Whaikaha disability support funding:

Individualised funding and wellbeing outcomes

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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.

All observation counts have been randomly rounded to base 3 in accordance with Statistics NZ confidentiality rules. Components may not sum to totals due to rounding. Cells marked with 's.' have been suppressed for confidentiality reasons.

Executive Summary

Background

Disabled people tend to have lower wellbeing outcomes compared with their non-disabled counterparts across a range of dimensions. Providing individuals with greater autonomy over how they spend their Whaikaha funding has the potential to empower individuals to drive their wellbeing outcomes. This report, therefore, uses Stats NZ's Integrated Data Infrastructure (IDI) to examine the wellbeing outcomes of those who receive individualised funding versus those who receive individualised funding (IF) versus those who are eligible for IF but receive only mainstream funding.

Assessing the effects of IF is difficult because individuals can choose whether or not to opt-in to IF. It is possible that those who opt-in to IF have different characteristics to those who do not, and that these characteristics may be related to wellbeing outcomes. To address this issue, this report uses matching methods to compare IF recipients with a matched comparison group of individuals who were eligible for IF funding but only received mainstream funding, which ensures that the observable characteristics of the two groups are very similar.

In its current state, this report is primarily for exploratory purposes. At the time of writing, a full set of data on who was receiving IF was unavailable. Thus, the analysis is restricted to approximately 10% of IF-receiving individuals. Unfortunately, it is not possible to know whether the characteristics of these 10% of individuals are representative of the full population of IF-receiving individuals. Moreover, some of those in the comparison group of individuals who were eligible for IF but not receiving it may have, in fact, been receiving IF. Thus, estimates of wellbeing effects of IF are likely to be underestimated. Overall, this report provides benchmark methodology to use when a full set of data on IF-receiving individuals becomes available and is intended for internal consumption by Manawanui.

Having reliable and comprehensive information on Whaikaha clients has the potential to provide valuable insights into how the needs of disabled people could be better met. It is, therefore, recommended that Whaikaha prioritise the provision of a full set of data on those receiving Whaikaha support, including information on those receiving IF, for integration into the IDI.

Key findings

Employment: The treatment group of those receiving IF have higher average employment rates after they first begin receiving IF than the matched comparison group of those who are eligible to receive IF but only ever receive mainstream funding. The difference is only weakly statistically significant, but this may reflect the small sample size, which means that the estimation is not very precise. Moreover, as mentioned, some of those in the comparison group of individuals who were eligible for IF but not receiving it may have, in fact, been receiving IF due to the incomplete nature of the data used. Thus, the relationships between IF funding and outcomes are likely to be underestimated.

Earnings: After they begin receiving IF, the treatment group has higher average earnings than the comparison group by up to $2,700 a year, which is a large difference given the average annual earnings for the two groups is just under $7,000. Once again, these differences are not statistically significant, which may in part be because the small sample size leads to imprecise estimates.

Benefit receipt: A lower share of the treatment group receive benefit payments compared with the comparison group, in all years, including those before the treatment group starts receiving IF. Similarly, the average annual benefit payment is lower for the treatment group in all years. However, none of the differences are statistically significant.

Hospitalisations, mental health outcomes, accidents and victimisations: The share who are hospitalised, the number of hospitalisations, the share with at least one mental health event, the number of mental health events, the share with at least one ACC claim, the number of ACC claims, the share with at least one victimisation and the number of victimisations are very similar for the treatment and control groups.

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1 Introduction

Disabled people tend to have lower wellbeing outcomes compared with their non-disabled counterparts across a range of dimensions. Whaikaha – Ministry of Disabled People - funding (previously Disability Support Services or DSS funding) has the potential to improve the wellbeing of disabled people. In particular, affording individuals greater autonomy over how they spend their Whaikaha funding has the potential to empower individuals to drive their wellbeing outcomes. This report, therefore, examines the wellbeing outcomes of those who receive individualised funding (IF) versus those who receive mainstream funding in New Zealand (NZ).

Mainstream disability funding in NZ provides disability care and support through contracts purchased by Whaikaha (the Ministry of Disabled People). 'Enabling Good Lives' (EGL) is a partnership between government agencies and the disability sector aimed at long-term transformation of how disabled people and their whānau are supported. Its vision is that disabled people and their families will have greater choice and control over their lives and supports, and one of its principles is self-determination – giving disabled people greater control of their lives. In line with this approach, IF allows those who receive Whaikaha funding for household management and personal care to choose how to spend their funding on services in the manner and direction they prefer. IF means that those who receive eligible Whaikaha funding can manage and purchase their own support (within purchasing guidelines).

Thus, theoretically, IF has the potential to improve the wellbeing of disabled people over-and-above mainstream funding. This report, therefore, uses Stats NZ's Integrated Data Infrastructure (IDI) to examine the wellbeing outcomes of individuals who receive IF versus those who are eligible to receive IF but only received mainstream funding.

Assessing the effects of IF is difficult because individuals can choose whether or not to opt-in to IF. It is possible that those who opt-in to IF have different characteristics to those who do not, and that these characteristics may be related to wellbeing outcomes. To address this issue, this report uses matching methods to compare IF recipients with a matched comparison group of individuals who were eligible for IF funding but only received mainstream funding, which ensures that the observable characteristics of the two groups are very similar.

In its current state, this report is primarily for exploratory purposes. At the time of writing, a full set of data on who was receiving IF was unavailable. Thus, the analysis is restricted to approximately 10% of IF-receiving individuals. Unfortunately, it is not possible to know whether the characteristics of these 10% of individuals are representative of the full population of IF-receiving individuals. Moreover, some of those in the comparison group of individuals who were eligible for IF but not receiving it may have, in fact, been

receiving IF. Thus, estimates of wellbeing effects of IF are likely to be underestimated. Overall, this report provides benchmark methodology to use when a full set of data on IF-receiving individuals becomes available and is intended for internal consumption by Manawanui.

Having reliable and comprehensive information on Whaikaha clients has the potential to provide valuable insights into how the needs of disabled people could be better met. As far as we are aware, there are no current plans for Whaikaha to add the full set of IF data to the IDI. Indeed, due to the need for remediation of the data, the National Needs Assessment and Service Coordination Information (SOCRATES) data that Whaikaha provides to Stats NZ for integration into the IDI is currently only included on an ad-hoc basis (as opposed to be included in the main IDI_Clean database). Remediating the SOCRATES data and including additional useful information, particularly on the receipt of IF, should be addressed as a matter of priority.

This report proceeds as follows. Section 2 provides background information on the disability funding system in NZ generally, and IF specifically. Section 3 outlines the data used.

2 Background

One in four New Zealanders identify as disabled (Stats NZ, 2014a). Previous literature shows that disabled people tend to have lower wellbeing outcomes compared to their non-disabled counterparts in terms of subjective wellbeing, housing conditions, labour market outcomes and educational attainment (Stats NZ, 2020). Whaikaha, the Ministry of Disabled People, was established in July 2022 in response to the barriers facing disabled people achieving ordinary life outcomes, in line with the Enabling Good Lives (EGL) approach (Ministry of Social Development, 2022).

2.1 Defining disability and the disabled population

Identifying disabled people in data can be difficult, with no universal definition as to what constitutes as a disability. Disability is not about having a specific medical condition but the limitations and functional difficulties that may result due to impairments (Stats NZ, 2020). The Washington Group Short Set (WGSS) of questions on functioning has been used to identify disabled people in New Zealand. The WGSS measures difficulty functioning in six basic and universal capabilities, with those who report 'a lot of difficulty' or 'cannot do at all' in at least one of these six capabilities defined as having a disability:

- Seeing
- Hearing
- Walking or climbing steps
- Remembering or concentrating
- Washing all over or dressing (self-care)
- Communication

The WGSS has been used in the 2018 Census and certain waves of the Household Labour Force Survey (HLFS), the General Social Survey (GSS), and other surveys to identify disabled peoples in New Zealand (Stats NZ, 2020). Other sources of disability include the 2013 Disability Survey which was a comprehensive survey on disabled people in New Zealand that was used to derive the official disability prevalence rate. Data collection for the most recent 2023 Disability Survey was completed in November 2023, and results were not yet available at the time of writing.

According to the 2013 Disability Survey, one in every four New Zealanders identified as disabled. Those aged 65 or over were more likely to be disabled (59%), followed by those under 65 (21%) and children under 15 (11%). Māori (26%) and Pacific Peoples (19%) had higher-than-average disability rates, even

after adjusting for ethnic-age profiles. The most common disability among adults were physical limitations, while learning disabilities were most common for children. Over half of the disabled population had more than one impairment.

This report focuses on those receiving Whaikaha funding (see Section 2.2 below). Although there is overlap between those identifying as disabled in surveys and the Census and Whaikaha clients, the two groups are not identical (Earle, 2023) The focus on Whaikaha clients also means that we focus on disabilities which are not the result of accidents, as accident-related disability support services are generally funded by the Accident Compensation Corporation (ACC) whereas our report focuses on Whaikaha funding. However, the publicly available data discussed in this section does not necessarily differentiate between accident- and non-accident-related disabilities.

2.2 Disability funding structure in New Zealand

The first Minister for Disability Issues was appointed in 1999. In 2002, the first New Zealand Disability Strategy was released, and the Office for Disability Issues (ODI – operating out of the Ministry of Social Development [MSD]) was established to focus on disability issues across government and to implement the strategy (Stace & Sullivan, 2020). While the ODI focused on providing policy- and strategy-related advice for disabled people, the disability funding structure was fragmented and difficult to navigate.

Ministry of Health (MoH) was the main provider of disability funding through Disability Support Services (DSS) until 2022, when Whaikaha (Ministry of Disabled People) was established, and MoH's disability funding role was transferred to Whaikaha. For individuals to be eligible for Whaikaha funding, they typically have to be under 65, experience a physical, intellectual, or sensory disability that is likely to continue for at least six months and require on-going support (Atkinson, 2017). However, it should be noted that clients will include people aged 65 and over, and also some who are medically fragile (as opposed to disabled). Whaikaha funding can be used towards services such as:

- Home and community support services (HCSS) - household management (cleaning, laundry, meal preparation), personal care (showering, dressing), funding for carers (such as family members or provide carers a break) and support living (budgeting, shopping, transport)
- Residential care – community residential, rest-homes, hospitals
- Environmental support – equipment for long-term disabilities, housing and vehicle modifications, hearing aids
- Assessments, treatments and rehabilitation

- Child development – occupational therapists, speech language therapists, psychologists, physiotherapists.

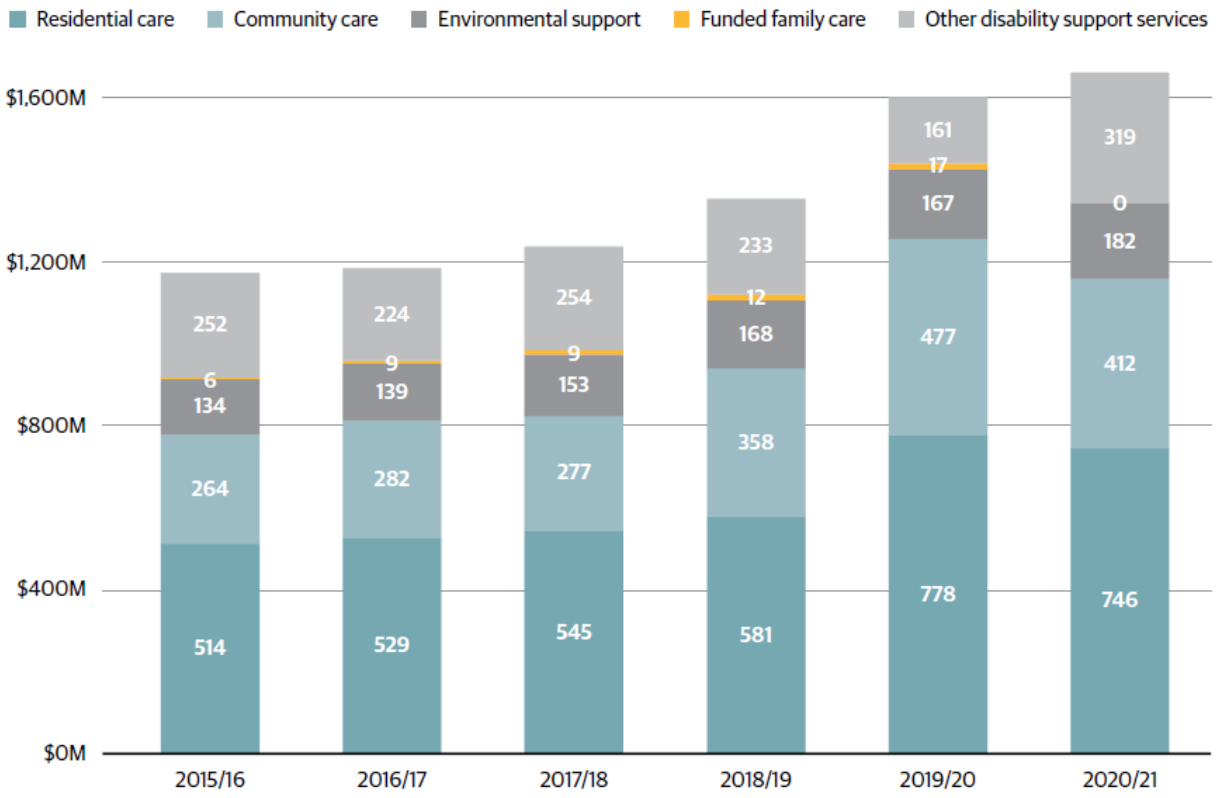
These support services are purchased from disability providers, and the support is delivered in community or residential facilities (Burgess & English, 2021).

