Evaluating Wellbeing in the Technology Sector

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Building a better working world

Table of contents

1. Key Findings

The demographic makeup of the tech sector identified for this analysis aligned to existing knowledge of the sector:

- The sector has an overrepresentation of males with around 3 in 4 employees being men.
- Māori/Pacific participate with the tech sector at less than half the rate of the rest of the population.
  - This difference is greatest for those aged 25-39 years old where Māori/Pacific are one third as likely to be working in the tech sector. This suggests that without directed policy positions, the disparity is not likely to change in the short to medium term.
- The tech sector offers an avenue to higher incomes for some participants.
  - Almost 1 in 5 non-Māori/Pacific who work in the tech sector earn over $140k p.a. Meanwhile, this statistic is around 1 in 10 for Māori and almost 1 in 25 for Pacific.
  - Almost half of Māori/Pacific working in tech earn between $40k-$80k p.a.

In evaluating indicators of wellbeing in the tech sector, particularly for Māori and Pacific groups, this analysis has focused on the outcomes of ethnicities in and out of the tech sector to provide more comparable results. Social disadvantage affects Māori and Pacific communities, as demonstrated in the data collated in this report. Rather than detailing the known significant gaps, this comparative analysis has focused on the relative outcomes within ethnicity groups, for example comparing Pacific cohorts in the tech sector to Pacific cohorts outside the tech sector. In this way, the results illustrate the ways in which employees in the tech sector experience lesser (or greater) disadvantage when compared to the broader community.

Throughout the analysis, income was demonstrated to be the primary driver of outcomes. This is an unsurprising effect, however, not an easily changed outcome. As such, this analysis controls for income in the comparative analysis by looking at the relative difference in outcomes within comparable income bands.

The key findings are drawn from a comparison of employees who consistently work in the tech sector with the rest of the adult working population. This comparison accounts for differences in income:

- Māori/Pacific are less likely to be on all main benefit types.
- The breakdown of benefits received is different to rest of population. Of note, all ethnicity groups are significantly less likely (around half) to be on single parent support.
- While the relationship between tertiary education attainment and income is different between the ethnicities, there is a clear correlation between educational attainment and escalation through low-to-middle incomes (income bands up to $80k p.a.). Beyond this income level, tertiary education rates stabilise.
  - Of note, Māori/Pacific in the tech sector who earn higher income bands (>$80k p.a.) have a relatively lower rate of tertiary qualifications to non-Māori/Pacific. This effect is not as strong as in other sectors where differences in educational achievement in high income bands are much narrower.
- Māori/Pacific in the tech sector with middle bands of income ($40k-100k p.a.) have longer tenure with employers of 10%/30% longer when compared to non-Māori/Pacific of similar income bands.
- Employees in the tech sector have lower likelihood of health treatment than those working in other sectors across hospitalisations, substance use and mental health treatment.
  - This size of this difference is experienced differently by the ethnicities with non-Māori/Pacific being consistently 20-25% less likely to receive treatment across all measures. Whereas Māori/Pacific are 5-35% less likely to receive treatment depending on the measures.
  - Uptake of mental health care treatment also differs for those in the tech sector. Māori/Pacific appear to have relatively lower access to non-pharmaceutical mental health

treatment when compared to Māori/Pacific in other sectors. This is driver particularly by those on lower incomes.

For children, the overarching finding of this analysis is the significance of income to outcomes. Moreso than outcomes for adult cohorts, few of the outcomes appeared to have significant effects beyond that of income. Two potential reasons for this are:

- In the analysis of children, joint income of birth parents was used to control for outcomes, whereas for adults only individual incomes were used as constructing a view of household/partners was not in scope. This means that income may have been better controlled for in the analysis of children than adults.
- Child outcomes may be more sensitive to family income as a driver of outcomes than adults.

The key trends identified in children of those who work in tech, when compared to other sectors, beyond the impact of income were:

- More stable schooling with fewer children having multiple school changes when comparing to other sectors. However, within the tech sector, Māori children remain almost 2x as likely to have several school changes than non-Māori/Pacific (Pacific children are 1.25x as likely).
- Children of those in the tech sector also have lower indicators of school disengagement (standdowns, suspensions and truancies), particularly Māori.
- After removing the effect of income, Māori children appear to be the only ethnicity with a lower exit rate from high school without NCEA qualification and a marginally higher rate of attainment of NCEA 3.
- Children of those working in the tech sector have relatively higher rates of Bachelors (or higher) enrolment, particularly for Māori. However, there is only a limited difference observed in qualification attainment after controlling for income.

When comparing the outcomes of adults in the tech sector to the public sector specifically, there was limited additional insights beyond those already identified. The two most significant differences were the notably lower rates of substance use treatment among public sector workers and higher tenure for lower-wage public sector employees when compared to those with similar incomes in the tech sector.

2. Purpose and Context

The purpose of this work is a proof of concept to leverage the IDI and Oranga Tamariki's Child Wellbeing Model to provide further depth of understanding of socio-economic outcomes for individuals pursuing careers in the technology sector and their whanau. The analysis will consider outcomes across domains of wellbeing for the cohorts of interest.

The motivation for the analysis questions is to provide contextual information which may inform Workforce Development Plans. The outputs of this analysis will help to quantify the effects of working in the sector, income and wellbeing outcomes for families. This will potentially support setting of cohort targets for participation and income within the technology sector.

The focus of the analysis questions is the technology sector, covering:

- *Analysis 1: Whether Māori, Pacific and children working in the sector have the same outcomes as non-Māori/Pacific?*

- *Analysis 2: What is the difference between Māori and Pacific outcomes in tech compared to Māori and Pacific outcomes in Public Administration?*

Initial versions of the analysis questions considered outcomes for women in the tech sector. Results were produced by gender and ethnicity to consider this factor. However due to low counts when splitting by gender, ethnicity and incomes, this analysis was not able to export results by gender which could control for income disparities. Given the differences in income distribution for men and women and the strong link between income and outcomes, this analysis focused on outcomes by ethnicity group and for their children. Considerations of gender in this analysis were limited to demographics, including incomes, and outcomes related to fertility.

3. Cohort Definitions and Outcomes

This section describes how we have determined the cohorts used in this study. Data is taken from various tables from the integrated data infrastructure (IDI).

3.1 Employment

Data is taken from the employee monthly schedule (EMS) table. This contains monthly income and tax information relating to individuals. This dataset has been filtered for the following:

- Wages and Salaries data (i.e., we have excluded the Self-Employed Income streams).
- Only income receipts over 10 tax years from 2013 – 2022 (i.e., 1 April 2013 to 31 March 2023).
- At least 50% or more of the income in the last 10 years comes from the sectors of interest (tech and public service).
- Sectors of interest are determined based on ANZSIC codes associated with the employer. That is, we have checked if the employer is classified in the sectors of interest as opposed to checking if the employee's occupation at the employer is in the sectors of interest. The ANZIC codes used for this classification can be found in Table 1 below.

Table 1: ANZSIC codes used to determine employer sector

Sector Name	ANZSIC Codes
Information and Communication Technology (ICT) sector	J542; J580; J592; M700; C241; C2421
High-tech manufacturing sector	C181; C184; C231; C239; C243; C244; C245; C246; C249
Public Administration	O75

- Include only those individuals who are residents of New Zealand.
- For those that die, excludes the income for the year those individuals pass away.
- Includes only those that are aged over 16 years and over (for adults).
- Exist in the APC (administrative population census) for each year of outcomes in scope
- Years before they started working in the Technology/Public Services are excluded - which means individuals will only appear in Technology, Public Services or Other Sectors
- Excluded individuals who are in the population for less than 2 years

3.2 Ethnicity

This report uses total ethnicity when describing outcomes for cohorts, this means that if an Individual identifies as Māori and Pacific, they will be counted as being part of the Māori cohort as well as the Pacific cohort. All remaining individuals have been included in an additional group labelled "Other" and is referred to as non-Māori/Pacific in this report.

