

TeMA

Journal of
Land Use, Mobility and Environment

The Times They Are a-Changin' and cities have to face challenges which may not be further postponed. The three issues of the 13th volume will collect articles concerning the challenges that cities are going to face in the immediate future, providing readings and interpretations of these phenomena and, mostly, methods, tools, technics and innovative practices (climate proof cities, zero consumption cities, car free cities) oriented to gain and keep a new equilibrium between cities and new external agents.

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THE CITY CHALLENGES AND EXTERNAL AGENTS.
METHODS, TOOLS AND BEST PRACTICES

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

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TeMA

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THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

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REVIEW NOTES

The quality of the offer that the magazine has set as a priority since its foundation has given increasingly encouraging results, first with the recognition by readers and, subsequently, by the institutional bodies responsible for the quality of research in Italy. The recent inclusion of TeMA in the list of reviews of A class represents a milestone to start from. The Review Pages section, since the first issue of TeMA in 2007, has played a substantial role in the general balance of the review, both as an expression of constant updating and as a permanent observatory on emerging issues relating to the relationships between urban planning, mobility and the environment. Starting from the issue of August 2020, the Review Pages will have the new form of Review Notes. They will become short scientific articles, which, while maintaining the function of a reasoned review, will deepen relevant issues in the context of the scientific debate on the recent challenges of the cities, territories and environment. The Review Notes will contain critical thoughts congruent with the topic of the review. The guidelines for these considerations will be: centrality and interest in the scientific debate; advancements and innovativeness of topics; significant gaps resulting from the analysis of the state of the art; recent evidence stemming from the scientific debate; perspectives and potential developments. The Review Notes will consist of four sections, edited by the following researchers:

- Carmen Guida for the section Urban Planning Literature Review;
- Federica Gaglione for the section Town Planning International Rules and Legislation Overview;
- Gennaro Angiello for the section Projects and Innovative Approach;
- Stefano Franco for the section Economy, Business and Land Use.

Researchers can identify a specific and personal topic to deepen in more than one issue, becoming self-contained scientific articles. Articles are subjected to the usual submission process required by the statement of TeMA journal. The Editorial Staff provides a specific quality control of the articles.

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REVIEW NOTES – Urban practices

Toward greener and pandemic-proof cities: Italian cities policy responses to Covid-19 outbreak

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Abstract

Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always following a rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of a continuous updating of emerging topics concerning relationships among urban planning, mobility and environment, through a collection of short scientific papers. The Review Notes are made of four parts. Each section examines a specific aspect of the broader information storage within the main interests of TeMA Journal. In particular, the Urban practices section aims at presenting recent advancements on relevant topics that underlie the challenges that the cities have to face. The present note provides an overview of the policies and initiatives undertaken by major Italian cities in response to the Covid-19 outbreak.

Keywords

Covid-19; Italy; Urban policies.

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1. Introduction

In December 2019, in the Wuhan province of China, a new form of Coronavirus (Covid-19) emerged. Since then, the virus has been spreading globally and, as of 05 July 2020, more than 200 Countries around the world have reported 16,997,821 confirmed cases and a death toll of 665,562 deaths (Template: Covid-19 pandemic data). The Covid-19 pandemic triggered both third and first world economies, causing severe disruption to society and business, especially in urban areas (OECD, 2020a).

2. Toward greener and pandemic-proof urban areas?

Urban areas have been the ground zero of the COVID-19 pandemic, with 90 per cent of reported cases (UN, 2020). They are densely populated places where people live and gather, thus at risk of spreading the virus due to the close proximity among residents and challenges to implement social distancing (Neiderud, 2015). These conditions have generated a large debate about the future role of cities in the post-Covid scenario. In this respect, some authors have argued that large urban areas are nearly defenseless in times of unprecedented disease outbreaks (Desai, 2020) and that dense urban settlements are not compatible with the needs of social distancing (Naglaa and Ghoneim, 2020). These circumstances, coupled with increasing dematerialization of services and pandemic-pushed growing teleworking rates, have prompted some authors to questioning the ever-growing urban concentration model and envisioning a resurgence of rural areas as alternative and safer mode of urbanization in the post-Covid society (Cotella and Brovarone, 2020). On the contrary, other authors have stressed the pivotal role played by cities in the Covid-19 response in terms of implementing nation-wide measures, but also in terms of providing laboratories for bottom-up and innovative recovery strategies (UN, 2020; OECD, 2020a; UCCN, 2020). In particular, advocates of this second line of argument have seen in the Covid-19 crises an unpredictable opportunity to reshape our cities toward a greener and cleaner urban future (OECD 2020a; Lai et al., 2020; Pierantoni et al., 2020). These optimistic claims are supported by a growing body of interdisciplinary research. Synergies, indeed, has been identified between policies aimed at providing answers to epidemic threats in urban areas and policies aimed at improving the sustainability and resilience of urban settlements (Duarte Pinheiro and Cardoso Luís, 2020; Garcia, 2020). Decentralization of facilities, prioritization of soft over car-centric mobility, hierarchization of the transport system and public services, and redundancy of public, green and open-space functions have been identified as integrated measures able to achieve both public health and city sustainability targets (Pisani, 2020).

