



**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
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Low pay in NZ



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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. The opinions, findings, recommendations, and conclusions expressed in this paper are those of the authors, not Statistics NZ, or MBIE.

The results are based in part on tax data supplied by Inland Revenue to Statistics 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 Statistics 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.

Acknowledgements

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Executive summary

The public debate on inequality within a society has intensified in recent years, including discussions on the makeup and size of the low pay sector. This study contributes to this topic by investigating the prevalence and characteristics of the low paid workforce in New Zealand and highlights changes in their attributes for the timeframe 2006 to 2015.

We employ data from Statistics New Zealand's Integrated Data Infrastructure (IDI) and focus on addressing the following four questions:

- How can we define low pay in NZ?
- What is the prevalence of low pay workers over the specified timeframe?
- What are the individual and job characteristics of these workers? And have these characteristics changed over time?
- What are the labour market characteristics of these workers?

While we identify four possible definitions for low pay thresholds, we nominate two that suit this research context. The first is a stricter measure that follows the OECD definition and labels a wage being low if it is below 2/3 of the median wage. The alternative threshold is a wage below 120 percent of the respective annual adult minimum wage is defined.

We find that between 2006 and 2015, the trend in low pay prevalence depends on the definition adopted. Based on the OECD definition, the proportion of workers falling below this threshold fell from 12.3% to 11.1%. Whereas according the minimum wage related definition, the proportion increased from 17.9% to 24.9%.

In general, regardless of the definition employed, we find that low pay is correlated with being female, working part-time, aged 20-29 years or over 65 years, holding low level of educational attainment, and being non-European. Furthermore, data reveal that labourers, community and personal service workers and sales dominate the low paid. There is also a noticeable variation across the country in terms of regional differences in low pay prevalence, with no indications of a strong correlation between prevalence and level of regional development.

We also analysed the Inland Revenue records for our low pay population to assess various indicators of labour market attachment. We found strong indications of low pay workers having a weak attachment to the labour market, relative to individuals earning close to the median wage. Based on a three year window surrounding their low pay status, these workers tended to have shorter employment spells, higher number of employers, higher likelihood of multiple job holding, higher propensity to receive a benefit and have longer benefit spells (all relative to the median worker). These findings provide a useful portrait of the low paid workforce in NZ in relation to both their employment and benefit receipt patterns, though the much more challenging question about the genuine effect of their low pay status on future outcomes remains as a tantalising direction for future research.

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MBIE commissioned the New Zealand Work Research Institute, Auckland University of Technology (NZWRI, AUT) to investigate the prevalence and characteristics of the low paid workforce in New Zealand, and to better understand the characteristics of their attachment to the labour market.

This research fills knowledge gaps and evidence around low paid workers, their transitions through work, and their changing employment status.

1. Introduction

The purpose of this research is exploratory in nature, aimed at better understanding the low pay sector within New Zealand (NZ), and the changing nature of this group in recent years. In particular, we focus on identifying who is low paid, to build a comprehensive portrait with regard to their individual, household, and job characteristics, over the period 2006 to 2015.

Better understanding of who makes up the low pay sector of NZ not only sheds some light on the topic of earnings distribution and how wages are spread across the workforce but is important for several reasons: it helps in capturing and monitoring which groups are potentially at higher risk of future unemployment, for whom being low pay is not just an intermediate labour market position, as well as who is more likely to be at risk of experiencing poverty and thus belonging to the group of 'working poor'.

In recent years, on the international front, there has been an upsurge of interest in the changing dynamics of the wage distribution, alongside growing concern regarding the rising levels of precariat and income inequality (e.g. IMF 2017, OECD 2015, Eurofound 2017). In fact, a common approach undertaken to measure inequality has been to derive the share of worker who earn less than some standardized benchmark and group them together under the label of 'low pay worker'.

Moreover, there are a number of international studies that argue low paid employment is synonymous with unemployment in terms of the level of risk of future unemployment spells. For example, based on UK data, Stewart (2007, p. 511) states that low wage employment has "almost as large an adverse effect as unemployment on future prospects". One possible theoretical explanation underlying such a finding is that because the labour market is characterized by incomplete information employers use signals like a person's level of education or past (un)employment experience to estimate the productivity of a worker. Thus, low paid employment might be evaluated negatively as it might indicate a low level of human capital. As Layard et al. (1991, p. 249) remarks "While unemployment is a bad signal, being in a low quality job may well be a worse one". Past research has also uncovered persistency in low pay employment, indicating that being low paid is often not just a transitional status (e.g. Clark & Kanellopoulos, 2013).

On the other hand, there is also evidence to suggest that episodes of low wage employment can be helpful especially for those unemployed with weak labour market attachment, like low skilled workers or those that are long term unemployed. For instance, Knabe & Plum (2013) and Mosthaf (2014) analysed the German labour market and both studies find evidence that especially low qualified workers profit from episodes of low wage employment as the risk of future non-employment is significantly reduced. Past research also indicates that the risk of becoming unemployed and poor may increase with the duration of unemployment and that

low paid employment is especially helpful to exit the ‘no-pay – poverty trap’ for persons who are long-term unemployed (e.g. Plum, 2016).

With the mixed international evidence in mind (as to the precarious nature of attachment to the labour market for the low paid), our analysis pays special attention to delving into the labour market characteristics for the low paid population in NZ. With the aid of linked administrative data, we are able to not only identify individuals as low paid in a particular year, but also follow their labour market experience in the years before and after that, using tax records for those individuals. These records permit construction of both employment and benefit reciprocity patterns, as well as details regarding job turnover or holding multiple jobs.

The format of this paper is as follows: The next section provides options for defining low pay; Section 3 details the data utilised from Statistics NZ; Section 4 then illustrates the descriptive profile of both low wage workers, as well as providing comparisons with workers earning the median wage; Section 5 focusses on the labour market characteristics that are derived from linking survey information with administrative tax records; and finally Section 6 signals key areas for future research in this space.

2. Defining low pay

This section sets out definitional issues emerging from a review of the literature¹. This resulted in the identification of four alternative methods for determining a low pay threshold² (see for example Bernstein & Gittleman, 2003; Lucifora et al, 2005; Boushey et al, 2007; Grimshaw, 2011).

2.1 Needs based

This method may also be termed a basic income (Boushey et al, 2007) or absolute wage approach (Grimshaw, 2011). In applying this method a poverty line is established, specified as the income necessary to purchase a minimal bundle of goods and services (by household type), and then this poverty line is converted into a low pay threshold using various assumptions regarding hours worked and household composition.

For example, Boushey et al (2007) begins by calculating the official U.S. poverty line for a family of four (two adults/two children). The assumption that one adult is a full-time year round worker in the household is then used to permit the household poverty threshold to be converted into an hourly threshold for being low paid. Another more recent example using this approach is by Fusaro & Schaffer (2016) who examine the effects of three separate low pay cut offs, defined by the amount of hourly earnings it would take for a full-time worker to lift his or her family above the federal poverty threshold (in the U.S.). This is done for (i) a family of two (one adult and one child); (ii) a family of three (one adult and two children); and (iii) a family of three up to 125 percent of the poverty threshold.

This type approach is household based and therefore not appropriate within the context of this study and its research objectives. It would also be difficult to follow a similar approach in NZ as we do not have an official poverty line analogous to the U.S. thresholds. We do however have an unofficial “living wage” (King and Waldegrave, 2012). This was calculated by the Family Centre Social Policy Research Unit in 2012 (and reviewed annually) as the hourly wage that is required for a two-adult family with two children (and 1.5 adults working) to participate in society and meet their basic costs³. Unfortunately, this wage threshold is only available for

¹ The literature review used a number of data bases including Google Scholar and Econlit and employed various combinations of the key words “low”, “pay”, “wage”, “review” and “definition”. Particular attention was paid to identifying previous reviews of low pay definitions and the search was largely restricted to internationally recognised journal articles and working papers.

² Other less common approaches include defining low waged workers as anyone earning less than Au\$500 a week or Au\$13.15 an hour (see McGuinness & Freebairn, 2007). A similar approach was adopted by Dunlop (2000 as cited in Buddlemeyer et al, 2010) who defined the low wage threshold as Au\$10 per hour in 1994 then indexed this to wage growth for succeeding periods.

³ An approach similar to this was taken by Clarke & D’Arcy (2016) who used as one of their low wage thresholds the London living wage.

the last three years of our ten-year timeframe under study, which would mean comparisons over time would not be possible.

Additionally, the NZ living wage has been subject to a number of criticisms (see Scott, 2013; Treasury, 2013) for a wide range of reasons including whether the definition of basic necessities used is appropriate, the consistency of the post-2013 indexing based on the quarterly employment survey, and the numeraire household used. It is the last of these issues that does render this type of threshold somewhat unwieldy for policy purposes.

2.2 Fixed proportion of earners

This approach defines a fixed proportion of the earnings distribution as low paid (e.g. the bottom 25 percent of employees) (Boushy et al, 2007; Grimshaw, 2011). In a similar vein Watson (2008) considers labour market churn and low pay in the Australian labour market focusing on those in the bottom 20 percent of the income distribution; while Cappellari (2000) adopted low wage cut points at the bottom 20 percent and 30 percent of the Italian income distribution.

The main disadvantage to using this approach is that it does not allow analysis of the changing prevalence of low paid work over time as the proportion of the population is fixed by definition.

