

Research article

Covid geographies of home and work: privileged (im)mobilities?

David McCollum*

University of St Andrews

Abstract

For hundreds of millions of people globally, the covid-19 pandemic has fundamentally re-ordered the relationship between where one resides and where one's paid work is done. Much ink has justifiably been spilled on the nature, drivers and consequences of these novel geographies of home and work. This analysis, drawing on the UK Household Longitudinal Study (UKHLS), seeks to generate novel insights into the socially and spatially uneven experiences of work related mobilities during this crisis. The findings illustrate significant differences in the characteristics and circumstances of those who did and did not get to work from home during the peak of the pandemic. These distinct cleavages, it is argued, are emblematic of deeper entrenched inequalities.

Keywords: covid-19, inequality, mobility, UK Household Longitudinal Study, working from home.

Introduction

It is well documented that the covid-19 pandemic has been a major global health and socio-economic catastrophe (Wang et al., 2022; World Bank, 2022). One of its many implications is a likely fundamental structural change in working practices and associated residential preferences, brought about by the widespread switch to remote working during the pandemic (Parry et al., 2022). Aided by advances in Information and Communications Technology, remote work (mainly in the form of homeworking) was becoming gradually more commonplace prior to the pandemic, but was greatly accelerated by it (Felstead, 2021). Soon after the introduction of the first lockdown measures in spring 2020 it is estimated that as much as half of the workforce in the UK was doing at least some of its work from home (Felstead and Reuschke, 2021; Mutebi and Hobbs, 2022). This rapid and dramatic change in the geography of home and work has spurred a body of literature that has examined the drivers, effects and short and also potentially longer-term consequences of homeworking (De Fraja et al., 2021; Wethal et al., 2022; Deole et al., 2021). This paper focuses on inequalities in remote working. Just as the material and psychological costs of covid-19 have been borne unequally

between populations and across space (Sidik, 2022; Blundell et al., 2022), so too has the privilege of immobility during a public health crisis.

An evidence base is already emerging which has explicitly paid attention to how the covid induced changes in how and where work is done have benefitted some more than others. Prominent areas of enquiry in this respect include gender (Chung et al., 2021; Feng and Savani, 2020) and housing (Horne et al., 2021; Preece et al., 2023) related disparities in experiences of homeworking. Likewise governments and social commentators have been attentive to the unevenly distributed benefits and limitations of remote working (Scottish Government, 2022; New York Times, 2020). Whilst there undeniably has indeed been a significant shift from work being done from outside to inside of the home, enthusiastic narratives abound of a 'new normal' of widespread digital mobilities and corresponding physical immobilities (Freudendal-Pedersen and Kesselring, 2021). Take for example Parry et al's proclamation in their recent Work After Lockdown report: 'hybrid working is the new workforce expectation. The evidence of our research is that there has been a permanent mindset shift around how work can be organised, and that "the grand experiment that nobody wanted" has worked' (2022: p.8). This paper is aligned with the body of evidence which contends that understandable interest in this transition neglects inequalities in privileged (im)mobilities. As others have noted and the analysis which follows demonstrates, the majority of the workforce never actually worked from home during the pandemic. This includes during the height of covid in terms of restrictions and fatalities (early 2021 in the case of the UK). Post-pandemic, only about a fifth of the workforce works mainly from home. The objective of this research is thus to contribute to the emerging evidence base on that majority of the workforce who did not have the privileged immobility of working from home during covid and to consider how these fissures relate to wider social and spatial inequalities. It does so through a quantitative analysis of a nationally representative dataset, which builds a detailed profile of the characteristics and circumstances of those who did and did not work from home in early 2021. This analysis adds nuance to the wider understanding that the pandemic created a systemic divide in WFH. It offers originality in this respect by utilising nationality representative and robust survey data, collected at the peak of the pandemic. Also novel is the comprehensive account of the characteristics of the WFH divide, including its geography, the use of modelling to elucidate the statistical determinants of WFH and an emphasis on those who never WFH that goes beyond Keyworkers.

Literature review

Government mandated restrictions on movement during the covid-19 pandemic led to an unprecedented global reduction in human mobility, which has had potentially significant impacts on the earth's system of interacting physical, chemical and biological processes (Rutz, 2022). These pauses in everyday mobilities had immediate but also potentially enduring structural implications for the geographies of home and work, as many hundreds of millions of workers underwent a rapid transition to working from home (WFH). The longer-term dynamics and implications of remote and hybrid work in a post-covid landscape are still emerging and have been subject to much speculation (Chung et al., 2021; Nathan., 2021; Wethal et al., 2022). However this analysis is motivated by an interest in social and spatial inequalities in work related mobilities during the pandemic. Whilst working from home (WFH) increased dramatically during government mandated restrictions on mobility, this phenomenon was nonetheless largely the preserve of a comparatively advantaged and modest share of the workforce. The geographers David Bissell (2021) and Tim Cresswell (2021) have contended that these inequalities in WFH are reflective of wider entrenched uneven power geometries of

mobility, but that the pandemic may have spurred a reevaluation of the meaning of mobility. Mobility has conventionally been regarded as a personal and public good (Halfacree, 2018; Cohen and Gössling, 2015). However in the context of work during this crisis, it is arguably immobility rather than mobility that has become privileged. Bissell's key insight in this respect is summed up by his statement that 'in order for us to be still, we require mobility from others' (2021: p.155). This paper aims to contribute to the evidence base concerning the characteristics and circumstances of these 'others'. Scholars have drawn attention to the predominance of the language of war in state and media discourses regarding covid (Clayton, 2021). These observations are apposite in that they raise the point that, if getting through the pandemic was akin to a war, then who were the 'frontline' workers who had to fight it, and at what cost? The issue of socio-economic inequality is central to addressing this question.

