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DISCLAIMER

The results in this paper are not official statistics; they have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand (Stats NZ). The opinions, findings, recommendations, and conclusions expressed in this paper are those of the authors, not Stats NZ.

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form or provided to Inland Revenue for administrative or regulatory purposes. Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes and is not related to the data's ability to support Inland Revenue's core operational requirements.

Access to the anonymised data used in this study was provided by Stats NZ in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this paper have been confidentialised to protect these groups from identification. Careful consideration has been given to the privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI.

Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

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EXECUTIVE SUMMARY

This study investigates the impact of COVID-19 ("COVID") on the labour market disparities between Pasifika and New Zealand European ("NZ European"). To analyse these disparities, we assess labour market outcomes for the pre-pandemic period (January 2017–December 2019, inclusive) and quantify how they changed during the COVID period (March 2020–June 2021, inclusive). We are particularly interested in understanding whether COVID amplified ethnic disparities in job accession and benefit dependence; job and wage mobility; and job separation.

The empirical research utilises the Integrated Data Infrastructure (IDI), a population-wide research database provided by Stats NZ. Our population of interest is drawn from the 2018 Census and linked with wage data from Inland Revenue. Supplementary information from various databases, including Benefit Dynamics data from the Ministry of Social Development, was added. We run gender-specific regressions and account for several individual-level and employment-related characteristics.

The key findings are as follows:

- There are significant pre-pandemic ethnic disparities between NZ European and Pasifika in the labour market. These are primarily observable in job-entry wages following a period of non-employment (commonly known and thereby referred to as wage scarring for the remainder of the report) and wage progression of the employed.
- The pandemic amplified ethnic disparities for some sub-populations. Of note was the impact on the following Pasifika sub-populations: women; those below age 30; and Auckland residents. We also find greater estimated ethnic labour market disparities in 2021 relative to 2020.
- The COVID period substantially impacted young Pasifika living in Auckland for 2021 by exacerbating the wage scarring effect and increasing benefit dependency.
- The industries hit the hardest during COVID (in terms of lower wage growth) positively correlate with where Pasifika are more prevalent in the workforce. This is manufacturing and construction for Pasifika men, and manufacturing and healthcare and social assistance for Pasifika women.
- In line with the prevalence of Pasifika in industries strongly affected by COVID and their geographical concentration in Auckland, Pasifika were also found to be more likely to work in firms receiving the COVID wage subsidy in 2020. Furthermore, there was a sizable impact on both wage scarring and wage progression across all workers at firms that received a COVID wage subsidy versus those that did not.

1 Introduction

This study has two key research aims: (1) To quantify labour market disparities for Pasifika relative to New Zealand Europeans ("NZ Europeans") prior to the COVID-19 ("COVID") pandemic; and (2) to estimate the impact of the COVID pandemic on Pasifika labour market outcomes.

Large ethnic disparities characterise the New Zealand labour market. These disparities are most pronounced for ethnic minorities like Māori and Pasifika, who face disproportionally higher unemployment rates and earn lower wages (Ministry of Business, Innovation and employment [MBIE], 2019). For the first research aim, we assess pre-COVID labour market disparities for Pasifika across a wide array of indicators. The outcomes of interest broadly fall into three domains – job accession; job and wage mobility; and job separation.

- *Job accession and benefit dependence:* includes the probability of entering employment, the likelihood to be receiving benefits, wage level when starting employment, and the likelihood of starting employment on low pay.
- *Job and wage mobility:* includes wage progression, the likelihood of being employed with a low-pay employer, and the likelihood of changing employer or industry.
- *Job separation:* includes the probability of exiting employment and the likelihood of entering benefit recipiency.

Our analysis uses linked administrative data available in the Integrated Data Infrastructure (IDI). The 2018 Census forms the basis for our spine of individuals. Inland Revenue data, as well as Ministry of Social Development (benefits) data, are used to populate outcome variables within each of the aforementioned domains. The administrative data allows us to provide population-wide statistics compared to survey data which capture only a sub-sample of the population.

The second research aim is to estimate the impact of the COVID pandemic on Pasifika labour market outcomes. The pandemic has caused an amalgam of national and international responses. New Zealand introduced a series of measures that included a strict lockdown in March 2020 with severe measures. These included stay-at-home orders, closure of non-essential businesses and closing our borders to non-New Zealand citizens and permanent residents. Economic aids such as the "COVID-19 Wage Subsidy Scheme" and the "COVID-19 Income Relief Payment" were made available to compensate businesses for revenue loss and protect jobs as well as support those who became redundant.

Most restrictions have since been lifted, and the New Zealand labour market has bounced back. Unemployment rates continued to fall and reached an all-time low of 3.2 percent in the

fourth quarter of 2021 (MBIE, 2022). However, the economic recovery has not been uniform across the country and differs with respect to sector, demographics, and region. For example, the order to close non-essential businesses affected the construction and retail sectors, where a large fraction of Pasifika are employed. Furthermore, Auckland experienced four additional lockdowns after the initial nationwide March 2020 lockdown, and Pasifika are regionally concentrated in Auckland. All these factors may have potentially triggered differential labour market effects of the COVID pandemic on Pasifika relative to other ethnicities.

Our identification strategy to measure the impact of the COVID period on the labour market disparities is to quantify pre-COVID disparities and then gauge how these evolved during the pandemic. We define the pre-COVID period as from January 2017 to December 2019 (inclusive) and the COVID period as from March 2020 to June 2021 (inclusive).[1] Numerous factors can explain ethnic differences in labour market outcomes, like differences in qualification, age, region, health, or job-related characteristics. Given this, our regression models control for an extensive range of observable individual and employment-related characteristics. We also separate our analysis for men and women as labour market patterns differ across gender.

Our primary econometric analysis is supplemented with sub-group analysis to acknowledge that the pandemic's labour market impact is not homogeneous across all demographics and regions. We, therefore, stratify our analysis by age group (separately for those aged 30 or below as well as for 50 and above); qualification (no qualification); region (individuals living in Auckland) and by excluding the year 2020. We additionally test whether the labour market impacts differ depending on whether an individual was located in a firm that received support from the COVID-19 Wage Subsidy Scheme.

The remainder of this report is organised as follows: Section 2 presents background context and a brief summary of the relevant literature encompassing our two research aims; Section 3 outlines in detail the administrative data utilised and descriptives, as well as the identification strategy; Section 4 discusses the key results; Section 5 delves briefly into employer characteristics to understand their potential role in our findings; and Section 6 concludes.

[1] Earnings information in the IDI was current up to June 2021 at the time of our analysis.

2 Background literature

2.1 Existing Pasifika labour market disparities

Clear ethnic disparities exist in the New Zealand labour market. Pasifika face disproportionally higher unemployment rates and are overrepresented in benefit recipiency relative to their NZ European counterparts (MBIE, 2019; Ministry of Social Development [MSD], 2022). Pasifika are also more likely to work in sectors characterised by low wages and high turnover (Cochrane et al., 2018; Lee et al., 2018; MSD, 2021). Gender differences exacerbate existing ethnic disparities. Women are more likely to be employed part-time to balance unpaid work such as childcare and have higher underutilisation rates than men (MSD, 2021). These disparities are even more pronounced for Pasifika women, who are concentrated in lower-paid occupations than their male or NZ European counterparts (Masselot & Hayes, 2020).

Several factors can help us understand some of the reasons behind these disparities. At the individual level, differences in educational attainment, occupation or age can contribute to the differential labour market outcomes for Pasifika relative to NZ Europeans. At the firm level, Pasifika are more heavily concentrated in low-wage industries such as manufacturing, wholesale and retail, healthcare and social assistance.

2.2 The COVID-19 pandemic

At the start of the COVID pandemic, the government imposed far-reaching restrictions, including working-from-home orders for staff from non-essential businesses. Furthermore, the social distancing requirements limited personal movements. Businesses and employees saw reduced working hours and wages, increased job losses and uptake of benefit recipiency (Fletcher et al., 2021; Cook, et al., 2020).

To mitigate the impact of the COVID restrictions on businesses, the New Zealand government rapidly introduced a supporting scheme: the COVID-19 Wage Subsidy (CWS). The primary aim of the CWS scheme was to support businesses in keeping staff if they experienced revenue loss caused by the imposed restrictions. In 2020, firms were eligible for the subsidy if they experienced a 30 percent revenue drop compared to the same month in the previous year (Work and Income New Zealand, 2022). The uptake of the subsidy scheme peaked in June 2020 and covered 1.65 million jobs (MBIE, 2022). Sole traders, smaller firms and firms in the construction, accommodation, hospitality and manufacturing sector had a particularly high uptake of CWS (Maré & Hyslop, 2021). A further policy introduced was the COVID-19 Income Relief Payment (CIRP), which provided up to 12 weeks of pay for employees who lost their jobs from 1 March to 30 October 2020 due to COVID.

The labour market improved when restrictions eased, followed by falling unemployment rates and increasing labour force participation rates (MBIE, 2022). However, recovery rates across the country have been heterogeneous across industries, demographics, and regions. For example, public health measures and border closures have heavily impacted the tourism, hospitality, and retail sectors. Moreover, Auckland has also experienced additional lockdowns in contrast to the rest of the country. The pandemic also has disproportionately affected specific populations, such as ethnic minorities (Cook, et al., 2020) and women (Masselot & Hayes, 2020). Pasifika generally have a younger age profile than NZ Europeans, and given youth have lower skill levels, they are often more vulnerable to economic shocks in the labour market (Cook, et al., 2020). Younger workers are also predominantly employed in sectors such as retail or hospitality, which are more vulnerable to economic shocks.

2.3 Current empirical evidence

The empirical evidence on how the economic restrictions during the pandemic could have affected the Pasifika workforce can be divided into several themes – (i) evidence on the labour market impacts for Pasifika from prior economic shocks, such as the Global Financial Crisis (GFC); (ii) international evidence on the COVID impact on labour market outcomes for different population groups; and (iii) current available evidence in New Zealand on the COVID impact for Pasifika in the labour market.

The empirical evidence on the economic impact of the GFC shows that the Pasifika workforce was disproportionately affected relative to NZ Europeans. Cook et al. (2020) examined unemployment rates for Pacific Peoples compared to the total population. Unemployment rates for Pacific People were almost twice as high compared to the total population (approximately 7 percent for Pacific Peoples compared to 4 percent for the total population). This doubled following the GFC with Pacific unemployment rates doubling to 14 percent in 2012, compared to just over 6 percent for the total population.

