

THE HIDDEN INEQUALITIES OF DIGITALISATION IN THE POST-PANDEMIC CONTEXT

CRISTIANO CODAGNONE AND MARIA SAVONA

Digitalisation has a 'hidden' impact on employment, particularly on the invisible conditions of some jobs, as perceived by workers, that are relatively less explored in the literature and that could represent a substantial social cost, particularly in the aftermath of the financial crisis and the COVID-19 pandemic.

We start by summarising a few main challenges of digitalisation, with a focus on the additional challenges brought about by the pandemic, the rise of platforms and alternative work arrangements, and the current attempts to regulate these.

We then discuss the hidden aspects of inequality linked to the unmeasured side effects of digitalisation. Mental health in particular should be taken into account, particularly in the post-pandemic context, which has led to a significant amount of working from home. Also, the reduction of tasks previously done in the workplace in favour of remote working might limit social interactions, creativity and innovation potential. We conclude by suggesting areas for policy interventions.

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Cristiano Codagnone (cristiano.codagnone@unimi.it) is a Professor of Sociology at University of Milan

Maria Savona (m.savona@sussex.ac.uk) is a Professor of Economics of Innovation at University of Sussex, UK, and Professor of Applied Economics at Luiss University, Italy



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1 Digitalisation and the race between man and machine

A growing number of research contributions are assessing empirically the effects on the loss, reshuffling and/or precarisation of jobs of digital transformation and digital automation, including the application of artificial intelligence (AI) to production, accelerated by the pandemic. Such effects are also related to the regulatory framework and policy decisions taken by countries (and sectors) exposed to digitalisation and AI. One example of such an effect is the emergence of platform workers and other alternative work arrangements and self-employment (Ciarli *et al*, 2019; Baiocco *et al*, 2022), also referred to as non-standard work (NSW). There is a clear interconnection between digital automation (AI), and the spread of NSW, all of which impact on working conditions. The COVID-19 pandemic acted as a catalyst for these processes.

More broadly, automation is associated with the 'race between man and machine', though there is no certainty that machines or digitalisation will entirely displace human work (Acemoglu and Restrepo, 2018). The introduction of machines that fully substitute all human work seems unlikely (Aghion *et al*, 2019), while a certain degree of complementarity is likely to occur (Savona *et al*, 2022). Tolan *et al* (2020) showed that even the most intellectual tasks will be affected by digitalisation by way of the application of AI, but also that this process will not take over 'our jobs' entirely. The available estimates of machine substitution for human work are still very uncertain and differ widely. For example, Frey and Osborne (2017) estimated that 47 percent of jobs in the United States were at risk of digital automation, but this was balanced by more accurate estimates of only 9 percent of job loss from digital automation in OECD countries (Arntz *et al*, 2016). Savona *et al* (2022), in a systematic engineering and technical literature review of the scholarship produced over the last two decades on a set of digital automation technologies, showed that there are extremely heterogeneous patterns of tasks substitution, depending on the specific technology and the sector adopting it.

All this evidence represents only a tiny fraction of the varying effects of digital automation on labour markets. It offers only an elasticity of substitution, even in the more refined Routine Biased Technical Change (RBTC) version.

This paper unpacks the variety of aspects that underpin a labour elasticity coefficient and are linked to the heterogeneous conditions of digital automation adoption, the spread of NSWs, and their wider effects, including those that go beyond working conditions, such as mental health. We pay particular attention to the policy-relevant aspects of the findings.

We highlight the following aspects:

- Digital automation has affected working conditions quite broadly, beyond job loss, in several other important ways, including:
 - The surge in NSW, which has spiked also as a result of the COVID-19 pandemic and the work-from-home (WfH) trend;
 - The deterioration of the welfare of workers, including a surge in mental health issues.

We do not aim here to establish causal relationships between all these aspects. Rather we survey the most recent literature that has focused on each of these aspects, and attempt to provide a full empirical picture that can feed policymaking.

