

COVID-19 and the accelerated shift to technology-enabled Work from Home (WFH)

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Abstract

People have been working remotely from many locations for many years, but the growth in work from home (WFH) has historically tended to be slow in both the United States and the European Union. Most of those who worked from home did so for only a portion, often small, of their working hours. COVID-19 has given a huge impetus to working from home for those jobs that can.

Work from home offers many benefits. It can be a driver of sustainability in the context of the green and digital transitions. The shift to WFH appears on balance to be positive in terms of productivity, despite the slightly negative impact at the individual level and for certain tasks. Many workers appreciate and benefit from the flexibility that work from home provides.

At the same time, this shift has significant implications for many aspects of our lives, and it raises a number of possible concerns that may need to be addressed by public policy. There is a risk that some groups (women, younger workers, and those who are less technically capable of using digital technology) may suffer from decline in wages and loss of opportunities for promotion and training. There are some indications of mental health issues due in part to the inability to separate work from private life, increased work hours, and the need to deal with children who are at home, but it is difficult to disentangle aspects that are caused by WFH in general from those that are primarily related to the pandemic. There are also some indications of a population shift from urban to suburban areas (limited so far, and mainly observed to date in the USA) which, if sustained, will need to be reflected in urban and regional planning.

By adopting a comparative approach, this research note explores these aspects and the main differences between the USA and the EU. It concludes by highlighting the key implications for public policy in terms of work-life balance, gender gaps, skill acquisition, modernisation of workflows, technology adoption, managerial culture and flexibility enhancement.

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1. Introduction

People have been working remotely from many locations for many years, but the growth in work from home has historically tended to be slow in both the USA and the EU (see for instance (DeSilver, 2020) and (Eurofound, 2017)). Most of those who worked from home did so for only a portion, often a small portion, of their working hours.

In both the USA and the EU, COVID-19 gave a huge impetus to working from home for those jobs that can be performed from home (Ahrendt, Mascherini, Nivakoski, & Sándor, 2021) (Eurofound, 2020). This affected the USA differently than the EU because the nature of unemployment caused by the pandemic was different. In the USA, employment plummeted immediately after COVID-19 first appeared in early 2020. In the EU, far fewer jobs were lost outright thanks to the prompt and judicious use of temporary innovative measures to keep workers employed, albeit on reduced hours and at reduced wages (as with the German *Kurzarbeitergeld*, an approach that had been used with success during the 2008 financial crisis). As a result, unemployment in the EU showed only a modest increase; however, the number of hours worked fell dramatically (Eurofound, 2020).

Definitions are important. For purposes of this paper, we focus on *work from home (WFH)*. There are many terms that are sometimes used as if they were interchangeable, including teleworking, remote work, and more, but not all of these are exactly identical in meaning. WFH (a form of remote work) is best understood as a sub-class of *multi-locational work* (Ojala & Pyoria, 2018). For most workers, the employer's premises play an important role; however, workers in sectors such as transportation, agriculture and fisheries, or construction have routinely worked at locations other than the premises of their employer. Those workers, and many others, were typically not in a position to benefit from a shift to WFH in response to the pandemic, and thus were at risk of loss of hours or of loss of employment altogether. The new pandemic-driven WFH was mainly available to those with higher levels of education and in higher income quantiles (see **Section 5**).

Our focus in this research note is on knowledge workers who have enjoyed increased freedom to work from home, many of whom are now also free to work from other locations as well. Indeed, one can argue that the real revolution that we are witnessing is that people are now discovering that they can design their jobs around their lifestyle instead of designing their lives around their jobs.

2. New technology as an enabler of work from home

Fortunately, the basic technology for a rapid and dramatic increase in WFH was already widely available in most developed countries: fast and reliable internet access, email, conferencing tools, and more (Marcus, et al., 2021); however, some Americans and Europeans had access only to rather slow broadband. The bandwidth needed to make fully effective use of online conferencing tools is greater than that available with the most basic internet services. As of 2019, 30 Mbps fixed broadband service was unavailable to an estimated 14.2% of European Union households, corresponding to 40.7% of rural households. At the same time, fixed

broadband service at 25 Mbps or more was unavailable to 5.6% of US households, corresponding to 22.3% of rural households (Marcus, 2021, p. 44).

