



**HAL**  
open science

# Who bears the burden of a pandemic? COVID-19 and the transfer of risk to digital platform workers

Paola Tubaro, Antonio A Casilli

## ► To cite this version:

Paola Tubaro, Antonio A Casilli. Who bears the burden of a pandemic? COVID-19 and the transfer of risk to digital platform workers. *American Behavioral Scientist*, 2024, 68 (8), pp.961-982. 10.1177/00027642211066027 . hal-03369291

**HAL Id: hal-03369291**

**<https://hal.science/hal-03369291v1>**

Submitted on 7 Oct 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# Who bears the burden of a pandemic? COVID-19 and the transfer of risk on digital platform workers

## Authors

Paola Tubaro, Laboratoire Interdisciplinaire des Sciences du Numérique (LISN), CNRS / Université Paris-Saclay / Inria, France. Email: [paola.tubaro@inria.fr](mailto:paola.tubaro@inria.fr)

Antonio A. Casilli, SID-SES Department, Interdisciplinary Institute for Innovation (i3), Telecom Paris /Polytechnic Institute of Paris, France. Email: [antonio.casilli@telecom-paris.fr](mailto:antonio.casilli@telecom-paris.fr)

## Authors' bios

Dr Paola Tubaro is Full Research Professor at the National Centre for Scientific Research (CNRS, in French *Centre National de la Recherche Scientifique*). Her current research explores the human platform labor underlying the digital economy and the artificial intelligence industry. She also studies the ethical dimension of big data and machine learning, and their effects on privacy. She has published in peer-reviewed journals such as *Big Data & Society*, *Sociology*, and *Social Networks*.

Dr. Antonio A. Casilli is Full Professor of sociology at Telecom Paris, the telecommunication school of the Polytechnic Institute of Paris, and a researcher at the Interdisciplinary Institute on Innovation (i3). His research foci are digital labor, data governance, and human rights. He is the author of the award-winning book *En attendant les robots* (Editions du Seuil, 2019) and one of the co-creators of the documentary mini-series *Invisibles. The Click Workers* (France Télévisions, 2020).

## Abstract

In this paper, we analyze the recessionary effects of the COVID-19 pandemic on digital platform workers. The crisis has been described as a great work-from-home experiment, with platform ecosystems positing as its most advanced form. Our analysis differentiates the direct (health) and indirect (economic) risks incurred by workers, to critically assess the portrayal of platforms as buffers against crisis-induced layoffs. We submit that platform-mediated labor may eventually increase precarity, without necessarily reducing health risks for workers. Our argument is based on a comparison of the three main categories of platform work – “on-demand labor” (gigs such as delivery and transportation), “online labor” (tasks performed remotely, such as data annotation) and “social networking labor” (content generation and moderation). We discuss the strategies that platforms deploy to transfer risk from clients onto workers, thus deepening existing power imbalances between them. These results question the problematic equivalence between work-from-home and platform labor. Instead of attaining the advantages of the former in terms of direct and indirect risk mitigation, an increasing number of platformized jobs drift toward high economic and insuppressible health risks.

## Keywords

Platforms, digital labor, risk, work-from-home, COVID-19.

## Introduction

The unprecedented magnitude of the COVID-19 pandemic has adversely impacted the lives and livelihoods of billions of people. According to some estimates, 6 out of 10 persons around the world have been in some form of lockdown (Ménard et al. 2021). Labor markets have been particularly affected, as 93% of the world's workers reside in countries which have put in place workplace closure measures. The International Labor Organization estimates working-hour losses equivalent to 255 million full-time jobs throughout 2020, compared to the last quarter of 2019, four times greater than during the global financial crisis in 2009 (ILOSTAT, 2021).

Both in private and public sectors, firms have put in place adjustments to mitigate the adverse effects of the pandemic, adopting digital solutions to rapidly reconfigure their work processes. Apart from pressure towards "forced automation" (Autor & Reynolds, 2020), whose long-term effects are difficult to estimate, in the short run technology has mainly been instrumental in accelerating adoption of remote work. The health crisis has been characterized as a great work-from-home experiment (Berg, Humblet, & Soares, 2021). This phenomenon is wider than telework, which prior to COVID-19 was accessible to employees under specific contractual arrangements.

Although increasingly popular, telework is far from constituting a new standard for labor. The occupations that can be performed at home do not cover the totality of available jobs. Even in higher-income economies, only one-third of existing jobs can be performed entirely at home, with dramatic variations across cities and industries. In lower-income countries the estimate drops to levels as low as 10%, due to economic, occupational, and infrastructural constraints (Dingel & Neiman, 2020). Indeed even when telework is possible in principle, not all workers have suitable equipment (computer, broadband, printer, headphones etc.), and a dedicated workspace at home.

If the pandemic has not generalized pre-existing forms of telework, it has created unprecedented room for another type of technology-mediated contingent work, centered on digital platforms. The effects of COVID-19 on labor cannot be fully grasped without considering that the pandemic has taken place during the age of "platform capitalism" (Srnicsek, 2016). Leveraging digital systems that algorithmically match supply and demand, platforms have crowded out traditional intermediaries in many markets both local and global, challenging established modes of production, exchange, and consumption. They have disrupted labor markets, offering non-standard earning opportunities not only to tech-savvy software engineers, but to a wide array of workers in sectors as diverse as delivery and transportation, data entry and content moderation.

Digital platform labor has been characterized as a generalization of job insecurity, stepping back on workers' rights and social protection (De Stefano, 2016). In this sense, the portion of it that can be performed remotely constitutes a significant departure from stable and formally recognized work from home. Nevertheless, platforms offer an easy access to earning opportunities for workers ousted from their previous occupations, especially in times of crisis. The economic downturn of the late 2000s "was an important spur to early platform participation" (Schor, 2020, p. 101). In 2020-21, financial need combined with the drive toward, but limited accessibility of, telework, have brought platforms to the fore. Considering the specific hazards created by COVID-19 for workers' health and safety, we thus ask first whether platform-based work opportunities may compensate to some extent for the loss of permanent jobs, and second, how platform labor compares to non-platform jobs when it comes to pandemic-induced risks. Answers to these questions have implications for debates around the future of work and platform capitalism alike.

To address these questions, we combine theories of the risk society and an economic-sociological approach to platforms, seen as coordination devices that leverage data-intensive processes to intermediate labor. Risk sociology interprets COVID-19 as a clear illustration of the interplay of large-scale threats and major advances in science and technology. Risks and opportunities do not affect populations uniformly but follow social and digital divides, whereby the better-resourced have more ability to control their exposure and minimize adverse consequences.

Combining this approach with the literature on platforms indicates that digitization is not always a protective factor, and that resorting to technology-mediated work to reduce human contacts and to lower contagion risks may deepen existing inequalities. Digitization of work organization through platforms involves individualization and precarization of the labor relationship. It fragments jobs into sets of standardized and “datafied” tasks that feed into the productive processes that shape contemporary developments in automation and artificial intelligence (Casilli & Posada, 2019).