Britain's 'key workers', a group conventionally facing scant occupational prestige, found themselves in the unfamiliar position of being (temporally) lauded as the exalted symbol of the pandemic, the heroic workers keeping the economy and society functioning whilst everyone else sheltered at home (De Camargo and Whiley, 2020; Bissell, 2021). Keyworkers were those classed as providing essential services (via the public and private sectors) and they constituted about a third of the workforce at the start of the pandemic (Wielgoszewska et al., 2022). Their efforts were not without cost. Keyworkers were at increased risk of covid infection (Topriceanu et al., 2021) and studies have demonstrated the particular mental health challenges they faced (Jia et al., 2020; May et al., 2021). This body of research has been attentive to differing outcomes within the keyworker category according to factors such as age, gender and sector (Paul et al., 2021; Wielgoszewska et al., 2022) and questions have since rightly been posed about the extent to which society values its most essential workers (Fernández-Reino and Kierans, 2020). This investigation seeks to contribute to these debates by shedding light on the characteristics and circumstances of those who did not have the privilege of immobility during the pandemic. Importantly, this extends beyond the keyworker cohort, as a third of those who never WFH (34 per cent) were not actually keyworkers (see Table 2 in the empirical section). As such the analytical focus is on propensity to never WFH rather than keyworkers status, although there is overlap between these categories.

This analysis seeks to contribute to studies that have successfully shed light on inequalities in opportunities to WFH. Examining the South African context, Nwosu et al (2022) find that the ability to WFH was positively associated with indicators of socio-economic status and wellbeing. Likewise Takami (2022) identifies similar inequalities in the prevalence of WFH in the Japanese context. A UK survey conducted at the start of the covid restrictions in March 2020 found that the lowest income households were six times less likely to be able to work from home than the highest (Atchison et al., 2021). Survey data from May 2021 also finds large divides in WFH according to pay level, with high earners being more than three times more likely to work outside of their home compared to low-paid workers (Collinson, 2021). Similarly, Marzec et al. (2021) emphasise that WFH was by no means a universal experience, and that industry sector and having managerial duties were key determinants of the propensity to work remotely. Likewise, analysis by the ONS of their Opinions and Lifestyle Survey illustrates clear disparities in remote/hybrid working according to qualification levels and occupational status (ONS, 2023). At the global scale, the ability to WFH is heavily skewed towards higher income countries (Nwosu et al., 2022). Worldwide, 17 per cent of the workforce is estimated to have WFH during the second quarter of 2020, yet in the UK the equivalent figure was more than double this (Wielgoszewska et al., 2022). In terms of geographical inequalities within countries, research in the USA (Iio et al., 2021), Spain (Glodeanu et al., 2021) and New Zealand (Campbell et al., 2021) have all indicated that everyday spatial mobilities declined least in deprived areas during lockdowns, plausibly because

fewer residents of these places had the privilege of work-related immobility during the pandemic.

Methodology

This analysis is based on analysis of the UK Household Longitudinal Study (UKHLS), often referred to as Understanding Society. The UKHLS started in 2009 and is the UK's largest and main longitudinal household panel study, with a representative sample covering around 40,000 households (ISER, 2022). It provides an insight into the social and economic circumstances, attitudes and behaviours and health of people living in thousands of households. Specifically, the research mainly makes use of one of the nine covid waves of the survey. The covid waves were short (20 minute) surveys fielded to individual sample members of the main annual survey and were carried out initially monthly (April–July 2020) and then bi-monthly (April 2020–March 2021) to quickly collect and evaluate the impact of the pandemic on people's lives (ISER, 2022). A final wave of the covid survey was undertaken in September 2021. Surveys were mostly completed online, with a smaller number conducted over the telephone for those lacking sufficient internet connectivity or digital literacy. Overall, 42,330 sample members were invited to participate in the covid waves, 42 per cent (17,761) of whom completed the first wave. Attrition meant that this figure had declined to 12,818 by the final covid wave. In addition to questions directly related to covid-19 (symptoms, testing, vaccination), the survey included questions on different aspects of people's lives that could have been impacted by the pandemic, including whether and how often they WFH. Special Licence data were used to link area deprivation and the ONS Area Classifications at the lower layer Super Output Area to the likelihood of WFH.

The analysis firstly generated a time-series of WFH propensity within the workforce for individual sample members prior to and at the start of the pandemic (main annual UKHLS) and then at more frequent intervals during it (UKHLS covid waves). Next, the bulk of the analysis focused on the characteristics and circumstances of those who did and did not WFH in January 2021 (UKHLS covid wave cg). This period was used because it can be considered the peak of the pandemic in terms of fatalities and movement restrictions (UKHSA, 2022). It also predates the mass vaccine rollout. As such, not WFH was arguably riskiest at this stage. Accordingly, it is also the UKHLS covid wave when the lowest share of the workforce physically left their homes to work (Figure 1). As such the focus of the analysis is those who did not get to WFH when most others did and when the pandemic was at its deadliest. Data were weighted using the provided cross-sectional inverse probability weights, which were derived from the relevant covid-19 wave back to the target population of the main wave prior to the pandemic (Benzeval et al., 2021). A note of caution is that the dates of the covid waves do not exactly correspond with their calendar equivalents. For example, the '2020' (wave K) survey contains responses collected over the period June 2019–May 2021 and the January 2021 wave (cg) contains responses from 27th January 2021–3rd February 2021. There were 6,993 valid responses to the question 'during the last four weeks how often did you work at home?'. The four response categories were: always, often, sometimes or never. The analysis is based on a comparison of the characteristics and circumstances of those who always or often WFH and those who never WFH. Excluding the ambiguous 'sometimes' category (681 responses) resulted in a study sample of 6,312. Statistically meaningful differences between members of the two cohorts were assessed via chi-square tests and a binary logistic regression model.

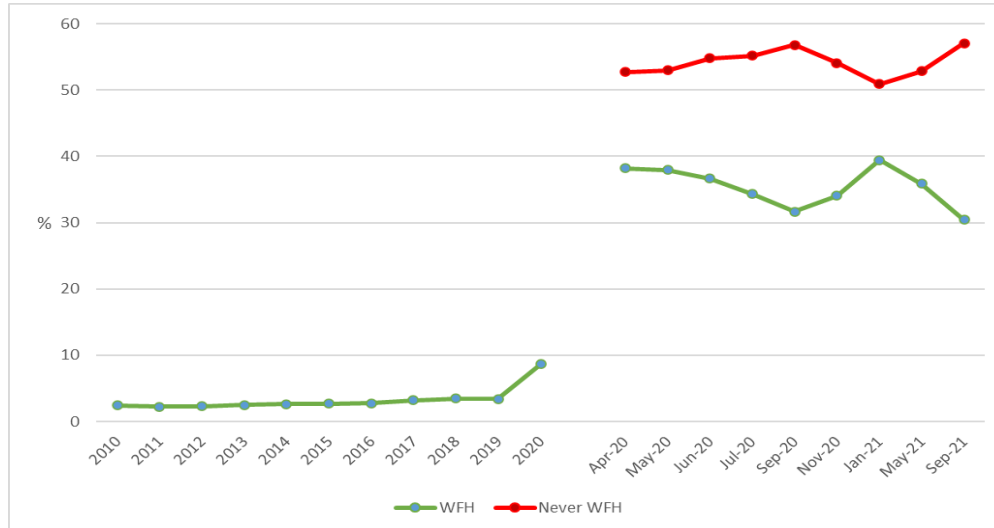
Results

Covid: an en masse transition to remote work?