At the beginning of the crisis, many worried that the internet might collapse under the strain of increased traffic; however, in practice the internet has continued to function reasonably well during the pandemic (OECD, 2020b). Work from home has contributed somewhat to increased load on the internet, but a far greater increase appears to have resulted from video on demand usage.

It is possible that the shift to WFH will expand the cybersecurity threat landscape in ways that are problematic. For some professions and sectors, this shift is linked to increased use of online services during the pandemic. Online conferencing tools such as Zoom were not designed with security in mind; however, as they now carry information that is sensitive to businesses and public institutions, this risk may need to be reassessed. This is an issue of growing concern (see, for instance, (Kass, 2021)). The shift to WFH may also have implications for data protection, cybersecurity, and quality of service.

Given that many of the online tools used to support WFH have around for perhaps a decade in both the USA and the EU, one might well wonder why the shift to remote work failed to materialise long ago. There appear to be a range of different factors involved. The simplest answer is that even though WFH appeared to offer some advantages, pre-WFH arrangements were not functioning badly enough to necessitate a potentially disruptive change. There are many suggestions in the literature of a lack of cultural preparedness and, in some cases, outright resistance from managers and supervisors. This is perhaps understandable – if a WFH arrangement were to fail to function well, the manager that authorised it would likely be held to account. Small and medium enterprises have been hesitant to implement WFH, and quick to withdraw the option as rapidly as possible once they were no longer compelled to offer it. This indicates a widespread reluctance to extend unsupervised autonomy (Aloisi & De Stefano, 2022 (forthcoming)).

The pandemic has also cleared away other barriers to adoption. Large segments of the population of the EU and the USA are now familiar with the conferencing tools used in support of WFH. Many of those who are able to conduct WFH have already sunk the personal or institutional investments requisite to effective WFH. A survey of workers in the USA (Barrero, Bloom, & Davis, 2021) found that the average worker invested more than 15 hours and \$561 US (about €486) in equipment and infrastructure to enable WFH. Their employers also had to invest in additional equipment and software to enable WFH, and may have reimbursed some of the worker expenses. The investments of time and money made presumably lower the cost of WFH going forward, and thus have benefits beyond the immediate pandemic crisis.

Many firms and institutions, unable to draw up work plans based on objectives, verifiable deliverables and multilateral accountability, instead increased the number of online meetings and hastened to implement surveillance software (to measure the time spent online, the

number of keystrokes on the keyboard, mouse movements, and the list of websites visited) (Aloisi & De Stefano, 2022 (forthcoming)). Among other things, the inability to modernise work patterns has slowed down the implementation of a “more trusting and more results-based” management (ILO, 2020).

What is sometimes forgotten is that the technologies that are employed to monitor workers could be used instead to improve transparency, verifiability and accountability of managerial decisions, thus advancing inclusion of underrepresented populations and reducing socio-economic gaps. Instead of contributing to replica building of previous recruits’ cohorts, data can be exploited to increase diversity by promoting the de-marginalisation of vulnerable groups (Ajunwa & Greene, 2019).

3. Work from home and productivity

There are some survey results suggesting that many workers think that they are more productive working from home; however, views among managers appear to be mixed (Barrero, Bloom, & Davis, 2021). The net effect is not altogether certain because there are few real, quantifiable measures of knowledge worker productivity.

It is widely assumed that day to day physical contact with co-workers stimulates creativity, helps to ensure alignment, and thus promotes productivity overall. In reality, the evidence for this appears to be thinner than is typically assumed (Miller, 2021).

Avoiding commuting time can improve productivity, but the home can also create more distractions (Barrero, Bloom, & Davis, 2021). There are multiple drivers in both directions. One case study found an increase in hours worked, but a reduction in productivity per hour for the firm that was studied. (Gibbs, Mengel, & Siemroth, 2021).