In what follows, we discuss how platforms have largely managed to shift pandemic-related risks on their workers whilst prioritizing their own interests. We distinguish between direct health risks and indirect economic risks, and compare the three main categories of platform work – “on-demand labor” (gigs such as delivery and transportation), “online labor” (tasks performed remotely such as data annotation) and “social networking labor” (content generation and moderation). Risk management emerges as a key tool through which platforms control labor and tip the power balance toward capital. At the time of writing this article, the amount of available data is limited, and measures of the economic impact of the pandemic on labor markets are partial at best. Our contribution leverages published sources, both academic and non-academic, to launch a theoretically-informed debate on these issues. As far as the growing global population of platform workers comes out on the losing end of this risk-allocation process, then the potential role of platforms as buffers against COVID-19 induced recession is largely illusory.

## **How inequalities affect direct and indirect risks in the pandemic**

The coronavirus pandemic is the most recent example of the place of risk in contemporary societies. Risk is partly a by-product of their development (Beck, 1992) in that today’s intense flow of goods and people around the globe has contributed to the rapid spread of the virus. Paradoxically, increased production of risk through manipulation of nature coexists with lowered tolerance for risk among segments of the population, who demand that risk be “managed” even when it is technically difficult to do so. Theories of the risk society initially disregarded the potential effects of axes of social differentiation such as gender, class and ethnicity, and expected social conflicts to develop around allocation of risks at individual rather than group level (Beck, 1992, 2009). Subsequent research acknowledges the role of socio-structural factors in shaping exposure to and experience of risks. Overlapping dimensions of inequality are especially noteworthy: “access to medication, sanitation and good food, for example, differentially distributed across gender and age groups in many countries, is a determining factor in the likelihood of becoming infected with tuberculosis” (Olafsson et al., 2014). The causal effect is bi-directional as risks may deepen inequalities by intensifying both the social sources of suffering of the least privileged and the power of the most fortunate (Curran, 2016). This happens when, for example, an infection is more likely to strike disadvantaged individuals (because they have limited access to health information, lack social security, or live in polluted areas), thereby widening the gap that separates them from the better-off.

The management of these risks is largely devolved onto the individual (Giddens, 1991). Public and private actors urge individuals to take control of their lives, including their own health, by monitoring threats and opportunities in their environment and adopting recommended behaviors. Throughout the COVID-19 pandemic, individuals have been constantly reminded of the need to minimize their contacts with potentially infected venues, objects, and people. However, individuals are not equal in their capacity to manage their exposure to risk. Among the best positioned, are those who have been able to smoothly shift to digitally-enabled work from home (Robinson et al., 2020). Besides access to technologies, it is along socio-economic dividing lines that the opportunity to work remotely is distributed. According to the European Foundation for the Improvement of Living and Working Conditions (2020), the strongest single correlate of working from home during the crisis was the educational level of the employee, with further variation depending on sector of activity. Longitudinal UK data show that employees in higher-paying jobs are more likely to be able to work

from home, and the pandemic-induced surge in homeworking has further increased their average pay (Office for National Statistics, 2020).

Among the people who could not telework, those least able to prevent contacts with potentially contaminated environments are workers whose out-of-home activities are deemed essential and have had to continue throughout the pandemic, despite scarcity of masks and gloves at the beginning, ranging from healthcare professionals and hospital staff to grocers and garbage collectors. With few exceptions, these categories disproportionately include lower-income, less qualified workers. Their case clearly illustrates how digital and social inequalities are rendering certain subgroups significantly more vulnerable to exposure to COVID-19. The digitally resourced who can telework have additional tools to mitigate some of the risks associated with the pandemic; and the digitally resourced who cannot telework (like medical doctors) can at least move part of their consumption and leisure activities online, a possibility that is hardly open to lower-class workers without know-how and equipment (Robinson et al., 2020).

In many countries, uncertainty about the magnitude of the threat, its consequences and its impact on healthcare systems have led the authorities to go beyond delegation of responsibilities to individuals (Giritli Nygren & Olofsson, 2020), to impose radical lockdown or at least restrictions to people's freedom to move around and meet others. But as often happens in risk management, efforts to counter one risk open the way to other – complementary, competing or substitutable – risks. The most obvious concurrent risks are economic in this case<sup>1</sup>, and have been felt primarily by workers (and companies) that could not easily switch to telework, and were not deemed sufficiently essential to be authorized to continue their activity: for example wedding planners, hairdressers, performance artists, flight attendants and restaurant waiters. These activities simply had to stop for variable durations – from few weeks to few months, often repeatedly over the first year of the pandemic – generating significant income losses for the workers and organizations concerned. These risks sometimes generate non-compliance, risk denial (Peretti-Watel, 2003) and open opposition to the approach of the authorities, as has been seen in anti-lockdown protests in countries like Britain, Germany, and the USA.

In light of risk society theories, two types of risks stand out in the recent pandemic: the (direct, primary) health risk of becoming infected and the (indirect, secondary) economic risk of losing income. The effort of many workers to actively manage these risks, to regain some control over the means and conditions of their productive activity, has brought platform labor to the fore as a potential solution. Figure 1 summarizes our questioning and sets the stage for the main lines of our argument. The vertical axis represents health risk (low in the bottom panel, high in the top one) and the horizontal axis represents economic risk (low to the left, high to the right). The relative positions of non-platform salaried workers represented on these axes have to be interpreted indicatively, mainly for comparison purposes. It appears clearly that salaried telework represents an advantage, protecting from both health and economic risks. Instead, “essential” non-digital occupations expose workers to high health risk but comparatively protect them from economic risk, while non-digital occupations forced to inactivity under lockdown limit health risk but are hard hit by economic risk.

The remainder of this paper aims to complete this diagram by adding the relative positions of platform workers. Are they positioned close to salaried teleworkers? Before addressing this question, though, we must first provide some background on platforms as intermediaries in labor markets, and as sources of labor demand.

---

1 Other concurrent risks, for example in terms of increased domestic violence or mental health issues that may arise as people lose the right to leave their homes, do not concern platform labor and are beyond the scope of this paper.



**Figure 1:** Mapping of different types of workers to the type of risk incurred. The horizontal axis represents economic risk (left = low, right = high), the vertical axis represents health risk (bottom = low, top = high). The position of each group on the diagram is indicative. Source: Authors' elaboration.

## Digital platforms and new modes of labor organization

In essence, platforms are firms that deploy a digital infrastructure to bring together two or more user groups (Srnicsek, 2016), specifically workers and clients in the case of labor platforms. Because the client-worker relationship lasts the time of a single project or task, excluding any long-term commitment, workers are typically construed as self-employed, the platform posing as a mere intermediary. This classification has been repeatedly challenged in courts in different countries (De Stefano, 2016; Prassl, 2018), on the grounds that many of these platforms actively manage and control workers, making them economically dependent (Rosenblat, 2018). Today in the European Union, only about 8% of platform workers have alternative statuses such as temporary agency work and zero-hour contracts (Centre for European Policy Studies, 2021).