Eligibility for Whaikaha funding is assessed by Needs Assessment Service Coordination (NASC) agencies who work with disabled people to identify what support services they could access. These are non-government organisations contracted by the government with 14 NASCs covering New Zealand. Individuals are assigned a support package allocation (SPA) level that specifies the funding or range of disability support to address their support needs. SPA levels are allocated based on the estimated number of support hours needed per week based on the individual's disability level multiplied by a standard hourly rate (Burgess & English, 2021). Personal health conditions, such as asthma, diabetes, and mental health, are not eligible for Whaikaha funding (Welfare Expert Advisory Group, 2019).

In addition to funding from Whaikaha, MSD provides means-tested support through the Disability Allowance (DA) which has similar thresholds to Whaikaha funding (Welfare Expert Advisory Group, 2019). For those who are not eligible for Whaikaha funding or DA, other funding types such as ACC payments, the Ongoing Resourcing Scheme from the Ministry of Education or District Health Board funding are available for those with disabilities – however, these are not covered within the scope of this report.

About 218,214 people received the DA in March 2023 and 40,064 received disability support in the 2019/2020 financial year (Ministry of Social Development, 2023; Ministry of Health, 2022). In 2019, over $1.8 billion worth of funding was distributed to 43,000 people (Burgess & English, 2021). The largest disability funding component was residential care, followed by community care (see Figure 1).

Figure 1: National disability funding components



Note. Retrieved from "The Power of Freedom" by Burgess, M. & English, Bill, 2021, *The New Zealand Initiative,* pg. 15.

2.3 Individualised funding in New Zealand

The 'traditional' or 'mainstream' disability funding in NZ provides disability care and support through contracts purchased by Whaikaha. In 2011, members of the disability community developed the Enabling Good Lives (EGL) approach, which is a framework to guide positive change for disabled people. Its overall vision is to give disabled people and their families greater choice and control over their lives and supports. One of its key principles is self-determination – that disabled people are in control of their lives. It emphases self-directed planning and facilitation and individualised and portable funding. In line with this approach, disabled peoples who receive Whaikaha funding for HCSS (household management and personal care) can choose to spend their funding on services that help make their life better. For example, an individual may choose to go to a barber to get their beard shaved, rather than have a paid carer come in to do it for them (Ministry of Health, 2023). This is known as individualised funding (IF).

With IF, those receiving eligible Whaikaha funding can manage and purchase their own support provided it falls within purchasing guidelines (Burgess & English, 2021). IF is also known as enhanced IF, Choice in

Community Living, Enabling Good Lives hosted personal budgets, Flexible Respite Budgets and Flexible Disability Supports (Ministry of Health, 2018; Priestley, Yeung, & Cooper, 2022).

While the EGL approach was formed in 2011, IF has been available in NZ on an ad-hoc basis since the early 1990s (Burgess & English, 2021). However, these discretionary funding arrangements had few processes and guidance in place to ensure consistent delivery. IF was launched in 1998 in Christchurch in response to dissatisfaction from the disabled community with a disability system that did not meet their needs (Burgess & English, 2021). It was later formalised and piloted by Ministry of Health in 2003 with Manawanui being the first IF host provider (Ministry of Health, 2003; Synergia, 2011; Burgess & English, 2021). Those who had previously received ad-hoc IF were transitioned onto the pilot with high-needs individuals also being offered IF and by the end of 2008, 130 individuals were receiving IF.

IF was initially limited to payment for support workers and personal assistants (i.e. hours of support) but has been expanded to include the purchase of items which could be considered disability supports. An example of this would be enabling a family to purchase an industrial size washing machine to help deal with an incontinence issue in the home. While payment to support people and personal assistants is still a fundamental component of IF, purchasing has also become common to support improved outcomes. The criteria for purchasing items is below (Ministry of Health, 2018):

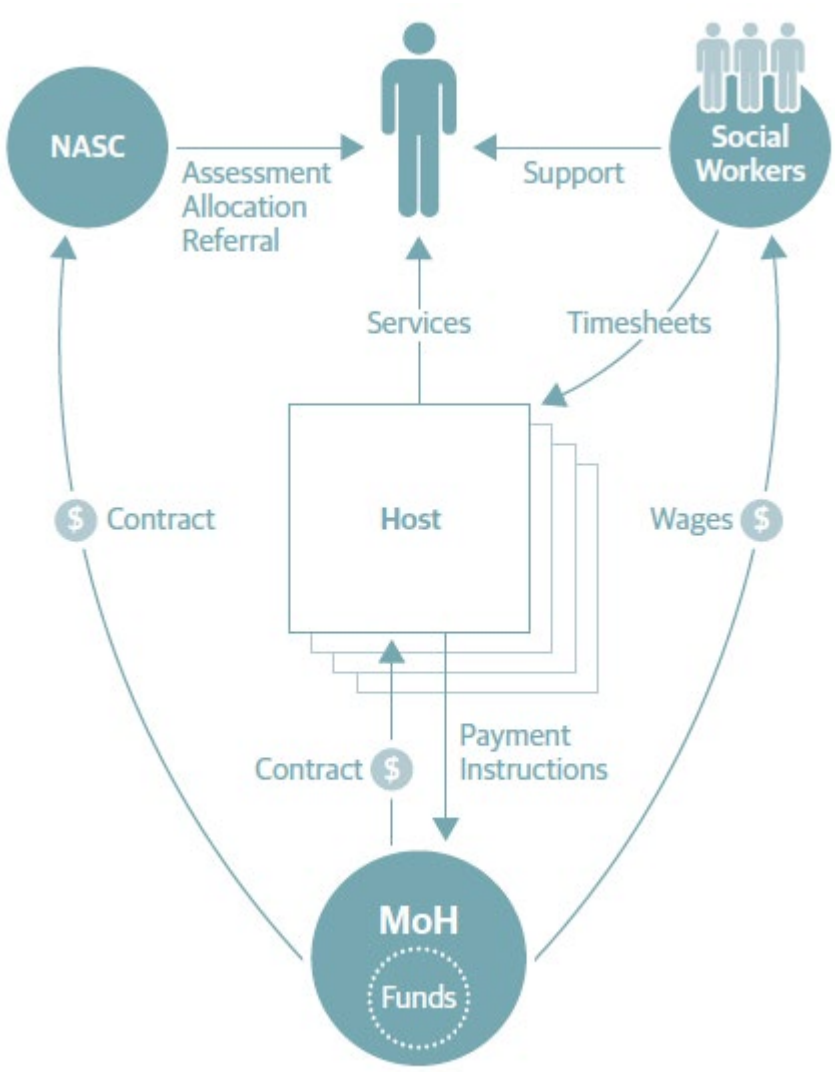
1. The support purchased should help people live their life or make their life better.
2. The support is only needed as the person is disabled – they would not need this service if they were not disabled.
3. The support should be reasonable and cost-effective – even if it may cost more than another type of support, it may help the person more.
4. The support is not subject to a limit or exclusion – the service purchased should fit within allocated funding budgets and not funded by other disability funding sources.

IF does not cover personal income, medical supplies and equipment, home renovations, services that fall outside disability supports or medical care-related costs. Funds cannot be used for gambling or alcohol.

The IF system structure is shown in Figure 2. Individuals who wish to access IF need to be eligible for HCSS funding. The individual's NASC determines their eligibility for funding, whether they can manage a budget and service delivery, and how much funding they can access as per their SPA levels. NASCs then provide individuals with a selection of IF host providers as well as traditional disability support providers. For those wishing to proceed with IF, the IF host provider helps them develop a service plan for how they plan on using IF (Synergia, 2011; Burgess & English, 2021). At a minimum, IF host providers provide setup information, advice and coaching and ongoing monitoring to help IF recipients pay their IF service provider. The planning overhead for individuals who choose to use IF can be high – many individuals can

act as employers and hire their own support workers, manage payments for wages and salary and managing how service is delivered to them. The IF host provider can also provide support in the form of payroll, recruitment, administrative duties, and legal support. IF host providers provide both IF and traditional disability support services (Burgess & English, 2021). Individuals eligible for IF may still choose to go with traditional disability support services, use IF only or have a combination of both.

Figure 2: IF system structure



Note. Retrieved from "The Power of Freedom" by Burgess, M. & English, Bill, 2021, *The New Zealand Initiative,* pg. 16.

The role of NASCs and IF host providers may have some overlap but they primarily serve different functions. NASCs provide assessments for the level of support and care needed and how much funding should be allocated based on their disability needs. IF host providers are responsible for monitoring and reporting service delivery and utilisation, to help ensure IF recipients are being delivered disability care as well as verifying delivery of services so Ministry of Health can make payments to service providers.

As of 2023, there are 10 IF host providers in NZ – the largest being Manawanui which is based in Auckland (Whaikaha, 2023; Burgess & English, 2021). By the end of 2021, the estimated number of IF recipients were approximately 8,000 individuals with many recipients receiving both IF and mainstream disability funding (Burgess & English, 2021).

2.4 Individualised funding and wellbeing outcomes

The underlying assumption of providing disabled individuals the freedom to choose how they manage their own disability is that it results in their greater wellbeing and quality of life (Burgess & English, 2021). Wellbeing outcomes for disabled people tend to be poor compared to their non-disabled counterparts (Welfare Expert Advisory Group, 2019; Stats NZ, 2020; Office for Disability Issues, 2017; Burgess & English, 2021; Stats NZ, 2020; Stats NZ, 2014b). Disabled people tend to have lower employment, wages, labour force participation and educational attainment rates. They are more likely to be in receipt of benefits, live in more deprived areas and lower quality homes. As a more vulnerable population, they are also at greater risk of abuse and violence.

IF has the potential to empower individuals to improve their wellbeing outcomes. As discussed in Burgess & English, 2021, the benefits of IF over the traditional services model are due to: dignity from control over who comes into your home; independent; better services flexibility; increased services reliability; clear decision rights which make spending permissionless; encourages recipients to make best use of available funds; and greater continuity with the same person delivering services each time.

IF and wellbeing outcomes have been previously explored in NZ with cost and wellbeing outcomes usually compared with non-IF recipients (Burgess & English, 2021; Synergia, 2011; New Zealand Productivity Commission, 2015; Field, McGechie, & King, 2015; Priestley, Yeung, & Cooper, 2022).

Increased flexibility of IF meant that individuals could employ personal assistants, allowing them to attend education and training courses. Under traditional funding models, disabled individuals could receive care from different support people. Additionally, reliability of disability services was important for keeping consistent employment. Being able to employ and receive disability support from the same people results in continuity of care by instilling trust and familiarity with disability needs. However, the NZ Productivity Commission (2015) conducted a literature and programme evaluation review and concluded that the health impacts of IF were unclear. In contrast, the mainstream funding model was noted for having limitations resulting in inflexible, unreliable, and non-continuous disability support. As a result, the NZ literature shows that IF mostly results in greater wellbeing outcomes for IF-recipients compared to non-IF recipients.

Internationally, the literature finds similar links with IF and wellbeing. Fleming, McGilloway, & Thomas (2021) conducted a meta-analysis of 73 IF-related research and found positive IF effects with respects to quality of life, client satisfaction and safety. There was limited evidence that IF improved physical functioning and health. In another review, Dickinson (2017) find that IF can be more cost-effective, but may not necessarily improve outcomes for IF recipients. The Australian Productivity Commission (2011) found improved satisfaction of life, continuity of care, employment, health and safety outcomes for individuals receiving self-directed disabiltiy funding. Glendinning, et al. (2008) conducted a randomised control trial to test the performance of IF and found that while IF recipients were satisfied overall with the funding process, there was little difference in quality of life and self-perceived health measures between IF and non-IF recipients.

The existing literature (both in NZ and internationally) compare wellbeing outcomes of IF recipients and non-IF recipients by qualitative, survey or descriptive means. Several of the IF literature focuses on cost and cost-effectiveness as a measure of how well IF performs (Synergia, 2011; Field, McGechie, & King, 2015). While the literauture reports positive wellbeing outcomes for IF recipients, other reports also show no changes in wellbeing outcomes when compared to non-IF recipients. Burgess & English (2021) notes the difficulty of isolating and measuring the impact of IF as participation is a self-selection process with those receiving IF having higher needs, but still “able”, that may result in biased effects of IF. Additionally, many wellbeing measures such as flexibility and reliability are qualitative measures that are hard to quantify. There is scope to measure the wellbeing impacts of IF using administrative data that is routinely collected by government agencies. Priestley, Yeung, & Cooper (2022) examine the wellbeing impacts of IF for mothers raising autistic children in NZ using qualitative methods. The report found negative wellbeing impacts for mothers and noted that IF did not ease the stress of caring for their autistic children. To the best of our knowledge, only two reports examine IF using administrative data. Field, McGechie, & King (2015) uses administrative data to examine IF costs and cost-effectiveness using the administrative disabiltiy dataset. Nicholson Consulting (2020) uses the same dataset to examine the demographic profile of those eligible for IF funding. These are mostly descriptive in nature and do not examine the wellbeing impacts of IF recipients.

This report thefore looks to empirically estimate the wellbeing impacts of individuals receiving IF, compared to those receiving mainstream funding, using population-wide administrative data. It also takes account differences in the characteristics of those receiving IF versus mainstreaming funding in order to mitigate self-selection issues.

3 Data

This report draws on administrative data from the Integrated Data Infrastructure (IDI) to measure demographic and wellbeing indicators for IF and non-IF recipients. This section first describes the Integrated Data Infrastructure (IDI). It then describes the framework, domains and indicators used to measure wellbeing. This section concludes with variable definitions and the relevant administrative datasets from the IDI used to create them.

