# Working from home and physical proximity during the COVID-19 pandemic: implications for gender inequality in the South African labour market

Jacqueline Mosomi[1] Amy Thornton[2] Nicola Branson[3]

[1]Junior Research Fellow at the Southern Africa Labour and Development Research Unit (SALDRU)
[2]Postdoctoral Research Fellow at the Southern Africa Labour and Development Research Unit (SALDRU)
[3]Chief Research Officer at the Southern Africa Labour and Development Research Unit (SALDRU)

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**Abstract**

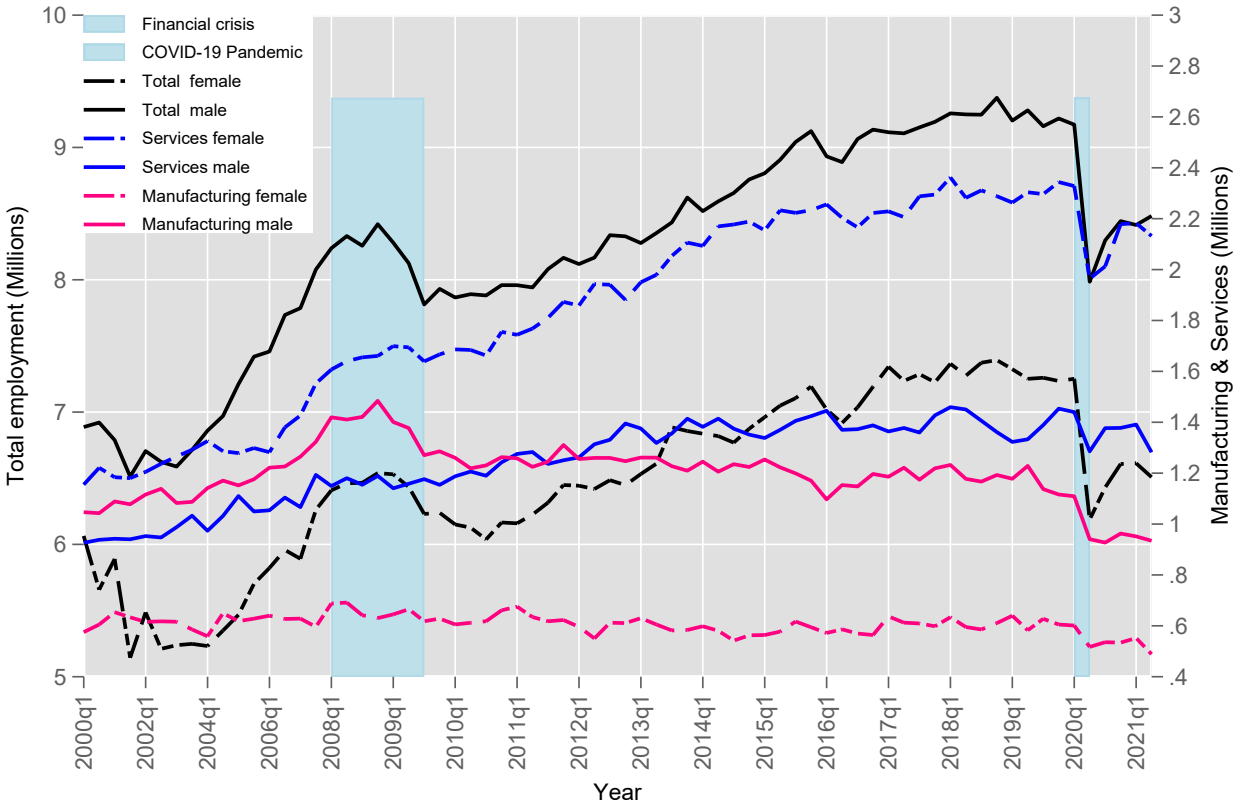
Previous economic downturns such as the recent 2008-2009 global financial crisis have tended to disproportionately affect male employment due to greater contractions in male dominated industries. However, South African national labour market data shows that men and women lost approximately the same number of jobs between quarter 1 and 2 of 2020. We combine South African labour market data with occupational work context data from O*NET to show that, the higher ratio of female to male job loss in 2020 compared to the 2008/2009 global financial crisis is related to gendered occupational sorting and the health risk nature of the COVID-19 recession. Employment change between quarter 1 and 2 of 2020 is well explained by factors specific to COVID-19 social distancing protocols. Occupations deemed non-essential, those that rank high in physical proximity and those that are difficult to carry out from home were most likely to shed jobs. The majority of female dominated occupations rank high in physical proximity and these were most vulnerable during lockdown. The ability to work from home emerges as the most important protective factor for job loss, however, less that 10% of the population could work from home suggesting worsening inequalities in the labour market.

**Keywords:** Covid-19; occupational sorting; O*NET; physical proximity; work from home; gender inequality

# 1 Introduction

In the past, depressions and recessions have unintentionally reduced gender inequality in the labour market (Blau & Kahn 2017). This effect did not necessarily come from the improvement of women's labour market outcomes but from relatively greater deterioration of male labour market outcomes. Previous recessions have tended to negatively affect production related sectors like manufacturing and construction, which are important employers of men (Albanesi & Sahin 2018, Blau & Kahn 2017, Rubery & Rafferty 2013). In South Africa, men lost about 2 times the number of jobs lost by women during the 2008-9 Global Financial Crisis (GFC) (see Figure 1), reducing the gender gap in probability of employment by about 2 percentage points[1]. However, when the Covid-19 pandemic first started spreading and governments around the world started imposing national lockdowns, many researchers (Alon et al. 2020, Beland et al. 2020, Casale & Shepherd 2020, Mosomi et al. 2020, Lewandowski et al. 2021) predicted such policies might roll back gains in gender equality in the labour market. The reasoning behind this was that the social distancing protocols imposed on the population would be particularly adverse for service occupations, in which women are disproportionately clustered (Mosomi et al. 2020, Lewandowski et al. 2021).

**Figure 1:** Trends in employment: total, manufacturing and services industries




Notes: own calculations using PALMS v3.3 and QLFS from StatsSA. totals weighted by survey weights.

More than a year into living with Covid-19 lockdown policies, these predictions have proven true to some extent. In the US, UK and Germany women have indeed lost more jobs than men or they have lost more

[1]In the second quarter of 2008, the gender gap in the employment rate was about 14.5% and this reduced to about 12.5% in the third quarter of 2009 (Own calculations using PALMS v3.3).

jobs than might have been expected, had the recession been only financial in nature (i.e. without a health risk and social distancing aspect) (Adams-Prassl et al. 2020, Albanesi & Kim 2021). The latter was the case in South Africa according to national labour market data from 2020. The South African government imposed a strict national lockdown on 26 March 2020, which roughly corresponds with the end of collection of quarter 1 (Jan-Mar) national labour market data. Between quarter 1 and 2 (Apr-Jun), men lost about about 1.2 million jobs and women, 1 million (see Figure 1). Figure 1 shows the trends in employment in South Africa for the past 2 decades. The Figure shows that the extent of job loss was more severe in 2020 for both men and women. Men lost more jobs in absolute numbers, but women actually lost a slightly higher share of jobs. Men's 1.2 million jobs amounted to 13.3% of male employment; women's million jobs lost represent a 14.8% contraction in female employment. The figure also shows that while job loss was more severe in the manufacturing sector during the 2008-9 Global Financial Crisis, the COVID-19 pandemic has been devastating in the services sector. Also highlighted in the Figure is the importance of the services sector for female employment in South Africa, accounting for over a third of all female employment.

In this paper, we are interested in why compared to 2008-9, women lost relatively more jobs in 2020 compared to men. In particular, we are interested in whether the result of gendered occupational sorting - women clustering in service sectors - set women up to lose more jobs compared to the GFC. We begin by showing that had 2020 job loss followed the pattern of GFC job loss, the effect on female employment would have been much different, whilst male employment would still have contracted. In other words, factors unique to Covid-19 social protocols are behind why women lost jobs in 2020 in South Africa. We construct four measures of the likelihood one will keep one's job given the restrictions of lockdown and social distancing protocols. We expect jobs that require more physical proximity or generate greater exposure to infectious diseases will be more vulnerable. And, we expect jobs that are classified as essential services or which are possible to do remotely from home will be most protected from job loss. Our measure of physical proximity and exposure are constructed using O*NET and merged into South African labour market data, along with classification of essential services from Kerr & Thornton (2020) and self-reported ability to work from home. In this way, we can study how social distancing protocols structured employment change over 2020.

We find that the ability to work from home emerges as the most important protective factor in 2020. However, only a small portion of workers (less than 10% pre-lockdown) are able to work remotely. Work that is more physically proximate or non-essential is found to be more vulnerable to job loss; and, women who cannot work from home are significantly more likely than men to be in work that requires more physical proximity or which is deemed non-essential. Women's clustering in high-proximity service occupations like personal and protective services; domestic work; and customer service clerking is then an important explanation for relatively worse female labour market outcomes in 2020. These types of occupations together make up almost 60% of female employment, whereas men are much more evenly distributed across different types of occupations. This is also an important exercise because one argument might be that workers who have lost ground during the Covid-19 lockdown are vulnerable groups anyway, e.g. low-skilled groups, less educated groups. We are able to show that even if some of the groups who have lost ground were vulnerable before the pandemic, Covid-19 has carved a unique path through the labour market.

This work is an extension of previous work (Mosomi et al. 2020) of how physically proximate work is distributed in the South African labour market shortly before the pandemic. This previous study was written prior to the release of the 2020 labour market data using data for the period 2017-9. The paper provides the rationale for why Covid-19 lockdowns would detail progress towards gender equality in the

South African labour market owing to women being clustered in more physically proximate work (Alon et al. 2020, Lewandowski et al. 2021). The paper also documents evidence that women were much more likely than men to be exposed to infectious disease as part of their jobs, meaning women in essential services over lockdown could be relatively more exposed to the Covid-19 virus. Of the small share of women who could work from home, the paper documents the concern that increased childcare due to schools and Early Childhood Development (ECD) centre closures would make working from home more difficult. This paper builds on this work by applying this framework to the real outcomes of the Covid-19 lockdown using 2020 labour market data.

Locally, our work links to previous work on gendered occupational sorting in South Africa and the effects on gender gaps in labour market outcomes (Casale et al. 2021, Mosomi 2019, Budlender 2019, Gradín 2018, Rospabé 2001). The work also contributes to the international literature on how labour market outcomes will be structured by the interaction between occupational work contexts and COVID-19 social distancing protocols (Albanesi & Kim 2021, Lewandowski et al. 2021, Mongey et al. 2021). An example is the study by Dingel & Neiman (2020) who used O*NET to estimate how many workers could work from home, or telework. Kerr & Thornton (2020) adapted this for the South African case, before the release of the 2020 labour market data and we use this measure as an alternative measure of working from home in this paper. Dingel & Neiman (2020) estimated that about 37% of the US workforce could telework, compared to an estimate of 14% for the South African case from Kerr & Thornton (2020).

More recently, Mongey et al. (2021) showed that an O*NET measure of physical proximity and remote work was correlated with employment change over lockdown in the United States. Mongey et al. (2021) use these measures to identify groups vulnerable to job loss over lockdown, being less educated, lower-earning workers. Women in the US were more likely to work in physically proximate work, while men were more likely to be able to work from home. Interestingly, women are often more likely to be able to work from home in the developing world (although the share of workers who can work from home is much smaller, in general) (Gottlieb et al. 2021). Mongey et al. (2021) also make a comparison to the GFC and similarly conclude that although many Covid-19 impacted workers are usually more economically-vulnerable, the Covid-19 pandemic has produced a unique pattern of job loss. Our present study extends this strand of the literature by more specifically mobilising analysis of occupational job loss to understand implications for gender inequality in the South African labour market. Our analysis of occupational measures of job-loss is informed by our understanding of how occupational sorting structures the South African labour market to provide an answer for why women have performed relatively worse in 2020 compared to the GFC.

