**The COVID-19: Impact and crisis management by the government policies.**

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**Abstract**

The COVID-19 crisis has had a wide-ranging regional and local impact, with significant implications for crisis management and policy responses. This paper examines the territorial impact of the COVID-19 crisis in all of its dimensions: health, economic, social, and fiscal. It provides a comprehensive overview of national and subnational government response measures for managing vaccination campaigns across levels of government and mitigating the crisis's territorial effects. Finally, the paper provides an outlook on the crisis's implications for multi-level governance, as well as considerations for policymakers as they work to build more resilient regions.

**Important points**

All governmental levels must respond to the COVID-19 epidemic while operating in a highly uncertain environment and under intense social, economic, and political pressure. Governments are faced with the constrained ability to sequence policy action due to the arrival of new waves of illness in many countries since mid-2020 and the introduction of variations. In order to manage, resolve, and recover from the crisis, national, regional, and local governments discover they cannot rely on pursuing a straightforward or linear course of policy action. Governments must instead take coordinated action across all fronts. Governments are rethinking their multi-level governance systems and reevaluating their regional development priorities in response to this demand for flexibility and adaptability.

The only long-term solution to the coronavirus crisis is to vaccinate everyone on Earth against COVID-19. Campaigns for vaccinations started in December 2020 and picked up in the first quarter of 2021. However, they provide a major logistical burden for all nations and have profound consequences for territorial and multi-level governance. In contrast to 2.5 percent and 1.6 percent in poor countries, 12.5% of the population in OECD countries had had some vaccinations and 15.8% had received all recommended vaccinations as of May 10, 2021. Globally, 4.2% and 4.1% of people had received either all of their recommended vaccinations or none at all.

**The COVID-19's geographical implications:**

The most severe economic and health crises since the Second World War have been brought on by COVID-19. As of April 2021, COVID-19 had spread to practically every nation, had infected more than 140 million individuals, and had claimed 3 million lives. Health, economic, and social issues are suddenly posing simultaneous challenges to governments all across the world.

Different parts of the world have adopted different tactics, and the crisis' exit path is not linear. Lockdowns are decided on a "stop and go" basis throughout Europe, and this is likely to continue until a sizable portion of the general population has gotten approved vaccinations. Many nations in the Asia-Pacific region have embraced the zero-COVID policy, which calls for more localised lockdowns and border controls to stop future outbreaks.

In several nations, vaccination efforts got underway in December 2020. The only long-term method of containing the coronavirus crisis by protecting individuals is to vaccinate the entire world's population against COVID-19. The WHO has not provided a precise estimate of the percentage of the population that must be vaccinated in order to achieve herd immunity, which may not be achievable at all. Nevertheless, it creates a sizable logistical challenge in every nation and has significant implications for territorial and multi-level governance.

In addition to the human and physical tragedies caused by COVID-19, the epidemic also sparked the worst financial crisis since World War II. Lockdowns, global supply chain disruptions, decreased domestic and international demand for goods and services, muted international tourism, and a decline in business travel are just a few of the ways that the majority of economic sectors are impacted. SMEs and business owners have been particularly hard-hit by the virus containment measures. Both the number of unemployed people and those looking for work have risen, sometimes significantly.

By mid-2021, global production is anticipated to return to pre-pandemic levels, but much will rely on how quickly vaccinations can keep up with newly mutated virus strains. Although the effective use of vaccines and the provision of additional fiscal stimulus in some countries has significantly improved global macroeconomic projections, real global GDP is only anticipated to return to pre-pandemic levels in the second half of 2021, with a heterogeneous pattern across countries and regions, depending on the rigour of containment measures and the extent of vaccine roll-outs. Real global GDP is estimated to have shrunk by 3.4 percent in 2020, according to the OECD's March 2021 Economic Outlook, but is expected to expand by 5.6 percent in 2021 and 4.0 percent in 2022. In 2020, OECD unemployment increased from 5.4 percent to 7.2 percent.

**The health crisis' regional effects:**

Like all pandemics, COVID-19 includes a geographical component that needs to be controlled. Although there are variations in how different nations classify mortality from COVID-19, the overall trend shows distinctly varied outcomes in terms of declared cases and linked deaths, not only across continents and countries but also between regions and municipalities within countries. Asia-Pacific regions have generally been less affected than those in Europe, North America, and Latin America.