Recent analysis of policy measures implemented in major European cities after the Covid outbreak provide early evidence of this integrated approach. Cities like Paris, Berlin, Athens and Dublin are being radically reshaped, as empty streets have given public authorities the opportunity to implement and accelerate large-scale urban projects finalized providing the ground for a green post-Covid city recovery (The Guardian, 2020a; WHO 2020; UCCN, 2020). Although Italy has been one of the most affected countries in the world, Italian cities policy response to the Covid-19 has been only partially covered by research and media. Furthermore, it is not clear whether and to what extent such response is contributing to build back more sustainable and pandemic-proof urban settings. Within this context, the present short paper provides a first overview of policies and initiatives undertaken by major Italian cities in response to the Covid outbreak. To this aim, paragraph 3 of the present contribution presents an overview of the measures implemented in the four largest Italian cities. This is followed, in paragraph 4, by a discussion on whether these measures are (or will) promote a sustainable recovery.

3. The Italian case study

Italy has been the first country outside Asia to bear the brunt of the Coronavirus and one of the most affected countries in the world. At the time of writing, 35,000 lost their lives, half of them in the Northern region of Lombardy. Why Italy has been so severely affected by the virus outbreak is currently under debate. Murgante et al., 2020, for instance, found that climate and weather conditions, air quality and urban form played a major role in the development of the virus in Northern Italy and on its diffusion in other parts of the country. On the contrary, Gargiulo et al., 2020 found a weak connection between urban form and the spread of the virus, identifying in the demographic characteristics and economic performances of cities under investigation the main drivers of the virus outbreak.

While the causes of the virus outbreak in Italy are still under investigation, the Italian response to the Covid crises has been timely and comprehensive: Italy has moved in few months from being a global pariah to a model — however imperfect — of viral containment (The Guardian, 2020b). Italy response has been articulated along three main levels of governance: i) the state level, determining general response principles; ii) the regional level adopting detailed rules and iii) the local level issuing regulatory and other administrative acts (Vedaschi, 2020). Municipalities, in particular, have provided a valuable contribution in the implementation of national and regional measures and, some of them, have further developed operational proposals to complement the broader national and regional agenda, with interventions specific to the context in which they operate.

The four sub-paragraphs below provide a summary of the measures undertaken by the four largest Italian cities in response to Covid-19 outbreak. Administrative acts, plans and regulatory frameworks issued by each city have been retrieved from cities' institutional websites, as reported in the bibliographical references at the end of the contribution. Description of impacts on economic sectors - providing background information for the four case studies - are based on CERVID (2020). The small-size pictures accompanying each subparagraph provides an intuitive visualization of the infection rate in each city by proportionally displaying on a map the number of confirmed cases per 10,000 inhabitants.

3.1 Rome



Rome is the capital city of Italy as well as the capital of the Lazio Region. With 2,9 million residents in 1,285 km², it is also the country's most populated urban area and the third largest city in the European Union. Serving as the center of administration for Italy, Rome hosts national, EU and international organizations headquarters and, as such, its urban economy is largely service-oriented. Furthermore, being appreciated for its large historic heritage, Rome is one of the most visited city in the world. For this reason, Rome's economy strongly relies on the tourist industry. While its historic center is listed by UNESCO as a World Heritage, the recent expansion of its outskirt areas has been characterized by a poorly regulated development, coupled with inadequate infrastructure provision and consequent urban sprawl.