Childrens' ethnicity has been derived from the ethnicity of birth parents and has also been grouped by total ethnicity.

3.3 Outcomes Framework

The outcomes framework focused on individuals captured in the analysis cohort definitions and their birth children. For participants with children, we leveraged data from Oranga Tamariki's child wellbeing model (CWM) and other IDI data sources. Further detail on the indicators considered can be found in Error! Reference source not found..

Outcomes were measured from the time individuals were considered to have entered the cohort. This is the latter of; beginning of the analysis period (2013), the first year they have recorded wages/salaries or the first year they have recorded wages/salaries in one of the two specific

sectors focused on in this analysis (tech sector or public sector). Outcomes fall into the following categories:

- Employment & Benefits (adult & child)
- Address churn (adult)
- Fertility (adult)
- Income (adult)
- Health (adult & child)
- Education (adult & child)
- Care & Protection (child)

3.4 Risk Ratios

A key measure used to compare outcomes between cohorts which has been used throughout the analysis was the relative risk ratio. Risk ratios compare the probability (or other measure) of an event between two comparison groups. The formula is defined as:

$$Risk\ Ratio = \frac{Probability\ of\ event\ (Group\ 1)}{Probability\ of\ event\ (Group\ 2)}$$

A value of >1 suggests that Group 1 is more likely to experience the event, conversely a value of <1 suggests that Group 2 is more likely to experience the event.

This measure was used as it is easy to interpret. Limitations of this measure are that the ratio can overstate or understate differences for very low or very high probability events. This report has tended to avoid calling out findings which may be overstated by this effect.

Controlling for income

To control for income in this analysis, incidence rates were also compared based on their income band. For example, the incidence rate of Pacific individuals who work in the tech sector earning $100-140k per annum was divided by the incidence rate of Pacific individuals earning $100-140k per annum who do not work in the tech sector. An average of these risk ratios is then taken, weighted by the number of children that fall into each group.

3.5 StatsNZ IDI Disclaimers

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data/.

Access to the data used in this study was provided by Stats NZ under conditions designed to give effect to the security and confidentiality provisions of the Data and Statistics Act 2022. The results presented in this study are the work of the author, not Stats NZ or individual data suppliers.

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes.

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.

4. Demographics and participation

Participation rates and demographics in the tech sector vary by ethnicity groups. Māori/Pacific appear to have fewer opportunities to enter the sector and those who do tend to be overrepresented in lower income bands.

Table 2 below illustrates the participation rates of individuals who work primarily in the tech sector as at March 2022. We can see there are lower participation rates amongst Māori/Pacific overall, with younger age groups having the greatest difference when compared to non-Māori/Pacific.

Table 2: Population distribution by total ethnicity and cohort working in tech sector in March 2022

Age Band	Māori[1]			Pacific[2]			Other		
	Total population[3]	Tech Sector	Participation Rate	Total population	Tech Sector	Participation Rate	Total population	Tech Sector	Participation Rate
16-24	150,600	1,000	0.6%	82,500	600	0.7%	386,900	5,000	1.3%
25-39	190,700	2,500	1.3%	104,300	1,700	1.6%	794,700	31,500	4.0%
40-54	143,900	2,200	1.5%	69,300	1,400	2.1%	747,200	30,700	4.1%
55-64	83,400	1,000	1.2%	34,200	700	1.9%	499,400	13,200	2.6%
65+	68,100	300	0.4%	28,700	200	0.6%	757,700	4,200	0.6%
Total	636,700	7,000	1.1%	319,000	4,600	1.4%	3,185,900	84,600	2.7%

The distribution of earnings also differs when comparing across ethnicities. Māori/Pacific employment in the tech sector is concentrated in middle incomes with very little representation in the highest income bands. While they constitute nearly 12% of the tech sector employment, less than 6% of those who earn over more than $100k are from these groups.

Table 3: Income distribution by ethnicity in the tech sector, March 2022

Wage & SEI band	Māori			Pacific			Other		
	Tech sector	Distribution	Participation Rate	Tech sector	Distribution	Participation Rate	Tech sector	Distribution	Participation Rate
< $10k	600	8%	0.7%	300	7%	1.0%	3,200	4%	1.2%
$10k-$25k	500	7%	0.7%	300	6%	0.9%	3,400	4%	1.3%
$25k-$40k	500	7%	0.9%	300	7%	1.1%	3,700	4%	1.5%
$40k-$60k	1,500	22%	1.6%	1,300	29%	2.1%	11,900	14%	2.6%
$60k-$80k	1,500	22%	2.2%	1,300	28%	3.1%	16,200	19%	4.1%
$80k-$100k	800	12%	2.4%	500	11%	2.9%	12,600	15%	5.2%
$100k-$140k	800	12%	3.5%	400	8%	3.8%	17,900	21%	8.4%
$140k-$180k	400	5%	5.3%	100	2%	4.8%	8,700	10%	10.4%
> $180k	300	5%	6.2%	100	2%	6.2%	7,200	9%	8.9%

The participation rate above looks at the proportion of working individuals who earn wages in each income band from participation in the tech sector. This provides a view of how income opportunities are accessed in the tech sector and whether ethnicities have greater or lesser access to higher income bands, beyond income distributions in the wider employment market.

[1] Māori counts are the based on total ethnicity and so include those who identify as Māori and Māori & Pacific

[2] Pacific counts are based on total ethnicity and so include those who identify as Pacific and Māori & Pacific

[3] Estimated total population is based on Administrative Population Census produced by StatsNZ based on linked administrative data.

As noted earlier, we see lower participation for Māori/Pacific in the tech sector, this is true across all incomes. However, the under-representation is greatest in higher income bands (> $80k) when compared to non-Māori/Pacific. This suggests that, overall, Māori/Pacific experience greater disadvantage to earn higher incomes in the tech sector than in the broader employment market.

Distribution of income by gender found that the smaller proportion of women in the sector also tended have lower wages compared to men. Trends by ethnicity appeared to be consistent for each gender with additional barriers to higher wages for Māori/Pacific women working in tech.

Interestingly, the distribution of income for Māori men is similar to that of non-Māori/Pacific women. Table 4 below illustrates this distribution. *Note: due to smaller counts in some groups of this view, the distribution is based on two time points to limit volatility and impacts of suppression of results.*

Table 4: Income distribution by ethnicity and gender in the tech sector, total counts for both March 2017 and 2022

Sex	Wage & SEI band	Māori			Pacific			Other		
		Tech sector	Distribution	Participation Rate	Tech sector	Distribution	Participation Rate	Tech sector	Distribution	Participation Rate
Females	< $10k	500	12%	0.5%	400	10%	0.9%	3,400	8%	1.0%
	$10k-$25k	400	10%	0.5%	300	8%	0.9%	3,700	8%	1.1%
	$25k-$40k	500	13%	0.7%	400	12%	1.3%	4,400	10%	1.3%
	$40k-$60k	1,100	28%	1.3%	1,300	35%	2.7%	9,500	22%	2.1%
	$60k-$80k	700	17%	1.5%	800	21%	3.3%	8,300	19%	2.9%
	$80k-$100k	300	9%	1.8%	300	7%	3.1%	5,200	12%	3.4%
	$100k-$140k	300	8%	2.5%	200	5%	3.7%	5,600	13%	5.2%
	$140k-$180k	100	3%	3.2%	<50	1%	4.0%	2,200	5%	6.1%
	> $180k	100	2%	4.0%	<50	1%	3.8%	1,700	4%	5.5%
Males	< $10k	800	8%	1.1%	300	6%	1.0%	6,000	5%	2.3%
	$10k-$25k	700	7%	1.2%	300	6%	1.2%	5,800	5%	2.5%
	$25k-$40k	900	9%	1.5%	500	10%	1.7%	6,300	5%	2.6%
	$40k-$60k	2,300	24%	2.3%	1,700	31%	2.7%	18,800	16%	4.1%
	$60k-$80k	1,900	20%	2.8%	1,300	24%	3.3%	22,500	19%	5.6%
	$80k-$100k	1,100	11%	3.2%	500	10%	3.5%	17,800	15%	7.3%
	$100k-$140k	1,100	11%	4.9%	400	8%	5.0%	23,700	20%	10.7%
	$140k-$180k	400	5%	6.8%	100	2%	6.1%	10,800	9%	11.7%
	> $180k	400	4%	7.0%	100	2%	7.9%	8,900	7%	9.2%

In contrast, the public sector sees greater equity both between ethnicities and genders. While women in the public sector on average have slightly lower incomes, the public sector provides greater opportunities for Māori/Pacific women to earn higher incomes. Of these women who earn over $140k p.a., almost 1 in 4 are employed in the public sector.