There are also important suggestions in the literature that WFH can bring benefits to the firms that employ it. Public companies that made substantial pre-pandemic use of WFH appear to have had significantly higher sales, net incomes, and stock returns than their peers during the pandemic. This appears to have been more the case in non-essential industries (where the adoption of WFH was indispensable to continued operation) than in essential industries, and more the case for non-high-tech industries than for high-tech industries (Bai, Brynjolfsson, Jin, Steffen, & Wan, 2020).

The pandemic has driven not only accelerated use of WFH, but has also accelerated digitalisation and automation across different sectors of the economy, which together with WFH have important implications for productivity. The combined effect appears to be synergistic. Growth in US labour productivity, which averaged only 1.3% since 2006, increased by 5.4% in the first quarter of 2021. Trends are coming together that might lead to a

productivity surge in developed countries in the coming years (Brynjolfsson & Petropoulos, 2021).

4. Likely evolution when work from home is no longer a pandemic driven requirement

It is important to bear in mind that WFH today is a crisis-driven arrangement. The impacts might look quite different in a post-pandemic world, where WFH (1) would ideally be organised so as to reflect the preferences of the worker, and (2) might be organised in most cases around a hybrid model where presence at the employer's premises alternates with WFH.

Some jobs are much more amenable to WFH than others. Some require face to face contact, for instance, while others entail control of machinery. JRC/Eurofound has looked at this for the EU (Sostero, Milasi, Hurley, Fernandez-Macías, & Bisello, 2020), while Dingel and Neiman explored this for the USA (Dingel & Neiman) (Petropoulos & Schraepen, 2021).

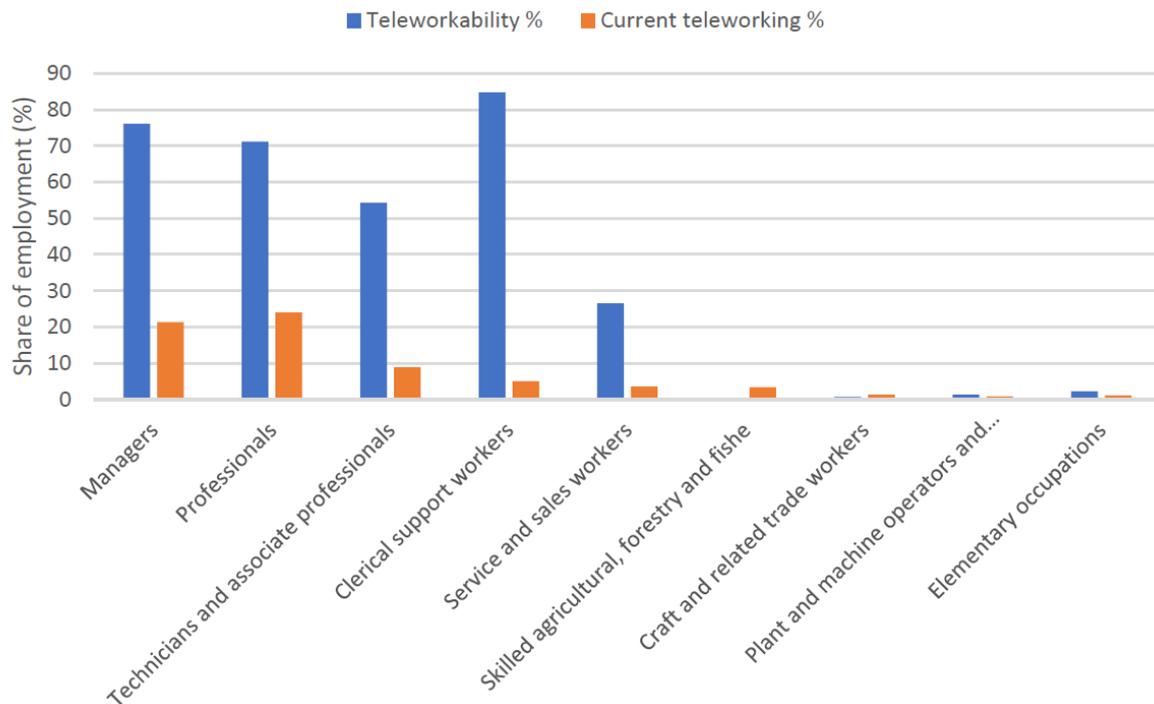
Intuitively, it seems clear that some jobs are particularly well-suited to WFT, such as software development, graphic design, creative writing, customer service, and phone banks. But a more concrete analysis requires a closer examination of available data.