We introduce our data in Section 2. We then use this data in Section 3 to describe gendered occupational sorting in South Africa and how this has shifted between 2008 and 2020. Section 4 then describes employment change by occupation during the GFC and in 2020. We answer the question of what employment change might have been in 2020 had the recession been only financial in nature in Section 5. We do this by constructing a counterfactual 2020 employment change using GFC rates of job loss and find the surprising result that women would not have lost any jobs at all. The next challenge is to describe what makes 2020 job loss unique. To do this, we construct measures of occupational job-loss risk using O*NET and describe their distribution in the labour market prior to lockdown in Section 6. In Section 7 we show that these measures are able to predict changes in employment in 2020. We also show that these measures distinguish 2020 job loss from GFC job loss: factors specific to lockdown explain 2020 job loss patterns and are not correlated with GFC job loss patterns. Even if some groups of workers who have lost jobs in 2020 are vulnerable anyway, lockdown-specific factors made them more so. We discuss some implications of our

findings in Section 8 and conclude in Section 9.

## 2 South African labour market data

We combine a number of data sets for this study. Firstly, we use the five quarters between 2020 Q1-2021 Q1 from the Quarterly Labour Force Surveys (QLFS) (*Statistics South Africa* 2019*a*,*b*, 2020*a*,*b*,*c*,*d*, 2021) collected by Statistics South Africa (StatsSA). The QLFS is South Africa's main source of labour market data. It is a cross-sectional household survey of approximately 30 000 dwelling units based on about 3 000 Primary Sampling Units from the most recent census and use a two-stage cluster sampling design to be nationally representative. The surveys cover the spectrum from basic demographic and household information to detailed labour market data. Importantly for our purposes, the data includes the 2003 South African System of Occupational Classification (SASCO) codes for employed workers at a detailed four-digit level.

Important to know is that the onset of lockdown in South Africa on the 26th of March 2020 forced changes to the collection of the QLFS. The QLFS changed from what had previously been a survey collected using face-to-face interviews, to one using Computer Assisted Telephone Interviewing (CATI). As such, the sampling design was forced to change from a cross-sectional design with a third of the sample being a rotating panel up until 2020 Q1, to a panel of the 2020 Q1 sample that were contactable by telephone from 2020 Q2 on wards. The implications of this structural break in the sampling method is still being investigated. However, the documentation released with the data subsequent to 2020 Q1 describes how StatsSA have adjusted the survey weights to account for this change.

To compare 2020 to the GFC, we utilize a subset of the Post-apartheid Labour Market Series (PALMS). PALMS is a harmonized series of South African household surveys for the years 1993-2019 curated by DataFirst at the University of Cape Town (Kerr et al. 2019). For this analysis we use data for the period 2008-9. The original data for these years comes from the QLFS. However, the PALMS series offers some advantages over using the QLFS, mainly a more consistently weighted population weight.

## 3 Gendered occupational sorting in South Africa

Occupational segregation by gender has been one of the most enduring characteristic of labour markets globally and is cited as an important explanatory variable for the gender wage gap (Bergman 1974, Levanon et al. 2009, Anker 1997, Blau & Kahn 2017, Goldin 2014). In fact, some researchers posit that women are not paid lower wages relative to men for doing the same job but rather, jobs where women are over represented tend to be characterized by low wages (England et al. 2002, Budlender 2019). These jobs tend to be mostly in the services sector and are highly interpersonal in nature. South Africa is no exception and gender inequality is a structural feature of the South African labour market. Women in South Africa are less likely to be employed compared to men, and if they are employed, they work fewer hours and earn less than men (Casale et al. 2021, Mosomi 2019). Over a third of employed women in South Africa are clustered in the services sector (Mosomi et al. 2020). Further, a description of labour market data shows that over 80% of employed women in 2019 were employed in four major sectors namely; domestic services, community services, trade and financial services sectors (Mosomi et al. 2020). What these sectors have in common is

that jobs in these sectors are highly interpersonal and require workers to be in close physical proximity with either other co-workers or clients. As other researchers have shown (Mongey et al. 2021, Albanesi & Kim 2021) and as we show in this paper, these job characteristics made women more vulnerable compared to men, to job loss and COVID-19 infection during the pandemic.

Table 1 describes the distribution of occupations for male and female employment, as well as, the percent per occupation who are female in the South African labour market in 2008 and 2020 Q1. We use 2008 and 2020 Q1 to set up the structure of the South African labour market before the impact of the recessions that hit soon after both of these time periods. Women are clustered in four main occupations: elementary sales and services (27.57% in 2020 Q1), personal and protective services (13.57%), and office and customer service clerks (16.5%). Together, these occupations account for 57.6% of female employment. Domestic workers fall into the elementary sales and services occupations, with half of women in this occupation code being domestic workers in 2020 Q1. Since 2008, the share of women employed in elementary sales and services has dropped slightly as women leave domestic work, often moving to personal and protective services. Employment in personal and protective services has grown for both men and women, although men and women sort further within this occupational code. Women are mainly employed in personal care (e.g. mostly cooks, then childcare workers); whereas about half of men in this occupation are in protective services not elsewhere classified (e.g. private security guards), followed by police and traffic officers.

Men are more evenly distributed across different occupations compared to women. For example, men were most highly concentrated in personal and protective services and this made up 11% of male employment in 2020 Q1. Men are also concentrated in building trades, drivers and mobile plant operators, elementary sales and services, agricultural labourers, and mining, construction, and manufacturing labourers. For comparison to the female case, the four largest occupations for men (codes 51, 83, 71, and 92), make up only 38.54% of male employment. The most notable change for men between 2008 and 2020 Q1 was the expansion of personal and protective services, followed by elementary sales and services. There was also a drop in trades workers being men in building trades, manufacturing occupations.

**Table 1:** Occupational make-up of men and women's employment in 2008 and 2020 Q1

| | 2008 | | | 2020 Q1 | | |
|---|---|---|---|---|---|---|
| **Two digit occupation code** | **Female Emp.** | **Male Emp.** | **Percent Female** | **Female Emp.** | **Male Emp.** | **Percent Female** |
| **11. Leg. + sen. officials** | 0.32 | 0.55 | 31.56 | 0.28 | 0.44 | 33.90 |
| **12. Corp. man.** | 3.32 | 5.40 | 32.37 | 4.56 | 6.77 | 34.74 |
| **13. Man. small enterp.** | 1.59 | 3.33 | 27.11 | 1.47 | 3.87 | 23.14 |
| **21. Science prof.** | 0.53 | 1.89 | 18.04 | 0.40 | 1.27 | 19.98 |
| **22. Life sci. + health prof.** | 1.44 | 0.56 | 66.71 | 0.82 | 0.56 | 53.39 |
| **23. Teaching prof.** | 0.96 | 0.41 | 64.63 | 3.50 | 1.24 | 69.03 |
| **24. Other prof.** | 2.82 | 2.49 | 46.86 | 2.32 | 1.74 | 51.38 |
| **31. Science technic.** | 0.82 | 2.61 | 19.63 | 1.26 | 2.56 | 27.93 |
| **32. Life sci. + health technic.** | 2.69 | 0.71 | 74.75 | 2.70 | 0.71 | 74.89 |
| **33. Teaching assoc. prof.** | 6.04 | 1.86 | 71.73 | 2.71 | 0.98 | 68.68 |
| **34. Other technic.** | 4.14 | 3.45 | 48.35 | 3.41 | 2.63 | 50.62 |
| **41. Office clerks** | 10.26 | 4.54 | 63.83 | 10.29 | 3.76 | 68.36 |
| **42. Customer services clerk** | 6.05 | 1.38 | 77.40 | 6.22 | 1.40 | 77.88 |
| **51. Pers. + protec. serv.** | 9.00 | 8.32 | 45.75 | 13.57 | 11.09 | 49.14 |
| **52. Salespersons** | 4.62 | 3.60 | 49.99 | 4.63 | 4.44 | 45.15 |
| **61. Skilled agri** | 0.28 | 0.56 | 27.97 | 0.20 | 0.43 | 26.49 |
| **62. Subsistence agri.** | 0.04 | 0.06 | 36.91 | 0.07 | 0.20 | 21.84 |
| **71. Building trades** | 0.69 | 11.00 | 4.65 | 0.62 | 9.33 | 4.95 |
| **72. Metal, mach. + trades** | 0.71 | 8.13 | 6.42 | 0.36 | 7.33 | 3.69 |
| **73. Precision, handicraft, printing trades** | 0.47 | 0.80 | 31.32 | 0.20 | 0.61 | 20.31 |
| **74. Other craft trades** | 2.79 | 1.41 | 60.64 | 2.12 | 1.25 | 57.34 |
| **81. Stationary plant ops** | 0.16 | 1.13 | 10.19 | 0.30 | 1.41 | 14.20 |
| **82. Machine ops + assemblers** | 2.24 | 2.91 | 37.51 | 1.64 | 2.09 | 38.17 |
| **83. Drivers + mobile plant ops** | 0.41 | 9.22 | 3.33 | 0.44 | 9.72 | 3.49 |
| **91. Elementary sales + serv.** | 30.19 | 6.99 | 77.12 | 27.57 | 8.02 | 73.09 |
| **92. Agricultural labourers** | 3.33 | 8.18 | 24.11 | 3.69 | 8.48 | 25.59 |
| **93. Mining, construc, manu labouers** | 4.07 | 8.51 | 27.17 | 4.66 | 7.65 | 32.46 |
| | **100.00** | **100.00** | | **100.00** | **100.00** | |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Adjusted using sampling weights.

# 4 Employment change during the Covid-19 recession

Gendered occupational sorting can partly explain why male employment has been more sensitive to previous recessions (Albanesi & Sahin 2018). Male employment is clustered in production sectors such as construction and manufacturing which are typically sensitive to business cycles while female employment is clustered in services sectors which tend to be less cyclical (Albanesi & Sahin 2018, Albanesi & Kim 2021). Table 2 compares employment at the two-digit occupational code level averaged across four quarters in 2008 and 2009[2]. Men lost 285 thousand jobs in 2009, a 3.4% reduction compared to 2008 while women lost 116 thousand jobs, a 1.8% reduction compared to 2008. The ratio of women's to men's jobs lost was 41% (being 116 thousand divided by 285 thousand). Occupations suffering the highest job losses for men were metal, machinery and trades workers; building trades; and, mining, construction, and manufacturing labourers. Whereas for women, the occupation with the highest job loss was elementary sales and services, which includes domestic workers. Notably, personal and protective services grew between 2008 and 2009, by almost as many jobs as elementary sales and services lost.

Table 2 compares occupational employment change between quarters 1 and 2 in 2020 and occupational employment change between 2008 and 2009. South Africa went into complete lockdown on 26 March 2021, meaning the break between Q1 (Jan-Mar) and Q2 (Apr-June) closely corresponds with a before and after period. This information is also illustrated in order of job loss in Figure 2. The first thing to note is that the scale of job loss was greater in 2020. A total of 2.3 million jobs, or 14% of quarter 1 total employment was lost. However, this was distributed much more evenly across men and women. Men lost 1.2 million jobs in quarter 2, a 13.3% drop from quarter 1 while women lost 1 million jobs, a 14.8% drop. In other words, women lost almost as many jobs as men, with the ratio of the number of women's jobs lost to men's being 88%. Based on the precedent of the GFC, this higher ratio of female-to-male job loss is unexpected. Not only were more jobs lost in 2020, but the occupations experiencing most job losses were those that were previously protected during typical economic downturns. For example, other professionals grew in 2020, but contracted in 2009. Science technicians expanded over the GFC, but contracted in 2020, as did life science and health technicians, and, to a lesser extent, personal and protective services.

The bubbles in Figure 2 are weighted by the size of employment in quarter 1. One can see how women are clustered in elementary sales and services; personal and protective services; and clerking (office and customer service). These four occupations all suffered severe job loss between quarter 1 and 2. Whereas in 2009, personal and protective services and office clerks expanded in number. This is important because personal and protective services has become an even more important employer of women, growing by about half a million jobs between 2008 and 2020 and increasing the share of female employment from 8% to 13%.