5. Analysis 1: Do Māori, Pacific and children working in the sector have the same outcomes as non-Māori/Pacific?

5.1 Analysis of adult outcomes

Benefits and Income

Measures	Tech Sector			Working population excl Tech		
Total ethnicity *Count of individuals*	*Māori* *7,596*	*Pacific* *5,082*	*Other* *96,090*	*Māori* *454,410*	*Pacific* *226,452*	*Other* *2,199,924*
Proportion who have received a main benefit type	22%	20%	8%	45%	36%	15%
Proportion who have received a Job Seeker benefit	19%	16%	7%	37%	30%	13%
Proportion who have received Supported Living Payment benefit	1.3%	1.3%	0.4%	3.6%	2.5%	1.2%
Proportion who have received Single Parent Support benefit	4.1%	3.8%	0.7%	13.7%	9.8%	3.0%
Average Wages and Self-Employed Income[3]	$68,757	$59,672	$85,991	$39,779	$39,694	$53,252
Average Benefits	$448	$353	$110	$1,741	$1,187	$412
Average income from other sources	$1,007	$891	$1,032	$1,261	$932	$1,612

Key findings:

1. Māori/Pacific adults working in the tech sector are significantly less likely to be on main benefits when compared to Māori/Pacific adults in the general working population. This effect is observable before and after controlling for income.

2. Across all ethnicities, individuals working in the tech sector are significantly less likely to receive Single Parent Support than the general working population excluding tech.

Evidence points:

1. After accounting for differences in income, Māori/Pacific adults working in the tech sector are 2.0/1.7x more likely than non-Māori/Pacific adults to be on one of the four main benefit types at least once in the analysis period (22% of Māori, 20% of Pacific vs 8% for non-Māori/Pacific). While this is a significant difference in outcomes, it represents a smaller gap than the rest of the working population where Māori and Pacific individuals are 2.3x and 1.9x more likely to go onto a benefit than their non-Māori/Pacific income peers.

2. The mix of benefits received by those in the Tech cohort also varies between the Ethnicities. Of those who have received at least one main benefit in the tech sector, around 20% of Māori/Pacific have been on Single Parent Support, compared to 9% for non-Māori/Pacific.

    - In the non-Tech cohort working population, the proportion of those who have received at least one main benefit, around 30% for Māori/Pacific have been on Single Parent Support, compared to 20% for non-Māori/Pacific.

[3] Averages taken over period of analysis, 2013-2022, after first year recorded in employment. These averages include both part- and full-time employment.

Employment and Education

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*454,410*	*226,452*	*2,199,924*
Proportion with any tertiary qualification[4] (NZQA levels 4+)	45%	31%	60%	38%	32%	51%
Proportion with a bachelor's qualification or higher (NZQA levels 7+)	13%	9%	21%	11%	10%	19%
Number of months not in employment[5].	6.7	5.5	5.7	14.3	12.6	9.7
Average[6] number of months with employer.	45.8	55.0	47.2	30.6	31.7	39.0
Average[7] number of months in employment.	68.8	74.6	70.5	45.3	45.9	56.8
Number of employers in five years till Mar22	2.2	2.2	2.1	3.1	3.0	2.6

Key findings:

1. At all levels of income, Māori/Pacific attainment of tertiary level qualifications is lower than non-Māori/Pacific in the tech sector. This means Māori/Pacific individuals in the tech sector can climb to higher income bands despite a relatively lower rate of tertiary qualifications compared to non-Māori/Pacific. This effect is not as strong in other sectors where differences in educational achievement in high income bands are much narrower. While this finding suggests slightly lower barriers from educational attainment to achieve higher income in the tech sector, there's still a clear link between educational attainment and lower to middle incomes for Māori/Pacific.

2. After controlling for income in the tech sector, Māori/Pacific adults are more likely to have longer employment spells and less time unemployed when compared to non-Māori/Pacific adults in the sector. This is mostly driven by those earning $40-$100k from wages and self-employed income.

3. The number of months not in employment is also an effect which has better outcomes in for those in the tech sector, including after controlling for income. However, this effect is similar to what is observed in the public sector. This effect may therefore be in part driven by:

    - Geographic distribution, i.e. those living in metro areas are able to access larger job markets and may be able to find alternative work more easily.
    - Selected cohort definitions implicitly select individuals with more stable careers.

Evidence points:

Table 5: Proportion of sector with tertiary education qualification by ethnicity and income band

	Tech Sector			Working population excl Tech		
Income band	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
< $60k	36%	25%	52%	34%	29%	46%
$60k -$80k	51%	35%	62%	54%	41%	58%
> $80k	58%	46%	66%	66%	56%	68%

1. Overall, Māori/Pacific attainment of tertiary level qualifications is lower than non-Māori/Pacific in the tech sector. While this explains some of the differences in income distribution between ethnicities, Table 5 above illustrates that Māori/Pacific are still able to

[4] Including certificate, diploma, bachelor's or higher level qualification
[5] This measure is based on receipt of Wage or Salary, therefore self-employed income or retirement would be considered not in employment in this measure.
[6] Note: Average taken as length of current spell at each year in cohort.
[7] Note: Average taken as length of current spell at each year in cohort.

attain higher income bands (more than $80k) whilst having lower rates of tertiary qualification rates. This observation holds for both non-Māori/Pacific in the tech sector and Māori/Pacific in the general working population.

    - Despite the potential lower educational requirements for Māori/Pacific suggested, there remains a strong relationship between educational attainment and low to middle income in the tech sector. Above $80k income, educational attainment tends to plateau.

2. Māori/Pacific earning $40-100k in the tech sector spend on average 1.1-1.3x longer with employers than non-Māori/Pacific when comparing those with similar incomes (4-4.75 years for Māori and 5.0-5.5 years for Pacific vs 3.5-4.25 years for non-Māori/Pacific).

    - This relationship is inverted for Māori/Pacific who earn less than $25k. Their tenure with employers are around half the length of non-Māori/Pacific in the tech sector on equivalent incomes (1yr/10mths for Māori/Pacific and 1yr 10mths for non-Māori/Pacific).

Immigration and Housing Stability

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*454,410*	*226,452*	*2,199,924*
Proportion who have immigrated to NZ.	2.3%	41.7%	46.4%	1.6%	37.0%	35.7%
Proportion of individuals who remain in same address over one year[8].	76%	80%	79%	68%	73%	75%
Proportion of individuals who remain in same address over five years till Mar22.	45%	51%	49%	39%	44%	46%

Key findings:

1. The tech sector has a higher proportion of individuals who have been recorded as immigrating to Aotearoa than the rest of the working population.

2. Māori/Pacific in the tech sector have similar housing stability when compared to Māori/Pacific with similar incomes outside of the tech sector.

