A PROFILE OF HEALTH AND DISABILITY RELATED BENEFIT RECIPIENTS IN NEW ZEALAND

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Abstract

With the launch of the New Service for People Receiving Sickness and Invalid's Benefits in 2003, the Ministry of Social Development signalled its intent to place greater emphasis on addressing the needs of people receiving these benefits, particularly with regard to employment. Historically little has been known about this group of benefit recipients. To begin to fill these gaps in our knowledge, the Ministry's Centre for Social Research and Evaluation undertook a profiling exercise, producing client "clusters" defining distinct groups of Sickness and Invalid's Benefit recipients. Five clusters were identified, based on people's history of benefit receipt and what could be deduced from administrative records about the time they were not receiving a benefit. A profile of each cluster was built up using demographic information, and outcomes were measured over a follow-up time period. This research has presented new insights into the diversity of experiences of people receiving these benefits, and has informed the way policy and services might be better designed and targeted to meet their needs into the future.

INTRODUCTION

The Ministry of Social Development (MSD) is responsible for administering two primary forms of income protection for working-age people unable to work due to ill health or disability: the Invalid's Benefit, which provides for people with a long-term and severe incapacity,[2] and the Sickness Benefit, which provides for people with a short-term and/or less severe incapacity.[3] People in receipt of an Invalid's Benefit are

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2 To qualify for an Invalid's Benefit a person must be "permanently and severely" restricted in his or her capacity for work, where "permanently" means that the sickness, injury or disability is expected to continue for at least two years, or have a terminal illness and not be expected to live more than two years, and "severely" means that a person could not regularly work 15 hours or more per week in open employment.
3 To be eligible for the Sickness Benefit, a person must have a condition that limits his or her capacity to seek or undertake full-time employment, or be in employment but losing earnings through sickness or injury.

paid at a higher rate than those in receipt of a Sickness Benefit. Like other OECD countries (OECD 2003), New Zealand has experienced considerable growth in the number of people receiving incapacity-related benefits in recent decades. Previous research has failed to show any single, simple explanation for this growth (Wilson et al. 2005, Wilson and McLeod 2006), and without intervention the growth is expected to continue.

In recent years, the growth in Sickness and Invalid's Benefit numbers has been coupled with strong economic growth, a tightening labour market with labour shortages in some industries, and an ageing population. In response to these conditions, and reflecting its social development mandate, MSD has begun to work more proactively with groups that have traditionally been overlooked in employment policy, including those with ill health or disability.

As part of this response, MSD has developed the New Service for People Receiving Sickness and Invalid's Benefits. The New Service includes a variety of initiatives, such as more active and enhanced case management for Sickness and Invalid's Benefit clients, improved access to employment services, and a limited range of health interventions. The New Service has a particular focus on assisting clients into sustainable employment, where appropriate. A key element of the New Service is a programme of research, monitoring and evaluation aimed at informing future service development for Sickness and Invalid's Benefit recipients. The research described in this article is one project in this stream of work.

To develop policies appropriate to the diverse needs of Sickness and Invalid's Benefit recipients, and to target services effectively, it is important to understand the characteristics of subgroups who are likely to have different needs and respond to assistance in different ways. This research uses information gleaned from MSD administrative data to develop longitudinal profiles of Sickness and Invalid's Benefit recipients' benefit and employment histories. Common histories are identified using clustering techniques, and people who share similar histories are grouped together and described according to a range of characteristics.

The research approach is based on the assumptions that:
• individuals' historical patterns of time in and out of work tell us something about the type and extent of employment barriers they have experienced
• the barriers that have influenced individuals' experiences of employment and benefit receipt in the past will often continue to influence them in the future.

To some extent the type of barriers may be deduced from proxy information. For example, it would be reasonable to assume that having to care for a child could constrain employment for a sole parent receiving the Domestic Purposes Benefit, while

issues related to poor health and disability are likely to be a significant barrier for people receiving Sickness or Invalid's Benefits. On the other hand, the fact that a person has been out of the workforce for a long time could signal the existence of significant pre-existing barriers to employment, and may also suggest barriers they may face as a result of that experience (e.g. lack of confidence).

The research is not intended to be a "screening" or "risk-profiling" tool for making decisions about how much or what type of support to offer individual clients. Rather, we are seeking to provide information to policymakers about the distinct groups of people receiving Sickness and Invalid's Benefits, and the key sets of characteristics that should be kept in mind in the development of policy and services aimed at assisting these clients. The approach is descriptive rather than being explicitly linked to a single characteristic of risk, such as expected future benefit receipt.

As well as informing the design of policy and services appropriate to the varied needs of Sickness and Invalid's Benefit clients, the research also provides a tool for future research and evaluation with a focus on people receiving Sickness and Invalid's Benefits. It allows the Sickness and Invalid's Benefit population to be broken down in a way that is broadly meaningful for answering a range of research questions, and allows future evaluations to assess differential outcomes achieved by subgroups.

APPROACH

We used cluster analysis techniques to identify and summarise the characteristics of Sickness and Invalid's Benefit population subgroups. In doing this we expected to gain clarity on the diversity of the population, what people have in common, and what differentiates them. We suggest that the characteristics that influence people's benefit and work experiences, and that are derived from these experiences, will provide insights into the policies and practices that will best meet their needs.