The city economy has been severely hit by the pandemic crisis with tourism, leisure and mobility being the economic sectors suffering the most. Measures in response to the Covid-19 in the Italian capital have been mainly target at containing the virus outbreaks by limiting social contacts and mass gatherings. For instance, the well-known cultural event 'Estate Romana', animating the city' summer nights since 1979 has been strongly downsized, with major events moved to open-air locations. With a drop of tourism - one of the main source of income for the city - of approx. 44%, the Municipality of Rome has devoted a large part of the Covid response to recover this sector. Financial support has been provided to tourism and leisure activities through the 'RomeSafeTourism' initiative. Within this context, the city has also approved stringent health-safety measures aimed at increase the confidence in the tourist market by promoting the city as a safe and attractive place to visit and discover. Another big part of the post-Covid response has been devoted to provide economic support to low-income and marginalized communities. The pandemic indeed has further exacerbated the already existent social inequalities and the longstanding rent crises, putting at high risk of social exclusion a big portion of the urban population. Measures finalized at safeguarding the fragile socio-economic households situation included economic support to pay the rent, food aids, facilitated access to credit, improved family and child protective services, and temporary shelters for needy persons and street sleepers.

Only few initiatives implemented by the municipal administration, mainly in the mobility sector, can be considered as structural and not contingent to the pandemic crises. These include the expansion of the city's bike lane infrastructure as well as investments in the city logistics. In this respect, on May 2nd 2020, Rome's city Council approved the construction of 150 kilometers of temporary and permanent cycle routes on the city's main streets and along other key transportation routes. Some of these routes were already foreseen within the city's Sustainable Urban Mobility Plan (SUMP) that has been updated to meet the new demand of cycling mobility, promoted by the Council as a safe mobility option. SUMP updates also included an expanded role for cargo-bikes in the city's logistics system as a safer and more sustainable logistic mode to serve the densely populated city center. Some interventions have also been target toward multimodality: Rome has allocated a dedicated budget to invest in intermodal actions such as multimodal hubs at main train/metro stations, as well as new parking facilities at public schools and offices. Finally, on the May 11th 2020, the Council approved new guidelines for shared electric mobility service provision to allow for the introduction of several thousand scooters via private service providers. Initiatives aimed at promoting sustainable mobility have been coupled with measures aimed at managing mobility demand trough time planning. In this respect, the city Council updated the 'Times and Hours Territorial Plan'. Plan updates are aimed at reducing congestion and mass gathering by rescheduling services opening hours for public facilities such as school, markets, municipal offices, cultural and leisure activities.

3.2 Milan



With 1.4 million inhabitants, Milan is the second largest city in Italy. As the capital city of the Lombardy, one of the wealthiest EU regions, Milan is considered a leading alpha global city, with strengths in the fields of the finance, commerce, art, design, fashion, media services, research and tourism. The city has experience a sustained urban growth over the past few decades, characterized by the implementation of large-scale urban renovation projects and the development of an efficient and modern public transportation network, coupled with a well-developed shared-mobility ecosystem.

