2

WAVE 4

National Income Dynamics Study (NIDS) – Coronavirus Rapid Mobile Survey (CRAM)

Who cannot work from home in South Africa?

Evidence from wave 4 of NIDS-CRAM

Miracle Benhura - University of the Witwatersrand

Prudence Magejo - University of the Witwatersrand

12 May 2021

N.i.D.S.
NATIONAL INCOME DYNAMICS STUDY

CRAM
CORONAVIRUS RAPID MOBILE SURVEY 2020

Who cannot work from home in South Africa? Evidence from wave 4 of NIDS-CRAM

Miracle Benhura, Associate Professor, School of Economics, University of the Witwatersrand

Prudence Magejo, Associate Professor, School of Economics, University of the Witwatersrand

Abstract

At the height of the COVID-19 pandemic, many governments across the world issued a directive for workers to stay at home and work from there where functionally possible. While this directive has become less stringent since its first issuance, it is still in force as governments strive to reduce disease transmission and save lives. Nonetheless, that not all jobs can be performed from home has prompted research into who cannot work from home as they face a higher risk of exposure to the virus relative to those who can work from home. This paper explores the correlates (demographic and job characteristics) of workers who are unable to work from home. The analysis utilises logit models and the NIDS-CRAM wave 4 dataset. Results show that men are more unable to work from home than women, while non-white race groups have lower probabilities of working from home relative to whites. Individuals who dwell in shacks/informal housing are less likely to work from home than those who dwell in a house/flat. In addition, workers in urban areas have lower probabilities of working from home than those in rural areas. Employees in formal jobs are less likely to work from home than their counterparts in informal jobs. For occupations, workers in elementary occupations and plant and machine operations are more likely to be unable to work from home than managers and professionals. Further, workers in the mining sector, private households, the manufacturing sector and community, social and personal services are more likely to be unable to work from home compared to workers in financial intermediation. These results call for interventions that minimise the risk of the vulnerable workers' exposure to COVID-19 in the workplace.

Executive summary

Since the first quarter of 2020, many governments across the world have instituted national lockdowns or social distancing measures to curtail the spread of COVID-19. Given that direct face to face interactions with consumers, employers or co-workers suddenly became an occupational hazard, a non-trivial proportion of workers has been ordered to stay at home and work from there, where functionally possible. This has resulted in unprecedented changes in the world of work. For example, some organisations have had to embrace teleworking to remain viable amidst the pandemic: this refers to work conducted outside the workplace with the aid of Information and Communication Technologies. The stay at home regulations generated a conducive environment for the most extensive mass teleworking experiment in history. While some organisations were already familiar with teleworking, others had to quickly follow suit. However, not all occupation tasks can be performed at home. For instance, domestic workers and security guards need to be at their employment sites while educators can remotely participate in online teaching programmes. This has raised a key question about the plausibility of jobs to be performed at home. Enquiry into this question is useful for identifying sectors that can operate without spreading the virus, and workers who are exposed to a higher risk of contracting the virus as they cannot work from home.

Using data from Wave 4 of NIDS-CRAM, this paper explores the characteristics of workers who are not able to work from home and whether the structure of their jobs is contributory. Specific focus is given to an understanding of the significant correlates for workers' inability to work from home, that is, demographic characteristics, human capital, type of dwelling, type of work, occupation, employment sector and residential location. We identify individuals who are not able to work from home as those who responded to the question: *Are you able to work from home*? with *'No - none of the time',* while those who can work from home responded as *'Yes - Most of the time'* or *'Yes - some of the time'.* Descriptive statistics and maximum likelihood (logit model) estimation methods are employed for analyses. Our results show that men have a higher likelihood of being unable to work from home than women. Of the four population groups, black Africans, Coloureds and Indians/Asians have a higher probability of being unable to work from home than whites. Furthermore, individuals who dwell in shacks/informal housing are more constrained to work from home when compared to those who live in a house/flat. For geographic location, we find that workers in urban areas have higher limitations of working from home relative to workers in rural areas.

Other results show that workers in formal employment are more likely to be unable to work from home than those in informal work. Also, clerical support workers, service and sales workers, craft and related trades workers, plant and machine operators and workers in elementary occupations are more constrained to work from home when compared to managers and professionals. Among these, the most disadvantaged workers are in elementary occupations and plant and machine operations. Further findings show that workers in the mining sector, private households, the manufacturing sector and community, social and personal services are more vulnerable to being unable to work from home compared to workers in financial intermediation. This suggests that the structural configuration of occupations and industries of employment is an inhibiting factor for working from home.

Our results call for interventions that minimise the risk of exposure to COVID-19 among workers who have been identified as more likely to be unable to work from home. Although COVID-19 vaccine supply is currently limited, the government can consider prioritising these workers in the vaccine rollout plan. Where possible, the vaccine can be distributed through work-based programmes, this can apply to workers in the mining and manufacturing sectors for instance. Alongside, the government can support effective communication that promotes the vulnerable workers' confidence in the vaccines and plans to address potential barriers to vaccination at community and workplace levels. Moreover, we also recommend for mental health support concerning the health effects of not being able to work from home in the COVID-era. The government can monitor the implementation

of these measures in formal workplaces, and deploy digital and telephonic counselling services for vulnerable workers in workplaces such as private households. This may be linked to strategies that address any fatigue that these workers and their employers may be having towards upholding the prescribed public health behaviours to reduce transmission of COVID-19: social distancing, wearing masks, frequent handwashing and sanitising workplaces.