Cluster analysis describes a family of techniques used across a range of disciplines and for a variety of purposes. Generally, the aim is to identify homogeneous subgroups within a heterogeneous population (Everitt 1980), that is, to classify individuals into groups on the basis of the similarity of the characteristics they possess. Rather than testing hypotheses that were decided *a priori*, or developing models that test the strength of the association between a range of predictor and response variables, clustering attempts to create a way of classifying individuals that is suggested by the structures in the data itself.

The approach used in the Sickness and Invalid's Benefit client clustering research can be broken down into three steps, which are discussed below. These involve:

- redefining the administrative data to describe histories and outcomes for each individual
- constructing clusters by grouping together people with similar histories
- naming the clusters and describing them according to a range of characteristics and outcome measures.

STEP ONE: DESCRIBING INDIVIDUALS' HISTORIES AND OUTCOMES

Information for the Sickness and Invalid's Benefit client clustering research came from the MSD benefit dynamics data set, a longitudinal research data set assembled from benefit administration records (see Wilson 2001 and 1999 for more information). At the time of analysis, the benefit dynamics data set covered the period 1 January 1993 to 31 December 2004. These data allowed us to observe clients' patterns of employment and benefit receipt over an extended period.

We selected a random sample from the benefit dynamics data of 20% of people who were receiving a Sickness or Invalid's Benefit at the end of 2001 (around 20,000 people). For each individual, information was extracted for the eight-year period from the beginning of 1994 to the end of 2001. We refer to this as the "history period". We then extracted information for the same individuals for 2002–2004, which we refer to as the "outcomes period". Although this latter information is not used in the construction of clusters, it provides information about outcomes individuals with particular histories might be expected to achieve in the future.

The 11-year period from 1994 to 2004 inclusive (incorporating the eight-year history period and the three-year outcomes period) is broken down into spells. A spell is defined as a period of time when a person is receiving a particular benefit or is off-benefit. The categories of all benefit and off-benefit states are listed below in Table 1. Each time a person changes state (moves from one benefit to another, or moves on-benefit or off-benefit), a new spell is created, and a range of indicators is derived relating to the period of time spent in the new state.

Table 1   Types of Benefit and Off-Benefit States

Off-Benefit States		Benefit States
At school	In prison	Receiving Sickness Benefit
Supported by a partner	In full-time study	Receiving Invalid's Benefit
Receiving New Zealand Superannuation	In full-time employment	Receiving unemployment-related benefit[a]
Receiving Accident Compensation Corporation (ACC) weekly compensation[b]	Dead	Receiving Domestic Purposes or Widow's Benefit

a) This includes Unemployment Benefit, Unemployment Benefit Hardship, Unemployment Benefit (in Training), Unemployment Benefit Hardship (in Training), Job Search Allowance, Independent Youth Benefit, Unemployment Benefit Student Hardship, and Emergency Benefit.

b) ACC weekly compensation is employment-related social insurance available to people who have sustained an accident-related injury. Payments are linked to past earnings.

Figure 1 illustrates the hypothetical history and outcomes of a person receiving an Invalid's Benefit at the end of 2001. The person in the example below had been in employment for almost five years of the history period, and came onto a Sickness Benefit directly from employment before transferring to an Invalid's Benefit. They also had historical spells on both Unemployment and Sickness Benefits. In the outcomes period they moved into employment, and were still in employment at the end of this period.

Figure 1   Example of History and Outcomes
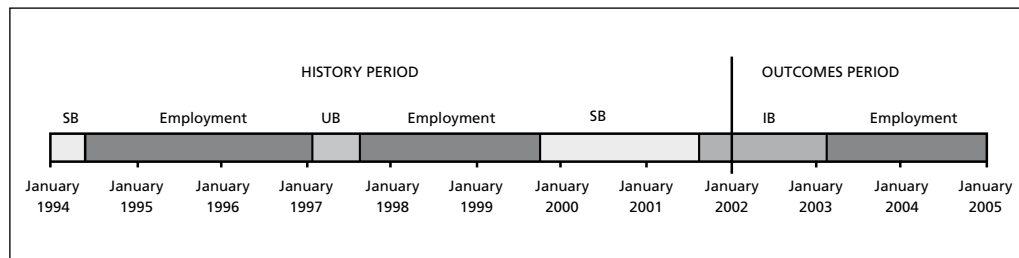
Notes: SB = Sickness Benefit; UB = Unemployment Benefit; IB = Invalid's Benefit.

Individuals' histories were described using a range of variables derived from the data that attempted to capture and measure:
- past engagement in full-time employment
- past and current engagement in part-time employment
- detachment from employment
- possible reasons for detachment
- pathways onto Sickness or Invalid's Benefit
- proximity to entry or exit from "working age".

Indicators were selected for inclusion in the analysis where they provided information about the recentness and extent of an individual's benefit and employment experience. For this reason, demographic characteristics were excluded from this phase.

A large initial list of variables was constructed covering a wide range of characteristics captured in the administrative data in different ways. This list was progressively refined throughout the analysis. Highly correlated variables were removed, as were those that muddied the interpretation of the results or did not contribute constructively to the clusters. The list of 30 variables included in the final analysis is given in Table 2 in the Appendix.