On February 21st 2020, the first Italian Covid-19 case was registered in Codogno, a small town about 50 kilometers south of Milan. Since then, the virus has spread over the Lombardy region, making Lombardy and its capital the focal point of the virus outbreak. The pandemic has severely hit the city's dynamic economy and social life, reversing the long-standing growth trends that have characterized its economy, with consulting services, finance, constructions and horeca being the most affected economic sectors. In order to provide a response to the social and economic challenges posed by the pandemic, on May 4th 2020, the city Council launched 'Milan 2020', the city's adaptation strategy to the Covid pandemic. The document was first released as a draft in early April 2020, open to observations and contributions through an online participatory process. Central to the adaptation strategy is the idea that the pandemic is generating long-lasting radical changes in citizens lifestyle and business operations and that these changes will require a strong reorganization of the city's physical and organizational assets. Therefore, city's reorganization should not merely provide a short-term operational response, but should also set the condition for improving city's readiness and resilience to 'current and future critical situations that could occur' in the mid and long term. The first part of plan provides an analysis of the social and economic impacts of the virus outbreak. This part serves as the plan knowledge-base to set a future vision of the city. The vision encompass five main guiding principles in the fields of governance, economic development, public services, workforce and sustainability. Based on such principles, several planning and revitalization interventions are defined. One of the most important line of intervention concerns with the reallocation of the uses of roads and public spaces with the main objective to increase soft mobility supply and develop areas that allow commercial, recreational, cultural, and sporting developments, while respecting the appropriate physical distances. In this respect, the adaptation strategy envisions the development of 35 km of new bicycle lanes, the re-development of city's pedestrian paths, with new and widened pavements, and the extension of Limited Traffic Zones (LTZ) and pedestrian areas. On the land use side, interventions have been target at strengthening public services with attention to proximity, ensuring access within a 15-min walk to essential services, balancing the differences between neighborhoods, enhancing specificities, and trying to reduce inter-district travel. Accordingly, the Municipality of Milan is cooperating with the Lombardy Region to create local services, starting from popular neighborhoods, with high population density and characterized by an older population. Other strategic lines of intervention included the adaptation of the city's 'Time and Hours Plan' to a different schedule for public services - especially for social and educational services and productive activities - in order to avoid overlaps in entry and exit times, regulate the demand for mobility and facilitate physical distancing, identifying timeslots reserved for the most vulnerable groups. A further line of intervention concerned with the simplification, expansion and acceleration of digital services available to the citizens in order to reduce the needs to travel and contain physical contacts between public servants and city users. Finally, the plan intends to support both business and household economic recovery by providing e.g. microenterprises financing services, social rental services and facilitated access to credit. A dedicated section of the strategy is also devoted to skills redevelopment, targeting individuals that have lost their jobs due to the current crises.

3.3 Naples



Naples is the regional capital of the Campania Region, the third-largest city of Italy and the largest city in the South, with a population of 967,069 within the city's administrative limits. As one of the oldest continuously inhabited urban areas in the world, Naples' historic city center is the largest in Europe and has been designated as a UNESCO World Heritage Site. City's economy has fast transitioned from industry-based to cultural, tourism and creative economy. However, despite recent economic progress and ambitious land-use and transportation redevelopment plans, the city still faces social and territorial imbalances, especially in peripheral urban areas where social-disadvantages conditions are coupled with persistent degradation of the built environment.

As for other southern Italian cities, the spread of the virus has been relatively contained. However, stringent lockdown measures imposed by the national government – in some cases further reinforced by the regional administration – have caused severe disruption to the city's fragile economy and social tissue. In contrast with the city of Milan that has articulated an organic city adaptation response, Naples response to the Covid-19 has been relatively fragmented and characterized by a number of sectoral policies regulating different aspects of the urban life. These policies have been issued by the city Council between March and July 2020, targeting specific domains such as mobility, social welfare, land uses and public services. In particular, measures in the social welfare domain have been the focus of the public administration. Unemployment rates indeed are relatively high in the city, and there are large numbers of households living below the poverty line. Covid-19 has further compounded this situation, disproportionately affecting low-income and marginalized communities. To tackle this issue the city administration has created a dedicate budget, financed by both public funds (national, regional and municipal resources) as well as private donations. These resources have been devoted to provide households aids in the form of direct economic support (based on family's income), rent relief support, food aids, municipal taxes relief programs and discounts on the purchase of public transport subscriptions.

Important measures have been taken also in the mobility sector, to alleviate congestion and reduce risk of virus transmission on the public transportation network. Lack of a well-functioning transportation network is indeed a longstanding problem in the city and risk of virus transmission have been identified as very high in Naples, since transit commuters are often packed into busy trains or buses at peak times. For this reason, the city is ensuring suitable preventive measures to protect employees and transit users, by cleaning and disinfecting passenger compartments of trains and buses and visibly displaying to the user the appropriate disinfection certification. Furthermore, the city is promoting the use of municipal taxis as alternative mode of transportation by introducing a flat rate of six euros for intra-neighborhood trips starting or ending in 24 established stops.

