PROJECT NOTE

Assessing teleworking strategies for local development: a framework proposal

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OECD Trento Centre for Local Development

Assessing teleworking strategies for local development: a framework proposal

Teleworking has risen to record levels since the COVID-19 outbreak. Beyond supporting business continuity during social distancing, it may contribute to multiple societal objectives in the future where a return to pre-pandemic levels of teleworking seems unlikely. Hence, these issues are becoming more prominent on policy agendas. Strategies that look to teleworking as a tool for local development have more chances to support their underlying objectives, if tailored to local conditions and grounded on evidence. This paper proposes a framework to monitor and assess teleworking practices, related policies and their influence on people, places and firms. It is based on a case study from the Autonomous Province of Trento, Italy.

JEL codes: JT03492424

Keywords: teleworking, local employment, SMEs, geography of jobs, future of work

Acknowledgments

This report was produced by the OECD Centre for Entrepreneurship, SMEs, Regions and Cities (CFE) led by Lamia Kamal-Chaoui, Director, as part of the Local Employment and Economic Development (LEED) Programme. It was authored by Mattia Corbetta and Paul Gerhard Peters, under the supervision of Alessandra Proto, Head of the OECD Trento Centre for Local Development.

The report proposes a general framework for assessing teleworking strategies for local development, and provides a sample assessment framework based on a case study from the Autonomous Province of Trento, Italy. It concludes by setting out policy recommendations to guide future assessment efforts.

The OECD is grateful to the Autonomous Province of Trento for having provided the opportunity to pilot its proposed assessment framework locally. Special thanks go to Luca Comper (Head of the Strategic Mission Unit of the provincial government) and Alessia Zanon (member of the Strategic Mission Unit), who closely followed the implementation of the project. The OECD also thanks the Research Institute for the Evaluation of Public Policies (IRVAPP) and the Institute of Statistics of the Province of Trento (ISPAT) for their useful advice.

The authors thank Karen Maguire (Head of the Local Employment, Skills and Social Innovation Division) for her helpful suggestions. They are also grateful to Wessel Vermeulen for his advice throughout the research and drafting process, as well as to Alison Weingarden and Carlo Menon (Trento Centre for Local Development) for sharing valuable comments. Finally, the authors thankfully acknowledge the editorial assistance provided by Elisa Campestrin (Trento Centre for Local Development).

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Executive summary

This paper proposes a general framework to assess teleworking strategies for local development. These strategies are defined as coordinated sets of policies aimed at guiding the likely future expansion of teleworking towards supporting medium to long-term public objectives in places. Strategies of this kind do not deem the promotion of teleworking as an end in itself, but rather a contributing factor towards broader objectives. The latter typically encompass: (a) improving people's work-life balance; (b) boosting productivity; (c) addressing spatial divides; (d) reducing commuting and the related emissions; and (e) fostering regional competitiveness.

Teleworking strategies are inherently place-based. Local conditions, such as the availability of high-speed Internet networks and work space in households, play a major role in enabling or constraining the uptake of teleworking. Moreover, many of the goals pursued by teleworking strategies have a clear spatial dimension. For instance, the Autonomous province of Trento, in Italy, conceives teleworking as a tool to address skills shortages and attract talent from other regions. Ireland's rural development policy for 2021-2025 encourages a broader diffusion of teleworking to achieve a more even distribution of residents and workers across geography.

Designing assessment frameworks can benefit both strategies in the making and those already under way. In the former case, an in-depth reflection upon the underlying objectives and the identification of corresponding indicators will help to ensure that tools envisaged are fit for purpose. In the latter case, having a sound evidence base will allow policy makers to grasp whether and to what extent policies in force are meeting their stated objectives, and take corrective action when needed. Therefore, monitoring systems should include indicators reflecting the specific objectives that inspire each strategy.

Monitoring systems could also be designed to track unintended policy effects. While it is established that teleworking implies both opportunities and challenges (e.g. from a well-being angle, teleworkers may both benefit from more flexible work schedules and suffer from social isolation) there are less obvious risks to account for. First, the objectives envisaged by teleworking strategies may collide, as would be the case if worker flows towards rural areas were to make urban agglomerations less productive. Second, promoting teleworking may cause adverse effects within a given policy area, as in the case of a rise in home energy consumption in homes offsetting the environmental gains of lower commuting. Third, opposing interests may exist between and within groups affected by teleworking, as shown by urban retailers' complaints on losing market shares to their peers in peripheries.

Accounting for such dichotomies, monitoring systems can serve multiple goals. These prominently include: preventing teleworking strategies that lead to inconsistent and divisive results; deterring zero-sum situations where policy makers are called upon to prioritise between objectives or groups; and informing compensatory policies to make up for any losses in a specific area or group, when due. Hence, a further defining aspect of teleworking strategies for local development regards their ability to anticipate challenges that may arise from a widespread, long-standing diffusion of teleworking.

A three-step approach could guide the assessment of teleworking strategies for local development, including:

1. **Screening of local conditions for teleworking,** ranging from basic technical requirements (i.e. Internet networks, work space, regulatory environment, public services) to complementary factors (i.e. employers' attractiveness, mobility infrastructure) and other local circumstances (i.e. workers' and firms' characteristics);
2. **Measurement of teleworking uptake over time and across space,** in order to assess where a given place stands in terms of its teleworking levels, notably whether there is room for expansion or, conversely, a risk that teleworking levels are excessive, potentially harming productivity or other public interests;
3. **Review of indicators reflecting strategic objectives**. Monitoring tools can help policy makers to assess societal change associated with teleworking. However, events and trends independent from or not entirely attributable to teleworking and its related policies may interfere in supporting and hindering strategic objectives, preventing causal analysis.

Teleworking levels must reach a critical mass for strategies to achieve sizeable effects, as reflected in the proposed approach**.** Favourable local conditions can prepare the ground for higher uptake levels, in turn improving the chances to meaningfully affect target areas – whereas marginal variations would have little or no impact on indicators of productivity, well-being, and alike.

Assessment frameworks should account for the multiple challenges associated with teleworking measurements, including the potential coexistence of different definitions of teleworking and other barriers to comparability across countries and regions. This paper provides both general guidance and hands-on recommendations, drawing from a case study analysis on Trentino, Italy.

1 General framework

Teleworking strategies can help regions meet broader goals

This report proposes a general framework to assess teleworking strategies for local development. These strategies are defined as coordinated sets of policies aimed at guiding the likely future expansion of teleworking towards supporting medium to long-term public objectives in places. Strategies of this kind do not deem the promotion of teleworking as an end in itself, but rather a contributing factor towards broader objectives, such as boosting productivity and fostering regional competitiveness. Hence, they seek to ensure coherence with relevant policies already in force. A further defining aspect of teleworking strategies for local development concerns their ability to anticipate future challenges that may arise from a widespread, long-standing diffusion of teleworking. Promoting a blend of office and on-line work is a typical response envisaged to mitigate such challenges. Although there is an expectation that the benefits of the ongoing transition to a large-scale teleworking model will exceed its costs, strategies do not prescribe this practice for everyone, in any form or quantity.

Teleworking strategies are inherently place-based. Local conditions, such as the availability of high-speed Internet (Perincherry, 2009[1]) and space suited to work from home or elsewhere outside the office (Cuerdo-Vilches, Navas-Martín and Oteiza, 2021[2]), play a major role in enabling or constraining teleworking. Moreover, many of the goals pursued by teleworking strategies have a clear spatial dimension. For example, the Autonomous province of Trento, in Italy, encourages the adoption of teleworking as a tool to address the divide between urban and peripheral areas, reduce the carbon footprint of commuting, and attract talent from other regions (OECD, 2021a[3]). Ireland's rural development policy for 2021-2025 looks to a broader use of teleworking to achieve a more even distribution of residents and workers across geography.[1] The national Remote Work Strategy aims to make teleworking a permanent option for life after the pandemic, setting out plans to strengthen the rights and responsibilities of employers and employees as well as the infrastructure to work remotely.[2] In Lower Saxony, Germany, the Wachstumsregion Ems-Achse, a public-private consortium for local development, conceives teleworking as an instrument to enhance digitalisation and regional competitiveness,[3] building on existing efforts aimed at addressing the long-standing issue of poor connectivity in rural areas (BMVI, 2016[4]). Ad hoc incentives to attract teleworkers (typically, from abroad) have also become commonplace among OECD countries since the beginning of the COVID-19 pandemic. Notable examples include seamless visa procedures (e.g. Estonia, Iceland), grants (e.g. New Brunswick, Canada, Tulsa and Vermont, US) and tax breaks (e.g. Greece) (OECD, 2020a[5]).

[1] For further information, visit: https://www.gov.ie/en/publication/4c236-our-rural-future-vision-and-policy-context/

[2] For further information, visit: https://www.gov.ie/en/press-release/32321-tanaiste-publishes-remote-working-strategy/

[3] For further information, visit: https://info.emsachse.de/aktuelles/nachricht/zukunft-der-arbeit.html

The time is ripe for a discussion on how to assess teleworking strategies. In early 2022, many OECD member countries experienced a new surge in teleworking uptake while facing the fourth pandemic wave.[4] As large-scale teleworking is likely to persist in the aftermath of the health emergency (Barrero, Bloom and Davis, 2021[6]), strategies with a focus on it will arguably remain high on policy makers' agendas. At a time when governments are preparing the ground for recovery and resilient development, embedding assessment into planning can crucially benefit the efficacy of public policies (OECD, 2020b[7]), including those in which teleworking plays a central role.

Assessing teleworking strategies against stated objectives

Teleworking strategies may envisage different objectives and policy tools, as the above-mentioned examples already attest. Nonetheless, it is possible to sketch a general framework to support policy makers in monitoring and assessing the outcomes of their respective initiatives.

Clarity on the strategic goals pursued is paramount, as it may improve policy makers' ability to assess the adequacy of the tools put in place as part of a teleworking strategy for local development, and take corrective action where necessary. Monitoring systems should include indicators that reflect the specific objectives that inspire each strategy.