The broad-based nature of the 2020 recession meant that men lost jobs in most occupations, most severely in building trades; elementary sales and services; mining, construction, and manufacturing labourers; agricultural labourers; personal and protective services; and drivers and mobile plant operators. Men lost the most jobs in building trades at 175 thousand; followed by metal, machinery, and trades workers at 145 thousand; and then elementary sales and services at 142 thousand. Compare to women losing 433 thousand jobs in elementary sales and services, most of them domestic work jobs; and, 208 thousand jobs in personal and protective services. Women were clustered in a smaller number of sectors which were devastated by lockdown, but men lost smaller, but still considerable, numbers across more occupations.

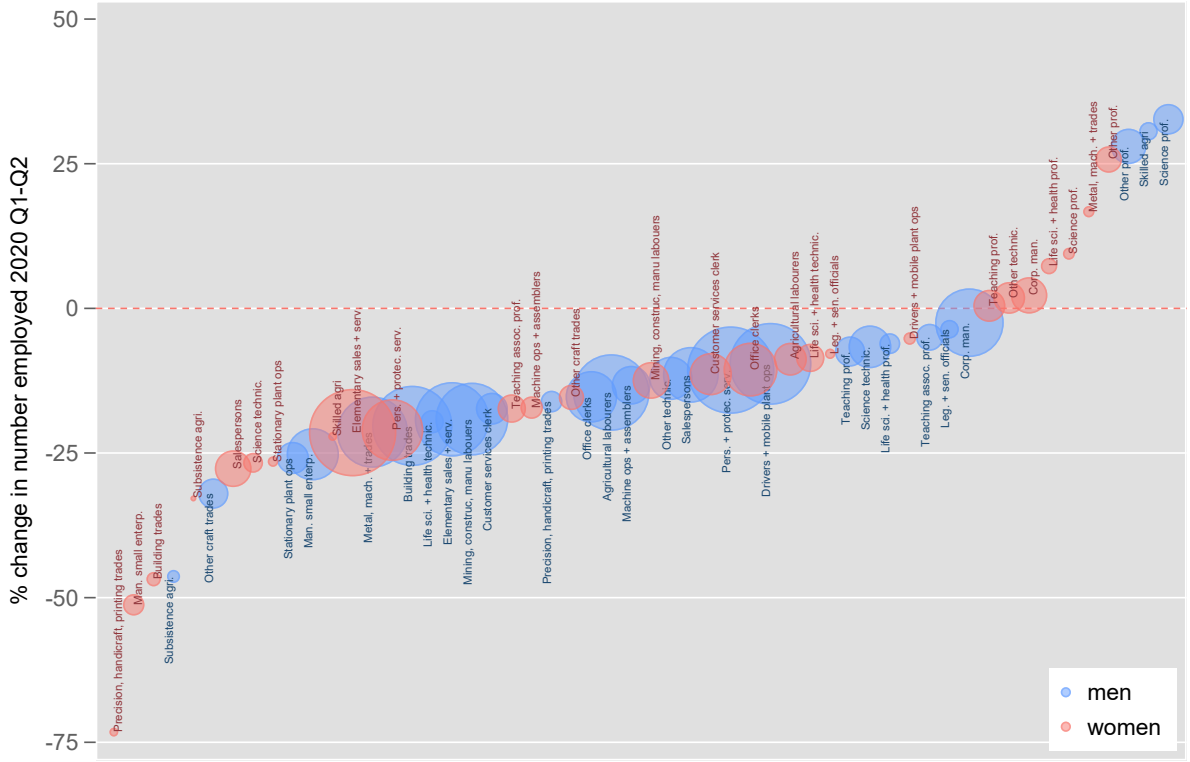
[2]Unlike lockdown in 2020, it is much harder to identify the date around which to delineate the before and after period for the GFC. We use 2009 as the after period because it is the first year in which total employment fell. Some analysts also include 2010 in the after-period because employment continued to fall.

**Table 2:** Change in employment numbers at the two-digit occupational level in 2020 and 2008-9

| 2020 | MEN | | | | WOMEN | | | |
|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Diff. | % | Q1 | Q2 | Diff. | % |
| **11. Leg. + sen. officials** | 40.7 | 39.2 | - 1.5 | - 3.6 | 20.9 | 19.2 | - 1.6 | - 7.8 |
| **12. Corp. man.** | 627.6 | 612.1 | - 15.5 | - 2.5 | 334.0 | 341.5 | 7.5 | 2.2 |
| **13. Man. small enterp.** | 358.7 | 268.2 | - 90.4 | - 25.2 | 108.0 | 52.7 | - 55.3 | - 51.2 |
| **21. Science prof.** | 117.9 | 156.5 | 38.5 | 32.7 | 29.5 | 32.2 | 2.8 | 9.4 |
| **22. Life sci. + health prof.** | 52.3 | 49.1 | - 3.2 | - 6.1 | 59.9 | 64.3 | 4.4 | 7.3 |
| **23. Teaching prof.** | 114.9 | 106.3 | - 8.6 | - 7.5 | 256.2 | 257.3 | 1.1 | 0.4 |
| **24. Other prof.** | 161.0 | 206.1 | 45.1 | 28.0 | 170.2 | 213.9 | 43.8 | 25.7 |
| **31. Science technic.** | 237.6 | 221.8 | - 15.8 | - 6.6 | 92.1 | 67.5 | - 24.6 | - 26.7 |
| **32. Life sci. + health technic.** | 66.2 | 53.3 | - 13.0 | - 19.6 | 197.6 | 180.7 | - 16.9 | - 8.6 |
| **33. Teaching assoc. prof.** | 90.7 | 86.1 | - 4.5 | - 5.0 | 198.8 | 164.4 | - 34.4 | - 17.3 |
| **34. Other technic.** | 243.9 | 214.4 | - 29.5 | - 12.1 | 250.0 | 254.5 | 4.5 | 1.8 |
| **41. Office clerks** | 348.9 | 295.6 | - 53.3 | - 15.3 | 753.9 | 674.1 | - 79.8 | - 10.6 |
| **42. Customer services clerk** | 129.4 | 107.0 | - 22.4 | - 17.3 | 455.6 | 403.8 | - 51.8 | - 11.4 |
| **51. Pers. + protec. serv.** | 1 028.2 | 918.5 | - 109.7 | - 10.7 | 993.5 | 784.5 | - 209.0 | - 21.0 |
| **52. Salespersons** | 411.7 | 364.4 | - 47.3 | - 11.5 | 338.9 | 245.0 | - 93.9 | - 27.7 |
| **61. Skilled agri** | 40.1 | 52.4 | 12.3 | 30.6 | 14.5 | 11.3 | - 3.2 | - 22.1 |
| **62. Subsistence agri.** | 18.5 | 9.9 | - 8.6 | - 46.3 | 5.2 | 3.5 | - 1.7 | - 32.9 |
| **71. Building trades** | 865.2 | 689.4 | - 175.7 | - 20.3 | 45.1 | 24.0 | - 21.1 | - 46.8 |
| **72. Metal, mach. + trades** | 679.5 | 534.2 | - 145.3 | - 21.4 | 26.0 | 30.4 | 4.3 | 16.7 |
| **73. Precision, handicraft, printing trades** | 56.8 | 47.7 | - 9.2 | - 16.1 | 14.5 | 3.9 | - 10.6 | - 73.2 |
| **74. Other craft trades** | 115.5 | 78.5 | - 37.0 | - 32.0 | 155.2 | 131.3 | - 23.9 | - 15.4 |
| **81. Stationary plant ops** | 130.7 | 96.9 | - 33.8 | - 25.9 | 21.6 | 15.9 | - 5.7 | - 26.5 |
| **82. Machine ops + assemblers** | 194.1 | 168.3 | - 25.8 | - 13.3 | 119.8 | 99.3 | - 20.6 | - 17.2 |
| **83. Drivers + mobile plant ops** | 901.3 | 814.9 | - 86.4 | - 9.6 | 32.5 | 30.9 | - 1.7 | - 5.2 |
| **91. Elementary sales + serv.** | 743.5 | 601.0 | - 142.6 | - 19.2 | 2 019.2 | 1 585.6 | - 433.6 | - 21.5 |
| **92. Agricultural labourers** | 785.8 | 671.5 | - 114.3 | - 14.5 | 270.3 | 246.6 | - 23.8 | - 8.8 |
| **93. Mining, construc, manu labouers** | 709.7 | 573.9 | - 135.8 | - 19.1 | 341.1 | 298.6 | - 42.5 | - 12.5 |
| **TOTAL** | **9 270.6** | **8 037.4** | **- 1 233.2** | **- 13.3** | **7 324.0** | **6 236.8** | **- 1 087.1** | **- 14.8** |
| **MEN + WOMEN** | **16 594.6** | **14 274.3** | **- 2 320.3** | **- 14.0** | | | | |
| **2008-9** | **2008** | **2009** | **Diff.** | **%** | **2008** | **2009** | **Diff.** | **%** |
| **11. Leg. + sen. officials** | 46.0 | 47.7 | 1.7 | 3.7 | 21.1 | 20.8 | - 0.3 | - 1.2 |
| **12. Corp. man.** | 452.2 | 432.2 | - 20.1 | - 4.4 | 216.1 | 221.4 | 5.3 | 2.5 |
| **13. Man. small enterp.** | 288.1 | 306.7 | 18.6 | 6.4 | 104.1 | 99.1 | - 5.0 | - 4.8 |
| **21. Science prof.** | 157.9 | 134.7 | - 23.2 | - 14.7 | 35.1 | 39.7 | 4.6 | 13.0 |
| **22. Life sci. + health prof.** | 47.0 | 39.5 | - 7.5 | - 15.9 | 93.8 | 78.4 | - 15.4 | - 16.4 |
| **23. Teaching prof.** | 34.2 | 45.5 | 11.4 | 33.2 | 63.0 | 73.1 | 10.1 | 16.0 |
| **24. Other prof.** | 208.0 | 195.9 | - 12.0 | - 5.8 | 183.2 | 165.6 | - 17.6 | - 9.6 |
| **31. Science technic.** | 217.7 | 252.1 | 34.4 | 15.8 | 53.1 | 60.9 | 7.7 | 14.5 |
| **32. Life sci. + health technic.** | 59.7 | 62.7 | 3.1 | 5.1 | 175.2 | 188.1 | 12.9 | 7.4 |
| **33. Teaching assoc. prof.** | 154.7 | 157.7 | 3.0 | 1.9 | 392.5 | 382.3 | - 10.2 | - 2.6 |
| **34. Other technic.** | 287.6 | 290.2 | 2.5 | 0.9 | 269.3 | 259.3 | - 9.9 | - 3.7 |
| **41. Office clerks** | 378.2 | 366.4 | - 11.8 | - 3.1 | 667.8 | 705.4 | 37.6 | 5.6 |
| **42. Customer services clerk** | 114.9 | 101.0 | - 13.9 | - 12.1 | 394.0 | 375.3 | - 18.7 | - 4.7 |
| **51. Pers. + protec. serv.** | 693.9 | 700.7 | 6.7 | 1.0 | 585.1 | 659.9 | 74.8 | 12.8 |
| **52. Salespersons** | 301.0 | 321.8 | 20.8 | 6.9 | 300.3 | 273.5 | - 26.8 | - 8.9 |
| **61. Skilled agri** | 77.9 | 68.4 | - 9.5 | - 12.2 | 24.4 | 15.8 | - 8.6 | - 35.4 |
| **62. Subsistence agri.** | 8.1 | 7.7 | - 0.4 | - 5.4 | 5.7 | 5.7 | 0.0 | 0.2 |
| **71. Building trades** | 917.2 | 854.6 | - 62.6 | - 6.8 | 44.7 | 47.5 | 2.7 | 6.1 |
| **72. Metal, mach. + trades** | 677.5 | 597.7 | - 79.9 | - 11.8 | 46.5 | 35.3 | - 11.1 | - 24.0 |
| **73. Precision, handicraft, printing trades** | 67.0 | 61.3 | - 5.7 | - 8.5 | 30.5 | 19.2 | - 11.2 | - 36.8 |
| **74. Other craft trades** | 117.9 | 100.9 | - 17.0 | - 14.4 | 182.3 | 136.4 | - 45.9 | - 25.2 |
| **81. Stationary plant ops** | 94.2 | 111.7 | 17.5 | 18.5 | 10.7 | 11.0 | 0.4 | 3.3 |
| **82. Machine ops + assemblers** | 242.9 | 217.6 | - 25.3 | - 10.4 | 145.8 | 151.0 | 5.2 | 3.6 |
| **83. Drivers + mobile plant ops** | 769.0 | 752.1 | - 16.9 | - 2.2 | 26.5 | 22.7 | - 3.8 | - 14.3 |
| **91. Elementary sales + serv.** | 585.0 | 574.7 | - 10.2 | - 1.8 | 1 964.1 | 1 886.2 | - 77.9 | - 4.0 |
| **92. Agricultural labourers** | 688.9 | 669.1 | - 19.7 | - 2.9 | 218.5 | 207.9 | - 10.6 | - 4.9 |
| **93. Mining, construc, manu labouers** | 710.0 | 641.3 | - 68.7 | - 9.7 | 264.7 | 260.4 | - 4.3 | - 1.6 |
| **TOTAL** | **8 396.6** | **8 111.8** | **- 284.9** | **- 3.4** | **6 518.1** | **6 402.0** | **- 116.2** | **- 1.8** |
| **MEN + WOMEN** | **14 914.8** | **14 513.7** | **- 401.0** | **- 2.7** | | | | |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Adjusted using sampling weights.