Main structural measures have been issued in the soft mobility domain, and are finalized at recovering and expanding the city's cycling networks and promote the use of shared bicycles as a safe transportation mode. In this respect, the city launched in April 2020 a participatory process aimed at identified the most suitable locations for the construction of new bike lanes. Based on this, on May 8th 2020, the City Council approved the expansion of the city's infrastructure, with 16 km of new cycle lanes and the implementation of small-scale interventions aimed at increase the comfort and safety of cyclists on already-existent routes. In the same date, the Council also approved guidelines for introducing electric shared mobility services in the city. These guidelines provide the legal and administrative base for the introduction of micro-mobility services, the development of the electric vehicles charging infrastructures and the activation of a line of financial support for the acquisition of electronic bikes. Mobility-related measures have been coupled with public spaces allocation measures. These measures have been mainly target at supporting the recovery of leisure and touristic activity. Tourism indeed has flourished in the city in the past few years and many activities have been reconverted to accommodate the growing demand of touristic services. With a step-down in the arrival of foreigner city visitors and strong lock-down measures, these activities, mainly concentrated in the historic city center, have suffered significant economic lost. To support their recovery, the LTZ zone of the city center have been further expanded. Furthermore, bars, restaurant and café have been allowed to expand their terraces onto sidewalks and even close roads in some areas. Finally, as for other Italian cities, the city Council has re-designed the 'Territorial Times and Hours Plan' that reschedules the opening hours of public services in order to reduce congestion and mass gathering.

3.4 Turin



Turin is the regional capital of Piedmont and the fourth largest city in Italy with an urban population of 875,698 inhabitants. Turin economy has been traditionally associated with the automotive and aerospace industry that since the seventies has been - and still is - the largest employer in the city. Starting from the early 2000s, the city has diversified its economy and is shifting back towards a service-oriented one. Due to consistent infrastructural investments and a smart place-branding strategy, the city has successfully promoted a new urban representation at an international level as a cultural and innovation hub.

Turin sustained economy has been hit hard by the virus outbreak. In particular, Turin and its metropolitan area ae the most affected area in the country in terms of economic dropdown, with an estimated reduction in revenues for business and companies operating in the city of approx. -15% for the current year, with manufacturing

and commerce being the most damaged sectors. Despite large economic impacts, signs of a coordinated municipal response are hard to find. On the contrary, a myriad of small-scale initiatives provide interesting examples of the growing role of technologies in the city recovery response. These initiatives are finalized at fostering city's sustainability, both on the social and environmental fronts. A notable example in this direction is the 'Torino solidale' project, a dedicated solidarity fund, aimed at supporting families and persons in needs by providing food aids and other form of welfare checks. Technologies here have been employed to drastically reduce the time needed to provide food to people in economic difficulties and to identify priorities in the distribution of food parcels in a more precise manner. Another interesting initiative is the 'Torino City Love' campaign which, through digital solidarity, has developed about hundred small-scale projects to 'freely provide' resources, actions and skills to citizens and businesses affected by the Covid crises', often in partnership with private companies and stakeholders. For instance, in partnership with internet providers, the city is providing free home connectivity, free laptops and collaboration tools in support of teleworking and long-distance learning. Another initiative, in partnership with automotive companies, is dedicated at improving the city mobility: the initiative, named 'Turin Geofencing Lab', is currently experimenting the introduction of electrical cars in the city as well as the introduction of intelligent transportation system solutions finalized at monitoring the correct implementation of traffic limitations in the city's central areas. The city is also paying a great attention to skills re-development as a tool to promote economic and social recovery and increase citizen's resilience to future threats. In this respect, a growing network of private partners, coordinated by the public administration, is providing free programs and e-learning courses for Turin citizens, with particular emphasis on the development of in-demand skills such as coding, translation, media production and sales. Finally, the city has recently started a general reorganization of its administrative apparatus, finalized at improving administrative procedures while promoting safety and security on workplaces. This reorganization is expected to provide the conditions for fostering teleworking among the municipal workforce with an estimation of 1,600 working units to be able to telework from home. The same initiative also includes financial incentives for municipal workers that will shift work-commuting from private cars to active modes of transportation.

4. Discussion and conclusions

As Covid-19 spreads across the world, cities have become epicenters of the pandemic, amplifying the spread and transmission of infection, with their dense population and transport networks. At the same time, cities have become catalyst of sustainable recovery. Many examples of good practices taking place in cities across the world are captured by dedicated and constantly-updated reports of international organizations such as WHO (2020), UN (2020) and OECD (2020a) and UCCN (2020). This contribution provided a focus on Italy and examined policy response to the Covid-19 epidemic in its four largest cities.