2.3 Relative to the minimum wage

Another alternative trialled in the literature is benchmarking the threshold relative to the appropriate minimum wage. For instance, Fok et al (2015) investigate transitions between low paid employment and other labour market states in Australia and define low pay as receiving less than 120% of the hourly federal minimum wage. They also test the sensitivity of their analysis to employing a threshold of 150% of the minimum wage, and the OECD measure, which is described next.

This method lends itself to the NZ context, given the long history of minimum wage legislation in this country, and the close to universal coverage that operates in the labour market. Every worker aged 16 or over must be paid at least the relevant minimum wage, unless they hold an exemption permit – which usually applies to cases of employees with a disability that hinders their completion of job requirements.

2.4 OECD definition

The final approach that regularly appears in the literature is a refinement to options (b) and (c). It is based on calculating a proportion of the median (or mean) hourly wage. The choice between median and mean as a basis for the low pay threshold becomes more important when the income distribution is skewed to the right with the median being preferred as it better captures the centre of the income distribution (Stewart & Swaffield, 1999).

The actual proportion of the median wage chosen seems to be largely arbitrary with 2/3rds being adopted by a wide range of authors and agencies, including the OECD and European Union (Lucifora et al, 2005; Bosch, 2009)⁴. The main argument in favour of the 2/3 rule appears to be international comparability.

One potential disadvantage with this threshold is that due to a high minimum wage in NZ (relative to the median)⁵, using a measure of 2/3 of the median may result in a very thin slice at the bottom of the wage distribution. This may therefore not be an accurate representation of the low wage workforce, relative to other OECD counterparts, where the minimum wage sits some distance away from the median.

Low wage thresholds adopted

Based on the discussion presented above, we have adopted the following two measures in the analysis that follows:

OECD low pay – 2/3 of the median wage (based on all employees). This threshold gives our analysis useful international comparability, and while there is no set agreed upon definition across the literature, this measure appears to be most widely used.

120% MW low pay - Relative to the minimum wage we set this threshold at 120% of the adult minimum wage. This provides a useful alternative to the OECD definition, and is at a similar setting to that used by Fok et al (2015).

Nominal values for both thresholds are provided in Section 4 and Appendix Table A1.

⁴ While the 2/3 of median rule seems widely accepted other proportions of the median wage have also been used such as 60 % (Marlier & Ponthieux, 2000; Muñoz de Bustillo and Antón, 2007 as cited in Grimshaw (2011)).

⁵ See <http://www.mbie.govt.nz/publications-research/publications/employment-and-skills/Minimum-Wage-Review-report.pdf>

3. Data

As stated earlier, the primary objective of this paper is to explore characteristics of the low pay workforce in NZ. With this in mind, we make use of the Income Survey (IS) produced by Statistics NZ, which is an annual supplement to the quarterly Household Labour Force Survey (HLFS). The IS provides usual hourly wages for those who indicate they are employed in the HLFS, which can then be compared to our two low pay thresholds, to create our relevant populations of interest.

The HLFS and IS data are used as the spine in the forthcoming analysis, and then linked with tax data from the Inland Revenue (IR) – all within the Statistics NZ framework of the Integrated Data Infrastructure (IDI). The HLFS provides individual and household characteristics; while the IR provides labour market descriptives for the low pay populations derived from the IS.

Background context to data sources:

IDI = Integrated Data Infrastructure - large research database containing microdata about individuals and households in NZ. It includes both Statistics NZ surveys, as well as information from both government and non-government agencies. The IDI provides the HLFS, IS, and IR data used in this paper.

HLFS = Household Labour Force Survey - quarterly survey conducted by Statistics NZ providing a comprehensive portrayal of NZ's labour force. It began in 1986, but is available via the IDI since 2006. It provides a representative sample of approximately 15,000 households (30,000 individuals) with a target population of the civilian, usually resident, non-institutionalised aged 15 years and over.

IS = Income Survey - annual supplement to the HLFS, focussed on providing detailed income information. It has run in the June quarter since 1997, and is available in the IDI since 2006.

IR = Inland Revenue - this is based on information from the Employer Monthly Schedule, via Inland Revenue. This dataset includes individual monthly income information, disaggregated by source (wages and salary; withholding payments; benefits; student allowance; paid parental leave; pensions; and claimants compensation), and the associated source of those funds (e.g. encrypted employer IRD numbers when the source is wages and salary).

Population coverage:

Time period under investigation = 2006 to 2015.

We focus on individuals aged 20 and over. Youth below 20 are excluded as many of this group are studying as their main activity. Additionally, given the absence of an official retirement age and the increasing proportion of 65 plus people in the workforce we don't limit the upper age of those included. We also exclude the self-employed.

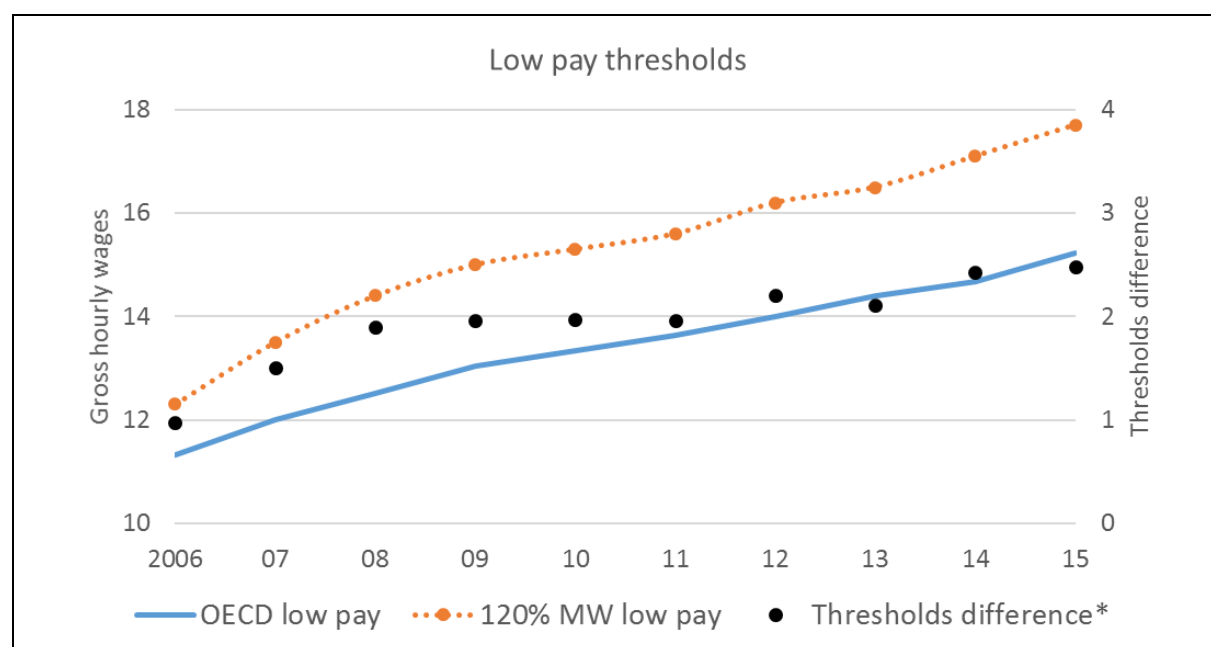
4. Who is low paid?

We next use the two low pay measures described at the end of Section 2 to present a picture of the prevalence (and characteristics) of the low paid workforce in NZ, and how both these aspects trend over the period 2006 to 2015. All results in this section are weighted using the replicate weights provided by Statistics NZ, to provide descriptives that are representative of the NZ population, as well as population estimates for the size of the low paid groups of interest.

4.1 Size of low pay population

Figure 1 below provides the two nominal low wage thresholds used in this research for the time period under study (2006 to 2015). Both measures start at a comparable level in 2006 (OECD low pay threshold = \$11.33; 120% MW low pay threshold = \$12.30). However, the gap between the thresholds gets more pronounced over time as shown by the black dots in Figure 1. The reason for the widening gap is that during the respective time frame the minimum wage rose at a faster rate than the median gross hourly wages did: between 2006 and 2015 the minimum wage increased in nominal terms by approximately 44 percent and the median wage increased by 34 percent.

Figure 1: Low pay thresholds



Notes: OECD low pay = 2/3 median wage; 120% MW low pay = 120% of adult minimum wage. All values provided in Appendix Table A1. Source of minimum wage rates is MBIE (2017). The effective date for minimum wage changes is 1 April annually, except for 2006 when it was 27 March. Minimum wage levels are based on the adult minimum. Source of median wages is Statistics NZ (2017). 'Thresholds difference' refers to the difference (in absolute \$ terms) between the 120% MW low pay threshold and the OECD low pay threshold (right scale).

Based on the benchmarks provided in Figure 1 and the regular usual hourly rate derived in the IS for each individual, we calculate the proportion of the employed workforce earning at or below each of the low pay thresholds. This is shown in Table 1 for the years 2006, 2009, 2012 and 2015⁶.

Table 1: Trends in low pay

	Proportion of employed (%)			
	2006	2009	2012	2015
OECD low pay	12.3 (197,500)	10.1 (167,500)	8.8 (147,300)	11.1 (206,300)
120% MW low pay	17.9 (287,600)	24.0 (396,600)	23.9 (401,200)	24.9 (463,000)
Total employed sample	(1,605,700)	(1,658,400)	(1,673,900)	(1,858,600)

Notes: Nominal values for both low wage thresholds are provided in Appendix Table A1. Replicate weights used to provide population estimates, which are shown in parenthesis. Source of data = HLFS and IS. Authors' compilation.