1. Introduction

The World Health Organisation declared COVID-19 as a global pandemic on 11 March 2020. Since then, many governments across the world have instituted stringent national lockdowns or social distancing measures to curtail the spread of the disease. Employers were forced to implement flexible working arrangements since workers were ordered to stay at home and work from there, where functionally possible (Avdiu and Nayyar, 2020). This has resulted in unprecedented changes in the world of work (ILO, 2020). For example, some organisations have had to embrace teleworking to remain viable amidst the pandemic: this refers to work conducted outside the workplace with the aid of Information and Communication Technologies (ICTs) (ILO, 2020). According to ILO (2020), the stay at home regulations generated a conducive environment for the most extensive mass teleworking experiment in history. While some organisations were already familiar with teleworking, others had to quickly follow suit. However, not all occupation tasks can be performed at home. For instance, domestic workers and security guards need to be at their employment sites while educators can remotely participate in online teaching programmes. Existing evidence, however, shows that fewer jobs can be performed from home when compared to those that cannot. This ranges from 6 percent of all jobs in Ghana to 56 percent in Germany (Saltiel, 2020; Dingel and Neiman, 2020; Alipour et al., 2020). These statistics allude to a public health concern as a large proportion of the global workforce cannot work from home (Dingel and Neiman, 2020).

The South African government has also responded to the COVID-19 global pandemic by imposing national lockdowns. These ranged from the most stringent lockdown level 5 (27 March - 30 April 2020) to the less restrictive lockdown level 1 (21 September to 28 December, and resumed in March 2021). One directive that spans all lockdown levels is for non-essential workers to work from home, conditions permitting. Given that a year has passed since the first lockdown, it is expected that employers have had sufficient time to adjust most of their operations to enable effective remote working. This suggests that individuals who still cannot work from home persistently face greater health risks that need to be abated. More information is, however, required to characterise these workers and the nature of their jobs to inform policy responses amidst the pandemic.

Using data from the South African National Income Dynamics Study Coronavirus Rapid Mobile Survey (NIDS-CRAM), this paper explores the characteristics of workers who are not able to work from home and whether the structure of their jobs is also contributory. Specific focus is given to an understanding of the significant correlates for an individual worker's not being able to work from home; that is, demographic characteristics, human capital, type of dwelling, type of work, occupation, employment sector and residential location. Results will serve to inform policies aimed at cushioning South African workers from the health impacts of COVID-19. The analysis exploits data from Wave 4 (collected in February and March 2021) of the NIDS-CRAM survey conducted by the Southern Africa Labour and Development Research Unit (SALDRU) based at UCT's School of Economics. It also utilises maximum likelihood estimation methods.

The rest of the paper is structured as follows. Section 2 contextualises the study, section 3 discusses data and methodology, section 4 discusses the results and concludes.

2. Background and Context

Governments across the world have implemented social distancing and stay at home measures to prevent the spread of COVID-19 (Saltiel, 2020). This has been associated with negative effects on the global economy and the world of work (ILO, 2020). The disruptive effect of COVID-19 on the labour market has seen a shift from traditional office-based work towards teleworking, where possible. To support teleworking, the ILO (2020) developed a practical guide for 'Teleworking during the COVID-19 pandemic and beyond'. This provides practical and actionable recommendations for effective teleworking to policymakers, private enterprises and public sector organizations (ILO, 2020). According to the ILO (2020), teleworking is generally important for business continuity during unforeseen events, hence it can be considered to extend beyond the COVID-19 pandemic.

However, that not all employment tasks can be performed at home has raised a key question about the plausibility of jobs to be performed at home (Dingel and Neiman, 2020, Saltiel, 2020; Hayatama et al., 2020). Enquiry into this question has been useful in identifying sectors that can operate without spreading the virus, and workers who are at risk as they cannot work from home (Dingel and Neiman, 2020).

Dingel and Neiman (2020) provide one of the first studies to classify the feasibility of working at home, taking advantage of the availability of detailed occupational dictionaries collated by the United States of America (US) Bureau of Labour Statistics. The classification is based on task-content information in the Occupational Information Network (O*NET) database and occupational employment counts. The ability to work from home is distinguished by physical and social factors that influence the nature of work and job behaviours such as the input of information, use of mechanised equipment and interaction with others, inter alia. Results show that 37 percent of jobs in the US can be performed at home, with variations across cities and industries. Jobs that can be performed at home also pay more than those that cannot, these account for 46 percent of the country's wages. This suggests that workers who cannot work from home face both economic and health-related disadvantages than those who can. The study also applies its occupational classification to 85 other countries and show that lower-income economies have a lower share of jobs that can be done at home. Particularly, countries with per capita gross domestic product levels below one-third of US levels may only have half as many jobs that can be done from home. This finding resonates with Hatayama et al. (2020) who focus on 53 developing countries. It implies a global inequality in workers' potential exposure to COVID-19 health risks, to the disadvantage of workers in poor countries.

In a developing country context, Saltiel (2020) analyses the share of jobs that can be done at home as well as the worker characteristics associated with such jobs. The study uses data from the Skills Toward Employment and Productivity (STEP) household survey conducted by the World Bank. It covers workers in urban areas of ten developing countries, including Armenia, Bolivia, Yunnan Province in China, Colombia, Georgia, Ghana, Kenya, Laos, Macedonia and Vietnam. The survey presents worker-level task content, which allows a study of within-occupation heterogeneity in workers' capacity to work from home. In addition, all STEP surveys include the same task content questions, which allows direct comparability of results across countries. Saltiel (2020) finds that only 6 percent (in Ghana) to 23 percent (Yunnan, China) of workers in these countries can feasibly carry out their tasks at home. Furthermore, high school dropouts, informal workers and those in low-asset households were shown to be more vulnerable to the negative effects of COVID-19 as their jobs cannot be done from home. For example, 4 percent of high school dropouts can work from home compared to 24 percent of their more educated peers, on average. In addition, occupation emerged to be a significant determinant of working from home, but there were vulnerable workers within an occupation. The study also highlights a need for country-specific studies to identify vulnerable workers and create policies aimed at lessening the negative effects arising from COVID-19 (Saltiel, 2020).