Regional differences in COVID-19-related death rates are significant. The number of COVID-19 deaths per 100,000 people within a country might vary substantially, especially in the worst-affected nations. Regional differences in death rates, as determined by the interquartile range, are most pronounced in Croatia, France, and Italy. Spain, Portugal, and the United nation.

The varied effects of COVID-19 are caused by a variety of circumstances. The location of the earliest "clusters" of patients is one factor. In many cases, big cities were the entry portals for the virus in 2020 and were severely affected due to their extensive international connections, which include foreign markets, business travel, tourism, etc. If precautionary, protective, or containment measures are not put in place as soon as possible, infection can spread more quickly in large urban areas due to proximity.

"First clusters" were also experienced in rural areas, and they were worse in places with a high elderly population. Hospital beds in rural places are typically less plentiful than in urban centres and the areas around them. In 2018, there were approximately twice as many hospital beds per 1000 people in urban areas than there were in rural ones. Since 2000, this disparity has dramatically expanded.

Urban areas with a high density of people were apparently severely hit within nations in the first half of 2020, but in certain nations, COVID-19 had spread to less populous places by the second half of the year. Mortality rates in rural areas rose, according to COVID-19, particularly starting in August 2020. Rural areas in the United States, France, and Italy experienced a higher death rate from the outbreak in the second half of 2020, which can be attributed in part to socioeconomic contrasts between rural and urban areas.

Rural locations in the United States are more vulnerable because they have older populations, greater rates of chronic illnesses or impairments than non-rural areas, and less developed healthcare infrastructure. Additionally, a higher proportion of occupations like those in agriculture and food processing, which have fewer teleworking options and higher infection risks, are found in rural counties. Because individuals in rural regions are more susceptible to COVID19, fatality rates increased as soon as the virus spread there. With daily deaths reaching 1.7 per 100 000, rural counties not adjacent to a metro region recorded the highest number of deaths (as a percentage of a county's population, over a 7-day rolling average) in December 2020.

Regional differences can be seen, for instance, in the severity and length of lockdowns, in how subnational governments respond to local COVID19 outbreaks. There was a large amount of variation in the length of strict lockdowns in Australia, where state governments oversaw social distancing programmes and lockdowns. An epidemic in July 2020 in Victoria, the state most severely afflicted, led to a second significant lockdown that lasted 111 days. In the third and fourth quarters of 2020, Victoria experienced the biggest annual decline in household consumption among all Australian States and territories.

The epidemic did not "great-level the playing field." According to a study conducted in the United States, socioeconomic segregation, poverty-associated density, poor housing conditions, labor force participation, and restricted access to health care facilities are all significant predictors of cross-regional death rates. While Manhattan, the borough with the highest population density and per capita income, was not the hardest afflicted, places with lower incomes, like the Bronx in New York City, are frequently the most affected.

Evidence for the United Kingdom demonstrates that during the first wave of COVID-19 transmission, more deprived areas in England and Wales with larger population densities showed disproportionate numbers of mortality relative to less deprived areas. 250 COVID-19 deaths per 100 000 people were reported by lower-tier local authorities in the worst decile of England's net income distribution as of April 2021, compared to 194 in upper deciles and 167 in the top decile. Similar to this, mortality rates in France are twice as high in lower quartile municipalities than they are in better quartile municipalities.

**Most areas lacked readiness:**

Most nations, regions, and cities were not well prepared for the pandemic for a number of reasons, including: I they underestimated the risk when the outbreak first appeared; (ii) many lacked basic personal protective equipment (PPE), such as masks; (iii) they lacked crisis management plans for pandemics; and (iv) in some countries, the health care system's capacity to respond to the coronavirus crisis was weakened by several years of moderating For instance, between 2008 and 2018, the average annual decline in the number of hospital beds per capita across practically all OECD nations was 0.7 percent.

**Impact of the economic crisis on the nation-states:**

Although the COVID-19 crisis and the global financial crisis of 2008 have frequently been compared, their scale, causes (endogenous in 2008 versus exogenous in 2020), and effects drastically differ. The effects of the two crises on various regions are also highly varied, with the coronavirus epidemic having a more distinct effect than the financial crisis of 2008.