Different typologies have been proposed to categorize labor platforms (Codagnone, 2016; Schmidt, 2017; Howcroft & Bergvall-Kåreborn, 2019; Vallas & Schor, 2020). Most of them distinguish between platforms for services that require physical presence in a given place (ride-hailing, delivery) and platforms for online-only services that can be performed remotely (translation, data entry). Another common distinction is between highly-skilled services (computer programming) and low-skilled ones (running errands). We rely on this basic scheme and enrich it through the typology elaborated in Casilli (2019), which in addition to these dimensions, explicitly takes into account the labor demand emerging from social networking sites, in the “digital labor” scholarship tradition (Scholz, 2012). On this basis, we distinguish three main types which we will call, respectively, “on-demand” platforms, “online labor” platforms and “social networking” platforms.

### ***On-demand labor platforms***

On-demand, or “gig economy” platforms bring together clients and small-service providers in specific locations. Well-known examples are ride-hailing platforms such as Uber and Lyft that connect two groups of users, passengers and drivers, and delivery platforms like Deliveroo and UberEats that intermediate between as many as three groups of users, that is, diners, restaurants and couriers. Most of the services they offer (driving, delivering) are performed offline and require physical presence in a given place, even if intermediation occurs online. The skills involved are often low-to-medium, though with some variation across platforms and countries.

All gig economy platforms require workers to own their equipment, and in this sense, they all imply a mix of labor and capital. Admittedly, the investment that workers make varies: many can afford a bike to cycle for Deliveroo, while few have properties to rent via Airbnb. Nevertheless, they can all be considered platform workers. Even if Airbnb does not aim to create a parallel labor market, it nudges its hosts into engaging in concrete productive activities in line with the company’s brand image, recommendations and policies (Bruni & Esposito, 2019).

### ***Online labor platforms***

Online-only labor platforms perform digital intermediation for services that can be executed remotely from home. Because they are not geographically constrained, they are often international in scope, resulting in a division of labor in which services tend to flow from workers in South- and South-East Asia to clients in North America and Europe (Graham, Hjorth, & Lehdonvirta, 2017). Online laborers are formally independent contractors like gig-economy providers, and are typically paid by piecework. Online labor is not without linkages to telework (Huws, Korte, & Robinson, 1990). In the 1980s, some companies restructured their operations by engaging former employees as subcontractors, sometimes offering them loans to buy their own equipment, so that their self-employment status could not be challenged. This trend gradually facilitated the spread of forms of non-standard employment, now booming through platforms (McCarthy, 2020).

Within this broad category, the literature distinguishes two sub-groups: freelancing platforms like Upwork that connect clients (usually, businesses) and highly qualified professionals such as graphic designers, software developers and writers, and “micro-working” platforms like Amazon Mechanical Turk, where clients fragment large data projects into small tasks and allocate them to masses of anonymous providers. Examples of micro-tasks include labeling objects in images, categorizing tweets, recording utterances, and transcribing short audio clips. Difficult to automate but requiring relatively low human skills, these tasks serve the data needs of the digital economy, especially the burgeoning artificial intelligence industry (Tubaro, Casilli, & Coville, 2020). The boundaries between these two groups are fuzzy, as freelancing platforms often offer lower-skilled jobs while micro-tasks are sometimes demanding (Tubaro, 2021), and both groups engage in active professional learning (Margaryan, 2019). A more salient difference (Casilli, et al., 2019) is that workers and clients independently negotiate the specifics of a project and its price on freelancing platforms, while clients are monopsonists that impose their conditions and prices on micro-work platforms (Dube, Jacobs, Naidu, & Suri, 2020).

### ***Social networking platforms and their workers***

Social networking platforms such as Facebook and YouTube connect advertisers with users who create and/or consume content such as images, videos and texts. They are not labor intermediaries in themselves, but their very functioning generates a strong demand for both paid and unpaid human workforce. Prosumers, amateurs, fans, volunteers and simple users all participate in generating value

which is captured by these platforms. Whether these largely unpaid activities constitute consumption or “unwaged free labor” has fueled a scientific controversy stretching over two decades (Terranova, 2000; Arvidsson & Colleoni, 2012). With increasing commercialization of web use, though, focus has progressively shifted to remunerated labor on networking platforms, such as that of social media influencers, click-farmers, community managers, and commercial content moderators (Ong & Cabañes, 2018; Gillespie, 2018; Lindquist, 2019). Specifically, the latter are paid to filter out violent, pornographic, illegal, and otherwise disturbing content. They ensure compliance with the law, and with platforms’ policies, which makes their work delicate and difficult to automate (Roberts, 2019).

Some of this work is fragmented into small tasks and distributed to micro-workers via the above-mentioned platforms, and in this respect, it shares the same risks and opportunities as other types of micro-tasks. But moderators may take on extra roles as internet forum admins, online support agents, and curators who select “quality” information from websites. As such, they are embedded in diverse organizations ranging from highly-secretive vendors working for tech giants, to boutique companies which design tailored services for e-commerce or brand websites, and call center-like operations located in emerging or developing countries. Due to the sensitive nature of the content they deal with and the confidentiality agreements they sign, the members of these teams are not typically allowed to work from home. They are sometimes hired by sub-contractors as fixed-term salaried employees, so that they can work at their employer’s premises. In this case, moderators enjoy better job security than gig workers and online laborers, but their main problems are low pay and the mental-health costs of constant exposure to distressing contents.

Importantly, content moderation is hard to automate and continues to require human intervention. Facebook’s effort since the mid-2010s to fight the spread of political propaganda and false news is an example. When, in 2016, it was revealed that the platform’s trending news section was not fully automated, but managed by an external team, the company quickly dismantled it and allegedly replaced it with an artificial intelligence (Nunez, 2016). However, the new system quickly fell prey to abuse and manipulation. Moderation was then reintroduced for fact checking, and again entrusted to external subcontractors relying on human workers (Thielman, 2016).

We now examine how these three types of platforms, and their workers whether formally classified as contractors or employees, have managed COVID-19 related risks. We focus on the precarious and low-income figures of workers just presented because they are typical products of the platform organizational model and because their particularly weak position calls for scholarly and policy attention. We exclude the stable salaried workers who are directly employed by the companies that manage platforms, ranging from engineers, computer programmers and data scientists, to sales and marketing officers.

## **How on-demand platforms have managed to transfer risk on workers**

On-demand platforms that arrange for offline gigs through online tools have been openly and repeatedly criticized for evading responsibilities toward workers in the interest of corporate advantage. In part, they have done so through a geographical strategy, managing their local market penetration from their global position so as to make national employment laws difficult to apply (Graham, 2020). They could not be immune to the effects of COVID-19, and the lockdown and distancing measures imposed to counter it, precisely because the gigs they offer happen in physical space. We argue that two sub-categories of on-demand platform labor can be distinguished, depending on platforms’ capacity to shift health risk from clients onto workers, in order to maintain sufficiently high levels of demand. Where physical distancing could not be applied, platforms were impacted by lower demand and suffered income losses. Their workers often had to make the difficult decision of continuing activity despite restrictions – thereby facing health risk – or to interrupt them –



exposing themselves to economic risk. Where they managed to reassure clients about physical distancing, instead, platforms thrived, appropriating all the advantages of a sustained market activity. Their workers could continue their gigs and maintain their income, but had to bear the related health risk.