Further, Hatayama et al. (2020) use skills surveys from 53 countries at varying levels of economic development to estimate jobs' amenability to working from home. The study focuses on job characteristics and internet access at home as an important determinant of working from home. It finds a positive correlation between the countries' level of economic development and the opportunity for jobs to be performed at home. This arises as poor countries are more intensive in physical/manual tasks, use less ICT, and have poorer internet connectivity at home. The study also educates us of a gender divide where women are more likely to work from home than men. Moreover, it corroborates Saltiel (2020) in that highly educated (college graduates) individuals are more likely to work from home than others. Type and sector of employment are also shown to be significant determinants of working from home. Salaried and formal workers have jobs that are more amenable to working from home than the average worker. On the contrary, workers in hotels and restaurants, construction, agriculture, and commerce are less likely to work from home. This shows that the structural configuration of jobs is a crucial determinant of the feasibility to work from home. These authors also maintain that using occupation-based information only to assess the feasibility

of working from home is insufficient as occupations explain less than half of the variability in the working-from-home indexes within countries. Rather, it is crucial to focus on individual-level data to assess jobs' amenability to working from home.

As for South Africa, Kerr and Thornton (2020) used the Post-Apartheid Labour Market Series data for 2017-2019 to classify occupations into those that can be plausibly done from home and those that cannot. The method of classification was adapted from US-based measures in Dingel and Neiman (2020). Notably, there is a common criticism in the literature that most studies on this theme rely on US-based measures of the type of tasks required by different occupations, yet task-content of jobs exhibits substantial variation across countries (Hatayama et al., 2020; Saltiel, 2020). According to Hatayama et al. (2020) variations in the organisation of production or levels of technology adoption mean that an occupation with feasibility of working from home in the US can be characterised in poorer economies as being more intensive in face-to-face interactions or in physical tasks. Hence, US based measures may lead to biased conclusions on the plausibility of working from home in developing countries. Within this limitation, Kerr and Thornton (2020) made some normative based attempts to adjust the Dingel and Neiman (2020) classification to the South African context. Results show that 13.8 percent of South Africans who were employed before the stringent lockdown could feasibly work at home (about 2 million). In addition, 63 percent of workers were shown to be neither essential nor could work from home (about 10.5 million workers). The study broadly concludes that working from home is possible only for relatively skilled workers. For instance, 65 percent of senior managers and 56 percent of professionals could work from home. However, no workers in low skilled occupations could work from home, since their jobs involve tasks that require them to be at their workplace. This finding resonates with Kawaguchi and Motegi (2020) for Japan. The latter attach higher chances of working from home to those in professional occupations, characterised by non-routine, analytical and non-interactive tasks, while the opposite applies to service sector workers requiring face-to-face interactive tasks or manual labourers, characterised by routine and manual tasks.

While Kerr and Thornton (2020) educate us on the feasibility of working from home in South Africa before the global pandemic, the situation could have changed amidst the pandemic. Evidence from longitudinal studies shows that some industries and occupations that had low pre-pandemic working from home capacity up-scaled the capacity during the pandemic (Kawaguchi and Motegi, 2020). For example, in Germany only 38 percent of employees in 'Financial and Insurance Activities' could work from home in 2018. The sector exploited its 'untapped work from home capacity' such that 90 percent of employees could work from home in 2020 (Alipour et al., 2020). This calls for studies that complement existing evidence on who cannot work from home in South Africa by focusing on the pandemic period.

Potential effects of COVID-19 regulations on Working from home

The South African government imposed a stringent lockdown level 5 from March-April 2020. This saw the closure of all sectors of the economy barring essential services (Department of Cooperative Governance and Traditional Affairs - COGTA, 2020a-b). Employees in non-essential services were ordered to stay at home and work from there where applicable. This was followed by lockdown level 4 from 1-31 May 2020, where the government issued strict health protocols and social distancing rules whose relevance tends to span all lockdown levels. The stay and work from home directive was still in force, employers had to equip employees to work from home and minimise contact. The government opened up more and more sectors of the economy during subsequent lockdown levels; level 3 (June - August 2020), level 2 (18 August - 20 September), level 1 (21 September to 28 December, and resumed in March 2021). More workers were allowed to work away from home with each successive lockdown level, under strict adherence to individual and workplace health protocols and social distancing measures (Benhura and Magejo, 2020). However, observing social distancing measures means that most workplaces cannot accommodate their entire workforce which requires that some work from home.

Moreover, working from home is still relevant given the risk of new waves of COVID-19 infections. For instance, on 29 December 2020 the country was moved from lockdown level 1 to adjusted lockdown level 3 to contain a sudden surge in COVID-19 infections. The government ordered employers to enable employees to work from home or minimise the need for employees to be physically present at the workplace (COGTA, 2020c). It is therefore expected that employers have had sufficient time to adjust working arrangements and enable working from home, in line with best practices from other countries and guidelines provided by the government and the ILO (2020). Importantly, employers could have devised human resource management practices to monitor employee output and prevent 'shirking from home' (Kawaguchi and Motegi, 2020). As such, workers who still report that they are not able to work from home require public health support. This solicits the present study to present the first set of evidence that classifies workers who cannot work from home using data for lockdown level 1.