The paper is structured as follows: the next section offers considerations on relevant aspects of the post-pandemic trends, as discussed in Savona (2020, 2021); section 3 extends the reflections to NSW; in section 4, we look at the hidden aspects of inequality, such as mental health. In the last section, we summarise and set out challenges for policy, based on the final report of the European Commission-convened High Level Group Report on the Impact of Digital Transformations on EU Labour Markets (HLG, 2019)¹, which analysed the effects of digital transformation on EU labour markets.

2 Post-pandemic trends: the irony of essential services

It has been argued that properly tackling the current economic crisis and the impact of the pandemic on labour markets might require a whole new strategy of ‘building back better’ (UN, 2015, 2017²; ECLAC, 2020).

This section selectively unpacks the impact of COVID-19 on the economy, with a particular focus on digital transformation and the sectoral and occupational dimensions. It argues that the so-called ‘new normal’ is the result of a structural transformation of modes of production and consumption. The policies adopted to contain the pandemic have accelerated digitalisation. From a normative

¹ Maria Savona was a member of this group.

² The ‘build back better’ approach was developed by the United Nations in 2015 as a strategy intended to reduce the risks to people and communities of future shocks and disasters (United Nations, 2015, 2017). The approach focusses on “*integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems*” (United Nations, 2017), emphasising recovery, rehabilitation and reconstruction.

perspective, these structural transformations force us to consider what the ‘new essential’ might be, in terms of jobs and policy priorities, and arguably how it might be possible to ‘build back better’.

The opportunities for remote working have large occupational and sectoral specificities (Dingel and Neiman, 2020; del Rio-Chanona *et al*, 2020). Some anecdotal evidence seems to suggest that remote working is either for privileged, highly skilled and well-paid workers, or for precarious, self-employed gig workers. The global lockdowns accelerated the pace of remote working and exacerbated these differences (Adams-Prassl *et al*, 2020; Haldane, 2020).

Stuck in the middle are all the ‘essential services’ that are unsuited to remote working. Wholesale and retail services, including delivery services, transport and related services, personal care, social services, and healthcare are the essential services that played a crucial role during lockdowns. Essential-service occupations cannot be carried out from home ‘by design’, and yet are indispensable for the economy to retain a minimum of functioning when most economic activities are shut down.

In the United Kingdom during the pandemic, some 50 percent of information and communication service workers, 45 percent of professional and scientific service workers, and 40 percent of finance and real-estate service workers could turn to home working (Haldane, 2020; ONS, 2020; Pichler *et al*, 2020), whereas essential services are structurally unsuited to remote working.

It is hard to reconcile the irony of essentiality: in pandemics, the very notion of essentiality comes back to that of basic needs, while in normal times, these are the very activities that are seen as the main drag on productivity growth and the main source of cost disease. Either productivity performance should not be a consideration where essential services are concerned, or decades of productivity mismeasurement in services (Grassano and Savona, 2022) have misconstrued or ignored the feature of essentiality. This is not just an academic issue: it has consequences for the mechanisms and structures of remuneration for these activities. If the mechanisms of wage formation for essential jobs were rethought, the starting point would perhaps be to ignore the link with productivity, and to make wages for essential services commensurate with the well-being they provide³.

More generally, there are further important aspects of the impact the COVID-19 pandemic has had on remote working, and on the challenges of managing the effects of digital transformations on working conditions.

³ There is no space here to develop this argument further, but we hope to spark a debate and fruitful research around this topic, which the current crisis has allowed us to consider in depth.

One of these aspect concerns the long-term consequences of the global shift towards smart (remote) working, from which, as argued here, essential services are most likely to be excluded. The second aspect is the extent to which digital home working, in both its traditional and emerging forms, is to become entrenched (Alipour *et al*, 2021) and if it can be made more inclusive.

Haldane (2020) suggested two interesting potential long-term negative effects of home working. First, the lack of face-to-face interactions might lead to the loss of a fertile environment for the creative and novel ideas that are at the core of innovation. Second, the loss of social networks and the opportunity to exchange ideas informally might lead to a loss of social capital as existing social capital is eroded and new social capital is not formed. Haldane (2020, wrote: *“Whether it is creative sparks being dampened, existing social capital being depleted or new social capital being lost, these are real costs and costs which would be expected to grow, silently but steadily, over time. They weigh on the other side of the ledger when it comes to assessing the case for home working. They cast doubt on whether it will lead to the promised land of improved productivity and greater happiness”*.