Drawing on a cross-sectional analysis of UKHLS data, Figure 1 details the extent of homeworking pre and during the pandemic. Three observations are particularly noteworthy.

1. Pre-covid, WFH was uncommon. In 2010, just 2.4 per cent of the workforce named 'at home' as their work location. By 2019, the year before the pandemic, this figure had increased gradually to 3.4 per cent. Therefore, before the onset of the covid crisis, the vast majority of the workforce did not WFH.
2. The onset of covid saw a significant transition to WFH. Between 2019 and 2020, the proportion of the workforce WFH more than doubled, albeit from a low base, from 3.4 per cent to 8.6 per cent. Thus, 5.2 per cent of the workforce transitioned from working at their employers premises to working from their own homes (the figure for 'multiple work locations' did not change over this period). Basic calculations using labour force data (NOMIS, 2022), infer that this equates to 1.7 million workers transitioning into WFH with the onset of the covid crisis. This is a significant shift that, as noted, has rightly been the subject of much scrutiny. At the time of writing, data availability makes it difficult to assess the permanency of these changes, as the most recently available UKHLS data covers the covid period. Annual Population Survey data covering July 2021-June 2022 was however available at the time of writing and might hint at post-pandemic geographies of work and home. During this period 19.7 per cent workers reported that they were working mainly in their own home. The corresponding figures for 2019-2020 and 2020-2021 were 6.1 per cent and 10.8 per cent respectively. The pandemic therefore led to a significant shift in the relationship between where a substantial minority of the workforce resides and works. How these post-pandemic geographies of home and work evolve going forward will have considerable implications for social and spatial inequalities and as such merit ongoing analytical scrutiny.
3. A final but critical issue of note in Figure 1 is the extent to which most workers never actually WFH during covid. Between April 2020 and September 2021 (the period covered by the UKHLS covid surveys), 51-57 per cent of the workforce reported that they always did their work outside of their homes. This includes a majority of the workforce (50.9 per cent) never WFH even at the peak of the crisis in early 2021. Contrary to the narrative of a covid induced en masse transition to remote working, only 30-39 per cent of the workforce always or often WFH during it. Whilst this is a significant minority of the workforce and a seismic shift compared to pre-pandemic, it is striking that most workers did not have the privilege of immobility during what was a health crisis of unprecedented scale in modern times. The lack of wider acknowledgement of this point arguably reflects deeper social and spatial inequalities and the remainder of this article is devoted to shedding light on the characteristics and circumstances of this overlooked group. This includes a focus on their demographic profile, employment conditions and wellbeing indicators, as well as geographical differences in where WFH was least and most prevalent.

Figure 1: Share of workforce whose work location was ‘at home’ pre covid (2010-2020) and who ‘always’ or ‘often’ versus ‘never’ worked from home during covid (April 2020 - September 2021)



Source: Author’s analysis of UKHLS waves A–K (2010-2020) and covid waves ca–ci (April 2020–September 2021).

The covid frontline: personal characteristics and circumstances

Elucidation of the demographic profile of the majority of the workforce who had to physically go out to work in the pandemic (Table 1) chimes with Bissell’s (2021) concerns regarding the uneven power geometries of (im)mobility during the health crisis. One of the starkest differences between those who did and did not WFH was in qualification levels. Just as education is a major determinant of life chances, it was also highly related to exposure to everyday physical mobility for work purposes during covid. Only 15 per cent of those never WFH were educated to at least degree level, whereas the equivalent figure for those who always or often WFH was 41 per cent. Significant variations in political engagement and preferences were also prominent. The never WFH cohort had less interest in politics and were less likely to vote, but were much more likely to be pro-Brexit and to hold negative views towards immigration. There is also a distinctive geography of the power geometries of (im)mobility. Those living in the Midlands, Yorkshire and Humberside, the North East and Northern Ireland were at greater exposure to never WFH whereas London residents were least exposed (55 per cent plus in these regions versus 38 per cent in the capital). Those who did and did not WFH had similar desire to move home, but the former was more confident about realising this aspiration.

Table 1: Personal characteristics and circumstances of those who never worked from home (WFH) versus always or often WFH in January 2021. Chi-square tests for statistically significant differences

	Never WFH	Always or often WFH
Sex**	49.7% were men	46.2% were men
Age***	49.2% were over 50	43.2% were over 50
Highest qualification***	15.5% had degree or higher	41.4% had degree or higher
Born in the UK	9.3% were not born in the UK	10.7% were not born in the UK
Ethnicity (white British inc English, Scottish, Welsh & N Irish)	85.2% were White British	83.5% were White British
Living with a partner***	69.1% were living with a partner	75.3% were living with a partner
Lives alone	12.6% lived alone	13.1% lived alone
Married or civil partnership**	57.9% were married or in civil partnership	62.1% were married or in civil partnership
Degree of happiness with relationship	84% were happy	85% were happy
Parent of children aged 0-15 in household***	25.1% had children in household	33.8% had children in household
Relationship with children	60.5% were very close	62.6% were very close
Responsibility for childcare	30.1% always or usually me	31.2% always or usually me
Government Office Region	North East***: 60.5% never WFH North West: 51.6% Yorks & Humberside***: 57.9% East Midlands**: 54.7% West Midlands***: 59.8% East England: 49.1% London***: 38.3% South East***: 44.1% South West: 51.9% Wales*: 57.8% Scotland*: 46.9% N. Ireland***: 58.3%	NE***: 30.1% always/often WFH North West: 39.2% Yorks & Humberside***: 30.9% East Midlands**: 34.1% West Midlands***: 30.7% East England: 41.4% London***: 52.3% South East***: 46.5% South West: 38% Wales*: 35.5% Scotland*: 42.3% N. Ireland***: 33.7%
Lives in urban or rural area	75.9% lived in urban area	76% lived in urban area
Prefer to move in next 12 months	30.1% preferred to move	30.2% preferred to move
Expect to move in next year***	71.8% no expectation of moving	68.7% no expectation of moving
Political engagement	81% voted in last election*** 74.6% voted in EU referendum*** 22% not at all interested in politics***	92.5% voted in last election*** 88.7% voted in EU referendum*** 10.7% not at all interested in politics***