3.1 Integrated Data Infrastructure

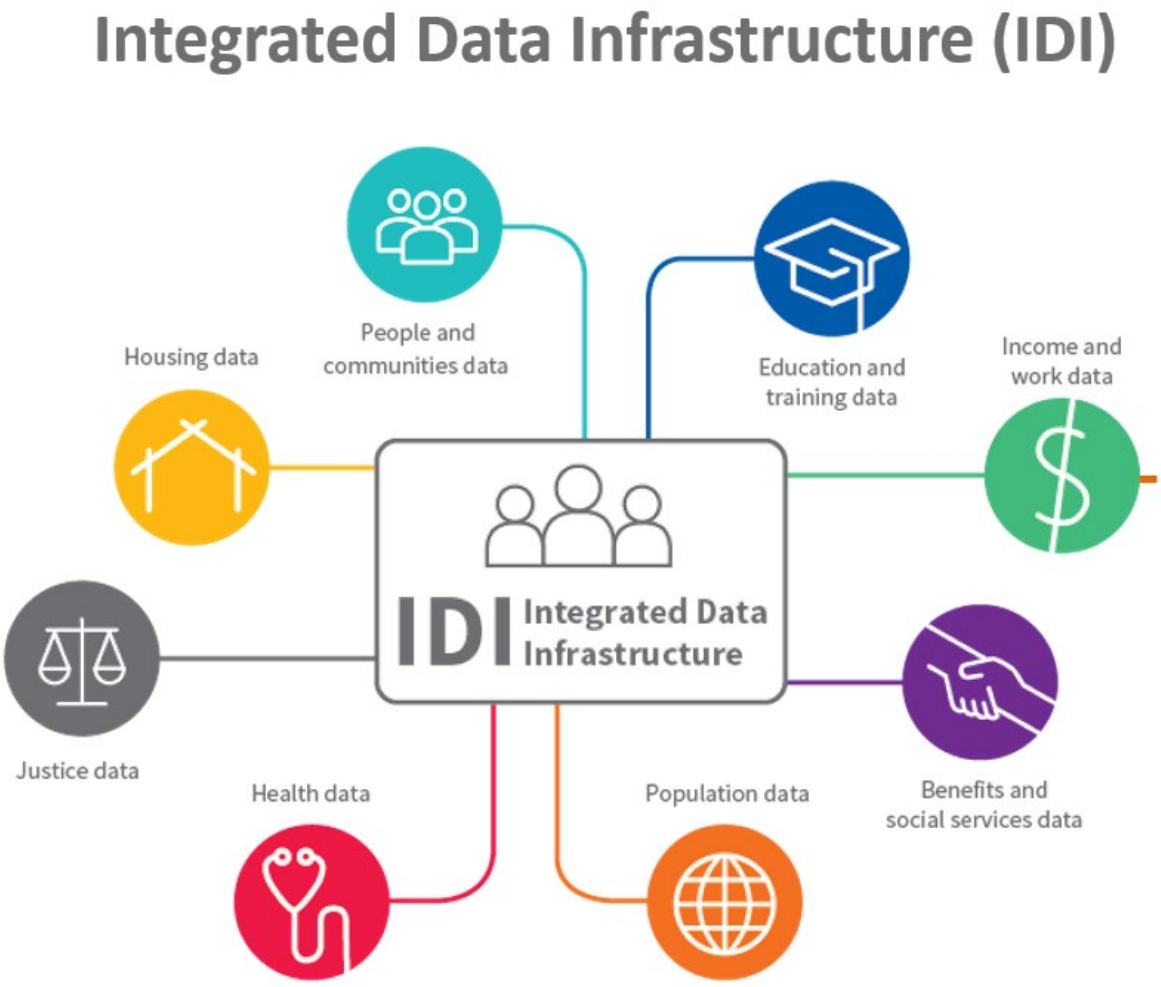
The IDI is a centralised population-wide administrative database managed by Stats NZ who collects, stores, and manages data collected from various government agencies, the Census, and surveys. Stats NZ then collates, stores, and manages it within a database called the Integrated Data Infrastructure (IDI). Data are anonymised and individuals are assigned a unique identifier. This allows multiple datasets to be linked at the individual level across several sectors such as health, social services, and education (Figure 3).

The IDI offers several analytical advantages:

1. High level of population coverage.
2. Researchers can link individuals across datasets to examine drivers across several sectors.
3. Data is consistently and accurately collected, providing highly reliable data.
4. The database is regularly updated – the IDI is generally updated quarterly.
5. Information is collected continuously over long periods of time, allowing for longitudinal analyses.
6. Provision of data is often cost-effective as data is already collected for administrative purposes.

However, there are certain limitations to administrative data. First, administrative data is collected for administrative purposes and so the range of variables available for research may be limited. For example, hours worked has only been recently collected (April 2019) by Inland Revenue but is not needed for tax collection purposes. Secondly, definitions and concepts of administrative data may not match those needed for research questions. There is no qualitative information in administrative data such as subjective wellbeing and so researchers need to construct proxy variables. There is the risk that the proxy variables may not capture what it intends to measure. For example, hospital admissions data may capture a combination of health status and propensity to access health services.

Figure 3: The Integrated Data Infrastructure



Source: Stats NZ (2023)

3.2 Wellbeing outcome measures

The outcome variables examined in this report focus on labour market, benefit receipt, health (mental and physical) and crime victimisation measures. These outcomes and their definition are provided in Table 1. While we explored the possibility of examining educational outcomes, the sample size of the IF population within the relevant age range was very small (see below).

Table 1: Outcome variables from IDI datasets

Variables	Definition	IDI Dataset
Labour market		
Employment rate	Dummy variable equal to 1 if between 25 to 64 and receiving wages and salary, 0 otherwise	Inland Revenue Employee Monthly Schedule
Wage and salary earnings	Total wages and salary for those aged between 25 to 64, measured in 2022 dollars.	Inland Revenue Employee Monthly Schedule
Benefit receipt	Dummy variable equal to 1 if aged 25 to 64 and receiving a main benefit	Inland Revenue Employee Monthly Schedule
Benefit payments	Amount of benefit payments received if aged 25 to 64, measured in 2022 dollars.	Inland Revenue Employee Monthly Schedule
Physical and mental health		
Hospital admissions	Number hospital admissions	MoH Public and Private hospital discharges
Mental health access	Dummy variable equal to 1 if received mental health-related secondary primary care, pharmaceuticals or admitted into hospital for mental health reasons	MoH Programme for Integration of Mental Health Data (PRIMHD), MoH Pharmaceuticals, MoH Public and Private hospital discharges
Self-harm events	Number of self-harm events	ACC Claims, National Minimum Dataset, Oranga Tamariki Abuse Events
Crime and safety		
Accidents	Number of accepted ACC claims	ACC claims
Victimisations	Number of victimisations	NZ Police recorded victimisations

Source: IDI 2023 and authors' compilation.

3.3 Sample creation and demographic profile

The SOCRATES dataset was previously managed by the Ministry of Health (and now Whaikaha) which provides data on individuals receiving Whaikaha support. This report uses an adhoc load to Ministry of Health SOCRATES data which includes an IF indicator and covers the period 2007 to December 2020. Individuals who at any point received IF funding in the observation period are grouped into 'IF Receiving'. Those who are eligible for IF (receive Home and community

support services (HCSS) funding) but not receiving IF are grouped into 'IF Eligible'. The remaining population is grouped into 'IF Ineligible'.[1] Individuals who are deceased or overseas are excluded from the sample. Individual datasets are linked to the SOCRATES table using the snz_moh_uid identifier to characterise the sample and serve as explanatory variables (Table 2).

Table 2: Explanatory variables from IDI datasets

Variables	Definition	IDI Dataset
SPA Level	Support Package Allocation (SPA) which measures funding range and level of disability needs: 0 – No SPA Recorded, 1&2 – Very Low to Low, 3 – Medium, 4 – High, 5 – Very High	SOCRATES
Age Group	Age group as of December 2020: 01 – Under 18, 02 – 18 to 24, 03 – 25 to 44, 04 – 45 to 64, 05 – 65+	Personal Details
Ethnicity	Prioritised ethnicity in order of: Māori, Pacific, Asian, MELAA, Other, European	Personal Details
Gender	Male/Female	Personal Details
Deprivation	Deprivation quintile based on where individuals resided as of December 2020: Quintile 1 (lowest deprivation), Quintile 2, Quintile 3, Quintile 4, Quintile 5 (highest), unknown	NZDep2018, Address Notification
Region	Te Whatu Ora (formerly District Health Board) region based on where individuals are enrolled as of December 2020: Auckland, Bay of Plenty, Canterbury, Capital and Coast, Counties Manukau, Hawkes Bay, Hutt Valley, Lakes, MidCentral, Nelson Marlborough, Northland, South Canterbury, Southern, Tairawhiti, Taranaki, Waikato, Wairarapa, Waitemata, West Coast, Whanganui, Not Enrolled	National Enrolment Service
NASC	Needs Assessment and Service Coordination that individuals are registered with as of December 2020.	SOCRATES

Source: IDI 2023 and authors' compilation.

It is important to note that the sample of 'IF Receiving' individuals in this report is incomplete – as indicated earlier the literature notes that there were 8000 IF recipients at the end of 2021 and this number is confirmed by Manawanui. There are however just 777 IF-receiving individuals

[1] Part of the IF cohort includes Te Whatu Ora clients.

in the analysis, which is less than 10% of the “true” IF receiving population. Discussions with Ministry of Health, Whaikaha and Stats NZ note that the method to how the IF indicator was initially calculated is no longer available and therefore could not be recreated at the time of analysis to capture the full IF population. Therefore, the ‘IF receiving’ population in this analysis is a subset of the true IF receiving population. It is likely that those in the ‘IF Eligible’ cohort that do not receive IF as per the dataset are actually receiving IF but are not flagged as such.

Table 3 provides the descriptive statistics for each disability cohort with demographics reported as a proportion within each cohort. The 'IF Receiving' cohort make up 1.6% of the sample (n = 777), with 'IF Eligible' and 'IF Ineligible' making up 54.5 and 43.9% of the remainder of the sample, respectively.

Across all cohorts, only a small proportion of individuals report having no, very low or low SPA levels. Within the 'IF Receiving' cohort, most individuals are high-need individuals reporting 4 – High and 5 – Very High SPA Levels and this is in line with the literature. By age group, half of the 'IF Receiving' cohort is under 24 with the literature reporting IF recipients being younger than non-IF cohorts. Europeans make up the largest proportion by ethnicity across all cohorts and there are more male disability recipients than female. As noted in the 2013 Disability Survey, the disabled population tend to live in higher deprivation areas (Stats NZ, 2014a) with two-thirds of the sample living in quintile 4 and 5. By region, the highest proportion of 'IF Receiving' recipients are based in Bay of Plenty – however, this is not reflective of the true IF population. Manawanui is the largest IF provider host in NZ and are predominantly based in Auckland with only 2.3% of the IF population in our sample living in Auckland. Therefore, the proportions by region and NASC are likely to reflect data availability rather than demographic characteristics of the sample.

Table 3: Descriptive statistics for disability cohorts

Cohort	IF Receiving		IF Eligible		IF Ineligible	
Population		n		n		n
Size (% of total sample)		777 (1.6%)		26,391 (54.5%)		21,225 (43.9%)
SPA Level	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
No SPA recorded	S	S	51	0.2%	60	0.3%
Very Low to Low	S	S	348	1.3%	1,098	5.2%
Medium	48	6.2%	4,830	18.3%	9,207	43.4%
High	321	41.3%	10,503	39.8%	7,158	33.7%
Very High	408	52.5%	10,659	40.4%	3,705	17.5%
Age Group	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Under 18	252	32.4%	7,410	28.1%	11,568	54.5%
18 to 24	141	18.1%	3,987	15.1%	2,859	13.5%
25 to 44	198	25.5%	5,472	20.7%	2,946	13.9%
45 to 64	129	16.6%	6,519	24.7%	3,075	14.5%
65+	57	7.3%	3,000	11.4%	777	3.7%
Ethnicity	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Asian	21	2.7%	1,707	6.5%	1,563	7.4%
European	513	66.0%	16,374	62.0%	12,273	57.8%
Māori	219	28.2%	6,126	23.2%	5,502	25.9%
MELAA	6	0.8%	408	1.5%	267	1.3%
Other	9	1.2%	132	0.5%	108	0.5%
Pacific	9	1.2%	1,644	6.2%	1,515	7.1%
Gender	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Female	339	43.6%	11,877	45.0%	7,149	33.7%
Male	441	56.8%	14,511	55.0%	14,073	66.3%
Deprivation	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Quintile 1 (Lowest)	42	5.4%	1,647	6.2%	1,593	7.5%
Quintile 2	87	11.2%	2,559	9.7%	2,301	10.8%
Quintile 3	135	17.4%	3,669	13.9%	3,195	15.1%
Quintile 4	201	25.9%	5,853	22.2%	4,698	22.1%
Quintile 5 (Highest)	303	39.0%	12,312	46.7%	9,033	42.6%
Unknown	9	1.2%	354	1.3%	408	1.9%
Region	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Auckland	18	2.3%	1,206	4.6%	1,533	7.2%
Bay of Plenty	315	40.5%	990	3.8%	585	2.8%
Canterbury	57	7.3%	2,781	10.5%	2,112	10.0%
Capital and Coast	12	1.5%	1,230	4.7%	744	3.5%
Counties Manukau	45	5.8%	2,895	11.0%	2,820	13.3%
Hawkes Bay	12	1.5%	750	2.8%	651	3.1%
Hutt Valley	6	0.8%	921	3.5%	729	3.4%
Lakes	24	3.1%	615	2.3%	483	2.3%
MidCentral	15	1.9%	1,341	5.1%	558	2.6%
Nelson Marlborough	9	1.2%	1,065	4.0%	672	3.2%
Northland	12	1.5%	1,137	4.3%	762	3.6%
South Canterbury	S	S	420	1.6%	279	1.3%
Southern	18	2.3%	2,238	8.5%	1,743	8.2%
Tairawhiti	6	0.8%	345	1.3%	270	1.3%
Taranaki	36	4.6%	849	3.2%	597	2.8%
Waikato	114	14.7%	2,877	10.9%	2,997	14.1%
Wairarapa	S	S	369	1.4%	297	1.4%
Waitemata	57	7.3%	3,261	12.4%	2,553	12.0%
West Coast	S	S	354	1.3%	252	1.2%
Whanganui	9	1.2%	657	2.5%	462	2.2%
Not Enrolled	S	S	90	0.3%	126	0.6%
NASC	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
AAL	24	3.1%	726	2.8%	552	2.6%
AAO	S	S	1,611	6.1%	1,362	6.4%
AAW	S	S	327	1.2%	243	1.1%

ALS	S	S	135	0.5%	63	0.3%
BHS	S	S	699	2.6%	675	3.2%
CCS	S	S	1,263	4.8%	744	3.5%
CCSR	S	S	57	0.2%	21	0.1%
CSW	S	S	900	3.4%	624	2.9%
DSL	36	4.6%	1,848	7.0%	2,262	10.7%
DSLR	S	S	57	0.2%	30	0.1%
FOC	S	S	222	0.8%	219	1.0%
ILB	S	S	12	0.0%	S	S
LLK	57	7.3%	3,912	14.8%	2,832	13.3%
LLKR	S	S	207	0.8%	36	0.2%
LUH	S	S	858	3.3%	642	3.0%
LUL	S	S	120	0.5%	111	0.5%
LUN	S	S	270	1.0%	219	1.0%
NACR	S	S	72	0.3%	12	0.1%
NTK	57	7.3%	7,254	27.5%	6,957	32.8%
NWD	S	S	1,320	5.0%	855	4.0%
SNT	543	69.9%	2,271	8.6%	1,383	6.5%
SUL	12	1.5%	1,617	6.1%	582	2.7%
UNK	12	1.5%	633	2.4%	804	3.8%

Source: IDI 2023 and authors' compilation. Note that cells denoted S are suppressed counts due to Stats NZ suppression rule for counts under 6.