A cross-city analysis of measures implemented in Italian cities can be a useful exercise to derive a taxonomy of urban policy measures. This is reported below, together with some considerations on the effectiveness of such measures in providing answers to epidemic threats in urban areas while, at the same time, improving the sustainability and resilience of urban communities:

- *Expansion of cycling infrastructures.* In line with major European cities, the cities of Milan, Rome and Naples have devoted a significant part of their recovery budget in the expansion of their cycling infrastructures. Cycling is promoted by many cities as a recovery strategy since it can reduce pressure on crowded (and often depotentiated) public transport while allowing citizens to respect social distancing, thus lowering the risk of virus transmission. Especially in dense urban settlements, where commuting distances are compatible with the use of bike, cycling represents an alternatives solution to provide citizens with essential needs, go to work when necessary, and still perform some physical activity, even in times of pandemic outbreaks (Garcia, 2020). At the same time, the promotion of cycling in urban areas represents an essential ingredient to improve cities livability and reduce the externalities of car-oriented urban development (Ison and Shaw, 2012).
- *Improvement of walking paths/ expansion of pedestrian areas.* Measure aimed at fostering pedestrian mobility by improving walking paths (e.g. widening the width of sidewalks or improving pedestrian safety) and expanding pedestrian areas have been introduced in the cities of Milan and Naples. These measures can be considered effective tools to promote sustainable mobility while, at the same time adapting the city physical environment to the new challenges imposed by the virus outbreak. On the city sustainability side, these measures can contribute to sustainable mobility targets by shifting mobility demand from private cars to active transportation modes (Li et al., 2014). On the health side, ameliorate walkability

has been demonstrated an effective tool to improve public health by promoting physical activity (Frank et al., 2006). Furthermore, extension of pedestrian areas and sidewalks can guarantee enough space for safe physical distancing while favoring business reopening by accommodating longer lines deriving from lower business accommodation capabilities (WHO, 2020).

- *Extension of green and open space functions.* The city of Milan has strongly promoted the extension of urban green spaces and the development of open spaces functions. To a less extent, these measures have been also promoted in the city of Naples. Environmental benefit of public, green and open spaces are well-established: they contribute to the purification of water and air climate, to the regulation and mitigation of the urban climate, and support biodiversity conservation (Chiesura, 2004). Following the pandemic outbreak, researchers have found that the virus transmission spreads more easily indoors than outdoors (Morawskaa and Caob, 2020) and that urban green urban spaces have been crucial for exercise and mental wellbeing during the stringent lockdown (Razani et al., 2020). Extension of these areas represents thus a valuable contribution to foster city sustainability while, at the same, time providing concrete spatial planning answers to epidemic threats.
- *Decentralization of public facilities.* The adaptation strategy of the city of Milan includes measures finalized at relocating public functions within the cities in order to balance the differences between districts. Decentralization of public facilities is considered a fundamental property to contain the spread of the virus since it allows people to be able to get the goods and facilities they need within the minimum distance from their houses, thus limiting the interaction with the other sectors of the population (Manual, 2020). Furthermore, the decentralization of healthcare services can reduce the response time, and saving operating costs (Pisani, 2020). A balanced juxtaposition of homes and services, is thus not only a well-known urban planning strategy to reduce long-distance trips and promote active transport, but represents also an emerging tool for containing epidemic spreading.
- *City time planning.* All cities under analysis have put in place some form of regulation aimed at a general reorganization of the times of the city to redraw city's work, school, and daily lifetime patterns. These measures might provide a valuable contribution in limiting social contacts and mass gatherings at facility sites as well as through the journey to reach such facilities. Furthermore, if coupled with opportune mobility and land use interventions these measure can also provide value in reducing traffic congestions during peak hours. However, the possibility to extend these measures in the long term might result problematic.
- *Household / small business economic support.* All cities under investigation provided some forms of economic support to households and business. The pandemic crises indeed has exacerbated the existing social inequalities while severely affecting cities economy. Measure aimed at provide households economic, social or rental support have been more intense in cities characterized by pre-existent social inequalities (e.g. Naples and Rome). Measures in support of city business have been target to the most affected sectors (e.g. tourism in Rome) but also strategically to sectors identified as key players in the post-Covid recovery scenario (e.g. the construction industry in Milan). While undoubtedly necessary, these measure, if not integrated in a wider urban economic recovery strategy, can be considered only effective in the short term. Their impacts on cities sustainability and resilience is hard to demonstrate.
- *Improvement of IT infrastructures and digital services.* The city of Turin and Milan have dedicated significant efforts in the improvement of IT infrastructures and digitalization of public services. These measures can generate positive co-benefits: the digitalization of public services can indeed reduce the need to travel while at the same time contain physical contacts between public servants and city users. As showed by the good practices implemented in the city of Turing, IT technologies can also provide a fast and concrete response to citizen's needs. Investments in this domain should be thus certainly encouraged.