3. Methodology

This study utilises descriptive statistics and the following logit model to identify the determinants of a worker's inability to work from home:

$$wh_i = x_i'\beta + u_i \tag{1}$$

where wh_i is equal to 1 if worker i is unable to work from home and 0 otherwise, x_i is a vector of individual i's demographic and job characteristics (age, gender, marital status, race, education, occupation, type of work, sector of employment, housing characteristics and location) $and\ \beta$ is the corresponding vector of coefficients. Assuming that u_i follows a standard logistic distribution, it follows that:

$$P(wh_i = 1 \,|\, x_i) = \frac{\exp(x_i'\beta)}{1 + \exp(x_i'\beta)} \tag{2}$$

where P is the probability of being unable to work from home. The model is estimated using the method of maximum likelihood. We compute the marginal effect of each covariate evaluated at the average value to evaluate the extent to which our covariates influence a worker's inability to work from home. We acknowledge that this analysis is limited by not accounting for workers' unobserved heterogeneity that may influence their inability to work from home and their occupation and sector choices. Accordingly, our analysis provides indications on who is unable to work from home and does not uncover the causal mechanisms underlying observed patterns. All estimations are weighted using new-scaled person weights

4. Data and descriptive statistics

4.1. Data

This paper uses data from the NIDS-CRAM wave 4 survey conducted in February/March 2021 by the Southern Africa Labour and Development Research Unit (SALDRU) based at UCT's School of Economics. The survey collects information on a wide range of individual and household characteristics (e.g. demographics, labour market status, education, health and location).

Our outcome variable, inability to work from home, is based on the following question in the survey:

Are you able to work from home?

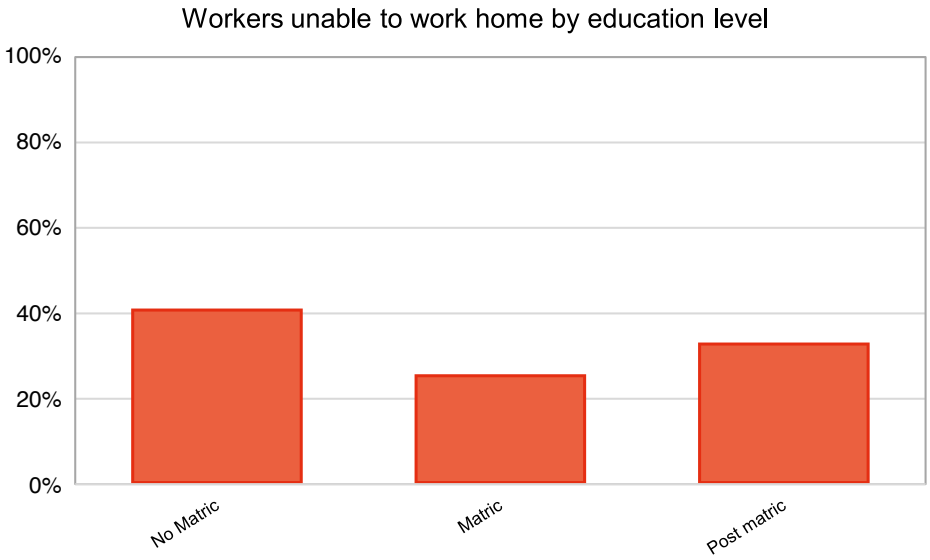
Individuals who respond to this question with *'No - none of the time'* are classified as being unable to work from home with our binary variable taking a value of 1. Those who respond with *'Yes - Most of the time'* or *'Yes - some of the time*' are classified as being able to work from home; our binary variable takes the value of 0 for these individuals. In our analysis, we exclude individuals with missing information on our key variables. The sample is also restricted to employed individuals aged 15 to 65 years. The data cleaning process leaves 2, 256 individuals in our final sample of analysis. Other variables that we use from the data relate to age, gender, race, marital status, type of work, occupation, sector of employment, housing characteristics and location (urban and province).

4.2. Descriptive statistics

Table A.1 in the Appendix presents descriptive statistics of our final sample while *Figure 1* provides a visual illustration of workers who are unable to work from home by demographic group and education level. Overall, 68 percent of workers in South Africa were unable to work from home in February/March 2021 (see *Table A.1*). The greatest share of workers who were unable to work from home was in the age group 15-35 (i.e. 45 percent), the share declines monotonically with age; becoming 6 percent for 56-65 year old workers. Men formed a higher percentage of workers who were unable to work from home than women (59 vs 41 percent) while Africans comprised the largest share of workers who cannot work from home than other race groups.

There are no significant differences in the share of married and unmarried workers who were unable to work from home. In terms of education, the highest share of workers who were unable to work from home was amongst those with no matric (41 percent) while matriculants (26 percent) were the least disadvantaged. A disaggregation by occupation, *Figure 2*, shows that workers in elementary occupations (31 percent), sales and service workers (18 percent) and managers and professionals (15 percent) were amongst the most constrained to work from home. A very small share of skilled agriculture, forestry and fishery workers could not work from home. Among white-collar occupations, those with post-matric education had considerable challenges of being unable to work from home, while among blue-collar jobs workers without matric education fared worse.

