions adopted in other European nations. Thus, elements are offered to identify possible correlations between infection curves and public measures adopted on a national and regional scale and to sketch a cautious assessment of effectiveness of such measures.

The concluding section completes the circle by summarizing the distinctive features of the research projects and the results achieved. The current health crisis has led to an acknowledgment of social and territorial vulnerabilities: these bring into question current models of living and urge us to rethink them on the basis of the vulnerabilities this research has exposed. Pandemic, environmental, and social issues are but three inseparable clusters we need to address in order to rework territorial governance. We need a new model based on the recognition of a much-needed overhaul of environmental quality profiles and services. We also need to envisage a progressive transition toward renewed ways of living territory, which may be seen as instruments for fulfilling the needs of humans, ensuring their quality of life and, ultimately, achieving well-being and happiness.

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