The COVID-19 issue has had a different economic impact in different locations due to a variety of local (such as the region's specialisation in and exposure to industries most affected by lockdown measures and capacities to adapt to restrictions) and international (such as global) elements (such as the degree of integration into global value chains and dependencies on tourism). With regard to the short term, capital regions and other metropolitan areas face a substantially larger risk of job disruption than other regions, but they also have greater capacity for adaptation, such as through the adoption of digital tools.

Despite differences in infection rates and limits, regional economic specialisation helps to explain some of the cross-regional differences in economic performance in the United States. Oklahoma, Wyoming, North Dakota, and West Virginia were particularly heavily hit over the first three quarters of 2020 because these States' gross value added is mostly derived from mining, quarrying, and oil and gas extraction. Travel restrictions and forced closures have an impact on states where tourism is the main industry (Hawaii, Nevada).

Different geographic effects of the crisis have been felt on employment. OECD countries' unemployment rates have risen sharply in numerous locations during the second half of 2020 compared to the same period in 2019. In most US states, unemployment rose by more than 2 percentage points, while there were notable regional variations in Chile, Mexico, Spain, Greece, and the Czech Republic. In such nations, fluctuations in the unemployment rate were twice as great in the most affected areas as they were nationwide. Numerous island communities, like the Balearic Islands (Spain), the Ionian Islands (Greece), and Hawaii (USA), have experienced particularly significant job losses, with unemployment rates in these areas rising by an average of 6 percentage points throughout the time.

**Telework's effects on reducing the effects of confinement and promoting social isolation***:*

Strong geographical variances are supported by the findings, and one key mitigating factor for the economic impact and expense of COVID-19 control measures is the degree to which jobs can be done remotely. For instance, the percentage of occupations that can be completed remotely is 11 percentage points higher in urban areas (41.6%) than in rural areas (30.5 percent ).

Large cities and capital regions typically offer the greatest opportunity for remote work within nations. Such a capability might help create territorial resilience differential. In a particular country, the difference between the area with the greatest and greatest potential for remote work is about 15 percentage points; however, in the Czech Republic, France, Hungary, and the United States, the difference is above 20 percentage points. It is significant to emphasise that this research makes the assumption that every employee, regardless of location, has access to a reliable internet connection and the appropriate tools. However, there are also substantial gaps in capabilities between OECD regions, with rural areas frequently showing lesser access to high-speed broadband connections and digital take-up.

**Impact of budgetary issues on regional administrations:**

Asymmetrical fiscal impacts on subnational governments

Given the vulnerability of subnational government to the impacts of the crisis and their commitment to addressing it, it was rapidly evident that the impact on subnational finances would be severe from the crisis's inception in 2020.

According to a survey conducted by the OECD and the European Committee of the Regions (CoR) in June–July 2020 of 300 representatives of regional and local governments in 24 member states of the European Union, 85 percent of surveyed subnational governments anticipated that the COVID–19 crisis would have a highly or moderately negative impact on their finances, leading to a risky "scissors effect" of rising expenses and declining revenues. Other surveys conducted outside of the European Union found comparable effects. For instance, the US National League estimated that the loss of own-source revenue will affect US towns severely and persistently, reaching 21.6 percent in 2020.

Data for the entire year 2020 confirm this adverse effect, albeit at a lower level than some of the earlier surveys initially suggested. This is partially due to significant central/federal government measures to support local finances (e.g., through emergency and compensation grants or the coverage by the central/federal government of certain types of expenditure), as well as savings in expenditures and the postponement or cancellation of investment projects.

Although the effects have been less severe than initially anticipated, there is still a great deal of ambiguity about the long-term effects for a variety of reasons.

**Various effects on the finances of subnational governments**

There are differences in the way COVID-19 affects subnational financing depending on the nation, the level of government, the region, and the municipality.

To analyse and compare the fiscal impact of COVID-19 on regions and municipalities, it is necessary to take into account five primary criteria that each have varying effects on subnational finance:

1. Importance and kind of spending obligations: Depending on the extent of spending decentralisation and the scope of subnational government responsibilities (e.g., health, social protection, economic growth, etc.), the involvement of regions and cities in addressing the crisis might vary.

2. The characteristics of subnational government revenues, in particular how sensitive they are to economic changes (e.g., a decline in activity, income, and consumption-based taxes, a decline in user fees and charges), and policy choices (e.g. exemptions, abrogation, postponement).