This is all very plausible and applies to non-essential but highly-valued services. Services that are essential, but on which a low value is put, will most likely be immune to the risks of creative sparks being dampened or social capital lost, simply because they did not enjoy these things in the first place. Acknowledging the costs of home working is undoubtedly forward-looking, but recognising that the value of essential services is not reflected in their wages would be revolutionary.

3 Alternative work arrangements

Work allocated through online platforms, also referred to as crowd-employment (Codagnone *et al*, 2016; Codagnone *et al*, 2018; Codagnone *et al*, 2019; Bogliacino *et al*, 2020), is part of the most recent trend of digital transformation and automation. Remote working has accelerated the pace of growth in platform working and alternative work arrangements, a trend which started before the crisis (Ciarli *et al*, 2019; Bell and Blanchflower, 2018). Although these kinds of work arrangement are relatively new, they can be grouped under the heading of non-standard work (NSW), which pre-dates platform work. While platform workers present some peculiarities and raise novel policy challenges, they cannot be considered as a separate ‘silo’ totally unrelated to the diffusion of NSW. They are part of a broader trend toward casualisation of work and *“demutualisation of risks”* (Di Stefano, 2016, p.6). Platform workers, especially those engaging in multi-jobbing, have contractual arrangements with multiple parties, which makes it difficult to identify who their ‘employer’ is for purposes of collective bargaining or

compliance with health and safety obligations (Prassl and Risak, 2016). Also, they are excluded from various forms of social protection (Adams and Deakin, 2014a, 2014b). A number of regulatory issues affect crowd workers and are debated in a growing number of contributions (Aloisi, 2015; Cherry 2016; Cherry and Aloisi, 2016; De Stefano, 2016; Dokko *et al*, 2015; Hagi and Biederman, 2015; Prassl and Risak, 2016; Sprague, 2015). The same issues are mentioned in an OECD report on new forms of work in the digital economy, according to which most of the work in various platforms “*is likely to be some form of non-standard work*” (OECD, 2016, p. 22).

NSW has increased markedly in Europe since 1995, a trend that has occurred together with clear job polarisation. Between 1995 and 2010, the total number of routine jobs (ie accountants) fell by 12 points (53 percent to 41 percent), while high-skilled abstract jobs (ie designers) increased by ten points from 28 percent to 38 percent, and non-routine manual jobs (ie drivers) increased by three points from 18 percent to 21 percent (OECD, 2015, p.29). So, crowd employment can be seen as part of this broader trend, which implies that regulation already exists (Di Stefano, 2016).

The diffusion and implications of NSW have been addressed in various policy reports and academic articles⁴. NSW includes self-employed own-account workers not hiring other individuals, temporary or fixed-term contracts, and part-time work (OECD, 2015). In the EU (including the United Kingdom), part-time work amounts to one-fifth (19.5 percent) of workers aged 15-64. The figure has been on a slow but almost steady increase for the past ten years. Own-account self-employed workers represent 10 percent of total employment in the same age group, while the share of temporary work amounts to about 12 percent.

Since the mid-1990s therefore, a clear job-polarisation trend (U-shaped work force with the relative decline of middle-skilled jobs and an increase in high and low-skilled ones) has emerged in most OECD countries. As argued in OECD (2015a, pp.147-152), however, technological trends and the RBTC hypothesis tells only one part of the story. Job polarisation is clearly associated with de-standardisation of labour contracts, but there is no conclusive evidence the direction of causation between technology and institutional change. What is clear from the data is that routine jobs based on standard contracts (ie accountants) have been substituted by routine jobs in NSW forms, which is exactly happening also through online platform employment. If the disappearance of accounting jobs in the middle of the jobs hierarchy was entirely driven by technology, then such jobs could not have

⁴ Adams and Deakin, 2014a, 2014b; DiPrete *et al*, 2006; Eichhorst, 2013; Eichhorst *et al*, 2013; Eurofound, 2015; European Commission, 2014a, 2014b, 2015, 2016; European Trade Union Institute, 2012, 2015; International Labour Office, 1997, 2015; Kahn, 2012; Nunez and Livanos, 2014; OECD, 2014, 2015.

been substituted by individuals working under NSW conditions with the same skills as those laid off, which is what the data shows. Digital labour markets are “*moving the frontier at which machines still fail to carry out tasks by employing humans to help machines to learn*” (OECD, 2016, p.22).