The analysis in (Sostero, Milasi, Hurley, Fernandez-Macías, & Bisello, 2020) is based on a task-level analysis. Tasks are analysed in terms of their content, the execution methods employed, and the tools employed. As regards the task content, information-processing (or intellectual) tasks that operate on information or ideas are most amenable to WFH, social interaction tasks that operate on social relations are less suitable, and physical tasks that operate on things are least suitable for WFH.

On this basis, they find that the proportion of self-employed who are doing work potentially amenable to WFH is approximately the same as the proportion who were in fact doing so before the pandemic, while the proportion of employees who are doing work potentially amenable to WFH (37%) is far greater than the proportion who were in fact doing so before the pandemic (15%). This implies a huge unrealised potential to do more WFH than has historically been done: about 22% of employees, or about 32 million EU27 workers (Sostero, Milasi, Hurley, Fernandez-Macías, & Bisello, 2020).

This same analysis shows a huge unrealised potential for WFH for managers, professionals, technicians, and clerical support workers, but very little potential for (for example) agricultural, forestry, and fishery workers and for machine operators.

Figure 1: Amenability to work from home versus actual work from home among employees (2018) by broad occupation group.



Source: (Sostero, Milasi, Hurley, Fernandez-Macías, & Bisello, 2020)

The shift to WFH for those jobs that are amenable to a greater share of remote work can be expected to affect many other jobs that depend on them but that cannot be done remotely. Autor and Reynolds note: *“If telepresence displaces a meaningful fraction of professional office time and business travel, the accompanying reductions in office occupancy, daily commuting trips, and business excursions will mean steep declines in demand for building cleaning, security, and maintenance service; hotel workers and restaurant staff; taxi and ride-hailing drivers; and myriad other workers who feed, transport, clothe, entertain, and shelter people when they are not in their own homes. This is significant because these services make up a large and rising share of employment among workers without postsecondary credentials; collectively, these services account for one in four U.S. jobs. In May 2019, 9.2 percent of U.S. employment was in food preparation and serving occupations, 8.5 percent in transportation, 3.0 percent in buildings and grounds cleaning and maintenance, and another 4.6 percent in protective services and in personal care and services (Bureau of Labor Statistics 2019). A substantial, long-run demand contraction in these services will mean significant job loss—or lock-in of existing COVID-induced job losses—and a sustained period of labor market adjustment.”* (Autor & Reynolds, 2020) (Petropoulos, 2021)

McKinsey has attempted to quantify this effect (Lund, et al., 2021): over the next decade, 4.3 million jobs could disappear in customer service and food service (the expected increase in associated delivery jobs, like food delivery is estimated to be very small, and thus will not

counterbalance these losses), while business travel will drop by around 20% reducing employment in commercial aviation and airport services, and in hospitality and food service. Having established that there is a large potential for more WFH in the EU, we now consider whether workers and managers expect to make use of this potential. Survey results in the EU (Ahrendt D. , Mascherini, Nivakoski, & Sándor, 2021) and the USA (Barrero, Bloom, & Davis, 2021) suggest that many workers (not all) want to continue some remote work as conditions return to a degree of normalcy. Work totally done from home was never a major factor in either the USA or the EU, and USA survey results suggest that a majority of workers would like to continue to work remotely for a part of the week rather than every day (Barrero, Bloom, & Davis, 2021). Survey results for managers are more limited, however, and also less definitive.

The return to the office is already well under way in both the USA and the EU. Effects are complex (Scheiber, 2021). There are indications in the press of an emerging generation gap, where older and more senior workers welcome the return to physical presence, while younger and more junior workers – especially those who first joined the work force during the pandemic – consider WFH to be perfectly natural and see no need to the return to the old norms (Schwartz & Marcos, 2021).