Figure 1: Workers unable to work from home by demographic group & education



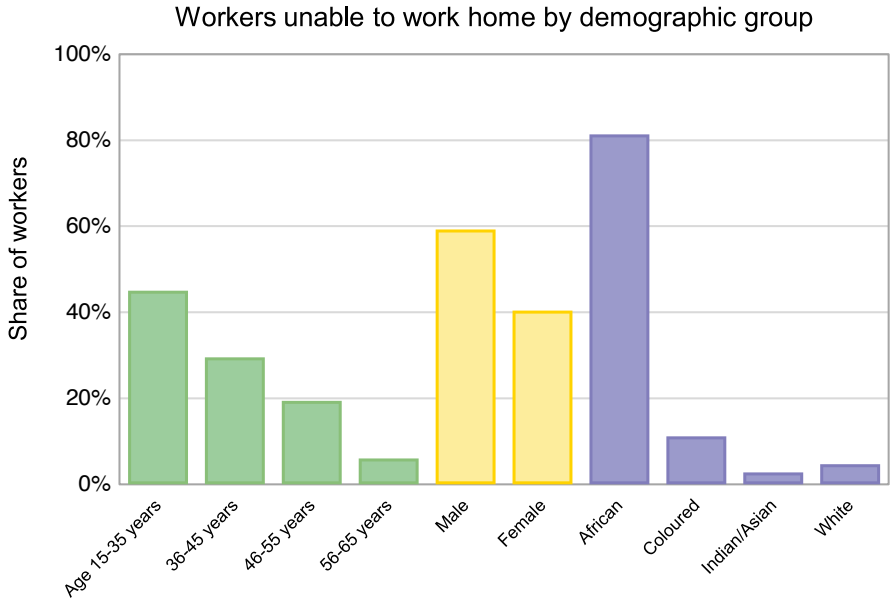


Figure 2: Workers who are unable to work from home by occupation & education

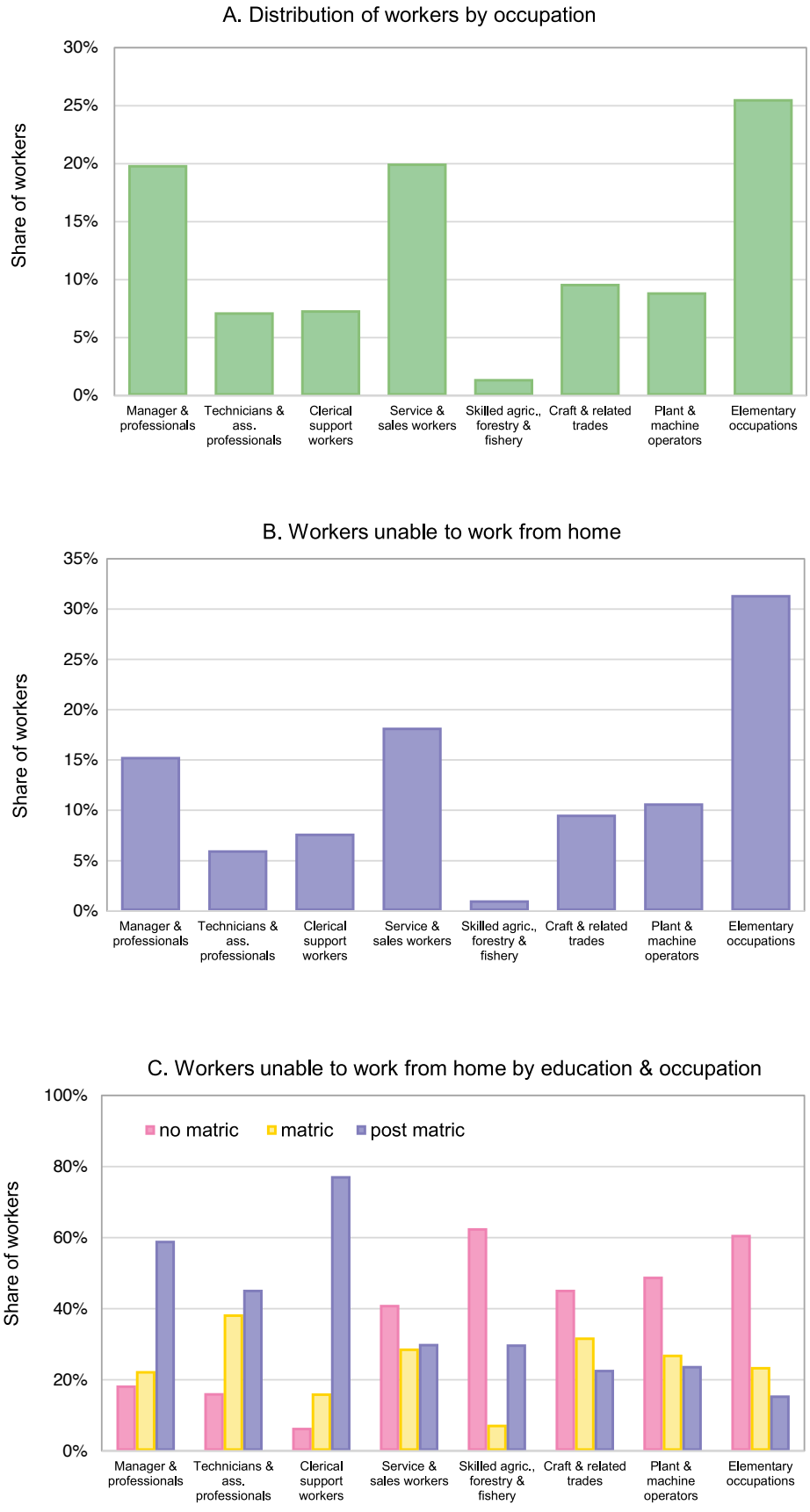


Figure 3 shows the distribution of workers who were unable to work from home by sector of employment. The community, social and personal services sector has the highest share of workers (29 percent) who were unable to work from home in February/March 2021 followed by those in wholesale and retail trade (18 percent) and the manufacturing sector (13 percent).