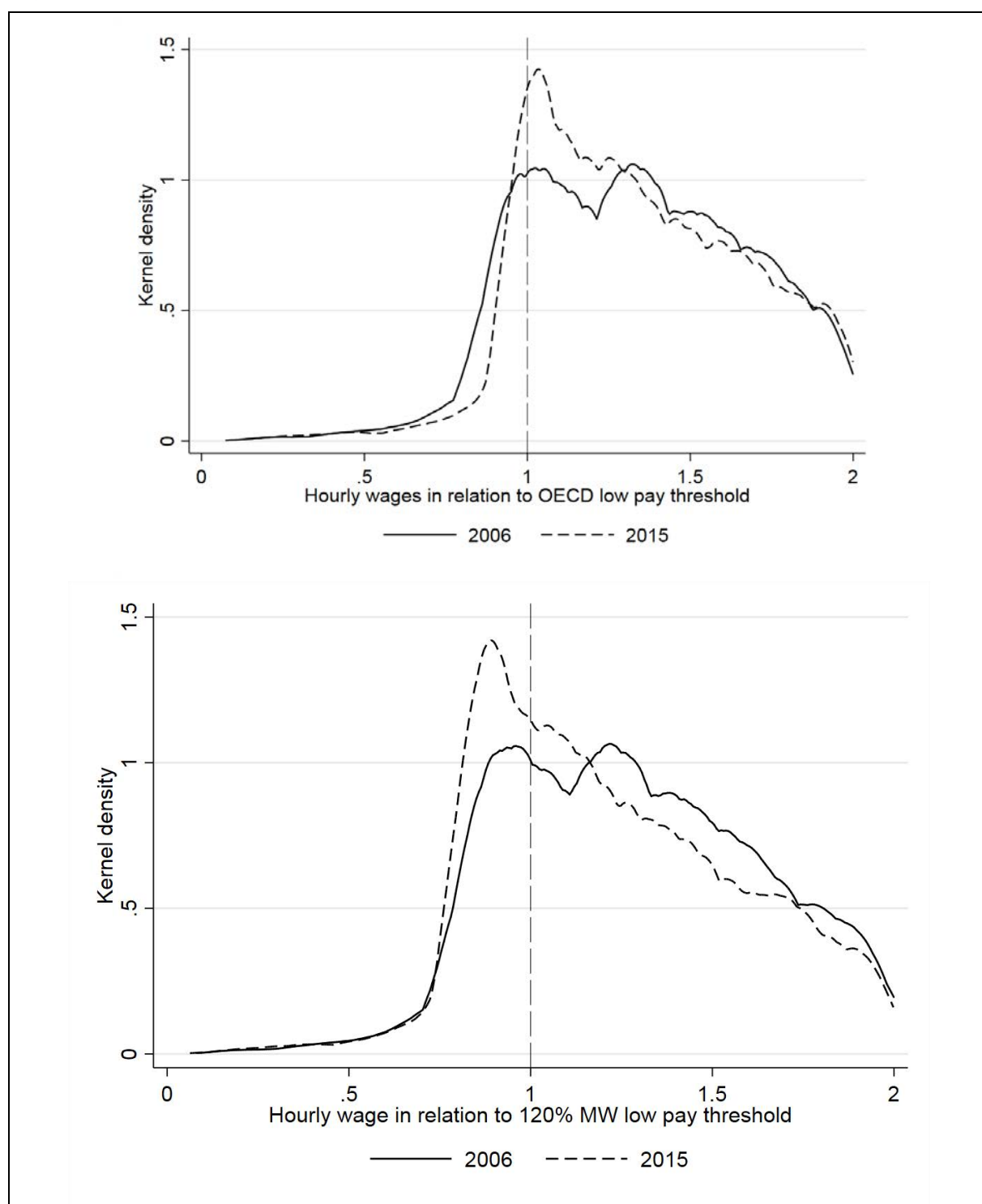
The lowest measure, 2/3 of the contemporary median, shows a u-shaped pattern: first, a declining trend from 2006 through to 2012 in both absolute numbers and as a proportion of the total employed (falling from 12.3% to 8.8%), and then an increase between 2012 and 2015 to end the sample timeframe at 11.1%.

The trend is very different for the higher low pay threshold of 120% minimum wage. The proportion of employed falling into this group rose sharply between 2006 and 2009 from 17.9% to 24%, and has hovered close to that level since then, ending the sample timeframe at 24.9%. The main reason for the different trends are that over the time period under study the minimum wage rose more rapidly than did median earnings, therefore pulling the higher low pay threshold further away from the 2/3 median measure.

To illustrate changes in the distribution of wages over time, see Figure 2 below where regular usual hourly wages are normalized to the respective low pay thresholds for 2006 and 2015. Therefore, a standardized hourly wage of one, means that the individual earns per hour the equivalent of the low pay threshold.

⁶ We trimmed our sample at the bottom of the wage distribution removing those reporting earning less than \$1 an hour.

Figure 2: Wage distribution



Notes: OECD low pay = $2/3$ median wage; 120% MW low pay = 120% of adult minimum wage. Source of minimum wage rates is MBIE (2017). Source of median wages is Statistics NZ (2017).

With respect to the OECD threshold (Figure 2, upper panel) it can be seen that *i)* the mass left of the vertical line shrinks over time and *ii)* the mass right of it increases. The shrinking on the left explains why the proportion of low paid employed according to the OECD definition decreased between 2006 and 2015.

In terms of the 120% MW threshold (see Figure 2, lower panel), there is pronounced growth in the distribution below the threshold between 2006 and 2015. The peak of the distribution is to the left of the normalized threshold line (see vertical line) by the end of the sample timeframe.

We next characterise the two low pay populations, and where appropriate, compare with the median group of workers (this includes those earning within +/- 5 percent of the median wage in a particular year). The descriptives are conducted along a number of levels of disaggregation – gender, age, ethnicity, educational attainment, occupation, industry, and region.

4.2 Gender

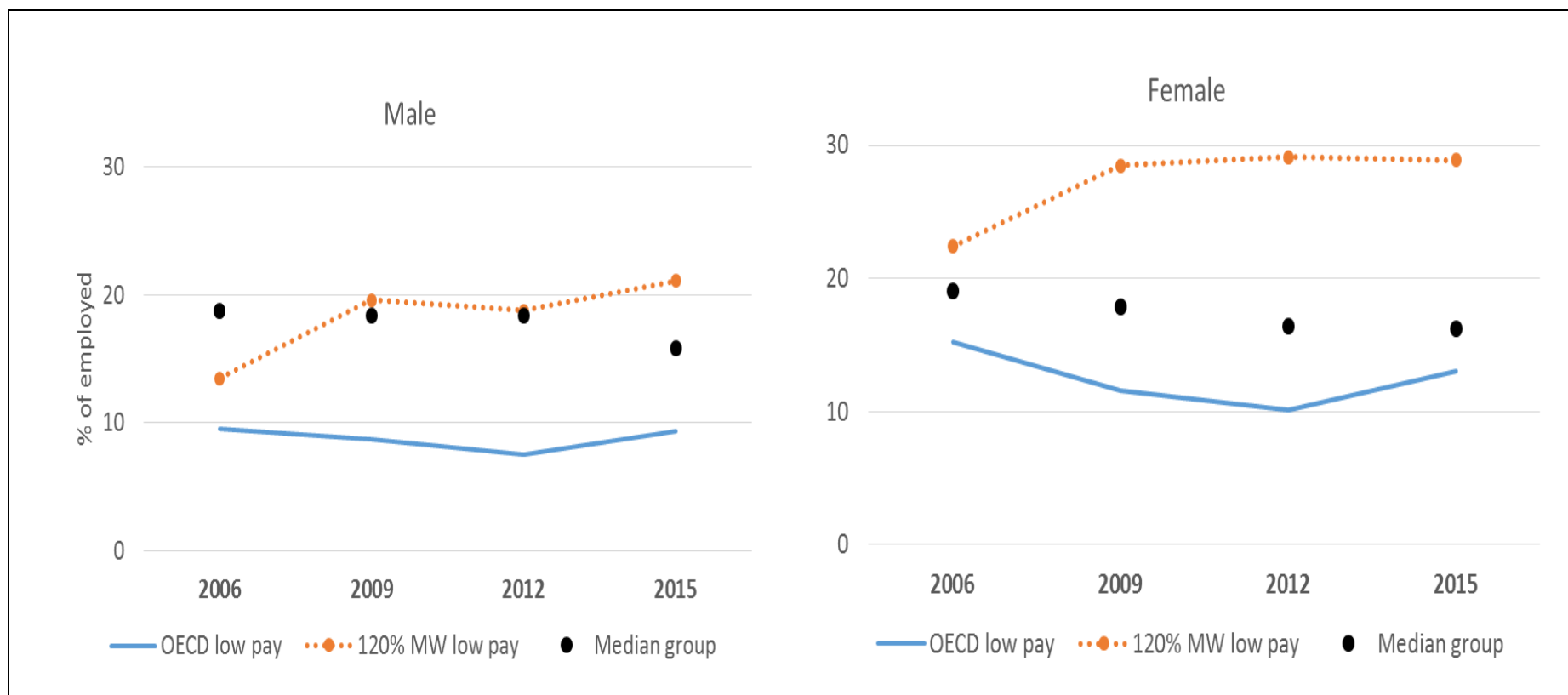
The low paid workforce includes more women relative to men. As at 2015, women comprised 56 percent of the low paid population group.