	Never WFH	Always or often WFH
Political opinions	41.5% voted Conservative at last election & 36.13% Labour *** 46.7% reported that they voted to Leave the EU*** 47.5% agreed with statement that immigrants good for UKs economy*** 18.8% agreed with statement that UKs culture is harmed by immigrants***	30.7% voted Conservative at last election & 38.5% Labour *** 25.6% reported that they voted to Leave the EU*** 71% agreed that immigrants good for UKs economy*** 9.5% agreed that UKs culture is harmed by immigrants***

*P<0.1, **P<0.05, ***P<0.001

Employment conditions and exposure to never WFH

The findings in Table 1, whilst nuanced, broadly substantiate the notion that inequalities in the propensity to WFH during the health crisis are emblematic of wider entrenched educational, political and spatial divides. Analysis now turns to employment circumstances and the extent to which they differ between those who did and did not get to WFH during the crisis. This is of interest as it can help to elucidate the labour market mechanisms that position some parts of the workforce at much greater exposure to not WFH during a health crisis than others. Some of the figures in Table 2 are striking in this respect and suggest a schism between prestige and conditions of work according to propensity to WFH. Of those who never WFH, fewer than a third (30 per cent) were in the most highly remunerated ‘professional and managerial’ category, whereas the equivalent figure for those always or often WFH was more than two-thirds (70 per cent). Those in the never WFH cohort were six times more likely to be paid hourly rather than salaried and more than seven times more likely to work in a physically demanding job. Furthermore, they were half as likely to benefit from informal working arrangements or enjoy managerial responsibilities. Finally, they were at more than three times greater risk of being furloughed. Those on furlough were not (officially) working. However these figures are likely to be an artefact of the wording of the questions in the survey, which asked whether someone had WFH during the past four weeks and also whether they were currently furloughed. Hence someone could be furloughed at the time of the survey but could also have legitimately answered that they had worked (remotely or otherwise) in the previous four weeks. These figures could also partly be explained some furloughed employees continuing to work for the same employer during their furlough period (Adams-Prassl et al., 2020).

A considerable sectoral divide is evident in the propensity to WFH. For example four-fifths of workers in the wholesale and retail sector never WFH, whereas the same proportion of those in finance and insurance and information and communications always or often WFH. Those who never WFH were considerably less likely to report productivity gains since the onset of the pandemic. The never WFH cohort was also significantly more likely to work part-time, in the private sector and in smaller workplaces. Unsurprisingly, most of those who never WFH were Keyworkers (although 36 per cent were not) whereas only a minority (39 per cent) of those always or often WFH fitted within the Keyworker category. This reinforces the point made earlier that the WFH distinction is a potentially more apposite avenue of enquiry for covid work experiences than the keyworker – non-keyworker distinction applied in some existing research.

Table 2: Employment characteristics of those who never worked from home (WFH) versus always or often WFH in January 2021. Chi-square tests for statistically significant differences

	Never WFH	Always or often WFH
Keyworker***	63.9% of those with jobs	38.8% of those with jobs
National Statistics Socio-economic Classification (NS-SEC): 3 major classes***	29.8% were managerial or professional & 70.2% were intermediate or routine	70.4% were managerial or professional & 29.6% were intermediate or routine
Managerial duties: manager, supervisor or foreman***	16.4% had managerial duties	31.8% had managerial duties
Industry: top ten by sample size All sectors listed***, except Construction (not statistically different from overall never WFH v always or often WFH distribution).	Health & social work: 59.2% in this sector never WFH Education: 30.8% Wholesale & retail: 80.1% Other services: 60.4% Professional, scientific & technical: 22.6% Manufacturing: 64.8% Public administration, defence & social security: 25.2% Finance & insurance: 15.4% Information & communications: 14.1% Construction: 53.8%	Health & social work: 27.7% in this sector always or often WFH Education: 48.8% Wholesale & retail: 14.3% Other services: 34.1% Professional, scientific & technical: 66.7% Manufacturing: 30.4% Public administration, defence & social security: 64.7% Finance & insurance: 81.2% Information & communications: 80.2% Construction: 38.4%
Employed or self-employed***	11.3% were self-employed	15% were self-employed
Working for a private company***	65.4% in private company	54.3% in private company
Job tenure: in same job since 2018 or longer*	67% same job since before 2018	70.1% been in same job since before 2018
Salaried or paid by the hour***	52.1% paid by the hour	8.3% paid by the hour
Working full or part-time***	31% worked part-time	20% worked part-time
Job satisfaction**	80.2% at least somewhat satisfied	83% at least somewhat satisfied
Physicality of job***	21.3% v. physicality active in job	2.8% v. physicality active in job
How much gets done per hour compared to Jan/Feb 2020***	12.5% got more done	31.3% got more done
Able to vary working hours on an informal basis***	40% had informal working arrangements	81.5% had informal working arrangements
Furloughed under the Coronavirus Job Retention Scheme***	16.6% were currently furloughed	5% were currently furloughed
No of employees at workplace***	66.5% at workplaces <100 people	45.8% at workplaces <100 people
Importance of profession to self-identity***	10.4% not at all important	5.6% not at all important

*P<0.1, **P<0.05, ***P<0.001

Never WFH and wellbeing

The findings contained in Tables 1 and 2 reveal a significant distinction in terms of socio-economic status and labour market circumstances between those who did and did not WFH during covid. This raises the question of what the implications of whether or not one got to work from home during this tumultuous period might be. Table 3 presents some indicators of health and wellbeing, disaggregated according to WFH status. Whilst being careful to avoid inferring causation from correlation, these figures suggest that physical mobility for work purposes during covid was associated with negative impacts on wellbeing. The never WFH cohort compared to those always or often WFH was in poorer general health, had lower levels of subjective overall and financial wellbeing and had lower levels of life satisfaction. They were also more likely to be smokers and to a lesser extent report excessive alcohol consumption. Some of these differences are not vast, but they do nonetheless represent statistically meaningful differences. Having a long-term health condition or being clinically vulnerable to covid did not offer protection against having to go out to work during covid, as people in these categories were just as likely to never as always/often WFH. As is discussed towards the end of this article, there is scope for research to better understand the repercussions of these patterns, especially from an inequalities perspective. Another related issue, which sits beyond the scope of this analysis but which merits further attention, is the extent to which the pandemic induced rollout of remote/hybrid working has generated positive wellbeing outcomes for some groups who have conventionally been disadvantaged in the traditional physical workplace (e.g. those with disabilities and carers). A partial erosion of the flexibility stigma that many workers faced pre-covid-19 provides qualified grounds for optimism that greater workplace inclusion may in time emerge as a positive by-product of the pandemic (Schur et al., 2020; Mutebi and Hobbs, 2022).