To see this, let us first look at those platform-mediated gigs whose demand has plummeted under lockdown or shelter-in-place measures. In 2020, Uber's total revenue decreased by 14%, and Airbnb's by 30%, compared with 2019 (Uber Technologies, 2021; Airbnb, 2021). In May 2020, both companies reduced their workforce by a quarter, corresponding to approximately 6,700 employees at Uber, and 1,800 at Airbnb. This count refers to salaried staff such as engineers and accountants, without considering formally-independent Uber drivers and Airbnb hosts.

These services cannot be offered under COVID-19 health recommendations: a ride requires some degree of physical proximity and a short-term rent involves some traveling, both strictly prohibited under lockdown and still discouraged after restrictions started to be eased. There is evidence that some drivers continued working through the pandemic for fear of economic losses, and thus put both themselves and their clients at risk (Ravenelle, Kowalski, & Janko, 2021). In most cases, however, clients' demand was so low that drivers (and Airbnb hosts) were forced to inactivity. In this sense, the COVID-19 crisis has amplified and made visible the economic vulnerability of these gig workers, deprived of suitable forms of support against fluctuating customer demand. Even workers who participate in the platform economy by virtue of their personal assets (cars and properties in the two cases discussed here), and could in principle have more control over their interaction with customers, have had to face the consequences of low demand. To face these concurrent risks, Uber implemented a financial assistance policy to support impacted drivers, and Airbnb set up a fund of \$250 million to help hosts affected by COVID-19-related cancellations (Uber Technologies, 2021, p. 52; Airbnb, 2021). These policies were not without limitations (Independent Workers' Union of Great Britain, 2020), and it can be argued that they were merely meant to maintain the two companies' user base stable: if, for example, hosts left Airbnb as a result of their losses, the platform's future business would suffer even in a scenario of rebounding travel (Airbnb, 2021). However according to Katta et al. (2020) these policies could be leveraged to promote change in these companies' approach to labor: in the case of Uber, they could be seen as implicitly acknowledging "significant control over the conditions, health, and even survival of its drivers, making it far more than the proprietor of a digital marketplace" (p. 205). In sum, the cost has been high both for platforms and for their workers.

In other cases, demand for platform-mediated gigs has skyrocketed. As the authorities of many countries imposed the closure of restaurants to counter the spread of COVID-19, delivery services like Deliveroo, Glovo and UberEats became the only way to keep these businesses alive – the "last mile" that connected them to diners forced to shelter at home. If Uber's Mobility gross bookings declined 44% in 2020 compared with 2019, its Delivery branch grew 110%, driven by stay-at-home order demand related to COVID-19 (Uber Technologies, 2021). From its earlier focus on restaurant meals, the platform expanded its delivery services to groceries, alcohol, and other goods (with some variation across countries). Other platforms such as Deliveroo (2021) also report strong growth as food delivery services have become the oil in the wheel of an economy functioning at lower speed, with limitations to people's mobility and to gathering opportunities.

One secret to this success has been "contactless" delivery which protects clients from contact with riders, thus lowering infection risks. Platforms such as Deliveroo, Glovo and UberEats have advertised it explicitly, while others have simply adapted their procedures to minimize physical contacts (for example, by waiving clients' signature at reception of orders). However, the work of riders cannot be

entirely contactless, as they must still circulate in public spaces and touch potentially contaminated surfaces such as doorbells and handles. In other words, platforms have taken out as much health risk as possible from clients and shifted it onto workers, who have been left individually responsible to apply hygiene recommendations and protect themselves. Put differently, platforms have offered their clients a means to externalize the new risks of everyday life onto workers. This was particularly apparent in the early days of the pandemic, when personal protective equipment such as gel, gloves and masks were scarce. Some court decisions prompted a change in this approach, requiring platforms to recognize the health risks to which workers were exposed, and to provide them with protective equipment (Wikilabour.it, 2020). But overall, workers in the on-demand delivery economy have not been able to reap the full benefits of the growing demand for their services.

## **Oversupply of online labor during the COVID-19 crisis**

Online labor platforms where work can be performed remotely, are best positioned to apply distancing measures. Especially international platforms are able to keep health risks down, partly because their workforce is distributed across countries and is therefore less affected by any national restrictions, partly because they routinely operate from the assumption that there will be no physical meetings between clients, platform managers and workers. However, online labor platforms can be affected by the indirect economic risks that have emerged as a result of the measures taken to counter health risks. We can best conceptualize the consequences by referring to the two competing hypotheses proposed by Stephany, Dunn, Sawyer, and Lehdonvirta (2020): a *distancing bonus effect*, whereby demand for online labor grows as companies switch from on-site staff to remote providers, and a *downscaling loss effect*, whereby demand diminishes as companies facing declining revenues reduce non-essential costs.

If this distinction summarizes well the two possible outcomes that may be observed, two questions should be asked: first, which process outweighs the other? Second, how are benefits and costs distributed between clients, workers and platform owners/managers? In what follows, we argue that the online labor platforms that have best coped with downscaling loss risks are those that have managed to shift most of these risks onto their workers, letting their numbers soar to be able to contend with a more variable customer demand, while keeping labor costs low.

Let us start the discussion by looking at the high end of this market, where the services of highly qualified freelancers are traded. Based on transaction data from a sample of top international platforms, Stephany et al. (2020) show that downscaling loss was prevalent during the first phases of the pandemic, but was followed by a rebound since April 2020. This positive effect greatly benefited platforms such as Upwork, whose total returns had been on a downward trend for months, but bounced back very quickly and brought the company in line with industry averages by the end of the year (Upwork, 2021, p. 116).

According to Stephany et al. (2020), the observed distancing bonus has been driven by demand for IT and software services, due to the rapid push towards videoconferencing and other remote operations, while downscaling loss has continued for other areas of online labor. Other data confirm these findings: the freelancing platform Malt surveyed its professionals in France, Germany and Spain, showing that the majority of them suffered from assignment cancellations due to the pandemic, but tech specialists were among those least affected (Malt-Boston Consulting Group, 2021). There have been initiatives to alleviate the economic hardship of adversely impacted freelancers, such as a Freelancers' Union Fund to which Upwork also contributed. Whilst welcomed by many freelancers, these moves served to maintain a sufficiently high market volume as clients' demand was at its lowest, so as to keep platforms afloat.

The possible scenarios are the same at the lower-skilled end of online labor, namely micro-work. If clients hold back their digital spending or cancel orders, then downscaling loss will prevail; if they invest in technology to limit human contacts in the post-COVID pandemic workplace, then distancing bonus effects will dominate. The data available at the time of writing this paper are limited and depend on platforms' communication policies, but they give preliminary support to the latter scenario. Appen, an Australia-based global market leader, reports overall growth in 2020 driven by acceleration in online advertising and e-commerce, despite COVID-related disruptions affecting some of its customers. Its micro-workers can be seen as the "last mile" (Gray & Suri, 2017) of the digital services that supported our economies during lockdown by doing tasks that consisted, among other things, in checking the relevance of search engine results after a given query. While their contribution is little visible, partly because it does not accommodate the narrative of technological progress that digital industries proudly promote (Tubaro & Casilli, 2019), platforms have invested to leverage this potential in 2020. For example, Crowd Guru explicitly targeted businesses that sought to speed up their digitalization process to manage their forced, pandemic-induced switch to telework (Schaarschmidt, 2020).