The most cited medium and long-term policy objectives that widespread teleworking can support include:

1. **Improving people's work-life balance.** Time saved from commuting and the adoption of more flexible working schedules may mitigate or prevent conflicts between workers' personal and professional needs, if safeguards are in place to limit the risk of isolation and blurring work-life borders. At the macro level, job flexibility may lead to higher employment rates. Surveys conducted throughout the pandemic suggest that the vast majority of workers would like to continue working from home at least some days per week in the future (Criscuolo et al., 2021[8]; Barrero, Bloom and Davis, 2021[6]);
2. **Boosting productivity.** Empirical analysis of pre-pandemic and pandemic evidence shows that increasing teleworking levels can boost staff productivity within firms. Occasionally, an inverted U-shaped relationship is observed: productivity climbs with a larger share of staff working more days per week remotely, but drops as soon as the level of teleworking becomes excessive, especially due to negative repercussions on teamwork and creativity. At the macro level, improved job matching is also expected to contribute to improving productivity as, with distance between workers and firms becoming a less binding factor, employers can choose out of a larger pool of employees (OECD, 2020c[9]);
3. **Addressing spatial divides.** The large-scale uptake of teleworking may contribute to reshaping an ever-changing geography of local employment, easing congestion of cities as well as promoting growth and raising tax revenues in less dense areas. Researchers' forecasts point to different, non-mutually exclusive scenarios, depending on whether and to what extent a reversal of urbanisation is in sight (OECD, 2021b[10]). Policies in fields such as housing, Internet infrastructure and transport can crucially affect these trends, depending on the focus of each specific initiative (e.g. some may aim to reduce daily commuting between central business districts and residential outskirts in cities,

[4] For further information, visit: https://www.bloomberg.com/news/articles/2021-11-18/europe-turns-to-work-from-home-to-stem-soaring-covid-infections

while others prioritise fostering job creation in remote areas). Turning underused office buildings into much needed residential housing in cities has also renewed policy makers' attention;[5]

4. **Reducing commuting and its negative repercussions.** Working from home one or more days per week would entail a drop in commuting. This, in turn, should lead to lower levels of congestion in cities and air polluting emissions by private vehicles. Therefore, teleworking is generally seen as an energy-saving practice, but this is not necessarily the case. For instance, travel by private means may increase over public transport use, and less efficient domestic energy use may increase over more efficient central office heating (Hook et al., 2020[11]);
5. **Addressing local skills shortages and attracting human capital.** The pandemic has highlighted that geographical distance becomes a less binding factor in teleworkable occupations, expanding the talent pool for local firms. This both implies better job matching within commuting distance and makes a case for policies targeting so-called anywhere workers. Local factors such as natural and cultural amenities and social welfare may gain traction in attracting residents from highly populated areas. Various governments have put in place marketing campaigns and other tools, including ad hoc visa schemes and tax incentives, to lure new residents, also with a view to boosting local consumption expenditure (OECD, 2020a, p. 25[5]).

Combinations of multiple objectives may underlie different strategies. One or several of the above-cited goals may be a priority over others in specific contexts**.** In addition, the emphasis placed on different goals and their very notion may vary across strategies depending on specific circumstances. For example, addressing spatial divides has a different connotation in Trentino compared to Ireland. Although both report a deterioration of community life in less populated areas, different residential patterns may be at play, implying different solutions. Half of the population of Trentino, a wholly mountainous region, live in towns with less than 10 000 inhabitants, and an additional fifth in towns with 20 000 inhabitants or fewer (OECD, 2020d[12]). Hence, most of the active workforce of Trentino drives to the regional capital on a daily basis. In Ireland, only three out of ten people live in rural areas, due to an unceasing rise in urban population in recent years.[6] Therefore, while Ireland may contemplate incentivising relocation to lower-density areas, such a solution would not be relevant for Trentino, whose major challenge is to reduce the number of daily commuters on weekdays.

Minimising the potential for unintended effects

Large-scale teleworking comes with opportunities and challenges. Workers may use the time saved from commuting for family and leisure, but they may also experience blurring work-life borders if a clear definition of working times and spaces is not in place. Firms may offer favourable teleworking packages to attract talent, but not all of them may be ready to do so. Notably, smaller businesses tend to report lower teleworking levels, which can be due to a lack of ICT facilities, limited digital skills among staff or managers inexperienced with integrating teleworking into the workplace. Remote areas may aim to win new residents through natural amenities and high quality public services, but shortages in Internet speed may constrain their ambitions. In fact, the pandemic showed that teleworking is unevenly accessible by different groups of workers, places and firms (OECD, 2020a[5]).

The objectives envisaged by teleworking strategies may partly collide. While numerous mutually beneficial links exist between the above-described objectives (e.g. improvements in air quality and people's work-life balance contributing to making a region more attractive for new residents), inconsistencies are

[5] For further information, visit: https://oecdcogito.blog/2021/10/29/can-office-conversion-help-solve-the-housing-crisis-in-cities/

[6] For further information, visit: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=IE

equally possible, potentially amplifying pre-existing policy trade-offs. For instance, measures pursuing an improvement of territorial cohesion, such as incentives to relocate to low-density areas, may lead to the unintended consequence of harming productivity, if a meaningful drop in agglomeration around the main urban areas is set in motion.

Promoting a broader uptake of teleworking may cause adverse effects. For example, a wider reliance on domestic heating systems instead of centralised office heating may partially offset the reduction of air pollution resulting from lower commuting, if office heating is more energy efficient. Moreover, the lack of childcare facilities within reasonable distance from home may nullify the beneficial effects of teleworking in terms of reduced commuting for parent workers who relocate to areas with a lower density of population and services. People that reside outside the urban transit system may become more reliant on private transport means over public transport.

Conflicting interests may exist between and within the social groups affected by teleworking. While workers and employees may be more sensitive to work-life balance and productivity stances respectively, service providers located within and outside city centres may offer a compelling case for intra-sectorial conflicts, with the latter potentially gaining market shares at the expense of the former. Embracing a gender lens, women are more likely to experience a decrease in productivity when working from home because of increased childcare responsibilities compared to men. Generally, when including unpaid and paid work, women are working more than their male counterparts across OECD countries (OECD, 2020e[13]).

Monitoring systems can account for such dichotomies. Indicators can incorporate the side effects that literature warns might come with an enduring diffusion of teleworking on a large scale, and be ready to keep track of unforeseen impacts arising from practice. Workers and other citizens potentially adversely affected can receive particular attention, preparing the ground for a fair and inclusive transition. Continuous monitoring over the medium and long term can help to avoid biased conclusions and take into account the variety of implications for different people, firms and places.

To sum up, **comprehensive monitoring systems can serve multiple goals.** These include:

- Preventing that teleworking strategies lead to inconsistent and adverse results;
- Deterring zero-sum situations where policy makers need to prioritise between objectives or groups;
- Informing compensatory policies to make up for any losses in a specific area or group when due.

This approach aligns with the recently proposed guiding principles on teleworking (OECD, 2020a, p. 31[5]), according to which teleworking policies should have fairness and inclusiveness at their core, and facilitate needed transitions when individual interests are at risk of harm.

A three-step approach to assessment

A three-step approach may guide the assessment of teleworking strategies for local development, including:

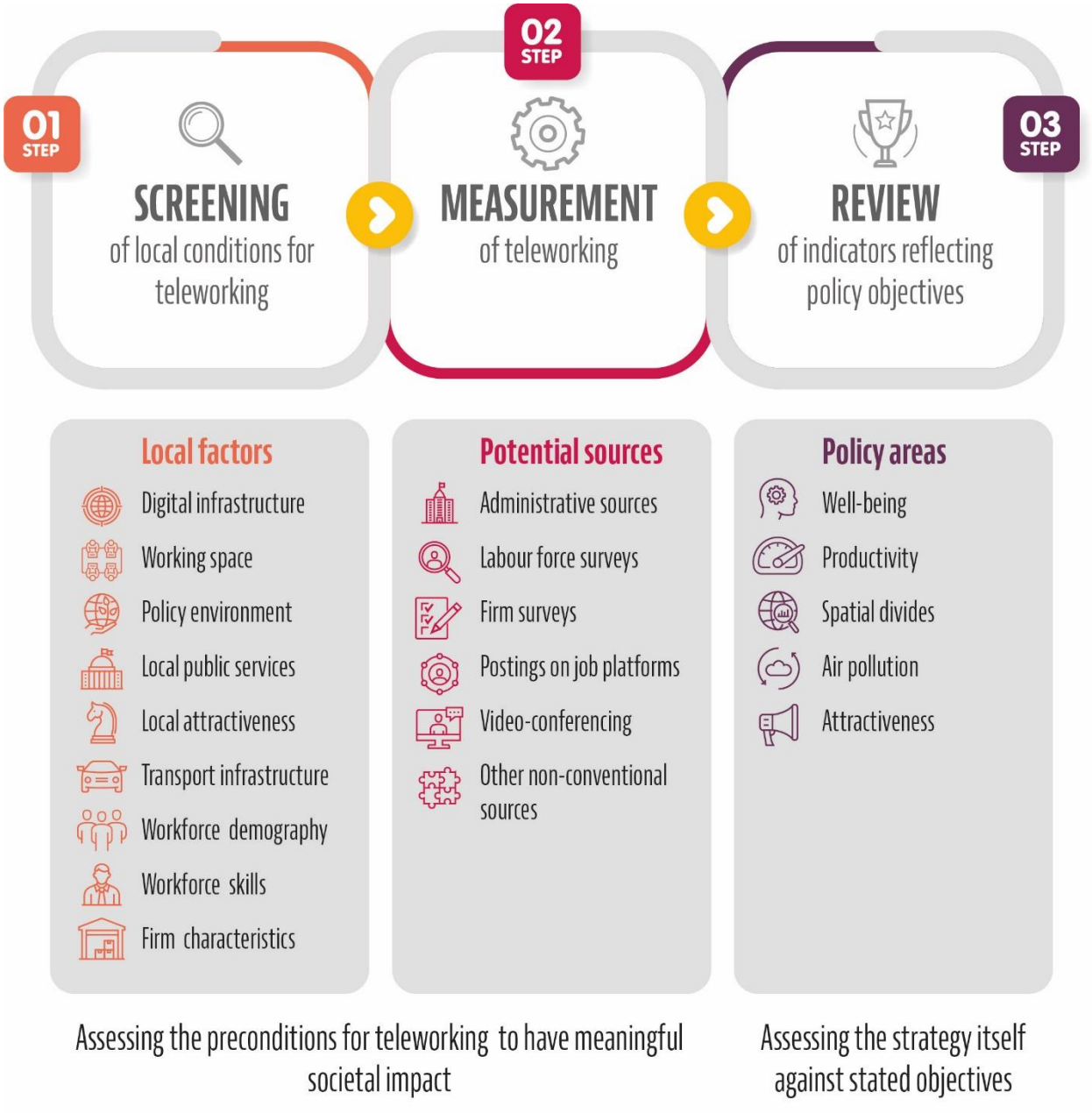
1. Screening of local conditions for teleworking;
2. Measurement of teleworking uptake over time and across space;
3. Review of indicators reflecting strategic policy objectives.