In Codagnone *et al* (2018) and Bogliacino *et al* (2020), we conducted a survey in support of a European Commission initiative on extending social protection across different forms of employment. The respondents were about 8000 individuals⁵, with 1893 reporting that they generated income from online platforms, representing 25 percent of those in the sample who were not unemployed (7502). So, one quarter of the active population works via online platforms to generate income. In terms of socio-demographic characteristics, this survey broadly confirmed the findings of other surveys about platform workers (younger, highly educated, 50:50 gender balance). In terms of education, 33 percent of those working via platforms had a university or higher degree (15 percent had postgraduate degrees). More than half (55 percent) reported that working from home was advantageous, 34 percent said they have more flexibility, and only 11 percent said they could not find regular employment. This latter percentage, however, increased for individuals in lower income brackets and in certain countries.

In sum, this short discussion of alternative work arrangements, with a special focus on work intermediated by online platform, connects in three ways with the overall argument of this paper. First, it shows that digital automation is contributing to an already existing and increasing trend of alternative work arrangements. Casualisation of work long predates the emergence of the flexible work arrangements of working via online platforms. Second, it also adds to the argument that it cannot be assumed that all jobs will be substituted by AI. In the sample we reviewed, one quarter of the active population was performing both routine and quasi-routine tasks through the intermediation of digital platforms. Third, work ‘platformisation’ is clearly related to the question of remote working, the very recent adjustments in terms of working from home, and to the issue of essentiality. Even before the pandemic, respondents to the survey indicated that the main advantage of platform work was the possibility to work from home. This trend has dramatically accelerated because of the pandemic. On the other hand, online platforms act as intermediaries both for jobs that can be entirely conducted remotely, and those essential services mentioned in the previous section that require co-presence, such as transportation, handyman work in the homes of clients, and delivery services. The discussion

⁵The sample consisted of 8,000 respondents (800 per each of the 10 countries: France, Germany, Italy, Netherlands, Poland, Portugal, Romania Slovakia, Spain, Sweden) and was representative of the online population in each country but stratified as follows: a) 40% in open ended full or part-time work; b) 40% in NSW (temporary part- or full-time contract and self-employed); 20% unemployed or looking for a job.

on essentiality is therefore relevant – and possibly all the more so – for platform work as a form of alternative work arrangement.

While the trend towards the diffusion of NSW and platform work already accelerated during the last decade, it is increasingly evident that the pandemic has impacted this trend in various ways. For instance, Stephany *et al* (2020), using data from the Online Labor Index and from interviews with online freelancers in the United States, showed that the pandemic increased the number of workers working remotely online, in addition to the regular online freelancers. These authors further showed that the pandemic has widened the growing gap between different types of online remote work. For instance, while the demand for clerical and marketing work diminished, the demand for software and tech work increased.

A further phenomenon, in part associated with the deepening of remote digital work caused by the pandemic, is the increasing polarisation of work mediated by online platforms in three ways (Braesemann *et al*, 2022). The first is at global level, as most platform workers concentrate in North America, Europe and South Asia. A second divide is between urban and rural areas, with the former pulling most of the platform mediated work. Finally, there is a clear skill polarisation: workers possessing skills that are highly demanded earn more than other workers, who face a lot of competition, causing low wages.