**Figure 2:** Change in occupational employment at the two-digit level between 2020 Q1 and Q2




Notes: own calculations using QLFS from StatsSA. Bubbles weighted by 2020 Q1 employment.

# 5 Covid-19 patterns of job loss differ structurally to the GFC

Since women lost so many more jobs relative to men in 2020 compared to the GFC, a question we are interested in is, what might job loss by gender have looked like if the 2020 recession was purely financial in nature? More specifically, would the distribution of job loss by gender have looked very different if social distancing was not a consideration? The difference between the answer to this question and the reality in 2020 might provide an idea of the extent to which women have been impacted by Covid-19-specific factors of the 2020 recession. We run a simple counterfactual exercise estimating the ratio of female to male job loss in 2020 to determine if the pattern of job loss had been what it was during the GFC.

Let $Y_g$ be the total job loss per gender, $g$, in 2020. The gender ratio of job loss which we are interested in understanding is $Y_{women}/Y_{men}$. $Y_g$ can be written as the sum of the job loss per occupation $i$, $y_{ig}$. Occupational job loss is the rate of job loss, $r_{ig}$, for that occupation multiplied by the number of jobs in that occupation in quarter 1, $n_{ig}$. The number of jobs in quarter 1 is the occupational share of employment, $s_{ig}$, multiplied by the total number of employment, $N_{ig}$:

$$Y_g = \sum^{ig} y_{ig} = \sum^{ig} n_{ig} * r_{ig} = \sum^{ig} (s_{ig} * N_{ig}) * r_{ig} \tag{1}$$

We can then substitute in $r$ from the GFC to approximate what job loss might have been in 2020, had it followed the same structure as during the GFC. Similarly, we can substitute in $s$ from 2008 to approximate

how job loss in 2020 might have looked like if men and women were distributed across occupations as they had been in 2008. These counterfactual counts of job loss then allow us to assess whether job loss rates or change in occupational distribution made a bigger difference to the gender ratio of job loss.

The main results are in Table 3. In row (a) we apply the GFC rates of job loss to the 2020 quarter 1 labour market. In row (b), we apply the 2008 occupational distribution to 2020. If South Africans had lost jobs in 2020 according to the same pattern as the 2008 GFC, men would have lost about 239 thousand jobs (2.5%) but women would actually have experienced marginal job growth of about 1 000 jobs. The main reason for this positive result is personal and protective services. Because this occupation grew during the GFC and the number of women employed in this occupation about doubled between 2008 and 2020, personal and protective services grew by 126 thousand jobs in the counterfactual 2020. The result is that the ratio of women to men's job loss would have been negative, with men almost exclusively experiencing net job loss. If we omit the out sized effect of personal and protective services (for both men and women), men would have lost about 239 thousand jobs and women 125 thousand. In other words, men would still have done substantially worse with a gender job loss ratio of 52% - but this is still much lower than the observed result of 88%.

**Table 3:** Counterfactual 2020 job loss based on GFC pattern of job loss and occupational distribution

| | **Female job loss ('000s)** | **Male job loss ('000s)** | **Female:Male job loss*100** |
|---|---|---|---|
| **2008-9 Observed** | - 116.2 | - 284.9 | **40.8** |
| **2020 Observed** | - 1 087.1 | - 1 233.2 | **88.2** |
| | | | |
| **2020 counterfactual with:** | | | |
| **(a) 2008-9 job loss rates; same occ. dist** | 1.1 | - 229.9 | **- 0.5** |
| **(b) same job loss rates; 2008 occ. dist** | - 1 101.7 | - 1 186.0 | **92.9** |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data.

The opposite exercise of using a counterfactual occupational distribution yields job loss of approximately a million for both men and women. Women lost slightly more jobs under this counterfactual scenario because of relatively greater concentration of women in elementary sales and services and teaching in 2008. Men lost slightly fewer in the counterfactual. In this case, the gender ratio of job loss is 92.9%. This means the shifts in how people are distributed across occupations between 2008 and 2020 has slightly protected women, but slightly hurt men. The main changes over this period were women moving out of elementary sales and services (often into personal and protective services and customer service clerking). It is not always clear if personal care services are more skilled than domestic work which means this could be a lateral move in terms of skill. Men, however, have shifted out of semi-skilled manufacturing and trades occupations into low/unskilled elementary sales and service occupations.

This exercise shows that if South Africans had lost jobs in 2020 according to the pattern of the GFC, the distribution of job loss by gender would have looked very different to what it has in reality. But, if the labour market had looked like 2008 and 2020 job loss had been what it was, the ratio of women's job loss to men's would have been quite similar. This suggests there is something specific about the structure of job loss in 2020 that resulted in a relatively more adverse outcome for women. As we mentioned before, researchers have already considered different explanations for this structure relating to physical proximity and the ability to work from home. In the next section we try to understand what explains this pattern of

job loss.

# 6 Measuring Covid-19 job-loss risk

We use four measures of occupational risk of job loss under lockdown.

## 6.1 Physical proximity and exposure to infectious diseases

The first two measures are constructed using work context data from the Occupation Information Network (O*NET) Survey conducted by the United States Department of Labour. The O*NET uses standardized surveys of a representative sample of job incumbents drawn from the U.S. Bureau of Labour Statistics (Handel 2016). The O*NET data collects a wide range of detailed occupational information on topics such as skills, tasks, and work context. The data is collected by surveying job incumbents in different occupations who fill in questionnaires on their level of Education and Training, Knowledge, Work Activities, Work Context and Work Styles while a small number of job analysts fill in the questionnaires on skills and abilities according to job descriptions (Handel 2016). Within occupation responses are averaged across respondents (Handel 2016) resulting in a continuous measure between 1 and 5. We use two questions from the O*NET survey to measure COVID-19 risk. These are:

- To what extent does this job require the worker to perform job tasks in close physical proximity to other people?
    1. I do not work near other people (beyond 100 ft.)
    2. I work with others but not closely (e.g., private office)
    3. Slightly close (e.g., shared office)
    4. Moderately close (at arm's length)
    5. Very close (near touching)
- How often does this job require exposure to disease/infections?
    1. Never
    2. Once a year or more but not every month
    3. Once a month or more but not every week
    4. Once a week or more but not every day
    5. Every day

These scores for physical proximity and exposure are merged into the QLFS and PALMS data using cross walks between the U.S. occupational classification system and the International Standard for the Classification of Occupations from 1988 on which SASCO is based. We achieve a 96% match between the ISCO data and SASCO. For the remaining 6% we identify what we judge to be appropriate adjacent occupations and allocate the proximity and exposure allocation from adjacent occupations to unmerged occupations. For example, mini-bus taxi drivers are not in the ISCO classification and we allocate them the

same score as bus and tram drivers who are in ISCO. We only make one direct adjustment to the O*NET scores to account for the South African context, this is for domestic workers which are a very important category of employment in South Africa's labour market. In the case of both proximity and exposure scores, we allocate domestic workers (ISCO-88 code 9131) a score that is the average of the O*NET score for domestic workers and childcare workers (ISCO-88 code 5131) in the U.S. In South Africa, domestic workers often undertake childcare as part of their duties in addition to cleaning services.

### 6.2 Essential worker status

In this analysis, we use an indicator variable for whether the job was classified as an essential service according to Government Gazette Numbers 11062 and 11089 (the update on 16 April 2020) from Kerr & Thornton (2020). The Government Gazettes indicated which sectors of the economy were deemed essential and should continue to operate during the hard lockdown. Kerr & Thornton (2020) use this information to classify the three-digit industry codes in the PALMS data as essential or not. We apply this classification to the QLFS data. Note that this classification applies most readily to the lockdown imposed on 26th of March. The South African government created a system of lockdown levels ranging from Level 5 (strictest) to Level 1 (most flexible). The state has adjusted the lockdown level according to the evolution of the COvid-19 viral load in the country. The share of workers who are allowed to go to work varies by lockdown level, with the fewest and only most essential for the operation of the economy allowed in Level 5 and incrementally more until Level 1.

When the pandemic first hit South Africa, the country went into a Level 5 lockdown on 26th of March 2020 until the 30th of April 2020. Lockdown level then incrementally eased up to a Level lockdown (until 31 May 2020), Level 3 lockdown (until 17 August 2020), Level 2 lockdown (until 20 September 2020), and Level 1 lockdown (until 28 December 2020). Owing to a second wave of the virus during the festive season, the country was shifted back into an Adjusted Lockdown Level 3 (until 28 February 2021) and then reverted to an Adjusted Level 1 from March 2021. Currently, we are on Adjusted Lockdown Level 2. Adjusted Lockdown Levels are a slightly updated version of the same incremental population lockdown system.