The proposed steps follow a logical order, as each prepares the ground for the next one (Figure 1.1). The presence of favourable conditions is likely to lead to higher teleworking levels, which in turn are likelier to affect target policy areas to a more meaningful extent.

Teleworking levels must reach a critical mass for strategies to achieve sizeable effects. A minimal increase in teleworking would result, for example, in a negligible drop in commuting, with little or no benefit

in terms of urban decongestion. Conversely, low uptake rates are unable to meet the strategic goals typically associated with teleworking strategies. If only a few people adopt teleworking, this is unlikely to affect the geography of jobs in a way that addresses pre-existing divides. For this reason, the first two proposed steps focus on screening the preconditions for and measuring the actual spread of teleworking in a given area.

Figure 1.1. A three-step approach to assessment of teleworking strategies for local development



Source: Authors' own elaborations.

Screening of local conditions for teleworking

Local conditions underlie the economic and social success of places. Factors such as good physical infrastructure for accessibility, advanced schooling and health care facilities as part of local public services provision, and competitive businesses that provide steady employment to residents all help to make a region thrive. Some of such local conditions are specifically important for the success of teleworking strategies, or may require specific policy intervention to ameliorate the existing situation.

A screening of local conditions for teleworking can support policy makers in the early detection of flaws that may undermine a teleworking strategy. Local conditions for teleworking define as the general attributes of a given country or region, susceptible of being affected by public policies, that play a decisive role in enabling and constraining the uptake of teleworking on the ground.

Key requirements for teleworking to be viable encompass:

1. **A widespread, high-speed, secure digital infrastructure.** The digital infrastructure should allow high-speed navigation, to enable videoconferencing and other data-intensive online services, and reach low-density areas, especially in the context of strategies aimed at a more even spatial distribution of residents. In addition, it should be secure, as risks have grown during the pandemic with cybercriminals leveraging the popularity of tools used for teleworking (OECD, 2020f[14]). Data shows that countries face problems in providing high-speed Internet for all regions, once again reflecting the spatial dimension of teleworking (OECD, 2019[15]). The pandemic has increased the demand for high-speed Internet, leading governments to invest in fibre networks, but digital divides remain across places (OECD, 2020g[16]).
2. **Available space in households or other venues outside the default place of work.** Availability of sufficient physical space in households and other premises, such as co-working spaces, is a major precondition for people to telework, considering the ergonomics that workplaces require. A lack of suitable workplace and equipment may negatively impact physical and mental well-being (OECD, 2021c[17]).
3. **A conducive regulatory environment for teleworking.** This chiefly includes a legal entitlement for employees in teleworkable jobs to request and adhere voluntarily to teleworking, and a clear definition of the rights and obligations of teleworkers and employers (OECD, 2021d, p. 279[18]). The design of regulation or collective agreements may in part occur nationally. Regional governments can still co-operate with social partners to investigate whether teleworking requires adaptation of existing collective agreements based on local circumstances.
4. **Well-functioning local public services.** The availability of schools and hospitals in areas where people reside is key as well, as working from home can imply a relocation of families' daily activities. In particular, relocation may occur from metropolitan areas to other cities or rural regions. Families considering to relocate may incorporate the availability of services in their choice of destination. Local public services can also include specific welcoming services for new residents, for instance through aid in job seeking for spouses, and facilitating information provision on local circumstances such as schooling, cultural activities, and the local housing market.[7]

In addition to essential requirements, other framework conditions can raise the profile of a given area for teleworking. They include:

[7] For example, the provincial government of New Brunswick, Canada, encourages remote workers to relocate locally with affordable housing, natural amenities and high living standards as well as a range of soft-landing services for teleworkers and their families. For more information, visit the website of the Live for the Moment NB campaign: https://liveforthemomentnb.ca/

5. **Local employers' reputation and attractiveness to new hires**: talent attraction is at the heart of several teleworking strategies. The conditions offered by local employers, both public and private, and their reputation among potential hires are a matter of regional competitiveness, which can be affected by policy in several ways, such as the fiscal framework, place branding and role modelling, to name but a few (Tuccio, 2019[19]).
6. **A transport infrastructure ensuring accessibility to metropolitan areas.** The presence of a sound mobility infrastructure is particularly appealing for "anywhere workers" and other groups of employees travelling regularly across national and regional borders. While teleworking for a few days per week on regular basis, good transport links are required in the remaining days to reach office locations, which are likely to remain concentrated in larger cities. If no sufficient transport system is available, remote workers are more likely to resort to more polluting transport options, such as cars (De Abreu e Silva and Melo, 2018[20]).

In addition to framework conditions, the attributes of incumbent workers and their employers can deeply affect teleworking uptake in a given area. This group includes:

7. **Workforce demographic characteristics.** Certain age and gender groups are more likely to work from home than others, and family status plays a major role (López-Igual and Rodríguez-Modroño, 2020[21]).
8. **Workforce skills, digital and other.** Digitally proficient workers are more likely to have jobs that are amenable to teleworking and, if they do not, to take on teleworkable tasks. More broadly, the likelihood to telework increases for workers with tertiary education and higher levels of numeracy and literacy skills (Espinoza and Reznikova, 2020[22]). Similarly, managerial practices need to be adapted to a teleworking workforce, for example the assessment of employee performance. Less employee presence in offices may suggest considering output-oriented assessment rather than presentism to assess worker performance. This would reduce stigma possibly hindering employees from taking up telework as an option (OECD, 2020c[9]).
9. **Firm characteristics.** Sectoral distribution, i.e. industries' relative weight on employment in a given economy, is widely used to estimate potential teleworking levels across regions (OECD, 2020h[23]), which in turn is a good predictor of actual teleworking levels, as recent evidence shows. Moreover, there is an established positive correlation between firm size, digital readiness, and teleworking adoption (OECD, 2021a[3]).

Public policies can affect all of these factors. Initiatives aimed at talent attraction may lead to modifying the characteristics of the local workforce, e.g. by targeting young or highly educated people. Teleworking strategies may leverage policies that are likely to pre-exist, such as those aimed at fostering digital skills in education, including adult education, as well as the digitalisation and scaling up of SMEs. Policies for digitalisation, in turn, may contribute to shifting part of production and clerical tasks online, expanding the potential for teleworkable occupations.

A screening of local teleworking conditions should take place repeatedly over time. This would allow policy makers to track any variations compared to the situation given before the adoption of a teleworking strategy, obtaining a first insight of its effectiveness. An improvement in local teleworking conditions can push uptake up to critical levels, allowing strategies to pursue their stated objectives.

Measurement of variations in teleworking uptake

Achieving scale is a critical precondition for teleworking to affect society strategically. Although no international standards exist in terms of what defines teleworking and how it is measured (let alone what uptake level is most beneficial and what could be excessive for individuals and society), scientific literature provides some useful insights on the matter.

Teleworking is generally defined as work that takes place outside the default working space using ICT (ILO, 2020[24])**.** While, in principle, teleworking can occur in any location other than the default place of work, working from home has been the only viable option for many during the COVID-19 pandemic due to the enactment of social distancing measures. Such an issue may come to the fore when measuring teleworking, at least as long as the health emergency remains present. In fact, according to several statistical sources "work at home" covers multiple circumstances, including dwellings that incorporate workshops without a separate entrance, which as is evident do not match with the notion of teleworking as defined above. The concurrence of multiple notions of teleworking within the same legal framework and differences in its legal definitions across legal systems may constitute an additional limitation to measurability and comparability on an international scale (OECD, 2021d[18]).

Several types of surveys run on a regular basis can serve as a source to measure teleworking (Ker, Montagnier and Spiezia, 2021[25])**.** They include:

1. **Surveys of ICT usage** by households and individuals, and by businesses, which almost all OECD countries undertake on a regular basis. Many countries use surveys of this kind to ask respondents about teleworking, but they may not be timely or frequent enough for the purposes of policy makers embarking upon a teleworking strategy. Commercial sources are available too. For instance, data tracking the speed and geographic reach of mobile and fixed connections can help to compare the quality of the Internet infrastructure across places.
2. **Labour force surveys** can ask respondents if they worked from home during a given period and, in some cases, how often. Statisticians weigh together sample survey responses in such a way as to be representative of the entire workforce. The result is an estimate of the share of employed persons who teleworked in the relevant period, often illustrating their composition by gender, age class, type of occupation and level of education. Information on the employing organisation, such as location, size and sector of activity, can add to the analysis.
3. **Surveys of business conditions** may ask employers to either indicate if they have any personnel teleworking or the share of their personnel teleworking during the reporting period. In this context too, there is an established practice to weigh together sample survey responses. Thus, results are representative of the population to which they refer.

Similar surveys, which may have both a national and a regional scope, have taken place outside regular schedules in the context of the COVID-19 pandemic to measure its economic repercussions. Although they may provide a useful evidence base in the near future, they may become outdated as soon as the health crisis is over. Therefore, surveys conducted on a regular basis may prove a more useful source in the long term.

Differences can arise in teleworking figures coming from different sources, prominently depending on the composition of the surveyed sample. Particularly, employer surveys tend to focus on employees, whereas surveys of individuals generally reflect employed persons. "Employees" work for an employer for compensation (i.e. wages, fees, and the like). In addition to the dependent workforce, "employed persons" include those who are self-employed working for profit (e.g. business owner-directors) and in family businesses (i.e. those working in family-owned enterprises without receiving an own pay).

Other response biases may drive differences in teleworking figures across sources. For example, the case study of Trentino suggests that companies may tend to underestimate the teleworkability of their own staff, compared to levels estimated based on employment characteristics. The discrepancy could be due to information asymmetries between employers and employees, including misalignments in assessing the degree of teleworkability of certain occupations and tasks. Other motivations may relate to reluctance on the part of employers to promote teleworking, for instance because the loss of control it entails among management – the latter being a factor often reported in interviews (OECD, 2021a, p. 27[3]).