Assumptions

MSD's administrative databases store reliable information about the period of time in which a person is receiving a benefit. However, in order to fill the gaps between, before and after a benefit spell, we need to impute information. By examining the reasons reported for a person entering or leaving each benefit spell, and by making a range of explicit assumptions related to the time off-benefit, we are able to construct a complete history for all individuals. The information we have is often reliant on Work and Income[4] staff knowing the reasons behind a benefit grant or cancellation, and recording this information correctly.

We make assumptions about an individual's circumstances where there is no information about the period of time when a person was not on benefit, where the information is contradictory, or where the information is not sufficiently rich to provide certainty. These assumptions are outlined in full in Table 3 in the Appendix. Most have a reasonable and logical basis, and/or are unlikely to have a significant impact on the findings of the research. However, one assumption in particular warrants further discussion, because it relates to the way we treat periods of time where we have no meaningful information whatsoever. In around a third of cases, when someone leaves a benefit we have no useful information about what they do subsequent to that benefit spell, while in almost half the cases when someone starts a new benefit spell we have no useful information about what they were doing immediately prior.[5] In these cases we do not know for certain whether they were working, or being supported financially in some other way.

A significant issue for this analysis is how to treat these spells. One approach is to simply exclude any individual with any "unknown" spells, but this would result in the research only reflecting a biased subset of the Sickness and Invalid's Benefit

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4   A service delivery arm of MSD.
5   The most commonly recorded event leading to a Sickness or Invalid's Benefit spell is simply "Incapacity".

population. We expect differences to exist between people with unrecorded and recorded information. This assumption is backed up by checks of observed characteristics, which are significantly different between the two groups.[6]

A different approach taken in the early stages of our research was to create a separate "state" representing periods of time when we had no information about how a person was being supported. While this reflects our knowledge about people's circumstances, this resulted in the final clusters unhelpfully dividing people according to whether or not we had information about the time they spent off-benefit. This creates similar issues to the previous approach, in which conclusions are largely only drawn about those for whom we have authoritative information.

The approach we finally adopted (in the latter stages of the research) was to assume that all missing spells were actually spells spent in full-time employment. While this overstates the employment histories of Sickness and Invalid's Benefit clients to some extent, the assumption is expected to hold true in the majority of cases. There are two main reasons for this belief. Firstly, people with missing spells are disproportionately more likely to have additional spells in employment than in other non-benefit states. Secondly, in almost three-quarters of cases where we have information from either an entry or exit from a spell (but not both), the information we do have indicates that the person was in employment during the spell in question.[7]

A final point to note is that the research is population-focused. Being assigned to a cluster will have no direct impact on an individual client. Nevertheless, there is a risk that by overstating the time Sickness and Invalid's Benefit clients spend in employment (and understating time spent in other states) we draw incorrect inferences about the employment history and outcomes of the Sickness and Invalid's Benefit population or groups within it.

In order to quantify the potential error arising from this assumption, we report on the proportion of spells that have been assumed (with no supporting evidence) to relate to employment. This gives the reader an idea of how much weight to give such results. Almost half of all employment spells in the history period fit into this category, although this differs considerably across clusters.

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6   For example, males are more likely to have at least some "unknown" spells, as are people of Pacific Island ethnicity, and those aged 20 to 35.
7   Of the remainder, 12% were studying, while 11% were in prison.

STEP TWO: GROUPING PEOPLE INTO CLUSTERS

Most approaches to cluster analysis can be considered as belonging to two families: hierarchical agglomerative methods on the one hand and iterative partitioning methods on the other.[8] The former group of methods have the advantage that they readily facilitate decisions about the number of clusters to produce, as well as allowing clusters to be easily produced at multiple levels. A limitation is that they are not readily applicable to large data sets. Such data sets are readily analysed using partitioning methods, however, and by using a two-stage approach, incorporating both methods in conjunction, we are able to get around the limitation and retain the advantages of taking a hierarchical approach.

The first stage involved using a "k-means" iterative partitioning approach through the SAS FASTCLUS procedure (SAS Institute Inc. 1999) to form preliminary clusters.[9] Ward's minimum variance method (Ward 1963) was then used in the second stage. This is a hierarchical agglomerative method, which attempts to minimise the variance within clusters. Both methods are based on a least squares criterion, which has a tendency to create reasonably even-sized clusters (Sarle 1982), which for our purposes helps to ensure that groups identified and presented are large enough to be of significant policy interest.[10]

The process we undertook involved iteratively examining the clustering algorithm results; making decisions about the inclusion, exclusion or weighting of the variables in the analysis; and, finally, making decisions about the appropriate number of clusters to create. The most important test of this analysis was a "face validity" check; that is, that the clusters were sensibly constructed, informative and linked to the purposes of the research. In addition, statistical measures relating to distance within and between clusters were examined.[11]

Transforming the Data

It is important in cluster analysis that the variables used are similar in magnitude and variability, since variables with large variance have a stronger influence on cluster construction. As can be seen from the list in Table 2 in the Appendix, the variables used in the research were a mix of continuous variables measured on different scales (such as the percentage of time on benefit), and binary indicator variables (such as those

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8   Other classes include hierarchical divisive methods, grid-based algorithms, and fuzzy clustering methods.