3. Flexibility of fiscal frameworks: The outcome will depend on the subnational governments' abilities to withstand extreme pressure, to modify their expenditures and income in response to urgent needs, and to obtain outside financing.

4. The impact will depend on the budget balance and debt situation of a specific local government prior to the crisis, as well as the amount of cash treasury and set-aside reserves. Fiscal health or pre-pandemic financial conditions.

5. The extent and effectiveness of higher-level government support measures as well as the presence of equalization/solidarity mechanisms have a significant impact on the financial impact.

The effects vary by country, by the various levels of subnational governments (such as regions or cities), and even amongst subnational governments at the same level.

The impacts vary significantly between nations depending on the level of decentralisation. Perhaps not unexpectedly, the impact on subnational government expenditure will also be stronger in nations with high levels of decentralisation, reflecting in large part devolved obligations for spending in areas most hit by the crisis (i.e. health, social protection, education, utility services, economic development, etc.). The OECD-CoR survey proved that this is also true in regards to revenue. The subnational public sector's underlying fiscal strength prior to the crisis also affects how much of an impact is felt.

The effects between levels of government rely on their individual spending priorities and revenue models. Alternately, the local level may be more negatively impacted than the regional level. For instance, it is predicted that municipalities in many countries will experience a financial shock mostly in 2020 as a result of the decline in tariffs, user fees, and/or local taxes, but it could be brief (tourist tax) or delayed (deferrals). Compared to regions, whose tax revenues are more dependent on levies that are sensitive to economic activity, consumption, or personal income, municipalities may be spared in the future. The financial shock that will affect several regions may not occur until 2021 or possibly 2022.

The level of local government budgetary health before the crisis also influences how resilient local governments are to the crisis. Some subnational governments might have a sizable cash reserve and a low amount of debt. There are different levels of preparedness for a recession in the US, and some states might not have enough reserves to handle the budgetary pressures beyond the near term. Given their substantially weaker credit indicators, which include lower reserve levels, cyclical revenue streams, and elevated fixed costs such as pensions, debt service, and other postemployment benefits, some states are more vulnerable to pressure resulting from exogenous shocks.

**Asymmetrical effects are also seen on assets, debt, and revenues:**

The COVID-19 crisis and the ensuing policy solutions have significantly harmed subnational government budgets, with regional variations. According to reports, the crisis has a slightly bigger effect on revenue than on spending.

**Revenues received by subnational governments as a result:**

Due to the COVID-19 problem, subnational governments' tax, user, and asset-based revenues have all experienced large drops in revenue. Unsurprisingly, the combination of these revenue sources will likely have an impact on subnational governance funding. The detrimental effect might be less noticeable in nations like Estonia, Lithuania, Mexico, and the Slovak Republic where subnational governments receive the majority of their funding from central governmental transfers1. There is significant concern regarding the ability of states to maintain their transfers in some nations, particularly federal ones like the United States where the majority of transfers to local governments originate from the state governments

**The effect on tax revenue is significant**:

Both shared and own-source tax receipts are predicted to experience a significant decline as a result of the COVID-19 epidemic. Revenues from personal income tax (PIT), corporate income tax (CIT), and value added tax will naturally decline as a result of declining economic activity, employment, and consumption brought on by COVID-19, notably containment measures (VAT). Additionally, counter-cyclical tax policies adopted by national and subnational governments as part of recovery packages, such as tax incentives, exemptions, deferrals, and rate reductions, could increase the mechanical loss in tax revenues.

Regardless matter the extent of the national-level recovery, most are expected to see the situation worsen in 2021 and even 2022 because subnational government revenues are frequently predicated on the previous year's activities (for example, income taxes). In addition to shared or own-source national taxes, numerous other subnational taxes may also be impacted by the state of the economy and tax policy. Taxes on business are one of them. The municipal trade tax in Luxembourg (impôt commercial communal), which accounts for 91% of municipal tax revenue, the municipal business tax in Germany and Austria, and the "territorial economic contribution" in France, which consists of a real estate tax (contribution foncière des entreprises or CFE) and a tax on business value-added are some examples.