Measuring teleworking in subnational contexts poses additional challenges. Large-scale teleworking is an unprecedented and, hence, still poorly investigated and socially perceived trend at local level, which could amplify common issues in survey-based research, such as sampling and response bias. Generally, challenges may include:

- **Ensuring regional representativeness when using data that stem from national sources.** The matter is crucial, as the above-mentioned types of surveys are often not yet available at regional or local level given the novelty of large-scale teleworking. National surveys ensure that results are representative at the upper levels of countries' subdivision for statistical purposes. However, this may not be the case at lower levels. Moreover, subdivisions in some levels do not necessarily correspond to administrative divisions within the country – an issue that may come to the fore when strategies on teleworking are undertaken by subnational entities. This may add complexity when measuring teleworking in a given area falling within the geographic scope of a local government that does not match with a statistical subdivision. In addition, difficulties may arise when accounting for multiple variables (e.g. as in measurement of teleworking uptake in firms by industry and size class), as samples may not be numerous enough to reflect the reality on the ground. Robustness tests can help to overcome these kinds of barriers. However, the result may be that information is available unevenly across subgroups, depending on their compliance with statistical representativeness criteria, de facto impeding a comprehensive analysis. Referring to the previous example, measures of teleworking levels across firm size classes may be available for a given industry where the sample is large enough to ensure a representative picture, whereas it may not for a different industry where the sample is too small.
- **Barriers to comparability with other regions.** Exceptionally, ad-hoc surveys may be available in the region of interest, but the lack of similar sources in neighbouring or other regions may prevent comparative analysis and benchmarking. The likelihood that comparable sources are unavailable climbs when targeting regions from different countries, as cultural factors may be at play. The latter may drive certain regions to place greater emphasis on the topic, whereas others may be less or not at all aware of it (or may be inclined to consider it from a wholly different viewpoint). Given that large-scale teleworking is a global trend, it would be desirable to have sources available that allow for cross-country analysis, making it possible to investigate how local circumstances drive uptake patterns.
- **The potential role of statistical outliers.** Such outliers may indicate that the distribution has high skewness, requiring cautiousness in using tools or intuitions that assume a normal distribution. This kind of issue may arise when a region hosts an exceptionally large employer, resulting in outstanding aggregate teleworking levels, compared to other regions that do not have such a feature but are otherwise very similar. Leaving the outlying value out of the analysis may lead to opposite results in terms of which regions presents the highest aggregate level of teleworking.
- **Accounting for potential biases in survey evidence and response rates.** Survey bias describes the general problem in survey-based research of participants responding inaccurately or falsely to questions. When it comes to surveys on teleworking, blurring boundaries between professional and personal activities may lead to misreporting the number of worked hours by respondents, potentially undermining the validity of results. In addition, survey modes may meaningfully affect response rates, as remote workers are more likely to answer online surveys. As these kinds of bias are not fully avoidable, using administrative data for quantitative analysis may be a more reliable option. This, though, may excessively limit the amount of available data for specific research questions.

Managers and workers from 25 countries find, on average, that the ideal amount of teleworking is around 2-3 days per week, in line with the idea that the benefits (e.g. less commuting, fewer distractions) and costs (e.g. impaired communication and knowledge flows) need to be balanced at an intermediate level of teleworking intensity (Criscuolo et al., 2021[8]). This figure may serve as a benchmark to assess where a given country or region stands in terms of its teleworking levels, notably whether there is room for expansion or, else, a risk that teleworking levels are excessive, potentially harming productivity and other

public interests. The expected benefits depend upon whether teleworking comes from a voluntary choice of employees, which is the underlying assumption for considering the above figures as a benchmark (as suggested in the previous subsection, monitoring the regulatory framework for teleworking should already ensure that this is the case).

Review of indicators reflecting strategic policy objectives

Teleworking strategies should be assessed against their underlying objectives. Achieving a critical mass in teleworking is a means, not an end in itself. The ultimate purpose is to support given objectives of general interest. While the previous steps of the proposed approach aim to explore the preconditions for strategies to unfold (i.e. the presence of enabling factors for and critical levels of teleworking), assessing whether and how such strategies affect target policy areas should be part of a separate phase.

However, there is little room for causal analysis, due to a two-fold interaction with external factors. First, trends irrespective of the policy context may contribute to lifting teleworking levels. For instance, advances in the field of digitalisation that have long been under way may play a major role irrespective of subsidies to SMEs for teleworking uptake – just to mention a measure commonly adopted in the context of the pandemic (OECD, 2020a, p. 24[5]). The cultural breakthrough brought about by the pandemic (e.g. showing managers that more teleworking may improve productivity without harming supervision) is another crucial factor independent from any policy effort. Second, events independent from or not entirely attributable to teleworking and the related policies may interfere in supporting or hindering strategic objectives. For instance, innovations in the field of mobility may concur with teleworking to a drop in commuting, amplifying the positive environmental impact of a teleworking strategy, but making it difficult to ascertain whether the policies adopted in the context of the latter played a greater role than external factors, if at all.

Assessing the individual policies that make up a teleworking strategy has drawbacks as well. On the one hand, statistical techniques would more likely be applicable in contexts where there is a clearer causal nexus, as in specific policy measures. On the other hand, a typically large number of policies to be assessed would make the whole process onerous, and results would still capture only partial aspects of the whole picture. For example, Trentino's teleworking strategy, which is the focus of Section 2, comprises a wide range of initiatives, each having a narrow scope and specific goals, such as fostering peer-learning between HR managers to improve relevant practices, converting a few dismissed public buildings to expand the supply of working space for remote workers, etc. While none of these policies is expected to individually play a decisive role in lifting teleworking uptake levels and meeting strategic objectives, policy makers expect their aggregate effect to be meaningful. Even when considering single initiatives, there may be limitations to the ability to perform causal analysis, such as contexts where a counterfactual is unavailable. For instance, a study on the effectiveness of incentive programmes to attract new workers in Vermont explicitly notes that there are limitations on quantifying how many of the participants would have relocated to the region absent the incentives, as well as on quantifying the "net" economic or direct tax revenue impact on the micro-level (Vermont Department of Financial Regulation, 2021[26]).

Despite limitations, monitoring tools can still support policy makers in assessing societal change associated with teleworking. Evidence shows that managers and workers' positive experience with it during the pandemic will give rise to more widespread adoption in the future, thereby reflecting a "breaking the stigma" generally associated with this practice (Criscuolo et al., 2021[8]). The findings of a survey among 15 000 people in the United States suggest that share of work carried out from home may increase from 5% before the pandemic to 22% afterwards (Barrero, Bloom and Davis, 2021[6]). The share of job postings that advertise teleworking more than tripled over the pandemic in a panel of 20 OECD member countries, from just 2.5% of job postings in January 2020 to 8.5% in December 2021, and has remained near its peak despite the easing of restrictions, further suggesting that teleworking is here to stay (Adrjan et al., 2021[27]). Having an eye on indicators reflecting the societal implications of teleworking may help, if

not to conclusively determine the impacts of related strategies, to create awareness of the effects of this transformative phenomenon.

Monitoring systems should account for the unintended effects of teleworking. Indicators that are part of the monitoring tool should both reflect the objectives pursued by teleworking strategies for local development and track any side effects potentially detrimental to society or specific groups. Downsides may feature in correspondence with any of the target policy areas. For example, while there is an expectation that working from home can help parent workers to better juggle professional and family duties, excessive teleworking levels may cause anxiety and blurred work-life boundaries (OECD, 2021e[28]).

Monitoring systems should make the most of existing sources of information, in order to minimise data collection costs. New surveys should be a last resort option, given the high number of labour force and firm surveys that typically exist across countries and regions. Instead, a few relevant questions can be added to existing surveys, including on still largely unexplored aspects such as teleworkers' relocation goals in a post-pandemic future. At the same time, existing sources are often untapped. For example, the Italian law requires employers to comply with online fulfilments when activating a teleworking contract, and such information is gathered by central government. Nevertheless, these administrative data are not made available for policy nor research purposes (OECD, 2021a, p. 46[3]).

As teleworking strategies look to the medium and long term, so should the related monitoring tools. Indicators reflecting the strategic objectives pursued are unlikely to display sizeable variations in the short term for several reasons, relating to the fact that teleworking was little widespread in most countries before the pandemic. Although the latter unveiled a large appreciation among managers and workers, corporate culture and digital skills as well as production and management processes are often not teleworking-proof yet, requiring further investment and more time. In addition, social distancing measures enacted due to the COVID-19 pandemic had profound repercussions on a number of areas related to the objectives that may underlie a teleworking strategy, which will only fade away once the health emergency is over. Therefore, monitoring and assessment should embrace a medium to long-term perspective and be steady over time. While the pace of the transition is largely unpredictable, its impact will become clearer the faster teleworking is widely adopted.

2 A sample assessment framework

This section provides a handy sample assessment framework that policy makers from other OECD countries and regions can readapt to local circumstances. As it refers to a real-life case study, some of its features (e.g. indicators, data sources) are context-specific. However, OECD and other tools allowing for comparison across countries and regions were used whenever possible. Therefore, practitioners from other places can make extensive use of it, in order to assess where their place stands in providing the necessary conditions for teleworking to take root and contribute to public goals.

A case study from Trentino, Italy

Trentino's performance in relevant policy areas

The Autonomous province of Trento, commonly referred to as Trentino, is located in the north-east of Italy. A fully mountainous area with approximately 540 000 inhabitants,[8] it presents a low population density (87 inh./km^2 against a national mean of 196 inh./km^2), high income levels[9] and a remarkably equal distribution of wealth compared to other Italian regions. It ranks near the top in all employment metrics, and its population is among most educated in the country.[10] R&D expenditure is also high in the Italian context, due to an unusually strong contribution by the public sector. Furthermore, this province ranks high under most parameters of regional well-being, notably in health, safety and community.[11]

Trentino shows room for improvement in many of the areas to which a typical teleworking strategy aims to contribute, when compared across all OECD regions:

a. **Work-life balance:** Trentino ranks in line with the OECD average in terms of self-evaluated life satisfaction, and slightly ahead of the national level.[12] However, the rate of female labour force

[8] See ISTAT, 2021: https://demo.istat.it/popres/index2.php?anno=2021&lingua=ita

[9] In 2018, Trentino's GDP per capita, expressed in terms of purchasing power standards, amounted to 126% of the EU average, the fourth highest rate among the Italian regions: https://ec.europa.eu/eurostat/documents/2995521/10474907/1-05032020-AP-EN.pdf/81807e19-e4c8-2e53-c98a-933f5bf30f58

[10] According to the Human Development Index, a composite index of life expectancy, education, and per capita income indicators, Trentino ranks second among the Italian regions: https://globaldatalab.org/shdi/shdi/ITA/?levels=1%2B4&interpolation=1&extrapolation=0&nearest_real=0&years=2019

[11] Trentino's ranking under the OECD Regional Well-Being Index is available at: https://www.oecdregionalwellbeing.org/ITH2.html

