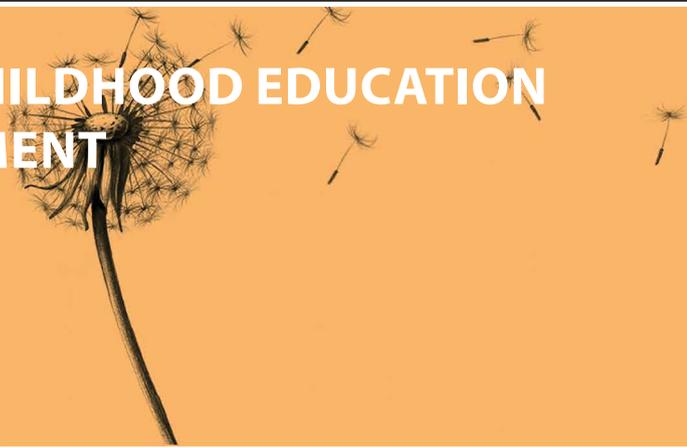


# CHARACTERISTICS OF EARLY CHILDHOOD EDUCATION WORKERS AND THEIR EMPLOYMENT



An executive summary of Motu Note #39

Dean R. Hyslop and Trinh Le

**Motu Economic and Public Policy Research**

dean.hyslop@motu.org.nz, trinh.le@motu.org.nz

## SUMMARY HAIKU

Filling info gaps  
On early childhood sector  
Insights with limits.

## INTRODUCTION

The Early Childhood Education (ECE) sector has changed over the last decade from comprising mainly community-based, not-for-profit services to comprising mainly privately-owned services. With the increase in demand for ECE, there is also an increase in the demand for ECE staff.

The Ministry of Education (MOE) has information on the ECE sector from the Early Learning Information (ELI) system and annual ECE Census. The information available is primarily about the service providers and the children that attend these services. There is limited information about the ECE teaching and non-teaching workforce.

This study seeks to fill that information gap. It follows on from a recent feasibility study by Fabling (2017) which established the suitability of the Longitudinal Business Database (LBD) for understanding the performance and evolution of the sector. Fabling notes that while there are some limitations, there are many opportunities to use the LBD and Integrated Data Infrastructure (IDI) to deliver ECE workforce statistics and insights.

This study focuses on ECE workforce dynamics, specifically the identification of people that work in ECE services, their educational background, their other employment experience, tenure, demographics, salaries etc. In particular, it seeks to answer these questions:

1. What are the characteristics of the current early learning teaching workforce?
2. What are the retention rates for the early learning teaching workforce?
3. Where do the teachers go to and come from?

The study covers 2001-2017, which is the entire period currently available in the IDI. The next section describes the data. The characteristics of ECE workers are described in Section 3. Section 4 analyses the retention and turnover patterns of ECE workers over time. Section 5 summarises.

## DATA

This study uses data from Statistics New Zealand's IDI, an integrated data environment with longitudinal microdata about individuals, households and firms. The data are obtained from several sources, including sample surveys, tax records and other administrative sources. In order to examine workforce dynamics we need data on personal employment, qualifications and personal demographics.

We define the ECE sector as comprising two 2006 Australian and New Zealand Standard Industrial Classification (ANZSIC06) industries: P801000 (Preschool Education) and Q871000 (Child care services). The 'child care services'

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industry also includes outside school-hours care, which is in the ‘school-aged’ rather than ‘early childhood’ sector. ECE workers are defined as those who work in plants<sup>1</sup> whose ANSIC06 code in the Business Register is either of those two. On the one hand this definition of ECE workers will overstate the ECE workforce by treating the ‘child care services’ industry as exclusively serving the ECE sector; on the other hand it will understate the ECE workforce by not covering self-employed people who do not pay themselves a wage.

Data on people’s employment are taken from the Employer Monthly Schedule (EMS).<sup>2</sup> EMS data are on a monthly frequency. We annualise earnings to the calendar year, to correspond to the academic year in New Zealand. We focus on all workers who work in the ECE sector during the year. A worker might work in multiple jobs concurrently, or change from one job to another in the same year. Thus, a worker might be involved in several industries or regions in a year. Given this, for each ECE worker we define their primary industry (region) as the industry (region) with their highest earnings in the year. We also categorise the extent of their involvement in ECE based on how much of their total annual earnings is from ECE (100%, [50–100%), or <50%).

One major disadvantage of the EMS data is that it does not include any information on hours worked. Thus, while this study provides reliable measures of monthly earnings for ECE workers, they are not full-time equivalent measures and should be used with caution, especially in comparison with sectors which have different patterns of working hours.<sup>3</sup>

Data on qualifications are from the MOE’s data on course completion at the tertiary level.<sup>4</sup> These data provide detailed information on provider code, qualification level code, subject code, completion year, etc. From this we can derive the highest qualification obtained to date, and whether a person has an ECE qualification to date.<sup>5</sup> Both of these measures will likely understate the number of qualified workers because they do not record qualifications obtained before 2003 or overseas. Finally, basic personal demographic characteristics are derived from date of birth, sex and ethnicity available in one of the central IDI tables (data.personal\_detail), which is Statistics NZ’s best assessment of a person’s characteristics based on multiple sources available in the IDI. Immigrant status is inferred from citizenship, domestic student status and funding source in the MOE’s data on tertiary enrolments and courses.<sup>6</sup>

1. The numbers are about 2-3% lower if we define ECE workers as those who work in enterprises whose ANZSIC06 code is either of the two. That approach ignores ECE workers employed in ECE roles but by a non-ECE firm, such as teachers at a crèche provided by a university.

2. Each month all employers file an EMS record with Inland Revenue, which lists all employees at that firm in the month, the amount of income they received, and the amount of tax that was deducted at source. From this we can calculate, among other things, gross earnings and employment location for each paid job, as well as the number of paid jobs or the highest-paying job a person holds in a year.

3. Fabling and Maré (2015) address the absence of hours using a few assumptions. The authors believe that their adjusted labour input measure is still an overestimate of the actual labour input for many workers, but it is superior to a simple headcount approach. Applying their approach is beyond the scope of this study.

4. Even though MOE completion data are available from 2000, pre-2003 data had a poor matching rate into the IDI due to the lack of the National Student Index (NSI). As a result, older cohorts of workers (i.e. those who completed their tertiary education before 2003) will tend to appear to have lower rates of qualifications in the data.

5. We thank Warren Smart for providing a list of 123 ECE qualifications which can lead to registration with the Teaching Council. In the absence of data on ECE teacher registration, this study assumes that a worker with at least one of such qualifications is a qualified ECE teacher.

6. We classify immigrants as those who ever appear in the MOE course data as a non-NZ citizen, a non-domestic student, a full fee paying foreign student, and English for Migrants student, or a Ministry of Foreign Affairs and Trade sponsored student. These criteria are likely to understate immigrants, as people who became residents before entering tertiary education (and thus appear in MOE data as domestic students) are not distinguished from NZ born.