Concern is also visible in the USA that many workers are quitting their jobs, and that surprisingly large numbers are choosing not to return to work at all, at least for now (Furman & Powell, 2021). Other workers may be quitting their jobs in order to look for better working conditions, which in some cases may include the flexibility associated with working from home. The number of individuals quitting in the USA is in line with historical trends in light of the large number of job vacancies in the USA at present, but the number of individuals accepting new jobs is considerably less than historical experience would lead us to expect (Furman & Powell, 2021). This phenomenon is only now starting to raise concerns in the EU.

5. Distributional effects

Before the pandemic, the vast majority of WFH was performed by those in higher income quantiles (DeSilver, 2020). Survey data suggests that this continues to be the case. Further, the shift to WFH might well tend to favour those with strong ICTs skills. All of these raise concerns that the growth of remote work might contribute to further income polarisation and inequality (Autor & Reynolds, 2020).

In the early stages of the pandemic, this already proved to be the case in the USA. Among workers who had been employed in February 2020 (before the pandemic emerged in the USA), 34% of those without an undergraduate were not continuously employed in March,

April and May 2020,⁴ compared with 18% of those with an undergraduate degree (Stevenson, 2020).

At the same time, we see indications that workers are more willing to quit a job if they consider the pay and working conditions to be unsatisfactory. WFH is moreover making it possible for some people who were previously excluded, including those with disabilities or with caregiver responsibilities. Furthermore, to the extent that WFH becomes more widely available as a result of the pandemic, it could increase labour participation with positive societal and macroeconomic impact, and thus with benefits for all. Thus, the evidence on polarisation seems to be mixed.

In the EU, the gender employment gap between women and men⁵ showed different patterns in 2020 versus 2021. The gender employment gap actually declined slightly during the first year of the pandemic as the employment rate declined less for women than for men. The employment rate for women in the EU fell by 0.5pp to 66.8%, while it dropped by 0.9pp for men to 78.1%. On the other hand, women in the EU experienced a steeper decline in working hours (-7.2%) than men (-6.7%) in 2020 (European Commission, 2021, p. 27).

In the second year of the pandemic, however, women were somewhat more likely than men to have lost their jobs as of July 2021 (9% versus 8%, respectively). In the age 18 – 34 group, however, women were considerably more likely than men to have lost their jobs as of July 2021 (11% versus 9%, respectively) (Ahrendt, et al., 2020). In the USA, among those who had been employed in February 2020, women were more likely than men to have not been continuously employed in March, April and May 2020 (31% versus 25%); however, those with a child under 18 were not more likely than those without children to have not been continuously employed (30% versus 33%).

Caregiving responsibilities clearly play an important role, and it seems clear that women tend to be more impacted than men. In Eurofound surveys in the EU-27 in the summer of 2020 and again in the spring of 2021 (Ahrendt D. , Mascherini, Nivakoski, & Sándor, 2021), women were significantly more likely than men to report that they were “too tired after work to perform household jobs”. Women with children under 12 were more likely to report this than women without children, and women who worked from their employers’ premises were more likely to report this than women who worked from home, but challenges for women are nonetheless visible across the board. Another Eurofound report makes clear why this should be the case: “*The 2016 European Quality of Life Survey (EQLS) found ... that women spent 39 hours a week on average taking care of their*

⁴ This analysis is based on *nonemployment* as reported in the Current Population Survey (CPS) of the US Bureau of Labor Statistics (BLS) because conventional unemployment statistics typically do not adequately reflect all of the forms of disruptions caused by the pandemic. “*As people left jobs they held in February, some transitioned to unemployment, others exited the labor force, and still others were employed but absent from work.*” (Stevenson, 2020) In Europe, the tendency has been instead to deal with this limitation in data collected by measuring the reduction in hours worked.

⁵ We recognise that gender is neither binary nor fixed, but available statistics are in terms of men and women.

children, against 21 hours spent by men. Women devoted an average of 17 hours a week to cooking and housework, compared with 10 hours for men.” (Mascherini & Bisello, 2020)

Figure 2: Proportion of parents stating that they are “too tired after work to do household jobs” (EU-27)

			Summer 2020	Spring 2021
Men	No children under 12	Worked from employer’s premises	25	26
		Worked only from home	23	23
	Children under 12	Worked from employer’s premises	27	20
		Worked only from home	24	24
Women	No children under 12	Worked from employer’s premises	30	36
		Worked only from home	30	30
	Children under 12	Worked from employer’s premises	38	44
		Worked only from home	31	39

Notes: Green = lowest value, red = highest value.