Figure 3: Workers who are unable to work from home by sector

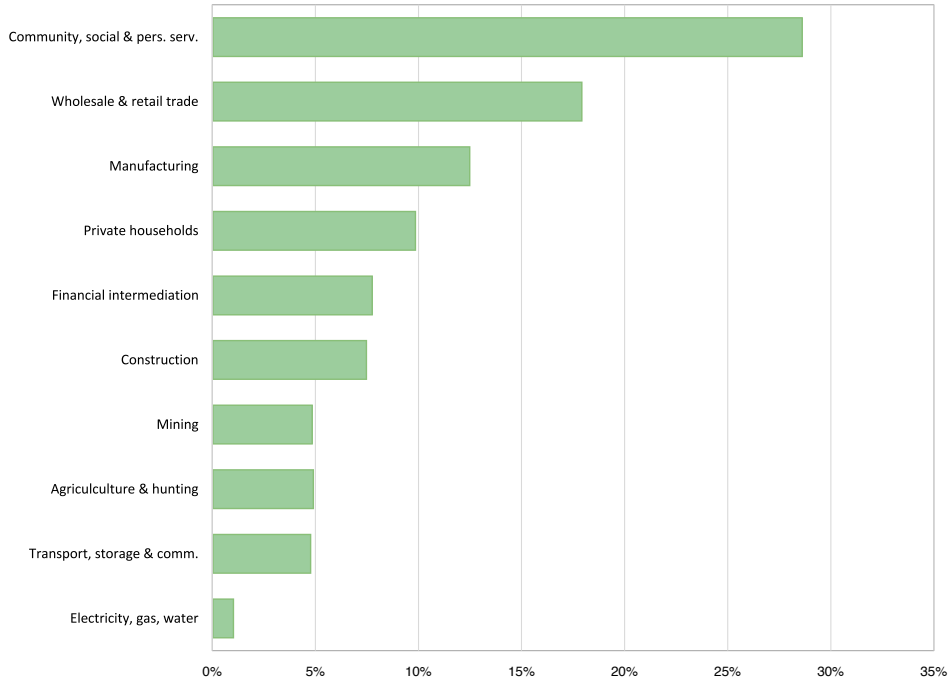


Table A.1 in the appendix also shows that 33 percent of workers who were unable to work from home had informal rather than formal employment. Given that the data at use does not have information on access to information and communication technologies within the household, we proxied for these using type of dwelling: house/flat, traditional housing and shack/informal housing. Statistics for these variables show that a large share (79 percent) of workers who were unable to work from home lived in a house/flat, 16 percent lived in informal housing while the remainder lived in traditional houses. In addition, most of the workers (81 percent) who were unable to work from reside in urban than rural areas. Taken together, these statistics show that there is a distribution of workers who were unable to work from home across demographic and job characteristics.

5. Regression Results

In this section, we present results of the logit model where the dependent variable is equal to 1 if a worker is unable to work from home and 0 otherwise. All estimations are weighted by person weights. Consistent with descriptive statistics we find that the probability of being unable to work from home was 9 percent higher for men relative to women. The gender differential is statistically significant at the 1 percent level. Relative to the white population group, we find that Africans, Coloureds, Indians/Asians were more likely to be unable to work from home. The marginal effects for these population groups are of the same order (0.26-0.27), suggesting that non-white population groups faced the same relative disadvantage of being unable to work from home. We also find that age, marital status and education were not significant predictors of an individual's inability to work from home. The result for education differs from what has been reported for other countries where the probability of not being able to work from home is inversely related to the level of education. This could be partly explained as our study does not account for employment tasks performed by individuals due to data constraints.

Turning to work characteristics, we find that workers in informal employment were 35 percent less likely to be unable to work from home compared to those in formal work. This result is rationalised by the flexible working conditions that characterise informal work, especially in the informal sector. Compared to managers and professionals, individuals in other occupations were more likely to be unable to work from home, except for technicians and associate professionals, and skilled agriculture, forestry and fishery workers where insignificant effects exist. The most affected workers were in elementary occupations and plant and machine operations, their probabilities of being unable to work from home were 32 and 38 percent higher than those of the base category, respectively. We also find that workers in all sectors except electricity, gas, water and transport, storage and communication faced higher working from home constraints relative to those in financial intermediation. Workers in the mining sector, private households, the manufacturing sector, agriculture and hunting and community, social and personal services were the most affected. Mine workers' probability of being unable to work from home was 62 percent higher than that for workers in financial intermediation. The corresponding probabilities for workers in private households, the manufacturing sector, agriculture and hunting and, community, social and personal services were 38 percent, 25 percent, 24 percent and 23 percent, respectively.

Table 2: Logistic regression results – workers unable to work home

	Coef.	SE.	Marginal effect	SE.	
Demographics					
Male	0.49	(0.19)	0.09	(0.04)	***
African	1.32	(0.39)	0.26	(0.08)	***
Coloured	1.32	(0.52)	0.26	(0.10)	**
Indian/Asian	1.42	(0.75)	0.27	(0.14)	*
Age 36-45 years	-0.03	(0.20)	-0.01	(0.04)	
46-55 years	-0.34	(0.23)	-0.07	(0.04)	
56-65 years	-0.18	(0.33)	-0.03	(0.06)	
Married	-0.21	(0.17)	-0.04	(0.03)	
No Matric	0.08	(0.23)	0.02	(0.04)	
Matric	0.43	(0.27)	0.08	(0.05)	
Type of work					
Informal work	-1.79	(0.19)	-0.35	(0.04)	***
Occupation					
Technicians & assoc. professionals	0.55	(0.36)	0.11	(0.07)	
Clerical support workers	0.98	(0.46)	0.19	(0.09)	**
Service & sales workers	0.82	(0.30)	0.16	(0.06)	***
Skilled agric., forestry & fishery	0.32	(0.47)	0.06	(0.09)	
Craft & related trades	1.16	(0.35)	0.22	(0.07)	***
Plant & machine operators	1.98	(0.57)	0.38	(0.11)	***
Elementary occupations	1.68	(0.30)	0.32	(0.06)	***