[12] Figures are from the OECD Regional Well-being Index, accessible at: https://www.oecdregionalwellbeing.org/

participation (49 percent) stands below the OECD average of 53 percent.[13] The assumption is that better work-life balance will translate into higher levels of life satisfaction and larger female labour force participation, since female workers are more likely to experience work-family conflicts. Teleworking could contribute to improving both measures. On the one hand, time saved on commuting could be used for personal needs. On the other hand, teleworking may support women by providing additional flexibility in working hours and locations.

b. **Productivity:** indicators in Trentino point to stagnant economic growth. Its reported 0.6 percent annual growth rate in regional GDP per capita was weaker than the national average of 0.8 percent and significantly lower than its neighbouring region of South Tyrol's 2 percent in 2018.[14] The rate of technological innovation in Trentino enterprises – an important predictor of productivity – is also slightly below the national average, pointing to persisting gaps in the future (ISTAT, 2019[29]). A teleworking expansion strategy is accompanied by investing in digitalisation, which could positively affect these fundamentals.

c. **Spatial divides:** Trentino has the fifth-largest share of inter-municipal commuting of the resident active population among Italy's 21 NUTS2 regions (51 percent, against a national average of 46 percent), implying that a comparatively lower share of the local population will find job opportunities in the municipality of residence compared to other regions.[15] A broader adoption of teleworking may help to mitigate this issue by decreasing the need to commute for work.

d. **Air pollution:** Trentino reports an average of 12.7 micrograms of particular matter per cubic metre, slightly below the OECD average of 13.9 micrograms per cubic metre.[16] The drop in commuting implied by higher levels of teleworking could push this indicator even further below, if measures are taken to limit energy consumption from higher online activity and domestic heating induced by teleworking.

e. **Skills and attractiveness:** in Trentino, the share of new residents aged 15 to 29 years old as a percentage of total newcomers from other regions is 26 percent, compared to a 35 percent OECD regional average.[17] The Skills for Jobs Indicators database[18] provides insights on skill shortages and surpluses for specific skills, abilities, knowledge areas or workstyles in regions (OECD, 2017[30]). Similar to other regions of Italy, Trentino displays skill shortages in various areas, including in potentially teleworkable occupations such as education, communications and clerical jobs. Teleworking may help to address the skills shortage and make the region more attractive for younger workers, who show a preference for flexible arrangements (Chillakuri and Mahanandia, 2018[31]).

[13] Figures are from the World Bank database, accessible at: https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?name_desc=false

[14] For further information, visit: https://www.bancaditalia.it/pubblicazioni/economie-regionali/2020/2020-0022/20-22-eco-regioni.pdf

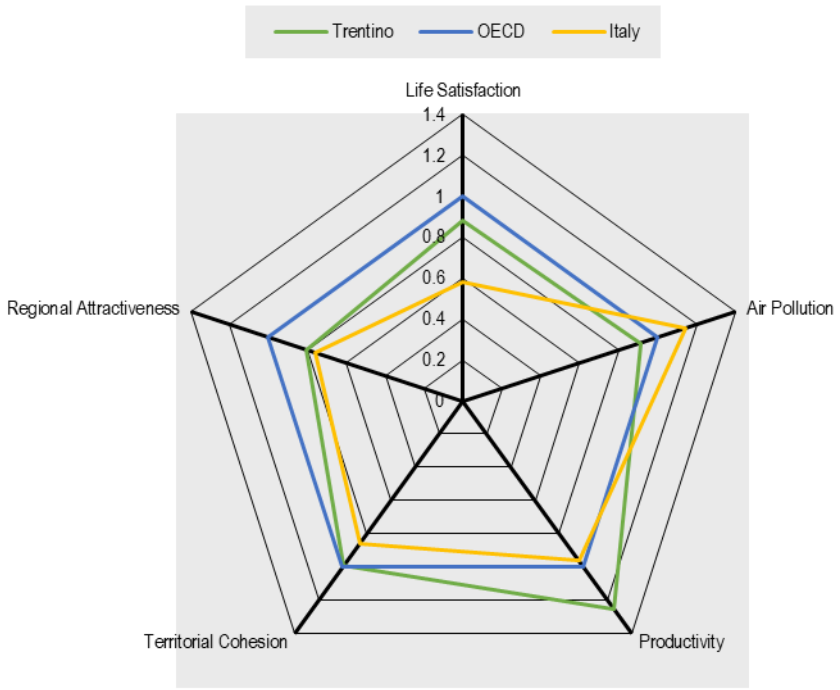
[15] Figures are from the ISTAT Labour Force Survey.

[16] For further information, visit OECD Regional Statistics at: https://www.oecd.org/regional/regional-statistics/

[17] For further information, visit OECD Regional Statistics at: https://www.oecd.org/regional/regional-statistics/

[18] For further information, visit: https://stats.oecd.org/Index.aspx?DataSetCode=SKILLS_2018_REGION

Figure 2.1. Trentino's performance in areas targeted by its teleworking strategy



Note: The following indicators, based on TL2 regions, were used, with the OECD mean (indicated in brackets) normalised to one: Life Satisfaction as measured by the OECD Regional Wellbeing on a scale of 1-10, 2018 (6.7=1); Air Pollution measured as exposure to fine particulate matter (PM2.5), which poses the greatest risk to health globally, Micrograms per cubic metre, 2019 (13.93=1); Productivity measured by GDP per capita, USD, current prices, PPP, 2019 (46132 =1); Territorial Cohesion measured by employment at place of residence as employment rate of individuals employed (age 15-64) over working age population (age 15-64), 2019 (68.7=1); Regional attractiveness measured by the share of young new residents, who have a longer working life ahead (15-29 year old newcomers over total newcomers from other regions), 2019 (33=1). Source: OECD Regional Statistics.

Trentino's performance in the target areas of its teleworking strategy exhibits strengths compared to the OECD and the Italian average, yet also areas for improvement. While Trentino ranks relatively high in terms of territorial cohesion, air pollution and productivity, life satisfaction and the attractiveness of the region for young newcomers lag behind the OECD, although scoring above the Italian mean. This illustrates the benefits of a teleworking strategy for a wide range of sectors.

Trentino's teleworking strategy

Trentino has ambitious plans on teleworking. After many years of experimenting with teleworking to increase efficiency in the public sector, the local government is resolved to leverage its expertise on the matter, as well as its wide range of delegated powers,[19] to improve its performance in the above areas.

[19] Italy's devolved local governance confers significant policy making powers to its 20 first-level sub-national units, i.e. regions. Moreover, five regions are designated by the Italian Constitution as "autonomous", being disciplined by ad hoc autonomy statutes. Trentino-Alto Adige/Südtirol further delegates its powers to its constituent provinces, Trento and Bolzano-Bozen, which are thus named "autonomous provinces", and are counted as regions in the framework of the nomenclature of territorial units for statistics (NUTS2). In this framework, the devolved powers transferred to the autonomous provinces cover political, legislative, administrative and fiscal issues, making them a unique test-bed for innovative policies.

Provincial law no. 3/2020 made a first step in promoting teleworking in Trentino as a way to enforce social distancing in the context of the pandemic,[20] and a resolution by the local government mandated the administration to design a longer-term strategy for teleworking in late 2020.[21] In promoting teleworking across the public and the private sector, and setting standards common to all employers, the resolution acknowledges that the transition to large-scale teleworking may "*have an impact on the socio-economic fundamentals of the Province, such as mobility and economic development in rural areas, which will have to be rethought based on new paradigms*".

The ultimate purpose of Trentino's teleworking strategy is to enhance regional competiveness. In the plans of the local government, teleworking could serve the purpose in different ways, including: a more efficient provision of public services, as service hours could be extended and civil servants reallocated to smaller communities; savings from lower investments in work premises, with more people working from home; an incentive to the digitalisation of processes among public and private employers; and an improved ability to attract workers and residents, thanks to better framework conditions to reconcile professional and personal needs.

Public dialogue and consultation with local stakeholders underpinned the preparation of Trentino's teleworking strategy. Consultation spanned across 2021 and followed a tripartite structure, with each group responsible for setting standards on a specific dimension at the heart of teleworking, i.e. managerial, digital, and spatial. Participants included members of the local government and its agencies in charge of relevant policy areas, business associations and individual firms of particular relevance, as well as the academia and research institutions. The whole process led to presenting strategic guidelines in September 2021, immediately followed by the launch of pilot measures, with a time horizon of 2021-23. Box 2.1 gives an overview of the main measures envisaged by Trentino's teleworking strategy.

[20] Provincial law no. 3/2020: https://www.consiglio.provincia.tn.it/doc/clex_36556.pdf

[21] The goal is the creation of a strategic plan at local level aimed at fostering social and economic development. For further information, visit: https://www.ufficiostampa.provincia.tn.it/Comunicati/Lavoro-agile-verso-la-creazione-di-un-distretto-Trentino-intelligente

Box 2.1. Trentino's teleworking strategy

The main actions envisaged by the plan revolve around the following areas:

Skills and culture

- Provision of training for teleworking staff, including managers, and certification of skills required for effective teleworking (the initiative will first be tested among public sector workers, and then be extended to the private sector);
- Set-up of a community of practice on teleworking, gathering HR managers from the public and the private sector, to foster peer-to-peer learning and the dissemination of good practices;
- Awarding higher scores in public procurement to firms offering teleworking and other well-being practices for staff;

Digital environment

- Establishment of crosscutting teams, including domain experts and innovation specialists, within the provincial public administration, to identify procedures and tasks that can be digitised and, therefore, carried out remotely;
- Set-up of a single cybersecurity risk monitor at provincial level in light of increased threats in an ever more digital work environment;
- Promotion of data sharing and collaborative virtual environments;

Regulatory environment

- Promotion of collective agreements to regulate teleworking among staff of municipalities and local health authorities, based on directives issued by the provincial government on areas such as eligibility and priority criteria for teleworking, working time schedules and right to disconnect, criteria for productivity assessment, etc.;
- Adoption of guidelines on safety at the workplace for teleworkers;

Access to working space

- Redesign of public office spaces, to improve team work in hybrid settings;
- Creation of co-working spaces across Trentino for incumbent and entrant teleworkers. This goal will be achieved through a set of actions, including reconverting dismissed public buildings and local branches of co-operative credit banks, and reviewing existing "telecentres". The latter had been set up by the provincial government already before the pandemic in support of officials with special needs (e.g. caregiving) requiring proximity to homes.