1. taxes imposed on economic activity, such as the Italian regional tax on productive output (IRAP), the municipal income taxes assessed in Korea and Japan, and the resident tax imposed on income from both individuals and businesses in Japan.
2. Real estate-related taxes, such as those on real estate transactions, on building permits and rights, etc.
3. Taxes on goods and services consumed by households and businesses, such as sales tax, taxes on motor fuel, energy products, automobiles, and transportation, taxes on recreation, taxes on tourists, taxes on advertising, taxes on gambling, etc.
4. tax revenue from the commodity industries.

**the effect on expenditures by local governments:**

The impact on subnational governments responsible for important components of the health care system, including as emergency services and hospitals, is, of course, more severe, and this crisis is forcing regions and cities to boost their spending in many areas. In the OECD, subnational spending on health made up 18% (weighted average) of total subnational spending in 2018. Additionally, subnational administrations are responsible for spending money on social benefits and protection, which is notably impacted by the COVID-19 problem (14 percent of subnational expenditure). Beyond health and social obligations, subnational governments are active in critical areas affected by the crisis, such as public administration (15%), economic development and transportation (13%) and education (the first budget item at 24%).

The majority of subnational spending items have increased in the short term (emergency expenditure) and also in the medium term in response to exit strategies and recovery programmes, despite the fact that some expenditure items have been temporarily reduced (e.g., cancellation of events, decrease in intermediate consumption, for example gasoline) or deferred in time (e.g., investments).

According to the OCDE-CoR poll, more than half of subnational governments plan large increases in spending on public health, SMEs, and support for the self-employed. It is anticipated that spending will rise more gradually in the areas of education, ICT, local public transportation, administrative services, and public order and safety. In the EU, regions have a higher likelihood than municipalities of seeing increases in spending on health services, support for SMEs, and assistance for the self-employed.

**The effect on health care costs is significant:**

The effect on health care costs is substantial. States, regions, and municipalities are in charge of public health services and hospital funding in a number of OECD nations. About 24.5 percent of the OECD's total public health spending and 12 percent of subnational government spending are covered by subnational governments3. The level of decentralisation in the health industry, however, varies greatly. Based on the combination of three subnational expenditure spending ratios—i) as a share of total public health expenditure; ii) as a share of total subnational expenditure; and iii) as a share of GDP—the OECD developed the typology to indicate the level of decentralisation in the health sector in OECD countries.

The duties of regional and municipal governments differ in the area of health services. As a result, the crisis will affect the subnational government sector differently. When it comes to secondary care, hospitals, and specialised medical services, state governments are typically in charge in federal countries. Regional governments may play a key role in unitary countries where health care is almost primarily a regional level duty (e.g. Denmark, Italy and Sweden). Municipalities typically focus on primary care facilities and prevention when it comes to healthcare. Municipalities or organisations that promote intermunicipal cooperation, though, may be given broad responsibility for infrastructure and healthcare services in several nations.

The consequences on subnational finances go beyond the immediate impact on expenditures and income and their direct influence on assets and liabilities; there are also indirect effects on the values of assets that may make it more difficult to borrow money. The COVID-19 problem is also a threat to nearby public corporations. Some categories, particularly those in the tourism, cultural, leisure, and transportation industries, were negatively impacted by the suspension or reduction of activities. Subnational governments are shareholders, and they are affected by business failures and threats to capitalization and equity.

less than anticipated. Budgetary conditions have sometimes improved as a result of support from the federal or central government (which have decided to absorb most of the fiscal shock on the national economy and which in turn saw their budget balances significantly deteriorate in 2020). Many nations anticipate a considerable decline in the subnational budget balance in 2021. While the assistance of central/federal, or state government will likely decline, lessening its stabilising influence, subnational government spending (expenditure associated to the recovery, social protection, and health) may continue to rise in many nations.

Future subnational government borrowing will be influenced by the extent and duration of the crisis, the degree and availability of federal and central government assistance, and the willingness of subnational governments to maintain a countercyclical fiscal policy in support of the recovery. The ability of the subnational government to secure new borrowing will also be a factor. Lower fiscal performance and creditworthiness have already undermined several regions and municipalities and will likely continue to do so. In some circumstances, the level of subnational governments' present debt restricts their ability to borrow.