The results in this working 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 working paper are those of the authors, not Statistics NZ, Ministry of Education, or Motu Economic and Public Policy Research Trust. 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 working 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](http://www.stats.govt.nz). 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.

## DESCRIPTIVE STATISTICS

Table 1 shows the (headcount) number of all workers who work in ECE from 2001 to 2017. As discussed above, since ECE workers might also work in other industries, we classify them into four groups based on their primary industry: preschool education, child care services, other school education, and other industries. Over the period, the total annual number of workers in ECE almost doubled, from 29,200 to 57,700, or at an average annual growth rate of 4.3%, outstripping NZ's population growth, which increased at 1.3% annually during 2001-2017.<sup>7</sup>

**Table 1: Number of ECE workers by worker's primary industry**

	Total ECE workers	Pre-school educ	Child care services	School educ	Other industry	Share in ECE primary	No. non-ECE jobs	No. ECE jobs
2001	29,232	12,324	9,060	1,632	6,210	0.73	0.88	1.24
2002	30,555	13,320	9,096	1,641	6,498	0.73	0.91	1.23
2003	32,067	14,172	9,468	1,794	6,630	0.74	0.89	1.27
2004	33,249	15,015	9,594	1,767	6,876	0.74	0.89	1.28
2005	35,466	16,080	9,849	1,782	7,758	0.73	0.93	1.29
2006	36,900	17,037	10,368	1,806	7,686	0.74	0.90	1.26
2007	39,060	18,765	10,668	1,728	7,896	0.75	0.87	1.28
2008	42,189	21,642	10,347	1,911	8,286	0.76	0.83	1.25
2009	44,382	24,111	11,571	1,668	7,032	0.80	0.71	1.23
2010	47,022	25,680	12,279	1,701	7,362	0.81	0.69	1.28
2011	48,324	26,724	12,684	1,746	7,170	0.82	0.64	1.29
2012	49,461	27,285	13,356	1,803	7,017	0.82	0.62	1.29
2013	51,567	28,353	13,944	1,878	7,389	0.82	0.58	1.26
2014	53,112	29,079	14,457	1,887	7,683	0.82	0.58	1.25
2015	54,447	29,820	15,024	1,995	7,611	0.82	0.55	1.29
2016	55,926	30,189	15,801	2,055	7,881	0.82	0.56	1.26
2017	57,684	30,903	16,224	2,190	8,361	0.82	0.58	1.29
Average annual growth rate								
2001-17	4.3%	5.9%	3.7%	1.9%	1.9%			
2007-17	4.0%	5.1%	4.3%	2.4%	0.6%			

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: Year is calendar year. Counts are randomly rounded to base 3 to protect confidentiality.

Disaggregated by worker's primary industry, the number of workers increased steadily for each industry in each year. However, the relative shares of the two ECE industries increased at the expense of the two non-ECE industry groups. In 2001, 42% of ECE workers derived most of their employment income from 'preschool education', 31% from 'child care services', 6% from 'school education' and 21% from 'other industries'. In 2017 the corresponding breakdown was 54%, 28%, 4% and 14%. The share of ECE workers whose primary industry was in the two ECE industries rose from 73% in 2001 to 82% in 2017. Furthermore, while the mean number of ECE jobs per worker stabilised at around 1.23-1.29, the mean number of non-ECE jobs decreased from 0.88 in 2001 to 0.58 in 2017. This suggests ECE employment has become more 'intensive', consistent with changes to increasing funding for and level of ECE over the period.

7. Between 2001 and 2017 the NZ population increased from 3.9 million to 4.8 million, see <https://www.stats.govt.nz/topics/population>.

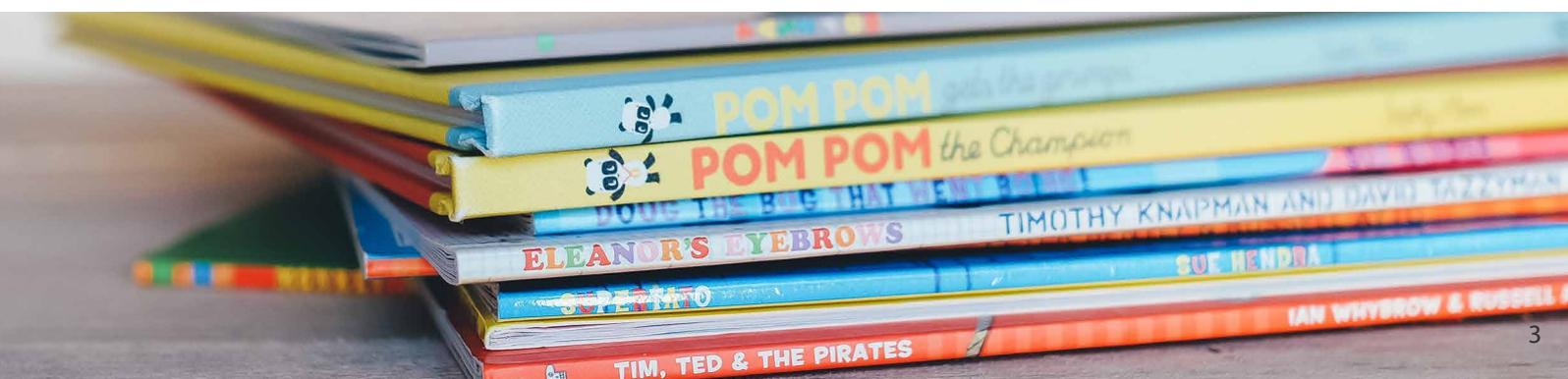


Figure 1 compares the number of ECE workers identified by our study with those from alternative sources, namely Statistics New Zealand’s Business Demography (BD) and Linked Employer-Employee Data (LEED).<sup>8</sup> The BD and LEED’s numbers of ‘child care services’ workers track very closely to each other, but BD’s number of ‘preschool education’ is slightly higher than LEED’s. Our numbers of ECE workers are around 20% higher than BD’s numbers. This is because BD statistics are limited to economically significant individual, private-sector and public-sector enterprises that are engaged in the production of goods and services in New Zealand. As such, BD statistics likely excludes kindergartens, which are apparently classified as belonging to the ‘central government’ institutional sector in the LBD.<sup>9</sup> Nevertheless, the three sources of data display similar trends over the period 2001-2017.