Evidence points:

1. The proportion of the tech sector that has immigrated to New Zealand is 1.4x higher than the rest of the working population. This is primarily driven by the non-Māori/Pacific which is 1.3x more likely to have immigrated (46% in Tech vs 36% in non-Tech working population). The overrepresentation of non-Māori/Pacific in the demographic distribution of the Tech cohort explains most of the remaining effect.

2. Overall, Māori/Pacific in the tech sector have slightly higher rate, around 1.1x, of remaining in the same address over last 12 months when compared to non-tech sector workers (76%/80% vs 68%/73% respectively). However, after accounting for income distributions the difference in relative likelihood is 1.02-1.04x. This is difference is caused by the mix of incomes for those in the Tech being higher than non-Tech, and those on lower income being more likely to move.

[8] Taken as average over time in cohort, Excludes immigration and emigration.

Health and Fertility

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*454,410*	*226,452*	*2,199,924*
Proportion of women with birth recorded in lifetime	63%	59%	56%	62%	54%	57%
Of women with birth recorded, proportion with 5 or more births	5%	10%	1%	10%	13%	2%
Proportion with a Potentially avoidable hospitalisation (PAH)	8%	13%	6%	11%	12%	7%
Proportion with a hospitalisation excluding PAH	42%	44%	34%	50%	46%	42%
Proportion with Substance Use treatment	7%	4%	2%	12%	7%	4%
Proportion with Mental Health (MH) treatment.	28%	15%	24%	34%	19%	31%
Proportion with non-pharmaceutical Mental Health treatment.	11%	7%	5%	20%	12%	9%
Proportion with pharmaceutical Mental Health treatment.	23%	11%	22%	24%	12%	28%

Key findings:

1. While fertility rates of Māori women in the tech sector are similar to Māori women in the general working population, they are significantly less likely to have large families.

2. Non-Māori/Pacific in the tech sector have lower likelihood of health treatment than those working in other sectors across hospitalisations, substance use and mental health treatment. The experience of Māori/Pacific however varies depending on the treatment types.

3. Māori/Pacific in the tech sector have similar rates of pharmaceutical mental health treatment when compared to those in the general working population. However, they are less likely to receive non-pharmaceutical mental health treatment.

Evidence points:

1. Māori women who have given birth are less than half as likely to have 5 or more children when compared to Māori women in the general working population (5% in the tech sector vs 11% in non-tech sector).
    - This analysis did not include controlling for both gender & income which may explain part of this effect.

2. Non-Māori/Pacific in the tech sector are around 0.80-0.85x as likely to receive at least once instance of the healthcare treatment amongst the indicators measured, when compared to the general working population, after controlling for income.
    - Māori adults in the tech sector are around 0.80-0.95x as likely to receive these health treatments when compared to those with similar incomes outside the tech sector. The greatest difference is observed for PAH and the smallest difference is observed in mental health treatment.
    - The observed variation of receipt of these health treatments for Pacific adults in the tech sector are 0.75-0.95x as likely, after controlling for income. The greatest difference is observed in substance use treatment and the smallest difference is observed in hospitalisations (both PAH and hospitalisations excluding PAH).

3. After controlling for income, overall Māori/Pacific in the tech sector have similar rates of pharmaceutical mental health treatment when compared to those in the general working population (0.95-1.00x as likely). However, they are less likely to receive non-pharmaceutical mental health treatment (0.75-0.90x as likely) after controlling for income. This effect varies with income as illustrated in Table 6 below.

   Comparing Māori/Pacific in the tech sector to those working in other sectors on similar incomes:
   - Those on higher income are relatively less likely to receive pharmaceutical treatment and have similar likelihood of receive non-pharmaceutical treatment.
   - Whereas those on lower incomes are relatively less likely to receive non-pharmaceutical treatment and have slightly higher pharmaceutical treatment when compared to Māori/Pacific outside the tech sector.

Table 6: Proportion of individuals receiving mental health treatment by ethnicity and income.

		Tech Sector		Working population excl Tech	
Ethnicity	Income band	non-pharmaceutical MH treatment.	pharmaceutical MH treatment.	non-pharmaceutical MH treatment.	pharmaceutical MH treatment.
Māori	< $25k	22%	27%	29%	25%
	$25k -$60k	13%	23%	16%	23%
	$60k -$140k	7%	22%	7%	23%
	> $140k	5%	21%	5%	24%
Pacific	< $25k	15%	17%	18%	13%
	$25k -$60k	6%	10%	10%	10%
	$60k -$140k	4%[9]	11%	6%	13%
	> $140k	0%[10]	16%	2%	21%
Other	< $25k	13%	29%	15%	30%
	$25k -$60k	7%	22%	9%	27%
	$60k -$140k	4%	21%	5%	27%
	> $140k	2%	26%	3%	30%

[9] Small counts and low frequency have meant around 30% of individuals in these groups have had activity suppressed. This has impacted the result.

[10] Small counts and low frequency have meant all individuals in these groups have had activity suppressed. This has impacted the result.

5.2 Analysis of child outcomes

An observation noted in the analysis of child outcomes was that while overall rates in the population of indicators appear quite different when comparing cohorts, in most cases, parental income was found to be the primary driver of the differences, with limited observed effect after controlling for this factor. Appendix C outlines the risk ratios, before and after controlling for income.

Health

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*449,064*	*220,152*	*1,082,112*
Proportion with a hospitalisation excluding PAH	43%	41%	38%	44%	43%	38%
Proportion with a Potentially avoidable hospitalisation (PAH)	14%	16%	10%	17%	19%	10%
Proportion with Substance Use treatment	6%	5%	3%	10%	6%	4%
Proportion with non-pharmaceutical Mental Health treatment.	20%	13%	15%	23%	14%	16%
Proportion with Mental Health treatment.	26%	15%	22%	27%	17%	25%

Overall, controlling for income accounts for most of the differences in outcomes observed in the above table.

Key findings:

1. There are slightly lower rates of potentially avoidable hospitalisation (PAH) for children of those in the tech cohort.

2. Lower Substance Use treatment in Māori children does not occur uniformly for all parental income bands. Relative to children in similar income bands whose parents work in other sectors, those on low to middle income (<$120k) tend to have lower incidence of substance use treatment when compared to Māori not working in tech, whereas those on higher incomes tend to have similar or higher rates.

3. While mental health treatment overall is lower for children of those working in tech, after accounting for income, there appears to be limited difference in outcomes.

Evidence points:

1. After accounting for income, children of Māori and non-Māori/Pacific working in Tech are 0.9x as likely to have a PAH is when compared to children whose parents do not work in tech.

2. Children of parents who work in tech with joint parental income of < $120k tend to have lower rates of substance use treatment when compared to Māori whose parents do not work in tech (7.3% vs 10.4% respectively). Meanwhile, Māori in Tech on higher income bands tend to have similar rates when compared to Māori whose parents work in other sectors (4.6% vs 4.7% overall).

3. After controlling for income, Māori appear to have a slightly higher relative risk (1.05x) of receiving Mental Health treatment. This is driven by Māori children of higher income tech workers having mental health treatment at similar rates to those on lower incomes. In the general Māori population, those on higher incomes tend to have lower rates of mental health treatment than those on lower incomes.