We extend the analysis done by Cook et al. (2020) by examining unemployment trends between Pasifika and Europeans between 2008 Q3 and 2021 Q3, separately for men and women.[2] When we break these down by gender, we see that unemployment rates for Pasifika men increased substantially following the GFC (see

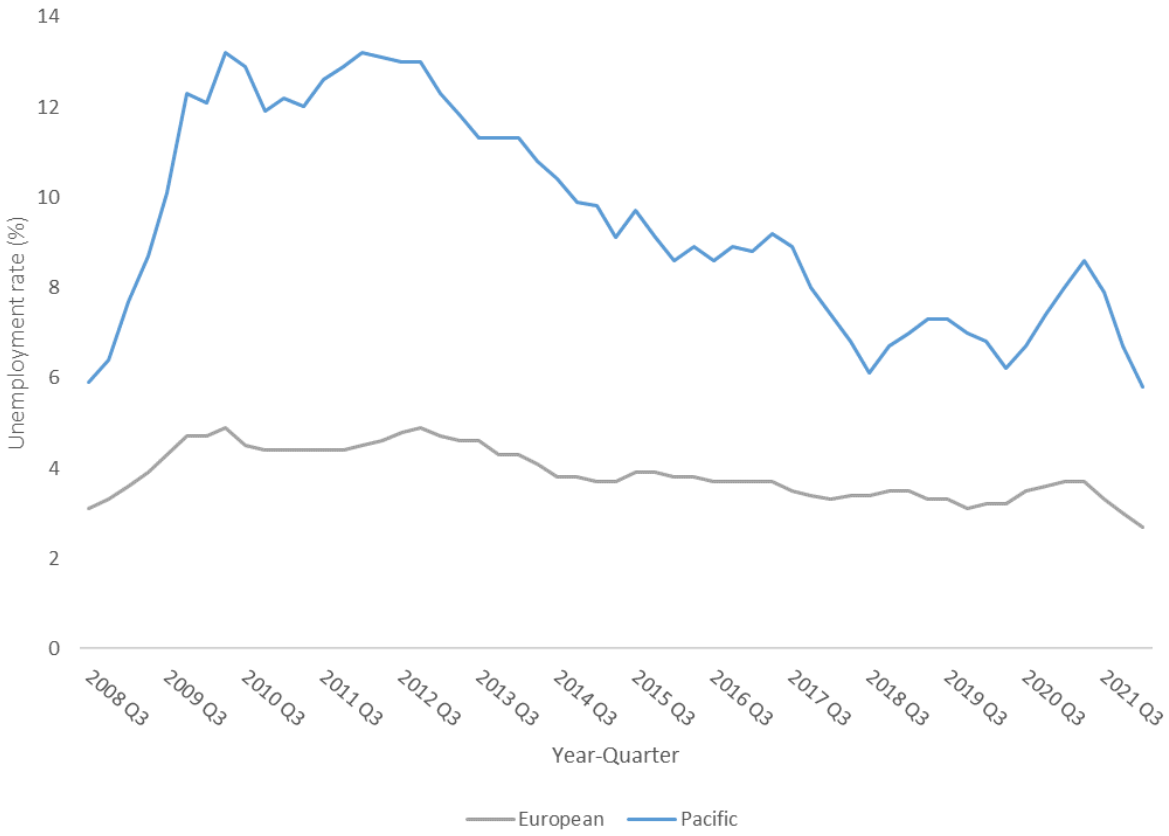
We note that following the GFC, unemployment rates for Pasifika men and women increased substantially before following a downward trend. In 2020 Q1, just before the COVID pandemic, unemployment rates for Pasifika men and women were 6.8 and 3.3 percent, respectively. For Pasifika men, this peaked to 8.6 percent in 2021 Q2 and peaked to 4.0

[2] Ethnic breakdowns by gender in the Household Labour Force Survey was only made available from 2008 Q3.

percent in 2021 Q3 for Pasifika women. The increase in unemployment rates just prior and during the pandemic was much smaller, compared to the increase in unemployment rates for Pasifika following the GFC.

). This peaked at 13.2 percent in 2012 with unemployment rates only recovering to pre-GFC levels as of 2022. In comparison, unemployment rates for European men increased slightly following the GFC, and remained much lower than those for Pasifika men.

Figure 1 Quarterly unemployment rates for Pasifika and European men



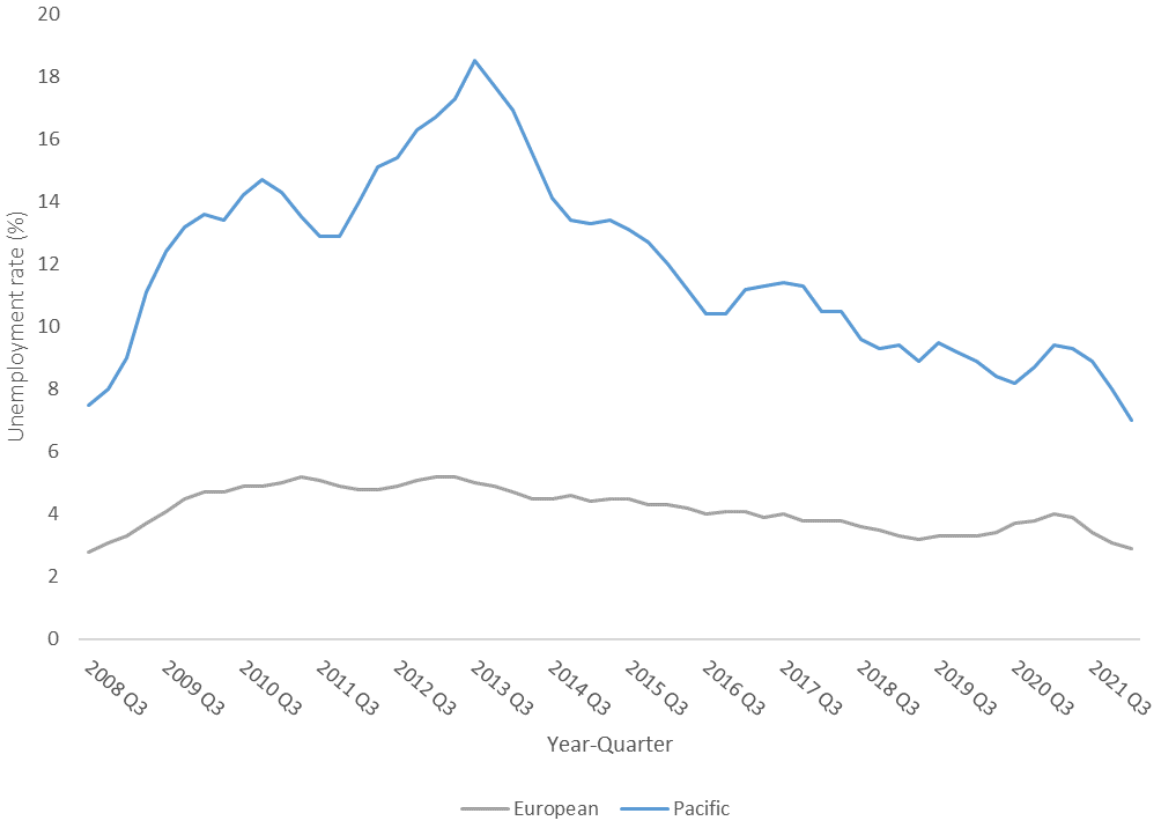
Source: Household Labour Force Survey (HLFS) data from Stats NZ.

In 2008, we see that Pasifika women had slightly higher unemployment rates compared to Pasifika men, and almost triple the unemployment rate compared to European women (see Figure 2). Unemployment rates for Pasifika women peaked at 18.5 percent in 2013, with unemployment rates also only recovering to pre-GFC levels as of 2022. Unemployment rates for European women remained similar to the male counterparts, and much lower compared to Pasifika women.

We note that following the GFC, unemployment rates for Pasifika men and women increased substantially before following a downward trend. In 2020 Q1, just before the COVID pandemic, unemployment rates for Pasifika men and women were 6.8 and 3.3 percent,

respectively. For Pasifika men, this peaked to 8.6 percent in 2021 Q2 and peaked to 4.0 percent in 2021 Q3 for Pasifika women. The increase in unemployment rates just prior and during the pandemic was much smaller, compared to the increase in unemployment rates for Pasifika following the GFC.

Figure 2 Quarterly unemployment rates for Pasifika and European women



Source: Household Labour Force Survey (HLFS) data from Stats NZ.

In terms of the second theme, we briefly summarise the international evidence on the pandemic's labour market impacts from a distributional lens. The literature identifies young people, low-skilled workers, ethnic minorities, and women are disproportionately impacted (Byrne et al., 2020; Cortes & Forsythe, 2020).

Concerning the final strand of literature—existing evidence on the COVID labour market impact for Pasifika—the evidence here is sparse and primarily descriptive. In a survey conducted after the first lockdown, 59 percent of Pacific households reported job or income losses, compared to 42 percent of NZ European households (Fletcher et al., 2021). Brunton (2021) comes to similar findings with their survey, reporting that almost one in five Pasifika households had lost half or more of their household income during the pandemic. Further descriptive analyses found that the fraction receiving main and unemployment benefits grew

stronger among Pasifika than NZ Europeans during the pandemic (MSD, 2021; Cook, et al., 2020). Additionally, data from the Household Labour Force Survey (HLFS) showed elevated levels of unemployment and underutilisation for Pasifika compared to other ethnicities (MSD, 2021).

Some of the industries where Pasifika are over-represented were heavily affected by COVID restrictions. This includes industries such as construction and manufacturing. Survey evidence points to employees in these industries reporting income loss due to reduced hours or pay and higher levels of job losses compared to other industries (Fletcher., 2021). These industries were also more likely to have firms receiving the COVID wage subsidy (Maré & Hyslop, 2021; Cook, et al., 2020). Furthermore, Cortes & Forsythe (2020) and Byrne et al. (2020) found that job losses were concentrated in low-paying firms and industries (where Pasifika tend to be over-represented).

In the June 2020 quarter, 90 percent of jobs lost were held by women, which may reflect the impact of COVID in female-dominated industries such as retail tourism, accommodation, and hospitality (Masselot & Hayes, 2020). MSD (2021) reported that women experienced increased unemployment and underutilisation compared to men due to being in industries more heavily impacted by the pandemic. As a result of compounded ethnic and gender disparities, the authors suggest that Pasifika women were even more affected. However, the MSD report notes that, by using the HLFS, findings for small populations need to be treated with caution. They suggest further work is required in order to understand the longer-term trends for Pasifika, including Pasifika women.

Since the initial March 2020 lockdown, the labour market has recovered, with unemployment and underutilisation rates for Pasifika returning to pre-pandemic levels (MSD, 2021). However, their unemployment rate remains above that of NZ Europeans. A survey by Colmar Brunton (2021) reported that 66 percent of Pacific individuals who lost their job during strict pandemic restrictions were still out of paid work when restrictions were lifted several months later. Some of these disparities may reflect the large fraction of Pasifika residing in Auckland, who experienced additional lockdowns compared to the rest of New Zealand.

To sum up the empirical findings, recent evidence related to the pandemic's impact and labour market disparities for Pasifika relative to NZ European are primarily descriptive in nature. Colmar Brunton (2021) and Fletcher et al. (2021) use surveys in their studies and present descriptive figures. Cook, et al. (2020) and MSD (2021) use administrative data and the HLFS to present descriptive statistics through a Pacific lens. One exception is the study by Maré & Hyslop (2021), where the authors use a statistical model to examine the impact of the CWS on firms. We, therefore, add to the existing literature by using population-wide administrative data in the IDI to assess the COVID effect on labour market disparities between Pasifika and NZ Europeans. Using detailed microdata on employment, earnings, and benefit

recipiency permits us to quantify the labour market outcomes of interest pre- and during COVID. We then employ a regression model to causally estimate the pandemic's labour market impact on pre-COVID ethnic differences.

3 Data and descriptives

We use linked administrative data available in Stats NZ's Integrated Data Infrastructure (IDI) for our empirical study. The IDI provides population-level unit record information on individuals and households in New Zealand. Each individual is assigned a unique identifier, which can be used to link various administrative data sources and Stats NZ produced tables. We draw on microdata related to employment, earnings and benefit recipiency to quantify labour market dynamics pre- and during COVID.