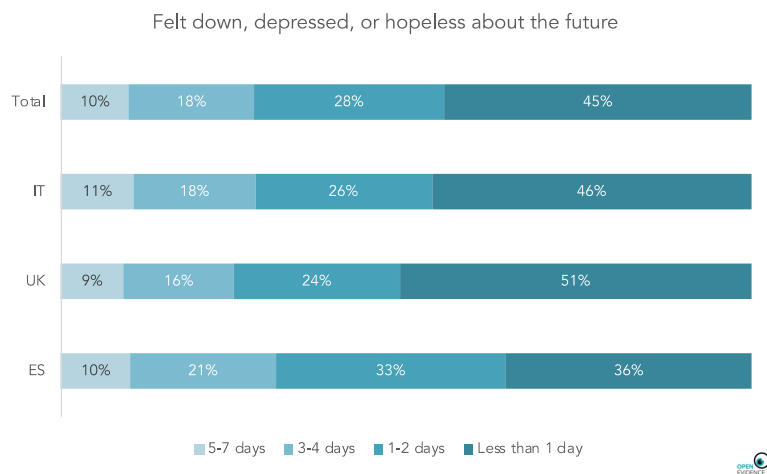
4 Other hidden aspects of inequality: mental health, expectations, behavioural changes and labour-market effects

This section focuses on the hidden aspects of inequality: those related specifically to the effects of digital automation on workers' conditions, which have been exacerbated by the pandemic. We focus on the mental-health effects of isolation and how they may shape expectations, behavioural changes, and labour market outcomes. The isolation produced by the lockdowns is very context-specific. Yet, it may also be taken by analogy and compared to the isolating effects that remote working may produce. To briefly discuss this aspect, we report the findings of three waves of a longitudinal research study (first wave N=10000; second wave N=5000; third wave N=3000) covering three countries (UK, Spain, Italy), designed by one of us to assess the effects of COVID-19 and lockdown (Open Evidence, 2020) on broadly defined mental health (Codagnone *et al*, 2020), cognitive capacity (Bogliacino *et al*, 2021), and by these channels on expectations and behavioural change (Codagnone *et al*, 2021). It is

important to note that this research documents a clear social gradient in terms of the extent of the effects [see Codagnone *et al*, 2020; Codagnone *et al*, 2021]⁶.

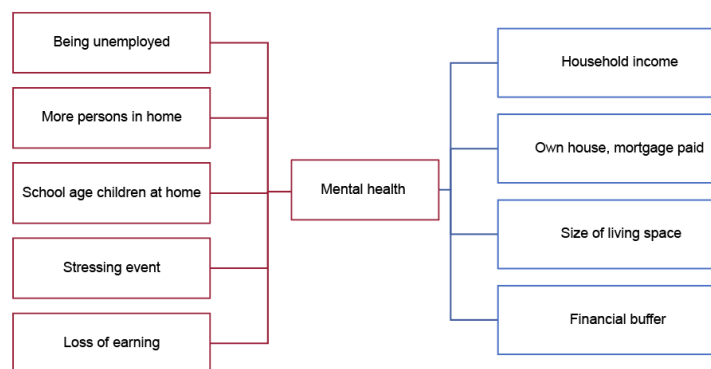
We found that the percentage of the population whose mental health was at risk was 46 percent in Spain, 41 percent in Italy and 42 percent in the UK (Open Evidence, 2020). Mental-health status is measured according to a psychometric scale including questions about depression, anxiety, lack of energy and lack of sleep. Figure 1 provides an example.

Figure 1: How often have you been bothered by the following in the past seven days?



Source: Open Evidence (2020).

Figure 2: Mental health vulnerability factors



Source: Open Evidence (2020).

⁶ In this section, we report some stylised descriptive facts from the main report available online (Open Evidence, 2020), while for more sophisticated inferential analysis the reader can refer to Bogliacino *et al* (2021), Codagnone *et al* (2020) and Codagnone *et al* (2021).