**Figure 1: Number of workers in the Early Childhood Education sector**

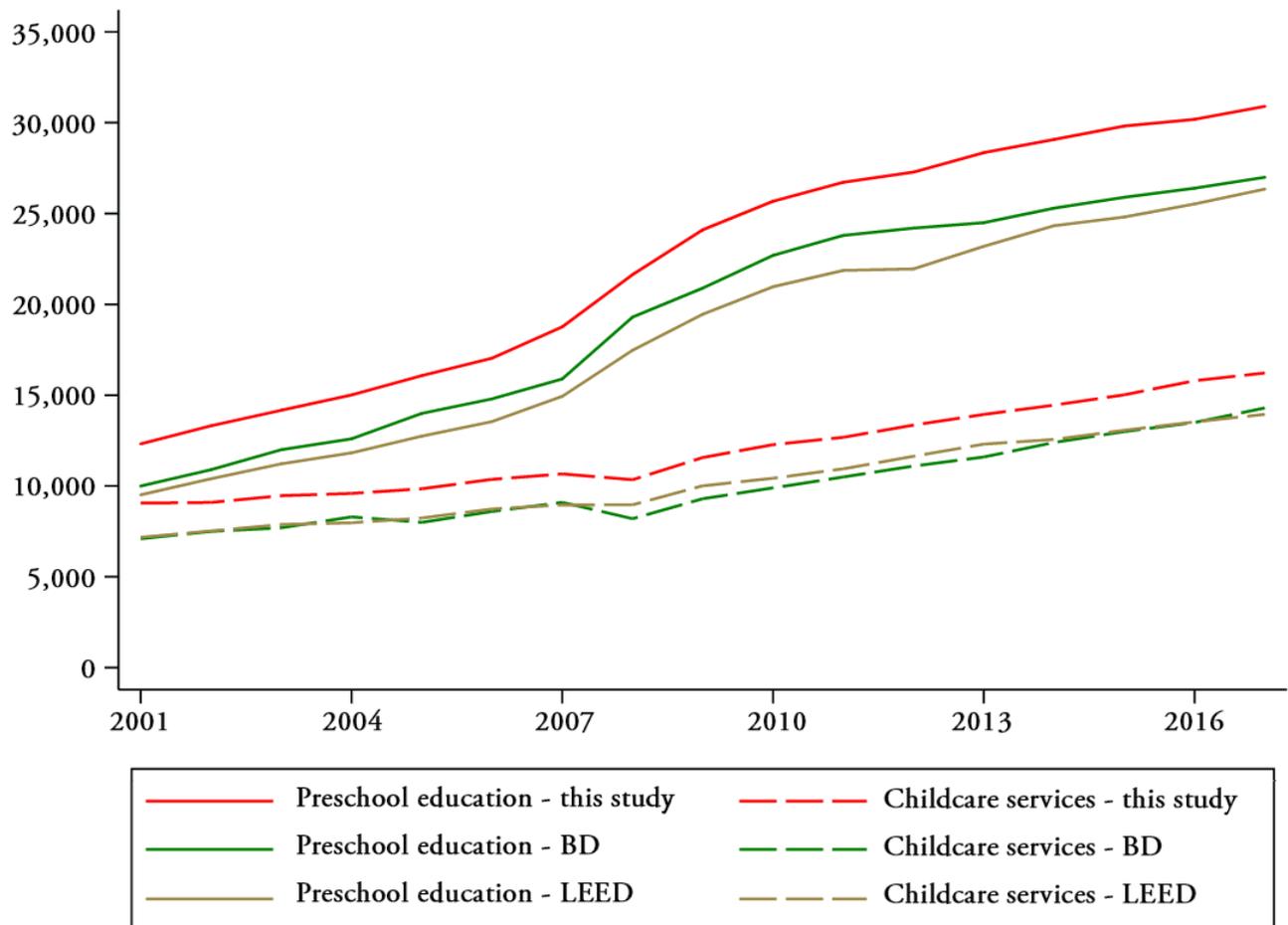
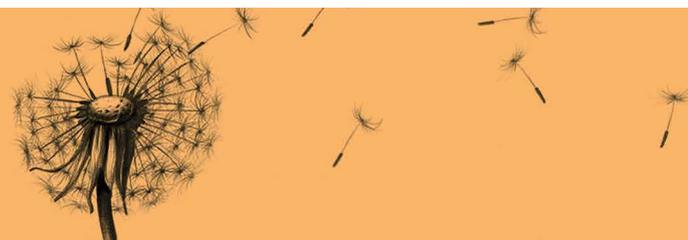


Table 2 presents descriptive statistics for ECE workers for selected years. Women make up the overwhelming majority (94%) of the ECE workforce. The share of immigrant workers increased from 7% in 2001 to 16% in 2017. Part of this increase is due to the fact that over time more and more workers are captured in the MOE data. As mentioned previously, our immigrant numbers are likely to be understated. Indeed, the share of immigrants here is much lower than in the general population. For example, Hyslop et al (2018, Table 1) show that the share of immigrants in the NZ usual resident population aged 18 or above was 23% in 2001, rising to 29% in 2013. Consistent with the rising share of immigrants, the share of workers of Asian ethnicity rose from 3% to 12% while the share of those of Pakeha ethnicity decreased from 67% to 59% over the period.<sup>10</sup>

8. Available from <http://nzdotstat.stats.govt.nz/wbos>.

9. When we exclude the ‘central government’ institutional sector, our employment numbers are 0-6% higher than BD’s numbers for ‘preschool education’ and 11-23% higher for ‘child care services’. Thus, excluding the government sector aligns the ‘preschool education’ numbers closely to BD’s while it seems plausible the remaining differences for ‘child care services’ is due to economically non-significant enterprises.

10. Unpublished work for Hyslop et al (2019) shows that between 2001 and 2013 the share of Pakeha decreased from 76% to 69%, while the share of Asians rose from 6% to 11%.



**Table 2: Characteristics of ECE workers**

	2001	2007	2009	2017
Female	0.94	0.93	0.93	0.93
Immigrant	0.07	0.12	0.13	0.16
<i>Ethnic group<sup>a</sup></i>				
Pākehā	0.67	0.64	0.64	0.59
Māori	0.14	0.11	0.1	0.09
Pacifika	0.05	0.05	0.05	0.06
Asian	0.03	0.06	0.07	0.12
Other single ethnic	0.02	0.02	0.02	0.02
Māori-Pākehā	0.07	0.08	0.08	0.09
Other ethnic mix	0.03	0.03	0.03	0.03
<i>Highest qualification</i>				
Qual level 1-3	0.05	0.08	0.08	0.08
Qual level 4-6	0.07	0.19	0.21	0.23
Degree (level 7+)	0.05	0.13	0.17	0.32
No quals data	0.83	0.6	0.54	0.38
Has ECE qual by current year	0.04	0.15	0.2	0.32
Has ECE qual any time in data	0.16	0.28	0.31	0.32
<i>Worker's primary industry</i>				
Preschool education	0.42	0.48	0.54	0.54
Child care services	0.31	0.27	0.26	0.28
School education	0.06	0.04	0.04	0.04
Other industries	0.21	0.2	0.16	0.14
<i>ECE attachment</i>				
All earnings is fr ECE	0.5	0.51	0.58	0.64
50%+ earnings is fr ECE	0.22	0.23	0.22	0.17
<50% earnings is fr ECE	0.28	0.26	0.21	0.19
<i>Worker's primary region<sup>b</sup></i>				
Auckland	0.29	0.31	0.3	0.36
Wellington	0.13	0.12	0.12	0.11
Canterbury	0.11	0.11	0.11	0.11
<i>Birth cohort</i>				
<1970	0.6	0.45	0.41	0.27
1970s	0.28	0.24	0.24	0.21
1980-84	0.11	0.13	0.12	0.12
1985-89	0.01	0.14	0.15	0.13
>=1990	0	0.03	0.07	0.27
Mean age	35.75	36.38	36.71	37.93
Mean earnings	19,500	24,800	27,200	30,000
Mean ECE earnings	14,500	19,200	22,700	25,400
Median earnings	14,800	20,100	22,100	26,700
Median ECE earnings	6,800	11,300	15,100	20,300
Mean non-ECE jobs	0.88	0.87	0.71	0.58
Mean ECE jobs	1.24	1.28	1.23	1.29
Mean months worked in non-ECE	3.23	3.11	2.58	2.31
Mean months worked in ECE	7.36	7.81	8.37	8.75
Total headcount	29,232	39,060	44,382	57,684