Table 4 presents funding descriptive statistics for each disability cohort. Most of the 'IF Receiving' cohort receives both IF and mainstream funding with only a very small proportion receiving IF only. For those in 'IF Eligible', one quarter receives only mainstream funding that is eligible for IF with the remaining three quarters receiving a mixture of both eligible and ineligible funding. On average, 'IF Receiving' individuals receive higher monthly disability funding compared to those in 'IF Eligible' and 'IF Ineligible'. When broken down by SPA Level, there are similar levels of funding at each SPA Level between 'IF Receiving' and 'IF Eligible'.

Table 4: Funding descriptive statistics for disability cohorts (2007-2020), adjusted for $2020 Q4

Cohort	IF Receiving		IF Eligible		IF Ineligible	
Population	n		n		n	
Size (% of total sample)	777 (1.6%)		26,391 (54.5%)		21,225 (43.9%)	
Funding Types	n	(%)	n	(%)	n	(%)
Receiving IF only	27	3.5%	-	-	-	-
Receiving IF + eligible and ineligible MF	750	96.5%	-	-	-	-
Receiving eligible MF only	-	-	5,931	22.5%	-	-
Receiving eligible MF + ineligible MF	-	-	20,460	77.5%	-	-
Receiving ineligible MF only	-	-	-	-	21,225	100.0%
Average months receiving						
Individualised Funding	38.5		-		-	
Eligible Funding	62.3		63.8		-	
Ineligible Funding	87.1		72.6		70.8	
Total months	**114.8**		**95.5**		**70.8**	
Average total months receiving by SPA Level						
No SPA recorded	0.1		0.9		0.2	
Very Low to Low	0.4		2.9		4.1	
Medium	17.3		28.3		32.7	
High	50.5		37.8		21.3	
Very High	46.5		25.6		12.5	
Average sum receiving *						
Individualised Funding	$1,973.52		-		-	
Eligible Funding	$2,709.90		$1,549.02		-	
Ineligible Funding	$816.98		$1,440.53		$1,816.12	
Total Funding	**$2,753.42**		**$2,130.75**		**$1,816.12**	
Average total months receiving by SPA Level						
No SPA recorded	$1,383.90		$1,663.25		$940.77	
Very Low to Low	$169.77		$219.53		$217.42	
Medium	$610.45		$579.87		$414.76	
High	$2,131.49		$1,960.65		$2,169.00	
Very High	$4,253.78		$4,330.62		$5,428.92	

Source: IDI 2023 and authors' compilation. Note that cells denoted S are suppressed counts due to Stats NZ suppression rule for counts under 6. Monthly earnings above the 95th percentile of earnings in that month are dropped due to impossible values that skew the distribution.

4 Method

The challenge in examining the health and wellbeing effects of IF is that we cannot see what would have happened if individuals had received mainstream Whaikaha funding instead of IF. A simple comparison of those who receive IF versus mainstream funding would not be enable any observed effect to be attributed to IF. The characteristics of those who choose IF over mainstream funding may be different, and these characteristics may also be related to differences in health and wellbeing outcomes.

To address this concern, we create a comparison group which is as similar as possible to the group who received IF funding (the 'treatment' group). First, the comparison group comprises of those who are eligible for IF funding but did not choose to take up IF funding and instead received mainstream funding. Second, we use a statistical method to make the comparison group look at similar as possible to the treatment group in terms of their observable characteristics (discussed below). As illustrated in Table 6, the main issue in comparing the IF-receiving and IF-eligible is that the regional distribution of these groups is very different. Given that factors which can be different across regions, such as access to health services, can impact health and wellbeing outcomes, it is important to take these differences into account.

We then apply difference-in-differences (DiD) methods to compare the health and wellbeing outcomes of the IF-receiving treatment group and the IF-eligible comparison group. DiD models allow the average treatment effect on the treated (ATT) to be estimated, which provide causal effects of the treatment under certain assumptions. For example, assumptions include that the treatment and comparison groups had similar trends in their health and wellbeing outcomes before the treatment group took up IF funding (the "parallel trends" assumption).

For this report, causality should be interpreted with some caution. While we account for differences in observable characteristics between the treatment and comparison group, we cannot account for unobservable characteristics. As noted in the literature, IF is a self-selection process – those with high needs but able to manage the higher mental workload or have a support network that can help them manage it, can opt-in to IF. Individuals who are eligible but not receiving IF may not be in the position to do so. These unobservable characteristics are likely to be correlated with health and wellbeing outcomes.

More specifically, we use difference-in-difference (DiD) event study models, also known as a dynamic DiD models. Different individuals start receiving IF at different times - treatment is staggered. Time period zero is the period in which the treated individual first receives IF. We estimate DiD models of the form:

$$Y_{it} = \alpha + \beta \mathrm{Treat}_i + \sum_{e=-2}^{e=5} \delta_e . M_e + \sum_{e=-2}^{e=5} \gamma_e . M_e . \mathrm{Treat}_i + \varepsilon_{it} \qquad (1)$$

where Y_{it} is the outcome (e.g. wages/salary) of person *i* at time *t*. $Treat$ is equal to 1 if the individual is in the treatment group (i.e. received IF funding) and 0 if the individual is in the comparison group. M_e is a time dummy; for example, $M_{e=2} = 1$ is it is the second year after an individual first receives IF funding and 0 otherwise, with e ranging from two years before to five years after first receiving IF funding. The base time period is $M_{e=-3}$. The coefficient of interest is γ_e which is the difference in outcomes between the treatment and comparison group before and after treatment. If the IF treatment group has higher wages/salary (for example) than the comparison group, γ_e will be positive and statistically significant.

For robustness, we also estimate two-period DiDs:

$$Y_{it} = \alpha + \beta \text{Treat}_i + \delta Post_{it} + \gamma Treat_i \cdot Post_{it} + \varepsilon_{it} \qquad (2)$$

where $Post$ is equal to 1 if the time period is after treatment and 0 if it is before.

Note that because time period 0 is the same year for an individual in the treatment group and the matched individual in the comparison group, there's no issue with timing effects in terms of e.g. differences in macroeconomic conditions

In terms of the comparison group, we considered two methods: staggered treatment timing and matching methods. For staggered treatment timing, we considered using a comparison group of those who received IF but at a later time period (Fadlon & Nielsen, 2019) and applying a doubly-robust DiD estimation for staggered treatment time (Callaway & Sant'Anna, 2021). This method rests on the assumption that those who are treated earlier are similar in observable and unobservable characteristics to those who are treated later. However, due to the small number of people receiving IF, the assumptions of this method were not met so was not pursued. This method may be possible if the full population of IF recipients become available.

Thus, we used matching methods to construct a comparison group with observable characteristics that is similar to that of the treatment group. Specifically, we use propensity score matching and apply a nearest-neighbour matching method.[2] Due to the small number in the treatment group, we focus on annual outcomes. First, we define the treatment group as those who received IF for the first time in a particular year. Second, we construct a comparison group by matching those in the treatment group with at least one person who is 1) eligible to receive IF in the same year but 2) never received IF over the entire time period investigated (2007-2020). For all outcomes we match on age, gender, ethnicity, DHB,

[2] In the case of ties in the propensity score, a treated individual may be matched to more than one comparison individual.

SPA-level and deprivation level. We also match on prior outcomes over the last two years before the receipt of IF, particularly whether or not the individual: was employed, received a benefit, had an accident, had a hospital admission, had a mental-health or self-harm event and had a victimisation event. For example, we match on whether or not the individual had an accident in the two years before the date of first treatment (or the date the individual entered the comparison group).

The literature on matching methods highlights a potential issue with matching methods where matching occurs with observable characteristics only (Caliendo, Mahlstedt, & Mitnik, 2017). The treatment and comparison group may still have different unobservable characteristics that may be related to the outcomes. For example, we cannot observe the strength of individuals' support networks and those who have a better support network may be more likely to use IF rather than mainstream funding and also have better employment outcomes. However, the literature also highlights that matching only on observables appears to be a good proxy for unobservable characteristics as well if, as has been done in this case, past outcomes (such as employment outcomes) are included in the matching equation (Caliendo, Mahlstedt, & Mitnik, 2017).

A likely bigger issue with the analysis is that some of those in the comparison group may have actually received IF but we cannot observe this due to undercounting of IF recipients in the data. Therefore, it is important to keep in mind that the estimates from the DiD are likely to underestimate the impacts of IF.

Table 5 examines covariate balance – that is, it presents descriptive statistics of the treatment and comparison groups before and after matching. Column 1 presents the mean for the treatment group. Column 2 presents the mean for the unmatched comparison group and Column 3 presents the p-value from a t-test examining whether the treatment and comparison means differ. Columns 4 and 5 present the matched comparison group means and p-values.

There are several statistically significant differences between the means of the treatment group and the unmatched comparison group. Recall that the unmatched comparison group comprises of all individuals who were eligible to receive IF in the same year that someone in the treatment group first started receiving IF. For example, the unmatched comparison group has a higher share of females, an older average age and have a lower average SPA level, with the differences being statistically significant at the 1% level. In contrast, once the treatment group is matched to someone in the comparison group, there are no statistically significant differences between the characteristics of the treatment and comparison groups. Thus, the matching results in a comparison group with very similar observable characteristics as the treatment group.

Table 5: Covariate balance

		Unmatched		Matched	
	1	2	3	4	5
Variables	Treatment: mean	Comparison: Mean	p-value	Comparison: mean	p-value
Female	0.43	0.50	0.00***	0.43	0.96
Age	23.04	34.16	0.00***	23.65	0.47
Age group					
Under 18	0.53	0.33	0.00***	0.56	0.21
18-24	0.14	0.13	0.41	0.12	0.24
45-64	0.15	0.28	0.00***	0.14	0.61
65+	0.01	0.08	0.00***	0.02	0.35
Ethnicity					
European	0.65	0.64	0.39	0.68	0.29
Māori	0.29	0.20	0.00***	0.29	0.95
Pacific Peoples	0.02	0.07	0.00***	0.01	0.49
Asian	0.03	0.07	0.00***	0.02	0.12
MELAA	0.01	0.02	0.06**	0.01	0.55
Other	0.01	0.00	0.11	0.00	0.19
SPA level	4.46	4.26	0.00***	4.45	0.71
SPA categories					
Very low	0.00	0.00	0.88		0.00
Low	0.00	0.01	0.00***		0.00
Medium	0.07	0.16	0.00***	0.07	0.61
High	0.40	0.38	0.18	0.40	0.96
Very high	0.53	0.45	0.00***	0.52	0.83
Deprivation quintile					
Q1 (lowest)	0.13	0.11	0.08*	0.13	0.88
Q2	0.19	0.15	0.00***	0.21	0.39
Q3	0.19	0.17	0.24	0.18	0.55
Q4	0.22	0.22	0.94	0.21	0.61
Q5 (highest)	0.22	0.31	0.00***	0.22	0.85
Unknown	0.05	0.04	0.11	0.05	0.71
DHB					
Auckland	0.03	0.05	0.00***	0.03	1.00
Bay of Plenty	0.41	0.03	0.00***	0.40	0.96
Canterbury	0.08	0.10	0.01**	0.08	0.84
Capital and Coast	0.02	0.04	0.00***	0.02	1.00
Counties Manukau	0.06	0.12	0.00***	0.06	0.51
Hawkes Bay	0.02	0.03	0.04**	0.01	0.09
Hutt Valley	0.01	0.04	0.00***	0.01	1.00
Lakes	0.04	0.02	0.00***	0.04	0.68
MidCentral	0.02	0.05	0.00***	0.02	0.70
Nelson Marlborough	0.01	0.04	0.00***	0.01	0.64
Northland	0.02	0.05	0.00***	0.01	0.65
South Canterbury	0.00	0.00	0.6	0.00	0.14
Southern	0.01	0.02	0.01***	0.00	0.39
Tairawhiti	0.02	0.09	0.00***	0.02	0.71
Taranaki	0.01	0.01	0.29	0.01	0.77
Waikato	0.05	0.03	0.05*	0.05	0.90
Wairarapa	0.14	0.09	0.00***	0.15	0.88
Waitemata	0.00	0.01	0.01**	0.00	0.14
West Coast	0.08	0.13	0.00***	0.09	0.34
Whanganui	0.00	0.01	0.01***	0.00	0.55
Not Enrolled	0.01	0.03	0.01***	0.00	0.07
In the last 2 years, any…					
Accident	0.38	0.40	0.31	0.37	0.59
Hospital admission	0.38	0.40	0.45	0.37	0.52

Mental health or self-harm incident	0.56	0.67	0.00***	0.58	0.43
Victimisation	0.01	0.02	0.06*	0.01	0.80
Employment	0.14	0.11	0.01***	0.13	0.45
Benefit received	0.39	0.55	0.00***	0.36	0.31
In the last 2 years…					
Annual wages/salary	3,220	1,844	0.00***	3,891	0.48
Annual benefit payments	6,604	9,546	0.00***	6,256	0.42
Observation count	**798**	**150,018**		**939**	

Source: IDI 2023 and authors' compilation.