In this section, we describe our data, present relevant descriptive statistics and detail our empirical identification strategy.

3.1 Forming our panel from the 2018 Census

Our starting point is the 2018 Census ("Census"), a population-wide survey. It was held on 6 March 2018 and collected information on numerous individual (and household) characteristics such as ethnicity, birth, and gender. We use the Census to form the spine of individuals to track monthly over the period January 2017 to June 2021 (the latest date of data availability).

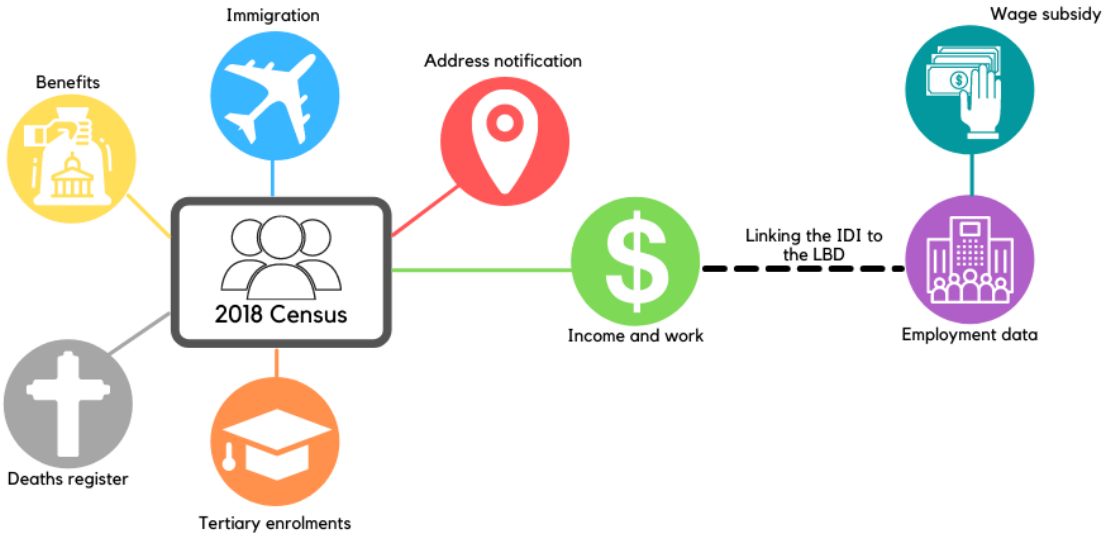
First, individuals who identify as NZ European and Pasifika are selected. In the Census, individuals can state multiple ethnicities. We use prioritised ethnicity to assign a single ethnicity to an individual (see also Plum et al., 2019; Tin Tin et al., 2018; Bakker et al., 2011). To assign a prioritised ethnicity, individuals are allocated ethnicity in the following order: Māori, Pasifika, Asian, MELAA (Middle Eastern, Latin American and African), Other and NZ European.

Second, the date of birth as provided in the Census is used to include individuals of working age (20 to 64, inclusive). Note that individuals may not appear for all months in the panel dataset. Individuals who turn 20 after 6 March 2018 (the lower bound of the working-age range) will be included in the dataset in the month they turn 20. Similarly, individuals who turn 65 after 6 March 2018 (upper bound of the working-age range) will be excluded from the month they turn 65.

3.2 Linking datasets to our spine

Figure 3 shows the IDI datasets we have linked to the Census spine to form our panel and outcomes of interest. Employer characteristics from the Longitudinal Business Database (LBD) are linked through income data. Wage subsidy data is linked through employment data.

Figure 3 Linking datasets to our Census spine



Source: IDI datasets and authors' compilation.

We use tax information from Inland Revenue's (IR) Employee Monthly Schedule (EMS) as our primary source of labour market outcomes. The IR-EMS database provides monthly income information on individuals for seven income sources: wages and salaries (W&S), benefits, paid parental leave, student allowances, claims, superannuation, and withholding payments. Our two primary income sources of interest are W&S and benefits. W&S information is provided monthly at the employer level. We use the term 'non-employed' rather than 'unemployed' to characterise individuals with no W&S. The definition of 'unemployed' refers to an individual who is not employed and is seeking work. As we cannot measure job-seeking behaviour in the IDI, we denote individuals with no W&S as 'non-employed'.

Individuals with multiple jobs will have multiple line entries per month corresponding to each unique employer. The respective tax code is provided for each entry, which helps us determine the main job in the case of multiple jobs per month. Where two jobs have identical tax codes, we consider the employment with the higher W&S level as the primary job. Benefit information in the IR-EMS database helps us determine *who* receives a benefit but not what

type of benefit they receive. For this reason, we also link the MSD benefit dynamics data to determine who receives unemployment-related benefits.

Firm characteristics are also relevant to our analysis. We identify an employer's industry using the Australian and New Zealand Standard Industrial Classification (ANZSIC) code linked to each employer. For each employer, we can identify 1) the number of employees and 2) the employer's mean monthly wage paid to its employees. Additionally, the IDI Adhoc database contains COVID-19 Wage Subsidy (CWS) information. In particular, which employers received the subsidy, the duration they received it for, how many employees it covered, and the amount of subsidy received. Note that we cannot determine if an individual received the subsidy, only if they were employed at a firm that received it.

We use responses to several questionnaires in the Census as our explanatory variables in the upcoming empirical model. These include the highest qualification, disability and smoking status, and social marital status (including de facto relationships). We assume these variables are time-invariant for our sample period. We also use the Address Notification table in the IDI to identify in which regions individuals live. We further add employer-related characteristics, which are often not available when using information available in surveys.

We impose further restrictions on our sample to ensure that the individuals in our population of interest have access to the New Zealand labour market:

- *Physically present in New Zealand:* The person overseas spell dataset summarises all border movements by individuals in MBIE's immigration data. We first identify overseas trips that are 30 days or longer (including non-returning) and remove the individual-month observations from our panel that correspond to the individual's overseas spell.
- *Non-deceased:* The Department of Internal Affairs has a register of all deaths registered in New Zealand. It provides the month and year an individual is deceased. As foregoing sickness may have limited an individual's ability to participate in the labour market, we remove the individual-month observations twelve months prior to their deceased date from our panel.
- *Not studying:* Students have limited time resources to participate in the labour market. Thus, we remove all individual-month observations where students are enrolled in any government-funded tertiary education organisations using the tertiary education enrolment data provided by the Ministry of Education.
- *Parenting:* The IR-EMS dataset lists whether an individual received paid parental leave (PPL). Individuals receiving PPL are legally not permitted in participating in the labour market. Therefore, we removed the individual-month observations where parents are receiving government support and removed these from the panel.

- *Self-employment:* Self-employed individuals are excluded from our analysis. We use several information sources to identify self-employed individuals. First, we use the IR-Income Tax Year Summary table to identify individuals who received income as sole traders, company directors and partnerships (IR3, IR4 and IR20 forms, respectively). Additionally, we identified self-employed individuals who paid themselves wages and salaries in the IR-EMS dataset (identical employee and employer identifier). Finally, we identified individuals who claimed the CWS as 'Sole Traders' in the Ad-hoc Employer CWS tables.[3]

3.3 Labour market snapshot using the 2018 Census

We use the Census to provide a point-in-time overview of demographic characteristics and labour market outcomes for NZ European and Pasifika, separated by gender. Table 1 indicates that Pasifika are a younger population compared to NZ Europeans. On average, Pasifika men and women are five years younger than their NZ European counterparts. When examining distribution by qualification level, we note that the proportion of individuals with no qualification is higher among Pasifika, particularly men. Further, the share of postgraduate NZ European men is about double the proportion for Pasifika men. We find little ethnic differences when comparing women with postgraduate qualifications.

For those in the labour market, being full-or part-time employed is the dominant working status irrespective of ethnicity. However, Pasifika have a higher proportion of individuals who are unemployed or not in the labour force compared to NZ Europeans. This holds across both genders. We observe large differences in the employment status for individuals in full- or part-time employment. Over nine out of ten Pasifika stated being a paid employee–these proportions are much lower for NZ European men and women (77 and 84 percent respectively). Conversely, NZ Europeans have a much higher share of employers or self-employed individuals. For example, approximately one in four NZ European men stated they are self-employed or an employer. About one in every sixteen Pasifika men stated they are self-employed or an employer.

[3] As a robustness check, we compared our results with individuals in the 2018 Census who identified as either an employer or self-employed with no employees and found a very large overlap.

Table 1 Census Individual-level characteristics

	Men		Women	
	NZ European	Pasifika	NZ European	Pasifika
Sample characteristics				
Number of individuals	847,776	92,145	867,090	89,421
Mean age	43.10	38.18	43.33	38.54
Qualification level				
No Qualification	0.209	0.310	0.188	0.244
Level 1-4 Certificate	0.430	0.398	0.548	0.446
Level 5/6 Diploma	0.058	0.078	0.059	0.065
Bachelor's degree and Level 7 Qualification	0.070	0.097	0.078	0.111
Post-graduate	0.234	0.117	0.128	0.133
Working status				
Employed Full-time	0.796	0.708	0.549	0.508
Employed Part-time	0.067	0.081	0.235	0.155
Unemployed	0.029	0.052	0.032	0.077
Not in the Labour Force	0.109	0.159	0.184	0.260
Employment status (if full- or part-time employed)				
Paid Employee	0.770	0.933	0.842	0.960
Employer	0.092	0.020	0.044	0.011
Self-Employed and Without Employees	0.131	0.043	0.098	0.025
Unpaid Family Worker	0.008	0.003	0.016	0.005
Working hours if paid employee				
	42.91	40.82	34.48	35.45
Disability status [a]				
Disabled	0.045	0.069	0.039	0.074

Source: 2018 Census in the IDI. Authors' compilation.

Notes: The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old during the 2018 Census interview.

[a] An individual is regarded as disabled if they answered "a lot of difficulty" or "cannot do at all" in one or more of the six activity limitations (walking, seeing, hearing, cognition, self-care and communications) in the 2018 Census.

We then examine the distribution of household characteristics by linking the individuals to the responses in the household questionnaire of the Census. There is no simple rule for assigning ethnicity at the household level (especially in cases of multi-ethnic households). Therefore, we present our distributional numbers of the household characteristics at the individual level.

Table 2 shows substantial differences in the location of residence. About two out of every three Pasifika live in Auckland—for NZ Europeans, this is one out of four. We also observe differences in homeownership by ethnicity. Approximately 60 percent of NZ Europeans partly or fully own their home or hold it in a family trust. For Pasifika, 75 percent of this population neither own their own home or hold it in a family trust.

The heterogeneities related to the location of residence also extend to socioeconomic status. The New Zealand Deprivation Index (NZDep) is used to provide granular geographic levels of

deprivation. At the most granular level, New Zealand is divided into meshblocks, the smallest geographic unit for which data is recorded. These vary in size–they may cover a small part of a city block or large rural areas. Census information is collected and used to measure the socioeconomic deprivation for each meshblock. These deprivation scores are divided into ten deciles, where decile 1 represents areas with the least deprived scores, and decile 10 represents areas with the highest deprived scores. To simplify our analysis, we aggregate these deciles into three groups: deciles 1 to 3 (least deprived), deciles 4 to 6, and deciles 7 to 10 (most deprived). One out of three NZ Europeans live in the most deprived areas–for Pasifika, this is every three out of four.