Table 3: Wellbeing indicators for those who never worked from home (WFH) versus always or often WFH in January 2021. Chi-square tests for statistically significant differences

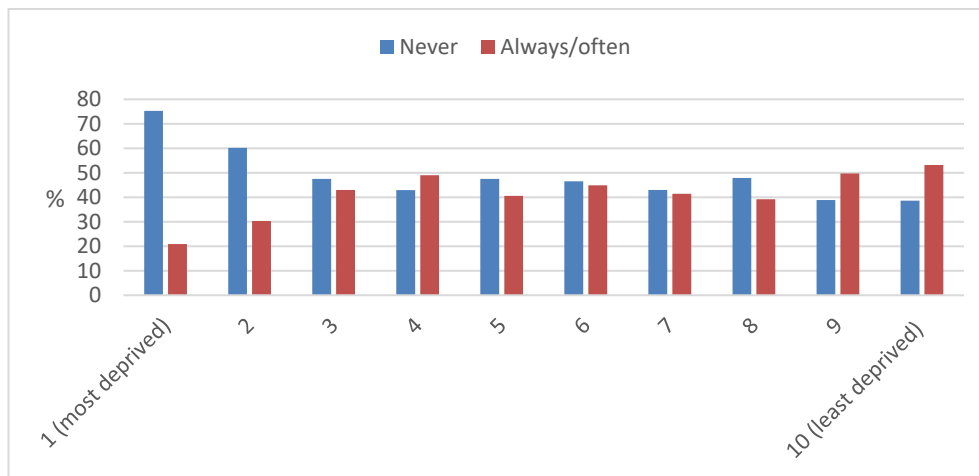
	Never WFH	Always or often WFH
General health***	53.7% excellent or very good	61.8% excellent or very good
Has a long-term health condition	45.4% had l-t health condition	44.7% had l-t health condition
Clinically vulnerable to covid	27.7% had moderate or high risk	28.9% had moderate or high risk
Satisfaction with life overall**	62.2% at least somewhat satisfied	66% at least somewhat satisfied
Subjective wellbeing likert scale***	7.2% in most distressed quartile & 24.2% in least distressed quartile	2.8% in most distressed quartile & 29.09% in least distressed
Subjective financial situation***	24.4% living comfortably or doing alright	35.4% living comfortably or doing alright
Heavy drinking**	22% had 6+ drinks in a single sitting on an at least weekly basis	18.2% had 6+ drinks in a single sitting on an at least weekly basis
Smoker***	10.2% were smokers	5% were smokers

*P<0.1, **P<0.05, ***P<0.001

The geography of never WFH

The evidence presented thus far points to a clear distinction in terms of the demographic, employment and wellbeing characteristics and circumstances between those who never and always or often WFH during the height of the covid pandemic. These social inequalities are reflected in the particular geography of (non)homeworking. Figure 2 below indicates that neighbourhood disadvantage is closely related to the likelihood of residents not WFH. In particular, propensity to never WFH is especially high in the top fifth of most deprived areas in England. The gradient is less distinct for areas ranked between 20-80 per cent in terms of deprivation, although residents of the fifth least deprived decile seemed to have been the most protected from having to go out to work during the pandemic. Three-quarters (75 per cent) of residents of the top tenth of most deprived areas in England never WFH whereas the equivalent figure for the least deprived decile was almost half of this (39 per cent). Only a fifth (21 per cent) of residents in the most deprived decile always or often WFH whereas in the least deprived decile the respective proportion was 53 per cent. These patterns showing geography as a predictor of covid risk chime with existing research, which links area deprivation to the risk of premature death from various diseases and life chances more broadly. For example, Woodward et al. (2021) note that residents of the top quintile in terms of area deprivation as measured by the Townsend Deprivation Score were two to three times at greater risk of death from covid-19, influenza/pneumonia and cardiovascular disease than residents of the least deprived quintile.

Figure 2: Propensity to WFH by Index of Multiple Deprivation decile (England)

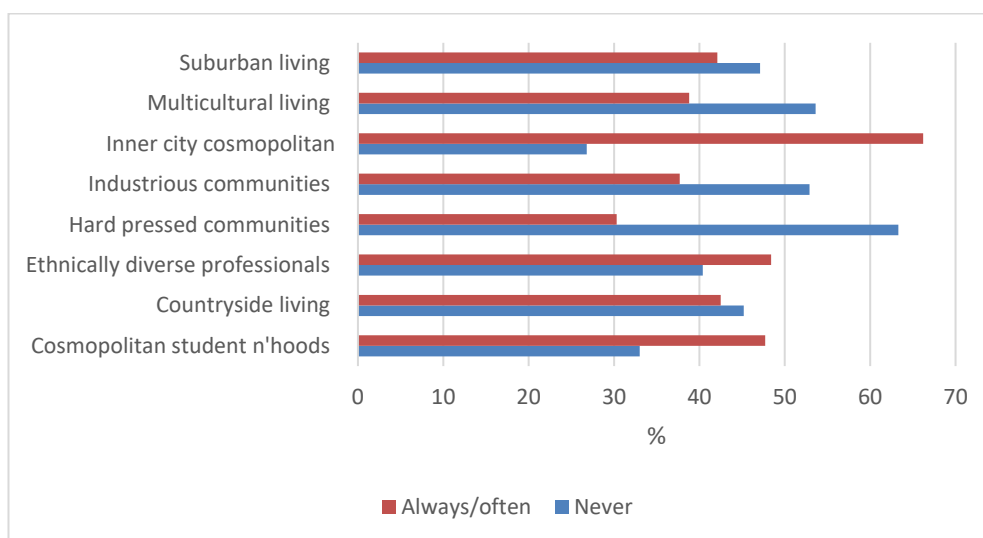


Source: Author's analysis of UKHLS cg covid-19 survey

An additional means of exploring spatial inequalities is to inspect how (non)homeworking varied across different kinds of areas. A range of residential-based area classifications have been published by the ONS since 1971. These classifications use socio-economic and demographic data from each census to identify areas of the country with similar characteristics. This analysis uses the ONS 2011 Area Classification for Super Output Areas, as this was the most recently available classification at the time of analysis. Areas are grouped into a hierarchical structure, involving eight Supergroups and 24 Groups. As is clear in Figure 3, variations in (non)homeworking across the Supergroups are considerable. Residents of hard-pressed communities in particular were exposed to never WFH. In these areas, almost two-thirds (63 per cent) of residents never WFH and only 30 per cent always or often WFH. In multicultural living (54 per cent) and industrious communities (53 per cent), most residents also never WFH at the peak