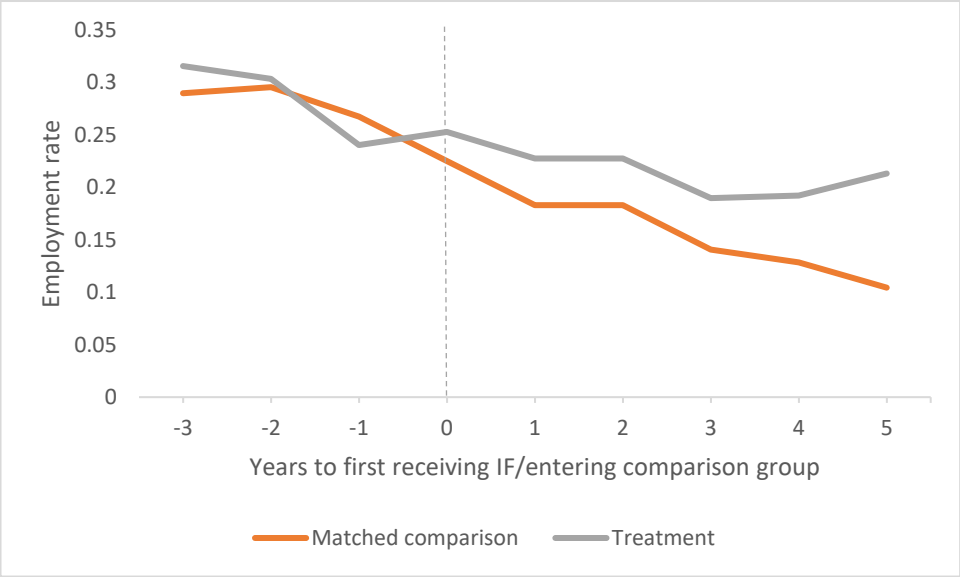
5 Results

5.1 Labour market outcomes

Employment

Figure 4 presents employment over time descriptively, including only those aged 25 to 60 years. It shows trends for the matched comparison group and the treatment group for three years before the individual started receiving IF (or entered the comparison group) to five years after first receiving it. Descriptively, the employment rates of both groups fall over time, with the trends for the treatment and comparison groups being similar before time 0 (when the treatment group first starts receiving IF). It appears that the employment outcomes of the treatment group are relatively better than the matched comparison group after time 0.

Figure 4: Employment over time



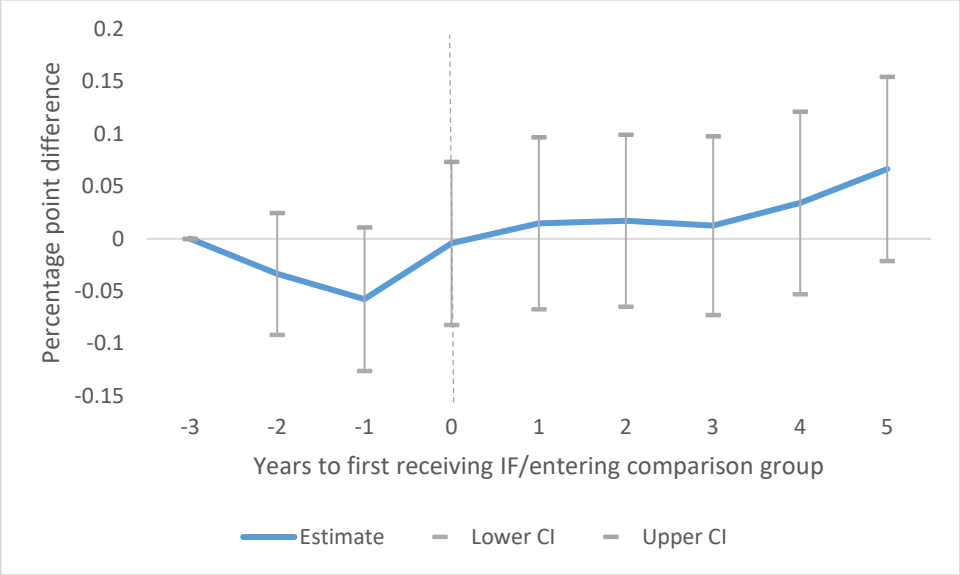
Source: IDI 2023 and authors' compilation.

However, Figure 4 does not tell us whether the changes over time are statistically significant. Therefore, Figure 5 presents results for the coefficient of interest (γ) from an estimation of Equation (1), which more formally compares the treatment group with the matched comparison group over time using a difference-in-differences method. Recall that the differences are measured relative to the base time period of three years before IF was first received and thus, the DiD results compare changes over time for the two groups. The employment rate is higher among the treatment group after they start receiving IF, with the largest difference being seven percentage points five years after they started receiving IF. While the magnitude of this difference is large, particularly given employment rates among both the treatment

and matched comparison group are relatively low (about 15% in year 5), the confidence intervals are wide, and the difference is not statistically significant. The small sample size may mean that the estimation is not very precise – once a larger sample size of the full set of IF-receiving individuals becomes available, this would likely increase the precision of the estimate and could result in statistically significant differences.

We also estimate two-period DiDs (see Appendix Table A.1). These show that after they start to receive IF in year 0, the treatment group has a higher average employment rate than the comparison group of about five percentage points. However, the difference is only weakly significant (significant at the 10% level).

Figure 5: Difference-in-differences results: Employment

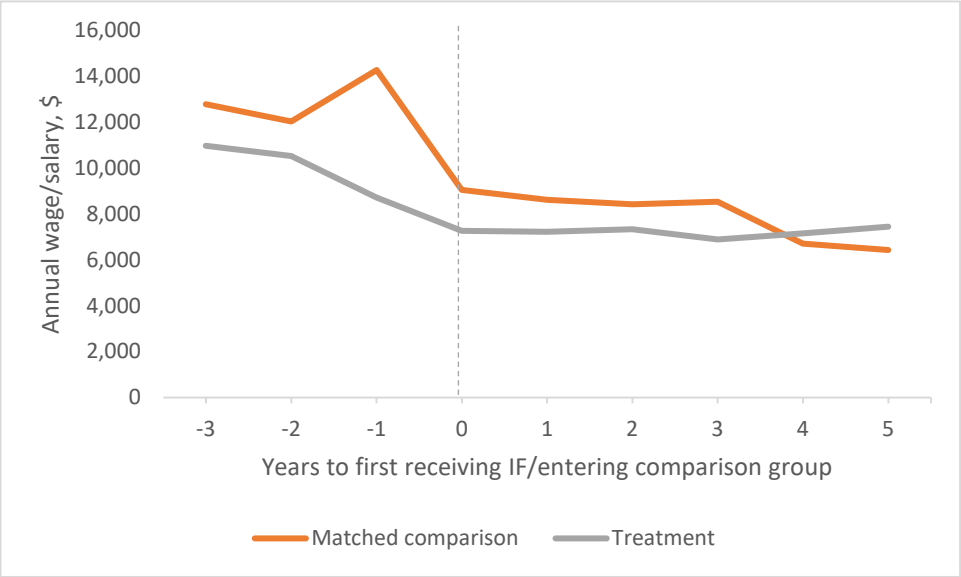


Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level. Population of interest limited to those aged 25-64 in year 0.

Earnings

Figure 6 presents wage/salary earnings over time for those aged between 25 and 60 years old in the treatment and the matched comparison groups. Note that earnings include those with zero earnings. Like the employment rate, the earnings of both the treatment and comparison groups decline over time. The earnings of the comparison group are higher than those of the treatment group over most of the time period examined. However, the earnings profile of the treatment group becomes flat after they begin to receive IF at time 0, whereas the earnings of the comparison group continue to decline (albeit at a slower rate). This results in the earnings of the treatment group overtaking the comparison group in year 4. Thus, descriptively it appears that the receipt of IF has a positive effect on earnings.

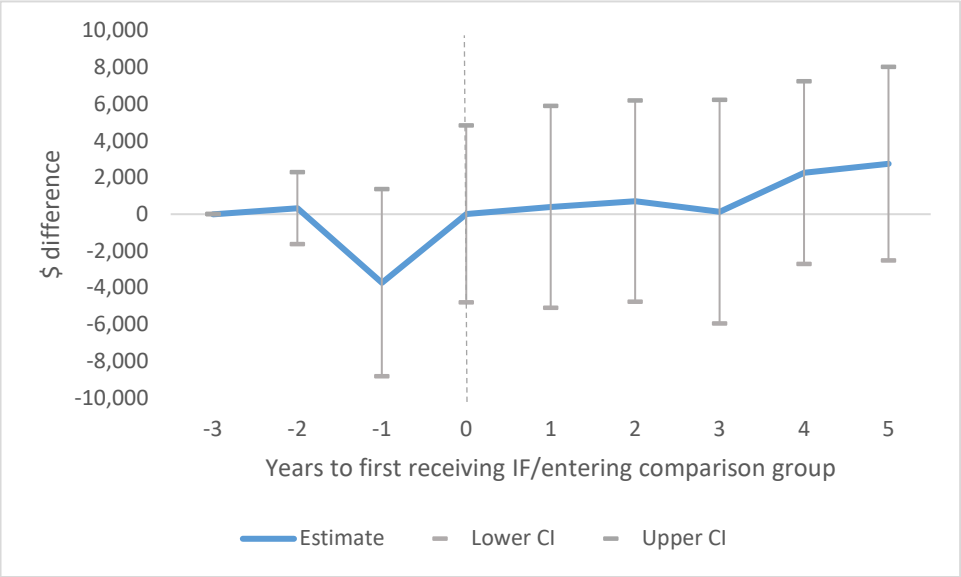
Figure 6: Wage/salary earnings over time



Source: IDI 2023 and authors' compilation.

Figure 7 presents DiD results for earnings which suggests there is little difference in the earnings of the treatment and comparison groups after the treatment group starts receiving IF in year 0, except in years 4 and 5, where the earnings of the treatment group are higher by up to $2,700 a year. Given the average earnings in year 5 for the two group is just under $7,000, this difference is large. However, it is not statistically significant. As mentioned, this may be in part because of the small sample size leading to wide confidence intervals. Once a larger sample size of the full set of IF-receiving individuals becomes available, this would likely increase the precision of the estimate and could result in statistically significant differences. The two-period DiD results provide consistent results (see Table A.1).

Figure 7: Difference-in-differences results: Wage/salary earnings

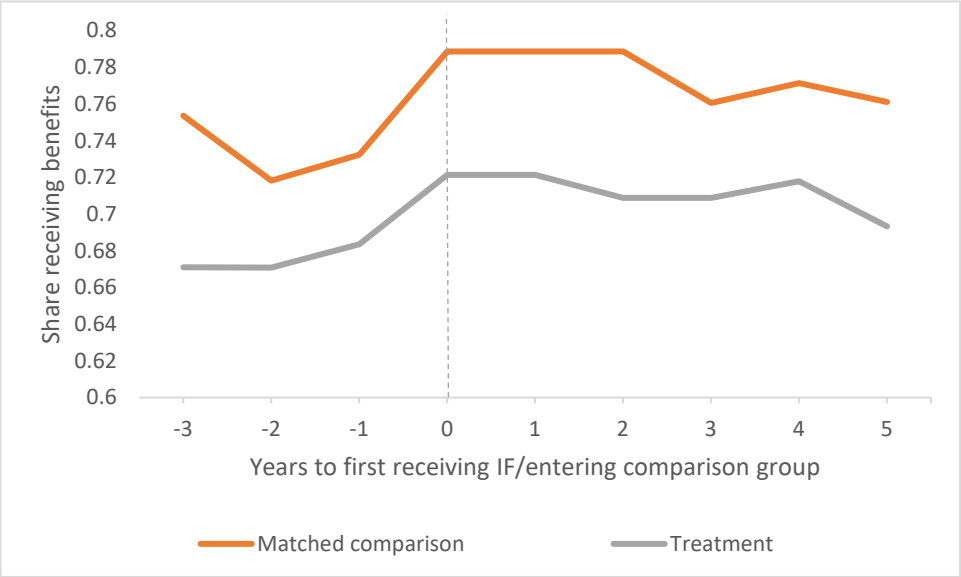


Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level. Population of interest limited to those aged 25-64 in year 0.