Sector					
Private households	1.95	(0.51)	0.38	(0.10)	***
Agriculture & hunting	1.24	(0.45)	0.24	(0.09)	***
Mining	3.22	(0.69)	0.62	(0.13)	***
Manufacturing	1.28	(0.34)	0.25	(0.07)	***
Electricity, gas, water	0.40	(0.51)	0.08	(0.10)	
Construction	0.80	(0.40)	0.15	(0.08)	**
Wholesale & retail trade	0.99	(0.30)	0.19	(0.06)	***
Transport, storage & comm.	0.22	(0.60)	0.04	(0.12)	
Community, social & pers. serv.	1.17	(0.30)	0.23	(0.06)	***
Housing					
No electricity access	0.37	(0.37)	0.07	(0.07)	
Traditional house	-0.29	(0.26)	-0.06	(0.05)	
Shack/other housing	0.81	(0.29)	0.16	(0.06)	***
Location					
Urban	0.67	(0.21)	0.13	(0.04)	***
Western Cape	0.16	(0.45)	0.03	(0.09)	
Eastern Cape	0.25	(0.32)	0.05	(0.06)	
Northern Cape	-0.19	(0.45)	-0.04	(0.09)	
Free State	0.45	(0.35)	0.09	(0.07)	
KwaZulu Natal	0.73	(0.27)	0.14	(0.05)	***
North West	0.08	(0.39)	0.02	(0.07)	
Mpumalanga	0.19	(0.29)	0.04	(0.06)	
Limpopo	0.35	(0.31)	0.07	(0.06)	
Constant	-2.55	(0.51)			

Notes:
1. Dependent variable =1 if worker is unable to work from home and 0 otherwise.
2. Robust standard errors in parentheses.
3. All estimations are weighted by person weights that account for the top-up sample.
4. Significance level: ***=1%, **=5%, *=10%.
5. Reference groups are male, age 15-35 years, white, single, post-matric, self-employment, managers and professionals, financial intermediation, house/flat, rural and the Gauteng province.

Results for housing characteristics show that living in a shack/informal housing is associated with a 16 percent higher likelihood of being unable to work from home compared to living in a house/flat. Since access to the internet at home is lower in informal settlements when compared to formal residential areas, this result somewhat suggests that a lack of access to the internet at home inhibits teleworking. In terms of location, we find that workers in urban areas were more likely to be unable to work from home compared to those in rural areas. This reflects the diversity of jobs in urban compared to those in rural areas. Workers in KwaZulu Natal were also more disadvantaged compared to those in the Gauteng province while no statistically significant effects were uncovered for the other provinces.

6. Conclusion and Policy Recommendations

Understanding the characteristics of workers who are unable to work from home in the COVID era is important given that they face a higher risk of exposure to the virus than those who can work from home. In this paper, we explored the demographic and job characteristics that significantly predict the probability that a South African worker cannot work from home. These specifically include gender, age, marital status, population group, education, type of dwelling, type of work, occupation, sector of employment, and geographic location (rural/urban and province of residence). The analysis utilises descriptive statistics, logit models and the NIDS-CRAM wave 4 dataset.

We find that men have a higher probability of being unable to work from home than women. Of the four population groups, black Africans, Coloureds and Indians/Asians have a higher probability of being unable to work from home than whites. Further, individuals who dwell in shacks/informal housing are more constrained to work from home compared to those who live in a house/flat. For geographic location, we find that workers in urban areas have higher limitations of working from home relative to workers in rural areas. Workers in KwaZulu Natal are also more constrained to work from home when compared to those in Gauteng.

Other results show that workers in formal employment are more likely to be unable to work from home than those in informal work. In addition, clerical support workers, service and sales workers, craft and related trades workers, plant and machine operators and workers in elementary occupations are more constrained to work from home when compared to managers and professionals. Among these, the most disadvantaged workers are in elementary occupations and plant and machine operations. Further findings show that workers in the mining sector, private households, the manufacturing sector, agriculture and hunting, and community, social and personal services are more vulnerable to being unable to work from home compared to workers in financial intermediation. This suggests that the structural configuration of occupations and industries of employment is an inhibiting factor for working from home.

Our results call for interventions that minimise the risk of exposure to COVID-19 among workers who are more likely to be unable to work from home. Although COVID-19 vaccine supply is currently limited, the government can consider prioritising these workers in the vaccine rollout plan. Where possible, the vaccine can be distributed through work-based programmes, this can apply to workers in the mining and manufacturing sectors for instance. Alongside, the government can support effective communication that promotes the vulnerable workers' confidence in the vaccines, and plans to address potential barriers to vaccination at community and workplace levels. Moreover, the provision of mental health support concerning the health effects of not being able to work from home in the COVID-era is recommended. The government can monitor the implementation of these measures in formal workplaces, and deploy digital and telephonic counselling services for vulnerable workers in workplaces such as private households. This can be linked to strategies that address any fatigue that these workers and their employers may be having towards upholding the prescribed public health behaviours to reduce transmission of COVID-19: social distancing, wearing masks, frequent handwashing and sanitising workplaces.

This study is not without limitations. For instance, we could not explicitly control for the effect of access to Information and Communication Technologies at home on a workers' inability to work from home due to data constraints. In addition, the data at use does not have information on employment tasks performed by the workers, which could have reduced the precision of our findings. We also do not account for the possibility of selection into jobs that can or cannot be done from home consequently our results do not uncover causal mechanisms. Future studies could benefit from addressing these issues.