School Disengagement

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*449,064*	*220,152*	*1,082,112*
Proportion with 0 school changes in lifetime, adjusted for regular middle and high school changes (10+ only)	66%	69%	74%	55%	63%	70%
Proportion with 3+ school changes in lifetime, adjusted for regular middle and high school changes (10+ only)	6%	4%	2%	11%	7%	4%
Average number of recorded truancy days per child with at least one event	123.2	98.9	79.9	160.3	123.1	101.4
Average number of suspension days per child with at least one event	17.7	15.0	20.5	22.7	19.0	21.0
Average number of standdown days per child with at least one event	7.9	7.1	6.3	8.3	7.5	7.3
Proportion with recorded truancy event (5+ only)	6%	7%	2%	12%	11%	3%
Proportion with recorded suspension (5+ only)	1%	1%	0%	2%	1%	1%
Proportion with recorded standdown (5+ only)	5%	5%	2%	8%	7%	3%

Key findings:

1. While Māori/Pacific children have higher rates of irregular school changes than non-Māori/Pacific. Children of those who work in the tech sector are less likely to have a high number of school changes, across all ethnicities, when compared to children with parents working outside the tech sector.

2. While Māori/Pacific children have higher average number of truant days than non-Māori/Pacific, children of those in the tech sector tend to have lower number of days truant when compared to Māori/Pacific whose parents work in other sectors.

3. Māori children of those in the tech sector have relatively lower rates of school disengagement when compared to Māori children with parents of similar incomes working in other sectors.

    - Lower counts for Pacific make it difficult to draw firm conclusions, but there is evidence they also have lower rates of disengagement.

Evidence points:

1. Unsurprisingly, children of parents on higher incomes are less likely to change school. After accounting for difference in income distribution of the tech sector, children of all ethnicities tend to be 0.80-0.85x less likely to have a high number of irregular school changes (3 or more).

2. Children of those in the tech sector tend to have lower average number of days truant when compared to those whose parents work in other sectors. After controlling for income Māori/Pacific have 0.9x fewer days and non-Māori/Pacific have 0.95x fewer days.

3. For the school disengagement indicators measured, children of Māori in the tech sector are 0.8-0.9x less likely to have these indicators than Māori working in other sectors on similar incomes.

Educational attainment

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*449,064*	*220,152*	*1,082,112*
Proportion with no NCEA qualification achieved (18+ only)	20%	19%	13%	29%	22%	15%
Proportion with highest NCEA achieved level 3 (18+ only)	41%	44%	58%	31%	40%	53%
Proportion with Bachelors of higher enrolment (18+ only)	30%	31%	51%	19%	25%	43%
Proportion with tertiary enrolment NZQCF levels 4-7 (18+ only)	16%	15%	12%	17%	16%	13%
Proportion with tertiary enrolment NZQCF levels 1-3 (18+ only)	16%	14%	7%	22%	17%	10%
Proportion with no NZQCF qualification (18+ only)	12%	11%	6%	18%	14%	8%
Proportion with highest qualification NZQCF level 3 or higher (18+ only)	58%	59%	74%	50%	56%	70%

Key findings:

1. While the overall rates of NCEA achievement are higher for children of those in the tech sector, this effect is predominantly driven by parental income. After removing the effect of income, Māori children appear to be the only ethnicity with relatively higher attainment of NCEA 3 and lower exit without qualification.

2. Children of those working in the tech sector tend to have relatively higher rates of Bachelors (or higher) enrolment. The converse is true for lower NZQCF levels of tertiary education. This is found when comparing each of the ethnicities between sectors before and after controlling for income.

Evidence points:

1. Māori children of those working in the tech sector are slightly less (0.95x) likely to leave school without any NCEA qualification and slightly more likely (1.05x) to have NCEA level 3.
    - Both Pacific and non-Māori/Pacific in the tech sector appear to have higher rates of no NCEA qualification after accounting for income (1.05x and 1.10x respectively).
2. Amongst Māori on similar incomes, children of those working in the tech sector are 1.15x more likely to be enrolled in bachelors or higher-level tertiary qualification when compared to those who work in other sectors.
    - This effect is around 1.05x for Pacific and non-Māori/Pacific.

Benefits and Employment

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*449,064*	*220,152*	*1,082,112*
No receipt of main benefit type over young adulthood (18-25)	64%	69%	81%	52%	62%	76%
Over 50% of young adulthood[11] spent on main benefit type.	14%	9%	5%	21%	12%	7%
Over 75% of young adulthood spent in EET[12]	82%	82%	92%	76%	81%	88%

Key findings:

1. After accounting for parental income, Māori/Pacific children of those working in the tech sector appear to be slightly more likely to receive no main benefit type in their young adult years.

2. While the rate of individuals spending more than 75% of adulthood in EET is higher for children of those in the tech sector across ethnicities, this effect appears to predominantly driven by parental income.

Evidence points:

1. After accounting for parental income, Māori/Pacific children of those working in the tech sector are 1.05x more likely to receive no main benefit type in their young adulthood.

2. After accounting for income distributions, the relative likelihood of children of those working in the tech sector for more than 75% of young adulthood are between 0.98x-1.01x for all ethnicities.

[11] 18-25 years old
[12] Education, Employment or Training

Care and Protection

Measures	Tech Sector			Working population excl Tech		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*449,064*	*220,152*	*1,082,112*
Sub-statutory[13] Care & Protection interaction in lifetime	17%	17%	7%	27%	22%	11%
Statutory[14] Care & Protection interaction in lifetime	3.6%	3.5%	0.9%	8.9%	5.7%	2.5%
Youth Justice intervention[15] in lifetime (10+ only)	1.9%	1.1%	0.5%	4.8%	2.3%	1.3%

Key findings:

1. This analysis found the largest driver of care and protection outcomes between children of those in the tech sector tech sector and other sectors is income. Notwithstanding, there remains some additional effect where children of those in the tech sector have lower relative incidence of care and protection (CP) and youth justice (YJ) interactions.

Evidence points:

1. The overall relative risk of a child of an individual working in the tech sector having a statutory level CP interaction is 0.4x when compared to a child of individuals working in other sectors. After controlling for income, the remaining relativity is 0.9x as likely. This is broadly similar across ethnicities[16].

2. Similar to above, the overall relative risk of a child of an individual working in the tech sector having a YJ interaction is 0.3x when compared to a child of individuals working in other sectors. After controlling for income, the remaining relativity is 0.8x as likely.

[13] Notification, Report of Concern or Investigation
[14] Family Group Conference (FGC) or Placement
[15] Family Group Conference (FGC) or Placement
[16] Corresponding table in Appendix has relativity >1, this is caused by suppression and random rounding during export from IDI.

6. Analysis 2: What is the difference between Māori/Pacific outcomes in tech compared to Māori/Pacific outcomes in public sector?

The motivation for this secondary comparison is to understand the experience of individuals working predominantly in the tech sector when compared to others who have stable sector employment. For this analysis we selected the public sector as it has some common characteristics such as size, relative geographic concentration and type of work (non-manual).

This comparison also allows for more similar comparison as the cohort definitions would implicitly remove those with more transient work who would be in the general working population of Analysis 1. As such, this section of the analysis will focus key findings to those which differ from findings in Section 5.

Benefits and Income

Measures	Tech Sector			Public Sector		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*12,801*	*6,582*	*75,036*
Proportion who have received a main benefit type	22%	20%	8%	20%	22%	8%
Proportion who have received a Job Seeker benefit	19%	16%	7%	14%	16%	7%
Proportion who have received Supported Living Payment benefit	1.3%	1.3%	0.4%	1.7%	1.3%	0.6%
Proportion who have received Single Parent Support benefit	4.1%	3.8%	0.7%	6.8%	7.0%	1.4%
Average Wages and Self-Employed Income	$68,757	$59,672	$85,991	$68,676	$61,830	$76,620
Average Benefits	$448	$353	$110	$424	$383	$127
Average income from other sources	$1,007	$891	$1,032	$1,224	$793	$1,615

Key findings:

1. After controlling for income, Pacific adults in the tech sector are less likely to receive a main benefit type than those working in the public sector. This is driven by lower uptake in Job Seeker and Single Parent Support payments.

2. As was found in Section 5.1, across all ethnicities, Single Parent Support uptake is lower in the tech sector than in the public sector, with Pacific individuals showing the strongest effect after adjusting for income distribution.