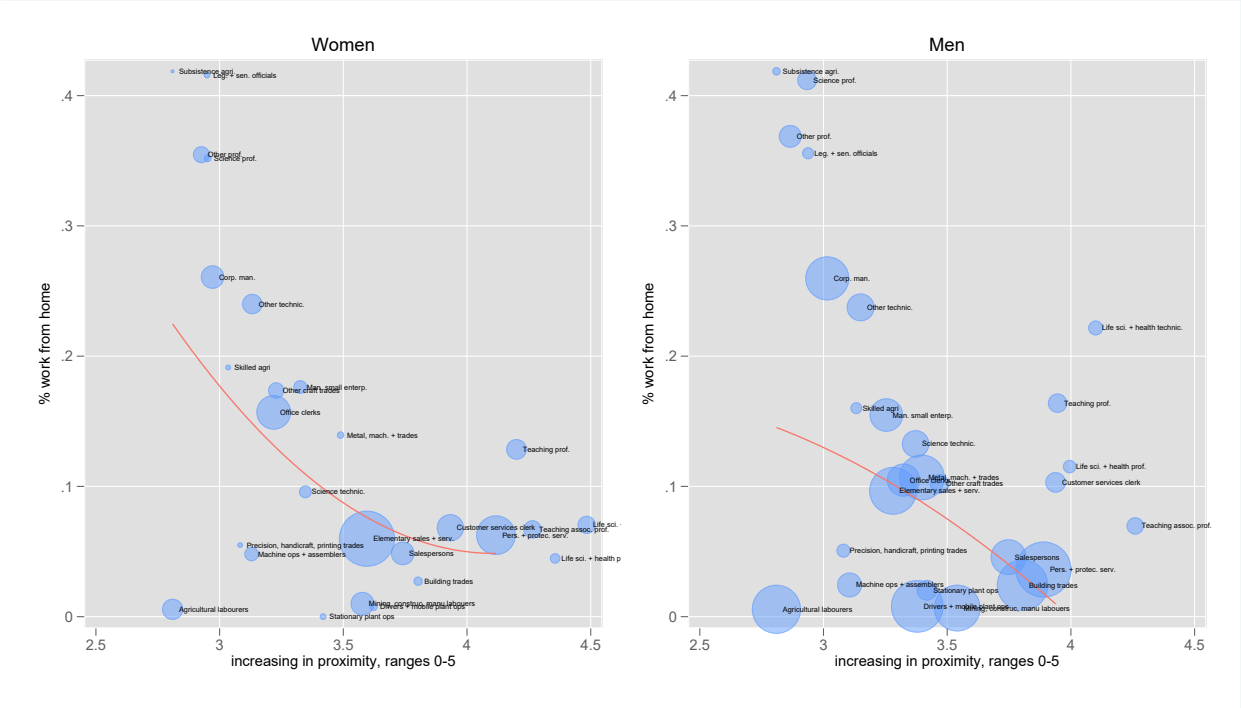
### 6.3 Working from home (WFH)

Our final measure is the share per occupation who can work from home. In Q2 and Q3 of the QLFS, employed respondents were asked whether they were expected to work during the lockdown and whether they were working from home. This provided some self-reported information about which occupations could be carried out from home in South Africa. However, this is a select sample since the question was only asked of employed people and only after the effect of the hard lockdown had taken place. To parse out the effect of occupational change on this variable, we use the Q2 and Q3 data to measure which occupations at the four-digit level answer that that they can work from home. Like with the O*NET data, we then have an occupational measure of WFH which we merge back into PALMS to measure WFH in quarter 1.

The WFH variable in the four-digit level occupational data set is continuous and not a dummy. Multiple people per occupation provide a yes/no answer to whether they are working from home, resulting in an occupational mean. This could be interpreted as a weight or a score of how easily this occupation can be performed remotely. When we aggregate our WFH measure to the two-digit occupational level for our analysis later on, this is the share per occupation who can work from home *weighted* by how many people

in that occupation agree they can work from home. As a validation exercise, we plot our WFH variable against our physical proximity variable for 2020 Q1 in Figure 3. As expected, occupations that are high in physical proximity are low in WFH. As a robustness check, we also use a WFH measure created using O*NET by Kerr & Thornton (2020).

**Figure 3:** Change in occupational employment at the two-digit level between 2020 Q1 and Q2




Notes: own calculations using QLFS from StatsSA. Bubbles weighted by 2020 Q1 employment.

## 6.4 Regression

We are interested in how well our measures of job-loss risk explain patterns of job loss over 2020. To investigate this, we run the following set of models. Our outcome is the percentage change in occupational employment at the two-digit occupation code level between 2020 Q1 and Q2, $Y_i$. We regress this on a gender dummy, $f$, and the 2020 Q1 levels of each job-loss measure: proximity ($P_i$), exposure ($X_i$), essential ($E_i$), and WFH ($WFH_i$). In a final specification, we combine all measures at the same time. For each two-digit occupation $i$:

$$Y_i = \beta_0 + f + P_i + \epsilon_i \tag{2}$$

$$Y_i = \beta_0 + f + X_i + \epsilon_i \tag{3}$$

$$Y_i = \beta_0 + f + E_i + \epsilon_i \tag{4}$$

$$Y_i = \beta_0 + f + WFH_i + \epsilon_i \tag{5}$$

$$Y_i = \beta_0 + f + P_i + X_i + E_i + WFH_i + \epsilon_i \tag{6}$$

A related interest is the extent to which these job-loss risk measures distinguish 2020 job loss from GFC

job loss. We therefore run the same set of specifications for the change in employment between 2008 and 2009.

In a second model, we pool the 2008-9 data and the 2020 Q1 Q2 data and run a pooled regression model. For each occupation $i$ in $t = 2008/9, 2020$:

$$Y_{it} = \beta_0 + f + T_t + P_i + T_t * P_i + \epsilon_{it} \tag{7}$$

$$Y_{it} = \beta_0 + f + T_t + X_i + T_t * X_i + \epsilon_{it} \tag{8}$$

$$Y_{it} = \beta_0 + f + T_t + E_i + T_t * E_i + \epsilon_{it} \tag{9}$$

$$Y_{it} = \beta_0 + f + T_t + WFH_i + T_t * WFH_i + \epsilon_{it} \tag{10}$$

$$Y_{it} = \beta_0 + f + T_t + P_i + T_t * P_i + X_i + T_t * X_i + E_i + T_t * E_i + WFH_i + T_t * WFH_i + \epsilon_{it} \tag{11}$$

This regression model is a more careful comparison of how our measures of job-loss risk explain the 2020 but not the GFC employment change by holding more constant in the regression than the separate regressions of models 1-5. However, to investigate our more immediate research question, we do not necessarily want to include GFC data in our regression. For these reasons, we run both of these sets of analysis.

A final set of regressions explore the explanatory power of the measures over the course of 2020 and the first quarter of 2021. We have five quarters between 2020 Q1 and 2021 Q1. We refer to these as Q1-Q5, for convenience, where Q5 is 2021 Q1. In this specification, we create an outcome variable that is employment change in each quarter relative to Q1. We have $q = 2 - 5$. These outcomes are regressed on the Q1 levels of each job-loss risk measure in the same sequence as models 1-5. For each occupation $i$ in quarter $q$:

$$Y_{iq} = \beta_0 + f + P_{iq} + \epsilon_{iq} \tag{12}$$

$$Y_{iq} = \beta_0 + f + X_{iq} + \epsilon_{iq} \tag{13}$$

$$Y_{iq} = \beta_0 + f + E_{iq} + \epsilon_{iq} \tag{14}$$

$$Y_{iq} = \beta_0 + f + WFH_{iq} + \epsilon_{iq} \tag{15}$$

$$Y_{iq} = \beta_0 + f + P_{iq} + X_{iq} + E_{iq} + WFH_{iq} + \epsilon_{iq} \tag{16}$$

## 6.5 Distribution of job-loss risk in the South African labour market prior to lockdown

Table 4 describes the distribution of our four measures of job-loss risk by two-digit occupation, as well as, our robustness measure for WFH (WFH-ONET). The proximity and exposure measures are scores increasing in intensity and ranging from 1 to 5. The WFH, WFH-O*NET and essential measures are shares per occupation. Occupations with the highest levels of physical proximity are teachers and life science and health professionals. Occupations with the lowest levels are agricultural labourers and other professionals. This corresponds with the WFH measure: occupations with the highest share of WFH are science professionals, other professionals, and legislators and senior officials.[3] The WFH-O*NET measure, which was constructed prior to the 2020 QLFS being released, partly agrees with the self-reported WFH. WFH-O*NET overestimates the shares of workers in occupations below and including main occupation code 4 who can work from home, and underestimates the shares above and including main occupation code 5.

[3]Subsistence agriculture actually have the highest share of WFH but this is probably by definition, making it hard to think about subsistence farmers as WFH by our idea of remote work.

Lastly, large shares of life science and health professionals counted as essential workers; although this was gendered to some extent. For example, many more men in protective sales and services counted as essential compared to women, owing to police being classified as essential service.

Women score higher than men in terms of proximate work with an average scores of 3.61 compared to men's score of 3.42. Women have higher proximity scores for life science and health professionals; teaching; and personal and protective services. Women have a substantially higher amount of exposure to infectious diseases through their occupations than men, with a score of 2.1 on average compared to men's average score of 1.69. Very similar shares of men and women WFH by either the self-reported or the O*NET measure. Slightly more men (26.18%) were essential workers compared to women (23.13%).