Micro-workers can also be seen as the last mile of artificial intelligence research on COVID-19. Throughout 2020, major investments have been made in "smart" technologies to support better understanding of the virus and its effects on the human body, to monitor recovering patients and to improve early-warning tools (see for example Organization for Economic Cooperation and Development, 2020). To be effective, these tools have to "learn" from high-quality datasets, such as thoracic scans with manual annotations that indicate relevant parts such as the lungs and heart. Some micro-working platforms and start-ups have sought to leverage this human potential. For example California's General Blockchain, previously a producer of image data for computer vision algorithms in the retail and fashion industries, launched a new service relying on human micro-workers to annotate medical images for COVID-19 diagnosis<sup>2</sup>. Scale AI, which also specializes in visual data, offered free data annotation services (also performed by micro-workers) to researchers studying the virus (Scale AI, 2020).

If most of these platforms have ensured continuity of service, they have done so to the benefit of capital rather than labor. The reason is excess supply, as unemployment in workers' local area pushes them toward these platforms, at least in the short run (Borchert et al., 2018). Appen notices "a record number of new contractor applications", which "has further added to the diversity of our crowd, and to the depth and breadth of our contractor skill base" (Appen, 2021, p. 22). The German Clickworker proudly announced reaching 2 million registered workers in April 2020, while most of Europe was under lockdown, growing further to attain 2.8 million in the first semester of 2021 (Clickworker, 2021). Stephany et al. (2020, p. 568) report an excess supply even of the highly demanded IT and software freelancers, at least in the USA, because the number of registered profiles with these competencies has increased more spectacularly than demand for their services.

Oversupply of online labor power keeps low the price of labor, and nullifies workers' capacity to negotiate, let alone organize. It is not exclusively a product of the pandemic, and it is mainly situated in lower-income countries (Graham & Anwar, 2019). But COVID-19 unveils its previously unrecognized role as a risk-management strategy. A large supply of labor is an asset for platforms, as it ensures that even unpredictable peaks of demand can be met: for example Appen (2020) explicitly included an increase in the number of available workers among the factors supporting its performance. Through open registrations, platforms shave off economic risk at least in part, whilst leaving it to individual workers to manage this risk for themselves, for example through constant watch to secure access to tasks as soon as they are published.

---

2 General Blockchain owns two services, the micro-tasking app Microwork.io which specializes in raw data generation, and ImageAnnotation.ai which relies on paid humans to enrich datasets for the AI industry. Details on the COVID-19 program are at <https://www.imageannotation.ai/COVID-19>, accessed 3 July 2021.

In this sense, COVID-19 magnifies the uncertainties associated with online labor, and showcases the vulnerabilities to which workers are exposed by the very fact of depending on one-off platform-intermediated contracts instead of stable jobs. If digitization can be a protective factor against contagion risks channeled by physical encounters (Robinson et al., 2020) – and the teleworking-by-design of online platform labor provides an advantage compared to other earning activities in this respect – it is ironically also one of the factors that have enabled platformization and with it, precarization of labor and volatility of income. There is always a high degree of economic risk associated to online platform labor, and the pandemic exposes it clearly to view.

## **The double standards regarding social media workers**

Among the wide array of social media workers, commercial content moderators constitute a compelling case to study the global effects of COVID-19. As mentioned above, they do not normally work from home and their activity is difficult to automate. At the beginning of the pandemic, Facebook's CEO Mark Zuckerberg admitted the adverse effects of the absence of human moderation (Nover, 2020). Between March and April 2020, some of the countries where moderators operate including Ireland, Spain and parts of the Philippines, imposed restrictive lockdown measures. Other platforms faced similar issues (Roberts, 2020). YouTube posted the following message at the beginning of the crisis: "IMPORTANT: because of COVID-19, we will be conducting less human moderation to protect the health of our workforce". Twitter acknowledged that, with human moderation limited by the pandemic, "automatic systems lack context and perspective" and are therefore bound to misclassify content (Gadde & Deralla, 2020). Despite a decentralized moderation infrastructure meant to soften the effects of unexpected events, the temporary closure of major moderation centers heavily disrupted moderators' activity.

At the peak of the crisis, social networking companies were quick to authorize the majority of their staff to work from home, but much less willing to extend this permission to content moderators as "some of this work must be done from the office for safety, privacy and legal reasons" (Biddle, 2020). After the first month of lockdown, in several countries, Facebook "prioritized" moderators for a swift return to the office (Hatmaker, 2020). It can be argued that the home-based digital infrastructure cannot entirely "substitute" for the commercial digital infrastructure.

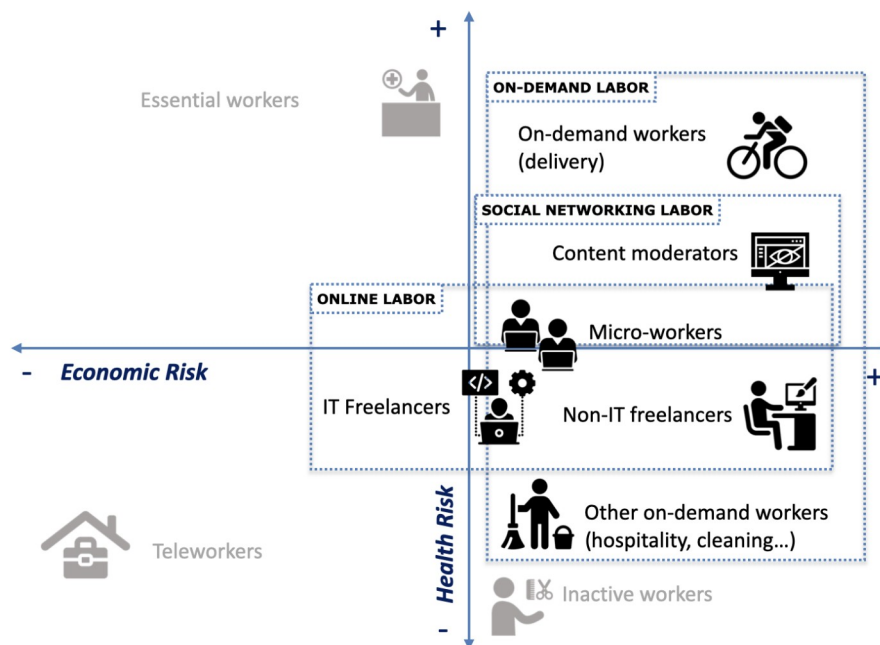
Within the frame of our analysis, moderators are particularly interesting because their activities are entirely digitized (and as such can be likened to online labor), yet less amenable to work-from-home. Thus moderation involves some degree of physical proximity (as in on-demand labor), with disproportionate exposure to health risk. Notice that those moderators who are salaried employees did not necessarily lose their jobs even when they were forced to inactivity: in this sense, even if little paid, they are better protected against economic risks than platform workers. The economic risk is nevertheless offset by the higher health risk. The re-opening plans of social media companies impose a double standard in the way they treat moderators (incentivized by their employers to return to office) in comparison to other workers (many of whom have been able to work from home for much longer). In an effort to minimize human contacts and the risk of further waves of contagion, content moderators could not leverage their high level of digitization to substitute for perilous in-person activities.