We find further ethnic differences by average household size. Pasifika households have, on average, five individuals living in the same house. For NZ Europeans, there are, on average, three individuals living in the same household (note that our sample does not hold pensioner households based on our restriction to include only individuals of working age 20 to 64, inclusive). Pasifika are also twice as likely to have dependents in the household under the age of 15. The Census also provides information on the Jensen Equivalised Annual Household Income (JEAH), a specific scale that equivalises annual household income to account for the economies of scale as household size increases. The Jansen scale is very close to the modified OECD scale and assigns a value of 1.0 to a one-person household, 1.54 to a couple with no children, and 2.17 to a two-adult, two-child household. We can see that the equivalised annual household income is slightly above $100k for NZ Europeans and approximately $70k for Pasifika.

Table 2 Census household-level characteristics

	Men		Women	
	NZ European	Pasifika	NZ European	Pasifika
Region				
Northland	0.032	0.012	0.033	0.011
Auckland	0.263	0.655	0.258	0.688
Waikato	0.097	0.046	0.099	0.041
Bay of Plenty	0.060	0.021	0.063	0.018
Gisborne	0.007	0.004	0.007	0.003
Hawke's Bay	0.034	0.020	0.035	0.016
Taranaki	0.030	0.005	0.030	0.004
Manawatū-Whanganui	0.053	0.024	0.054	0.021
Wellington	0.120	0.121	0.122	0.120
Tasman	0.009	0.001	0.009	0.001
Nelson	0.164	0.055	0.160	0.048
Marlborough	0.064	0.018	0.064	0.016
West Coast	0.027	0.006	0.026	0.006
Canterbury	0.015	0.002	0.015	0.001
Otago	0.013	0.003	0.014	0.003
Southland	0.012	0.004	0.012	0.003
Homeownership				
Hold in a family trust	0.121	0.038	0.121	0.036
Own or partly own	0.470	0.209	0.491	0.202
Do not own and do not hold in a family trust	0.409	0.753	0.389	0.763
NZ Deprivation Index [a]				
1-3	0.359	0.091	0.366	0.081
4-6	0.326	0.176	0.327	0.162
7-10	0.315	0.734	0.307	0.757
Average number of individuals in the household				
	3.13	4.94	3.10	4.95
Average number of children below 15 in household				
	0.59	1.23	0.63	1.30
Jensen Equivalised Annual Household Income (JEAH) [b]				
	$106,005	$73,223	$101,105	$67,699

Source: 2018 Census in the IDI. Authors' compilation.

Notes: The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old during the 2018 Census interview.

[a] The NZ Deprivation Index is based on socioeconomic deprivation for each meshblock, the smallest geographic unit for which data is recorded. These deprivation scores are divided into ten deciles, where decile 1 represents areas with the least deprived scores, and decile 10 represents areas with the highest deprived scores.

[b] A specific scale equivalises annual household income to account for the economies of scale as household size increases. The Jansen scale is very close to the modified OECD scale and assigns a value of 1.0 to a one-person household, 1.54 to a couple with no children, and 2.17 to a two-adult, two-child household.

3.4 Pre-COVID labour market disparities

Next, we link our population of interest derived from the Census (as described in Section 3.2) with IR data to understand the labour market status during the pre-COVID period covering

January 2017 until December 2019 (inclusive). As we use monthly earnings information, the descriptives we provide are on the individual-monthly level.[4]

Table 3 provides an overview of the employment status for NZ European and Pasifika men and women for the pre-COVID period. We find that the share of men receiving income from wages and salary is similar between NZ European and Pasifika (77 percent and 75 percent of individual-month observations, respectively). Both NZ European and Pasifika women have lower shares than men, with approximately 70 percent of NZ European women receiving income from wages and salary and 62 percent for Pasifika women. Most individuals receive monthly earnings from one employer; however, women were more likely than men to have multiple employers.

IR also reports whether an individual receives income from benefits. About 10 percent of men received benefits, regardless of ethnicity. However, we see Pasifika women are almost twice as likely to receive income from benefits than NZ European women. When we look at only unemployed-related benefits from MSD, we see that both gender and ethnic differences are minor.

Table 3 Labour market status of 20-64-year-olds pre-COVID (2017-19)

	Men		Women	
	NZ European	Pasifika	NZ European	Pasifika
Share of individuals receiving income from W&S				
	0.772	0.754	0.691	0.624
Mean number of months receiving income from W&S				
	15.30	15.11	13.41	12.08
Number of employers				
1	0.973	0.962	0.936	0.947
2	0.026	0.036	0.057	0.050
3 and more	0.002	0.002	0.006	0.003
Receive income from any benefits as shown in IR				
	0.097	0.114	0.124	0.200
Mean number of months receiving income from IR benefits				
	0.59	1.23	0.63	1.30
Receiving MSD unemployment-related benefits				
	0.013	0.019	0.013	0.021

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old in the period January 2017 until December 2019.

[4] For example, if we trace 1,000 individuals for three years (=36 months), we have 36,000 individual-month pairs, which will be our denominator. If each individual works for ten out of twelve months per year (30,000 employed individual-month pairs), the respective employment fraction on the individual-month level is 0.83 (30,000/36,000).

Table 4 provides further labour market characteristics of 20- to 64-year-olds in the pre-COVID period. For each month in our data panel, we calculate the proportion of respective populations that are in the bottom two deciles of the wage distribution. We find that Pasifika men are more likely to be earning low pay relative to their NZ European counterparts, as well as relative to Pasifika females.

In terms of industry distribution, Pasifika men are most prevalent in manufacturing and construction. In Table 4, we have highlighted the seven industries with the greatest proportion of Pasifika, specifically with at least 5 percent of the Pasifika workforce employed in the respective sector. For Pasifika women, the two industries they are most concentrated in are manufacturing and healthcare and social assistance.

Furthermore, higher occupation levels generally have a lower proportion of Pasifika relative to NZ Europeans. For example, 8 percent of Pasifika men are managers, whereas the corresponding proportion of NZ European men is 22 percent. A similar pattern is evident for females, although the ethnic gap is not as large. Here, 8 percent of Pasifika women are managers compared to 14 percent of NZ European women. Notably, at the next occupation level of professionals, NZ European men are close to twice as likely to fall into this category compared to Pasifika men; the ratio in this category is similar between NZ European and Pasifika women. In occupations like machinery operators and drivers and labourers which, on average, receive lower wages, we see that the distribution between the ethnicities flips. About every fourth Pasifika man is a labourer; for NZ European men, this is every seventh.

Finally, Table 4 also shows the average wage level for the different population groups. Note that Table A.1 in the Appendix also delves into the average wage levels by qualification level, industry and occupation level. As Table 4 shows, NZ European men, on average, earn $1,000 more per month than their Pasifika counterparts. By contrast, the average mean monthly wage is similar between NZ European and Pasifika women.

We next create an age-wage profile, as shown in Figure 4, left chart, for men and right chart, for women. It is apparent from the graphs that the ethnic difference in earnings is not static with age for men. The earnings differential is smaller for those in their early twenties. The wage gap then increases with age, reaching the peak difference around the age of 50 with a monthly wage difference of $1,240.

Concerning women, the right chart's age-wage profile shows little ethnic differences in earnings across the life course. A similar pattern is evident even when the data is disaggregated by qualification level (Table A.1). However, when disaggregating by industry and occupation (Table A.1), we then find numerous examples of NZ European women having, on average, higher mean wages than Pasifika women.

Table 4 Labour market distribution of 20-64-year-olds pre-COVID (2017-19)

	Men		Women	
	NZ European	Pasifika	NZ European	Pasifika
Low-pay employment (share) [a]				
	0.191	0.278	0.205	0.153
Share by industry [b]				
Agriculture, Forestry and Fishing	0.069	0.030	0.035	0.017
Mining	0.007	0.002	0.002	0.000
Manufacturing	0.181	0.269	0.077	0.133
Electricity, Gas, Water and Waste Service	0.012	0.011	0.007	0.006
Construction	0.172	0.138	0.036	0.016
Wholesale Trade	0.094	0.090	0.056	0.052
Retail Trade	0.093	0.059	0.142	0.095
Accommodation and Food Services	0.025	0.021	0.058	0.072
Transport, Postal and Warehousing	0.073	0.102	0.033	0.066
Information Media and Telecommunications	0.013	0.008	0.013	0.015
Financial and Insurance Services	0.020	0.016	0.048	0.043
Rental, Hiring and Real Estate Services	0.014	0.013	0.024	0.011
Professional, Scientific and Technical Services	0.051	0.029	0.080	0.043
Administrative and Support Services	0.033	0.070	0.041	0.098
Public Administration and Safety	0.055	0.068	0.054	0.072
Education and Training	0.016	0.015	0.079	0.058
Health Care and Social Assistance	0.018	0.025	0.157	0.161
Arts and Recreation Services	0.013	0.010	0.016	0.013
Other Services	0.040	0.026	0.043	0.028
Share by occupation (only March 2018) [c]				
Manager	0.213	0.085	0.140	0.081
Professionals	0.092	0.051	0.088	0.080
Technicians and Trade Workers	0.237	0.176	0.054	0.035
Community and Personal Service Workers	0.052	0.081	0.157	0.191
Clerical and Administrative Workers	0.052	0.062	0.309	0.206
Sales Worker	0.075	0.045	0.146	0.142
Machinery Operators and Drivers	0.142	0.258	0.020	0.067
Labourers	0.136	0.242	0.086	0.199
Monthly mean wage (in $NZD) [d]				
	5,792	4,859	3,846	3,854

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old in the period January 2017 until December 2019.

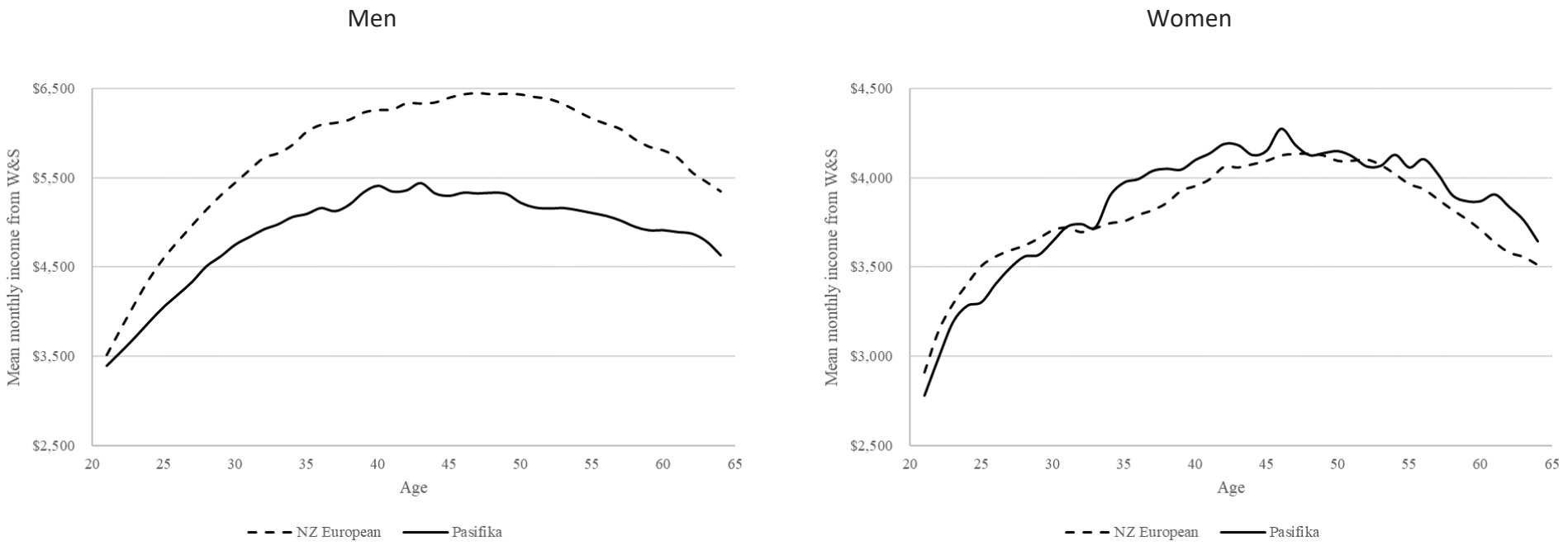
[a] Low pay is defined as earnings from wages and salaries belonging to the two lowest deciles (gender-specific distributions).