Figure 3 drills further into the low pay – gender association by providing information on the proportion of each gender that is low paid over the years 2006, 2009, 2012, and 2015. Women are clearly more likely than men to be low paid, irrespective of the low pay measure used. As evident in Figure 3, in 2015, 13 percent of employed women earn below the OECD low pay threshold and 28.9 percent are below the 120% MW low pay benchmark (with the proportion rising over the sample timeframe under the latter threshold). For men the equivalent figures are 9.4 percent and 21.1 percent respectively.

Not provided in the figure below for the sake of brevity, we also find differences across the gender wage groups in terms of hours worked. For example (in 2015), according to the OECD definition, 54 percent of employed women are working part-time⁷, with the respective figure for men equating to 32 percent. The proportions are lower when applying the 120% MW threshold, but sex specific gap is consistent. For those falling in the median group, the majority work full-time, with only 3 percent of men in this category working part-time and 19 percent of women.

⁷ Part-time is defined as working less than 30 hours per week.

Figure 3: Low pay by gender



Notes: The 'median group' are those paid within a band plus or minus 5% of the median wage. Nominal values for the two low wage thresholds are provided in Appendix Table A1. Source of data = HLFS and IS. Authors' compilation.

4.3 Age

Past empirical research has shown that there is a positive relationship between age and wages (e.g. Heckman, 1976; Willis, 1986; Heckman et al, 2006), and that this relationship is especially strong when entering the labour market (Murphy & Welch, 1990). Thus, it can be expected that there is a negative correlation between age and the likelihood of falling into the low pay group.

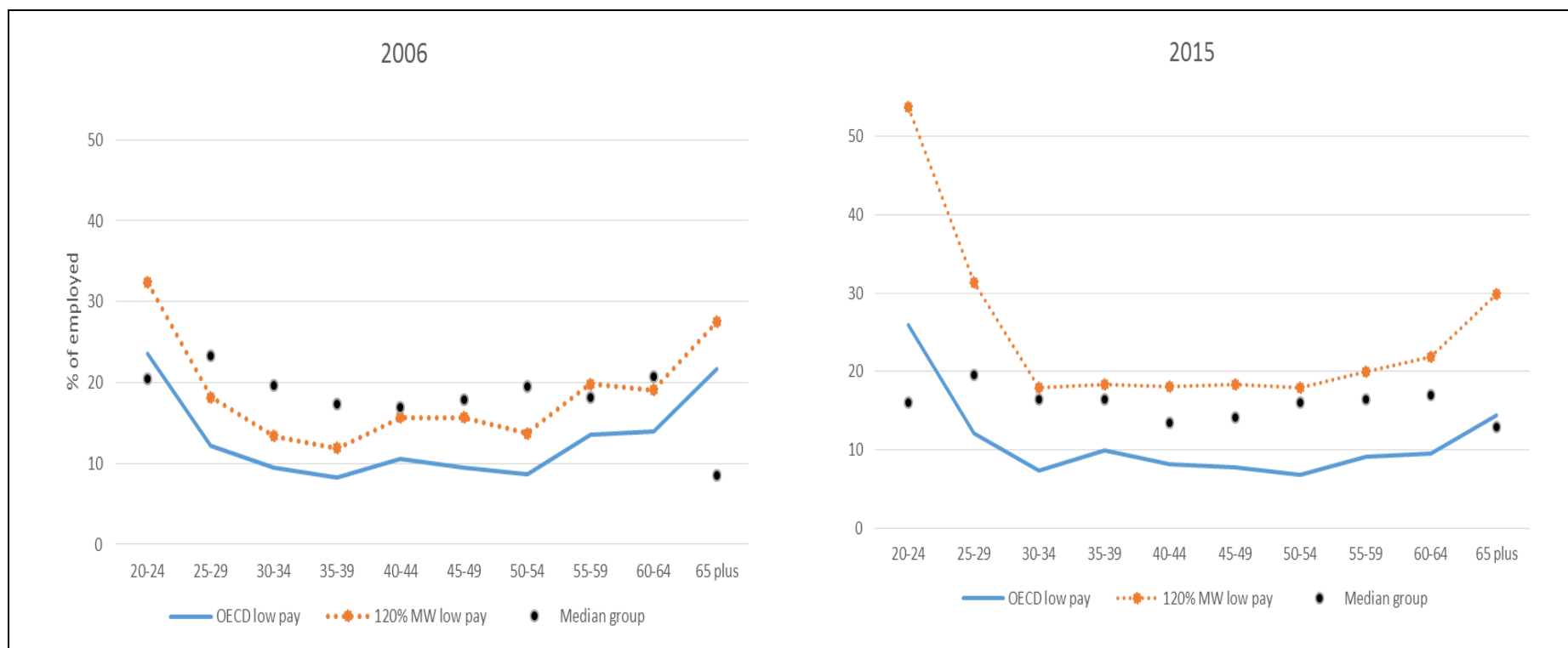
As Figure 4 indicates, irrespective of the low pay measure used, there is strong evidence signalling a u-shaped distribution, whereby those in their twenties⁸ and above 65 are more likely than other age categories to fall into the low pay population. Referring to the prime aged worker between 30 and 65, there appears to be no age specific pattern at play, resulting in a rather flat profile with regard to likelihood of being in the low paid group across that age range.

Comparing the distributions between 2006 and 2015, we also find that the likelihood of low pay incidence at the two extremes of our age distribution increases markedly. The rise is particularly evident for those aged 20 to 29, and when focussing on the 120% MW low pay measure.

The depicted age-wage nexus – beside other factors – might also help to understand the distribution of specific household characteristics as these may be correlated with the age of the worker. In terms of marital status, not shown in Figure 4 (for the sake of brevity), we find that regardless of the low pay definition used, approximately 40 percent of low paid workers were never married, in 2015. This number drops to a quarter with respect to the median wage group. Likewise, the share of married individuals is much higher among the median group. Additionally, correlated with marital status, differences can also be detected with respect to the number of dependent children under 15 living in the household. About 15 percent of the low paid employed have one or more dependent children (again irrespective of low pay definition), and the comparable proportion increases to 19 percent for the median group.

⁸ Our data do not include workers aged below 20 years.

Figure 4: Low pay by age group



Notes: The 'median group' are those paid within a band plus or minus 5% of the median wage. Nominal values for the two low wage thresholds are provided in Appendix Table A1. Source of data = HLFS and IS. Authors' compilation.

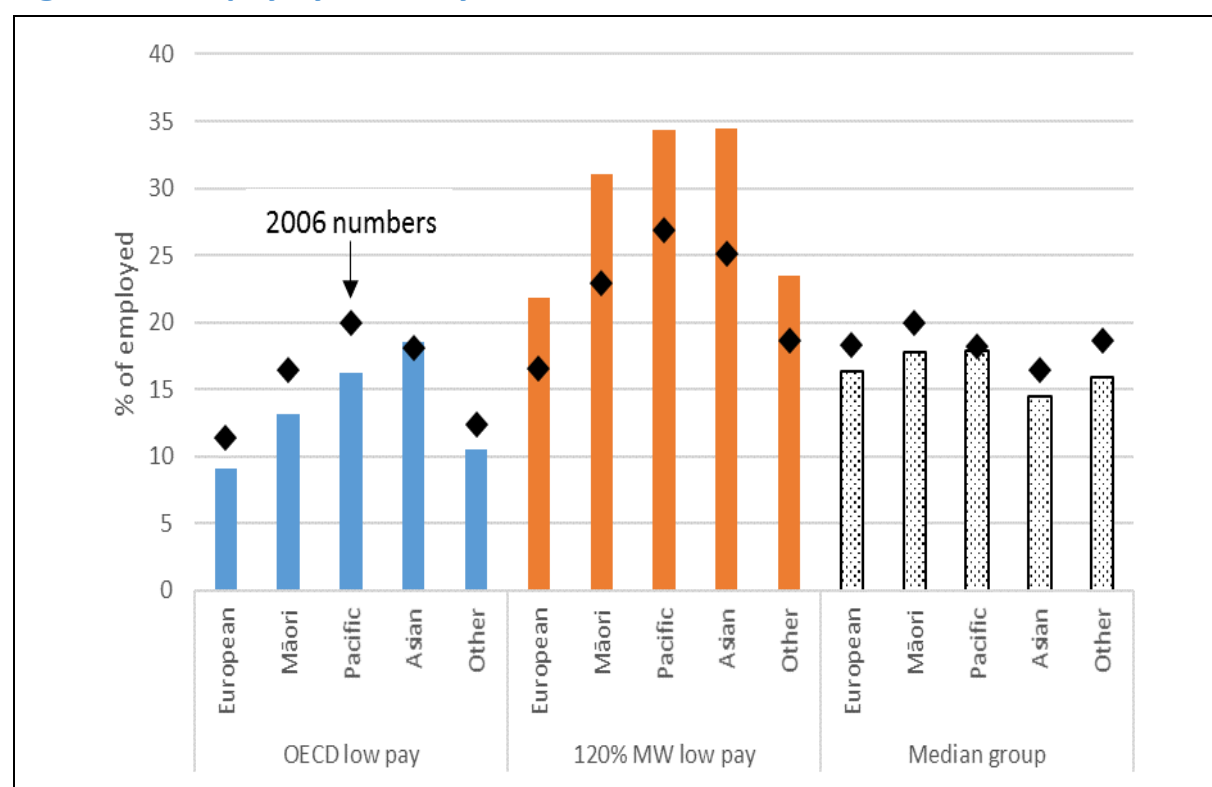
4.4 Ethnicity

Looking at the ethnicity⁹ profile of the low paid population (Figure 5), a heterogeneous distribution can be detected. NZ Europeans are the least likely to be low paid, regardless of definition used, while Pacific Peoples and Asians are the most likely.