**Managing the COVID-19 crisis and recovery's geographical effects:**

Different regions are affected differently by the COVID-19 crisis's economic, budgetary, and social effects, and varied areas are exposed to different levels of danger. This regionally distinct impact necessitates both very strong intergovernmental cooperation and a territorial approach to policy responses on the fronts of health, economics, social policy, and fiscal policy. The need for efficient intergovernmental coordination channels cannot be overstated. "The foundation of an efficient reaction is strong coordination between all actors responsible for the response at central and regional levels."

The six categories of actions performed by national and subnational governments to provide territorial responses to the crisis and the recovery are the main topics of this section:

1. The geographic component of healthcare responses

2. Reactions in the economy and society

3. Electronic responses

4. Reactions in subnational public finance

5. Strategies for reviving public investment at all levels of government

6. Cooperation among governments

**a regional strategy for the health issue:**

All nations' crisis management plans, as advised by the WHO, are built around testing and tracing techniques, however their efficacy varies. Effective testing methods and social exclusion are two approaches to reduce the high expenses of confinement while vaccines are being administered. The delayed rollout of vaccines across nations and regions will influence the type of policy reaction to the issue in spring 2021. The Israeli government has loosened containment limits due to the country's quick immunisation rollouts.

*A test and a trace:*

Testing has been a crucial part of containment exit techniques. The WHO suggests widespread testing to combat the coronavirus given the pandemic's infancy. Regular viral testing reduces the likelihood of second waves by enabling the early detection and isolation of contagious individuals. The OECD noted in 2020 that 70 percent to 90 percent of all people who have been in contact with an infected person need to be located, tested, and isolated if infected in order to decrease the danger of subsequent waves of COVID-19 epidemics.

While central governments in decentralised nations must assure coordination and financial resources, regional and local governments are in charge of implementing policies. Local and regional governments participate in organising testing and isolation measures, even in nations with more centralised health service delivery, which leaves flexibility for regional initiatives and experimentation. It helps manage the asymmetric effects of the pandemic, which frequently call a prompt local-level response to locate and eradicate clusters.

*Social estrangement:*

Since the beginning of the epidemic, social distance has been at the centre of crisis management and is expected to have a long-lasting impact on behaviour and regulations. The WHO and national health organisations have outlined specific guidelines to prevent contagion. Among these is the requirement that people be spaced apart by a certain amount. Urban mobility, schools, and public transportation are all impacted by advice on physical distance. Organizing the return to school under the best conditions while adhering to social segregation laws in the face of an uptick in cases has been one of the largest issues for local governments. The use of protective gear has significantly risen in order to stop the virus from spreading. The usage of masks in shops, public transportation, and other commercial or industrial settings is advised by numerous subnational and national governments.

*National and local lockdowns:*

Regional mobility patterns were largely uniform in the early stages of the crisis, but when regionalization of restriction measures occurred during the first phase of exit, regional mobility patterns within countries began to diverge (Austria, Germany, Italy). To effectively control local outbreaks, collaboration between local authorities, health services, and the central government is crucial.

*coordinating the immunisation initiatives at all governmental levels:*

The only long-term solution to effectively manage the coronavirus crisis is to immunise the entire world's population against COVID-19. In several nations, vaccination efforts started in December 2020. The WHO does not know whether or not global herd immunity against COVID-19 can be achieved, and does not anticipate it to happen in 2021 in particular given that the deployment of vaccines takes time due to both upstream and downstream supply chain bottlenecks and the geographical concentration of production. Early in 2021, there were considerable obstacles to the deployment of vaccines, including inadequate vaccine supplies in some rich economies and the majority of underdeveloped nations due to restricted production capacity and a highly inequitable and inefficient distribution system.

**A regional strategy for addressing the economic and social crisis:**

*Regional and local support for SMEs and self-employed individuals:*

Small and medium-sized enterprises (SMEs) make up 99 percent of all firms within the OECD and between 50 and 60 percent of value created. In a crisis, SMEs are more at risk. In addition to SMEs, the self-employed account for a sizeable portion of overall employment in several OECD nations. Self-employment, which accounts for little less than 15% of all employment, is especially common in Greece, Italy, and Turkey, where it approaches 20%. Compared to regular workers, the self-employed may receive less protection from unemployment benefits.