[b] Industry information as provided in the IR-EMS data. If an individual holds multiple jobs per month, we identify the main job via the tax code and/or earnings level. Cells with an orange shading refer to a share of 5% or greater (only for Pasifika).

[c] Information on occupation as provided in the 2018 Census.

[d] Deflated using the consumer price index.

Figure 4: Age-wage profile of 20-64-year-old men and women pre-COVID (2017-19)



Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.
Notes: The graphs show the age-wage profile of monthly earnings from W&S as recorded in the IR-EMS data. The left chart refers to men and the right chart to women. Earnings are deflated using the consumer price index

3.5 Empirical identification strategy

Our regression model takes the following form:

$$y_{it} = \beta_1 P_i + \beta_2 COVID_t + \beta_3 P_i \times COVID_t + X'_{it}\gamma + E'_{i(t-12)}\delta + u_{it} \quad (1)$$

with subscript i referring to individual $i = 1, \dots, N$ and t to the time-point, spanning January 2017 to June 2021 (inclusive). Our unit of analysis is individual-month observations as labour market outcomes are available at the monthly level. We exclude January and February 2020 from our analysis as we consider these transitional months between our time periods of interest. Although no formal restrictions were yet implemented, several countries had already discussed or began initial countermeasures in response to COVID.

We describe the terms used in equation (1), beginning with the left-hand side:

- y_{it} denotes the dependent variable corresponding to our different labour market outcomes e.g. wage scarring or labour market entry. These are described in full in Table 5.
- P_i is an ethnicity dummy variable taking the value of 1 if the person's ethnicity is Pasifika and 0 if NZ European.
- $COVID_t$ is a binary indicator which takes value = 1 for the months from March 2020 to June 2021 (inclusive) and 0 for the months January 2017 to December 2019.
- $P_i \times COVID_t$ is the interaction term between ethnicity and the COVID time identifier. This takes value = 1 for Pasifika during the months March 2020 to June 2021; 0 otherwise.
- X'_{it} is a matrix corresponding to the individual-level explanatory variables used in our analysis. These include: individual's highest qualification, age, disability, smoking status, social marital status, and region of residence. Full details and definitions of these explanatory variables are provided in Appendix Table A 2.
- $E'_{i(t-12)}$ is a matrix holding labour-market related information from 12 months ago. Note that these covariates are only included if the person was employed in the previous year. The variables are: employment history (W&S 12 months prior) and employer-related characteristics such as industry, firm's age, and the number of employees. Full details and definitions of these explanatory variables are provided in Appendix Table A 3.
- u_{it} denotes the idiosyncratic shock. We clustered the standard errors at the individual level as we have repeated observations over time.

The three β coefficients correspond to specific effects:

- β_1 estimates the ethnic difference between Pasifika and NZ European in labour market outcomes in the pre-COVID period (2017/19).
- β_2 estimates the COVID impact on labour market outcomes for the full population (e.g., how did wages evolve between 2020/21 compared to 2017/19).
- β_3 estimates the Pasifika-specific impact of the COVID.
- The sum of β_1 and β_3 estimates if ethnic disparities changed during the COVID period.

Our primary interest will be the value of β_1 which estimates the baseline pre-pandemic ethnic difference, and the sum of $\beta_1 + \beta_3$, which estimates ethnic differences during the pandemic. Note that if the COVID response had caused a strong but uniform impact across both NZ Europeans and Pasifika $(\beta_2 \neq 0, \beta_3 = 0)$, then we would not observe any change in ethnic differences over time $(\beta_1 = \beta_1 + \beta_3)$.

Table 5 Labour market outcome variables

Job Accession and benefit dependence		
For individuals not employed 12 months prior and employed currently:		
1	Labour market entry	The likelihood of entering employment
2	Wage scarring	W&S when entering employment
3	Low-pay risk entering employment	Likelihood to be on low pay when entering employment
For individuals not employed and in receipt of some form of benefit 12 months prior		
4	Any benefit dependence	The likelihood of being a benefit recipient (per IR-EMS) conditional on receiving a benefit 12 months prior
5	Unemployment-related benefit dependence	The likelihood of receiving an unemployment-related benefit (per MSD) conditional on receiving the same 12 months prior
Job and wage mobility		
For individuals employed 12 months prior and currently:		
6	Wage progression	Annual wage change
7	Low-pay risk in employment	Likelihood of moving into low-paid employment
8	Job stability	Likelihood to remain employed with the same employer
9	Industry stability	Likelihood to remain employed in the same industry
Job separation		
For individuals employed 12 months prior and non-employed currently:		
10	Job separation	The likelihood of exiting employment
11	Any benefit receipt	The likelihood of receiving any benefit receipt (per IR-EMS) if they become non-employed
12	Unemployment-related benefit receipt	The likelihood of receiving unemployment-related benefits (per MSD) if they become non-employed

4 Results

Our empirical regression model estimates existing pre-pandemic labour market disparities between NZ European and Pasifika and quantifies how these have changed during COVID. As detailed in our model in Section 3.5, we control for a range of confounding factors that potentially affect labour market outcomes. We also run separate regressions for men and women as labour market patterns differ across gender.

Each table related to our outcome domains follows the same format (see Table 6):

- Columns (I)-(III) refer to outcomes for men, and columns (IV)-(VI) refer to women.
- Columns (I) and (IV) address our research aim 1 by quantifying the labour market disparity between Pasifika and NZ European for the pre-COVID period.
- Columns (II) and (V) address the first step of research aim 2 by gauging the labour market disparity between Pasifika and NZ European for the COVID period.
- Columns (III) and (VI) address the second step of research aim 2 by reporting the difference in outcome variables between the pre-COVID and COVID periods.

4.1 Job accession

Our first set of estimation results is focused on the population of individuals who were not employed 12 months ago.

Labour market entry

We start with the likelihood of moving into employment. The first column of Table 6 shows that during the pre-COVID period, Pasifika and NZ European men had almost the same probability of moving from non-employment into employment (no statistically significant difference). During the COVID period, we see slightly better transition chances for Pasifika men (0.7 percentage points, column II). However, the change between the two time periods (2017-2019 versus 2020-2021), which we denote as the COVID change, is statistically insignificant. In summary, these results indicate that for non-employed Pasifika men, there was no impact of COVID on their likelihood of entry into the labour market relative to non-employed NZ European men.

For Pasifika women, the picture is different. Compared to NZ European women, Pasifika women were, on average, 0.4 percentage points (column IV) less likely to exit non-employment during pre-COVID. During COVID, this probability gap widened further to 1 percentage point (column V). This means the pandemic deteriorated the chances of entering employment by 0.6 percentage points for Pasifika women.

Table 6 Regression results for job accession outcome variables

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Labour market entry (in percentage points)					
0.003	0.007***	0.004	-0.004*	-0.010***	-0.006***
(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Wage scarring (in percent)					
-0.225***	-0.250***	-0.024*	0.019*	-0.051***	-0.070***
(0.010)	(0.012)	(0.014)	(0.010)	(0.012)	(0.013)
Low-pay risk when entering employment (in percentage points)					
0.151***	0.145***	-0.006	-0.033***	0.013*	0.046***
(0.005)	(0.006)	(0.007)	(0.005)	(0.006)	(0.007)
Any benefit dependence (in percentage points)					
-0.029***	-0.007**	0.023***	-0.017***	0.000	0.017***
(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
Unemployment-related benefit dependence (in percentage points)					
-0.024*	0.007	0.031**	-0.001	0.001	0.002
(0.012)	(0.011)	(0.013)	(0.012)	(0.011)	(0.013)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

Wage scarring and low-pay risk when entering employment

Next, we examine the earnings level (in terms of wages and salaries) for individuals entering employment. The economic literature describes this as 'wage scarring' as it reflects the likely adverse effect of a non-employment spell on subsequent wages. As shown in column I of Table 6Table 7, Pasifika men, on average, earned 22.5 percent less than NZ European men when entering employment pre-COVID. This disparity increased by a further 2.4 percentage points during the pandemic. Lower starting wages are usually associated with a substantially higher risk of working in a low-paid job. During the pre-COVID period, Pasifika men were, on average, 15 percentage points more likely to begin employment on low pay relative to NZ European men, and this figure did not change during the COVID period.

As with labour market entry, the picture for wage scarring and low pay risk looks markedly different between the genders. We see that Pasifika women earned slightly more (2 percent on average) than NZ European women when entering employment pre-COVID. However, the relationship reversed during COVID – Pasifika women, on average, earned 5.1 percent less than NZ European women when entering employment, which is a 7 percentage points drop.

At the same time, the likelihood to enter employment on low pay increased by 4.6 percentage points during the pandemic (for Pasifika women relative to NZ European women).

Benefit dependency

In the bottom half of Table 6, we examine two benefit dependency variables – first, for those non-employed and receiving any benefit 12 months prior, the likelihood of currently receiving any benefit; and second, for those non-employed and receiving an unemployment benefit 12 months prior, the likelihood of currently receiving an unemployment benefit. Both indicators measure benefit dependency, where the first one is broader in nature and covers any benefit, and the second is focused solely on unemployment benefits.

During the pre-COVID period, both Pasifika men and women had significantly lower probability of any benefit dependency than NZ Europeans. For example, Pasifika men (women) were, on average, 2.9 (1.7) percentage points less likely to stay on benefits than NZ European men (women). Furthermore, the difference was 2.4 percentage points for unemployment-related benefits for Pasifika men.

However, during the pandemic, the likelihood of exiting benefit recipiency dropped significantly for both Pasifika men and women (relative to NZ Europeans) and narrowed or even closed the ethnic divide. For example, unemployment-related benefit dependency for Pasifika men, who were 2.4 percentage less likely to be receiving benefits compared to NZ European men pre-COVID, became 0.7 percentage points more likely during COVID - a change of +3.1 percentage points.

4.2 Job and wage mobility

The second set of estimation results is focussed on the population of individuals who were employed 12 months ago and employed currently.

Wage progression and low-pay risk

We start by examining wage progression (based on percentage change in W&S for those who were employed 12 months ago as well as currently). Table 7Table 7 shows that during the pre-COVID period of 2017-2019, the annual wage growth for Pasifika men was on average, 5.4 percent lower than for NZ European men. During COVID, this ethnic divide remained at a similar level (5.0 percent). We also find that Pasifika men have a significantly higher likelihood of being in low-pay employment in both the pre-COVID and COVID periods compared to NZ European men.