Source: Statistics New Zealand's Integrated Data Infrastructure. Note: Year is calendar year. Counts are randomly rounded to base 3 to protect confidentiality.

Earnings are in June 2017 dollars. a. The ethnic groups are exclusive to each other but do not add up to 100% due to missing data. b. We define 9 regions: Auckland, Waikato, Rest of Upper North Island, Wellington, Rest of Lower North Island, Canterbury, Otago, Rest of South Island, and Areas not in territorial authority or Missing. To save space we only present results for the three metropolitan regions.

The share of degree-qualified workers and ECE qualified workers increased dramatically (from 4-5% in 2001 to 32% in 2017), both because over time increasingly more workers have their qualifications captured in the MOE data, and because the ECE workforce is increasingly required to be qualified.<sup>11</sup> On average ECE workers were just under 36 years old in 2001, rising to just under 38 years old in 2017.

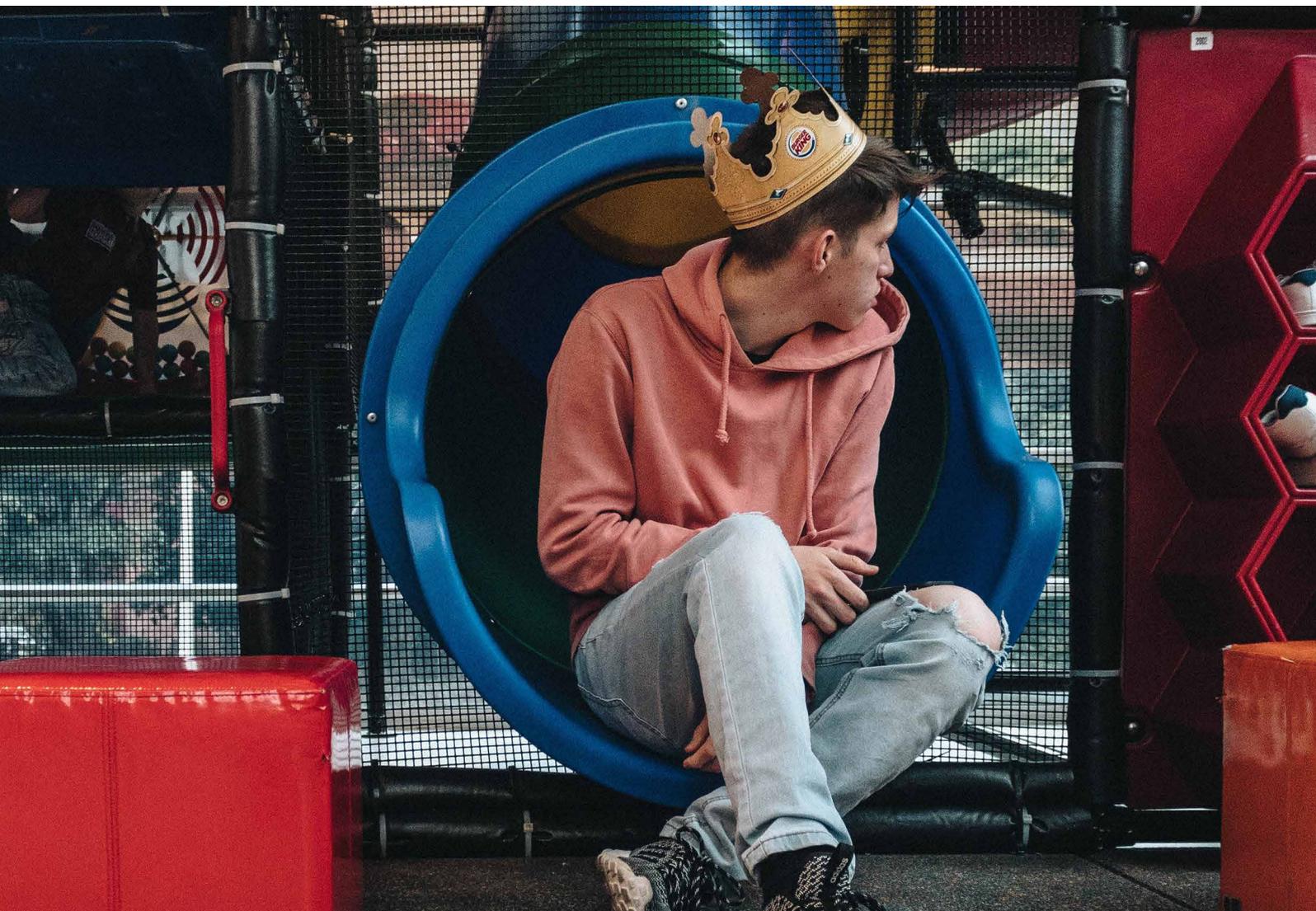
In terms of ECE industry attachment, whereas only half of ECE workers derived all of their earnings from ECE in 2001, this share rose to 64% in 2017. Correspondingly, the share of ECE workers who derived less than half of their earnings from ECE dropped from 28% to 19% over the same period. While mean total earnings of all ECE workers increased by 54% over the period 2001-2017, mean ECE earnings increased by 75% and median ECE earnings almost tripled. The mean number of months worked in ECE jobs increased from 7.4 to 8.8 months a year, while the mean number of months worked in non-ECE jobs decreased from 3.2 to 2.3. All of these are consistent with the increasing intensity of ECE generally, leading to more intensive ECE work. However, the annual earnings levels for ECE workers are comparably low, indicating that part-time is widespread in the sector.<sup>12</sup>

Disaggregated by industry, Table 3 shows that both ECE industries experienced similar temporal trends. The most noticeable differences are that 'child care services' workers are on average 3.5 years younger than 'preschool education' workers, and that in 2001 'preschool education' workers earned less than 'child care services' workers but the opposite was true in 2017.