Local companies and independent contractors are impacted both directly and indirectly by the limits placed in place to combat the outbreak. During lockdowns, some businesses—such as restaurants and cafes—closed, while other small- and medium-sized enterprises (SMEs) and independent contractors were able to continue their operations—albeit with significantly lower demand. Some companies laid off or furloughed their employees. Local companies were able to reopen in considerable numbers in many nations in June 2020, but the recovery was delayed, especially in the service sector, by fresh lockdowns across Europe and targeted lockdowns elsewhere.

*Increased usage of digital tools in towns and regions:*

Numerous mega-trends and revolutions, including digitalization, have been hastened by the COVID-19 catastrophe. Different time periods are covered by the digital government policy response to the COVID-19 crisis: short-term reactions, medium-term solutions, and long-term reinvention. Through the use of digital platforms, information-sharing, eparticipation, and two-way communication, accurate short-term responses to the crisis were made possible. Within a few weeks, public services like education and healthcare switched to a digital format. While this is going on, remote work is proven to be a successful way to increase social distance and lessen the economic effects of the crisis. In regions, cities, and rural areas, COVID-19 has sped up the digitalization of public administration and the provision of public services. Subnational governments should use this experience to upgrade their digital services in the longer term and strengthen their digital collaborations with other governmental levels and the corporate sector. However, the capacity of regional and local governments to deal with the issues posed by unprepared and incomplete digitalization differs greatly. Given that many subnational governments weren't necessarily prepared to go digital, the current crisis may exacerbate these inequities. Digitalization is expected to be more difficult in more rural and distant areas if there is insufficient IT infrastructure. Long-term solutions to the urban-rural divide and improved public service delivery would benefit from more convergence in the availability to digital infrastructure.

*Using digital technologies to track the epidemic and subnational governments*:

The use of digital technologies by regional and local governments to monitor and halt the spread of the coronavirus is growing.

Expanded use of digital tools for pandemic tracking and informational purposes has helped to: I inform decision-makers, aiding them in adopting appropriate measures and containing the pandemic; and (ii) communicate with citizens transparently, fostering trust, which is essential to ensuring compliance with containment measures.

The usage of these tools has also brought up difficult issues with regard to secrecy and data protection. While acknowledging the potential advantages that tracking applications may have for crisis management, they also have an impact on data privacy. While the legal framework in many nations prohibits this form of data use, it has proven simpler to execute in other nations. The European Commission, for instance, has created guidelines and a toolset for creating COVID-19-related apps that aim to ensure adequate personal data protection in order to reduce the risks relating to privacy and data protection.

*Local service digitization is progressing quickly, and there are regional digital differences*:

The digitalization of services has been expedited by confinement measures, expanding the selection of online services offered, including e-administration, e-education, and e-health. Even before the COVID-19 problem, there were growing trends towards the digitalization of services. Since 2006, the number of OECD nations' citizens who have access to government services through online portals has tripled. Prior to the financial crisis, a survey on local governments' usage of digital information systems revealed that, on average, the degree of digitalization was greater for local services in real estate development, construction, tourism, and culture and sports, and smaller for social services.

The COVID-19 issue caused a significant shift toward e-education and online courses starting in March 2020, with more than 1.5 billion children (or more than 60% of the world's student population) not attending school during the closure in spring 2020. Numerous nations provide local governments extensive authority to implement education policy. This places them in the driver's seat in terms of the digitalization process, even in the context of the current crisis.

*E-health services*: In a setting where social isolation plays a crucial role in containment and prevention, these services offer considerable advantages, and usage of them has significantly increased since March 2020. This is particularly true of telemedicine and electronic medications. According to some early study conducted in the US, as COVID-19 instances rise, so does public interest in telehealth. Such innovations can be encouraged by local and regional governments, particularly in nations with more decentralised health care systems.

*Urban-rural divides and regional digital divides:*

Additionally, the pandemic has highlighted regional digital gaps and, in certain cases, sped up efforts to promote digital inclusion. The availability and use of the internet vary greatly among OECD nations. Both in nations with high ICT penetration, such as France, Israel, the United States, and New Zealand, as well as those with low average ICT access, such as Mexico or Turkey, regional disparities in the number of homes with broadband connection are clearly evident. For instance, in the US, 25 percent or more of underprivileged 15-year-olds lack access to a computer. In the most underprivileged areas of Italy, 20% of families and 42% of families don't have access to a computer or tablet at home.