Benefit receipt

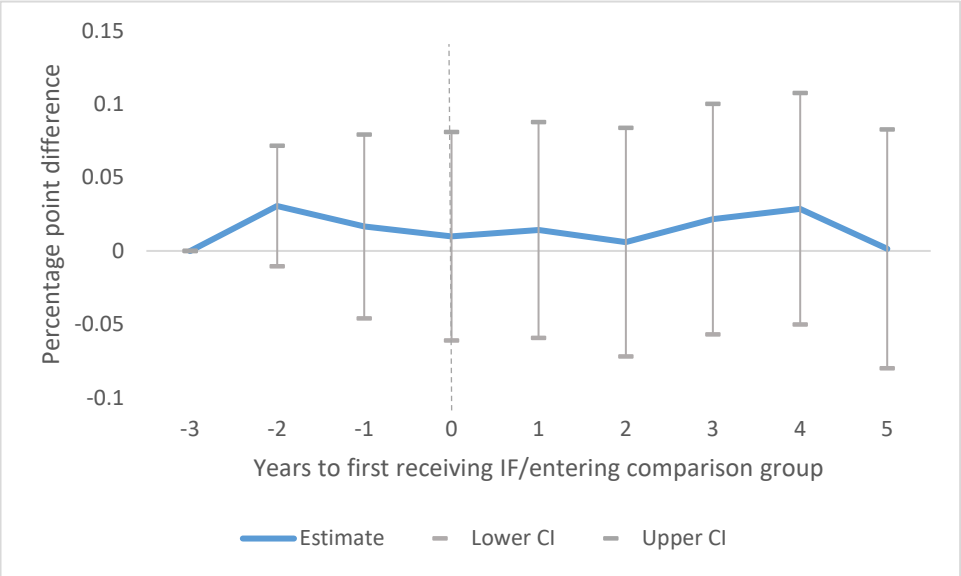
Figure 8 shows the share of individuals receiving a benefit. More than two-thirds of individuals in the treatment group are receiving a benefit, while the share is more than three-quarters in most years for the comparison group. However, the trends for the two groups over time are similar. These similar trends are confirmed by the DiD results (Figure 9), which shows that benefit receipt is somewhat higher among the treatment than comparison groups in most years. However, the differences are not statistically significant in any year. These results are consistent with the two-period DID results (see Table A.1).

Figure 8: Share receiving benefits over time



Source: IDI 2023 and authors' compilation.

Figure 9: Difference-in-differences results: Share receiving benefits

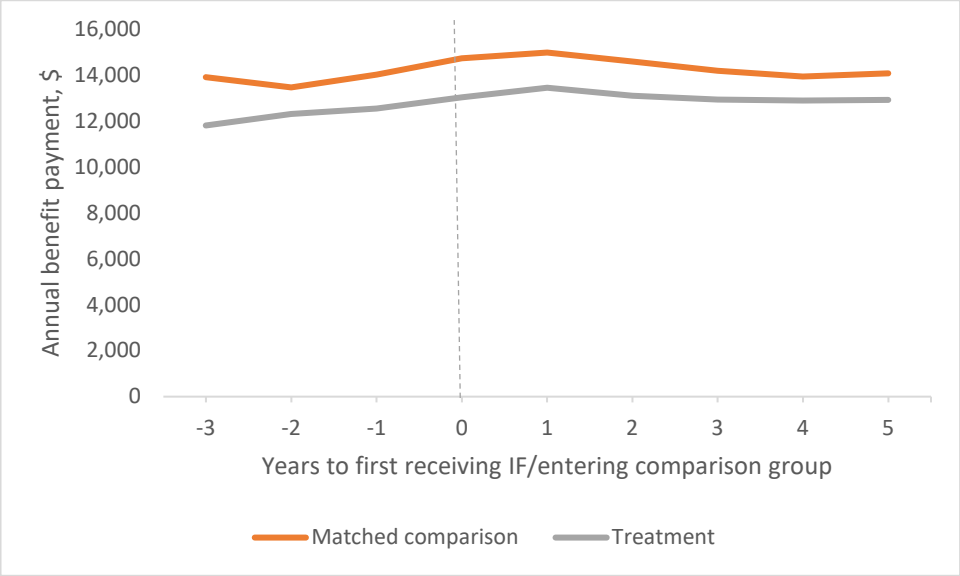


Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level. Population of interest limited to those aged 25-64 in year 0.

Figure 10 shows the amount of benefit payments (including those with no benefit payments). The matched comparison group has a higher average amount of annual benefit payments in all time periods. However, the patterns over time are very similar for both groups. Figure 11 examines this more formally via DiD estimation. This shows that the amount of benefit payments received is higher for the treatment

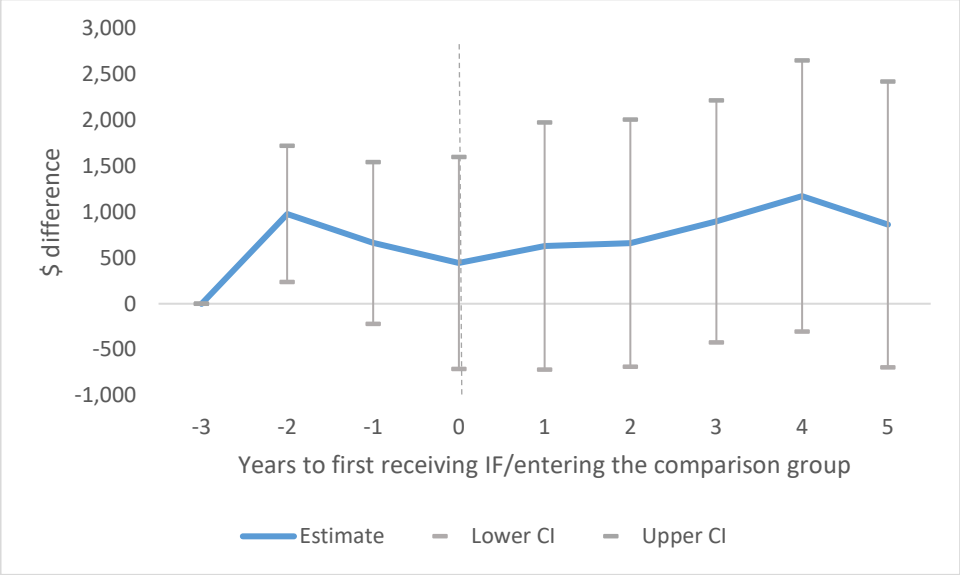
group than the comparison group both before and after the treatment group starts receiving IF at time 0 – however, none of the differences in the post-IF years are statistically significant.

Figure 10: Amount of annual benefit payments over time



Source: IDI 2023 and authors' compilation.

Figure 11: Difference-in-differences results: Annual benefit payment

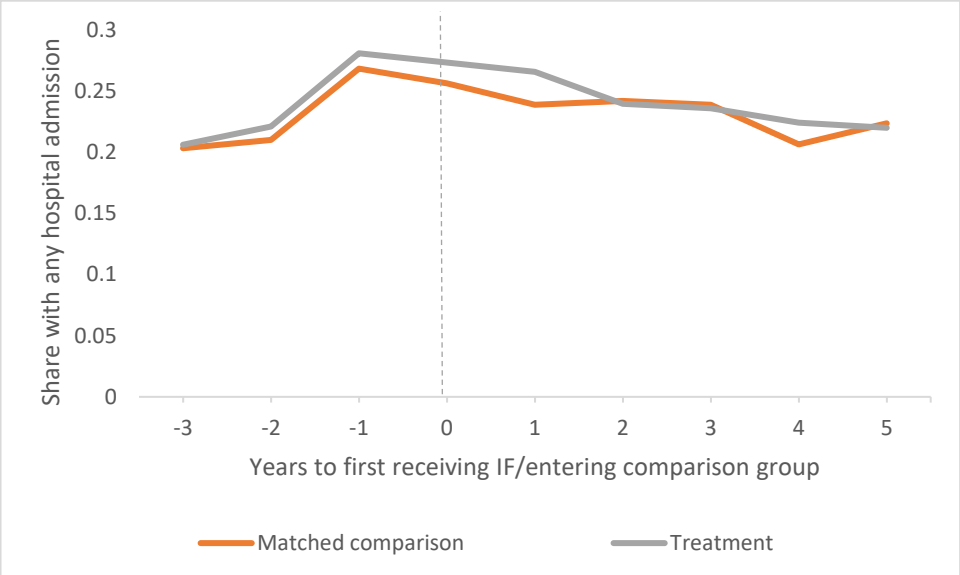


Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level. Population of interest limited to those aged 25-64 in year 0.

5.2 Hospital admissions

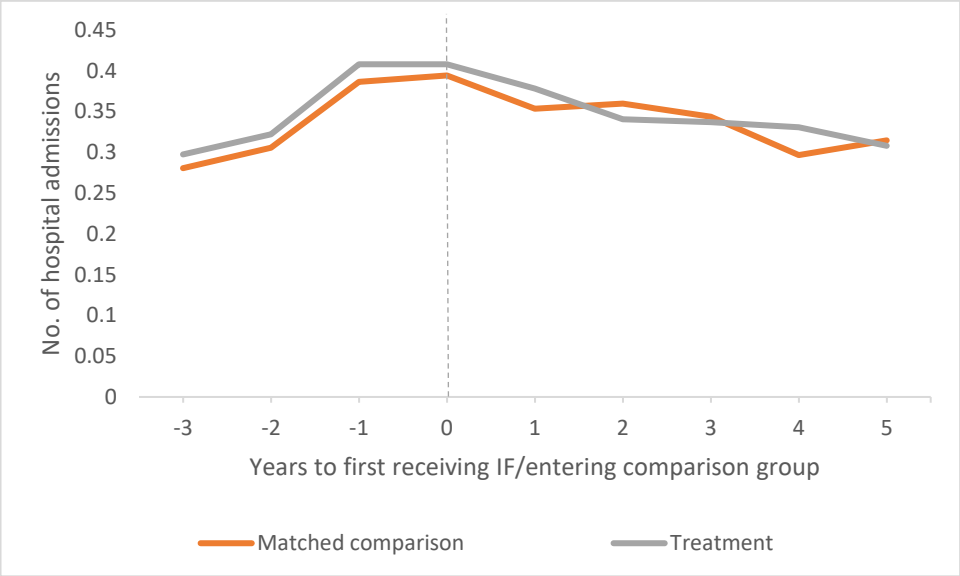
This outcome is measured for everyone rather than limited to those in the 25-60 age category as was the case for employment, earnings and benefit receipt. The share with at least one hospital admission in any given year is similar for the treatment and comparison groups, and ranges from about a fifth to a quarter. The changes in these shares over time are also very similar between the two groups (Figure 12). The average number of hospital admissions is also similar between the two groups (Figure 13).

Figure 12: Share with at least one hospital admission over time



Source: IDI 2023 and authors' compilation.

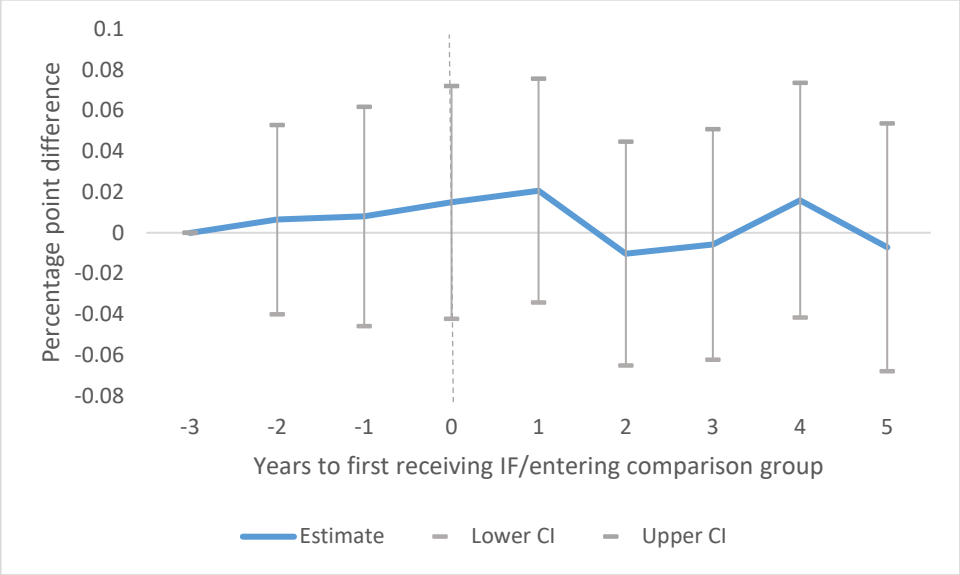
Figure 13: Number of hospital admissions over time



Source: IDI 2023 and authors' compilation.

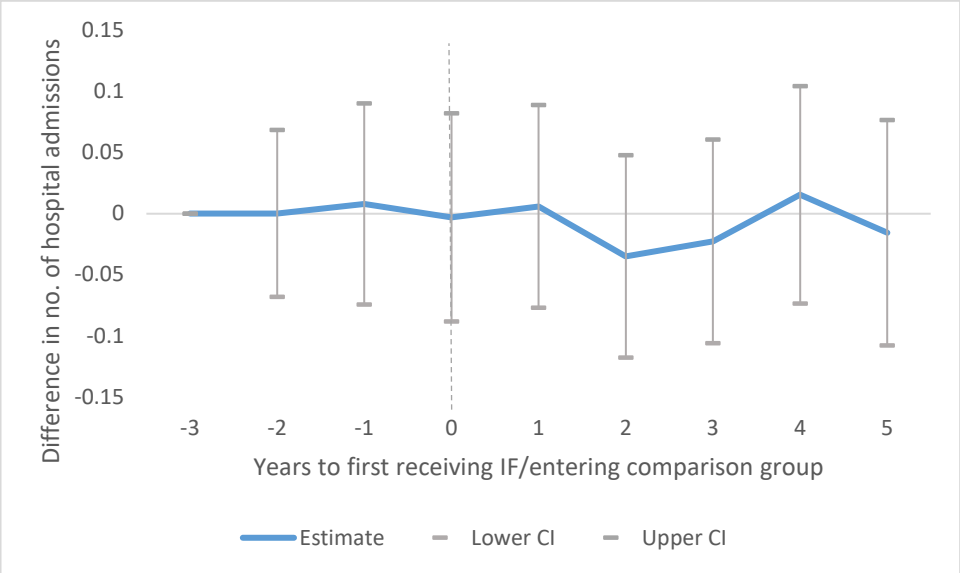
The DiD results confirm that estimated share with at least one hospital admission and the number of hospital admissions is variable year-by-year among the treatment versus comparison groups. Moreover, these differences are not statistically significant in any year (Figure 14 and Figure 15). These results are confirmed by the two-period DiD results (Table A.1).