9   In our case, 60 preliminary clusters were produced.

10 While many small population groups are of policy interest, this exercise is aimed at providing a picture of the population as a whole and the major groups within it.

11 These include the pseudo F statistic, pseudo t^2 statistic, and the cubic clustering criterion (SAS Institute Inc. 1999).

relating to transfers from various states onto the Sickness and Invalid's Benefit). It was therefore necessary to transform the data in some way to roughly equalise the variances. Transformation also allows us to weight variables relative to each other (Anderberg 1973), affecting the influence they will have on the final clusters.

Given the different scales against which the variables are measured, a simple standard-isation of all variables would not produce sensible results.[12] Various methods of standardisation have been given a great deal of attention in the clustering literature, but there is no clear consensus on an optimal approach (Milligan and Cooper 1988). Given the complex mix of variables in our analysis, we took the approach of refining the transformations iteratively, based on practical rather than theoretical considerations.

Decisions about transforming the data were, as with decisions about variable inclusion and exclusion, made essentially by trial and error over many iterations of the analysis, and driven by a desired emphasis on indicators of proximity to the labour market. The final transformations involved standardising continuous variables to mean 0 and variance 1, with a few exceptions,[13] while binary variables were multiplied by two (i.e. defined as 0 or 2), and not standardised.

Assessing Cluster Validity

Since cluster analysis identifies groupings that are not known a *priori*, in most situations some sort of assessment of the validity of the results is necessary (Rezaee et al. 1998). External validity checks ask whether the identified clusters agree with prior knowledge in the subject area, while internal validity checks ask whether the clusters that have been identified fit the data well. In our analysis, external validity was provided by an analysis of the profiles of the identified clusters, highlighting demographic characteristics and outcomes that are consistent with expectations from the cluster descriptions. It was also provided by consultation with internal and external stakeholders.

There is a range of approaches we can take to assessing internal validity, from assessment of statistical measures and "validity indices" (Halkidi et al. 2001), to assessing replicability. We took a fairly simple approach to assessing internal validity, as follows.
• A second, independent, 20% sample was selected from the data, and the clustering process replicated. This resulted in an almost identical split of clusters.

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12 Binary variables are particularly problematic in this regard.
13 The percentage of time in employment was standardised to a variance of 2, increasing the emphasis on this important variable. Percentages were standardised with zeros excluded, to diminish the influence of sparsely populated variables. These excluded zeros were later re-inserted with a value 0.1 below the minimum of the standardised values. The "number of spells" variables were halved in value, but not standardised.

- The sensitivity of the results to the method used was tested using our initial sample. The final transformed data set was run through a range of algorithms, and the solutions examined. While this had some impact for low-level groupings, it did not significantly affect the broad high-level clusters.
- A discriminant function was constructed that allowed people not included in the sample used in the analysis to be assigned to a cluster. When this function was applied to our sample, 93% of individuals were allocated to the correct cluster. Although this is high, the fact that a small percentage of people were not correctly assigned is an indication of the poor separation between clusters.[14]

STEP 3: NAMING AND PROFILING THE CLUSTERS

The final step in the clustering process was to describe the clusters according to the characteristics that defined them, name the clusters according to these characteristics, and test the cluster names and descriptions among people familiar with the Sickness and Invalid's Benefit population.[15] Since clusters were based on historical data, the cluster names also largely relate to people's past experiences, rather than necessarily reflecting their current situation.

We constructed cluster "profiles" that summarised each of the clusters according to the demographic characteristics of the people within them, as well as the outcomes achieved by these people over the outcome period. As discussed above, an important external test of cluster validity is to assess how well the clusters differentiate between people based on a range of characteristics linked to the purposes of the research. One objective of the research is to provide insights into how we could positively influence the outcomes people achieve in the future, and it is therefore important that the clusters highlight variation in the outcomes clients achieve.

FINDINGS

We identified five clusters of people within the Sickness and Invalid's Benefit population,[16] reflecting the diversity in the histories of people at a high level. The relative size of the clusters within the Sickness and Invalid's Benefit population is outlined in Figure 1 below. The clusters are discussed in more detail in the following paragraphs. Summary statistics for the clusters are included in the Appendix (Tables 4, 5 and 6).

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14 Unsurprisingly, this means that, at the margins, there are people who could be considered as fitting into more than one cluster.
15 Workshops were held with staff involved in the Sickness and Invalid's Benefit New Service from across MSD, as well as with a reference group of clients.
16 Within these five clusters, a total of 18 sub-clusters were also identified. For simplicity, these sub-clusters are not discussed in this article, but will be outlined in an upcoming descriptive report, which will be published on the MSD website.