Figure 2 indicates that being unemployed, living with more people, having children of school age at home, experiencing a stressful event (ie losing a job), and loss of earnings increase psychological stress and its impact on mental health. On the contrary, having a relatively higher household income, owning a house without a mortgage to pay, having a relatively large living area and having the resources to pay bills over a period decrease stress levels. Unsurprisingly, those in the sample manifesting stress and depression reported pessimism about the future, fears, and some detrimental behavioural change (Open Evidence, 2020): 91 percent of the overall sample considered an economic depression somewhat likely and/or very likely (92 percent in Spain; 90 percent in the UK; 91 percent in Italy); 56 percent of the overall sample considered a permanent restriction on rights and freedom to be somewhat or very likely (65 percent in Spain; 50 percent in the UK; 54 percent in Italy). Most importantly, taking the sample as a whole, when respondents were asked to compare some behaviour in the four weeks prior to the survey to the same behaviour before the disease outbreak, 32 percent reported having used their savings, 41 percent said they had decreased their consumption of cultural products, 47 percent that they have stayed less in contact with people relevant for their career/status (or their future opportunities to get a job), and 23 percent that they had lapsed into an unhealthier life. Those who reported having stopped cultivating their instrumental social capital were those who were worst positioned in the labour market. This resonates with the argument previously cited about the potential loss of social capital that might be caused by isolation resulting from remote working.

On the actual effects of the pandemic crisis on jobs, estimates as of January 2021 produced by ILO (2020) indicated that during 2020 there was an unprecedented loss of 114 million jobs globally, with job losses more likely for women (5 percent) than for men (3.9 percent), and most likely for young people (8.7 percent). On the other hand, while the effect on young people may be short term, there is a risk that working women may be affected on a more permanent basis (Bateman and Ross, 2020; OECD, 2020a, 2020b; ILO, 2020). A first factor is that women overwhelmingly work in those sectors that were hit hardest in the pandemic: they represent 62 percent of employment in retail, 60 percent in accommodation, 53 percent in food and beverages and 47 percent in air transport⁷. Not surprisingly, across all regions, women have been more likely than men to become economically inactive, that is to drop out of the labour force, during this crisis (ILO, 2020: 9). A second factor is that women have faced more unpaid work at home, especially working mothers who are among those most hit by loss of jobs (Bateman and Ross, 2020). Women are also 72 percent of the healthcare work force and 90 percent of

⁷ OECD power point presentation available at: <https://www.oecd.org/coronavirus/en/data-insights/the-pandemic-has-not-improved-things-for-women> (retrieved 28/05/2021). The reported figures are OECD estimates on data from ILO (<https://ilostat.ilo.org/data/>).

long-term carers (OECD, 2020b). They have been at the forefront of the fight against COVID-19 and may in the future suffer from mild to severe post-traumatic stress disorder).

The policy implications of these developments are clear and urgent, both in general and with specific regard to women and young people. Hard-hit groups (low-skilled workers, young people and women) must be supported immediately and helped to find decent job opportunities, also to avoid a long-term scarring effect that is very likely given what we have shown about mental health status, expectations and behavioural change. The policy response must also be immediate and strong to support women, considering their specific condition and concerns. All policy response must embed a gender dimension, for gender equality must become a concrete goal in the post-pandemic new normality.

5 Digitalisation and labour markets: a summary of main policy challenges

Digitalisation and globalisation, together with changes in labour market institutions, regulations and policies, are drastically changing work relations. This has resulted in a reduced need for static hierarchies, fixed desks and long-term contracts, which are being replaced by flat management and temporary cross-functional teams, virtual workplaces, non-standard work and shorter contracts. These trends have been coupled with those that pertain to the post-pandemic context, such as the exacerbated polarisation between essential services and remote workers, the Great Resignation in the US and the 'quiet quitting' from jobs.

These changes pose several significant challenges to how workers, employers, intermediaries and other participants in the labour market interact. We focus on a few challenges that seem particularly relevant (Savona, 2020, 2021; HLG, 2019):

How can digital transformation be managed to ensure employment inclusion?

As discussed, remote working and digital jobs are only a symptom of a much deeper and longer-standing transformation of occupations and working models, long pre-dating (but accelerated by) the pandemic and the restrictions imposed by governments on some occupations. Digital transformations have in fact profoundly modified the structure of jobs and skills (see, among others, Goos and Manning, 2007; Mokyr *et al*, 2015).