Figure 14: Difference-in-differences results: At least one hospital admission



Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

Figure 15: Difference-in-differences results: Number of hospital admissions

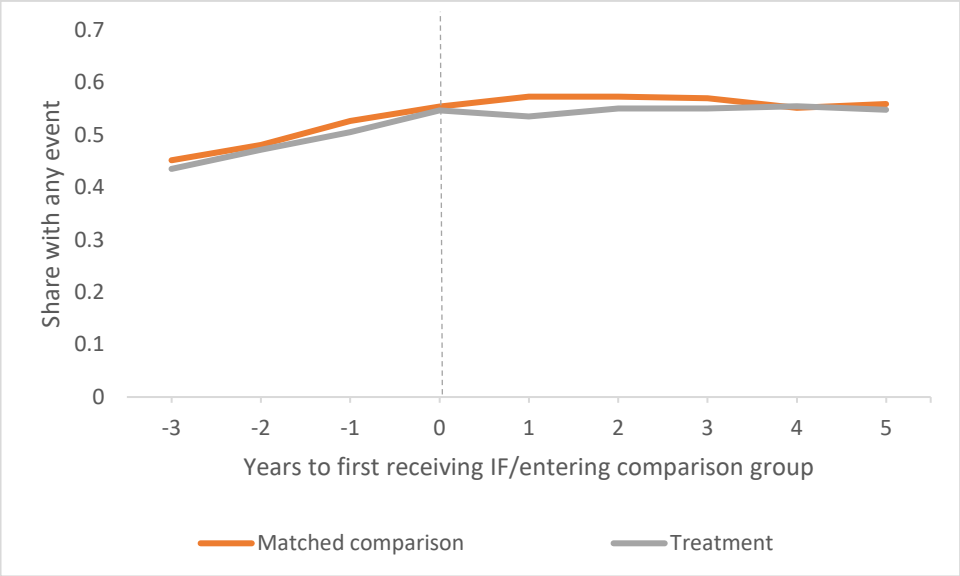


Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

5.3 Mental health

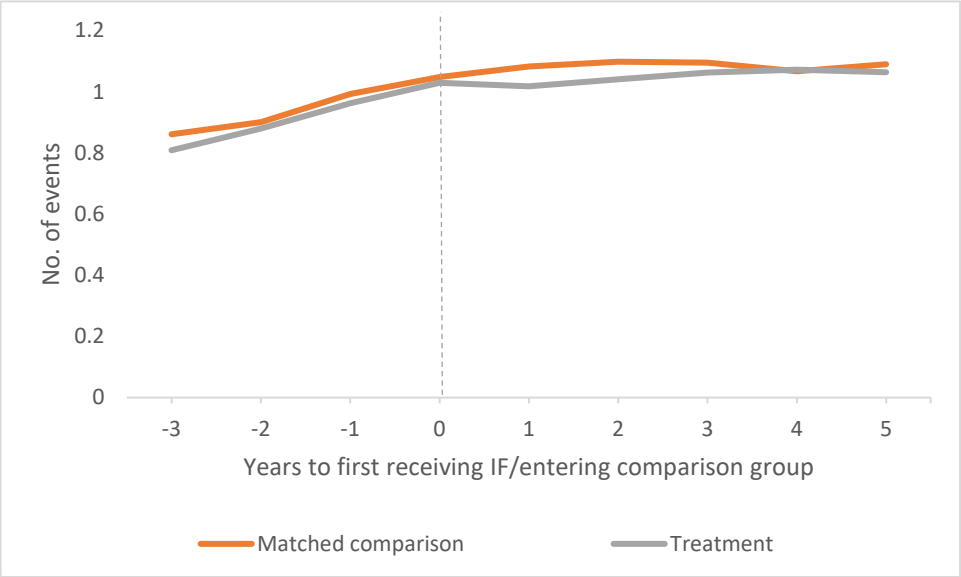
As with hospital admissions, mental health is measured for everyone rather than limited to those in the 25-60 age category. Figure 16 shows the share of those in the treatment and comparison groups who had a mental health or self-harm event. Recall that this covers any secondary mental health referral, prescriptions for mental-health related medications, incapacity benefit receipt and hospital admissions for mental health or self-harm events. Patterns for the treatment and control groups are very similar and quite high with around 50-60% having at least one mental health event in a given year. Likewise, the number of mental health events in a year is very similar for the treatment and comparison groups (Figure 17).

Figure 16: Share with at least one mental health event over time



Source: IDI 2023 and authors' compilation.

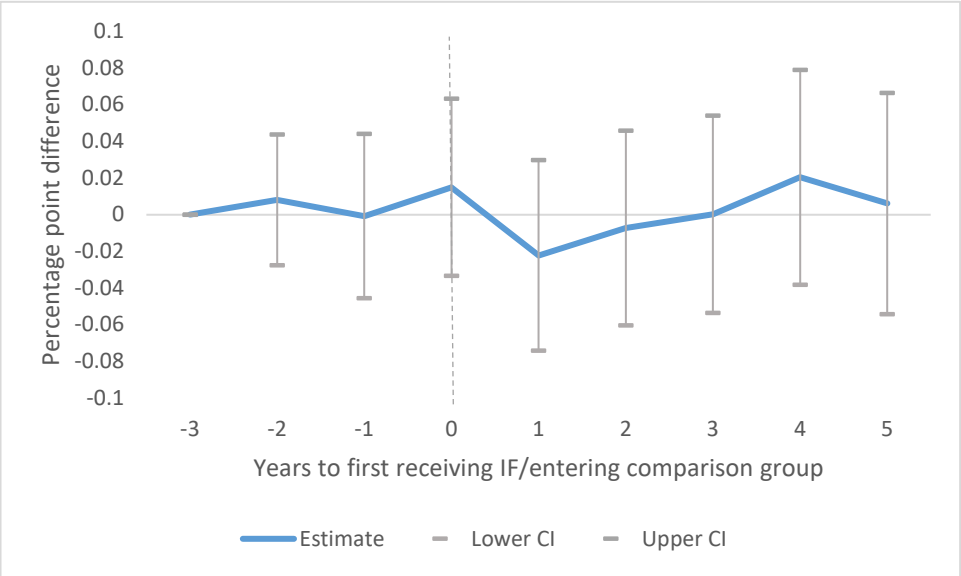
Figure 17: Number of mental health events over time



Source: IDI 2023 and authors' compilation.

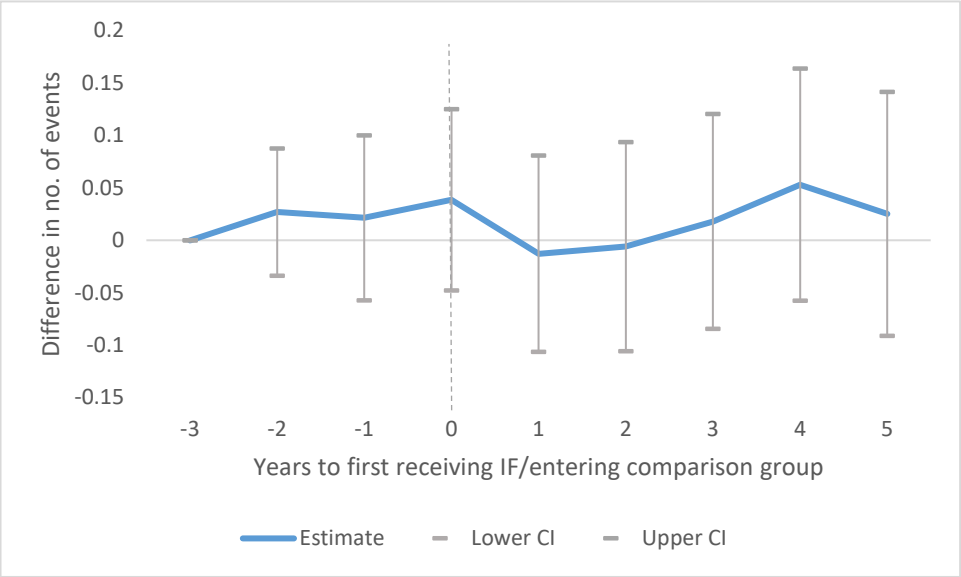
The DiD results confirm that there are no statistically significant differences in the share of those in the treatment and comparison group who had at least one mental health event in a given year (Figure 18). Likewise, there are no statistically significant differences in the number of mental health events (Figure 19).

Figure 18: Difference-in-differences results: At least one mental health event



Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

Figure 19: Difference-in-differences results: Number of mental health events

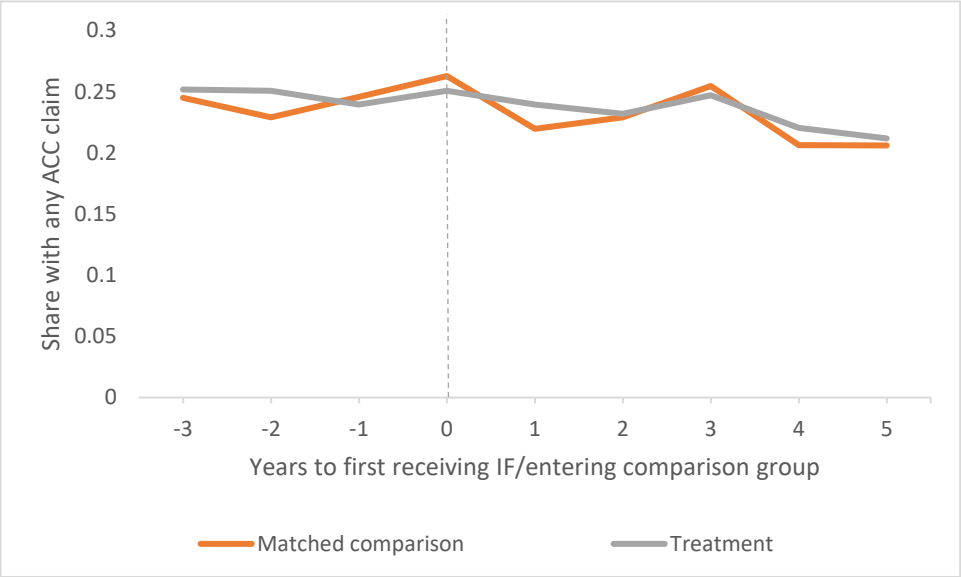


Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

5.4 Accidents

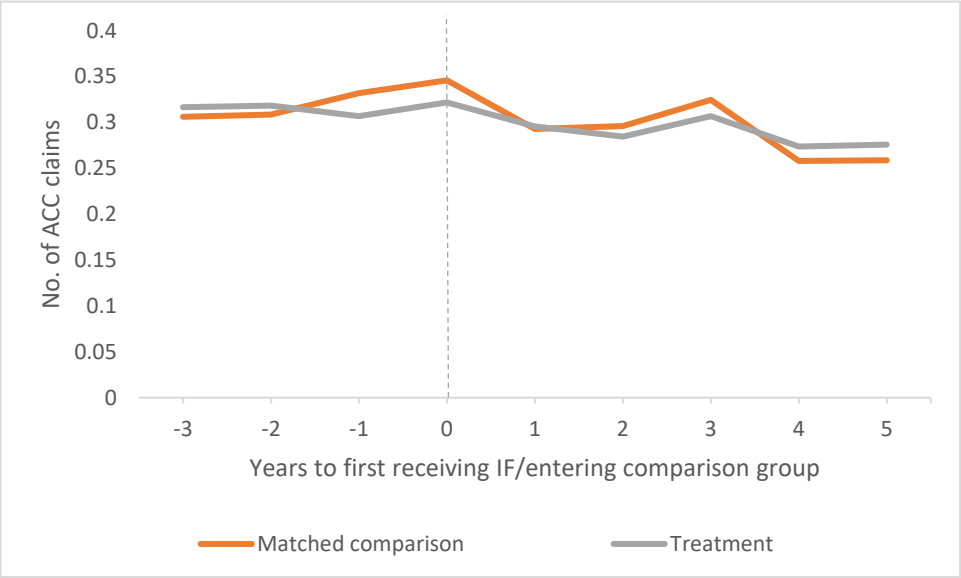
We now examine accident outcomes. As with health outcomes, accidents are measured for everyone rather than limited to those in the 25-60 age category as was the case for employment, earnings and benefit receipt. Figure 20 shows the share in the treatment and comparison groups with at least one accepted ACC claim in the given year. The level and trends in the share with at least one ACC claim between the two groups are very similar, with between a fifth and a quarter of individuals each year having at least one ACC claim. Figure 21 shows that the average number of ACC claims for the two groups is also very similar, and not much higher than the share with at least one ACC claim, indicating that most of those who had an ACC claim had only one claim in a given year.

Figure 20: Share with at least one ACC claim over time



Source: IDI 2023 and authors' compilation.