Overall, if commercial content moderators differ from Deliveroo couriers and Appen micro-workers under many respects, they share with them the burden of risk, which their employers leave them alone to manage. It is in their case primarily the health risk associated with human contacts in their office and the commuting necessary to reach that office. This adds to the psycho-social risks they routinely face by being exposed full-time to disturbing contents – ironically, to the purpose of protecting social media users from the risk of inadvertently bumping into problematic images or text. Only recently (and unrelated to the COVID-19 crisis) has Facebook recognized that this job can cause

health issues, and agreed in a landmark settlement to pay compensation to diagnosed moderators, in addition to adjusting their working conditions to reduce impact (Newton, 2020).

## Discussion and conclusions

Figure 2 is a development of Figure 1 and summarizes our main results. As already mentioned, relative positions have to be interpreted indicatively, mainly for comparison purposes. Delivery couriers who take the risk of moving around town are in the top panel because they face high health risk, and they tend to be placed to the right because their economic risk is limited but not inexistent, as they face high volatility of demand. The on-demand workers that had to interrupt their activity under lockdown or stay-at-home rules, like Uber drivers, are those that face the highest economic risk, and are therefore placed to the right of the plot. Lockdown protects them from health risks, but they have an incentive not to comply: if income losses are too heavy, and support from either the government or the platform is insufficient, they may be tempted to offer their services anyway, thereby facing an increased health risk. Online laborers are largely in the bottom-right corner because they face virtually no health risk, but high economic risk. They are all in over-supply but micro-workers and especially IT freelancers are slightly more protected (tending toward the left) because demand for their services has not plummeted. One specific form of online labor, micro-work, partly overlaps with social networking labor, as some micro-workers act as content moderators. Nevertheless, commercial content moderation cannot be reduced to remote micro-tasks. In most cases this activity requires working out-of-home, which raises the health risk without necessarily mitigating the economic one. For this reason, they are mostly situated in the top-right panel.



**Figure 2:** Mapping of different types of platform workers to the type of risk incurred. The horizontal axis represents economic risk (left = low, right = high), the vertical axis represents health risk (bottom = low, top = high). Platform workers are represented in black, other workers are represented in gray. The position of each group on the diagram is indicative. Source: authors' elaboration.

Although these stylized categories of platform workers may occupy multiple positions or move across them, the economic recession triggered by the health crisis makes it more difficult to move from a platform “gig” to formal employment. Yet the opposite movement is not unlikely. Salaried teleworkers who lost their jobs as a result of the pandemic (as several thousand Uber and Airbnb employees, laid off in May 2020) may register on a platform as freelancers and move from the bottom-left to the bottom-right quadrant. Some workers temporarily forced to idleness (such as restaurant waiters) have also started using platforms, and in some cases, they may move from the bottom-right to the top-right quadrant. While these transitions can take manifold shapes and are hard to predict, it is clear that as long as they involve participation in some form of platform labor, they will never move workers toward the bottom left corner.

An important point that emerges from our analysis is that the safe haven of a job with low health and low economic risks is not a stable equilibrium state towards which platform work converges. Despite common discourses about the increasing pervasiveness of telework, the latter does not exist in an occupational vacuum. On the contrary, in pandemic times, teleworkers compete against platform workers, and new risks of job instability arise. Some teleworkers may become unemployed or have their job outsourced to a platformized workforce, although no clear evidence is available at the time of writing this paper.

In general, most movements will be from left to right (high economic risk), while some will go from bottom to top (high health risk). This is due to the very nature of platforms and the strategies they have put in place to organize labor. Indeed, the COVID-19 pandemic has brought to light how digital platforms apply a management style that revolves around transferring the burden of risk to their own workforce. Casilli & Posada (2019) stress four dimensions along which platforms manage economic coordination in ways that distinguish them from both markets and firms: reliance on data to create value, extraction of these data from multitudes of users in the form of labor, taskification of users’ behaviors, and active contribution to the development of automation and artificial intelligence. We can now add a fifth dimension: risk management, undertaken in ways that place as much of the burden as possible onto individual workers as well as on public welfare institutions. Compared to traditional risk management techniques, such as purchasing insurance, in which risk was transferred to a third party, this amounts to shift the risk internally, among the constituencies of each platform’s ecosystem.

Understanding platforms’ approach to risk and its linkages with labor organization is an important step toward a more comprehensive description of these new economic actors and the way in which they shape contemporary capitalism. These results have a bearing on policy, as they suggest that further platformization is not necessarily a suitable response to the coronavirus-induced crisis, in that it may increase (especially economic) risk for growing parts of the global workforce, at least in the short run. Rather, it is necessary to take steps to mitigate the drawbacks of job insecurity and lack of social protection for the workers concerned, in long-term perspective. Starting points should be the reflection on fairer working conditions on platforms (Graham & Woodcock, 2018), the increasingly numerous regulations (such as California’s AB 5 of 2019) and rulings that require reclassification of on-demand platform workers as employees, and efforts to devise alternative models of platformization (Scholz & Schneider, 2016).

## References

- Airbnb (2021). *Annual Report 2020*. Retrieved from [https://s26.g4cdn.com/656283129/files/doc\\_financials/2020/q4/84dcc076-235d-4520-805c-0e64b6fe8c40.pdf](https://s26.g4cdn.com/656283129/files/doc_financials/2020/q4/84dcc076-235d-4520-805c-0e64b6fe8c40.pdf).
- Appen. (2021). *Annual Report 2020*. Retrieved from <https://appen2020.qreports.com.au/>
- Appen. (2020). *Company update on COVID-19. ASX announcement*. Retrieved from <https://appen.com/investors/announcements/>
- Arvidsson, A., & Colleoni, E. (2012). Value in informational capitalism and on the Internet. *Information Society*, 28(3): 135–150.
- Autor, D.H., & Reynolds, E.B. (2020). *The Nature of Work After the COVID Crisis: Too Few Low-Wage Jobs*. Washington, D.C.: Brookings Institution. Retrieved from: [www.brookings.edu/research/the-nature-of-work-after-the-covid-crisis-too-few-low-wage-jobs/](http://www.brookings.edu/research/the-nature-of-work-after-the-covid-crisis-too-few-low-wage-jobs/)
- Beck, U. (1992). *Risk Society: Towards a New Modernity*. London: SAGE.
- Beck, U. (2009). *World at Risk*. Cambridge, UK: Polity.
- Berg., J., Humblet, M., & Soares, S. (2021). *Working From Home: From Invisibility to Decent Work*. Geneva: International Labor Organization (ILO). Retrieved from [https://www.ilo.org/global/publications/books/forthcoming-publications/WCMS\\_765806/lang--en/index.htm](https://www.ilo.org/global/publications/books/forthcoming-publications/WCMS_765806/lang--en/index.htm)
- Biddle, S. (2020). Facebook contractors must work in offices during Coronavirus pandemic — while staff stay home. *The Intercept*, March 12. Retrieved from <https://theintercept.com/2020/03/12/coronavirus-facebook-contractors/>
- Borchert, K., Hirth, M., Kummer, M.E., Laitenberger, U., Slivko, O., & Viète, S. (2018). *Unemployment and online labor*. Mannheim: ZEW Discussion Paper n. 18-023. Retrieved from <http://ftp.zew.de/pub/zew-docs/dp/dp18023.pdf>
- Bruni, A.E., & Esposito, F. (2019). Digital platforms: Producing and infrastructuring users in the age of Airbnb. In Meyer, U., Schaupp, S., & Seibt, D. (Eds.). *Digitalization in Industry between Domination and Emancipation* (pp. 207-232). London: Palgrave Macmillan.
- Casilli, A.A. (2019). *En attendant les robots. Enquête sur le travail du clic*. Paris: Seuil.
- Casilli, A.A., Tubaro, P., Le Ludec, C., Coville, M., Besenval, M., Mouhtare, T. & Wahal, E. (2019). *Le micro-travail en France. Derrière l'automatisation, de nouvelles précarités au travail?* Report of the Digital Platform Labor (DiPLab) Project. Retrieved from <http://diplab.eu/>
- Casilli, A.A., & Posada, J. (2019). The platformization of labor and society. In Graham, M., & Dutton, W.H. (Eds.). *Society and the Internet. How Networks of Information and Communication are Changing Our Lives* (second ed., pp.293-306), Oxford: Oxford University Press.
- Centre for European Policy Studies (CEPS). (2021). *Digital labour platforms in the EU. Mapping and business models*. Luxembourg: Publications Office of the European Union.
- Clickworker. (2021). *Clicworker Company Presentation*. Retrieved from <https://cdn.clickworker.com/wp-content/uploads/2021/04/Company-Presentation-2021.pdf>
- Codagnone, C., Abadie F., & Biagi, F. (2016). *The future of work in the 'sharing economy'. Market efficiency and equitable opportunities or unfair precarisation?* Brussels: Publications Office of the European Union.