Figure 1   Five Clusters of Sickness and Invalid's Benefit Recipients
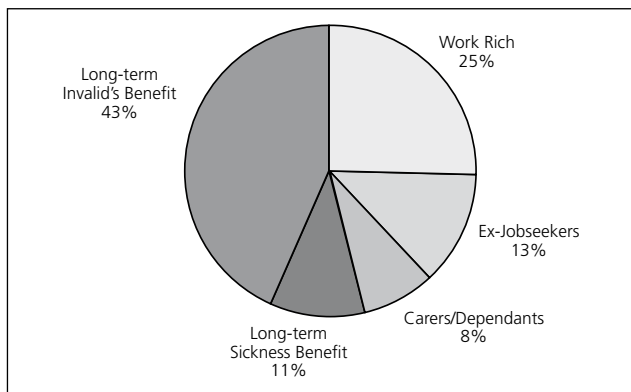
Work Rich recipients were employed full-time[17] for most of the eight-year history period before coming onto a Sickness or Invalid's Benefit. The Work Rich cluster includes:

- people with a long history of full-time employment (on average 66% of the eight-year history period), and a high percentage of people who went onto Sickness or Invalid's Benefits directly from full-time employment (69%)
- people with a low average percentage of time on-benefit (33% of the history period), and on Sickness and Invalid's Benefits in particular (22% of the history period)
- a high proportion of people with a partner included on their benefit at the end of 2001 (21%).

Ex-Jobseekers received an unemployment-related benefit for most of the history period before going onto a Sickness or Invalid's Benefit. The Ex-Jobseeker cluster includes:

- people with a high average percentage of time receiving an unemployment-related benefit (50% of the history period), and a high percentage of time receiving benefit (82% of the history period), but a relatively low percentage of time receiving Sickness or Invalid's Benefits (30% of the history period)
- a high percentage of people with past full-time employment but only for a short time (72% of these people were employed, but for only 15% of the time on average).

Carers/Dependants is the smallest cluster. It includes people who have received a Domestic Purposes or Widows Benefit, as well as those who have been dependent on, or received benefit as, a partner before going onto a Sickness or Invalid's Benefit. This cluster includes:

- people who had received a Domestic Purposes or Widow's Benefit (71% of the cluster for, on average, 56% of the history period), were dependent on a working

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17 Note that this includes a significant amount of time where a person has been assumed to be in employment without evidence in support of this assumption, as discussed in the "Assumptions" section above.

partner (33% of the cluster for, on average, 35% of period), and/or were included on a partner's benefit for an extended period (41% of the cluster received benefit as a secondary recipient for, on average, 37% of the period)

• people with a relatively low percentage of time receiving Sickness or Invalid's Benefits (24% of the history period)

• many people who had declared income in the past (43% of the cluster declared income for, on average, 21% of the time they received benefit)

• people who have had a dependent child in the past (75%, although only a third of these still did so at the end of the history period).

People in the Long-term Sickness Benefit cluster were mostly receiving Sickness Benefit at the end of 2001, and had received Sickness Benefit for nearly all of the history period. This cluster includes:

• people who had received Sickness Benefit for a long time (on average 78% of the history period), and a high proportion of individuals who were receiving Sickness Benefit at the end of 2001 (93%)

• a relatively high proportion of people who had come onto their most recent Sickness or Invalid's Benefit spell directly from school (7%).

Long-term Invalid's Benefit is the largest cluster. People in this cluster were receiving Invalid's Benefit at the end of 2001, and had received Invalid's Benefit for nearly all of the history period. This cluster includes:

• people who received Invalid's Benefit for a high proportion of the history period (87%) and were all receiving Invalid's Benefit at the end of 2001

• a relatively high proportion of people who had come onto their most recent Sickness or Invalid's Benefit spell directly from school (9%) and a high proportion who began receiving a Sickness or Invalid's Benefit before 1993, when the history period began (64%).

Clusters Look Different Across a Range of Characteristics

We explored the demographic characteristics and incapacity profile[18] of people in each cluster at the end of 2001. We then compared these characteristics with the Sickness and Invalid's Benefit population overall and with other clusters. The main differences between the clusters are outlined below, while detailed results are given in Table 5 in the Appendix.

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18 As part of the process of assessing Sickness or Invalid's Benefit eligibility, medical practitioners are asked to record the incapacity or incapacities that restrict the person from being employed. Multiple incapacities are able to be recorded, and we have used all recorded incapacities in the results presented. The percentages therefore add to more than 100.

Clusters had varied age profiles.
- The Work Rich and Carers/Dependants clusters had an older age profile overall (over two-thirds of individuals in each cluster were aged 40 or over at the end of 2001).
- Ex-Jobseekers tended to be younger (35% were under the age of 30 at the end of 2001).
- The Long-term Sickness Benefit and Long-term Invalid's Benefit clusters had the highest rates of people aged 15–19 years at the end of 2001 (6% and 5% respectively), as well as the most even age distribution.

There was variation in the ethnicity profile.
- The Ex-Jobseeker and Carers/Dependants clusters had the highest proportions of Māori (35% and 31% respectively), while the Work Rich cluster had the lowest (17%).
- The Long-term Invalid's Benefit cluster had the lowest proportion of people of Pacific ethnicity (3%), while the Long-term Sickness Benefit cluster had the highest (8%).[19]

Most clusters had higher proportions of males than females. Two-thirds of the Work Rich and Ex-Jobseeker clusters were male, while the smallest cluster, Carers/Dependants, was nearly all female (86%).