Source: Resolution no. 1735 of 25 October 2021 of the council of the Autonomous province of Trento.

Screening of local conditions for teleworking

Monitoring the local conditions for teleworking requires using multiple indicators. A teleworking-friendly region qualifies as such as it meets certain essential technical requirements, including the availability of a high-speed, widespread and secure digital infrastructure, as well as affordable and sufficient workspace. An enabling regulatory and policy environment, as well as the provision of effective local public services that benefit teleworkers beyond the professional sphere, constitute further preconditions for teleworking to take root. The presence of employers offering competitive remuneration packages and an efficient transport infrastructure that facilitates commuting for those who combine online

and office work can make a region even more attractive for teleworkers. Lastly, certain attributes of the local economy, such as workers' skills and demographic characteristics, as well as firms' digital readiness and sectoral distribution, correlate with higher levels of teleworkability. Table 2.1 provides a set of indicators that can support policy makers in investigating such local conditions, in order to identify any potential constraints to the implementation of place-based strategies that look to an increase in teleworking as a tool for local development. While there are multiple factors associated with teleworking potential in places, challenges arise in identifying suitable indicators, and using them for policy design. Trentino as a regional case study accentuates the importance of obtaining data at a suitable level.

Table 2.1. Indicators and statistical sources for screening teleworking local conditions in Trentino

Local factors	Indicators	Data sources	Level of data
Digital infrastructure	Fixed connection download speed	OECD Broadband, based on Ookla, Steam, M-lab	National
	Broadband coverage (% of connected households)	OECD Regional Social and Environmental Indicators	National
		EU Quality of Government regional dataset (eu_is_bacc)	Regional*
	Affordability (price of fixed broadband basket)	OECD Broadband	National
	Cyber security	Dedicated agencies, e.g. UK and Baden Württemberg	Variable
Working space	Rooms per person in households	OECD Housing Conditions	National
	Real estate prices (nominal house & rent prices)	OECD Housing Prices Portal	National
	Office space vacancy rates	Various sources, such as Statista Global Office Vacancy	Variable
	Availability/occupancy of shared working spaces	Trentino's government	Regional
Policy environment	Right to request teleworking	National legislation	National
	Right to disconnect	National legislation	National
	Performance vs time assessment (PA)**	Regional legislation	Regional
	Teleworking cost covered by employer	Regional legislation	Regional
	Teleworking collective agreements	Regional sources	Regional
Local public services	Active physicians per 1 000 population	OECD Health Statistics	National
	Student to teacher ratio	OECD Data Teachers	National
	Perceived social network support***	OECD Data Well-being	National
Local attractiveness	Permanent immigrant inflows	OECD International Migration Database	National
	New businesses started (% per population)	OECD Enterprise Statistics	National
	Average wages (PPPs)	OECD Employment Statistics	National
	Nights spent at tourist accommodation establishments per resident	Eurostat Regional Tourism Statistics	Regional
Transport infrastructure	Motorway density (km per 1000 km^2)	Eurostat Regional Transport Statistics	Regional
	Congestion rates	Sources such as TomTom Traffic Index	Municipal
	User opinion on public transport	ISTAT Survey on Households: aspects of daily life	Municipal
Workforce demography	Youth (aged 25-34) percent of total employment	OECD Labour Force Survey	National
		EU Quality of Government regional dataset (eu_emp_1524t)	Regional
	Gender ratio in workforce	OECD Regional Labour	Regional
		EU Quality of Government regional dataset (eu_emp_ft_f)	Regional
	Share of high-pay workers	OECD Wage levels	National
	Employment rates	OECD Regional Labour Indicators	Regional
Workforce skills	Digital skills	Digital Economy and Society Index	National
	Workers with tertiary education (% of total)	OECD Employment Statistics	National
		EU Quality of Government regional dataset (eu_empl_edled58)	Regional
Firm characteristics	Employment distribution (% of teleworkable jobs)	OECD regional employment by industry	Regional
	ICT investment and usage by business	OECD ICT access and usage by business	National

Note: * Regional: NUTS2 level of classification of territorial units. ** PA: public administration. *** Perceived social network support: the share of people reporting to have relatives and friends to count on. See (OECD, 2020e[13]).
Source: Authors' own elaborations.

Selecting indicators reflective of local factors implies some degree of approximation. While several local conditions are easily relatable to specific indicators, such as internet speed and broadband coverage providing a clear measure of digital infrastructure in a region, other local conditions do not provide obvious indicators. For example, quantifying the availability of working space is less straightforward, as the basic measure of rooms per person in households does not account for the size of rooms (e.g. the average size of a room in Trentino is arguably larger than in Paris, while having a fair amount of space is essential for teleworkers in both places). In addition, a share of teleworkers may opt to work outside homes. The concept of local attractiveness is even more elusive. In these cases, proxies, i.e. variables that are closely related to the variable of interest, can help to obtain a fairly approximate picture of the reality on the ground. For instance, desk availability and occupancy levels in co-working and other shared spaces may represent a proxy of working space available outside of homes, however there might be spaces not formally defined as such nor captured in statistics despite still offering desks to teleworkers. Real estate prices may provide a general indication of availability and affordability of working spaces for entrants willing to buy a home or rent an office to telework in a given region. For local attractiveness, the number of new firms started or the permanent immigrant inflow might give meaningful information about the attractiveness of a region.

Data availability represents an additional challenge. Some indicators may be suitable from a theoretical point of view, but the data are not always available**.** This is particularly the case for regional and local data, which existing OECD monitoring systems are often not yet designed to capture. However, since EU rules require member states to comply with strict data harmonisation criteria, coverage is often ensured for a fair share of the countries and regions part of the OECD (22 out of 38 OECD member countries are also part of the EU). Yet, even EU sources may not capture all variables of interest. For example, while factors of the workforce such as the gender ratio, the age structure, employment rates[22] or the earnings distribution can largely influence teleworking levels,[23] regional data are unavailable for the latter. In some cases, including Trentino, there are national sources (e.g. ISTAT) that provide data at regional level, but this may not the case for every country. In these cases, using less granular national sources can provide a second-best solution and allow for cross-regional comparison at least at domestic level. Should this not be possible either, the launch of new or the expansion of existing regional surveys could help to bridge the gap, the latter providing a less costly (albeit potentially less informative) solution. For Trentino, this translates into using OECD or EU sources that are available at regional level, to ensure comparability with a broader range of regions internationally, and to consult sources such as ISTAT if regional-level data are not available. For sources that are generally not available at regional level, policy needs to weigh the benefits of using only data at national level and expanding existing surveys.

Comparability is key to assess where a place stands in terms of its teleworking conditions. When a suitable indicator is found and measured, it is important to compare the data with other values to assess whether it is high or low, if not directly evident. Places with similar demographic or economic fundamentals (e.g. population size, sectoral distribution, etc.) can provide a useful benchmark. In the case of regions, if benchmarking is not possible at the same level of government, values at national level can be used as a more general reference. If no other place is available for comparison, variation over time can be used as an alternative for assessment. Identifying trends, for example a constant increase or decrease in a given indicator over the years, can offer valuable knowledge even when the analysis is limited to a single place.

[22] Higher employment rates are likely to increase the number of teleworkers.

[23] A number of studies, including (Brussevich, Dabla-Norris and Khalid, 2020[33]), suggests that male, young and low-income workers are less likely to telework, possibly reflecting a different occupational and role distribution.

For instance, firm surveys on ICT investment (a crucial factor for teleworking to take root) may be designed in different ways across regions, hindering comparability. Yet, if they are run on a regular basis in the place in question, local trends in relevant indicators can still provide valuable data. Comparing cyber-security levels (a crucial factor for teleworking to spread safely) across places is no less complex. While the number of cyberattacks in a given region are typically measured at regional level, comparisons with other regions are difficult due to the amount of differences between regions susceptible to influence these numbers. In this case, past numbers are a helpful benchmark in this case to examine the local cyber security development. The same applies to figures on the availability and occupancy of co-working and other shared spaces, whose notion and data coverage may vary across places.

Measurable information is easier to interpret and compare. Therefore, it is important to consider whether or not indicators used to screen local conditions are measurable. Although most indicators can be selected in such a way that allows for quantification, such as when considering the share of active physicians per population as a proxy of local public services, this is not always possible. The legal framework provides a typical example. The presence of a legal entitlement to request teleworking and disconnect outside core working hours is a crucial precondition for fair teleworking practices to spread on a large scale. Similarly, policies for public sector workers' performance assessment can be indicative of a country's openness for flexible working arrangements, which in turn provide a fertile ground for teleworking. All these aspects are likely to impact teleworking levels, but are not directly measurable. It can only be assessed whether certain legal provisions, policy incentives or ad hoc collectively bargained agreements are in place or not, but their suitability to promote teleworking is harder to quantify. In these cases, other approaches could be used to allow for comparability, such as considering the OECD modus, i.e. the most frequent legal ruling among OECD member countries in a given domain (e.g. the presence or absence of a right to request teleworking in the majority of observed countries), using (OECD, 2021d[18]) for data background. In the future, an index comprising a range of regulatory indicators could be set up to measure readiness for teleworking in national and regional legislation.

Measurement of variations in teleworking uptake

Measuring teleworking levels is crucial, but presents several complexities. As discussed in Section 1, teleworking strategies promote a wider adoption of teleworking as a means to support certain medium to long-term objectives, some of which have a clear spatial dimension. Therefore, measuring variations in teleworking uptake over time and across space is essential. However, the data used to this end may raise several challenges, including timeliness, representativeness and comparability. Table 2.2 summarises the sources that could be used to measure teleworking in Trentino, illustrating their respective advantages and limitations. While the type of available data varies across places, alternatives may still allow for a certain degree of comparability.