- *Human capital development.* According to OECD (2020b), the global pandemic is triggering substantial changes in the labor market. Accordingly, it is essential for governments to help workers transition to the post-Covid 19 economy. Within this context, the city of Turin has invested a consistent effort in human capital re-development as a measure to recover from the virus pandemic. These measures are highly recommended by international organizations as they provide the ground for fostering citizens' resilience to current and future disruptive events.

Table 1 provides an overview of the measures discussed above and their implementation in the four cities under analysis. It suggests that urban policies in the Italian cities has been mainly target at ensuring financial support to households and business and regulating the opening hours of public services. While undoubtedly necessary, these measures are temporary and contingent to the ongoing crisis.

	Rome	Milan	Naples	Turin
Cycling infrastructures expansion	✓	✓	✓	✗
Pedestrian areas/walking paths recovery	✗	✓	~	✗
Green and open-space functions expansion	✗	✓	✗	✗
Decentralization of public facilities	✗	✓	✗	✗
City time planning	✓	✓	✓	✓
Households/business economic support	✓	✓	✓	✓
IT infrastructures and services improvement	✗	✓	✗	✓
Human capital development	✗	~	✗	✓

Tab.1 Overview of measures implemented in the four largest Italian cities.

✓ Consistent policy making in this area. ✗ No intervention in this area. ~ Limited policymaking in this area.

Although more structural interventions to promote soft mobility and digitalize public services have been put in place, in most cases, measures have been uncoordinated, favoring a sectoral rather than a systemic approach. The city of Milan represents the only notable exception. The capital city of Lombardy has put in place a long-term adaptation strategy, addressing different policy domains in a coordinated fashion, and aimed at making Milan a pandemic-proof city, while, at the same time, improving city sustainability and quality of life of its citizens.

References

- Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and urban planning*, 68(1), 129-138. <https://doi.org/10.1016/j.landurbplan.2003.08.003>.
- Connolly (18 May 2020). 'Cleaner and greener': Covid-19 prompts world's cities to free public space of cars. The Guardian. Available at: <https://www.theguardian.com/world/2020/may/18/cleaner-and-greener-covid-19-prompts-worlds-cities-to-free-public-space-of-cars>. Last accessed: 15 July 2020
- Cotella, G., & Vitale Brovarone, E. (2020). Questioning urbanisation models in the face of Covid-19. *TeMA - Journal of Land Use, Mobility and Environment*, 105-118. <https://doi.org/10.6092/1970-9870/6913>.
- Desai, D. (2020). Urban Densities and the Covid-19 Pandemic: Upending the Sustainability Myth of Global Megacities. Observer Research Foundation. ISBN: 978-93-90159-00-0. Available at: https://www.orfonline.org/wp-content/uploads/2020/05/ORF_OccasionalPaper_244_PandemicUrbanDensities.pdf. Last accessed: 05 July 2020.