The High Level Group Report on the Impact of Digital Transformations on EU Labour Markets (HLG, 2019) unpacked the effects of digitalisation trends on several occupations⁸. While the literature dealing with the effects of digitalisation on occupations and tasks has produced robust findings, sketched also in section 1, what is missing is a systematic effort to devise policies that tackle potential side effects, mentioned in section 4. The policy recommendations offered by HLG (2019) have proved to be somewhat prophetic in the context of the post-pandemic crisis.

A skilled workforce

The abrupt shift to home working and the need to shield at-risk categories, including those with hidden disabilities, have shown that one of the most important requirements for survival in current labour markets is for workers to acquire digital literacy and update their digital skills. Workers might not be aware of the need or might not have the opportunities and access to invest in their digital skills. If so, policymakers can organise digital skills personal learning accounts that belong to workers and are portable from job to job. Details such as contributions, the number of hours per year, top-ups, eligible expenses, withdrawal processes and taxation schemes are important, and are being in some cases implemented, though not much is known yet about their effectiveness.

New labour relations and a new social contract

The combination of the abrupt shift we have discussed and the effects of lockdown have put a dramatic strain on workers' mental health. The HLG (2019) recommendations emphasised the need to prevent occupational safety and health risks such as mental health and stress-related issues emerging from digitalisation and increased volatility in today's world of work. What is needed is to increase the focus on prevention in employee-assistance programmes, and to improve uptake by increasing social acceptance of mental-health issues through informed discourse. The crisis is an unprecedented opportunity to increase public expenditure in the health sector, and governments should plan a substantial expansion of mental-health programmes.

One of the most inclusive steps governments could and should take in the wake of the crisis, as proposed in HLG (2019), is to equalise the (administrative) treatment of standard and non-standard work arrangements, for example by providing equal access to government services and credit lines, and limited benefits mobility regardless of employment status.

⁸ The focus on jobs and occupations necessarily led to a limit on the scope of the analyses and recommendations. However, the issue of access to broadband and more in general of digital exclusion, due to income, race and age, is crucial.

Along the same lines, it is important to ensure neutral social protection against unemployment, sickness and other life circumstances, independently of employment status. The increasing numbers of workers with non-standard employment should have access to social protection, eg through portable benefits attached to the worker rather than the job, or the establishment of 'underemployment insurance' to smooth out fluctuating incomes in the gig economy.

These structural, forward-looking actions could well be spillovers from government spending on furlough schemes to tackle the COVID-19 crisis. We advocate a combination of context-specific and structural interventions that would not only cover the emergency but would ensure long-term inclusivity in labour markets.

Digitalisation, worker wellbeing and work-life balance

Workers, employers and policymakers play a key role in determining the trade-offs for worker physical and mental health and overall wellbeing from new workplace technologies. Policies should help build worker wellbeing into company culture. Examples are offering preventative medical check-ups (eg to prevent 'tech-neck' injuries), and training staff to recognise and address stress in colleagues (due to 'organisation change fatigue' and 'learned helplessness' from workplace digitalisation). A focus on mental-health issues seems particularly important because, unlike many physical conditions, mental-health conditions can be denied for a long time by the individual, both to themselves and to those around them.

These policies can be based on recent experiences with employee-assistance programmes (EAPs), offered to help employees navigate challenges at work and in their personal lives. Many employees can access early support related to topics like marital challenges, anxiety and stress – thus providing an early-stage prevention approach that has proven to be cost effective for employers. As well as improving morale within firms, studies show that through investments in EAPs, companies can increase worker productivity and reduce absenteeism costs.

In sum, occupational safety and health risks are rising in part because of digitalisation. Although more evidence is needed to determine the emerging trade-offs for worker health and wellbeing from new workplace technologies, policies should focus on prevention through EPA-type programmes and improve uptake by increasing social acceptance through informed discourse and the delivery of personalised, cost-effective solutions enabled by technology.

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Bruegel, Rue de la Charité 33, B-1210 Brussels
(+32) 2 227 4210
info@bruegel.org
www.bruegel.org