Between 2006 and 2015, based on the OECD low pay definition, the proportion within each ethnicity that are low paid either remained static or fell. The comparable proportions rose for all ethnicities under the 120% MW definition. Asians in particular, experienced the largest percentage point increase over the sample timeframe.

However, as Europeans form by far the biggest ethnic group, independent of the low pay definition used in 2015 every second low pay worker is of this ethnicity, followed by Māori and Asians of comparable size ranging between 14 and 18 percent.

Figure 5: Low pay by ethnicity



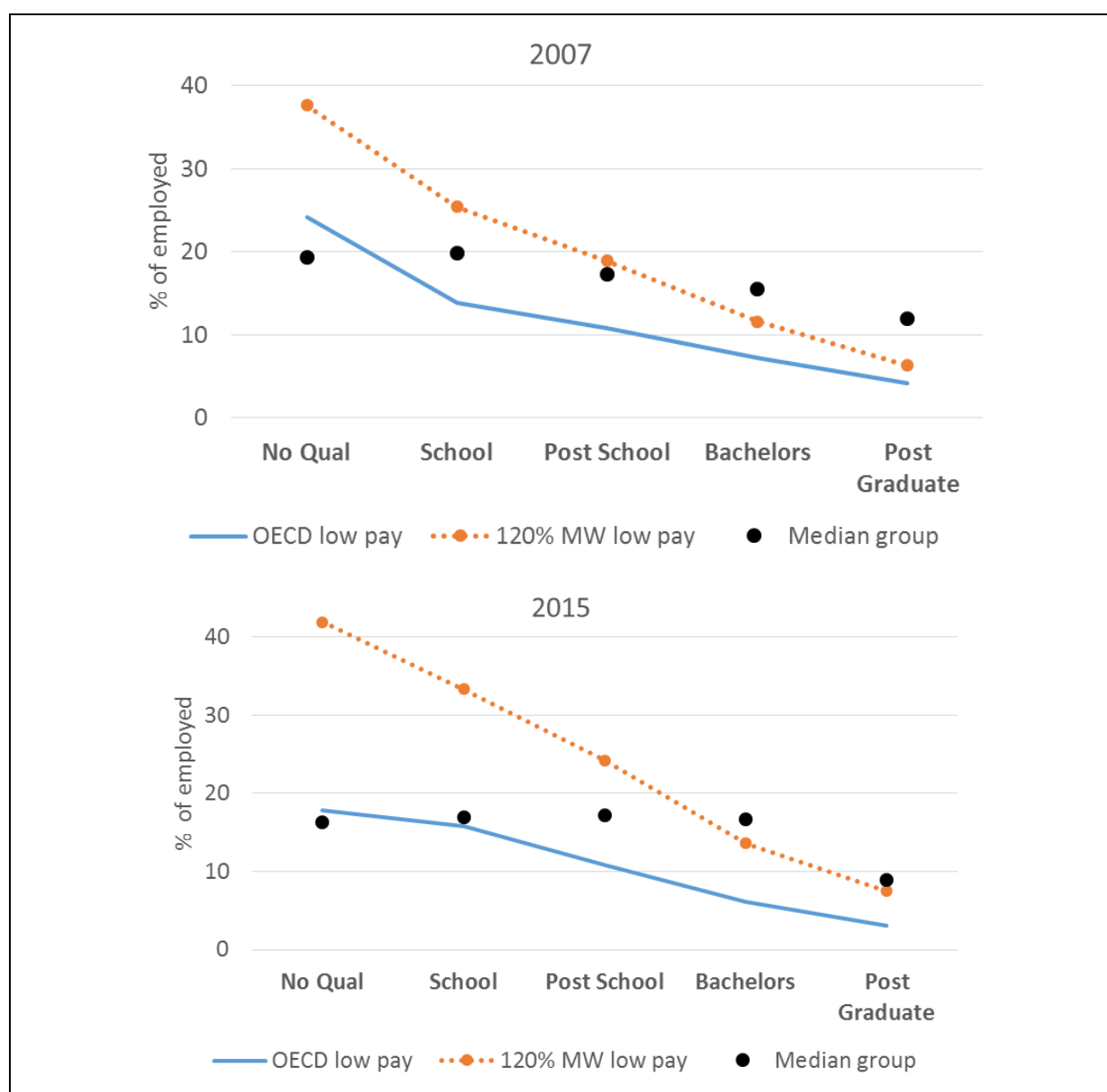
Notes: The 'median group' are those paid within a band plus or minus 5% of the median wage. Nominal values for the two low wage thresholds are provided in Appendix Table A1. Source of data = HLFS and IS. Black diamonds in the figure refer to the respective value in 2006, while the solid bar provides the relevant value for 2015.

⁹ These figures are based on multiple ethnicities, not prioritised ethnicity groupings. That is survey respondents appear in more than one category where they indicate more than one ethnicity.

4.5 Educational attainment

Starting from Becker’s renowned human capital theory, numerous studies have shown that educational attainment has a strong positive correlation with earnings (Card, 1999). As expected (and shown in Figure 6), we find that independent of the low pay measure used those without any school qualification have the highest propensity to be low paid while those with post-graduate education the lowest. This relationship is pronounced when applying the 120% MW low pay threshold, where the slope (in absolute terms) is much steeper compared to the case of the OECD low pay threshold.

Figure 6: Low pay by qualifications



Notes: The ‘median group’ are those paid within a band plus or minus 5% of the median wage. Nominal values for the two low wage thresholds are provided in Appendix Table A1. Timeframe is narrowed to 2007 – 2015, due to definitional inconsistencies with 2006 qualification data. Source of data = HLFS and IS. Authors’ compilation.

4.6 Occupation

At the single-digit ANZSCO level¹⁰, three occupational categories dominate the low paid: labourers, community and personal service workers, and sales. These three categories comprised 62.4 percent of the low paid workforce in 2015 according to the OECD low pay measure, and 57.4 percent based on the 120% MW low pay measure. Furthermore, the prevalence of low pay is also higher among these occupations compared to other occupations groups, with marked increases evident between 2010 and 2015. The shorter timeframe is used for consistency reasons.¹¹

Table 2: Low pay by occupation

Occupation	Share of occupation in low pay (%)				Share of low paid (%)	
	2010		2015		2015	
	OECD low pay	120% MW low pay	OECD low pay	120% MW low pay	OECD low pay	120% MW low pay
Managers	5.7	13.0	5.8	13.0	7.5	7.5
Professionals	3.3	7.8	3.2	7.7	7.2	7.8
Technicians / trades	5.5	15.9	9.2	21.2	10.1	10.4
Community / personal	14.9	40.4	24.8	53.7	20.4	19.6
Clerical / administrative	5.8	15.1	5.4	14.2	6.7	7.9
Sales	19.2	46.2	22.9	47.3	18.6	17.1
Machinery operators	11.1	25.7	11.0	31.7	6.2	8.0
Labourers	20.5	44.6	25.6	53.4	23.4	21.7

Notes: Nominal values for the two low wage thresholds are provided in Appendix Table A1. Source of data = HLFS and IS. Authors' compilation.

¹⁰ [Australian and New Zealand Standard Classification of Occupations](#)

¹¹ The occupation categories changed between 2009 and 2010 and no concordance is available across this change.

4.7 Industry

We find retail trade accounts for the largest proportion of low paid workers – 17.8 percent using the OECD low pay measure (18.1 percent using the 120% MW measure). This finding is consistent with that found with UK data (Clarke & D’Arcy, 2016). The other main low pay industries are accommodation and food services (13.3 percent), health care and social services (12.7 percent) and manufacturing (10.6 percent) – using the OECD low pay definition

The prevalence of low pay within an industry shows a somewhat different picture, reflecting differences in the relative sizes of sectors and distribution of occupations and earnings within them. The highest rates of low pay in 2015 were in accommodation and food (26.5 percent of workers falling below the OECD threshold), administrative and support (17.1 percent), retail (17.9 percent), and agriculture (18.4 percent). For certain sectors – the prevalence rate makes substantial leaps upward when we switch from the OECD definition to the 120% MW low pay threshold. This is particularly true for agriculture, accommodation and food services, and transport services.