Incapacity profiles varied across clusters.
- The Carers/Dependants cluster had the highest recording of multiple incapacities (40%, compared with 27% of all people receiving Sickness and Invalid's Benefits).
- Psychological and psychiatric conditions (excluding schizophrenia[20]) were highest among Ex-Jobseekers and Carers/Dependants (34% and 33% respectively), although these incapacities are recorded for around a quarter of people in every cluster. A relatively high proportion (8%) of Ex-Jobseekers were also recorded as having schizophrenia, more than double the rate of any other cluster except for the Long-term Invalid's Benefit cluster (see below).
- More than a quarter of people in the Work Rich, Carers/Dependants and Long-term Sickness Benefit clusters were recorded as having musculoskeletal conditions (compared with 14–18% of people in other clusters).
- Almost a third of people in the Long-term Invalid's Benefit cluster were recorded as having an intellectual incapacity or congenital condition (compared with 2–4% of people in other clusters); 9% were recorded as having schizophrenia.
- Rates of substance-abuse-related incapacity were highest among the Ex-Jobseekers (12%) and Long-term Sickness Benefit (11%) clusters (more than double the rate of other clusters).

19 This result may be due to tighter residency requirements associated with Invalid's Benefit eligibility.
20 Schizophrenia has been reported as a separate category. Although psychological conditions such as depression and bipolar disorder also have separate incapacity codes, these were introduced in the mid-1990s, and we have grouped them together for consistency.

Outcomes Vary by Cluster

We followed the employment outcomes achieved over the three-year outcomes period (2002–2004) for each cluster. More than half of the people receiving a Sickness or Invalid's Benefit in 2001 continued to receive these benefits without interruption from 2002 to 2004. This ranged from 32% for the Work Rich cluster up to 80% for the Long-term Invalid's Benefit cluster. However, many people did move off benefit and into work.

Figure 2 shows the rates of exit into full-time employment, and the proportion who exited and sustained employment through to the end of 2004. These figures should be treated with some caution, because in more than half the cases we have assumed an employment outcome without supporting evidence (see the "Assumptions" section, earlier in this paper).

Figure 2   Rates of Exit to Employment and Sustained Exit to Employment
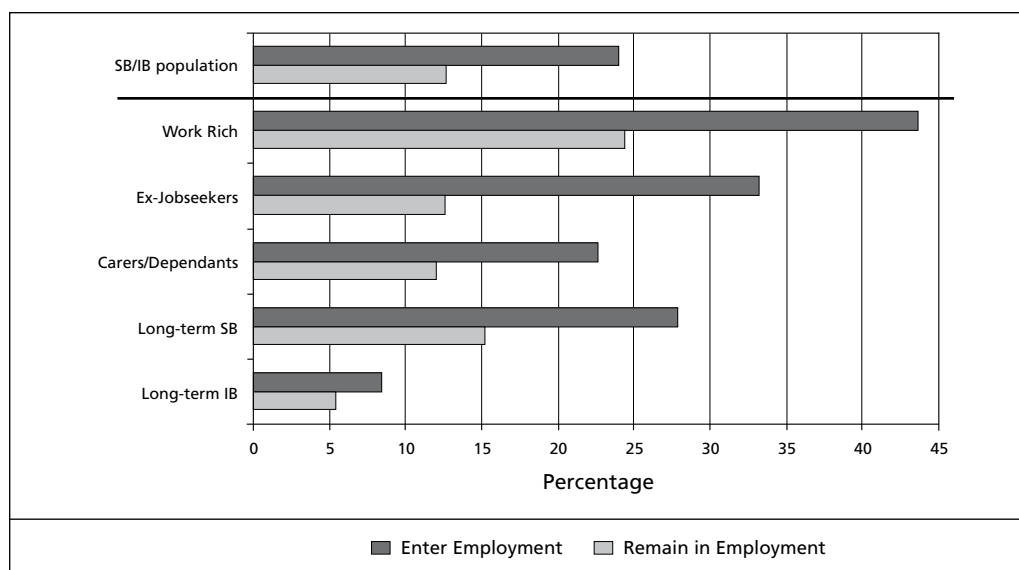
People in the Work Rich cluster were the most likely of any cluster to move into full-time employment (44%), reflecting their strong past attachment to the labour force. Even in this cluster a sizeable proportion of people continued to receive an Invalid's Benefit for many years (32% stayed on the same Sickness or Invalid's Benefit spell without interruption).

Although many Ex-Jobseekers moved into employment (33%), the majority subsequently returned to benefit (in particular, to the Sickness Benefit or an unemployment-related benefit). Only 38% of those people who left to employment

remained off-benefit until the end of 2004. People in the Long-term Invalid's Benefit cluster were the least likely to take up full-time employment (8%), although those who did so had a high probability of sustaining it (64% did not return to benefit).

Other off-benefit outcomes also varied among the clusters.
- In most clusters, 4–5% of people died during the outcomes period. The exception to this was the Long-term Sickness Benefit cluster, of which 2% died. This is likely to be a reflection of the few people in this cluster with incapacities severe enough to result in their being assessed as eligible for the Invalid's Benefit.
- The number of people moving onto New Zealand Superannuation largely reflected the age profile of each cluster. In the youngest group, the Ex-Jobseekers, only 1% began to receive New Zealand Superannuation in the outcomes period, while 5% of the Work Rich and Long-term Invalid's Benefit clusters did so.
- Of the Ex-Jobseekers cluster, 6% left benefit to go into prison during the outcomes period. This compares with only 1–2% of other clusters.