Employment and Education

Measures	Tech Sector			Public Sector		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*12,801*	*6,582*	*75,036*
Proportion with any tertiary qualification[17] (NZQA levels 4+)	45%	31%	60%	65%	59%	69%
Proportion with a bachelor's qualification or higher (NZQA levels 7+)	13%	9%	21%	26%	27%	29%

[17] Including certificate, diploma, bachelor's or higher level qualification

Measures	Tech Sector			Public Sector		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*12,801*	*6,582*	*75,036*
Number of months not in employment[18].	6.7	5.5	5.7	5.8	5.2	5.6
Average[19] number of months with employer.	45.8	55.0	47.2	57.7	54.6	55.9
Average[20] number of months in employment.	68.8	74.6	70.5	75.7	72.1	76.1
Number of employers in five years till Mar22	2.2	2.2	2.1	2.0	2.0	1.9

Key findings:

1. Similar to in analysis 1, but to a greater degree, Māori/Pacific adults who are able to enter higher income bands, do so despite significantly lower rates of tertiary education qualifications when compared to the public sector.

2. Māori and non-Māori/Pacific adults in the tech sector have shorter tenure with employers when compared to the public sector. After adjusting for income, Māori and non-Māori/Pacific in the tech sector have tenure with employers of 0.8x compared to the public sector.

3. When compared to the public sector, the tech sector has significantly more churn of employees in the lowest pay bands (<$25k p.a.) across all ethnicities, however this effect is strongest for in Māori/Pacific. On average Māori/Pacific in the tech sector in these pay bands remain with employers for 1y/0.75y compared to 1.75y/1.25y in the public sector.

Immigration and Housing Stability

Measures	Tech Sector			Public Sector		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*12,801*	*6,582*	*75,036*
Proportion who have immigrated to NZ.	2.3%	41.7%	46.4%	1.4%	24.1%	31.6%
Proportion of individuals who remain in same address over one year[21].	76%	80%	79%	78%	79%	82%
Proportion of individuals who remain in same address over five years till Mar22.	45%	51%	49%	47%	50%	54%

Key findings:

1. The tech sector has a higher proportion of individuals who have immigrated to New Zealand when compared to the public sector.

2. Housing stability indicators have limited variation between the Tech and public sectors after accounting for income distribution.

Health and Fertility

Measures	Tech Sector			Public Sector		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*12,801*	*6,582*	*75,036*
Proportion of women with birth recorded in lifetime	63%	59%	56%	65%	58%	58%

[18] This measure is based on receipt of Wage or Salary, therefore self-employed income or retirement would be considered not in employment in this measure.
[19] Note: Average taken as length of current spell at each year in cohort.
[20] Note: Average taken as length of current spell at each year in cohort.
[21] Taken as average over time in cohort, Excludes immigration and emigration.

Measures	Tech Sector			Public Sector		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*7,596*	*5,082*	*96,090*	*12,801*	*6,582*	*75,036*
Of women with birth recorded, proportion with 5 or more births	5%	10%	1%	7%	8%	1%
Proportion with a Potentially avoidable hospitalisation (PAH)	8%	13%	6%	10%	13%	7%
Proportion with a hospitalisation excluding PAH	42%	44%	34%	50%	50%	43%
Proportion with Substance Use treatment	7%	4%	2%	3%	2%	2%
Proportion with Mental Health treatment.	28%	15%	24%	31%	20%	33%
Proportion with non-pharmaceutical Mental Health treatment.	11%	7%	5%	9%	7%	7%
Proportion with pharmaceutical Mental Health treatment.	23%	11%	22%	28%	17%	32%

Key findings:

1. As with Analysis 1, the tech sector has similar fertility rates to the public sector. They generally are also less likely to have large families, however this is not the case for Pacific women.

    - This analysis did not include controlling for both gender & income which may be the driver of this observation.

2. tech sector workers, across all ethnicities are more likely to receive substance use treatment than those in the public sector. This difference is notable for Māori/ Pacific who are 2.0-1.9x more likely to receive substance use treatment after adjusting for income. non-Māori/ Pacific, those in Tech are 1.3x more likely than those working in the public sector.

3. However, workers in the tech sector are less likely to receive mental health treatment, driven by lower pharmaceutical treatment.

Appendix A Data sources

The analysis was conducted on individuals that received income from the year 2013 to 2022 (inclusive) from the employee monthly schedule (EMS) table and the Administrative Population Census (APC) dataset. The analysis variables, included in the model were taken for within the last year, last 5 years, as well as the individual's lifetime. The children's outcomes were leveraged using the datasets from Oranga Tamariki's Children Wellbeing Model (CWM).

Income and Sectors:

Employee Monthly Schedule (EMS)	This data was originally sourced from: ir_clean.ird_ems
Administrative Population Census (APC)	This data was originally sourced from: 1. data.apc_constants 2. data.apc_time_series

Child outcomes:

Health	CWM's dataset – wb_health_full
Education	CWM's dataset – wb_development_full
Care & Protection	CWM's dataset – wb_modelling_fy23_v2
Employment & Benefits	CWM's dataset – wb_development_full,& wb_security_full

Adult outcomes:

Hospitalisations	CWM's dataset – ASH_PAH • This dataset was originally sourced from: 1. moh_clean.pub_fund_hosp_discharges_diag 2. moh_clean.pub_fund_hosp_discharges_event
Mental Health/ Substance Use	CWM's dataset – mhsu • This dataset was created based off several different datasets from the IDI: 1. ACC: acc_clean.payments 2. Primhd_team & Primhd_act: moh_mhd_activity_type_code 3. Diagnostics: moh_clean.pub_fund_hosp_discharges_event & moh_clean.pub_fund_hosp_discharges_diag 4. Pharmaceutical: moh_clean.pharmaceutical
Education	Education data was sourced from: 1. moe_clean.student_qualifications dataset 2. clean_read_CLASSIFICATIONS.moe_ncea_qualification_20190830
Benefit	Benefits data was sourced from msd_clean.msd_spell dataset
Employment	Employment data was sourced from ir_clean.ird_ems dataset

Adult outcomes

Domain	Indicator	Description
Demographic	Total ethnicity	Total ethnicity was used in this analysis, so if an individual identifies as Māori & Pacific, they would be counted in both groups.
	Age band	Final age in the analysis period was banded into the following groups: "16-24", "25-39", "40-54", "55-64" and "65+"
	Gender	As defined in the StatsNZ population spine.
	Income band of Wages and Self-Employed Income	Average annual income over the years in cohort were banded into: "< $10k", "$10k-$25k", "$25k-$40k", "$40k-$60k", "$60k-$80k", "$80k-$100k", "$100k-$140k", "$140k-$180k" and "> $180k"
	Participation rates	Were calculated based on demographics at end of analysis period (2022). The view of gender and income is an exception where participation was calculated as the total as at 2017 & 2022 to smooth results and reduce suppression.
Benefit and Income	mainben_qtrs/ ben_JWR/JHD/SLP/SPS_qtrs	Of those who have received one of the four main benefit types, over years in cohort, average number of quarters individuals spent on benefit. Main benefit types being: Job Seeker – Work Ready, Job Seeker – Health and Disability, Sole Parent Support and Supported Living Payment.
	mainben_IP_LT/ ben_JS/SLP/SPS_IP_LT	Proportion of individuals who have received a main benefit type while in the cohort. For this measure both Job Seeker benefits were combined into a single measure.
	Tax_WSEI/BEN/OTH_income_ LT	Average income from each of the three categories: "*Wages, Salaries and Self-Employed Income"*, "*Benefits"* (including ACC) and "*Investments & Other" based on tax records.*
	Prop_Tax_BEN_income_05L /15L/50P	Proportion of cohort with less/more than 5%/15%/50% of income coming from benefits over last 10 years, or since entering cohort, whichever is less.
	Prop_Tax_WSEI_income_95P/ 85P/50L	Proportion of cohort with more/less than 95%/85%/50% of income coming from wages and self-employed income over last 10 years, or since entering cohort, whichever is less.
Employment and Education	S4HIGHQUAL_GRP_TL_2P	Proportion of individuals with highest educational qualification of NZQA levels 4-6 (Dip or Cert) or 7+ (Bachelors and higher)
	unempmt_spell_LT_mths	Average number of months individuals were not in employment receiving Wage or Salary (SEI would be considered not employed in this measure)
	empyr_spell_CP_Avg/ empyr_spell_CP_last	Length of current spell with employer (based on monthly Wages & Salary payments). Spell ends after 3 months of no-income receipt or income from difference employer. "_Avg" uses average over time in cohort. "_last" takes final value for individual.
	empmt_spell_CP_Avg/ empmt_spell_CP_last	Length of current employment spell (based on monthly Wages & Salary payments). Spell ends after 3 months of no-income receipt. "_Avg" uses average over time in cohort. "_last" takes final value for individual.
	Employers_CP_5y_last	Unique employers over last five years (since 2022)
	Sectors_CP_5y_last	Number of ANZSICs of employers over last five years (since 2022)
	EMS_Tech_CP_5y_last/ EMS_PS_CP_5y_last	Number of ANZSIC sector groups over last one/five years