Table 3: Low pay by industry

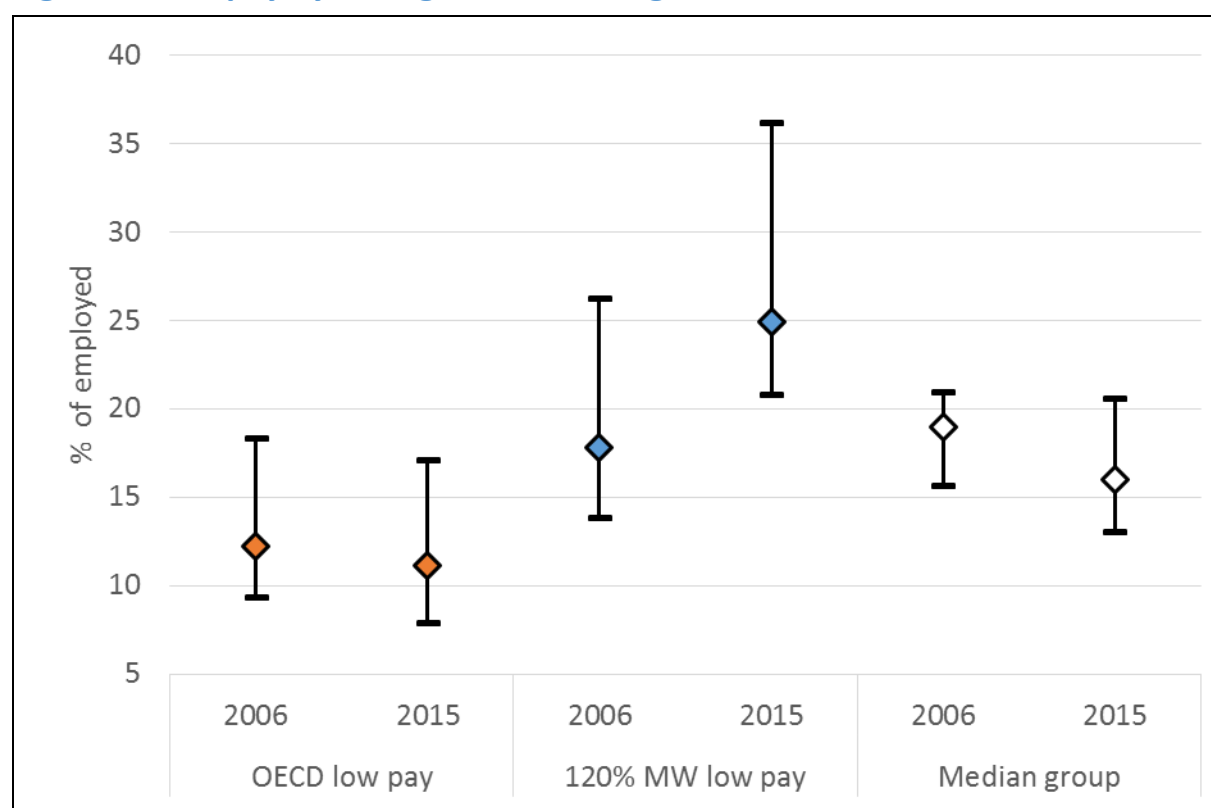
Industry	Share of industry in low pay (%)				Share of low paid (%)	
	2010		2015		2015	
	OECD low pay	120% MW low pay	OECD low pay	120% MW low pay	OECD low pay	120% MW low pay
Agriculture, Forestry & Fishing	20.1	35.8	18.4	39.7	7.2	6.8
Manufacturing	7.3	18.3	9.4	22.7	10.6	11.3
Construction	5.0	12.3	6.3	18.8	6.1	6.3
Wholesale Trade	4.5	11.8	6.3	19.8	2.5	3.0
Retail Trade	18.3	48.2	17.9	47.3	17.8	18.1
Accommodation & Food Services	23.8	51.3	26.5	61.3	13.3	11.2
Transport, Postal & Warehousing	7.8	18.2	7.4	20.2	3.4	3.8
Information Media	9.3	16.3	4.2	13.6	1.4	1.1
Finance & Insurance Services	3.9	8.7	3.3	5.4	0.8	0.7
Real Estate Services	9.6	23.7	11.0	21.8	0.8	1.1
Professional, Scientific & Technical	3.1	8.4	2.1	6.7	1.8	2.1
Administrative & Support Services	20.1	36.7	17.1	43.0	7.2	5.7
Public Administration & Safety	2.1	7.6	2.2	8.9	1.9	2.2
Education & Training	5.0	16.0	3.5	17.4	6.2	6.7
Health Care & Social Assistance	8.9	24.4	8.8	27.3	12.7	13.2
Arts & Recreation Services	13.0	27.4	12.8	22.9	1.7	1.6
Other services	9.2	23.6	8.2	29.1	4.5	4.5

Notes: Mining and Utilities have been suppressed due to small sample size. The categories displayed are based on the Australian and NZ Standard Industrial Classification 2006 (ANZSIC06). Nominal values for the two low wage thresholds are provided in Appendix Table A1. Source of data = HLFS and IS. Authors’ compilation.

4.8 Region

To complete the descriptive portrait of the low paid in NZ, we examined regional disparities at the local government level.¹² As Figure 7 illustrates, there is noticeable variation across the country in terms of the propensity to fall into the low paid group. For 2015, based on the OECD definition, the proportion employed within a region that were classified as low pay ranged from 8 percent (Canterbury) to 17 percent (Manawatu), with a nationwide average of 11 percent¹³. The regional labour market heterogeneities are even more pronounced when applying the low pay threshold with respect to the minimum wage: here the range is between 21 percent (Taranaki) and 36 percent (again Manawatu), with a nationwide average of 25 percent.

Figure 7: Low pay by local government regions



Notes: The figure shows the minimum, maximum and average (illustrated by a 'diamond') number of the respective indicator. The 'median group' are those paid within a band plus or minus 5% of the median wage. Nominal values for the two low wage thresholds are provided in Appendix Table A1. Source of data = HLFS and IS. Authors' compilation.

¹² The HLFS provides data on 12 regions – Northland; Auckland; Waikato; Bay of Plenty; Gisborne / Hawke's Bay; Taranaki; Manawatu-Wanganui; Wellington; Nelson / Tasman / Marlborough; Canterbury; Otago; and Southland.

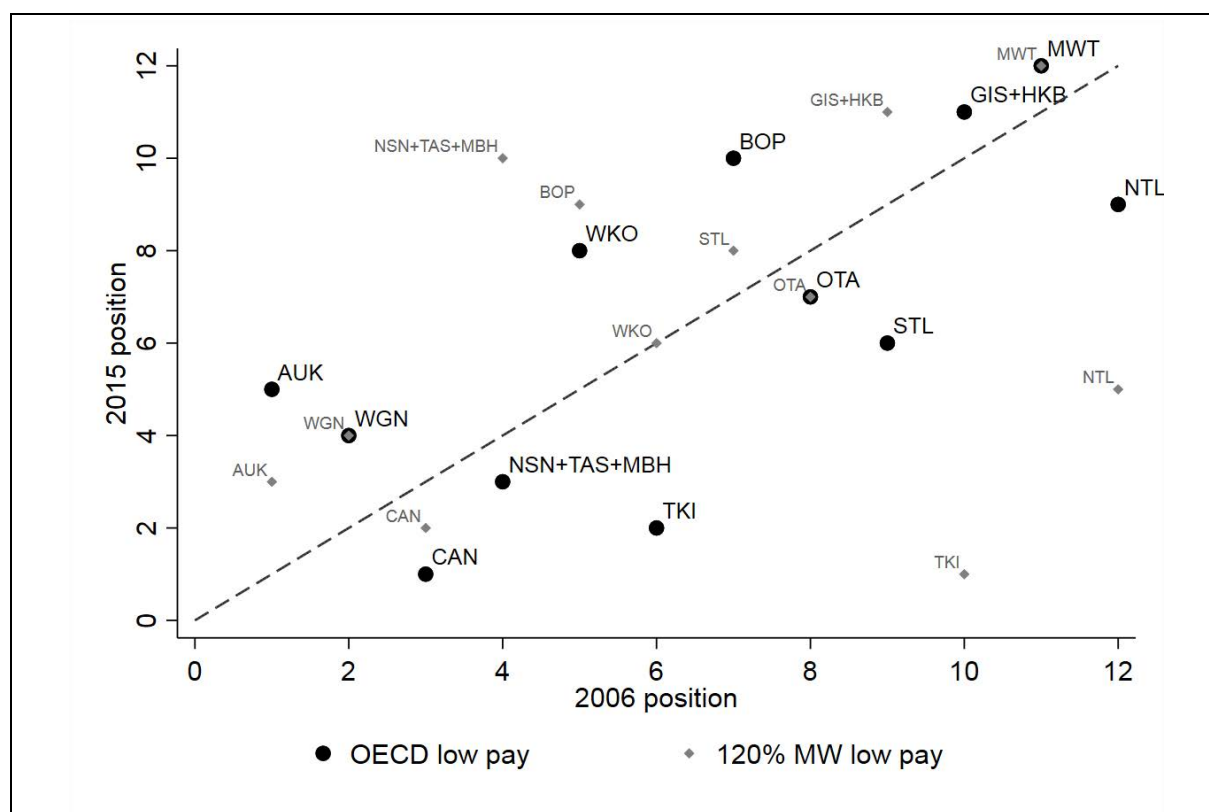
¹³ In terms of share of the low paid population, Auckland constitutes a third of this group, and five regions (Auckland, Wellington, Waikato, Canterbury and Manawatu) account for 70% (regardless of definition used).

To explore changes over time, for the years 2006 and 2015 the regions are sorted in ascending order according to the share of the respective region's employment that is classified as low paid. Their respective positions over the two time points are compared in Figure 8.

If a region's relative position is unchanged from 2006 to 2015, they lie close to the diagonal line. If a region's relative ranking has worsened over time, they are left of the line, and those for whom their position has improved over time, they are right of the line.

The black dots are based on the OECD threshold, which illustrates that many regions are close to the diagonal line.¹⁴ However, according to the 120% MW low pay definition (the grey dots), the pattern is less clear.¹⁵ Some regions like Waikato, Canterbury or Southland have not changed their position much between the two time points. In contrast to this, Taranaki has moved from 10th to 1st position, and Auckland moved from 1st to 3rd.