**Table 4:** Means of occupational measures of job risk loss in 2020 Q1

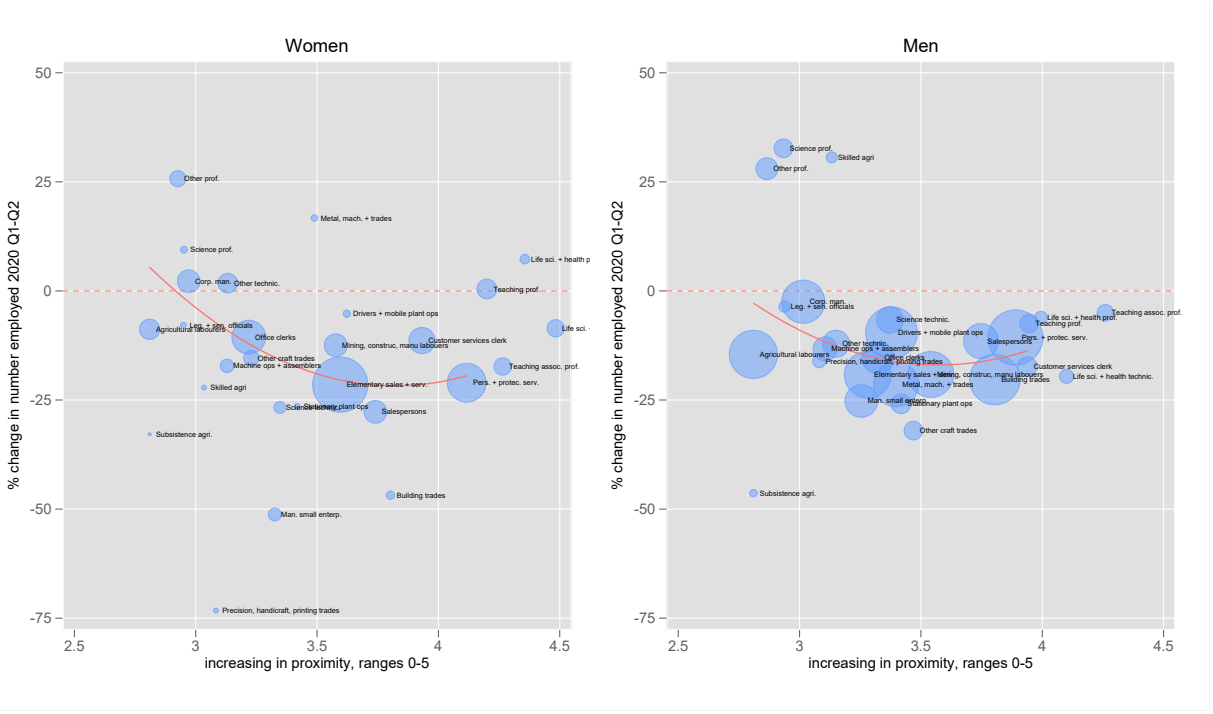
| | MEN | | | | | WOMEN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Two-digit occupation code** | **Proximity** | **Exposure** | **WFH** | **Essential** | **WFH-ONET** | **Proximity** | **Exposure** | **WFH** | **Essential** | **WFH-ONET** |
| **11. Leg. + sen. officials** | 2.94 | 1.49 | 34.35 | 16.57 | 45.08 | 2.95 | 1.50 | 41.58 | 14.91 | 68.05 |
| **12. Corp. man.** | 3.02 | 1.46 | 25.97 | 22.64 | 71.18 | 2.97 | 1.48 | 26.07 | 26.70 | 77.35 |
| **13. Man. small enterp.** | 3.25 | 1.51 | 15.48 | 15.58 | 58.78 | 3.33 | 1.53 | 16.56 | 7.39 | 60.23 |
| **21. Science prof.** | 2.93 | 1.14 | 41.18 | 17.86 | 89.51 | 2.95 | 1.20 | 32.48 | 41.42 | 75.38 |
| **22. Life sci. + health prof.** | 3.99 | 3.67 | 7.48 | 80.90 | 2.76 | 4.36 | 4.34 | 3.10 | 83.43 | 3.04 |
| **23. Teaching prof.** | 3.95 | 2.18 | 15.45 | 0.00 | 27.08 | 4.20 | 2.36 | 12.84 | 0.32 | 12.21 |
| **24. Other prof.** | 2.87 | 1.51 | 36.52 | 19.89 | 91.93 | 2.93 | 1.42 | 35.47 | 22.45 | 81.01 |
| **31. Science technic.** | 3.37 | 1.29 | 9.75 | 26.56 | 20.37 | 3.35 | 1.18 | 9.58 | 38.08 | 13.14 |
| **32. Life sci. + health technic.** | 4.10 | 3.76 | 20.27 | 80.98 | 0.00 | 4.48 | 4.43 | 6.85 | 87.06 | 2.50 |
| **33. Teaching assoc. prof.** | 4.26 | 2.99 | 6.74 | 0.56 | 0.00 | 4.26 | 3.00 | 6.69 | 0.58 | 0.00 |
| **34. Other technic.** | 3.15 | 1.30 | 23.75 | 28.57 | 85.06 | 3.13 | 1.29 | 24.00 | 29.63 | 86.14 |
| **41. Office clerks** | 3.32 | 1.53 | 10.49 | 25.02 | 15.51 | 3.22 | 1.57 | 15.55 | 25.04 | 29.21 |
| **42. Customer services clerk** | 3.94 | 1.66 | 7.97 | 32.68 | 5.83 | 3.93 | 1.64 | 6.83 | 25.53 | 5.59 |
| **51. Pers. + protec. serv.** | 3.89 | 2.33 | 3.62 | 62.58 | 0.00 | 4.12 | 2.55 | 6.26 | 28.20 | 0.00 |
| **52. Salespersons** | 3.75 | 1.19 | 4.46 | 41.65 | 0.00 | 3.74 | 1.19 | 4.66 | 25.77 | 0.00 |
| **61. Skilled agri** | 3.13 | 1.48 | 9.76 | 81.96 | 0.00 | 3.03 | 1.36 | 14.60 | 79.41 | 0.00 |
| **62. Subsistence agri.** | 2.81 | 1.44 | 41.87 | 100.00 | 0.00 | 2.81 | 1.44 | 41.87 | 100.00 | 0.00 |
| **71. Building trades** | 3.80 | 1.49 | 2.27 | 4.80 | 0.00 | 3.80 | 1.64 | 2.47 | 17.97 | 0.00 |
| **72. Metal, mach. + trades** | 3.40 | 1.36 | 10.57 | 7.29 | 0.00 | 3.49 | 1.40 | 9.29 | 27.44 | 0.00 |
| **73. Precision, handicraft, printing trades** | 3.08 | 1.09 | 5.07 | 2.00 | 0.00 | 3.08 | 1.18 | 3.27 | 39.10 | 0.00 |
| **74. Other craft trades** | 3.47 | 1.30 | 9.19 | 33.79 | 0.00 | 3.23 | 1.34 | 17.36 | 33.59 | 0.00 |
| **81. Stationary plant ops** | 3.42 | 1.48 | 0.47 | 30.74 | 0.00 | 3.42 | 1.68 | 0.00 | 47.24 | 0.00 |
| **82. Machine ops + assemblers** | 3.11 | 1.16 | 1.44 | 10.32 | 0.00 | 3.13 | 1.12 | 3.62 | 11.87 | 0.00 |
| **83. Drivers + mobile plant ops** | 3.38 | 2.02 | 0.79 | 18.33 | 0.00 | 3.62 | 2.20 | 0.73 | 15.46 | 0.00 |
| **91. Elementary sales + serv.** | 3.28 | 2.39 | 8.72 | 7.54 | 0.00 | 3.60 | 2.65 | 5.40 | 2.78 | 0.00 |
| **92. Agricultural labourers** | 2.81 | 1.45 | 0.57 | 51.78 | 0.00 | 2.81 | 1.44 | 0.57 | 81.66 | 0.00 |
| **93. Mining, construc, manu labouers** | 3.54 | 1.30 | 0.67 | 16.20 | 0.00 | 3.58 | 1.22 | 1.00 | 31.11 | 0.00 |
| | | | | | 0.00 | | | | | 0.00 |
| **Total** | **3.42** | **1.69** | **8.26** | **26.18** | **13.80** | **3.61** | **2.10** | **9.48** | **23.13** | **13.77** |

Notes: own calculations using QLFS data. Adjusted using sampling weights.

# 7 Correlates of lockdown job loss

Figures 4-7 plot our occupational job-loss risk measures against rates of job loss between Q1 and Q2 in 2020, with an employment-weighted regression line overlaid. We find a negative relationship between occupational physical proximity and job loss in Figure 4. More proximate occupations, like personal and protective services and domestic workers (in elementary sales and services), lost a greater share of jobs than less proximate occupations, like corporate managers and other professionals. The relationship is stronger for women than for men. Teaching and life science and health occupations stand out as outliers in this figure, because both occupations are very high in physical proximity and likely to keep their jobs, but for different reasons. Life science and health occupations were likely to keep their jobs because there were very high shares of essential workers in these occupations. Teachers were not classified as essential, but many are employed by the public sector and it was anticipated that children would be returning to school in the short-to-medium term future. Teachers and life science and health occupations are omitted from the estimation of the regression line.

**Figure 4:** Change in occupational employment at the two-digit level between 2020 Q1 and Q2

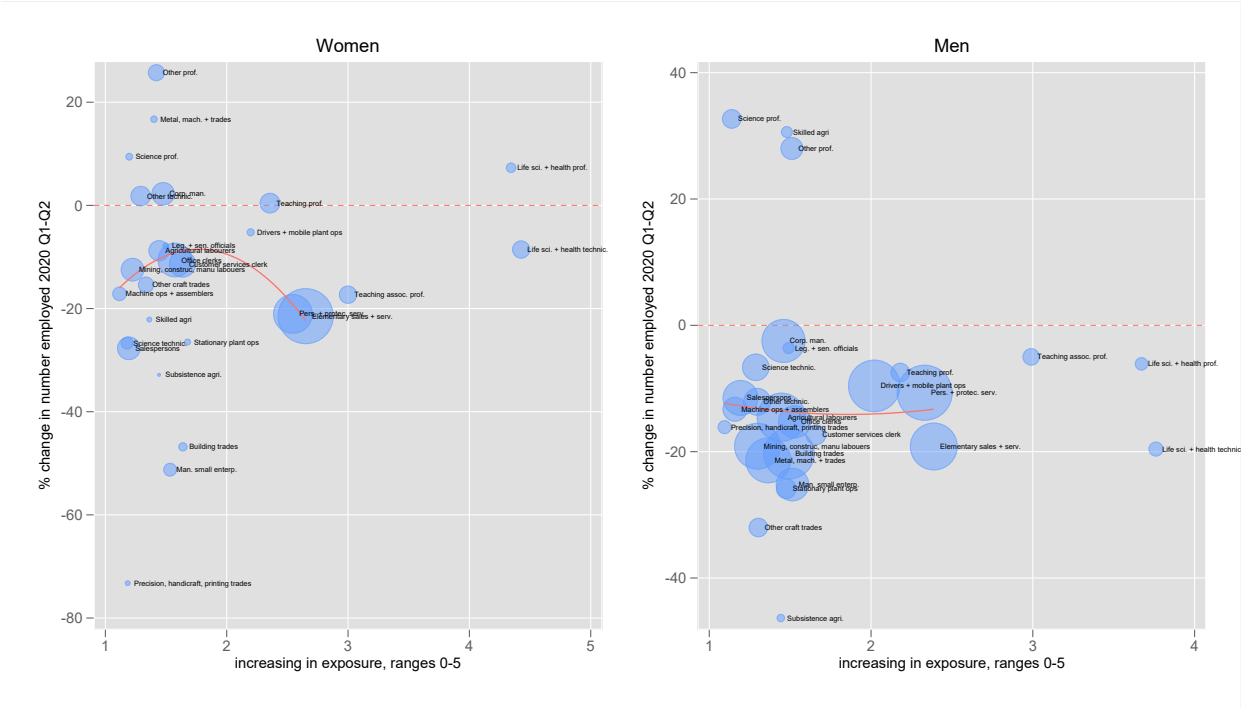



Notes: own calculations using QLFS from StatsSA. Bubbles weighted by 2020 Q1 employment.

We do not find a strong relationship between occupational exposure to infectious diseases and job loss in Figure 5. This could be due to some occupations that score highly in exposure also being classified as essential workers, e.g. life science and health workers.

There is a positive relationship between the occupational share of essential workers and job loss for women in Figure 6. Male occupations follow a more quadratic pattern owing to male life science and health technicians suffering substantial job loss despite a high share of essential workers in this occupation. Within life science and health technicians, about a third of men are nurses and another third are traditional medical practitioners, the latter of whom would have struggled to work during the hard lockdown. By contrast,

**Figure 5:** Change in occupational employment at the two-digit level between 2020 Q1 and Q2




Notes: own calculations using QLFS from StatsSA. Bubbles weighted by 2020 Q1 employment.

two-thirds of women in this occupational category are nurses who were classified as essential. The regression for essential worker status and occupational job loss omits skilled agricultural and subsistence farmers, since the distinction between home and workplace is blurred for these occupations.

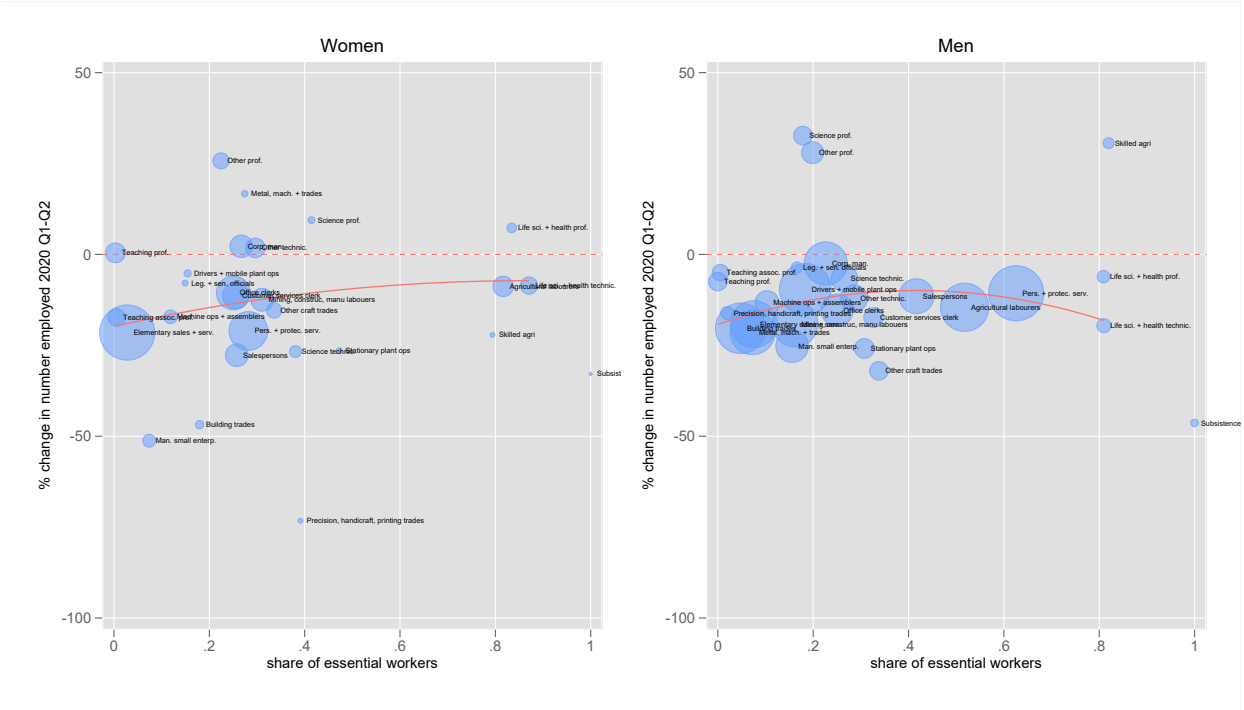
We also make this omission when assessing the relationship between WFH-ability and job loss in Figure 7. In this case, there is a very strong positive relationship between these variables for both men and women. Occupations that are impossible (e.g. mining, construction, and manufacturing labourers) or very difficult (e.g. personal and protective services) to do from home, lost more jobs than those with WFH-ability, like science and other professionals.