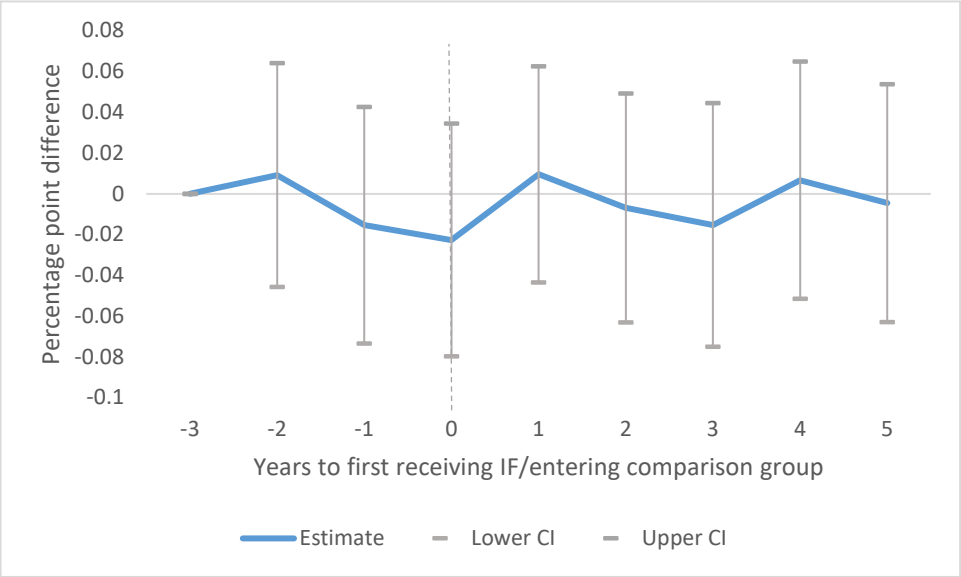
Figure 21: Number of ACC claims over time



Source: IDI 2023 and authors' compilation.

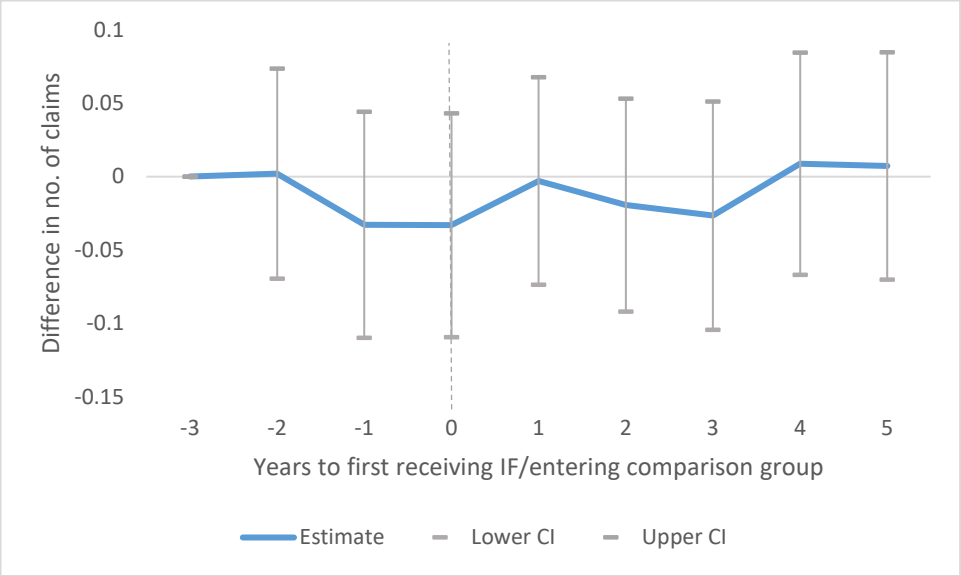
The DiD results show that the estimates for the share with at least one ACC claim and the number of ACC claims are lower for the treatment group in some years, and higher in others (Figure 22 and Figure 23 respectively). However, none of the differences are statistically significant.

Figure 22: Difference-in-differences results: At least one ACC claim



Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

Figure 23: Difference-in-differences results: Number of ACC claims



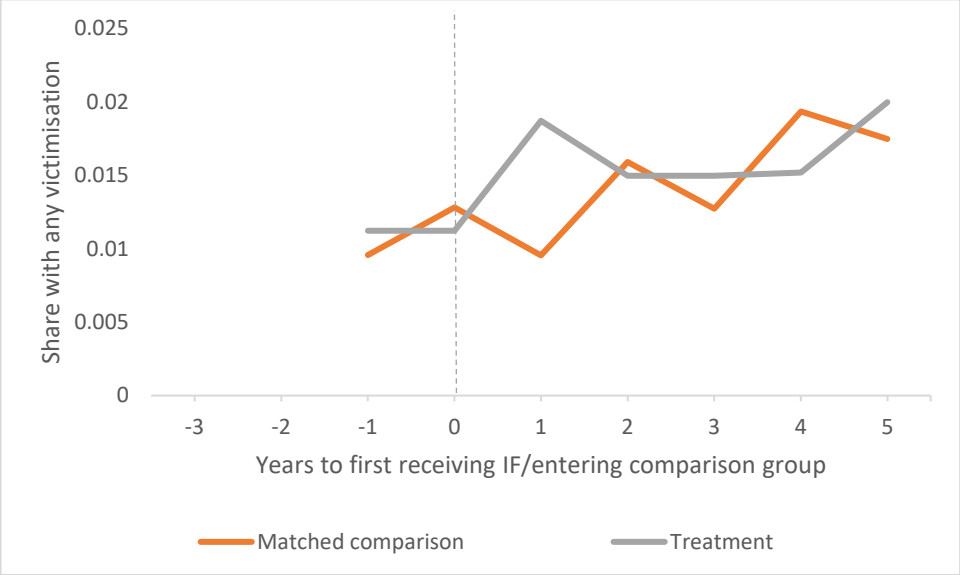
Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

5.5 Victimisations

The share with at least one victimisation is low for both the treatment and control groups, ranging from about 1% to 2% (Figure 24). Indeed, the numbers are so low that the data for years -3 and -2 were

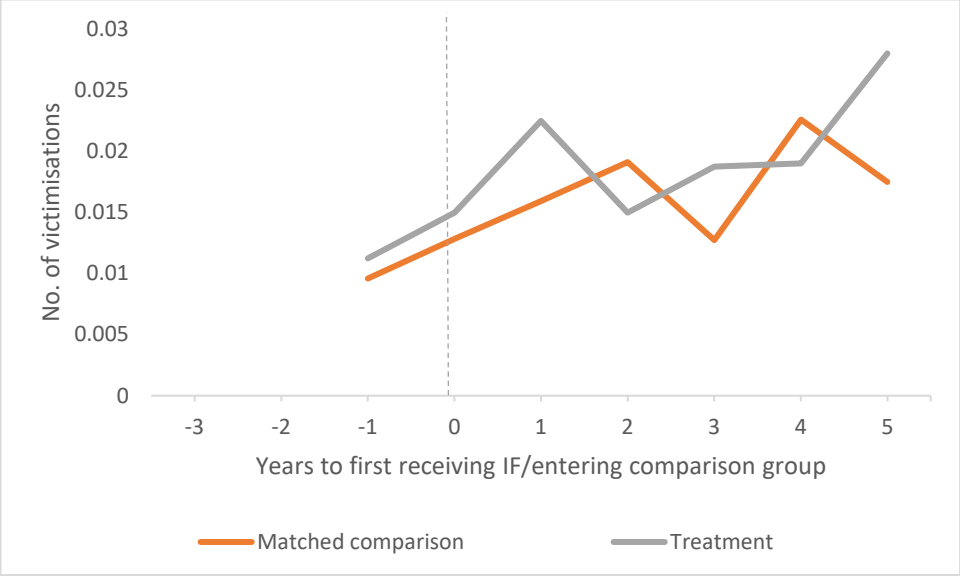
suppressed in accordance with Stats NZ confidentiality rules. While the share of victimisations varies over time, there is no discernible difference between the treatment and comparison groups. Similarly, the average number of victimisations is low - while those in the treatment group have a higher number of victimisations in year 5, this does not appear to be unusually high given variation in the patterns over time (Figure 25).

Figure 24: Share with at least one victimisation over time



Source: IDI 2023 and authors' compilation.

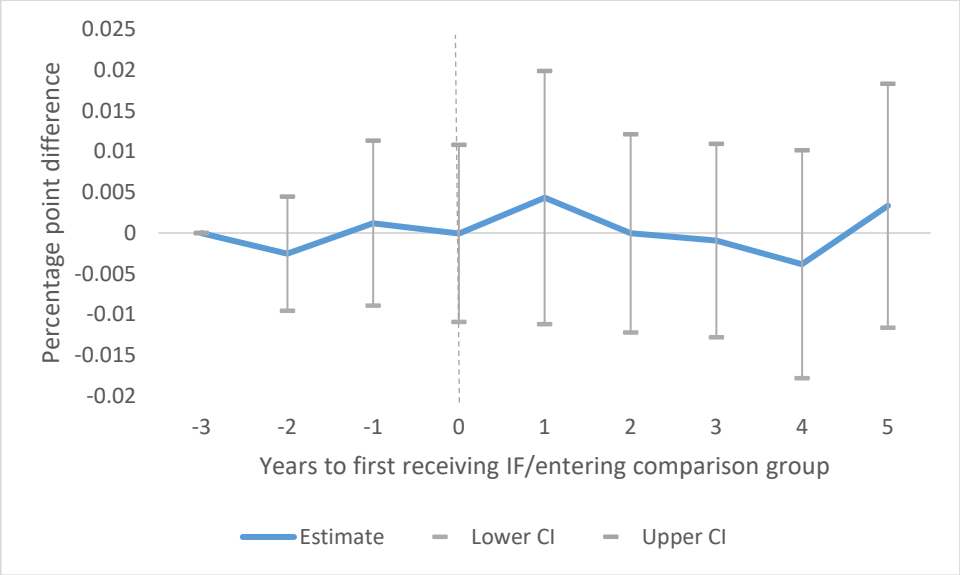
Figure 25: Number of victimisations over time



Source: IDI 2023 and authors' compilation.

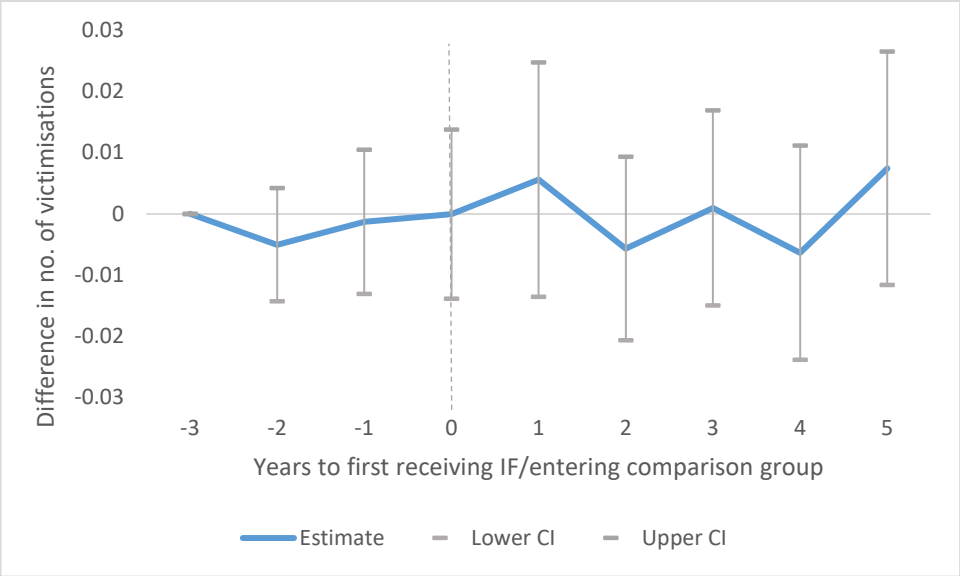
Figure 26 and Figure 27 show the DiD results for victimisations. There are no statistically significant differences between treatment and comparison groups in the share of those with at least one victimisation and the number of victimisations.

Figure 26: Difference-in-differences results: At least one victimisation



Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

Figure 27: Difference-in-differences results: Number of victimisations



Source: IDI 2023 and authors' compilation. Notes: This figure displays the average monthly effects calculated using Equation (1) along with the 95% confidence intervals. Standard errors are clustered at the individual level.

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Appendix A

Table A.1: Two-period difference-in-differences results

Variable	Estimate	p-value
Employment rate (percentage point difference)		
Post	-0.122	0.000***
Treatment	0.013	0.760
Post * Treatment	0.054	0.089
Wage/salary earnings ($ difference)		
Post	-5017.26	0.055*
Treatment	-2838.39	0.569
Post * Treatment	12963.23	0.771
Benefit receipt (percentage point difference)		
Post	0.043	0.055*
Treatment	-2838.39	0.569
Post * Treatment	12963.23	0.771
Benefit payments ($ difference)		
Post	643.46	0.110
Treatment	-1423.39	0.133
Post * Treatment	224.733	0.654
Hospital admission rate (percentage point difference)		
Post	0.007	0.572
Treatment	0.009	0.612
Post * Treatment	0.00	1.00
Number of hospital admissions (number difference)		
Post	0.02	0.282
Treatment	0.018	0.525
Post * Treatment	-0.012	0.632
Mental health event rate (percentage point difference)		
Post	0.078	0.00***
Treatment	-0.014	0.586
Post * Treatment	-0.001	0.978
Number of mental health events (number difference)		
Post	0.16	0.00***
Treatment	-0.034	0.52
Post * Treatment	0.003	0.935

Accident rate (percentage point difference)		
Post	-0.01	0.37
Treatment	0.007	0.678
Post * Treatment	-0.003	0.816
Number of accidents (number difference)		
Post	-0.019	0.185
Treatment	-0.002	0.922
Post * Treatment	-0.001	0.962
Victimisation rate (percentage point difference)		
Post	0.01	0.00***
Treatment	0.001	0.714
Post * Treatment	0.001	0.807
Number of victimisations (number difference)		
Post	0.011	0.00***
Treatment	0.00	0.895
Post * Treatment	0.002	0.618
Observation count	3,999	

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