Many clients transferred to another benefit, or returned to benefit after a period off-benefit, during the outcomes period. This varied across the clusters. Almost a quarter of Ex-Jobseekers started a new spell on an unemployment-related benefit during the outcomes period, while a fifth started a new Sickness Benefit spell. This is a continuing reflection of the high number of spells this cluster spent on these two benefits in the history period. The Work Rich cluster was also more likely than other clusters to begin new spells on an unemployment-related benefit or Sickness Benefit.

Around a quarter of the Long-term Sickness Benefit cluster began an Invalid's Benefit spell during the outcomes period, while only around 5% of the Long-term Invalid's Benefit cluster began a new benefit spell of any sort. This latter finding reflects the very high proportion of this group who stayed on the same spell over the entire period (80%), the high proportion either dying or moving onto New Zealand Superannuation (10% in total), and the high proportion of those moving into employment who did not return to benefit.

CONCLUSIONS

Care must be taken when drawing strong inferences on the basis of the results presented here about the assistance that should be offered to individual clients. The work is predicated on a range of assumptions, and hints at (rather than provides direct evidence of) the barriers faced by clients. On the other hand, the results do provide pointers to the general types of service that could be offered to people receiving a Sickness or Invalid's Benefit, and give some direction to future research.

Despite making assumptions that are likely to overstate the employment history and outcomes of Sickness and Invalid's Benefit recipients, only a quarter of clients are considered to be "work rich" in that they have a significant amount of time in the past in full-time work. It is clear from this that in addition to barriers arising directly from issues related to ill health and disability, people receiving the Sickness Benefit and Invalid's Benefit are likely to face many other barriers related to long-term detachment from the workforce. This conclusion is supported by a summary of research (Beynon and Tucker 2006), to be found in this issue (Issue 29) of the *Social Policy Journal of New Zealand*.

There is considerable international evidence of a strong link between unemployment and poor mental health, particularly for sole parents. Butterworth (2003) presented evidence of this in an Australian context, while this was confirmed in a recent analysis of New Zealand data (Beynon and Tucker 2006). Longitudinal studies suggest that this relationship is at least partly causal; that is, unemployment contributes to deteriorating mental health (see Kasl and Jones 2000). It is therefore not surprising that mental health issues appear to be a major area of concern for people receiving Sickness and Invalid's Benefits with a history of receipt of other benefits (i.e. the Ex-Jobseekers and Carers/Dependants clusters). Early health-focused intervention (particularly around mental health) targeted at people receiving Unemployment or Domestic Purposes Benefits could potentially reduce the likelihood that they will move onto a Sickness or Invalid's Benefit.

Research has shown that people with disabilities often have less secure kinds of employment than those without disabilities (Yelin and Trupin 2003). Although people in the Work Rich cluster are expected to achieve better employment outcomes than other Sickness and Invalid's Benefit clients, many nevertheless remain on Sickness and Invalid's Benefits for a long time, and almost half of those who left benefit during the outcomes period returned to benefit. Interventions focused on addressing health issues for clients who have recently left work may limit the development of other barriers, and improve outcomes for this group. Early intervention to promote a return to work, and ongoing communication with employers and clients throughout rehabilitation, have been identified as important components of successful programmes (Miller 2006).

Despite a relatively good rate of return to work in the outcomes period (33%), considerably fewer than half of those in the Ex-Jobseeker cluster sustained that employment to the end of the period. These clients may benefit from more comprehensive support after they exit benefit. An additional concern for this group of clients is that almost a fifth have spent time in prison – something that has been shown to affect employability in a multitude of ways (Western 2002).

Despite an extensive history of health-related and/or disability-related benefit receipt, those in the Long-term Sickness Benefit cluster achieved a rate of sustained employment outcomes[21] second only to the Work Rich cluster. It is possible that despite long-term receipt of the Sickness Benefit, this group may be better equipped to enter employment than those who have received the Domestic Purposes Benefit or Unemployment Benefit for a similar period of time.

People in the Long-term Invalid's Benefit cluster achieved the lowest rates of employment exit of any cluster. Despite this, almost two-thirds of those who did exit benefit for employment did not return to benefit. Working with more of these clients to achieve their employment goals may produce sustained outcomes.

Finally, it is clear from this research that the Sickness and Invalid's Benefit population should not be thought of as a single homogeneous group, or defined solely by the type of benefit received. Although Sickness Benefit has often been characterised as (and usually is) a short-term benefit, many people receive it for many years. Additionally, some Sickness Benefit clients appear little different to Invalid's Benefit clients, with many clusters containing clients in receipt of both benefits. There is also considerable movement from the Sickness Benefit to the Invalid's Benefit, as the condition of a person's health worsens, or once their eligibility for the Invalid's Benefit is confirmed.

Research has failed to identify any single approach that works well for all people in receipt of a health-related or disability-related benefit. The wide range of personal characteristics, experiences and outcomes of Sickness and Invalid's Benefit clients identified here reinforces the idea that an individualised approach is extremely important, and underscores the importance of active case management of these clients. Further research is needed to fully understand the approaches that will be most effective for people with different backgrounds, in different situations.

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21 A move into full-time employment during the outcomes period (2002 to 2004), and sustained to the end of that period.