of the pandemic. At the other end of the exposure spectrum, residents of cosmopolitan inner city (66 per cent) and student neighbourhoods (48 per cent) and ethnically diverse professional (48 per cent) areas were much more likely to always or often WFH during the pandemic. Of the 24 individual area classification Groups, those with the highest proportion of residents never WFH were challenged white communities (71 per cent) and constrained renters (64 per cent). Alternatively the specific area Groups where residents were least vulnerable to the exposure of never WFH were inner city cosmopolitan (27 per cent) and affluent communities (30 per cent). Therefore, as with the social inequalities in WFH documented in Tables 1-3, Figures 2-3 expose stark spatial inequalities in the types of places where residents were most vulnerable to physical mobility for work purposes during the health crisis.

Figure 3: WFH propensity by 2011 ONS Area Classification



Source: Author's analysis of UKHLS cg covid-19 survey

Exposure to never WFH: key determinants

The analysis thus far has identified significant inequalities in terms of the populations and places where WFH was most and least prevalent. Finally, a binary logistic regression model was run to ascertain the relative effects of these characteristics and circumstances on the likelihood of never working from home during the height of the covid-19 pandemic. The outcome of this exercise is displayed in Table 4 below. The model was statistically significant ($X=1174.832$, $P<0.001$) and explained 59 per cent (Nagelkerke R^2) of the variance in never working from home and correctly classified 82 per cent of cases. Reflecting the prevailing message thus far, many of the conventional markers of difference in socio-economic status were strong predictors of one's exposure to never WFH. Those in routine occupations were 17 times more likely to never WFH than workers in the managerial and professional occupational group. The odds ratios of exposure to never WFH were four times higher for those without a degree level qualification. Keyworkers in most sectors were more exposed to never WFH than non-keyworkers. In particular, Keyworkers in food and other necessary goods and health and social care were at least ten times more likely to never WFH than non-keyworkers. Those who never WFH were almost six times more likely to have been put on the furlough scheme and residents of the top decile neighbourhoods in terms of area deprivation in England were more than twice as likely to never WFH than those in the least deprived decile. Men and those living in households without resident dependent children present

were at a slightly higher risk of never WFH, whereas age and general health were not predictors of the chance of never WFH.

Table 4: Binary logistic regression. Dependent variable: never versus always or often worked from home

Independent variable	Odds ratios (Exp(B) of never WFH & significance)
Sex. (reference = female) Male	1.569**
Age	1.004
Socio-economic classification of job (reference = management & professional) Intermediate Routine	2.463*** 17.520***
Highest qualification (reference = undergraduate degree or higher) No degree	4.022***
Parent of child aged 0-15 in household (reference = yes) No	1.548**
General health (reference = excellent) Very good Good Fair Poor	1.030 0.817 0.628* 0.586
Whether keyworker & sector (reference = not keyworker) Health & social care Education & childcare Key public services Local & national government Food & other necessary goods Public safety & national security Transport Utilities, communications & financial services	10.693*** 1.273 2.774** 0.900 13.470*** 7.353*** 6.760*** 2.600***
Whether currently furloughed through the Coronavirus Job Retention Scheme (reference = no) Yes	5.967***
Index of Multiple Deprivation decile (reference = 10, least deprived) 1 (most deprived) 2 3 4 5 6 7 8 9	2.360** 1.632* 0.712 0.802 1.153 1.247 1.107 1.705* 0.833

*P<0.1, **P<0.05, ***P<0.001

Discussion and Conclusions

This analysis has been motivated by a desire to contribute to existing evidence concerning social and spatial inequalities in work related (im)mobilities during the covid-19 health crisis. The findings presented in this article indicate that there has indeed been a significant shift towards work being done at home instead of at an employer's premises. The most recently available figures suggest that just over five per cent of the workforce, equating to 1.7 million people, has undertaken this transition. The permanency of this shift, and the possible winners and losers from it, have justifiably been the focus of much attention. This analysis has focused on those who did not have the privilege of work-related immobility during the covid-19 health crisis. Arguably, the characteristics and circumstances of this cohort reflects deeper entrenched disparities, as the population sub-groups and places where working from home (WFH) was most and least prevalent correlates with the social and spatial patterning of inequalities. This analysis has reiterated but also added nuance to the broader notion that the pandemic created a systemic divide in WFH. It offered originality in this respect by utilising nationality representative and robust survey data, collected at the peak of the pandemic. Also novel was the comprehensive account of the characteristics of the WFH divide, including its geography, the use of modelling to elucidate the statistical determinants of WFH and an emphasis on those who never WFH that went beyond Keyworkers.

Physical immobility during a deadly and highly transferrable virus induced health crisis represents a privileged form of (im)mobility (Bissell, 2021). As this analysis demonstrates, education level and occupational status are key predictors of the likelihood of undertaking all or most of ones work from home. This raises pertinent questions regarding the value attached to mobility in a post-covid world (Cresswell, 2021). It ought to also provoke reflection on the value society attaches to those who were on the 'frontline' during the pandemic 'war' (Clayton, 2021), frequently at considerable personal cost (Jia et al., 2020; Topriceanu et al., 2021). Those providing essential services throughout the crisis, whilst a (sizeable) minority sheltered at home, were momentarily lionised during the pandemic, with those undertaking roles previously dismissed as unskilled or low skilled temporarily rebranded as keyworkers (De Camargo and Whiley, 2020). As this analysis demonstrates, it was many of those population sub-groups and types of places that were already disadvantaged that lacked the privilege of immobility during the pandemic. Moving into a post-covid era, the same social and spatial inequalities that were evident in the health crisis are again being replicated in the contemporary cost of living crisis. Many of those who faced the greatest risks by physically going out to work during the pandemic are now facing real wage cuts and declining living standards. Whilst wary of fruitlessly co-opting the WFH divide into the culture war (Maçães, 2021) and societal schism narratives (Goodhart, 2017), this investigation substantiates calls for greater recognition of that significant proportion of the population who were not and have not benefitted from 'the grand experiment that nobody wanted' (Parry et al., 2022: p.8).