- Ison, S., & Shaw, J. (2012). *Cycling and sustainability*. Emerald Group Publishing. ISBN: 978-1-78052-298-2.
- Lai, S., Leone, F., & Zoppi, C. (2020). Covid-19 and spatial planning. *TeMA - Journal of Land Use, Mobility and Environment*, 231-246. <https://doi.org/10.6092/1970-9870/684>.
- Li, W., Joh, K., Lee, C., Kim, J. H., Park, H., & Woo, A. (2014). From car-dependent neighborhoods to walkers' paradise: Estimating walkability premiums in the condominium housing market. *Transportation Research Record*, 2453(1), 162-170. <https://doi.org/10.3141/2453-20>.
- Gargiulo, C., Gaglione, F., Guida, C., Papa, R., Zucaro, F., & Carpentieri, G. (2020). The role of the urban settlement system in the spread of Covid-19 pandemic. The Italian case. *TeMA - Journal of Land Use, Mobility and Environment*, 189-212. <https://doi.org/10.6092/1970-9870/6864>.
- Megahed, N. A., & Ghoneim, E. M. (2020). Antivirus-built environment: Lessons learned from Covid-19 pandemic. *Sustainable Cities and Society*, 102350. <https://doi.org/10.1016/j.scs.2020.102350>.
- Morawska, L., & Cao, J. (2020). Airborne transmission of SARS-CoV-2: The world should face the reality. *Environment International*, 105730. <https://doi.org/10.1016/j.envint.2020.105730>.
- Municipality of Naples (2020). *Coronavirus: i provvedimenti adottati dal Governo, dalla Regione Campania e dal Comune di Napoli*. Available at: <https://www.comune.napoli.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/40477>. Last accessed: 05 July 2020.
- Municipality of Milan (2020). *Milano 2020. Strategia di adattamento*. Available at: <https://www.comune.milano.it/aree-tematiche/partecipazione/milano-2020>. Last accessed: 05 July 2020.
- Municipality of Rome (2020). *Coronavirus, Fase 2. Tutti i provvedimenti del Campidoglio, le informazioni necessarie*. Available at: <https://www.comune.roma.it/web/it/notizia/coronavirus-fase-2-tutti-i-provvedimenti-del-campidoglio-le-informazioni-necessarie.page>. Last accessed: 05 July 2020.
- Municipality of Turin (2020). *La politica di innovazione nella città di Torino*. Available at: <https://www.torinocitylab.it>. Last accessed: 05 July 2020.
- Neiderud, C.-J. (2015). How urbanization affects the epidemiology of emerging infectious diseases. *Infect. Ecol. Epidemiol.* 2015, 5, 27060. <https://doi.org/10.3402/iee.v5.27060>.
- Nobajas, A., i Casas, J. G., i Agustí, D. P., & Peacock, A. J. (2020). Lack of sufficient public space can limit the effectiveness of Covid-19's social distancing measures. medRxiv. Available at: <https://www.medrxiv.org/content/10.1101/2020.06.07.20124982v2>
- OECD - Organisation for Economic Co-operation and Development (2020a). *OECD Policy Responses to Coronavirus (COVID-19). Cities policy responses*. Available at: <http://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/>. Last accessed: 05 July 2020.
- OECD - Organisation for Economic Co-operation and Development (2020b). *Skill measures to mobilise the workforce during the COVID-19 crisis*. Available at: <http://www.oecd.org/coronavirus/policy-responses/skill-measures-to-mobilise-the-workforce-during-the-covid-19-crisis-afd33a65/>. Last accessed: 05 July 2020.
- Pinheiro, M. D., & Luís, N. C. (2020). COVID-19 could leverage a sustainable built environment. *Sustainability*, 12(14), 5863. <https://doi.org/10.3390/su12145863>.
- Pisano, C. (2020). Strategies for Post-COVID Cities: An Insight to Paris En Commun and Milano 2020. *Sustainability*, 12(15), 5883. <https://doi.org/10.3390/su12155883>.
- Razani, N., Radhakrishna, R., & Chan, C. (2020). Public lands are essential to public health during a pandemic. *Pediatrics*, 146(2):e2020127
- Template: COVID-19 pandemic data. (2020 August 6). In *Wikipedia*. Available at: https://en.wikipedia.org/wiki/Template:COVID-19_pandemic_data. Last accessed: 05 July 2020.
- UN – United Nation. *Policy Brief: COVID-19 in an Urban World*. Available at: <https://unsdg.un.org/resources/policy-brief-covid-19-urban-world>. Last accessed: 05 July 2020.
- UCCN - UNESCO Creative Cities Network (2020). *Cities' Response to COVID-19*. Available at: <https://en.unesco.org/creative-cities/>. Last accessed: 05 July 2020.
- Vedaschi, A. 2020. *Italy and COVID-19: A Call for an "Italian Emergency Constitution"?*. Available at: <https://www.justsecurity.org/70081/italy-and-covid-19-a-call-for-an-italian-emergency-constitution/>. Last accessed: 05 July 2020.
- WHO – World Health Organization. *Strengthening Preparedness for COVID-19 in Cities and Urban Settings*. Available at: <https://www.who.int/teams/risk-communication/cities-and-local-governments>. Last accessed: 05 July 2020.

Image Sources

All figures are author's elaboration, based on ISTAT and Italian Civil Protection data and use of QGIS 3.4 software.

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