Disaggregated by ECE industry attachment, people who derive most or all of their earnings from ECE are far more likely to hold an ECE qualification than those whose ECE earnings is only a small share (<50%) of their total earnings. Table 4 also shows that mean age is higher the higher the extent of ECE attachment. If low ECE attachment is an indicator of casual work, these numbers suggest casual workers are younger than non-casual workers. Furthermore, Table 3 and Table 4 show higher proportions of females among people who work primarily in the ECE industries, consistent with the common knowledge that ECE work is predominantly carried out by women.

11. The proportion of ECE teachers that were registered with the New Zealand Teachers' Council increased from 35% in 2003 to 75% in 2013. To become registered teachers must hold a qualification approved by the Council, see the Ministry of Education (2014).

12. Median weekly earnings for the June 2017 quarter was \$959 ([http://archive.stats.govt.nz/browse\\_for\\_stats/income-and-work/Income/LabourMarketStatisticsIncome\\_HOTP/jun17qtr.aspx](http://archive.stats.govt.nz/browse_for_stats/income-and-work/Income/LabourMarketStatisticsIncome_HOTP/jun17qtr.aspx)), implying median annual earnings that are over 80% higher than those of ECE workers (\$26,700 in 2017).



**Table Three:** Characteristics of ECE workers, by worker's primary industry

	2001		2017	
	Preschool education	Child care services	Preschool education	Child care services
Female	0.95	0.95	0.95	0.92
Immigrant	0.07	0.08	0.16	0.17
Pakeha	0.59	0.74	0.59	0.58
Maori	0.22	0.06	0.11	0.05
Pacifika	0.06	0.04	0.06	0.06
Asian	0.02	0.04	0.12	0.14
Other single ethnic	0.01	0.02	0.02	0.02
Maori-Pakeha	0.07	0.06	0.08	0.09
Other ethnic mix	0.03	0.03	0.03	0.04
Qual level 1-3	0.04	0.06	0.08	0.07
Qual level 4-6	0.07	0.08	0.25	0.21
Degree	0.04	0.05	0.35	0.31
No quals data	0.85	0.81	0.33	0.40
Has ECE qual by current year	0.04	0.06	0.39	0.33
Has ECE qual any time in data	0.15	0.21	0.39	0.33
All earnings is fr ECE	0.70	0.67	0.79	0.75
50%+ earnings is fr ECE	0.29	0.30	0.20	0.23
<50% earnings is fr ECE	0.02	0.02	0.01	0.02
Auckland	0.29	0.32	0.33	0.41
Wellington	0.10	0.15	0.10	0.12
Canterbury	0.09	0.12	0.13	0.08
Mean age	37.98	34.54	40.33	36.24
Mean earnings	19,600	20,400	33,100	27,600
Mean ECE earnings	18,600	19,300	32,000	26,500
Median earnings	14,600	17,300	30,700	25,000
Median ECE earnings	13,100	15,700	29,400	23,200
Mean non-ECE jobs	0.44	0.49	0.28	0.34
Mean ECE jobs	1.24	1.27	1.34	1.27
Mean months worked in non-ECE	1.25	1.34	0.82	1.01
Mean months worked in ECE	8.65	8.85	10.01	9.44
Total headcount	12,324	9,060	30,903	16,224

Source: Statistics New Zealand's Integrated Data Infrastructure  
Note: see Table 2.



**Table 4: Characteristics of ECE workers by ECE attachment**

	2001			2017		
	All earnings from ECE	50%+ earnings from ECE	<50% earnings from ECE	All earnings from ECE	50%+ earnings from ECE	<50% earnings from ECE
Female	0.95	0.95	0.91	0.94	0.92	0.87
Immigrant	0.07	0.08	0.07	0.17	0.16	0.13
Pakeha	0.64	0.69	0.71	0.59	0.58	0.59
Maori	0.16	0.12	0.10	0.09	0.09	0.08
Pacifika	0.05	0.04	0.04	0.06	0.05	0.05
Asian	0.03	0.03	0.02	0.13	0.12	0.11
Other single ethnic	0.02	0.01	0.02	0.02	0.02	0.02
Maori-Pakeha	0.07	0.07	0.07	0.08	0.09	0.09
Other ethnic mix	0.03	0.03	0.03	0.03	0.04	0.04
Qual level 1-3	0.05	0.05	0.05	0.07	0.08	0.09
Qual level 4-6	0.07	0.09	0.06	0.24	0.24	0.20
Degree	0.03	0.06	0.07	0.34	0.32	0.22
No quals data	0.85	0.79	0.82	0.35	0.36	0.49
Has ECE qual by current year	0.05	0.06	0.02	0.39	0.32	0.10
Has ECE qual any time in data	0.17	0.20	0.10	0.39	0.32	0.10
All earnings is fr ECE	0.58	0.56	0.03	0.67	0.62	0.02
50%+ earnings is fr ECE	0.42	0.44	0.03	0.33	0.37	0.03
<50% earnings is fr ECE	-	-	0.20	-	-	0.20
Auckland	-	-	0.75	-	-	0.75
Wellington	0.31	0.29	0.27	0.36	0.35	0.35
Canterbury	0.12	0.12	0.14	0.11	0.11	0.11
Mean age	0.10	0.12	0.12	0.11	0.10	0.12
Mean age	37.09	35.33	33.70	39.61	36.68	33.47
Mean emp earnings	18,800	23,100	18,000	31,500	30,600	24,500
Mean ECE emp earnings	18,800	20,000	2,600	31,500	26,100	4,200
Median emp earnings	14,600	18,800	12,700	29,900	26,200	19,600
Median ECE emp earnings	14,600	15,100	900	29,900	20,900	2,000
Mean non-ECE jobs	-	1.39	2.06	-	1.30	1.84
Mean ECE jobs	1.21	1.35	1.20	1.30	1.38	1.18
Mean months worked in non-ECE	-	3.91	8.42	-	3.83	8.61
Mean months worked in ECE	8.75	8.95	3.69	10.00	9.35	4.07
Total headcount	14,652	6,300	8,274	36,699	9,912	11,073

Source: Statistics New Zealand's Integrated Data Infrastructure  
Note: see Table 2

Examining qualifications, Table 5 shows that the share of female workers is even higher among qualified workers than among non-qualified workers, which suggests that men who work in the ECE sector are more likely to work in non-teaching positions. Compared to their non-qualified counterparts, qualified workers work more in and earn more from ECE jobs. Interestingly, while median earnings are lower than mean earnings for non-qualified workers, which is typical of an income distribution, among qualified workers median earnings are greater than mean earnings. This pattern holds when we restrict to workers who derive all of their earnings from ECE (Table 6).