A number of potentially useful research avenues are possible going forward. This study has shed light on the sizeable extent of non-homeworking during the pandemic and elucidated the characteristics and circumstances of those who had to do it. However it has been less able to reveal the mechanisms that have created these social and spatial inequalities, the experiences of those who never WFH and, critically, most of their personal and societal effects. As such, there is scope for focused case study approaches that engage with people in the many roles and places that may be bypassed by a wider transition to remote/hybrid working. In this analysis, four fifths of workers in the wholesale and retail sector never WFH. Likewise, data from the recent Census in England indicates that, nationally 31.5 per cent of workers worked at or mainly from home at the time of the survey in March 2021. In many London boroughs this figure exceeded 50 per

cent, whereas in the cities of Hull and Stoke the equivalent figures were only 13 per cent and 15 per cent respectively. Topics of interest could include the relationship between WFH and local economic development, the role of choice and constraint in working practices and how self and societal perceptions of occupational prestige have shifted.

Finally, by positioning those who never WFH during the pandemic as relatively disadvantaged relative to those who did, this research in no way wishes to portray the latter group as being universally privileged. As recent studies have demonstrated, factors such as gender (Chung et al., 2021) and housing circumstances (Horne et al., 2021) are sources of significant disparities in experiences of homeworking. This detailing of the relatively disadvantaged characteristics and circumstances of those who did not work from home should therefore not be used to make sweeping assertions about homeworkers. Rather, it is hoped that this evidence can serve as a timely reminder that the profile of the types of people and places that were most exposed to the covid crisis mirrors vulnerability to other types of economic and health crises, and will continue to do so going forward unless action is taken. If the covid catastrophe did not shine a sufficiently bright light on inequality then regrettably it is difficult to imagine what will.

*Correspondence address: David McCollum, School of Geography & Sustainable Development, University of St Andrews, St Andrews, UK. Email: David.McCollum@st-andrews.ac.uk

References

- Adams-Prassl, A., Boneva, T., Golin, M. and Rauh, C. (2020) *Furloughing*. Cambridge Working Papers in Economics CWPE2079.
- Atchison, C., Bowman, L.R., Vrinten, C., Redd, R., Pristerà, P., Eaton, J. and Ward, H. (2021) Early perceptions and behavioural responses during the COVID-19 pandemic: a cross-sectional survey of UK adults. *BMJ Open*, 11.
- Benzeval, M., Burton, J., Crossley, T., Fisher, P., Gardiner, C., Jäckle, A. and Moore, J. (2021) *High frequency online data collection in an annual household panel study: some evidence on bias prevention and bias adjustment*. Understanding Society Working Paper Series No. 2021-03.
- Bissell, D. (2021) A changing sense of place: Geography and COVID-19. *Geographical Research*, 59, 150-159.
- Blundell, R., Costa Dias, M., Cribb, J., Joyce, R., Waters, T., Wernham, T. and Xu, X. (2022) Inequality and the COVID-19 Crisis in the United Kingdom. *Annual Review of Economics*, 14, 1, 607-636.
- Campbell, M., Marek, L., Wiki, J., Hobbs, M., Sabel, C.E., McCarthy, J. and Kingham, S. (2021) National movement patterns during the COVID-19 pandemic in New Zealand: the unexplored role of neighbourhood deprivation. *Journal of Epidemiology and Community Health*, 75, 903-905.
- Chung, H., Birkett, H., Forbes, S. and Seo, H. (2021) Covid-19, Flexible Working, and Implications for Gender Equality in the United Kingdom. *Gender & Society*, 35, 2, 218-232.
- Clayton, D. (2021) Tropicality and the choc en retour of Covid-19 and climate change. *eTropic: Electronic Journal of Studies in the Tropics*, 20, 1, 54-93.
- Cohen, S. and Gössling, S. (2015) A darker side of hypermobility. *Environment and Planning A*, 47, 1661-1679.
- Collinson, A. (2021) A tale of two pandemics: low-paid workers hit hardest by Covid class divide. TUC, 09 September 2021. Available at: <https://www.tuc.org.uk/blogs/tale-two-pandemics-low-paid-workers-hit-hardest-covid-class-divide>
- Cresswell, T. (2021) Valuing mobility in a post COVID-19 world. *Mobilities*, 16, 1, 51-65.