- Curran, D. (2016). *Risk, Power, and Inequality in the 21st Century*. London: Palgrave Macmillan.
- Deliveroo. (2021). The IPO Prospectus (March 2021). Retrieved from [https://dpd-12774-s3.s3.eu-west-2.amazonaws.com/assets/8116/1643/5610/Deliveroo\\_-\\_Prospectus.pdf](https://dpd-12774-s3.s3.eu-west-2.amazonaws.com/assets/8116/1643/5610/Deliveroo_-_Prospectus.pdf)
- De Stefano, V. (2016). Introduction to the special issue: crowdsourcing, the gig-economy and the law. *Comparative Labor Law & Policy Journal*, 37(3): 461–470.
- Dingel, J.I., & Neiman, B. (2020). How many jobs can be done at home? *Journal of Public Economics*, 189, 104235, DOI: 10.1016/j.jpubeco.2020.104235
- Dube, A., Jacobs, J., Naidu, S., & Suri, S. (2020). Monopsony in online labor markets. *American Economic Review: Insights*, 2(1): 33-46.
- European Foundation for the Improvement of Living and Working Conditions (Eurofound). (2020). *Living, working and COVID-19*. Luxembourg: Publications Office of the European Union.
- Gadde, V., & Derella, M. (2020). An update on our continuity strategy during COVID-19. *Twitter Blog*, Apr. 1. Retrieved from [https://blog.twitter.com/en\\_us/topics/company/2020/An-update-on-our-continuity-strategy-during-COVID-19.html](https://blog.twitter.com/en_us/topics/company/2020/An-update-on-our-continuity-strategy-during-COVID-19.html)
- Giddens, A. (1991). *Modernity and Self-Identity. Self and Society in the Late Modern Age*. Cambridge, UK: Polity Press.
- Gillespie, T. (2018). *Custodians of the Internet: Platforms, Content Moderation, and the Hidden Decisions that Shape Social Media*. New Haven: Yale University Press.
- Giritli Nygren, K., & Olofsson, A. (2020) Managing the COVID-19 pandemic through individual responsibility: the consequences of a world risk society and enhanced ethopolitics. *Journal of Risk Research*, 23(7-8): 1031-1035, DOI: 10.1080/13669877.2020.1756382
- Graham, M. (2020). Regulate, replicate, and resist – the conjunctural geographies of platform urbanism. *Urban Geography*, 41(3): 453-457.
- Graham, M., & Anwar, M. (2019). The global gig economy: Towards a planetary labour market? *First Monday*, 24(4), DOI: 10.5210/fm.v24i4.9913.
- Graham, M., Hjorth, I., & Lehdonvirta, V. (2017). Digital labour and development: impacts of global digital labour platforms and the gig economy on worker livelihoods. *Transfer: European Review of Labour and Research*, 23(2): 135-162, DOI: 10.1177/1024258916687250.
- Graham, M., & Woodcock, J. (2018). Towards a fairer platform economy: Introducing the Fairwork Foundation. *Alternate Routes*, 29: 242-253.
- Gray, M., & Suri, S. (2017). The humans working behind the AI curtain. *Harvard Business Review*, 9 January, 2-5.
- Hatmaker, T. (2020). Facebook wants content reviewers back ASAP, slows return plan for most employees. *TechCrunch*, April 16. Retrieved from <https://techcrunch.com/2020/04/16/facebook-content-moderators-wfh-when-will-facebook-employees-return/>
- Howcroft, D., & Bergvall-Kåreborn, B. (2019). A typology of crowdwork platforms. *Work, Employment and Society*, 33(1):21–38, DOI: 10.1177/0950017018760136
- Huws, U., Korte, W.B. & Robinson, S. (1990). *Telework: Towards the Elusive Office*. Hoboken, NJ : Wiley.
- International Labor Organization – Statistical Department (ILOSTAT). (2021). *ILO Monitor: COVID-19 and the world of work. Seventh ed.* Geneva: International Labor Organization (ILO). Retrieved from



[https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms\\_767028.pdf](https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_767028.pdf)

Independent Workers' Union of Great Britain (IWGB). (2020). Deliveroo COVID-19 hardship funds are unworkable; IWGB Couriers send demands to "gig economy" employers. Retrieved from <https://iwgb.org.uk/en/post/deliveroo-COVID-19-hardship-funds-are-unworkable-iwgb-couriers-send-demands-to-gig-economy-employers>

Katta, S., Badger, A., Graham, M., Howson, K., Ustek-Spilda, F., & Bertolini, A. (2020). (Dis)embeddedness and (de)commodification: COVID-19, Uber, and the unravelling logics of the gig economy. *Dialogues in Human Geography*, 10(2): 203–207, DOI: 10.1177/2043820620934942

Lindquist, J. (2019). Illicit economies of the Internet: Click farming in Indonesia and beyond. *Made in China Journal*, 3(4): 88-91.

Malt-Boston Consulting Group (BCG). (2021). *Freelancing in Europe 2021*. Retrieved from <https://web-assets.bcg.com/77/62/07a1c84f4be6b671ca10ec16f6f1/malt-bcg-freelancing-in-europe-2021.pdf>

Margaryan, A. (2019). Workplace learning in crowdwork: Comparing microworkers' and online freelancers' practices. *Journal of Workplace Learning*, 31(4), 250-273, DOI: 10.1108/JWL-10-2018-0126

McCarthy, H. (2020). *Double Lives: A History of Working Motherhood*. London: Bloomsbury.