Again, the patterns are different for Pasifika women. Pre-COVID, there appears to be similar average wage progression for employed Pasifika women relative to their NZ European counterparts. During COVID, average wage growth for Pasifika women dropped relative to NZ European women, with a decline of 0.6 percentage points. We also find that employed

Pasifika women were less likely to be in low-pay employment than NZ European women in both the pre-COVID and COVID periods.

Table 7 Regression results for job and wage mobility outcomes

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Wage progression (in percent)					
-0.054***	-0.050***	0.004**	0.001	-0.005***	-0.006***
(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Low-pay risk (when already employed) (in percentage points)					
0.032***	0.034***	0.003*	-0.043***	-0.042***	0.001
(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Job stability (in percentage points)					
-0.008***	-0.003*	0.005**	-0.028***	-0.019***	0.008***
(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Industry stability (in percentage points)					
-0.004**	-0.006***	-0.003	0.015***	0.009***	-0.006***
(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

Job and industry stability

In terms of remaining in the same job or same industry for those who were employed 12 months ago and currently, the effect sizes for men as shown in Table 7 are economically small. For instance, while Pasifika men were less likely compared to NZ European men to remain in the same job over an annual time frame, the differences were -0.8 and -0.3 percentage points in the pre-COVID and COVID periods respectively. Similarly small ethnic differences were found for industry stability.

There were greater ethnic differences found for women. Pasifika women, relative to NZ European women, were 2.8 percentage points less likely to be in the same job over an annual time frame pre-COVID; and this gap reduced to 1.9 percentage points during COVID.

4.3 Job separation

Our final set of estimation results is focussed on those employed 12 months ago and their likelihood of not being employed currently. For those who do become non-employed, we also examine their likelihood of receiving both any benefit and unemployment-related benefits.

Table 8 shows that during the pre-COVID period, Pasifika men (relative to NZ European men) were 0.7 percentage points more likely to move from employment to non-employment over a 12-month time frame. This ethnic difference is small and remained relatively stable at 0.6 percentage points more likely in the COVID period. Therefore, these results indicate that for employed Pasifika men, there was no impact of COVID on their likelihood of exiting the labour market relative to employed NZ European men.

Compared to NZ European women, Pasifika women were 0.8 percentage points less likely to exit the labour market pre-COVID; and this remained at a similar level during COVID (1 percentage points less likely).

For those who become non-employed, COVID increased the likelihood of benefit recipiency for Pasifika relative to NZ Europeans, irrespective of gender. It is, however, worth noting that the effect sizes are small concerning unemployment-related benefits (only 0.3 and 0.2 percentage points more likely for Pasifika men and women, respectively).

Table 8 Regression results for job separation outcomes

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Job separation (in percentage points)					
0.007***	0.006***	-0.001	-0.008***	-0.010***	-0.001
(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Any benefit recipiency (in percentage points)					
0.001	0.008***	0.008***	0.009***	0.016***	0.007***
(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment-related benefit recipiency (in percentage points)					
0.000	0.003***	0.003***	0.001**	0.003***	0.002***
(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

4.4 Sub-population analysis

By design of the econometric model, it is assumed that the impact of COVID restrictions caused a uniform economic shock. However, this may not entirely reflect reality as particular cohorts, skill groups, regions, and years may have been impacted more than others. For this reason, we re-run our regression models and restrict our sample according to the following five dimensions:

1. Below the age of 30 to assess the impact for young people.
2. Above the age of 50 to assess the impact for older people.
3. Individuals without school qualifications to assess the impact on low-educated individuals.
4. Individuals living in Auckland to assess the regional impact.
5. Excluding the year 2020 to exclude the year where government COVID-19 support was most provided.

We present the effect of our sub-sample analysis for selected outcome variables – wage scarring and wage progression.

Wage scarring

Table 9 illustrates the estimated ethnic differences pre-COVID, during COVID and the COVID change in terms of wage scarring. The top row in Table 9Table 9 refers to the wage scarring effect for the entire sample by gender (as was reported in Table 6). Our sub-population analysis shows that the impact of the COVID restrictions was particularly strong for Pasifika below the age of 30, those living in Auckland, and women. For example, Pasifika men below 30 earned, on average, 2.7 percent lower wages when entering employment pre-pandemic—this gap increased by almost 11 percentage points during COVID. For Pasifika women below the age of 30, pre-pandemic they were receiving higher wages on labour market entry following non-employment, relative to NZ European women below the age of 30. However, this positive relationship of higher job-entry wages reversed during the pandemic, leading to a difference of, on average, -10.6 percent lower wages when entering employment compared to NZ European women.

We also observe large COVID impacts when restricting our population to individuals living in Auckland or when only considering the year 2021 for the pandemic. However, the latter is only significant for Pasifika women.

Table 9 Regression results for wage scarring (in percent) for sub-population samples

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Full population sample (see Table 6)					
-0.225* **	-0.250***	-0.024*	0.019*	-0.051***	-0.070***
(0.010)	(0.012)	(0.014)	(0.010)	(0.012)	(0.013)
Below the age of 30					
-0.027*	-0.135***	-0.108***	0.050***	-0.106***	-0.157***
(0.015)	(0.016)	(0.019)	(0.015)	(0.017)	(0.02)
50 years and above					
-0.385* **	-0.371***	0.014	0.019	-0.013	-0.031
(0.026)	(0.029)	(0.035)	(0.026)	(0.03)	(0.035)
No qualification					
-0.110* **	-0.122***	-0.012	0.213***	0.173***	-0.039
(0.022)	(0.024)	(0.027)	(0.024)	(0.029)	(0.03)
Auckland					
-0.272* **	-0.316***	-0.045**	-0.024*	-0.134***	-0.110***
(0.015)	(0.016)	(0.019)	(0.014)	(0.016)	(0.019)
Only considering 2021					
-0.224* **	-0.244***	-0.019	0.027***	-0.057***	-0.084***
(0.011)	(0.015)	(0.017)	(0.01)	(0.015)	(0.017)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

Wage progression

We extend our sub-population analysis to wage progression for Pasifika and NZ European for those employed 12 months prior, and those currently employed (see Table 10). The first noteworthy finding is that for men, the ethnic divide in the form of lower-wage progression for Pasifika compared to NZ European is observable for each sub-population. However, we do not find for any of the five sub-populations an economically significant impact of COVID. Often the effect size is small or statistically insignificant.

For women, the largest COVID impact is found for Pasifika below the age of 30. They face a 2.3 percent lower wage progression than NZ European women pre-COVID and this ethnic difference increases by 1.5 percentage points during COVID.

Table 10 Regression results for wage progression (in percent) for sub-population samples

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Full population sample (see Table 7)					
-0.054* **	-0.050***	0.004**	0.001	-0.005***	-0.006***
(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Below the age of 30					
-0.059* **	-0.050***	0.008*	-0.023***	-0.038***	-0.015***
(0.004)	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)
50 years and above					
-0.045* **	-0.045***	0.000	0.012***	0.010***	-0.001
(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)
No qualification					
-0.032* **	-0.029***	0.004	0.027***	0.025***	-0.003
(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Auckland					
-0.065* **	-0.057***	0.008***	-0.009***	-0.011***	-0.001
(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Only considering 2021					
-0.054* **	-0.046***	0.008***	-0.001	-0.018***	-0.017***
(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

4.5 Young and living in Auckland in 2021

Table 9 and Table 10 indicate that COVID had a particularly strong impact on young individuals below age 30, those living in Auckland, and in 2021. We therefore create a subset sample to include only individuals with these demographics and re-run our regressions for all outcomes of interest. All results that follow in this sub-section refer only to individuals below the age of 30, living in Auckland, and where we restrict the COVID time period to just 2021.

Job accession

Table 11 shows no significant difference in the likelihood of moving from non-employment into employment over an annual timeframe pre-COVID for Pasifika men and women in this sub-sample. While we do not see changes for men during COVID, we observe a substantial drop of 5.5 percentage points for Pasifika women in terms of their likelihood of job entry relative to NZ European women. Recall, that in this subsample, COVID is restricted to the year 2021.

When entering employment, we see wage scarring impacts for Pasifika men who earned lower wages when entering employment before the pandemic, relative to their NZ European counterparts in this sub-sample (and no significant ethnic difference for Pasifika women). During COVID, the ethnic gap substantially widens for both Pasifika men and women. During COVID, Pasifika women had 22.8 lower wages when entering employment compared to NZ European women. This wage scarring pattern is mirrored by a substantially larger risk of entering employment in the low-pay sector.

We also find that non-employed Pasifika men and women in this sub-sample were less likely to have benefit dependency over an annual timeframe compared to NZ Europeans during the pre-pandemic period. However, this relationship flipped substantively, with young Pasifika in Auckland finding themselves much more likely to stay on a benefit during 2021.

Table 11 Regression results for job accession outcome variables (below 30, Auckland, 2021 sample)

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Labour market entry (in percentage points)					
0.005	0.001	-0.004	-0.001	-0.056***	-0.055***
(0.009)	(0.009)	(0.011)	(0.007)	(0.009)	(0.010)
Wage scarring (in percent)					
-0.053**	-0.198***	-0.145***	0.019	-0.228***	-0.247***
(0.021)	(0.029)	(0.035)	(0.023)	(0.030)	(0.036)
Low-pay risk when entering employment (in percentage points)					
0.068***	0.149***	0.080***	-0.019	0.149***	0.168***
(0.010)	(0.015)	(0.018)	(0.013)	(0.017)	(0.021)
Any benefit dependence (in percentage points)					
-0.041***	0.051***	0.092***	-0.024***	0.070***	0.095***
(0.013)	(0.014)	(0.017)	(0.009)	(0.011)	(0.013)
Unemployment-related benefit dependence (in percentage points)					
-0.055	0.079**	0.134***	-0.091**	0.103**	0.194***
(0.038)	(0.034)	(0.045)	(0.039)	(0.04)	(0.052)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

Job and wage mobility

Table 12 shows the wage progression and job mobility for employed young Aucklanders. We see wages for Pasifika men in this sub-sample grew, on average, 7 percent slower than NZ European men pre-pandemic. The ethnic divide declined during COVID to a 5 percent difference in wage progression.

For Pasifika women in this sub-sample, we observe that the wage growth rate was 4.1 percent lower relative to NZ European women pre-pandemic; and this gap further increased by, on average, 3.7 percentage points during 2021. This was compounded by the increased risk of working on low pay.

Table 12 Regression results for job and wage mobility outcome variables (below 30, Auckland, 2021 sample)

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Wage progression (in percent)					
-0.070***	-0.053***	0.017**	-0.041***	-0.078***	-0.037***
(0.005)	(0.007)	(0.008)	(0.007)	(0.009)	(0.01)
Low-pay risk (when already employed) (in percentage points)					
0.066***	0.077***	0.011	-0.011**	0.026***	0.037***
(0.006)	(0.006)	(0.007)	(0.005)	(0.006)	(0.007)
Job stability (in percentage points)					
0.006	0.028***	0.022**	-0.047***	-0.031***	0.016
(0.007)	(0.008)	(0.01)	(0.008)	(0.009)	(0.011)
Industry stability (in percentage points)					
-0.024***	-0.024***	0.000	0.039***	0.011*	-0.028***
(0.006)	(0.006)	(0.008)	(0.007)	(0.007)	(0.009)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

Job separation

The results regarding the likelihood of moving from employment to non-employment over a 12-month timeframe for our sub-sample are similar to the aggregate results shown in Table 8. There were minor ethnic differences in job separation rates between Pasifika and NZ European men with no changes during COVID. For Pasifika women, relative to NZ European women, they were less likely to experience job separation in both the pre-COVID period and 2021.