Source: (Ahrendt D. , Mascherini, Nivakoski, & Sándor, 2021)

Eurofound survey data also indicate that women with children aged 0 through 11 years are far more likely than similarly situated men to experience work-life conflicts (Mascherini & Bisello, 2020). Women are more likely than men to have no savings to fall back on, and less likely to have savings sufficient to cover twelve months; once again, women with young children are disadvantaged even more than those without (Mascherini & Bisello, 2020). When it comes to feeling tense, lonely, or depressed, there is negligible difference between women and men without children. Among those with children zero through 11 years however, women seem to be at a substantial disadvantage compared to men. Interestingly, among those with children 12 - 17 years old, women seem to be much more likely to feel stressed, but not more likely to be lonely or depressed (Mascherini & Bisello, 2020).

Some data ((Fana, Tolan, Torrejón, Urzi Brancati, & Fernández-Macías, 2020), (Sostero, Milasi, Hurley, Fernandez-Macías, & Bisello, 2020)) suggests that women are slightly more likely than men to work in jobs that are amenable to remote work. At the same time, many sources suggest that women have been disadvantaged in terms of their career prospects by the pandemic – notably, they have often had primary responsibility for caring for children whose schooling took place from home (Ahrendt D. , Mascherini, Nivakoski, & Sándor, 2021). Furthermore, to the extent that they do more remote work in the future, they may risk being passed over for promotion and for training opportunities.

The young were also disproportionately impacted (Wolff, 2020). Prior to the pandemic, most young people worked in sectors that were heavily impacted by COVID-19, such as accommodation and food services (13%), wholesale and retail (11%), and health and social work (11%). As a result, this age cohort experienced greater increases in unemployment (of 1.4%, to 13.3%) and a greater increase in the *not in employment, education or training (NEET)* rate (of 1.2%, to 13.6%) than older groups (Eurofound, 2021).

There are also indications of disproportionate adverse impacts on Hispanic and Black workers in the USA (Stevenson, 2020).

These challenges must be viewed in the context of the many other challenges that the pandemic has exacerbated for women, including an increase in domestic violence (Wenham, et al., 2020).

6. Health and wellbeing of those working from home

Workers benefit from avoiding the commute to work, but surveys suggest that much of the time saved goes into working about an hour more per day. Those working from home appear to “devote most of their savings in commuting time to non-leisure activities – work for pay, but also chores, home improvement, and childcare” (Barrero, Bloom, & Davis, 2021). There are indications that WFH workers have difficulty distinguishing between work time and private time, and also that managers may not fully respect time that in some sense ought to be private (Yeung, 2021).

There are also some suggestions of increased stress due to pandemic-induced WFH. Some survey results suggest a decline in mental well-being (Ahrendt D. , Mascherini, Nivakoski, & Sándor, 2021). This might well be exacerbated if children are at home.

7. Implications for urban areas

During the early months of the pandemic, there was a strong expectation in the USA that the pandemic would lead to a hollowing out of major cities. People would abandon cities both because of the risk of contagion, and also because it was no longer necessary to endure the high costs, congestion and pollution of the city in order to work. This concern seems to have been less prominent in the EU.

Preliminary indications are that there has indeed been some migration out of major US cities, notably New York City and San Francisco, but the numbers involved are far less than had been feared. By in large, US cities that had been losing population before the pandemic continued to lose population during the pandemic (Kolko, Badger, & Bui, 2021). “For the most part, big pandemic shifts were confined to people moving out of the urban parts of a few large metros at higher rates, and more people moving into smaller metros in New York State, New England and other vacation and seasonal-home destinations. Metro New York and the Bay Area had net outflows in 2020 at twice the rate of 2019. [...] But the larger pattern among metros [...] has been the stability of pre-pandemic trends. Sun Belt metros have continued to draw new residents, while those in upstate New York and the Midwest have not.” (Kolko, Badger, & Bui, 2021)