## 7.1 Regression results

Table 5 present the results of specifications 1-5 for 2020 and the GFC separately. WFH emerges as the most important covariate of job loss in 2020. A a percentage point increase in the share of an occupation who can WFH, increases their employment by almost 70 percentage points. This result holds when controlling for other explanations of job loss in specification 5. Using our alternative O*NET measure of WFH yields the same results in Appendix Table 9.

Physical proximity also emerges as an important explanation for the pattern of job loss in 2020. A one unit increase in an occupation's physical proximity score is associated with a 12.62 percentage point contraction in employment in 2020; however, physical proximity loses significance when included in the full specification 5. Interestingly, essential worker status is not significant on its own in specification 3, but becomes significant at the 5 percent level in specification 5. A percentage point increase in the share of

**Figure 6:** Change in occupational employment at the two-digit level between 2020 Q1 and Q2




Notes: own calculations using QLFS from StatsSA. Bubbles weighted by 2020 Q1 employment.

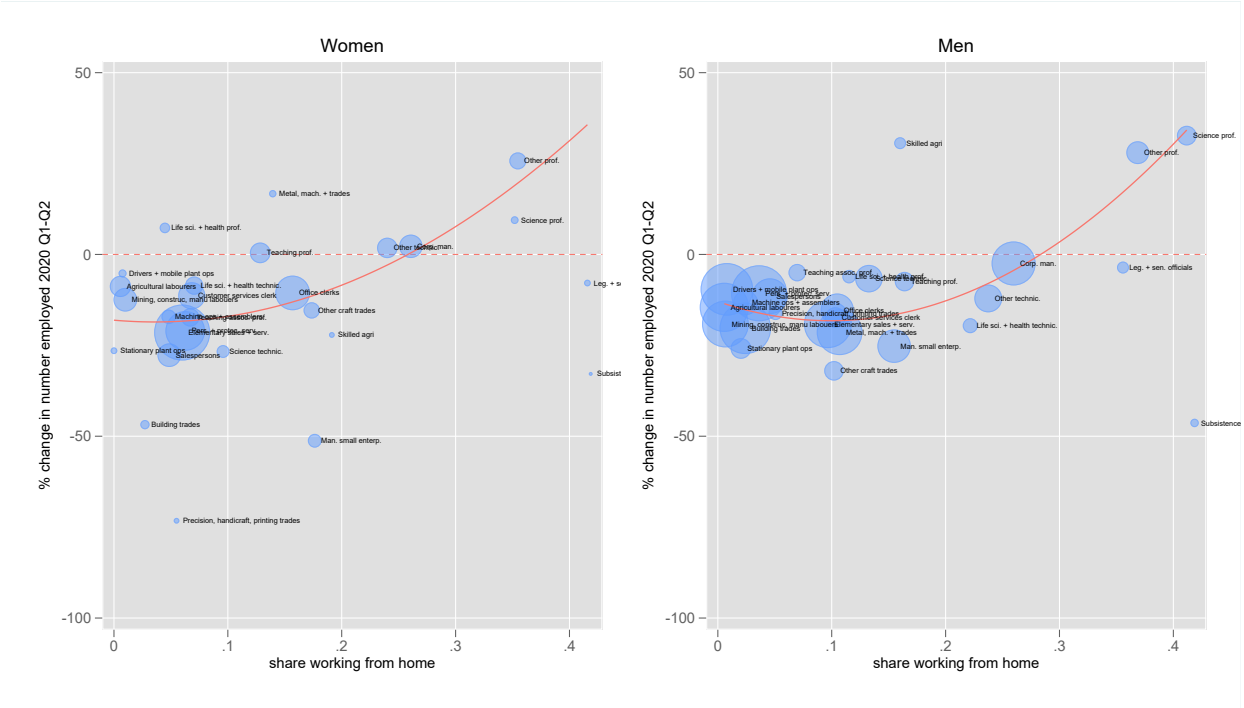
essential workers in an occupation, increases employment change by 14 percentage points.

Table 5 also shows that none of these explanatory variables have any statistical significance for explaining employment change between 2008 and 2009. The pooled regression results in Table 6 more precisely compare patterns of job change in 2020 and the GFC, and echo the results from Table 5. These results confirm that lockdown-specific factors are only relevant in 2020. The variables that emerge as important in Table 6 are the same as in Table 5: WFH is most preeminent, followed by proximity. Recall that the average physical proximity score was 3.42 for men and 3.61 for women (Table 4). In Table 6, a physical proximity score of 3.61 in 2020 would reduce employment by 11.1 percentage points. However, when included in the full specification in model 5, physical proximity loses significance. The strength of the WFH result is again robust to a robustness check using the O*NET measure in Appendix Table 10.

Finally, Table 7 compares the explanatory power of our job-loss risk measures across the duration of the lockdown until 2020 Q1 (which we term Q5 here for convenience). The strictness of lockdown levels fluctuated over the period of study. Lockdown levels sometimes changed part-way through a quarter, but in the same direction of easing up until Q5. Lockdown was strictest in Q2 (Level 5 and then down to Level 4), and then eased down over the course of Q3 (Level 3 and then down to Level 2 and briefly Level 1) and Q4 (Level 1). Quarter 5 was ramped up to Adjusted Lockdown Level 3 from the beginning of 2021 until 28 February 2021, and then eased down to Adjusted Level 1 for the remaining month of that quarter. Many of the coefficients in Table 6 reflect this downward trajectory across Q2-Q4 and then the uptick in Q5.

The protective power of WFH wanes only slightly over the period, from a coefficient size of 72.34 in Q2 to 54.41 in Q5 (2021 Q1). The importance of the coefficient dips the most in Q4, when lockdown level was at its laxest. This result is confirmed again using the O*NET measure in Appendix Table 11. Essential work is protective in Q2 and Q5, but is not significant in between in specification 5. In specification 11, the

**Figure 7:** Change in occupational employment at the two-digit level between 2020 Q1 and Q2




Notes: own calculations using QLFS from StatsSA. Bubbles weighted by 2020 Q1 employment.

vulnerability associated with more physically proximate work is most severe in Q2, but weakens over time. By Q4 and 5, it is no longer an important explanatory factor. As was the case with the previous regression output, physical proximity is outweighed by WFH and essential work in the full specification 15.

**Table 5:** Regression output for the correlation between lockdown job-loss risk measures and employment change in 2020 and 2008-9

| | 2020 Q1 vs Q2 | | | | | 2008 vs 2009 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Spec.:** | **1** | **2** | **3** | **4** | **5** | **1** | **2** | **3** | **4** | **5** |
| **female** | -0.59 | -0.72 | -1.02 | -2.33 | -2.01 | 1.31 | 0.70 | 1.68 | 1.60 | 0.68 |
| | (3.22) | (3.53) | (3.14) | (2.58) | (2.73) | (2.42) | (2.48) | (2.24) | (2.32) | (2.58) |
| **proximity** | -12.62** | | | | -1.46 | 2.78 | | | | 1.99 |
| | (4.44) | | | | (4.24) | (3.32) | | | | (4.09) |
| **exposure** | | -4.88 | | | 0.81 | | 3.10 | | | 1.11 |
| | | (3.30) | | | (2.49) | | (2.46) | | | (2.36) |
| **essential** | | | 11.66 | | 13.66* | | | 6.87 | | 4.75 |
| | | | (7.62) | | (6.13) | | | (5.82) | | (6.02) |
| **wfh** | | | | 74.71*** | 72.34*** | | | | -0.75 | 3.43 |
| | | | | (14.64) | (15.87) | | | | (11.71) | (13.47) |
| **_cons** | 29.39 | -5.41 | -16.42*** | -19.54*** | -19.22 | -13.00 | -8.51* | -4.85* | -3.13 | -13.36 |
| | (15.20) | (5.87) | (2.86) | (2.09) | (13.65) | (11.29) | (4.16) | (2.04) | (1.77) | (12.91) |
| **N** | **46.00** | **46.00** | **50.00** | **50.00** | **54.00** | **46.00** | **46.00** | **50.00** | **50.00** | **54.00** |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001. Regressions are weighted by employment in the before period (2008 for the GFC and Q1 for 2020). Specifications 1 and 2 omit life science and health occupations (codes 22 and 32) and teaching occupations (codes 23 and 33). Specifications 3 and 4 omit skilled agriculture and subsistence agriculture (codes 61 and 62).

**Table 6:** Regression output for pooled regression model of job-loss risk during the GFC and 2020

| **Model** | **6** | **7** | **8** | **9** | **10** |
|---|---|---|---|---|---|
| **female** | 0.89 | 0.38 | 1.09 | 0.33 | -0.41 |
| | (1.84) | (1.93) | (1.73) | (1.70) | (1.87) |
| **Year = 2020** | 43.31* | 3.23 | -12.88*** | -17.62*** | -2.75 |
| | (20.76) | (7.72) | (3.24) | (2.82) | (21.39) |
| **proximity** | 2.90 | | | | 2.30 |
| | (2.85) | | | | (3.34) |
| **proximity x 2020** | -15.90** | | | | -4.30 |
| | (5.99) | | | | (6.69) |
| **exposure** | | 3.20 | | | 1.33 |
| | | (2.15) | | | (1.93) |
| **exposure x 2020** | | -8.40* | | | -0.86 |
| | | (4.19) | | | (3.86) |
| **essential** | | | 6.81 | | 4.53 |
| | | | (5.10) | | (4.94) |
| **essential x 2020** | | | 5.25 | | 9.56 |
| | | | (10.35) | | (9.79) |
| **wfh** | | | | 0.57 | 5.36 |
| | | | | (9.67) | (10.91) |
| **wfh x 2020** | | | | 63.92** | 58.40* |
| | | | | (20.90) | (22.43) |
| **_cons** | -13.24 | -8.55* | -4.57** | -2.70 | -14.49 |
| | (9.74) | (3.68) | (1.74) | (1.43) | (10.55) |
| **N** | 92.00 | 92.00 | 100.00 | 100.00 | 108.00 |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001. Regressions are weighted by employment in the before period (2008 for the GFC and Q1 for 2020). Specifications 1 and 2 omit life science and health occupations (codes 22 and 32) and teaching occupations (codes 23 and 33). Specifications 3 and 4 omit skilled agriculture and subsistence agriculture (codes 61 and 62).