Domain	Indicator	Description
Immigration and Housing Stability	apc_immigration_flag	Identifies those who immigrated to New Zealand
	apc_addrchg_1y_LT apc_addrchg_1y/5y_last	Proportion of individuals who have remained in same address over last one/five years, excludes immigration. "_LT" version takes averages over time spent in cohort, "_last" takes value as at 2022.
Health and Fertility	apc_birth_ind/5P	Proportion of females who have at least one/five births recorded in lifetime.
	W2PAH_CP	Of those with a Potentially Avoidable Hospitalisation (PAH), average number of PAHs while in cohort.
	W2PAH_IP_LT	Proportion of individuals with a PAH while in cohort
	W2HOSPNONPAH_CP	Of those with a hospitalisations excluding PAH (HOSPNONPAH), average number of HOSPNONPAH while in cohort.
	W2HOSPNONPAH_IP_LT	Proportion of individuals with a HOSPNONPAH while in cohort
	W2_SU_IP_LT	Proportion of individuals with Substance Use treatment while in cohort
	W2MH_IP_LT / MH_PH_IP_LT / MH_NONPH_IP_LT	Proportion of individuals with Mental Heath /pharmaceutical /non-pharmaceutical treatment while in cohort.

Child outcomes

Domain	Indicator	Description
Health	W2HOSPNONPAH_CCP/ W2HOSPNONPAH_CIP_1y/ W2HOSPNONPAH_CIP_LT	Count/indicator of non-preventable hospitalisations for child in last year/time in cohort
	W2PAH_CCP/ W2PAH_CIP_1y/ W2PAH_CIP_LT	Count/indicator of preventable hospitalisations for child in last year/time in cohort
	W2SU_CIP_1y/ W2SU_CIP_LT	(12-24 y.o.) Indicator whether a child has had Substance Use Treatment in the last year
	W2MH_NONPH_CIP_1y/ W2MH_NONPH_CIP_LT	(5-24 y.o.) Count of non-pharmaceutical Mental Health Treatments for child in last year
	W2MH_CIP_1y/ W2MH_CIP_LT	(5-24 y.o.) Indicator for pharmaceutical Mental Health Treatments for child in last year
School Disengagement	W4SCHOOLCHGADJ_GRP _OCL_0/1_2/3P	0/1-2/3 or more school changes in their lifetime, adjusted for regular middle and high school changes (10+ only)
	W4TRUA/SUSP/STDNDAYS _CCP	Average number of days recorded for truancy/suspension/stand down days per child with at least one event (5+ only)
	W4TRUA/SUSP/STDNDAYS _CIP_LT	Proportion of children with a truancy/suspension/stand down in lifetime to date (5+ only)
	W4SUSPTRUASTND_CIP_LT	Proportion of children with at least one of the types of school disengagement in lifetime i.e. truancy, suspension or stand down.

Domain	Indicator	Description
Educational attainment	W4NCEA_CTL_0/1/2/3	Highest level of NCEA achieved 0/1/2/3 (18+ only)
	W4ENROL_BACH/ TERT_L4_7/ TERT_L123_CIP	Children with Bachelors of higher/ NZQCF levels 4-7/ NZQCF levels 1-3 tertiary enrolment (18+ only)
	W4HIGHQUAL_CTL_0/1/2/3	Highest level of education achieved (NCEA 0-3, Tertiary(any)) (18+ only)
Employment & Benefits	main_ben_LT_0/50P	Proportion of quarters spent on a main benefit type over adulthood is 0%/over 50% (18+ only)
	W4EET_CIP_LT_25L/75P	Proportion of quarters spent in Education, Employment or Training within adulthood is less than 25%/more than 75% (18+ only)
Care & Protection	CP_SubStat_CIP_LT	Indicator for sub-statutory level Care & Protection interaction (Notification, Report of Concern or Investigation) in their lifetime to date
	CP_Stat_CIP_LT	Indicator for statutory level Care & Protection interaction (either FGC or placement) in their lifetime to date
	YJ_FGC_PLC_CIP_LT	Indicator for YJ Family Group Conference (FGC) or Placement in their lifetime to date (10+ only)

Appendix B Demographic tables

Table 7: Population distribution by region

Region	Total population	Tech	Participation rate	Distribution of Tech Sector workers
Auckland Region	2,627,175	85,998	3.3%	46%
Bay of Plenty Region	520,083	7,419	1.4%	4%
Canterbury Region	1,023,045	27,282	2.7%	15%
Gisborne Region	77,262	435	0.6%	0%
Hawke's Bay Region	274,506	3,030	1.1%	2%
Manawatu-Whanganui Region	395,352	5,070	1.3%	3%
Marlborough Region	79,785	849	1.1%	0%
Nelson Region	87,234	1,437	1.6%	1%
Northland Region	296,166	2,589	0.9%	1%
Otago Region	383,604	4,338	1.1%	2%
Southland Region	159,468	1,527	1.0%	1%
Taranaki Region	194,940	3,213	1.6%	2%
Tasman Region	89,793	1,194	1.3%	1%
Waikato Region	757,710	14,022	1.9%	8%
Wellington Region	847,524	26,859	3.2%	14%
West Coast Region	53,049	402	0.8%	0%

Table 8: Participation and income distribution by sector

	Population counts				Participation rates			
Wage & SEI band	Total population	Tech sector	Public sector	Other employed	Tech sector	Public sector	Other employed	Residual[22]
No income	2,412,708							
< $10k	823,068	11,205	10,842	621,360	1.4%	1.3%	75.5%	21.8%
$10k-$25k	757,167	10,995	11,196	613,575	1.5%	1.5%	81.0%	16.0%
$25k-$40k	755,127	12,930	11,751	632,352	1.7%	1.6%	83.7%	13.0%
$40k-$60k	1,194,381	34,374	32,421	1,024,470	2.9%	2.7%	85.8%	8.6%
$60k-$80k	856,944	35,184	35,415	720,006	4.1%	4.1%	84.0%	7.7%
$80k-$100k	469,428	25,146	23,826	385,206	5.4%	5.1%	82.1%	7.5%
$100k-$140k	375,720	31,167	23,562	285,183	8.3%	6.3%	75.9%	9.5%
$140k-$180k	140,520	13,662	7,638	97,320	9.7%	5.4%	69.3%	15.6%
> $180k	136,953	11,184	5,574	92,760	8.2%	4.1%	67.7%	20.0%