REFERENCES

Alipour, J-V., Falck, O. and Schüller, S., 2020. Germany's Capacities to Work from Home. IZA Discussion Paper No. 13152

Avdiu, B. and Nayyar, G., 2020. When Face-to-Face Interactions Become an Occupational Hazard: Jobs in the Time of COVID-19. Policy Research Working Paper; No. 9240. World Bank, Washington, DC.

Benhura, M. and Magejo, P. 2020. Differences between formal and informal workers' outcomes during the COVID-19 crisis lockdown in South Africa. National Income Dynamics Study-Coronavirus

Rapid Mobile Survey (NIDS-CRAM). 2020, Wave 2, Paper 2.

Department of Co-operative Governance and Traditional Affairs, 2020a. Disaster Management Act (57/2002): Regulations made in terms of Section 27(2) R. 398, Government Gazette No. 43148,

Department of Co-operative Governance and Traditional Affairs, 2020b. Regulations issued in terms of section 27(2) of Disaster Management Act (57/2002), NO. R. 446, 2 April 2020.

Department of Co-operative Governance and Traditional Affairs, 2020c. Disaster Management Act, 2002, Amendment of Regulations issued in terms of terms of Section 27(2), 29 December 2020.

Dingel, J.I and Neiman, B., 2020. How Many Jobs Can be Done at Home? Journal of Public Economics, 189: 104235

Hatayama, M., Viollaz, M. and H. Winkler, H., 2020. Jobs' Amenability to Working from Home: Evidence from Skills Surveys for 53 Countries. Documentos de Trabajo del CEDLAS N°263, CEDLAS-Universidad Nacional de La Plata.

ILO, 2020. Teleworking during the COVID-19 pandemic and beyond A practical guide. Geneva: International Labour Office.

Kawaguchi, D. and Motegi, H., 2020. Who Can Work from Home? The Roles of Job Tasks and HRM Practices. Discussion Paper No. 9240 Center for Research and Education for Policy Evaluation (CREPE). The University of Tokyo.

Kerr, A. and Thornton, A., 2020. Essential workers, working from home and job loss vulnerability in South Africa. A DataFirst Technical Paper 41. Cape Town: DataFirst, University of Cape Town.

National Income Dynamics Study-Coronavirus Rapid Mobile Survey (NIDS-CRAM) 2021, Wave 4 [dataset]. Version Beta2. Cape Town: Allan Gray Orbis Foundation [funding agency]. Cape Town: Southern Africa Labour and Development Research Unit [implementer], 2021. Cape Town: DataFirst [distributor], 2021.

Saltiel, F. 2020. Who Can Work From Home in Developing Countries? Mimeo.

Appendix

Table A1: Descriptive statistics

	Overall		Able to work home				Unable to work home			
	Mean	SE.	Mean	SE.	95% CI		Mean	SE.	95% CI	
Unable to work home	0.68	(0.01)								
Demographics										
Age 15-35 years	0.43	(0.01)	0.38	(0.02)	{0.34	0.69}	0.45	(0.01)	{0.43	0.85}
36-45 years	0.29	(0.01)	0.27	(0.02)	{0.24	0.48}	0.30	(0.01)	{0.27	0.55}
46-55 years	0.21	(0.01)	0.24	(0.02)	{0.21	0.43}	0.19	(0.01)	{0.17	0.35}
56-65 years	0.08	(0.01)	0.11	(0.01)	{0.09	0.18}	0.06	(0.01)	{0.05	0.10}
Male	0.57	(0.01)	0.51	(0.02)	{0.47	0.95}	0.59	(0.01)	{0.57	1.13}
Female	0.43	(0.01)	0.49	(0.02)	{0.45	0.90}	0.40	(0.01)	{0.38	0.76}
African	0.76	(0.01)	0.66	(0.02)	{0.62	1.24}	0.81	(0.01)	{0.79	1.57}
Coloured	0.11	(0.01)	0.10	(0.01)	{0.08	0.17}	0.11	(0.01)	{0.10	0.20}
Indian/Asian	0.03	(0.00)	0.03	(0.01)	{0.02	0.04}	0.03	(0.00)	{0.02	0.04}
White	0.10	(0.01)	0.21	(0.02)	{0.18	0.37}	0.05	(0.01)	{0.04	0.08}
Married	0.52	(0.01)	0.57	(0.02)	{0.53	1.06}	0.50	(0.01)	{0.47	0.94}
Education										
No Matric	0.40	(0.01)	0.37	(0.02)	{0.33	0.67}	0.41	(0.01)	{0.39	0.77}
Matric	0.23	(0.01)	0.18	(0.01)	{0.16	0.32}	0.26	(0.01)	{0.24	0.47}
Post matric	0.37	(0.01)	0.45	(0.02)	{0.41	0.83}	0.33	(0.01)	{0.31	0.62}
Type of work										
Informal work	0.42	(0.01)	0.60	(0.02)	{0.57	1.13}	0.33	(0.01)	{0.31	0.61}
Housing										
No electricity access	0.04	(0.00)	0.03	(0.01)	{0.01	0.03}	0.05	(0.01)	{0.04	0.08}
House/flat	0.82	(0.01)	0.88	(0.01)	{0.86	1.69}	0.79	(0.01)	{0.77	1.52}
Traditional house	0.05	(0.00)	0.06	(0.01)	{0.04	0.09}	0.05	(0.01)	{0.04	0.07}
Shack/other housing	0.13	(0.01)	0.06	(0.01)	{0.04	0.09}	0.16	(0.01)	{0.15	0.30}
Location										
Urban	0.79	(0.01)	0.75	(0.02)	{0.72	1.43}	0.81	(0.01)	{0.79	1.56}
N (unweighted)	2,256		1,557				699			

Notes: Statistics are weighted by person weights that account for the top-up sample.

For further information please see **cramsurvey.org**