Using Federal Reserve Bank of New York/Equifax Consumer Credit Panel (CCP) data,⁶ (Whitaker, 2021) found that there had indeed been net migration away from major US cities. The net flow of people out of US urban neighbourhoods averaged nearly 28,000 people per month in March through September from 2017 to 2019, versus 56,000 people per month in 2020 after the pandemic hit. This is a huge change in percentage terms, a doubling; however, in a country of some 330 million individuals, the shift can hardly be said to be earth-shaking. It is also noteworthy that this shift in net migration was, in almost all cases, driven more by a decrease in in-migration than an increase in out-migration. In other words, *“hundreds of thousands of people who would have moved into an urban neighborhood in a typical year were unwilling or unable to do so in 2020”* (Whitaker, 2021).

The moves in 2020 typically involved short distances. Using data on changes of address from the US Postal Service, (Wichter, 2021) found that the great majority of moves out of US cities were within the same US state or county.

The shift from urban areas to suburban areas in the USA has been smaller than expected to date, but might well prove to be important if it grows or is sustained over time. There could be major implications for municipal and regional planning in terms of the availability of schools, health services, transport, and other public services. Even a small shift might have large impact on vehicular traffic in some US urban areas.

The same migration trends that slow or reverse the growth of cities may have the positive effect of strengthening countries and regions that have historically suffered from a brain drain.⁷ Several countries have witnessed an increase in the number of returnees reversing the brain drain. It is already clear that many workers appreciate the opportunity to work from less developed provinces, towns, and even small villages (Ghiglione & V Romei, 2021). For hybrid workers, the trends already noted above that this is likely to mainly benefit towns and regions close to where the employers are located; however, workers who shift fully to WFH could in principle locate anywhere where power and internet are available.

8. Implications for public policy

Relatively little seems to have been done so far to promote WFH, or to ease the burdens that it places on workers.

WFH has some obvious advantages for governments that seek to foster sustainability and a green and digital transition. WFH reduces needless travel, thus reducing emissions. It reduces traffic congestion in central cities. With that said, one can nonetheless debate the degree to which public policy needs to actively encourage WFH; however, there seems to be a clear need to modernise existing business practices, work arrangements, and social protection policy. Public policy thus has an important potential role to play.

⁶ This is a nationally representative anonymous random sample of 5 percent of US consumers with a credit file, resulting in a sample of more than 10 million adults.

⁷ See for instance <https://southworking.org>.

We anticipate that, in a stable post-pandemic world, WFH would ideally be organised so as to (1) reflect the preferences of the worker, and (2) organised in most cases around a hybrid model where presence at the employer's premises alternates with WFH. WFH provides the opportunity to enable authentic spatial, temporal and decision-making autonomy for all, thus allowing businesses and workers to reap the full benefits. Public policy should support this evolution of WFH.

Ensuring *universal* broadband access at sufficient speeds to support WFH tools including online conferencing is a clear need. Plans are already in place in the USA (in the form of the Infrastructure Investment and Jobs Act) and in the EU (in the form of the "2030 Digital Compass: the European way for the Digital Decade" strategy) to achieve this in the coming years, but prompt and effective execution of these plans is called for.

Care for the emotional and mental well-being of workers in this brave new world is likely to require attention from policymakers. As noted earlier, for instance, WFH can lead to difficulty in distinguishing between work time and private time, which can in turn lead to overwork and stress.⁸ Public policy will need to help workers set boundaries. There are serious calls in Europe to implement a "right to disconnect". France, Spain, Belgium, Italy and Portugal have already proposed or enacted rules, and the European Parliament has called on the Commission to propose legislation to this effect (Yeung, 2021). The degree to which this should be regulatory versus recommended business practice is however not yet clear.

Women, especially women with caregiving responsibilities for young children, appear to have been especially disadvantaged by the pandemic, and continue to be at risk going forward. Measures to counteract this are needed, including a renewed focus on ensuring the availability of full day child care (including during a pandemic) (Stevenson, 2020).