Tables 4-6 suggest that factors contributing to low earnings among ECE workers included not having an ECE qualification, working fewer months, and not working exclusively in the ECE sector. These are indicators of part-time work (even though information on hours worked is not captured in our data). Indeed, the median earnings for qualified workers who derived all of their earnings from ECE was \$45,500 in 2017, very close to the general median earnings as mentioned in footnote 12.

**Table 5: Characteristics of ECE workers, by qualified status**

	2001		2017	
	Not qualified	Qualified	Not qualified	Qualified
Female	0.94	0.98	0.90	0.98
Immigrant	0.07	0.08	0.13	0.23
Pakeha	0.67	0.76	0.56	0.63
Maori	0.14	0.04	0.11	0.04
Pacifika	0.05	0.05	0.06	0.06
Asian	0.03	0.04	0.11	0.16
Other single ethnic	0.02	0.01	0.02	0.02
Maori-Pakeha	0.07	0.06	0.09	0.07
Other ethnic mix	0.03	0.04	0.04	0.03
Qual level 1-3	0.05	-	0.11	-
Qual level 4-6	0.05	0.56	0.22	0.25
Degree	0.03	0.44	0.11	0.75
No quals data	0.87	-	0.56	-
Has ECE qual any time in data	0.12	1.00	-	1.00
Preschool education	0.42	0.41	0.48	0.65
Child care services	0.30	0.43	0.28	0.29
School education	0.06	0.04	0.05	0.02
Other industries	0.22	0.11	0.19	0.04
All earnings is fr ECE	0.50	0.54	0.57	0.77
50%+ earnings is fr ECE	0.21	0.30	0.17	0.17
<50% earnings is fr ECE	0.29	0.16	0.25	0.06
Auckland	0.30	0.25	0.35	0.36
Wellington	0.12	0.17	0.11	0.11
Canterbury	0.11	0.13	0.11	0.12
Mean age	35.92	32.05	37.57	38.68
Mean earnings	19,100	28,400	23,900	43,100
Mean ECE earnings	14,000	24,700	18,200	40,500
Median earnings	14,200	31,200	19,600	45,300
Median ECE earnings	6,300	27,100	11,400	43,700
Mean non-ECE jobs	0.89	0.72	0.71	0.30
Mean ECE jobs	1.23	1.46	1.24	1.41
Mean months worked in non-ECE	3.26	2.37	2.88	1.11
Mean months worked in ECE	7.29	8.93	7.99	10.35
Total headcount	27,960	1,269	39,207	18,477

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2.

Qualified: has ECE qual by current year, Not qualified: has no ECE qual by current year as found in MOE 'completion' data



**Table 6: Characteristics of ECE workers, by qualified status, for workers in ECE only**

	2001		2017	
	Not qualified	Qualified	Not qualified	Qualified
Female	0.95	0.98	0.92	0.98
Immigrant	0.07	0.08	0.13	0.23
Pakeha	0.63	0.76	0.56	0.63
Maori	0.17	0.04	0.12	0.03
Pacifika	0.05	0.04	0.06	0.06
Asian	0.03	0.04	0.11	0.16
Other single ethnic	0.02	0.01	0.02	0.02
Maori-Pakeha	0.06	0.07	0.09	0.07
Other ethnic mix	0.03	0.04	0.04	0.03
Qual level 1-3	0.05	-	0.12	-
Qual level 4-6	0.04	0.60	0.23	0.25
Degree	0.02	0.40	0.09	0.75
No quals data	0.89	-	0.57	-
Has ECE qual any time in data	0.13	1.00	-	1.00
Preschool education	0.59	0.48	0.65	0.69
Child care services	0.41	0.52	0.35	0.31
Auckland	0.31	0.27	0.36	0.36
Wellington	0.12	0.19	0.11	0.11
Canterbury	0.10	0.11	0.10	0.12
Mean age	37.33	32.28	40.13	38.79
Mean earnings	18,300	28,500	24,300	43,100
Median earnings	13,700	32,000	20,400	45,500
Mean ECE jobs	1.21	1.39	1.24	1.39
Mean months worked in ECE	8.69	10.02	9.45	10.86
Total headcount	13,974	681	22,476	14,220

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2.

Qualified: has ECE qual by current year, Not qualified: has no ECE qual by current year as found in MOE 'completion' data. This table is like Table 5 but for people whose all employment income is from ECE only.

## RETENTION AND TURNOVER

Table 7 shows the overall industry transition rates for early childhood education workers. In 2001, 73% of all ECE workers worked primarily in the two ECE industries, 6% worked primarily in 'school education' and 21% in 'other industries'. In 2017, 82% of all ECE workers worked primarily in the two ECE industries, only 4% worked primarily in 'school education' and 14% in 'other industries'.

Disaggregated by industry, the two ECE industries have relatively high retention rates, which improved over time. For example, 64% of 'preschool education' workers in 2001 had been in the same industry the previous year and 69% would remain in that industry in the following year. The corresponding rates for 2017 were 77% and 79% respectively. 'Child care services' workers also experienced the same patterns. Consistent with improved retention rates over time, movements into and out of ECE decreased over time. In 2001 about a fifth of ECE workers had worked in 'other industries' the previous year and similar proportion would go to 'other industries' the following year, but by 2017 this proportion had halved. Interestingly, there is very little movement between the two ECE industries.

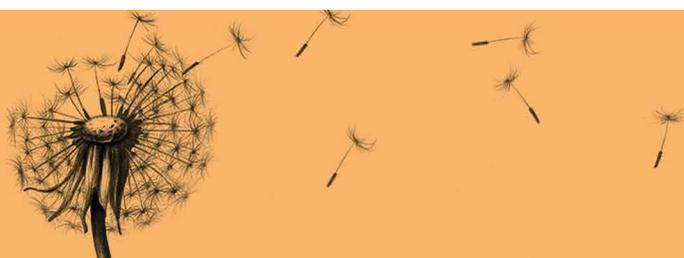


Table 7: Industry annual transitions for ECE workers

	Primary industry: current year			
	Preschool education	Child care services	School education	Other industries
2001				
Overall share	0.42	0.31	0.06	0.21
Last year's industry				
Preschool education	<b>0.64</b>	0.04	0.15	0.11
Child care services	0.03	<b>0.63</b>	0.08	0.09
School education	0.03	0.03	0.51	0.03
Other industries	0.21	0.22	0.20	0.70
Non-employment	0.08	0.09	0.07	0.07
Next year's industry				
Preschool education	<b>0.69</b>	0.07	0.09	0.09
Child care services	0.03	<b>0.63</b>	0.05	0.08
School education	0.04	0.03	0.70	0.04
Other industries	0.18	0.18	0.14	0.76
Non-employment	0.07	0.07	-	0.03
2017				
Overall share	0.54	0.28	0.04	0.14
Last year's industry				
Preschool education	<b>0.77</b>	0.07	0.17	0.13
Child care services	0.04	<b>0.67</b>	0.12	0.12
School education	0.02	0.02	0.51	0.02
Other industries	0.11	0.14	0.14	0.65
Non-employment	0.06	0.10	-	0.08
Next year's industry				
Preschool education	<b>0.79</b>	0.10	0.09	0.13
Child care services	0.04	<b>0.67</b>	0.05	0.09
School education	0.02	0.03	0.74	0.03
Other industries	0.10	0.14	0.10	0.71
Non-employment	0.05	0.07	0.02	0.04

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2. – Suppressed to protect confidentiality.