Table 2.2. Sources and methods to measure teleworking uptake in Trentino

Source	Variables	Advantages	Limitations	Comparability
Italian Ministry of Labour and Social Policies portal to register teleworking agreements	All data included in individual teleworking agreements, pursuant to national legislation	• Administrative data; • Real-time tool; • Inclusion of entire teleworking population; • Potential for interoperability with other public sources	• Data currently not publically available for policy and research; • Part of teleworking population may not be covered due to non-compliance with legal obligations; • Data limited to Italy	Across Italian regions
ISTAT labour force survey	Number of days worked remotely per week or month	• Simple measure, easy to answer; • Relatively high frequency (quarterly); • Large number of observations (on average, 62 000 households per quarter)**	• Few relevant questions, as teleworking is not the focus (e.g. preferences for the future not captured); • Potential for response bias (blurred work-life boundaries)	Across Italian regions and EU countries*
Eurofound labour force surveys during the COVID-19 pandemic	Number of hours worked remotely per week	• Allows for comparability across EU countries; • Large number of observations (e.g. 46 800 complete responses in the third round of the survey)	• Representativeness at regional level is not the focus; • Survey non conducted on a regular basis; • Potential for response bias (blurred work-life boundaries)	Across EU countries
ISTAT firm surveys during the COVID-19 pandemic	Share of firms adopting teleworking (for part or all of the staff) and perceived impact of teleworking on firm productivity, costs, training etc., by region, industry and size class	• Insight into firm behaviours to adapt to large-scale teleworking; • Large number of observations (i.e. about 90 000 firms with +3 employees in trade, services and manufacturing)	• Few relevant questions (e.g. does not distinguish between staff working remotely in part or in full); • Survey non conducted on a regular basis; • Potential for response bias (issues in reporting teleworking)	Across Italian regions
Zoom, Teams, other video platforms	Frequency of video calls	• Simple measure; • Direct link to teleworking; • International scope	• Microdata not publicly available; • Not all firms use the same software, hence representativeness may greatly vary across space	Potentially, across OECD regions, if data are available
LinkedIn, Indeed, Burning Glass and other job platforms, including institutional	Job postings mentioning the possibility to work remotely (as an alternative: analysis of job posts based on assumed teleworkability of different occupations)	• Allows tracking trends in the supply of teleworkable jobs; • International scope	• Microdata not publicly available; • Popularity of platforms varies across places; • Low-paid jobs tend to be underrepresented; • Language barrier to comparability	Potentially, across OECD regions, if data are available

Note: * Labour force surveys are harmonised at EU level, in compliance with Regulation (EU) 2019/1700 establishing a common framework for European statistics relating to persons and households. ** For more information: https://www.istat.it/it/archivio/253072
Source: Authors' own elaborations.

Approaches to measuring teleworking levels in places depend on the locally available data. Higher quality and preciseness reduce the potential for error in estimating teleworking levels. For this reason, it is crucial for policy makers to carefully assess the available sources. For Trentino's policy makers, these encompass, among other things, administrative data on individual teleworking agreements potentially obtainable from central government, labour force and firm survey data gathered by the Italian institute for statistics (ISTAT) and data on job postings collected by the provincial labour agency as well as by private job platforms. Such an assessment should also take into account the need to understand where a place stands in terms of its teleworking levels compared to other places. Using a mix of sources may provide both an insightful picture of the teleworking situation in the place of interest and an empirical ground for

comparative analysis. The sources presented in the above table will be briefly discussed having this dual purpose in mind.

Public data on teleworking agreements represent an untapped asset in Italy. The Italian law requires employers to submit individual teleworking agreements to the Ministry of Labour and Social Policies.[24] The resulting dataset is currently not made publicly available for policy or research purposes. Potentially, it would provide a number of advantages, including:

1. Administrative data are generally less affected by bias than survey data;
2. Data would be updated virtually in real-time, accounting for each new entry;
3. Coverage should be ensured for the entire teleworking population in the private sector;
4. Individual teleworking agreements cover a number of variables, spanning from the number of days per week worked online to the places where teleworking is practiced;
5. Data drawing on teleworking agreements could be linked to other public sources (e.g. the Business Register, social security datasets), broadening the evidence base on employers and teleworkers.

However, not every government has legal requirements for firms to report teleworking, implying the need for alternative sources to ensure comparability with non-Italian regions.

Labour force surveys offer a major alternative to administrative data for measuring teleworking. In this context, workers are typically asked to report the number of days worked at home. In the EU, labour force surveys are conducted by the national statistical institutes in accordance with a common coding scheme established by Commission Implementing Regulation (EU) 2019/2240,[25] allowing for comparability across the member countries. A major limitation of labour force surveys is that there may be few relevant queries on teleworking, which is typically not a major focus, resulting in a lack of evidence on crucial issues such as related preferences and intentions to modify daily behaviours. Labour force surveys conducted in the context of the COVID-19 crisis may partly help to address this issues, as they place unusual emphasis on teleworking, but may be eliminated in the future, as they were only meant to be temporary.

Firm surveys can provide a further alternative, but present several limitations. Misreporting by survey respondents, i.e. managers asked to report the share of teleworking staff, is a common issue. Comparing ISTAT data from labour force and firm surveys suggests that the latter tend to display lower teleworking levels. In addition, as in labour force surveys, teleworking is but one of several topics covered, which means that the data collected are limited. Compared to labour force surveys, firms surveys are also less standardised at EU level, limiting comparability. Yet, they allow for cross-regional comparisons at least at domestic level and shed some light on the important issue of how firms updated their practices, investment and strategies in light of the large-scale diffusion of teleworking.

In case of unavailability of administrative and survey data, proxies can be used to infer teleworking levels in a given region. Firms such as ZOOM or Microsoft could provide time series and spatial data on video calls, a type of activity that is closely related to working from a remote environment. Data would then need to be weighed by the size of the local active population in order to obtain a clear picture of teleworking levels in the concerned place. A major limitation is that microdata are currently not made publicly available by the firms in question. The fact that different firms may use different platforms in different places poses a further challenge for comparability.

[24] For further information, visit: https://www.lavoro.gov.it/strumenti-e-servizi/smart-working/Pagine/default.aspx

[25] For further information, visit: https://ec.europa.eu/eurostat/web/lfs/legislation

Public and private job platforms may provide insights into future teleworking trends. Analysing job postings mentioning the possibility to work from a remote location allows measuring actual and projecting future trends in the supply of remote jobs, including from a comparative perspective. However, limitations encompass the lack of publicly available data, high variance in data coverage and representativeness due to the prevalence of different platforms in different places, a likely underrepresentation of lower paid jobs in private platforms and language barriers to comparability.

Review of indicators reflecting strategic policy objectives

Assessing teleworking strategies against their underlying goals requires identifying relevant indicators. Table 2.3 provides an overview of the societal objectives that a rise in teleworking could contribute to, according to Trentino's strategy, and proposes a set of corresponding indicators. As discussed earlier in this report, it is difficult to develop a causal link between an increase in teleworking levels and such indicators due to the interference of independent factors. Nevertheless, a dashboard reflecting policy areas relevant for teleworking can still be useful to investigate how society develops in the context of a new normal where an unprecedented share of people will work remotely. This includes monitoring figures relating to potential negative repercussions associated with larger teleworking levels in each of the target policy areas. Examples encompass, among other things, the risk of an increase in domestic violence on women, which would be in clear contrast with the objective of using teleworking as a tool to improve well-being, and the risk that a broader use of heating in homes offsets the environmental gains from lower commuting levels. The issue of the unintended consequences of promoting a larger adoption of teleworking are discussed in depth in Section 1.

Table 2.3. Indicators reflecting the objectives of Trentino's teleworking strategy

	Indicators	Rationale	Data sources	Level	Details
Well-being	Life satisfaction	Time saved from commuting and flexible work arrangements may improve work-life balance	OECD Better Life Index	National	Self-reported number of hours per day spent on leisure and personal care
			OECD Regional Well-being	Regional	Self-assessed level of life satisfaction
			I.Stat > Aspects of daily life (Survey on Households)	Regional	Self-assessed level of job and life satisfaction by size of municipality
	Hours worked	Blurring work-life boundaries raise the risk of unpaid overtime	OECD Employment	National	Number of hours worked per week
			I.Stat > Employment	Regional	
	Health status	Working from home may increase sedentariness, isolation, anxiety	OECD Health	National	% of population reporting to perceive their own health status as bad
			Eurostat Mental Health	National	% of population reporting to suffer from chronic depression
	Violence on women	Working from home raise the risk of domestic violence in fragile contexts	OECD Inequality	National	% of women experiencing in the lifetime
			ISTAT dedicated monitor	Regional	Police reports of abuse of women
Productivity	Productivity	Expected positive correlation between teleworking and productivity	OECD Productivity	National	GDP per capita/person employed
			OECD Regions and Cities	Regional	
			ISTAT firm survey during COVID-19	Regional	Perceived impact of teleworking on productivity in firms
			Trentino's government survey	Regional	Perceived impact of teleworking on productivity in public sector
	Absence from work	Teleworking is expected to reduce absences	OECD Health	National	Number of days lost per person per year, variation over time
Spatial divides	Spatial concentration of population	Teleworking may lead to a more even distribution of population across geography	OECD Regional Demography	National	% of population by type of region (i.e. metropolitan, non-metropolitan with access to a metropolitan area/to a small/medium city, remote)
			Italian Agency for Territorial Cohesion	Regional	% of regional population by type of municipality, based on a 6-tier scale of remoteness
	Social activities	Community life is expected to rise in areas to which teleworkers relocate	I.Stat > Culture > Public events (Survey on Households)	Regional	% of residents who attended a social event (i.e. concert, museum, sport event, etc.) by size of municipality
					% of residents who participated in civic activities by size of municipality
	Employment at place of residence	Teleworking may allow more people to work where they reside	OECD Regions and Cities	Regional	% of workers employed at place of residence
	Type of transport for commuting	Teleworking may lead to a change in commuting patterns	ISTAT Survey on Households: aspects of daily life	Regional	% of workforce by type of transport for commuting (including no commuting needed for work)
Air pollution	Commuting time	Work from home may lead to a reduction of the aggregate commuting time	Eurostat main place of work and commuting time	National	Employed persons by commuting time
			I.Stat > Services > Commuting (Survey on Households)	Regional	Employed persons by commuting time
	Air pollution	Expected drop in commuting-related emissions	OECD Regions and Cities	Regional	Average level of PM2.5 in the region experienced by the population
	Heating	Centralised vs. locally distributed	I.Stat > Energy > Consumption in households	Region	Energy consumption for heating and cooling in households

	Indicators	Rationale	Data sources	Level	Details
Attractiveness	Inter-regional mobility	Teleworker-friendly destinations are expected to be more competitive in attracting residents	OECD Regional Demography	Regional	New residents in the region coming from another region in the same country
	International mobility		I.Stat > Migration > Foreigners (Annual Survey on Foreign Residents)	Regional	New foreign residents in the region
	Touristic flows	Teleworker-friendly destinations are expected to attract "workationers", who tend to stay longer	I.Stat > Services > Tourism (Survey on Touristic Facilities)	Regional	Occupancy rate in touristic facilities and average duration of stays

Source: Authors' own elaborations.