As WFH becomes widespread, there are likely to be implications for education and training. The technology-driven changes that already suggest the need for a shift to lifelong learning (Petropoulos, Marcus, Moës, & Bergamini, 2019) are relevant here as well. There was already a need to ensure that workers who were displaced by technologies such as artificial intelligence have a chance to re-enter the work force, but lower skilled workers who are unable to benefit from WFH are likely to pose a related challenge that might perhaps be addressed with largely the same modernisation of systems for education and training. There may also be scope for education and training specifically geared towards helping those who were thrown out of work by the pandemic to enter the job market, for instance by targeting workers in sectors that were especially impacted such as air transport, food services, and accommodation. Low to medium skilled workers, including in particular workers displaced in those sectors, may have a particularly strong need for training in the digital skills that would

⁸ See also Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers and repealing Council Directive 2010/18/EU.

enable them to participate in higher-paying jobs that require the ability to operate on a WFH basis.

At the same time, the need for a shift to lifelong learning is not limited to those in low skill jobs. In the USA, college graduates in all fields experience rapid earnings growth after entering the job force, but earnings growth for graduates majoring in applied subjects such as computer science, engineering, and business subsequently declines rapidly over time, once again implying a need for a shift to lifelong learning (Deming & Noray, 2020).

The implications for the EU might be somewhat different than for the USA in these respects – EU education and training arrangements are less flexible or adaptable than those of the USA, but on the other hand vocational training in some of the EU Member States is advanced and effective. Aside from that, different measures may be needed because the USA is experiencing a shortage of workers as of early 2022.

Digital tools are another consideration. Workers and their employers have already invested time and money in online tools to facilitate remote interaction in a WFH setting (Barrero, Bloom, & Davis, 2021). These digital tools can potentially improve the health and safety of WFH workers if aptly designed, deployed and developed.

At the same time, network and information security for work performed at home is likely to need increased attention from employers, workers, and policymakers.

The use of these digital tools can also lead to a growing risk of surveillance of WFH workers, already increasingly visible with gig workers such as ride-hailing drivers (Petropoulos, Marcus, Moës, & Bergamini, 2019). As noted earlier, the AI technologies that have proliferated with WFH policies raise serious surveillance and privacy concerns (Aloisi & De Stefano, 2022 (forthcoming)). This is particularly true for lower wage workers who are more likely to have their productivity algorithmically measured. For WFH workers, this potentially invasive surveillance reaches into the home, a normally private domain. There is also the risk of discriminatory practices stemming from, or embedded in, algorithmic management and AI systems. There is thus an apparent role for public policy in setting guidelines and guardrails so as to protect workers not only from inappropriate loss of privacy and agency, but also from discrimination.

Social partners (employer organisations and trade unions) also have an important individual and collective role to play in contributing to a successful digital transformation that takes account of the needs of both employers and workers, and that thus represents a key enabler for WFH. This is at the heart of the 2020 EU framework agreement on digitalisation (ETUC, Business Europe, SME United, and CEEP, 2020), which seeks to provide a human-oriented and productivity-enhancing approach to integrating digital technology into the workplace. The parties to the agreement (Business Europe, SME United, CEEP and ETUC) have agreed that it should be implemented at national level by 2024. The European social partners have also addressed the issue of telework in a 2002 agreement.

In a world where WFH becomes more routine, companies will need to review their HR policies to make sure that training and promotion opportunities do not inappropriately disadvantage those who choose to work from home.

Most of the literature focuses on WFH performed by employees; however, largely the same issues also apply to the self-employed. There has been an active discussion in the EU on the need to strengthen social protection for the self-employed (or at least, for self-employed who do not have their own employees) that has now been embodied in a European Pillar of Social Rights, and more specifically in a Council Recommendation that seeks to strengthen social protection for non-traditional employees and for the self-employed. If these measures were fully implemented by the Member States – which is far from being the case today – they would likely go a long way toward solving the most serious social protection challenges that self-employed WFH workers face today.

Businesses likely need to re-think their processes to cope with a work force where hybrid work is common. Social partners likewise need to consider how to organise and preserve worker rights when workers are less frequently in contact with one another than was historically the case (Grzegorzcyk, Mariniello, Nurski, & Schraepen, 2021). For both businesses and social partners, they may have to adapt their practices and their thinking for a world where hybrid or total WFH is the preferred norm rather than a rare exception.

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