Tables 8-11 contain industry transition by worker characteristics for 2001 and 2017. Men are more likely to move in and out of ECE than women. For example, in 2017, 35% of male ECE workers had come from non-ECE industries in the previous year and 53% would move to non-ECE industries in the following year. The corresponding proportions among females were respectively 22% and 36%. Conversely, ECE retention rates are higher among women than among men. For example, 70% female ECE workers in 2017 had come from within the ECE sector and 70% would remain in the sector in the following year. Among male workers these figures were respectively 55% and 53%.

Younger groups are more mobile (into and out of ECE) than older groups, however this seems more an age group effect than a birth cohort effect. Also more mobile are people with higher qualifications or no recorded qualifications, people without an ECE qualification, and those who derive less than 50% of their earnings from ECE. There are no noticeable differences in transition rates across the major regions, or between kiwis and immigrants.



**Table 8: Industry annual transitions for ECE workers: from last year to current year (2001)**

	Primary industry: last year				
	Preschool education (1)	Childcare services (2)	School education (3)	Other industries (4)	No EMS work (5)
Male	0.25	0.17	0.07	0.42	0.09
Female	0.32	0.24	0.06	0.31	0.08
Kiwi-born	0.32	0.23	0.06	0.32	0.08
Immigrant	0.28	0.22	0.06	0.29	-
Pakeha	0.28	0.26	0.06	0.31	0.08
Maori	0.49	0.09	0.05	0.33	0.04
Pacifika	0.34	0.18	0.04	0.36	0.07
Asian	0.21	0.28	0.06	0.23	-
Other single ethnic	0.21	0.30	0.07	0.32	-
Maori-Pakeha	0.29	0.20	0.05	0.39	0.06
Other ethnic mix	0.26	0.24	0.05	0.35	-
Qual level 1-3	0.23	0.25	0.04	0.44	-
Qual level 4-6	0.32	0.29	0.07	0.30	-
Degree	0.22	0.23	0.10	0.42	-
No quals data	0.32	0.23	0.05	0.31	0.09
No ECE quals by current year	0.31	0.23	0.06	0.32	0.09
Has ECE qual by current year	0.33	0.37	0.05	0.23	-
No ECE quals ever found	0.32	0.21	0.06	0.33	0.09
Has ECE qual any time in data	0.30	0.33	0.05	0.27	0.06
<50% earnings is fr ECE	0.12	0.09	0.12	0.59	0.07
50%+ earnings is fr ECE	0.33	0.25	0.06	0.31	0.05
All earnings is fr ECE	0.41	0.31	0.01	0.17	0.10
Auckland	0.30	0.24	0.05	0.30	0.11
Wellington	0.27	0.27	0.06	0.32	0.08
Canterbury	0.27	0.27	0.07	0.31	0.08
Born <1970	0.37	0.22	0.07	0.26	0.07
Born 1970s	0.27	0.27	0.04	0.34	0.07
Born 1980-84	0.11	0.18	0.02	0.59	0.10
Born 1985-89	0.09	0.20	-	0.19	0.51
Born >=1990	0.21	0.21	-	0.16	-
Overall share	0.31	0.23	0.06	0.32	0.08
Total headcount	9,129	6,768	1,629	9,291	2,409

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2. – Suppressed to protect confidentiality.



**Table 9: Industry annual transitions for ECE workers: from current year (2001) to next year**

	Primary industry: last year				
	Preschool education (1)	Childcare services (2)	School education (3)	Other industries (4)	No EMS work (5)
Male	0.26	0.15	0.09	0.44	0.06
Female	0.34	0.23	0.07	0.29	0.06
Kiwi-born	0.34	0.23	0.07	0.30	0.06
Immigrant	0.36	0.23	0.10	0.26	0.06
Pakeha	0.31	0.26	0.08	0.29	0.06
Maori	0.49	0.08	0.07	0.34	0.03
Pacifika	0.44	0.20	0.05	0.28	0.03
Asian	0.30	0.28	0.12	0.20	-
Other single ethnic	0.26	0.30	0.08	0.29	-
Maori-Pakeha	0.29	0.21	0.07	0.38	0.05
Other ethnic mix	0.29	0.24	0.07	0.36	-
Qual level 1-3	0.29	0.29	0.04	0.35	-
Qual level 4-6	0.38	0.28	0.08	0.23	-
Degree	0.29	0.21	0.22	0.24	-
No quals data	0.34	0.22	0.07	0.31	0.06
No ECE quals by current year	0.33	0.22	0.07	0.31	0.06
Has ECE qual by current year	0.43	0.35	0.07	0.12	-
No ECE quals ever found	0.32	0.20	0.08	0.33	0.07
Has ECE qual any time in data	0.41	0.37	0.05	0.15	-
<50% earnings is fr ECE	0.09	0.08	0.18	0.61	0.04
50%+ earnings is fr ECE	0.41	0.27	0.06	0.23	0.04
All earnings is fr ECE	0.45	0.30	0.02	0.15	0.08
Auckland	0.34	0.24	0.07	0.28	0.07
Wellington	0.28	0.26	0.08	0.31	0.07
Canterbury	0.31	0.27	0.07	0.29	0.06
Born <1970	0.38	0.21	0.08	0.26	0.06
Born 1970s	0.30	0.26	0.07	0.31	0.07
Born 1980-84	0.20	0.23	0.04	0.50	-
Born 1985-89	0.13	0.26	0.01	0.48	-
Born >=1990	0.21	0.16	-	0.16	-
Overall share	0.34	0.23	0.07	0.30	0.06
Total headcount	9,858	6,687	2,169	8,775	1,743

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2. – Suppressed to protect confidentiality.