[22] Self-employed income or those who have less than 2 years working over the analysis period

Table 9: Income distribution by ethnicity and gender in the public sector, total counts for both March 2017 and 2022

Sex	Wage & SEI band	Māori			Pacific			Other		
		Public sector	Distribution	Participation Rate	Public sector	Distribution	Participation Rate	Public sector	Distribution	Participation Rate
Females	< $10k	1,200	8%	1.4%	600	8%	1.7%	5,800	7%	1.7%
	$10k-$25k	1,300	8%	1.7%	700	9%	2.2%	6,300	8%	1.8%
	$25k-$40k	1,300	8%	1.9%	800	9%	2.3%	6,900	9%	2.1%
	$40k-$60k	3,900	25%	4.8%	2,300	28%	4.9%	17,100	22%	3.7%
	$60k-$80k	3,700	24%	8.6%	2,100	26%	9.2%	17,200	22%	6.0%
	$80k-$100k	2,000	12%	10.0%	900	11%	10.3%	10,500	13%	7.0%
	$100k-$140k	1,600	10%	12.8%	600	7%	13.4%	9,500	12%	8.7%
	$140k-$180k	500	3%	14.1%	100	1%	12.3%	2,900	4%	8.0%
	> $180k	300	2%	12.3%	100	1%	11.5%	1,900	2%	6.2%
Males	< $10k	500	7%	0.7%	200	7%	0.8%	2,600	5%	1.0%
	$10k-$25k	500	7%	0.8%	200	7%	0.9%	2,400	5%	1.0%
	$25k-$40k	400	6%	0.7%	300	7%	0.8%	2,300	4%	0.9%
	$40k-$60k	1,400	20%	1.4%	900	23%	1.4%	7,200	14%	1.6%
	$60k-$80k	1,600	23%	2.4%	1,000	26%	2.5%	10,100	20%	2.5%
	$80k-$100k	1,100	15%	3.4%	600	15%	3.8%	9,000	18%	3.7%
	$100k-$140k	1,100	15%	4.9%	500	12%	5.4%	10,600	21%	4.8%
	$140k-$180k	300	5%	5.3%	100	3%	5.9%	3,800	7%	4.1%
	> $180k	300	4%	5.3%	<50	1%	3.2%	3,000	6%	3.1%

Appendix C Child outcome risk ratios

This appendix includes the risk ratios comparing the incidence rate of indicators wellbeing for children whose parent(s) works in the Tech cohort compared to those working in other sectors. Each table includes the overall risk ratios of the cohort, as well as the risk ratios after controlling for income.

To control for income in this analysis, incidence rates were compared based on their income band. For example, the incidence rate of Māori children whose parent(s) work in the tech sector earning $60-80k per annum was divided by the incidence rate of Māori children whose parent(s) earning $60-80k per annum but do not work in the tech sector. An average of these risk ratios is then taken, weighted by the number of children that fall into each group.

Health

Risk Ratios (Tech vs Non-Tech)	Cohort Risk Ratios			Cohort Risk Ratios - (controlling for income)		
Total ethnicity *Count of individuals*	*Māori* *13,188*	*Pacific* *8,583*	*Other* *83,670*	*Māori* *13,188*	*Pacific* *8,583*	*Other* *83,670*
Proportion with a hospitalisation excluding PAH	0.99	0.96	0.97	0.99	0.97	0.97
Proportion with a Potentially avoidable hospitalisation (PAH)	0.81	0.90	0.87	0.91	0.96	0.92
Proportion with Substance Use treatment	0.64	0.88	0.67	1.02	1.14[23]	0.83
Proportion with non-pharmaceutical Mental Health treatment.	0.89	0.94	0.90	1.05	1.03	1.01
Proportion with Mental Health treatment.	0.95	0.95	0.94	1.07	1.00	1.00

[23] Due to low counts in the pacific cohort and low incidence of Substance Use treatment, this figure was not considered to be a reliable finding.

School Disengagement

Risk Ratios (Tech vs Non-Tech)	Cohort Risk Ratios			Cohort Risk Ratios - (controlling for income)		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*13,188*	*8,583*	*83,670*
Children with 0 school changes in lifetime, adjusted for regular middle and high school changes (10+ only)	1.20	1.09	1.06	1.08	1.04	1.02
Children with 3+ school changes in lifetime, adjusted for regular middle and high school changes (10+ only)	0.49	0.57	0.59	0.82	0.80	0.85
Average number of recorded truancy days per child with at least one event	0.78	0.82	0.82	0.89	0.89	0.93
Average number of suspension days per child with at least one event	0.80	0.77	0.98	0.70	0.57	0.97
Average number of standdown days per child with at least one event	0.92	1.00	0.87	1.08	1.06	0.96
Children with recorded truancy event (5+ only)	0.48	0.50	0.73	0.88	0.97	1.06
Children with recorded suspension (5+ only)	0.43	0.48	0.43	0.81	1.09	0.91
Children with recorded standdown (5+ only)	0.61	0.65	0.70	0.91	0.94	1.00

Educational attainment

Risk Ratios (Tech vs Non-Tech)	Cohort Risk Ratios			Cohort Risk Ratios - (controlling for income)		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*13,188*	*8,583*	*83,670*
Proportion with no NCEA qualification achieved (18+ only)	0.68	0.82	0.86	0.93	1.05	1.09
Proportion with highest NCEA achieved level 3 (18+ only)	1.29	1.10	1.10	1.03	0.99	1.01
Proportion with Bachelors of higher enrolment (18+ only)	1.58	1.23	1.19	1.14	1.04	1.07
Proportion with NZQCF levels 4-7 tertiary enrolment (18+ only)	0.95	0.91	0.91	0.96	0.91	0.96
Proportion with NZQCF levels 1-3 tertiary enrolment (18+ only)	0.72	0.83	0.72	0.88	0.95	0.87
Proportion with no NZQCF qualification (18+ only)	0.65	0.81	0.78	0.92	1.09	1.08
Proportion with highest qualification NZQCF level 3 (18+ only)	1.17	1.05	1.07	1.02	0.97	1.01

Benefits and Employment

Risk Ratios (Tech vs Non-Tech)	Cohort Risk Ratios			Cohort Risk Ratios - (controlling for income)		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*13,188*	*8,583*	*83,670*
No receipt of main benefit type over young adulthood (18-25)	1.23	1.12	1.05	1.05	1.04	1.00
Over 50% of young adulthood[24] spent on main benefit type.	0.66	0.75	0.68	1.04	0.99	1.01
Over 75% of young adulthood spent in EET[25]	1.09	1.02	1.03	1.01	0.98	1.01

Care and Protection

Risk Ratios (Tech vs Non-Tech)	Cohort Risk Ratios			Cohort Risk Ratios - (controlling for income)		
Total ethnicity	*Māori*	*Pacific*	*Other*	*Māori*	*Pacific*	*Other*
Count of individuals	*13,188*	*8,583*	*83,670*	*13,188*	*8,583*	*83,670*
Sub-statutory[26] level Care & Protection interaction in lifetime	0.63	0.71	0.63	0.96	0.92	0.96
Statutory level[27] Care & Protection interaction in lifetime	0.38	0.51	0.37	0.94	1.04[28]	0.91
Youth Justice Family Group Conference (FGC) or Placement in lifetime (10+ only)	0.24	0.36	0.28	0.86	1.07[29]	0.76

[24] 18-25 years old
[25] Education, Employment or Training
[26] Notification, Report of Concern or Investigation
[27] Family Group Conference (FGC) or placement
[28] This result is spurious as suppression of small counts and random rounding during export from IDI has impacted it.
[29] This result is spurious as suppression of small counts and random rounding during export from IDI has impacted it.

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