For individuals in this sub-sample who became non-employed, both Pasifika men and women were more likely to receive benefits during 2021, with these effects particularly pronounced for Pasifika women.

Table 13 Regression results for job separation outcome variables (below 30, Auckland, 2021 sample)

Men			Women		
Pre-COVID (2017-19)	COVID (2020-21)	COVID Change	Pre-COVID (2017-19)	COVID (2020-21)	COVID Change
(I)	(II)	(III)	(IV)	(V)	(VI)
Job separation (in percentage points)					
-0.003	0.000	0.002	-0.025***	-0.037***	-0.012
(0.004)	(0.005)	(0.006)	(0.006)	(0.006)	(0.008)
Any benefit recipiency (in percentage points)					
-0.005**	0.020***	0.024***	0.019***	0.051***	0.032***
(0.002)	(0.004)	(0.004)	(0.003)	(0.005)	(0.006)
Unemployment-related benefit recipiency (in percentage points)					
-0.001	0.006***	0.007***	-0.002	0.008***	0.009***
(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variables defined in Table 5, and explanatory variables detailed in Table A 2 in the Appendix. Numbers in parenthesis are standard errors clustered at the individual level. *, **, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

5 Employer characteristics

5.1 Industry

Our study analyses how labour market-related ethnic disparities between NZ European and Pasifika changed between the pre-pandemic period 2017-19 and the COVID period 2020-21. The findings indicate significant ethnic differences during the pre-pandemic period, especially concerning earnings for those entering new employment and wage progression for those already in employment. Further, the results indicate that the existing disparities were further exacerbated during the COVID period for some sub-populations.

One potential explanation why Pasifika were more affected by the COVID period is that they worked in industries that were strongly hit during the pandemic. In the first two columns of Table 14, we present where Pasifika workers are concentrated by industry. We have highlighted the industries with the greatest proportion of Pasifika, specifically those with at least 5 percent of the Pasifika workforce employed in the respective sector. As detailed in Section 3.4 and as shown in Table 14, Pasifika men are most prevalent in manufacturing and construction, and Pasifika women are most concentrated in manufacturing and healthcare and social assistance.

In this subsection, we move away from measuring labour market outcomes for NZ European and Pasifika and turn to an employer-level perspective. We are particularly interested in the industry-specific wage evolution and the impact of the pandemic. To quantify which industries were potentially more affected by the pandemic, we employ the following identification strategy:

$$y_{it} = \beta_1 I_i + \beta_2 COVID_t + \beta_3 I_i \times COVID_t + X'_{it}\gamma + u_{it} \qquad (2)$$

with subscript i referring to employer $i = 1, \dots, N$ and t to the time-point, spanning January 2017 to June 2021. We again note that the IR-EMS dataset contains the universe of monthly wages and salaries paid to all employees in New Zealand, including a unique employer identifier. We use this identifier to create the mean monthly wages an employer pays to their employees, which serves as our outcome variable. Further, we do not use the employee's characteristics (e.g., ethnicity) to restrict our pool of employers.

- Our outcome variable y_{it} measures an employer's mean monthly wage.
- I_i is a time-invariant measure of an employer's industry. It is a categorical variable with Agriculture, Forestry and Fishing as the reference industry—this means we estimate how an employer's mean monthly wages evolve compared to our reference industry.
- Similarly, as in section 3.5, $COVID_t$ is a binary indicator for the pandemic period.
- The interaction effect $I_i \times COVID_t$ is designed to help identify how the pandemic affects different industries relative to the reference group.

- X'_{it} denotes further explanatory variables such as am indicator whether the employer is based in Auckland, number of employees, firm age, month fixed effects.
- u_{it} is the idiosyncratic shock. Standard errors are clustered at the employer level.

Table 14 Regression results for employer's mean wage

	Pasifika		New Zealand		Auckland	
Industry	Men	Women	Coeff	Std Err	Coeff	Std Err
Agriculture, Forestry and Fishing	0.030	0.017	*Reference industry*			
Mining	0.002	0.000	-0.064***	(0.018)		
Manufacturing	0.269	0.133	-0.024***	(0.004)	-0.038**	(0.016)
Electricity, Gas, Water and Waste Service	0.011	0.006	-0.042***	(0.014)	-0.071**	(0.029)
Construction	0.138	0.016	-0.027***	(0.003)	-0.037**	(0.016)
Wholesale Trade	0.090	0.052	-0.026***	(0.005)	-0.030*	(0.016)
Retail Trade	0.059	0.095	0.001	(0.004)	-0.009	(0.017)
Accommodation and Food Services	0.021	0.072	0.025***	(0.004)	0.006	(0.017)
Transport, Postal and Warehousing	0.102	0.066	-0.016***	(0.006)	-0.04**	(0.019)
Information Media and Telecommunications	0.008	0.015	0.001	(0.014)	-0.032	(0.024)
Financial and Insurance Services	0.016	0.043	0.011	(0.010)	0.008	(0.022)
Rental, Hiring and Real Estate Services	0.013	0.011	0.010	(0.007)	-0.008	(0.02)
Professional, Scientific and Technical Services	0.029	0.043	-0.012***	(0.005)	-0.014	(0.017)
Administrative and Support Services	0.070	0.098	-0.045***	(0.008)	-0.076***	(0.02)
Public Administration and Safety	0.068	0.072	-0.021	(0.013)	-0.078**	(0.032)
Education and Training	0.015	0.058	-0.007	(0.008)	-0.021	(0.020)
Health Care and Social Assistance	0.025	0.161	0.002	(0.005)	0.008	(0.017)
Arts and Recreation Services	0.010	0.013	-0.020**	(0.009)	-0.041*	(0.024)
Other Services	0.026	0.028	-0.009**	(0.004)	-0.026	(0.017)

Source: IR-EMS data in the IDI, and authors compilation.

Notes: Outcome variable is the employer's mean monthly wage. Other explanatory variables included are whether the employer is based in Auckland, number of employees, firm age, month fixed effects. Numbers in parenthesis are standard errors clustered at the employer level. *,**, and *** signify statistical significance at the 10%, 5%, and 1% level respectively.

Table 14 shows that there is a positive relationship between the industries that experienced significantly lower wage growth due to COVID (relative to the reference industry of agriculture) and the industries where Pasifika are more prevalent in the workforce. After discounting small industries like Mining and Utilities (which include Electricity, Gas, Water and Waste Service); we see substantial impacts on wage growth in Manufacturing; Construction; Wholesale Trade; Accommodation and food services; Transport; and Administrative Services

(relative to agriculture). For example, wage growth was 2.4 per cent lower during the pandemic for the Manufacturing sector compared to the Agriculture sector. More than a quarter of Pasifika men and just over 13 percent of Pasifika women are in this sector.

Several sectors show amplified effects on wage growth when the sample is trimmed to employers in Auckland, which included Manufacturing, Construction, Administrative Services, and Public Administration and Safety. These sectors are those in which Pasifika men and women are predominantly employed. For example, the Administrative Services industry (a sector with 7 percent and close to 10 percent of the Pasifika male and female workers respectively) saw a 4.5 percent drop in wage growth across New Zealand (relative to the Agriculture sector). When we focus the analysis on Auckland, this becomes a 7.8 percent drop in wage growth.

5.2 COVID-19 Wage Subsidy Scheme

The lockdowns caused severe economic disruptions and limited the possibility for many businesses to operate as usual. To protect businesses and to support employers to keep paying their staff, the government introduced the COVID-19 Wage Subsidy Scheme (CWS). The CWS was designed as lump-sum payments to the employer. Thus we cannot identify actual payments made from the employer (who received the subsidy) to the employee – only whether the employee was working in a firm that received CWS. Our analysis focuses on the period April-September 2020, when the CWS played a significant role.

We are interested in understanding how the wage subsidy scheme affected wage scarring (for individuals who were non-employed one year prior) and wage progression (employed individuals one year prior).

Our sample is the pool of NZ Europeans and Pasifika we used in our primary analysis who are employed in the period April-September 2020. We adjust the regression model described in Section 3.5 to account for CWS impacts:

$$y_{it} = \beta_1 P_i + \beta_2 CWS_t + \beta_3 P_i \times CWS_t + X'_{it}\gamma + E'_{i(t-12)}\delta + u_{it} \qquad (3)$$

We measure wage level exclusively for 2020, and therefore drop our binary $COVID_t$ indicator. We introduce a new binary indicator CWS_t, which takes the value of 1 if the employer received the CWS and 0 otherwise. The coefficient β_2 measures the extent of how wage scarring and wage progression differs between CWS-receiving firms and firms that did not receive the CWS. The interaction effect between the Pasifika-indicator P_i and CWS_t explains whether the impact of CWS is uniform across our sample (i.e. no ethnic differences).

The covariates X'_{it} and $E'_{i(t-12)}$ are the same as those used in our primary analysis (see Table A 2 and Table A 3 for details). We investigate the wage-subsidy effect for the entire population, as well as for the following sub-populations: aged below 30, 50 years and above, having no qualification, and living in Auckland.

Table 15 illustrates the general impact of the wage-subsidy scheme on wage scarring and wage progression. Regardless of whether we view results for the entire population sample or sub-population, there was a sizable impact on both wage scarring and wage progression across all workers in firms that received a CWS versus firms that did not. The results are not differentiated by ethnicity, and therefore the pooled population of workers includes both NZ European and Pasifika. For example, we find that men who are non-employed in 2019 and entering a firm receiving the CWS in 2020 received 13.7 percent lower wages than if entering a firm not receiving the CWS. For women, this is 15.2 percent lower. It also needs to be remembered that Pasifika experience, on average, substantially lower job-entry wages and wages progression when employed. In Equation 3, we also account for ethnic disparities (β_1) and the estimated coefficients (available upon requests) are close to what we show in Table 9 and 10.[5] This means that Pasifika men receive, on average, a 39.8 percent ($\beta_1 = -0.248 + \beta_2 = -0.137 + \beta_3 = -0.013$) lower job-entry wage when starting employment in a firm that receives wage subsidy compared to NZ European men starting employment in a firm that does not receive CWS. For Pasifika women, the corresponding number are 20.4 percent ($\beta_1 = -0.054 + \beta_2 = -0.152 + \beta_3 = 0.002$).

[5] Our regression models also account for ethnic differences in the effect of CWS on wage scarring and wage progression, denoted in Equation (3) with β_3. However, effects (not shown here but available on request) are minor and, in most cases, not statistically significant, indicating that the wage subsidy scheme did not further amplify wage disparities between Pasifika and NZ European.