**Recovery plans for public investments**

*Strategies for restoring national investment:*

The immediate fiscal reactions to COVID-19 were geared toward aiding businesses and households. Since June 2020, numerous national governments have unveiled major economic recovery plans, generally emphasising public investment. Additional public investment stimuli will be provided through Next Generation EU, the European Union's recovery strategy. While maintaining a longer-term focus on three primary themes, these investment recovery packages attempted to boost employment and economic growth. improving health care systems, digitalization, and hastening the shift to a carbon-neutral economy. To overcome the obstacles to COVID-19 recovery, the OECD and the IMF have strongly urged governments to increase public investment. In this regard, subnational governments are crucial because they account for 57% of OECD.

Supporting subnational public investment: Subnational governments' public investments will play a critical role in the COVID-19 crisis' recovery. In OECD nations, subnational governments are in charge of managing the crisis and are also in charge of 57 percent of public investment. Additionally, given the varied effects of COVID-19 on regions, subnational governments are able to provide a territorial dimension in recovery plans that takes into consideration the social and economic shocks on local economies. However, subnational governments may need to develop new competencies to support efficient public investment because they are particularly susceptible to the financial effects of the COVID-19 dilemma.

*Intergovernmental cooperation is a key factor:*

International cooperation and domestic coordination between levels of government are both proving crucial for solving this global challenge, especially for addressing regional and local socio-economic difficulties and long-term recovery. Failures in crisis management can be minimised by a coordinated response from all levels of government. In order to effectively address the crisis on all fronts—health, economic, social, and fiscal—all nations—federal, unitary, centrally or decentralized—require effective coordination between national and subnational administrations as well as across jurisdictions.

In order to deal with the crisis, some nations have reactivated coordination bodies and processes to include regional governments and associations of municipalities in the decision-making or consultative process. According to 71% of EU subnational government respondents to the OECD-CoR poll, one of the major obstacles to tackling the health crisis is a lack of coordination (vertical and horizontal) with other levels of government. During the crisis' first stage, the effectiveness of coordination mechanisms was constrained.

**Looking forward How COVID-19 is changing regional development and multi-level governance**:

Multilevel governance structures are shifting as a result of the COVID-19 crisis, as are regional development agendas. The arrival of COVID-19 has highlighted the importance of multi-level governance, shedding more light on the balance of centralised versus decentralised approaches to crisis management, and emphasising the need for effective leadership balanced with effective coordination, consultation, and a collaborative approach among government and non-government actors. It highlights the importance of trust in public institutions, both for crisis management and for health outcomes, as well as the strength of good communication with stakeholders and the general public.

All governmental levels have had to show adaptability and flexibility during the crisis. They had to establish new coordination plans and strategies due to a sequencing difficulty they experienced. Governments will need to concentrate on continuing to modify governance structures and regional development strategies so that they are focused to address territorial implications during the recovery.

The need for effective leadership that is balanced with efficient coordination, consultation, and a collaborative approach among government and non-government actors has been further highlighted by COVID-19. It has also been highlighted the importance of a place-based approach to crisis management and recovery. It has highlighted the importance of effective communication with the public and the role that trust in public institutions plays, not just in crisis management but also in health outcomes.

New trends in regional development policy-making are "revealing" and "accelerating" as a result of the COVID-19 crisis.

revealing: The crisis has brought to light a lack of regional resilience, particularly through its amplification of pre-existing weaknesses, including those related to territorial disparities in access to housing and healthcare, demographic shifts, digital divides between urban and rural areas, and the effects of a decade of underinvestment in municipalities and regions in many countries. These amplifications run the possibility of continuing well into the medium-long period.

1. Accelerating: The COVID-19 crisis has significantly quickened the pace of a number of mega-trends, including digitalization and the need to move toward a low-carbon economy. The rise of remote labour could drastically alter the spatial balance between urban and rural areas.
2. Governments are reevaluating their multi-level governance systems, reviewing their policy tools, and reevaluating their regional development priorities as a result of the requirement for flexibility and adaptation. Important factors for success in an emergency are as follows:
3. mobilising and coordinating all governmental levels as well as many policy sectors.
4. utilising a place-based strategy to address the health and financial issues.
5. With good coordination, consultation, and a cooperative mindset among government and non-government players, clear leadership is balanced.
6. fostering regular contact with stakeholders and the general public in order to increase public trust in institutions.

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