**Table 10: Industry annual transitions for ECE workers: from last year to current year (2017)**

	Primary industry: last year				
	Preschool education (1)	Childcare services (2)	School education (3)	Other industries (4)	No EMS work (5)
Male	0.30	0.25	0.05	0.30	0.11
Female	0.47	0.23	0.03	0.19	0.07
Kiwi-born	0.46	0.23	0.04	0.20	0.07
Immigrant	0.46	0.25	0.03	0.16	0.08
Pakeha	0.47	0.24	0.04	0.19	0.06
Maori	0.54	0.14	0.05	0.23	0.05
Pacifika	0.48	0.23	0.03	0.19	0.06
Asian	0.41	0.27	0.03	0.17	0.13
Other single ethnic	0.41	0.25	0.03	0.20	-
Maori-Pakeha	0.43	0.23	0.04	0.24	0.07
Other ethnic mix	0.38	0.23	0.03	0.25	0.11
Qual level 1-3	0.43	0.19	0.03	0.29	0.06
Qual level 4-6	0.51	0.23	0.03	0.20	0.04
Degree	0.54	0.26	0.04	0.12	0.04
No quals data	0.37	0.22	0.03	0.24	0.13
No ECE quals by current year	0.39	0.21	0.04	0.26	0.10
Has ECE qual by current year	0.61	0.28	0.02	0.06	0.02
No ECE quals ever found	0.39	0.21	0.04	0.26	0.10
Has ECE qual any time in data	0.61	0.28	0.02	0.06	0.02
<50% earnings is fr ECE	0.14	0.12	0.12	0.54	0.08
50%+ earnings is fr ECE	0.41	0.22	0.04	0.27	0.06
All earnings is fr ECE	0.57	0.27	0.01	0.07	0.08
Auckland	0.42	0.26	0.03	0.19	0.10
Wellington	0.43	0.26	0.04	0.20	0.07
Canterbury	0.54	0.17	0.03	0.20	0.06
Born <1970	0.58	0.22	0.04	0.12	0.03
Born 1970s	0.54	0.23	0.04	0.14	0.06
Born 1980-84	0.48	0.24	0.03	0.16	0.08
Born 1985-89	0.45	0.23	0.03	0.19	0.09
Born >=1990	0.27	0.24	0.03	0.34	0.12
Overall share	0.46	0.23	0.04	0.20	0.08
Total headcount	26,508	13,449	2,052	11,325	4,353

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2. – Suppressed to protect confidentiality.



**Table 11: Industry annual transitions for ECE workers: from current year (2017) to next year**

	Primary industry: last year				
	Preschool education (1)	Childcare services (2)	School education (3)	Other industries (4)	No EMS work (5)
Male	0.31	0.22	0.07	0.35	0.06
Female	0.48	0.22	0.05	0.19	0.05
Kiwi-born	0.47	0.22	0.05	0.21	0.05
Immigrant	0.50	0.24	0.05	0.16	0.06
Pakeha	0.48	0.23	0.06	0.19	0.05
Maori	0.53	0.13	0.05	0.25	0.04
Pacifika	0.48	0.21	0.05	0.21	0.06
Asian	0.48	0.26	0.04	0.16	0.05
Other single ethnic	0.41	0.25	0.05	0.22	0.07
Maori-Pakeha	0.42	0.23	0.06	0.25	0.04
Other ethnic mix	0.42	0.22	0.06	0.25	0.05
Qual level 1-3	0.43	0.20	0.04	0.29	0.05
Qual level 4-6	0.51	0.22	0.04	0.19	0.04
Degree	0.55	0.23	0.07	0.12	0.04
No quals data	0.39	0.22	0.05	0.26	0.08
No ECE quals by current year	0.40	0.21	0.06	0.26	0.06
Has ECE qual by current year	0.61	0.25	0.03	0.07	0.03
No ECE quals ever found	0.40	0.21	0.06	0.26	0.06
Has ECE qual any time in data	0.61	0.25	0.03	0.07	0.03
<50% earnings is fr ECE	0.13	0.09	0.17	0.57	0.04
50%+ earnings is fr ECE	0.44	0.23	0.05	0.24	0.03
All earnings is fr ECE	0.58	0.26	0.01	0.08	0.06
Auckland	0.43	0.25	0.05	0.20	0.06
Wellington	0.46	0.23	0.05	0.20	0.06
Canterbury	0.55	0.16	0.04	0.19	0.05
Born <1970	0.56	0.21	0.05	0.13	0.06
Born 1970s	0.53	0.21	0.06	0.16	0.04
Born 1980-84	0.50	0.22	0.05	0.17	0.05
Born 1985-89	0.48	0.22	0.05	0.18	0.06
Born >=1990	0.32	0.24	0.05	0.33	0.06
Overall share	0.47	0.22	0.05	0.20	0.05
Total headcount	27,177	12,804	2,991	11,598	3,111

Source: Statistics New Zealand's Integrated Data Infrastructure

Note: see Table 2. – Suppressed to protect confidentiality.



## SUMMARY DISCUSSION

This note has summarised the results of exploratory research into the ability of Statistics New Zealand's IDI to support analysis of the early childhood education workforce. We have focused on three issues: the characteristics of the ECE workforce; the annual transition and retention rates of workers in the ECE sector; and the industry sources and destinations of ECE workers who move into and out of the ECE sector.

Overall, we believe the EMS data provides reliable employment and earnings data for wage and salary workers in the ECE sector, subject to some caveats. First, the base observation in the data is monthly employment and earnings, with no direct indicator of part-time versus full-time employment or measure of hours. This makes it difficult to gauge the level of employment intensity worked within a month, or obtain a reliable measure of hourly earnings or (full-time equivalent) salary rates. It may be possible to obtain benchmark from reported hours worked in the Household Labour Force Survey (HLFS) or the population Census. Second, both the measures of qualifications and immigration status used in the analysis are less reliable for older cohorts of workers. This makes trend comparisons of these characteristics over time difficult for all ECE workers; however, analyses based on younger cohorts should be more reliable and informative.

We find that, between 2001 and 2017 the number of annual ECE workers almost doubled, from 29,200 to 57,700. Within the ECE sector, the 'preschool education' industry has grown from having just over a third more workers than 'child care services' to almost double the size of the latter. Women make up the overwhelming majority (94%) of the ECE workforce. The share of immigrant workers more than doubled and consistently, the share of workers of Asian ethnicity rose dramatically over the period. The share of degree-qualified workers and ECE qualified workers increased dramatically, both because over time increasingly more workers have their qualifications captured in the MOE data, and because of the increasing requirements for qualifications in the ECE workforce. On average ECE workers were just under 36 years old in 2001, rising to just under 38 years old in 2017.





ECE employment has become more intensive during the study period. This is evident given that the mean number of months worked (per worker per year) in ECE increased, while the mean number of non-ECE jobs and the mean number of months worked in non-ECE decreased over the period. In addition, mean total earnings of all ECE workers increased by 54% over the period 2001-2017, compared to the 75% increase in mean ECE earnings and an almost tripling of median ECE earnings.

Retention rates within the ECE sector improved over the study period. Male workers are more likely than female workers to come from outside ECE industries and to move into those industries. Other characteristics that are associated with higher mobility include younger age groups, highest qualification being level 1-3, having no ECE qualifications, and deriving less than 50% of total earnings from ECE.

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