Table 15 Regression results for wage effects (in percent) for CWS firms

Wage scarring		Wage progression	
Men	Women	Men	Women
(I)	(II)	(III)	(IV)
Full population sample			
-0.137***	-0.152***	-0.078***	-0.067***
(0.011)	(0.011)	(0.001)	(0.001)
Below the age of 30			
-0.122***	-0.223***	-0.076***	-0.07***
(0.019)	(0.021)	(0.003)	(0.005)
50 years and above			
-0.118***	-0.141***	-0.073***	-0.065***
(0.020)	(0.021)	(0.002)	(0.002)
No qualification			
-0.068***	-0.084***	-0.066***	-0.057***
(0.025)	(0.028)	(0.002)	(0.003)
Auckland			
-0.207***	-0.220***	-0.087***	-0.089***
(0.020)	(0.025)	(0.002)	(0.003)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variable is job-entry wage of men/women non-employed in April-September 2019 (columns I-II) and employed in April-September 2020 (columns III-IV). The regression model includes explanatory variables detailed in Table A 2 and Table A 3 in the Appendix, and a binary identifier of whether the employer received CWS. Numbers in parenthesis are standard errors clustered at the individual level. *,**, and *** signify statistical significance at the 10%, 5%, and 1% level respectively

These findings are to be expected as firms that received the CWS were only those that experienced at least a 30 percent drop in revenue compared to the same month in the previous year. Therefore, it is unsurprising that these firms experienced greater wage scarring for any new employees, as well as poorer wage progression for current workers, relative to firms not eligible for the CWS. Also evident in Table 15 is that the impacts on wage scarring and wage progression are larger for individuals in Auckland. Again, this is potentially expected as Auckland experienced a longer lockdown period in 2020 relative to other parts of the country.

Finally, we check the distribution of Pasifika and NZ European working in a wage-subsidized firm. Table 16 shows for all employed between April and September 2020 the respective share of workers at firms that receive wage subsidy. For both gender, we do not find much differences between the ethnicity, even after breaking it down by sub-populations. However, when we focus on non-employed individuals in 2019 who enter employment in 2020, we see that Pasifika men are much more often in a firm that receives wage subsidy compared to NZ European (numbers in parenthesis). For the full population, the difference is 5.6 percentage points, and this difference is persistent across the sub-population.

Table 16: Share of employees working in a firm that received CWS

Men		Women	
NZ European	Pasifika	NZ European	Pasifika
(I)	(II)	(III)	(IV)
Full population sample			
0.442	0.457	0.408	0.399
(0.487)	(0.543)	(0.446)	(0.458)
Below the age of 30			
0.475	0.488	0.445	0.433
(0.488)	(0.548)	(0.448)	(0.472)
50 years and above			
0.423	0.437	0.393	0.391
(0.473)	(0.521)	(0.443)	(0.458)
No qualification			
0.455	0.482	0.432	0.441
(0.504)	(0.554)	(0.473)	(0.494)
Auckland			
0.493	0.479	0.455	0.414
(0.537)	(0.578)	(0.496)	(0.483)

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in Section 3.2.

Notes: Outcome variable is share of men employed in CWS-receiving firms in April-September 2019 (columns I-II) and similarly for women (columns III-IV).

All of the above information helps explain the greater impacts found for Pasifika over the COVID period – in that they are regionally concentrated in Auckland, and firms in Auckland were more likely to receive the CWS. Furthermore, firms that received the CWS were more affected (relative to firms not receiving the CWS), impacting wage scarring for individuals entering the firm and wage progression for individuals already employed.

6 Conclusion

The outbreak of COVID marks a once-in-a-century event, which caused governments around the globe to take drastic actions to secure public health. New Zealand went into a strict lockdown in late March 2020. The economic turbulence created by this policy direction has fuelled discussion and debate on how and to what extent different communities of interest have been affected by the pandemic response. Pasifika is a particular population that experienced higher unemployment and, on average, lower wages already in the pre-pandemic period. To the best of our knowledge, this is the first study that aims to quantify the labour market impact of the COVID period on the Pasifika workforce.

To study a minority population empirically can be challenging in several aspects. First, the database needs sufficient power to identify the group and ensure representative findings. Second, we require timely and detailed data on earnings to adequately track the individual's labour market outcome. For this reason, we use Stats NZ Integrated Data Infrastructure (IDI). The IDI is a large research database holding microdata about people and households and sourced from government agencies, Stats NZ surveys, and non-government organisations (NGOs). We use the 2018 Census with a population-wide coverage of individuals to create our population spine of Pasifika, with NZ European as the reference population. The Inland Revenue research database has monthly information on earnings, which can be matched with our spine to generate our labour market outcome variables. We use Census information and data contributed by other datasets (e.g., address notification dataset) to determine a comprehensive background for the individuals in our sample. Additional IDI information ensures that the person is physically present in New Zealand, non-deceased, not studying, not receiving paid-parental leave, and not self-employed.

Our empirical model estimates labour market disparities between Pasifika and NZ European before the pandemic (defined as the period 2017-19) and how COVID affected this relationship (defined as the period 2020-21). We assess a range of labour-market-related outcomes under three domains: job accession and benefit dependency; job and wage mobility; and job separation.

Three key findings are evident from the empirical analysis:

- There are significant pre-pandemic ethnic disparities between NZ European and Pasifika in the labour market. These are primarily observable in job-entry wages following a period of non-employment (i.e. wage scarring); and wage progression of the employed.
- The pandemic amplified ethnic disparities for some sub-populations. Of note was the impact on the following Pasifika sub-populations: women; those below age 30, and Auckland residents. We also find greater labour market impacts on estimated ethnic disparities in 2021 relative to 2020.

- The COVID time period had a substantial impact on young Pasifika living in Auckland for 2021 by exacerbating the wage scarring effect and increasing benefit dependency.

To investigate possible reasons behind the COVID effects, we link IDI data with employer level information in the Longitudinal Business Database (LBD) and assess the role of employer characteristics in the Pasifika workforce.

Two further findings emerge:

- The industries hit the hardest during COVID (in terms of lower wage growth) positively correlate with where Pasifika are more prevalent in the workforce. For Pasifika men, this is manufacturing and construction, and for Pasifika women - manufacturing and healthcare and social assistance.
- In line with the prevalence of Pasifika in industries strongly affected by COVID and their geographical concentration in Auckland, Pasifika were also found to be more likely to work in firms receiving the COVID wage subsidy in 2020. Furthermore, there was a sizable impact on both wage scarring and wage progression across all workers at firms that received a COVID wage subsidy versus not.

In conclusion, it is imperative to repeat that irrespective of the impact found of COVID on Pasifika labour market outcomes, relative to NZ Europeans, there were sizable ethnic disparities pre-COVID on a number of fronts. These were also evident after accounting for a range of individual and employer level characteristics. Therefore, policy needs not just to tackle recent COVID-related changes but also to be long-term focused on addressing the entrenched disparities evident pre-COVID.

There are also several future research directions possible. This study's focus is on the individual's labour market outcome. One possible future research avenue could be to widen the angle by looking at household level effects. As shown in Table 2, the household structure is, on average, very different between Pasifika and NZ European, including a higher average number of individuals living in the household and lower annual household income for the former.

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Appendix

Table A.1: W&S of 20-64-year-olds pre-COVID (2017-2019)

	Men		Women	
	NZ European	Pasifika	NZ European	Pasifika
W&S by qualification level (in $NZD)				
No Qualification	5,102	4,645	3,258	3,575
Level 1-4 Certificate	5,914	4,906	4,062	3,993
Level 5/6 Diploma	5,449	4,742	3,604	3,707
Bachelor's degree and Level 7 Qualification	5,564	4,853	3,587	3,746
Post-graduate	6,255	5,378	3,899	3,941
By industry (in $NZD)				
Agriculture, Forestry and Fishing	5,021	3,164	4,139	3,208
Mining	7,895	5,383	7,012	5,823
Manufacturing	5,987	4,278	5,068	4,245
Electricity, Gas, Water and Waste Service	6,661	4,987	5,446	4,554
Construction	5,821	4,181	5,245	4,369
Wholesale Trade	6,343	4,578	4,823	4,260
Retail Trade	4,815	3,237	4,370	3,342
Accommodation and Food Services	3,954	2,749	3,619	3,008
Transport, Postal and Warehousing	6,103	4,420	5,132	4,394
Information Media and Telecommunications	7,248	5,327	5,404	4,411
Financial and Insurance Services	7,936	5,553	5,815	5,232
Rental, Hiring and Real Estate Services	5,759	4,124	4,668	4,284
Professional, Scientific and Technical S	7,257	4,704	5,377	4,396
Administrative and Support Services	4,735	3,700	3,569	3,056
Public Administration and Safety	6,382	5,175	5,409	4,902
Education and Training	4,412	2,788	3,569	2,779
Health Care and Social Assistance	4,322	3,413	4,501	3,786
Arts and Recreation Services	4,940	3,563	4,739	3,526
Other Services	5,158	3,253	4,258	3,214
By occupation (only March 2018, in $NZD)[a]				
Manager	7,026	5,259	5,895	5,062
Professionals	6,901	4,843	5,502	4,419
Technicians and Trade Workers	5,371	3,259	4,933	3,542
Community and Personal Service Workers	5,247	2,897	4,688	3,293
Clerical and Administrative Workers	5,564	3,902	4,932	4,143
Sales Worker	4,905	3,191	4,201	3,401
Machinery Operators and Drivers	5,181	3,363	4,576	3,731
Labourers	4,273	2,463	4,166	3,118

Source: 2018 Census linked with IR-EMS data in the IDI, and authors compilation. Population exclusions as described in section 3.2. *Notes:* The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old in the period January 2017 until December 2019.

[a] Information on occupation taken from 2018 Census; W&S taken from IR-EMS and only refer to March 2018.

Table A 2: Individual-level explanatory variables

Control variables	Description
Age	Categorical : 20-24 (reference category), 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60-64
Region	Categorical: Northland (reference category), Auckland Region, Waikato Region, Bay of Plenty Region, Gisborne Region, Hawke's Bay Region, Taranaki Region, Manawatu-Wanganui Region, Wellington Region, West Coast Region, Canterbury Region, Otago Region, Southland Region, Tasman Region, Nelson Region, Marlborough Region
Qualifications	Categorical: No qualification (reference category), Level 1-4 Certificate, Level 5/6 Diploma, Bachelor Degree and Level 7 Qualification, Post-graduate
Disability status	Binary: No disability (reference category), disability.
Smoking status	Categorical: Never smoked (reference category), Ex-Smoker, Never Smoked Regularly
Marital status	Binary: non-partnered (reference category), partnered (includes married, in a civil union, or in a *de facto* relationship)
Month-fixed effects	Effects that are common to all individuals in a specific month.

Source: 2018 Census linked with IR-EMS data in the IDI, longitudinal business data (LBD) linked to the IR-EMS data, and authors compilation. Population exclusions as described in Section 3.2.

Notes: The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old in the period January 2017 until June 2021.

Table A 3: Labour-market related explanatory variables

Control variables	Description
Employment-related characteristics	Individual's level of wages & salaries in log unit (12 months prior)
Industry	Categorical: Agriculture, Forestry and Fishing (reference category), Mining, Manufacturing, Electricity, Gas, Water and Waste Service, Construction, Wholesale Trade, Retail Trade, Accommodation and Food Services, Transport, Postal and Warehousing, Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Administrative and Support Services, Public Administration and Safety, Education and Training, Health Care and Social Assistance, Arts and Recreation Services, Other Services – based on employment status 12 months prior.
Firm age	Age of firm in years (continuous)
Firm size	Total number of employees in a firm (continuous)
Firm pay decile	Firm level's decile for average wages and salaries paid

Source: 2018 Census linked with IR-EMS data in the IDI, longitudinal business data (LBD) linked to the IR-EMS data, and authors compilation. Population exclusions as described in Section 3.2.

Notes: The sample consists of Pasifika and NZ European men and women between 20 and 64 (inclusive) years old in the period January 2017 until June 2021. Labour-market related explanatory variables are only included in the regression model if the person was employed twelve months prior.