Figure 8: Temporal change of the low pay intensity



Notes: The graph shows the regional position of low pay intensity for 2006 and 2015. The 45-degree line indicates that the region has the same position in both years. Regions are classified as follows: NTL = Northland; AUK = Auckland; WKO = Waikato; BOP = Bay of Plenty; GIS + HKB = Gisborne / Hawke's Bay; TKI = Taranaki; MWT = Manawatu-Wanganui; WGN = Wellington; NSN + TAS + MBH = Nelson / Tasman / Marlborough; CAN = Canterbury; OTA = Otago; and STL = Southland Source of data = HLFS and IS. Authors' compilation.

¹⁴ When comparing the regional low pay intensity of 2006 with 2015 according to the OECD definition, it has to be noted that – except for Auckland – all regions experienced a decrease in the respective size (proportion) of the low pay sector, showing no indications of particular patterns by levels of regional development.

¹⁵ When applying the OECD definition, the correlation parameter for the position of both years is rather strong (0.72) but in the case of the 120% MW definition, the correlation ratio falls to 0.31.

5. Linking with administrative records

As explained earlier, within the IDI structure we are able to link individuals from the IS to their tax records from the IR. These data include information on income from seven potential sources: wages and salary; withholding payments; benefits; student allowance; paid parental leave; pensions; and claimants' compensation. For the purposes of our research, we are interested in two of these sources – wages and salary; and benefits.

Before linking with the IR records, we first considered the prospect of constructing a sample of those who present as persistently low paid, i.e. fall into the low paid category in consecutive IS waves. However, the rotating nature of the HLFS means that one eighth of the sample is rotated out of the survey every quarter and replaced by new individuals. Further to that, additional aspects such as missing observations and non-response by survey respondents, mean that the resulting overlap over consecutive IS waves (which are only every June quarter) is only about 30 percent. As such, we decided not to pursue this empirical avenue.

We restrict our sample of interest to one IS wave - 2014. We then linked the individuals that were part of this wave with their corresponding IR records for the years 2013 to 2015. This allows analysis of both employment and benefit reciprocity patterns across a timeframe where we know the individual's low paid status in the middle of it.

Those reporting being employed and earning positive wages in the 2014 IS wave equate to 16,152 individuals.¹⁶ Once linked with the IR data for 2013 to 2015, the sample falls to 11,151 individuals. Unfortunately the HLFS – IS is noted for having a weak link rate with the spine in the IDI¹⁷ and as such our match rate with IR records is 69%.¹⁸

To ensure that these individuals had access to the NZ labour market across all three years of interest, we use information on border movements to identify the duration of time an individual spent overseas each year. When an individual spent a total of at least nine months overseas in a year, we excluded them from the sample for that particular year¹⁹.

Finally, for our matched IS – IR sample we use information on source of income, and monthly variations in wage and benefit reciprocity, along with associated employer codes to construct a variety of indicators related to a range of labour market characteristics. This is done for both the low paid populations of interest (based on the OECD definition and the 120% MW threshold), and the median group.

¹⁶ Note this excludes the self employed, those reporting earning less than a \$1 an hour, and those aged under 20.

¹⁷ Statistics NZ indicate this is largely due to name quality, where things like shortened names make it difficult to match HLFS – IS individuals to the spine in the IDI.

¹⁸ Of course, there may also be a few individuals for which lack of IR data is not due to linking issues, but because they report earnings in the IS that are not declared to the IR. We expect these numbers to be small in magnitude.

¹⁹ This follows Ministry of Education (2017) methodology for classifying an individual as overseas based.

Our main findings are reported in Table 4, and Figures 9 and 10, and the key points are summarised below. It has to be emphasized that though we have observed an individual as being low paid only for one month in the IS data, we can see clear differences in the analysed indicators between the low paid and the median wage groups. These findings might indicate that being low paid is often not associated with a transient labour market position and leaves a “footprint” in the data. Many of the findings are in line with expectations:

- **Low paid employed are less likely to be receiving wages and salary**

On average, low paid employed spent about 10.5 months per year in employment (86.3% of the three year sample timeframe under the OECD definition; and 88.1% under the 120% MW low pay threshold). The comparable proportion is 11.3 months per year (93.9%) for the median group.

- **Low paid employment are less stable**

IR data provide monthly records for each unique employer from whom the worker has received their wage and salary from. For the 2013 to 2015 time period low paid workers have on average just over two unique employers, with this number falling to 1.7 for the median group. When the distribution of this variable is assessed, we see that for those falling into the OECD low pay category, 57% had more than one employer over the three year timeframe and further to that, 16.5% had four or more employers. In comparison, only 7.5% of the median group are associated with four or more employers over the same time period.

- **Low paid employed have on average shorter employment spells**

The average employment length differs noticeably across the three populations of interest in Table 4. In terms of those low paid according to the OECD definition the average length of employment spell amounts to 20.4 months, and close to a fifth of this low paid group have an average employment spell less than or equal to 12 months. The distribution of this variable is shown in Figure 9 below.²⁰ It is clearly evident that differences in average spell length are fuelled by the much higher share of individuals with short employment spells in the low pay groups.

- **Low paid employed are more likely to be multiple job holding**

We define multiple job holding in the context of our data as having two employers in two consecutive months. The motivation behind this particular definition is that having two employers in just one month may be indicative of an individual that is changing employers and moving from one job to another.

²⁰ As individuals are tracked for the period 2013 to 2015, the maximum spell length is 36 months. Future work could analyse this data in a number of different ways. For instance, Figure 9 could be recreated based on each employment spell as the unit of observation, rather than the individual; or could be focussed on just maximum spell lengths, etc.

We find that just over a fifth of low paid workers have at least one instance of multiple job holding (regardless of low pay definition). This number is halved to one out of every ten in the median group classed as multiple job holding.

- **Low paid employed are more likely to receive benefits**

About a quarter of low paid workers according to the OECD definition received benefits in the sample time frame. This number decreases marginally to 22 percent when applying the 120% MW threshold. In contrast, this share drops to about 11 percent for the median group.

- **Low paid employed are much longer on benefits**

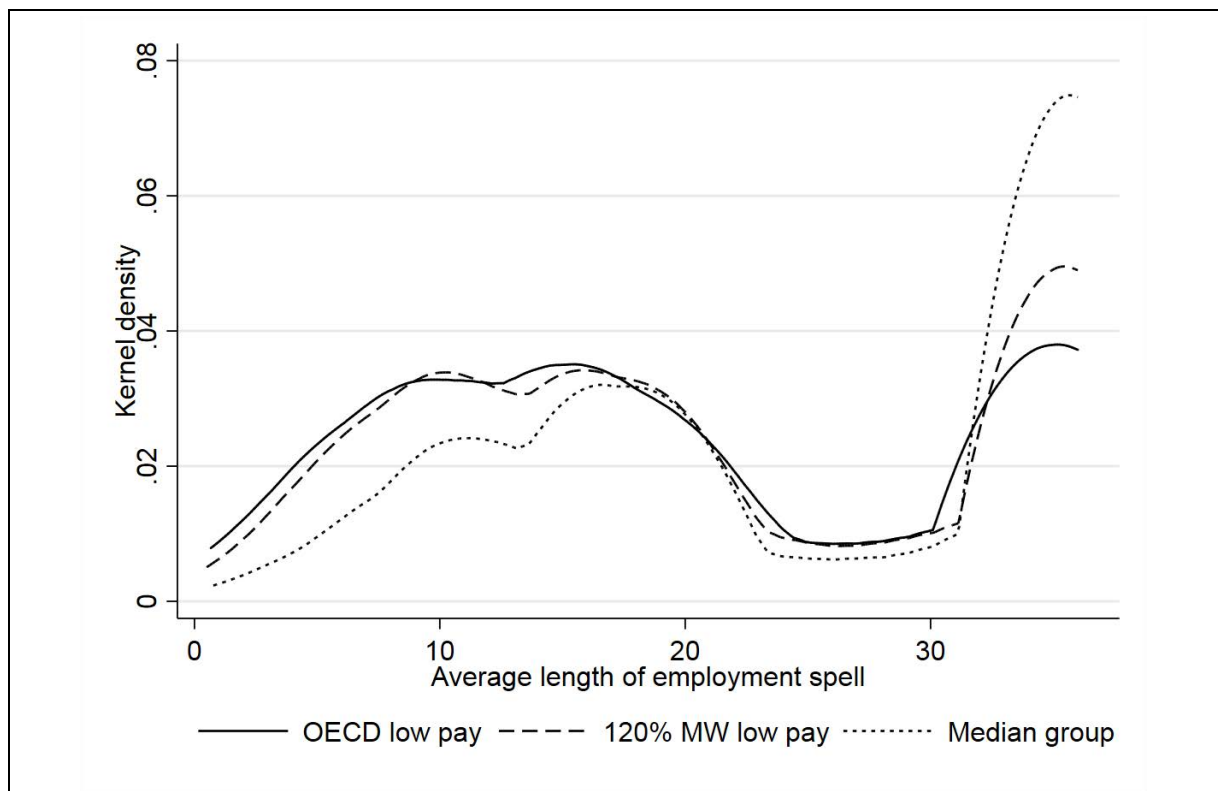
For the sample of those that received benefit at some point in the time period 2013 to 2015, 41.3% of the OECD low pay group received these benefits for the majority of the three years (80 to 100% of the time). This number shrinks to 21.4% for the median group. Further to that, the average spell length is substantially shorter for the median group compared to either of the low pay groups (10 months versus approximately 15 months respectively). The distribution of average spell of benefit receipt is also presented in Figure 10, showing that the median group have a much higher share of short spells and both low pay groups of longer spells.