**Table 7:** Regression output comparing lockdown job-loss risk measures across the duration of lockdown in 2020 and into 2021

| Spec.: | Depvar: | % jobs lost between | | | |
|---|---|---|---|---|---|
| | | Q2vs.Q1 | Q3vs.Q1 | Q4vs.Q1 | Q5vs.Q1 |
| 11 | female | -0.59 | -0.51 | 0.31 | 0.73 |
| | | (3.22) | (3.39) | (2.89) | (3.40) |
| | proximity | -12.62** | -9.92* | -7.53 | -8.97 |
| | | (4.44) | (4.68) | (3.98) | (4.68) |
| | _cons | 29.39 | 23.71 | 16.87 | 21.26 |
| | | (15.20) | (16.02) | (13.66) | (16.04) |
| | N | 46.00 | 46.00 | 46.00 | 46.00 |
| 12 | female | -0.72 | -0.98 | 0.22 | 1.06 |
| | | (3.53) | (3.65) | (3.07) | (3.56) |
| | exposure | -4.88 | -2.70 | -2.88 | -4.75 |
| | | (3.30) | (3.42) | (2.87) | (3.34) |
| | _cons | -5.41 | -5.52 | -3.95 | -1.36 |
| | | (5.87) | (6.07) | (5.10) | (5.93) |
| | N | 46.00 | 46.00 | 46.00 | 46.00 |
| 13 | female | -1.02 | -1.70 | -0.29 | 0.44 |
| | | (3.14) | (3.69) | (3.29) | (3.80) |
| | essential | 11.66 | 9.12 | 9.52 | 17.47 |
| | | (7.62) | (8.98) | (7.99) | (9.22) |
| | _cons | -16.42*** | -11.86*** | -10.98*** | -13.25*** |
| | | (2.86) | (3.36) | (2.99) | (3.46) |
| | N | 50.00 | 50.00 | 50.00 | 50.00 |
| 14 | female | -2.33 | -2.73 | -1.10 | -0.78 |
| | | (2.58) | (3.42) | (3.17) | (3.70) |
| | wfh | 74.71*** | 58.57** | 40.27* | 52.17* |
| | | (14.64) | (19.42) | (18.02) | (21.04) |
| | _cons | -19.54*** | -14.31*** | -11.83*** | -13.03*** |
| | | (2.09) | (2.77) | (2.57) | (3.00) |
| | N | 50.00 | 50.00 | 50.00 | 50.00 |
| 15 | female | -2.01 | -2.96 | -1.06 | -0.74 |
| | | (2.73) | (3.59) | (3.46) | (3.79) |
| | proximity | -1.46 | -3.37 | -2.20 | 0.17 |
| | | (4.24) | (5.57) | (5.37) | (5.88) |
| | exposure | 0.81 | 3.16 | 1.76 | 1.04 |
| | | (2.49) | (3.28) | (3.16) | (3.46) |
| | wfh | 72.34*** | 55.49* | 37.98 | 54.41* |
| | | (15.87) | (20.88) | (20.11) | (22.02) |
| | essential | 13.66* | 8.97 | 11.02 | 17.81* |
| | | (6.13) | (8.06) | (7.76) | (8.50) |
| | _cons | -19.22 | -10.31 | -9.85 | -20.20 |
| | | (13.65) | (17.96) | (17.30) | (18.94) |
| | N | 54.00 | 54.00 | 54.00 | 54.00 |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001. Regressions are weighted by employment in the before period. Specifications 1 and 2 omit life science and health occupations (codes 22 and 32) and teaching occupations (codes 23 and 33). Specifications 3 and 4 omit skilled agriculture and subsistence agriculture (codes 61 and 62).

# 8 Discussion: labour market implications when WFH matters most

The main result emerging from the analysis in this study is that being able to work from home is one of the most important protective factors. To draw out some implications of this finding, we present some characteristics of groups who can WFH using 2020 Q1 data to show who will weather lockdown more easily. Table 8 shows that there is a severe race dimension to WFH: almost a fifth of white people are concentrated in WFH occupations, while less than 10 percent of Coloured and Black Africans are the same. This bodes poorly for the existing levels of racial inequality in the South African labour market. WFH has a positive gradient with age and skill - older and more educated people are more likely to be able to WFH.

**Table 8:** Characteristics of workers who can and cannot work from home in 2020 Q1

| | **2020 Q1 percent who can WFH** |
|---|---|
| **Female** | 9.5 |
| **Male** | 8.3 |
| | |
| **African** | 7.2 |
| **Coloured** | 7.8 |
| **Indian** | 15.9 |
| **White** | 17.8 |
| | |
| **15-34 years** | 7.8 |
| **35-49 years** | 8.9 |
| **50+ years** | 10.4 |
| | |
| **No schooling** | 5.6 |
| **Less than primary** | 6.1 |
| **Primary** | 5.1 |
| **Less than secondary** | 5.2 |
| **Secondary** | 8.3 |
| **Tertiary** | 16.7 |

| | **For Low WFH (<0.1 of occupation can WFH)** | |
|---|---|---|
| | **Men** | **Women** |
| **Mean proximity score** | 3.50 | 3.74*** |
| **Mean exposure score** | 1.78 | 2.40*** |
| **Share essential** | 29.01 | 22.44*** |

Notes: own calculations using QLFS 2020 Q1 data and adjusted using sampling weights.

Similar shares of men and women can WFH. However, women who WFH are more likely to live with young children than men who WFH. Using the self-reported WFH data from 2020 Q2 and Q3, the share of women WFH who co-resided with young children increased from 31% in Q2 to 35% in Q3. The same figures for men are 29% in Q2 up to 30% in Q3. The QLFS unfortunately did not ask questions about the division of labour in the household, and particularly juggling work and childcare. However, evidence

from another survey conducted over lockdown, the National Income Dynamics Study - Coronavirus Rapid Mobile Survey (NIDS-CRAM), does ask such questions. Research using these data point out that women, much more so than men, stepped up to fill the gap in the supply of childcare when schools and ECD centres closed (Casale & Shepherd 2020). This means it is not immediately clear that just because a similar share of men and women could WFH in 2020 Q1, that WFH will have an equally protective effect on women's work. Even if women are able to keep their jobs, this scenario could simply men an increase in women's double burden of work and childcare.

However, the vast majority of South African's work in occupations that cannot be performed from home. Within this much larger group, women are statistically significantly more likely than men to work in occupations that require physical proximity or which have fewer essential workers. Women also work in occupations that also put them more at risk of contracting Covid-19: both because they work in jobs that require more physical proximity and because they work in jobs that are substantially more likely to expose them to infectious diseases than men.

# 9 Conclusion

Previous economic downturns have tended to hurt male employment more than female, because industries that employ relatively more men, like manufacturing, contract more. For example, during the 2008-9 GFC women only lost 40% of the jobs that men lost. The 2020 recession triggered by the Covid-19 pandemic and associated population lockdowns presented differently. Women lost 88% of the jobs that men lost; meaning men and women lost almost the same number of jobs. We show that had job loss pattern in 2020 been what they were in the 2008 GFC, women would not have lost any jobs and men alone would have suffered job loss. Factors specific to the 2020 recession then explain this relatively worse performance by women. Our analysis shows that occupational measures of the ability to work from home, and to a lesser extent the degree of physical proximity required by one's job and essential worker status explain patterns of 2020 job loss. The same factors were not relevant for explaining job loss during the GFC.

When these explanations are compared to the distribution of men and women across occupations in the economy, we arrive at an understanding of why women have done relatively worse in 2020 than they might have under a purely financial recession, like the GFC. Although working from home was the most protective job trait, only a small share (about 8%) of the employed in 2020 Q1 could work from home. For the vast majority of workers facing the imposition of national lockdown on 26th of March 2020, women were significantly more likely to be working in jobs that either required more physical proximity or exposed them to infectious diseases. Women are also clustered in few occupations, whereas men are more evenly distribution across different types of occupations. And, the occupations women are mainly clustered in are those that require high levels of physical proximate work. These job traits made their jobs relatively more vulnerable given the imposition of social distancing protocols. Women who couldn't work from home were also less likely to be classified as essential workers.

Similar shares of men and women represent the small group of workers who could work from home. However, we caution that other research has shown that working women, more than working men, have upped their hours of childcare in the wake of school and ECD closures. Even if women are hanging onto their jobs by working from home, they may be under doing more hours of labour in total when household production is considered.

# A Alternative O*NET measure of WFH

**Table 9:** Robustness regression output for the correlation between lockdown job-loss risk measures and employment change in 2020 and 2008-9: alternative measure of WFH

| | **2020 Q1-Q2** | | **2008-9** | |
|---|---|---|---|---|
| **Spec.:** | **4** | **5** | **4** | **5** |
| **female** | -1.37 | -1.64 | 1.63 | 0.34 |
| | (2.64) | (2.76) | (2.25) | (2.37) |
| **proximity** | | -1.06 | | 3.91 |
| | | (4.36) | | (3.96) |
| **exposure** | | 1.82 | | 1.05 |
| | | (2.54) | | (2.27) |
| **essential** | | 12.43 | | 4.70 |
| | | (6.20) | | (5.76) |
| **WFH_O*NET** | 22.92*** | 23.80*** | 2.10 | 5.84 |
| | (4.86) | (5.50) | (4.01) | (4.62) |
| **_cons** | -16.61*** | -19.28 | -3.60* | -20.35 |
| | (1.88) | (13.99) | (1.59) | (12.38) |
| **N** | **50.00** | **54.00** | **50.00** | **54.00** |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001. Regressions are weighted by employment in the before period (2008 for the GFC and Q1 for 2020). Specification 4 omits skilled agriculture and subsistence agriculture (codes 61 and 62).

**Table 10:** Robustness regression output for a difference-in-differences model of job-loss risk during the GFC and 2020: alternative WFH measure

| **Model:** | **4** | **5** |
|---|---|---|
| **female** | 0.98 | -0.11 |
| | (1.65) | (1.74) |
| **Year = 2020** | -14.34*** | 2.21 |
| | (2.23) | (21.14) |
| **proximity** | | 4.00 |
| | | (3.28) |
| **proximity x 2020** | | -5.33 |
| | | (6.63) |
| **exposure** | | 1.15 |
| | | (1.88) |
| **exposure x 2020** | | 0.34 |
| | | (3.76) |
| **essential** | | 4.60 |
| | | (4.78) |
| **essential x 2020** | | 8.16 |
| | | (9.50) |
| **WFH_O*NET** | 2.12 | 5.99 |
| | (3.33) | (3.82) |
| **WFH_O*NET x 2020** | 20.81** | 17.38* |
| | (7.31) | (8.17) |
| **_cons** | -3.31* | -20.63* |
| | (1.26) | (10.26) |
| **N** | **100.00** | **108.00** |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001. Regressions are weighted by employment in the before period (2008 for the GFC and Q1 for 2020). Specification 4 omits skilled agriculture and subsistence agriculture (codes 61 and 62).

**Table 11:** Robustness regression output comparing lockdown job-loss risk measures across the duration of lockdown in 2020 and into 2021: alternative WFH measure

| Spec.: | Depvar: | % jobs lost between | | | |
|---|---|---|---|---|---|
| | | **Q2vs.Q1** | **Q3vs.Q1** | **Q4vs.Q1** | **Q5vs.Q1** |
| **14** | **female** | -1.37 | -1.98 | -0.59 | -0.11 |
| | | (2.64) | (3.48) | (3.19) | (3.68) |
| | **WFH_O*NET** | 22.92*** | 16.80* | 12.09* | 17.36* |
| | | (4.86) | (6.40) | (5.87) | (6.77) |
| | **_cons** | -16.61*** | -11.85*** | -10.21*** | -11.17*** |
| | | (1.88) | (2.48) | (2.27) | (2.62) |
| | **N** | 50.00 | 50.00 | 50.00 | 50.00 |
| **15** | **female** | -1.64 | -2.65 | -0.87 | -0.63 |
| | | (2.76) | (3.61) | (3.45) | (3.73) |
| | **1 proximity1** | -1.06 | -3.20 | -1.98 | 1.17 |
| | | (4.36) | (5.70) | (5.45) | (5.89) |
| | **1 exposure1** | 1.82 | 3.92 | 2.30 | 1.88 |
| | | (2.54) | (3.32) | (3.18) | (3.43) |
| | **1 essential** | 12.43 | 8.01 | 10.38 | 16.96* |
| | | (6.20) | (8.11) | (7.76) | (8.38) |
| | **WFH_O*NET** | 23.80*** | 17.82* | 12.53 | 20.14** |
| | | (5.50) | (7.19) | (6.88) | (7.43) |
| | **_cons** | -19.28 | -9.80 | -9.93 | -23.10 |
| | | (13.99) | (18.28) | (17.50) | (18.91) |
| | **N** | 54.00 | 54.00 | 54.00 | 54.00 |

Notes: own calculations using a combination of QLFS and PALMS v3.3 data. Standard errors in parenthesis. * p<0.05, ** p<0.01, *** p<0.001. Regressions are weighted by employment in the before period (2008 for the GFC and Q1 for 2020). Specification 4 omits skilled agriculture and subsistence agriculture (codes 61 and 62).

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