Ménard, J., Foucreault, A., Leduc, H., Meunier, S., & Trépanier, S.-G. (2021). A diary study on when and with whom recovery experiences modulate daily stress and worry during a COVID-19 lockdown. *Frontiers in Psychology*, 12: 620349, DOI: 10.3389/fpsyg.2021.620349

Newton, C. (2020). Facebook will pay \$52 million in settlement with moderators who developed PTSD on the job. *The Verge*, May 12. Retrieved from <https://www.theverge.com/2020/5/12/21255870/facebook-content-moderator-settlement-scola-ptsd-mental-health>

Nover, S. (2020). Facebook labeled 50 million pieces of COVID-19 misinformation in April. *AdWeek*, May 12. Retrieved from <https://www.adweek.com/brand-marketing/facebook-removed-50-million-pieces-of-COVID-19-misinformation-in-april/>

Nunez, M. (2016). Former Facebook workers: We routinely suppressed conservative news. *Gizmodo*, May 9. Retrieved from <https://gizmodo.com/former-facebook-workers-we-routinely-suppressed-conser-1775461006>

Organization for Economic Cooperation and Development (OECD). (2020). *Using artificial intelligence to help combat COVID-19*. Retrieved from <https://www.oecd.org/coronavirus/policy-responses/using-artificial-intelligence-to-help-combat-covid-19-ae4c5c21/>

Olofsson, A., Zinn, J.O., Griffin, G., Giritli Nygren, K., Cebulla, A., & Hannah-Moffat, K. (2014). The mutual constitution of risk and inequalities: intersectional risk theory. *Health, Risk & Society*, 16(5): 417-430, DOI: 10.1080/13698575.2014.942258.

Ong, J.C., & Cabañes, J.V.A. (2018). Architects of networked disinformation: Behind the scenes of troll accounts and fake news production in the Philippines. *The Newton Tech4Dev Network report*, DOI DOI: 10.7275/2cq4-5396.

Office for National Statistics (ONS). (2020). *Homeworking hours, rewards and opportunities in the UK: 2011 to 2020*. Retrieved from

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/homeworkinghoursrewardsandopportunitiesintheuk2011to2020/2021-04-19>

Peretti-Watel, P. (2003). Neutralization theory and the denial of risk: Some evidence from cannabis use among French adolescents. *The British Journal of Sociology*, 54(1): 21-42, DOI: 10.1080/0007131032000045888.

Prassl, J. (2018). *Humans as a Service: The Promise and Perils of Work in the Gig Economy*. Oxford: Oxford University Press.

Ravenelle, A.J., Kowalski, K. C., & Janko, E. (2021). The side hustle safety net: Precarious workers and gig work during COVID-19. *Sociological Perspectives*, DOI: 10.1177/07311214211005489.

Roberts, S.T. (2019). *Behind the Screen: Content Moderation in the Shadows of Social Media*. New Haven: Yale University Press.

Roberts, S.T. (2020). Over\*Flow: Digital humanity: Social media content moderation and the global tech workforce in the COVID-19 era. *Flow Journal*, March 19. Retrieved from <https://www.flowjournal.org/2020/03/digital-humanity/>

Robinson, L., Schulz, J., Khilnani, A., Ono, H., Cotton, S.R., McClain, N., Levine, L., Chen, W., Huang, G., Casilli, A.A., Tubaro, P., Dodel, M., Quan-Haase, A., Ruiu, M.L., Ragnedda, M., Aikat, D., & Tolentino, N. (2020). Digital inequalities in time of pandemic: COVID-19 exposure risk profiles and new forms of vulnerability. *First Monday*, 25(7), DOI: 10.5210/fm.v25i7.10845.

Rosenblat, A. (2018). *Uberland: How Algorithms Are Rewriting the Rules of Work*. Berkeley: University of California Press.

Scale AI. (2020). Supporting researchers and our community during COVID-19. Blog post, March 17. Retrieved from <https://scale.com/blog/scale-ai-COVID-19-research>

Schaarschmidt, M. (2020). Das Virus als Katalysator für eine digitale Transformation? Crowd Guru Blog, March 31. Retrieved from <https://www.crowdguru.de/blog/digitalisierung-in-zeiten-von-COVID-19/>

Schmidt, F. (2017). *Digital labour markets in the platform economy: Mapping the political challenges of crowd work and gig work*. Bonn: Friedrich-Ebert-Stiftung.

Scholz, T., & Schneider, N. (eds.). (2016). *Ours To Hack and Own: The Rise of Platform Cooperativism, a New Vision for the Future of Work and a Fairer Internet*. New York: OR Books.

Scholz, T. (2012). *Digital Labor: The Internet as Playground and Factory*. New York: Routledge.

Schor, J. (2020). *After the Gig: How the Sharing Economy Got Hijacked and How to Win It Back*. Oakland: University of California Press.

Srnicek, N. (2016). *Platform Capitalism*. Cambridge, UK: Polity Press.

Stephany F., Dunn M., Sawyer S. & Lehdonvirta V. (2020). Distancing bonus or downscaling loss? The changing livelihood of US online workers in times of COVID-19. *Tijdschrift voor economische en sociale geografie*, 111: 561-573, DOI: 10.1111/tesg.12455.

Terranova, T. (2000). Free labor: Producing culture for the digital economy. *Social Text*, 18(2): 33-58.

Thielman, S. (2016). Facebook fires trending team, and algorithm without humans goes crazy. *The Guardian*, Aug. 29. Retrieved from <https://www.theguardian.com/technology/2016/aug/29/facebook-fires-trending-topics-team-algorithm>

Tubaro, P. (2021). Disembedded or deeply embedded? A multi-level network analysis of online labour platforms. *Sociology* (online first), DOI: 10.1177/0038038520986082.

Tubaro, P., Casilli, A.A., & Coville, M. (2020). The trainer, the verifier, the imitator: Three ways in which human platform workers support artificial intelligence. *Big Data & Society*, 7(1), DOI: 10.1177/2053951720919776.

Tubaro, P., & Casilli, A.A. (2019). Micro-work, artificial intelligence and the automotive industry. *Journal of Industrial and Business Economics*, 46(3): 333–345, DOI: 10.1007/s40812-019-00121-1.

Uber Technologies. (2021). Annual Report 2020. Retrieved from [https://s23.q4cdn.com/407969754/files/doc\\_financials/2021/ar/FINAL-Typeset-Annual-Report.pdf](https://s23.q4cdn.com/407969754/files/doc_financials/2021/ar/FINAL-Typeset-Annual-Report.pdf)

Upwork. (2021). Annual Report 2020. Retrieved from <https://investors.upwork.com/static-files/3e32780b-95da-429b-9f36-22b5e508d6f7>

Vallas, S., & Schor, J.B. (2020). What do platforms do? Understanding the gig economy. *Annual Review of Sociology*, 46(1): 273-294, DOI: 10.1146/annurev-soc-121919-054857.

Wikilabour.it (2020). Speciale emergenza COVID-19. Web page, April 27. Retrieved from <https://www.wikilabour.it/>