- De Camargo, C.R. and Whiley, L.A. (2020) The mythologisation of key workers: occupational prestige gained, sustained... and lost? *International Journal of Sociology and Social Policy*, 40, 9/10, 849-859.
- De Fraja, G., Matheson, J. and Rockey, J. C. (2021) Zoomshock: The Geography and Local Labour Market Consequences of Working from Home. *Covid Economics*, 64, 13, 1-41.
- Deole, S., Deter, M. and Huang, Y. (2021) Home Sweet Home: Working from home and employee performance during the COVID-19 pandemic in the UK. GLO Discussion Paper, No. 791. Essen: Global Labor Organization (GLO).
- Felstead, A. (2021) *Outlining the contours of the 'great homeworking experiment' and its implications for Wales*. Welsh Government: Senedd Economy, Infrastructure and Skills Committee Commissioned Report.
- Felstead, A. and Reuschke, D. (2021) A flash in the pan or a permanent change? The growth of homeworking during the pandemic and its effect on employee productivity in the UK. *Information Technology & People*.
- Feng, Z. and Savani, K. (2020) Covid-19 created a gender gap in perceived work productivity and job satisfaction: implications for dual-career parents working from home'. *Gender in Management*, 35, 7/8, 719-736.
- Fernández-Reino, M. and Kierans, D. (2020) *Locking out the keys? Migrant key workers and post-Brexit immigration policies*. Oxford: COMPAS, University of Oxford.
- Freudental-Pedersen, M. and Kesselring, S. (2021) What is the urban without physical mobilities? COVID-19-induced immobility in the mobile risk society. *Mobilities*, 16, 1, 81-95.
- Glodeanu, A., Gullón, P. and Bilal, U. (2021) Social inequalities in mobility during and following the COVID-19 associated lockdown of the Madrid metropolitan area in Spain. *Health & Place*, 70, 1-9.
- Goodhart, D. (2017) *The road to Somewhere*. London: C Hurst & Co Publishers Ltd.
- Halfacree, K. (2018) Sedentary no longer seems apposite: internal migration in an era of mobilities. In: T. Champion, T. Cooke, and I. Shuttleworth (Eds.) *Internal migration in the developed world*. Abingdon: Routledge. pp. 272-284.
- Horne, R., Willand, N., Dorignon, L. and Middha, B. (2021) Housing inequalities and resilience: the lived experience of COVID-19. *International Journal of Housing Policy*.
- lio, K., Guo, X., Kong, X., Rees, K. and Bruce Wang, X. (2021) COVID-19 and social distancing: Disparities in mobility adaptation between income groups. *Transportation Research Interdisciplinary Perspectives*, 10, 1-10.
- ISER (2022) *Understanding Society, Main Survey user guide*.
- Jia, R., Ayling, K., Chalder, T., Massey, A., Broadbent, E., Coupland, C. and Vedhara, K. (2020) Mental health in the UK during the COVID-19 pandemic: cross-sectional analyses from a community cohort study. *BMJ Open*, 10.
- Maçães, B. (2021) *Geopolitics for the end time: from the pandemic to climate change*. London: C. Hurst & Co.
- Marzec, P., Nandi, A. and Patel, R. (2021) *Understanding Society COVID-19 Survey Briefing Note: Working at home*. Understanding Society Briefing Note. Essex: ISER, University of Essex.
- May, T., Aughterson, H., Fancourt, D. and Burton, A. (2021) Stressed, uncomfortable, vulnerable, neglected': a qualitative study of the psychological and social impact of the COVID-19 pandemic on UK frontline keyworkers. *BMJ Open*, 11.
- Mutebi, N. and Hobbs, A. (2022) The impact of remote and hybrid working on workers and organisations. London: UK Parliament. Available at: <https://post.parliament.uk/research-briefings/post-pb-0049/>
- Nathan, M. (2021) Critical Commentary: The city and the virus. *Urban Studies*, 60, 8, 1346-1364.

- New York Times (2020) What if You Don't Want to Go Back to the Office? 5th May 2020. Available at: <https://www.nytimes.com/2020/05/05/business/pandemic-work-from-home-coronavirus.html>
- NOMIS (2022) *Labour market profile*. Essex: University of Essex.
- Nwosu, C. O., Kollamparambil, U. and Oyenubi, A. (2022) Socio-economic inequalities in ability to work from home during the coronavirus pandemic. *The Economic and Labour Relations Review*, 33, 2, 290–307.
- Office for National Statistics (ONS) (2023) *ONS website, article, 'Characteristics of homeworkers. Great Britain: September 2022 to January 2023'*.
- Parry, J., Young, Z., Bevan, S., Veliziotis, M., Baruch, Y., Beigi, M., Bajorek, Z., Richards, S. and Tochia, C. (2022) *Work After Lockdown: No Going Back what we have learned from working from home through the COVID-19 pandemic*. Work After Lockdown project. Available at: <http://dx.doi.org/10.5258/SOTON/PP0001>
- Paul, E., Wan Mak, E., Fancourt, D. and Bu, F. (2021) Comparing mental health trajectories of four different types of key workers with non-key workers: A 12-month follow-up observational study of 21,874 adults in England during the COVID-19 pandemic. *The British Journal of Psychiatry*, 220, 5, 1-8.
- Preece, J., McKee, K., Robinson, D. and Flint, J. (2023) Urban rhythms in a small home: COVID-19 as a mechanism of exception. *Urban Studies*.
- Rutz, C. (2022) Studying pauses and pulses in human mobility and their environmental impacts. *Nature Reviews Earth & Environment*, 3, 157–159.
- Schur, L.A., Ameri, M. and Kruse, D. (2020) Telework After COVID: A “Silver Lining” for Workers with Disabilities? *Journal of Occupational Rehabilitation*, 30, 521–536.
- Scottish Government (2022) *Working from home during the COVID-19 pandemic: benefits, challenges and considerations for future ways of working*. Edinburgh: SG Central Analysis Division.
- Sidik, S.M. (2022) How COVID has deepened inequality - in six stark graphics. *Nature* 606, 7915, 638-639.
- Takami, T. (2022) Social Inequality in the Prevalence of Working from Home under the COVID-19 Pandemic in Japan. *Japan Labor Issues*, 6, 36, 2-7.
- Topriceanu, C.C., Wong, A., Moon, J.C., Hughes, A.D., Chaturvedi, N., Conti, G., Bann, D., Patalay, P. and Captur, G. (2021) Impact of lockdown on key workers: findings from the COVID-19 survey in four UK national longitudinal studies. *Journal of Epidemiology and Community Health*, 75, 10, 955-962.
- UKHSA (2022) *UK Health Security Agency data series on deaths in people with COVID-19, technical summary*. <https://www.gov.uk/government/publications/phe-data-series-on-deaths-in-people-with-covid-19-technical-summary> [Accessed: 26/10/2022].
- Wang, H. et al. (2022) Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–21. *The Lancet* 399, 10334, 1513-1536.
- Wethal, U., Ellsworth-Krebs, K., Hansen, A., Changede, S. and Spaargaren, G. (2022) Reworking boundaries in the home-as-office: boundary traffic during COVID-19 lockdown and the future of working from home. *Sustainability: Science, Practice and Policy*, 18, 1, 325-343.
- Wielgoszewska, B., Booth, C., Green, M.J., Hamilton, O.K. and Wels, J. (2022) Association between home working and mental health by key worker status during the Covid-19 pandemic. Evidence from four British longitudinal studies. *Industrial Health*, 60, 4, 345-359.
- Woodward, M., Peters, S.A.E. and Harris, K. (2021) Social deprivation as a risk factor for COVID-19 mortality among women and men in the UK Biobank: nature of risk and context suggests that social interventions are essential to mitigate the effects of future pandemics. *Journal of Epidemiology and Community Health*, 75, 1050-1055.

p. 99. Covid geographies of home and work: privileged (im)mobilities?

World Bank (2022) *Emerging risks to the recovery*. World Development Report 2022: Finance for an Equitable Recovery, pp. 49-73.