Table 4: Low pay by employment and benefit receipt, 2013 - 2015

	OECD low pay	120% MW low pay	Median group
Sample size	1,509	3,834	2,907
Employment patterns			
Time earning wages and salary (%)	86.3	88.1	93.9
Proportion earning wages and salary (%):			
- > 0 and ≤ 20% of time	2.2	2.0	0.7
- > 20% and ≤ 40% of time	2.2	2.1	1.1
- > 40% and ≤ 60% of time	4.4	4.0	3.0
- > 60% and ≤ 80% of time	6.3	4.7	2.7
- > 80% and ≤ 100% of time	85.0	87.2	92.5
Number of employers	2.2	2.1	1.7
Proportion with (%):			
- 1 employer	43.0	45.3	58.6
- 2 to 3 employers	40.5	40.0	33.9
- 4 to 5 employers	11.9	11.3	5.8
- More than 5 employers	4.6	3.5	1.7
Average employment spell (months)	20.4	21.4	25.6
Proportion with average employment spell:			
- ≤ 6 months	5.8	5.1	2.4
- > 6 months and ≤ 12 months	13.8	13.4	8.9
- > 13 months and ≤ 24 months	18.7	18.7	18.1
- > 24 months	61.7	62.8	70.7
Multiple job holding (%)	21.6	20.4	10.2
Benefit patterns			
Proportion receiving benefits (%)	25.8	22.0	11.1
*Proportion receiving benefits (%):			
- > 0 and 20% of time	18.6	21.6	34.2
- > 20% and ≤ 40% of time	16.9	16.9	21.4
- > 40% and ≤ 60% of time	14.9	16.4	17.1
- > 60% and ≤ 80% of time	8.3	8.1	6.0
- > 80% and ≤ 100% of time	41.3	37.0	21.4
*Average benefit spell (months)	15.6	14.6	10

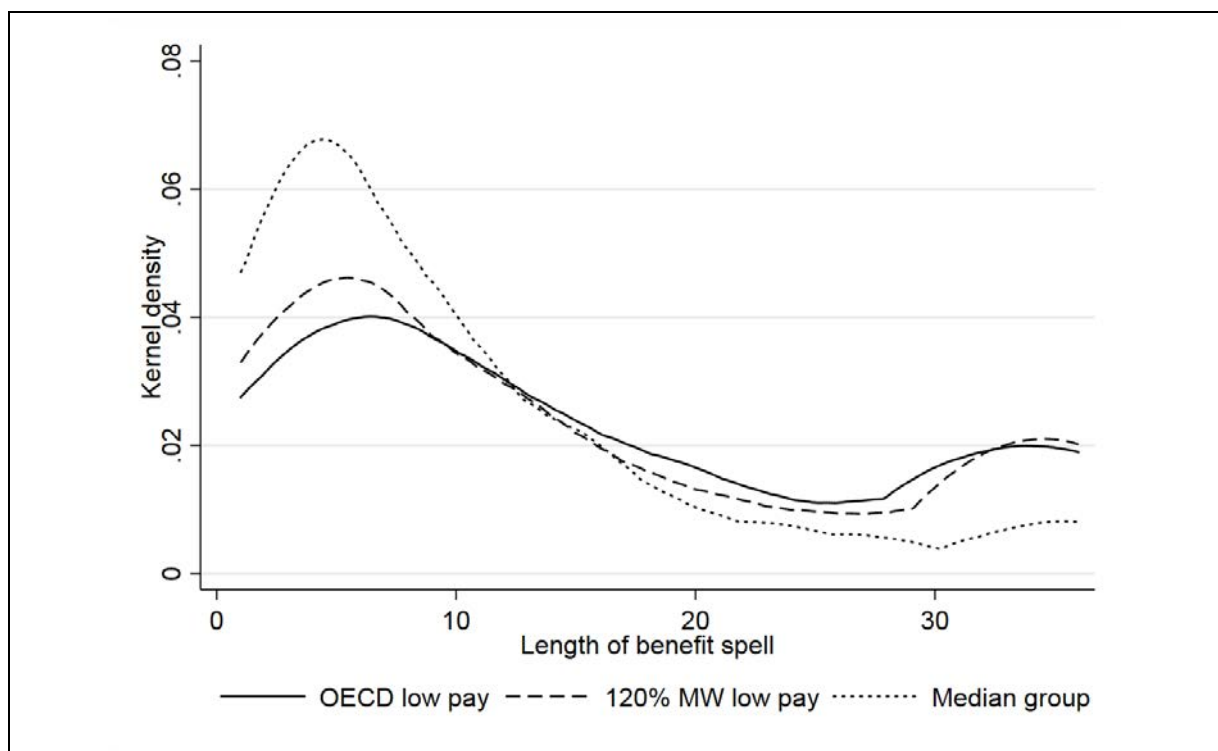
Notes: 2014 IS sample linked with 2013 to 2015 IR data as described in Section 5. Multiple job holding is defined as having two employers in two consecutive months. * Sample sizes are smaller for the distribution of benefit receipt and average length of benefit spell – these results are based on individuals in the linked sample that reported any benefit experience in the 2013 to 2015 time period.

Figure 9: Average length of employment spell



Notes: The graph shows the average length of employment spell (minimum: 1 month; maximum: 36 months). Source of data = 2014 IS sample linked with 2013 to 2015 IR data as described in Section 5. Authors' compilation.

Figure 10: Average spell of benefit receipt



Notes: The graph shows the average spell of benefit receipt (maximum: 36 months). Source of data = 2014 IS sample linked with 2013 to 2015 IR data as described in Section 5. Authors' compilation.

6. Conclusions and future research

The public debate on labour market inequalities has intensified in recent years and with it the discussion on low pay. Though the debate is strong, it is less clear when a wage has the attribute 'low'. Therefore, the first step is to set up a definition when a wage can be called low. In this study, two different definitions are adopted, the first one accounting for the relative distance to the median wage (OECD low pay) and the second one in relation to the minimum wage (120% MW low pay). As a result of these different measures the low pay incidence varies; in 2015 about 11.1 percent of the employed were low paid according to the OECD definition and 24.9 according to the minimum wage definition. Moreover, no clear pattern over time can be derived, showing a slight reduction since 2006 (OECD definition) or a substantial increase (MW definition).

However, a much clearer picture can be found when looking at the characteristics of individuals working in the low pay sector. As shown in the descriptive analysis within Section 4 and 5 of this study, being in the low paid workforce in NZ is correlated with certain observable characteristics: being female, working part-time, aged 20-29 or over 65, holding a low level of educational attainment and/or being non-European. Moreover, when tracking the respective individuals' labour market characteristics over time, their tax data reveals that these individuals have weaker attachment to the labour market, relative to individuals earning close to the median wage. This is exhibited via shorter employment spells, higher likelihood of multiple employers, higher propensity to receive a benefit and having longer benefit spells, all relative to the median group.

These findings present a useful portrait of the low paid workforce in NZ in relation to both their employment and benefit receipt patterns. While these results meet the intended objectives of this exploratory study, the much more challenging question about the genuine effect of this labour market position on future outcomes is still open. As indicated in the introduction, the labour market position itself might be evaluated by the employer and thus form a factor that influences future labour market patterns²¹. More specifically, it is still unclear what the interrelation is between low pay and unemployment ('no pay'), and this is the broad research avenue that we believe deserves further attention.

²¹ A number of studies have argued that low-paid employment itself might signal low individual productivity and therefore not lead to better employment and earnings prospects (e.g. Stewart 2007).

Future research on the NZ labour market could therefore be aimed at investigating the 'no pay low pay' nexus, including accounting for local labour market heterogeneity and its interrelation with household poverty:

1. Is there evidence of a 'no pay low pay' trap? Do people who join the low pay sector face similar risks of future unemployment compared to those already unemployed?
2. Does a previous low pay spell not only increase the risk of future unemployment but also amplifies the risk turning into a long-term welfare recipient?
3. Descriptive statistics reveal that NZ's regions are unequally affected by low pay. Does this also affect the interrelation of low pay and unemployment as suggested by Plum & Knies (2015) for the British labour market?
4. Studies have shown evidence that there are feedback effects from household poverty on the employment prospects (e.g. Biewen 2009). Moreover, the low paid employed have a higher risk of experiencing poverty (e.g. Plum 2016). Research could help to uncover whether indications exist in favour for that interrelation also in NZ.
5. What role do job characteristics such as type of employment contract play? Does the type of contract influence the risk of being caught in a 'no pay low pay' trap?

7. Appendix

Table A1: Low wage thresholds 2006-2015

Year			Low pay thresholds	
	Minimum wage	Median	OECD low pay	120% MW low pay
2006	10.25	17.00	11.33	12.30
2007	11.25	18.00	12.00	13.50
2008	12.00	18.75	12.50	14.40
2009	12.50	19.56	13.04	15.00
2010	12.75	20.00	13.33	15.30
2011	13.00	20.46	13.64	15.60
2012	13.50	21.00	14.00	16.20
2013	13.75	21.58	14.39	16.50
2014	14.25	22.00	14.67	17.10
2015	14.75	22.83	15.22	17.70

Notes: OECD low pay = 2/3 median wage; 120% MW low pay = 120% of adult minimum wage. Sources as described in Figure 1.

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