Measures of work-life balance, hours worked, health status and violence on women may give useful hints on teleworking's influence on well-being. Time saved from commuting could be used for personal duties, improving people's work-life balance and life satisfaction. At the same time, a number of risks are associated with excessive levels and unregulated forms of teleworking, including blurred work-life borders and difficulties in reporting overtime, a potential increase in sedentariness, isolation and anxiety, as well as in domestic violence for women and other vulnerable groups in fragile contexts. The sources included in the above table, which combine OECD, Eurostat and ISTAT[26] datasets, provide internationally-comparable data at national and regional levels on all of these indicators except mental health. In fact, despite a long-standing OECD effort to "make mental health count" (Hewlett and Moran, 2014[32]), data on mental health (including on anxiety and depression during the COVID-19 pandemic) are gathered at national level based on different methodologies, hindering comparability across countries (OECD, 2021e[28]). Yet, Trentino's policy makers may resort to local sources and new surveys to expand the evidence base on the matter.

Measures of productivity and absences from work may provide insights into growth prospects. As discussed earlier in the report, empirical studies on teleworking during the COVID-19 pandemic show that this practice may lead to productivity gains, including lower worker turnover and less absenteeism. Indicators of managers' perception of how higher teleworking levels affect worker efficiency in public and private sector may cast further light on the matter, which is key to Trentino in light of the long-standing stagnation of its productivity growth.

Measures of the spatial concentration of population and social activities may help to infer whether and how teleworking affects pre-existing divides. There is a widespread expectation that teleworking may lead to a more even distribution of population across geography, implying a rise in community life in areas to which teleworkers relocate. Along the same lines, there could be an expanding share of people working in the place where they reside and changing their commuting habits. A mix of OECD and ISTAT datasets could help to monitor these expected developments. These are a matter of great importance for Trentino in light of its peculiar geography. Its population tends to reside in towns located at high altitudes and drive downhill on a daily basis to the workplace, typically located in the valleys. Teleworking could contribute to mitigating this spatial divide by boosting economic activity and social life in smaller towns.

Measures of commuting time and air pollution may help to shed some light on the implications of large-scale teleworking for mobility and the environment. As an increase in people working from home may lead to a reduction of aggregate commuting levels, there is an expectation that air-polluting emissions

[26] I.Stat, the complete data warehouse of the Italian institute for statistics, is widely referenced in Table 3. For more information, visit: http://dati.istat.it/

from private vehicles (by far the most widely used means of transport for commuting in Trentino) may drop substantially.

Measures of resident mobility and tourism flows may provide signals of whether enhanced local conditions for teleworking can benefit regional attractiveness. This aspect is all the more important for a region that has been experiencing flat population growth rates for decades. In addition, while tourism accounts for a large share of local employment, Trentino's policy makers have long been struggling with the issue of concentration of touristic flows in the high season. So-called "workationers", i.e. people who combine remote work and holidays in their touristic destination, are a key target group for new territorial marketing strategies undertaken by the local government[27] and private players.[28]

[27] For further information, visit: https://www.visittrentino.info/it/dove-dormire/appartamenti-smart-working

[28] For further information, visit: https://trentoremote.com/

Policy recommendations

The following recommendations aim to support policy makers in designing effective assessment frameworks for teleworking strategies for local development. These define as coordinated sets of policies aimed at guiding the likely future expansion of teleworking towards supporting medium to long-term public goals in places. Such goals may include fostering worker well-being and productivity, reducing commuting and the related emissions, addressing spatial divides and fostering regional competitiveness.

The design of assessment frameworks can benefit both strategies in the making and those already under way. In the former case, an in-depth reflection upon the strategic objectives and the identification of corresponding indicators will ensure that the tools envisaged are fit for purpose. In the latter case, policy makers will access a broader knowledge base concerning ongoing initiatives. Recommendations draw on both the general discussion and the case study analysis provided in the previous sections.

Five guidelines for effective assessment

The following guidelines are meant to inspire a holistic, technically sound approach to assessing teleworking strategies for local development.

A. **Follow a vision:** clarify policy objectives at the core of strategies and the "theory of change"[29] that informs associated actions, making sure that it is aligned with available evidence.

B. **Assess by design:** embed monitoring and assessment into policy design, in order to:

- Cast light on the potential synergies, inconsistencies and trade-offs between and within the objectives teleworking strategies aim for; and
- Inspire solutions to mitigate any clash of interests large-scale teleworking may spark within and between policy target groups and other stakeholders.

C. **Pursue transparency:** set up public reporting systems and ensure that monitoring tools reflect policy objectives and local conditions, in order to:

- Create a compelling narrative around a teleworking strategy, whose underlying context and needs are unique;
- Contribute to policy makers' accountability for and raise acceptance of the measures undertaken, building trust among policy target groups and other stakeholders.

D. **Beware of side effects:** design assessment frameworks in such a fashion that allows capturing adverse effects associated with teleworking and potentially arising from the related strategies, such as conflicting interests between social groups, in order to:

- Prevent that policies lead to inconsistent and adverse results;
- Deter zero-sum situations where policy makers need to prioritise between objectives or groups;
- Inform compensatory policies to make up for any losses in a specific area or group.

E. **Mind the scale:** acknowledge that a critical mass of teleworking is needed for strategies to have meaningful impact, devoting particular attention to the interplay between local conditions for teleworking, changes in teleworking levels and the societal goals that expanding teleworking levels are expected to support. The presence of favourable conditions is likely to lead to higher teleworking levels, which in turn are likelier to affect target policy areas to a more meaningful extent.

A three-step approach to assessing teleworking strategies is hereby proposed. Drawing from the above guidelines, specific recommendations are provided for each step.

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[29] A specific and measurable description of a social change initiative that forms the basis for strategic planning, on-going decision-making and evaluation.

Recommendations

1. **Preventive check-up:** screen local conditions to detect any structural weaknesses that might undermine a teleworking strategy, and repeat such a measurement over time to track any progress compared to the situation prior to policy adoption;

2. **Leave no factor behind:** take into account all the local conditions that can possibly affect teleworking uptake, ranging from basic technical requirements (i.e. digital infrastructure, work space, regulatory environment, local public services) to complementary factors (i.e. employers' attractiveness, transport infrastructure) and other local circumstances (workforce demographic characteristics, workforce skills and firm characteristics);

3. **Focus on what counts:** account for the potential challenges relating to the accuracy, availability, comparability and measurability of datasets.

    a. Accuracy: while several local conditions are easily relatable to specific indicators (e.g. digital infrastructure), other do not provide obvious indicators (e.g. quality of local public services), in which case proxies can help to obtain a fairly accurate picture of the reality on the ground;

    b. Availability: indicators suitable in theory may be unviable in practice, due to data gaps (typically, in regional data). Launching new or expanding ongoing surveys can help bridge the gap, the latter providing a less costly (albeit less informative, if only few queries can be added) solution;

    c. Comparability: benchmarking is key to assess where a place stands, but if data are not available at same level of government, values at higher levels can offer general reference. If comparison with other places is impossible, variation over time can provide a minimum of guidance;

    d. Measurability: although most indicators can be selected in such a way that allows for quantification and comparability, this is unviable for some local conditions (e.g. the legal framework). In these cases, indexes or similar tools can be set up to allow measuring qualitative data;

Recommendations

1. **There is no single teleworking:** take into account the different notions of teleworking that may coexist within the same legal framework and clean statistics from any circumstance misleadingly associated with teleworking (e.g. as in retail shops located in homes) to improve teleworking measurements.

2. **Test out new sources:** consider all the potential sources of teleworking data, including regular or ad-hoc surveys of ICT usage, labour force and business conditions conducted at national or regional level, as well as administrative data (e.g. teleworking agreements filed by the government in Italy), in order to obtain an accurate picture of actual uptake levels, bearing in mind that different sources may lead to different teleworking figures, and the causes thereof require investigation.

3. **Think spatial:** keep in mind that ensuring spatial representativeness in teleworking data poses several challenges. In teleworking strategies adopted from regional governments, there could be a need to ensure that data is representative not only at upper but also at lower levels of territorial subdivisions for statistical purposes. These may not correspond to administrative divisions within the country, leading to a misalignment between the scope of the measurements and that of the strategy. In addition, cross-variable analysis at lower local levels may not be robust enough or lead to an incomplete representation of the reality on the ground, due to insufficient sample size. In fact, labour force surveys and other sources commonly used to measure teleworking levels typically have a national scope, and thus do not aim to provide a fine depiction of local circumstances.

4. **Take a comparative glance:** make an effort to overcome any barriers to comparability with other countries or regions, so as to assess where the place of interest stands in terms of its teleworking levels. When joint or harmonised sources of information are unavailable, measures could be adopted to foster comparability, such as adjusting the data or resorting to unconventional data sources.

5. **Watch the outliers:** account for potential statistical outliers, including those arising from natural deviations in populations (e.g. small regions hosting very large employers that may shift aggregate teleworking up to record levels), to avoid that biased observation leads to misleading inference and policy decisions.

6. **Refer to standards:** benchmark teleworking levels against commonly accepted standards (i.e. 2-3 days per week), which should provide the right balance between the expected benefits and costs based on a number of international surveys. This can help measure the room for expansion of this practice or, conversely, assess the risk that teleworking levels are excessive, which could harm productivity and other public interests.

Recommendations

1. **The narrow path to causality:** bear in mind that there is little room for causal analysis, because teleworking strategies are likely to interact with external factors in pursuing their underlying goals. On the one hand, trends irrespective of the policy context may contribute to lifting teleworking levels. On the other hand, events independent from or not entirely attributable to this practice and the related policies may interfere in supporting or hindering strategic goals. Despite limitations, monitoring tools can still support policy makers in assessing societal change associated with teleworking;

2. **Factor in all dimensions:** ensure that the selected indicators cover all the implications generally associated with teleworking, including from a social, economic, environmental and spatial point of view, and take into account the unintended effects of teleworking when selecting indicators, so that they both reflect the strategic objectives pursued and allow tracking of any side effects potentially detrimental to society or specific groups;

3. **Pursue efficiency:** monitoring systems should get the most of existing sources of information, so as to minimise data collection costs. New surveys should be a second best, given the many untapped sources of information that typically exist in country and regions, which should already cover the various policy areas potentially affected by teleworking;

4. **Keep an eye on time:** consider the time factor in assessment. Indicators reflecting the strategic objectives pursued are unlikely to display sizeable change in the short term, considering that actual teleworking levels are still way lower than potential. While the pace of the transition is largely unpredictable, its impact will become clear sooner the faster teleworking is widely adopted.

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