APPENDIX

Table 2   Variables Used in the Cluster Analysis

Variable Name	Variable Description	Type
Benefit Receipt		
Bene_pct	Proportion of time (since school) on-benefit	%
Bene_spells	Number of spells per year on-benefit (since school)	#/yr
Health and Disability Related Benefits		
SBcurr	Is current spell on Sickness Benefit (SB)?	1 or 0*
SBIBdur	Duration of current Sickness and Invalid's Benefit (SB/IB) period (combining adjacent spells)	days
SB_pct	Proportion of time (since school) on SB	%
IB_pct	Proportion of time (since school) on Invalid's Benefit (IB)	%
SBIB_pct	Proportion of time (since school) on SB or IB	%
SBIB_spells	Number of spells per year on SB or IB (since school)	#/yr
TransSBIB	Transferred to current IB spell from SB?	1 or 0
TransIBSB	Transferred to current SB spell from IB?	1 or 0
Non-Health and Disability Related Benefits		
DPBWB_pct	Proportion of time (since school) on a Domestic Purposes or Widow's Benefit	%
UBR_pct	Proportion of time (since school) on an unemployment-related benefit	%
Transbene	Transferred to current SB/IB period from another benefit?	1 or 0
Employment		
TransEMPR	Transferred to current SB/IB period from full-time employment?	1 or 0
EMPR_pct	Proportion of time (since school) in full-time employment	%
TransEMPR	Transferred to current SB/IB period from full-time employment?	1 or 0
DIcurr	Declaring earnings-related income at 31/12/2001?	1 or 0
Benpct_di	Proportion of time (since school) on any benefit declaring earnings-related income	%
Other Financial Support		
ACC_spells	Number of spells per year receiving ACC weekly compensation (since school)	#/yr
TransACC	Transferred to current SB/IB period from ACC?	1 or 0
DEPT_pct	Proportion of time (since school) dependent on a partner	%
TransDEPT	Transferred to current SB/IB period from dependent spell?	1 or 0
PRIS_pct	Proportion of time (since school) in prison	%
STUD_spells	Number of spells per year in study (since school)	#/yr

* Yes/No variables were coded as 1 = Yes, O = No.

Variable Name	Variable Description	Type
Miscellaneous		
Nonbene_ spells	Number of spells per year off-benefit (since school)	#/yr
Benpct_chd	Proportion of time (since school) on-benefit with a dependent child	%
Benpct_part	Proportion of time (since school) on-benefit as a primary recipient with a partner or on-benefit as a partner	%
TransSCHL	Transferred to current SB/IB period from school (under 20)?	1 or 0*
Over55	Over 55 years at 31/12/2001?	1 or 0
Under25	Under 25 years at 31/12/2001?	1 or 0

* Yes/No variables were coded as 1 = Yes, 0 = No.

Table 3   Assumptions Made in Data Construction

Category	Assumption Description
"Off benefit" state	If the reason for benefit exit and the reason for later re-entry are not the same, and the spell is longer than 57 days, then split into two spells and assume half of the time was spent in each state.
	If the reason for benefit exit and the reason for later re-entry are not the same, and spell is shorter than 57 days, then use the re-entry reason as the state for the entire off-benefit spell.
	If there is a reason for benefit exit but no reason for later re-entry, assume entire off-benefit spell is for the reason given.
	If there is no reason for benefit exit but there is a reason for later re-entry, then assume the entire off-benefit spell is for the reason given.
	If reason for off-benefit is excess income/assets – assume employed.
	If reason for off-benefit is commenced living de facto/separated /partner deceased/reconciled/spouse released from prison/remarried – assume dependent.
	Assume time spent off-benefit before 16 years of age is in school.
	If age is less than 20, this is the first spell, and reason for benefit entry is unknown or left studying – assume left school to enter benefit.
	If age is over 60, this is the last spell, and no reason for benefit exit is given – assume left benefit for retirement.
	If client turns 65 during an off-benefit spell – assume move to retirement at that point unless dead.
	If client leaves benefit when over 65 years old and goes to unknown – assume retired.

Category	Assumption Description
ACC spells	End date of ACC spells is set to the last received date from ACC match data UNLESS the reason for entering the next benefit spell is exit ACC.
	Maximum length of ACC spells is 182 days (based on average length data from ACC website).
	Spells previous to 182 days are set to employed (based on ACC requirements that weekly compensation is paid if employed previous to accident).
Merging spells	If state is unknown or dependent, and spell length is less than 29 days, then merge with next spell.
	If concurrent spells are of the same state (these may be created by the above assumptions) then merge.
	If state is studying and spell length is less than 29 days then merge with next spell.
Declared earnings	Weekly declared earnings are divided by 7 to give a daily income amount.
	Date last earnings are taken from the last day earnings have been declared, or set at 31/12/2001 if client continues earning across the history/outcome periods.
	Days income declared are counted as all days between the earning from and earning to dates (i.e. if 1/8/2000–8/8/2000, 7 days earning).

Cluster Summaries

The following tables show a breakdown of the characteristics of each cluster in three areas.

- **History**: the patterns of benefit receipt and employment for people in each cluster over the eight-year history period (1993–2001). These variables were used to construct the clusters.
- **Profile**: the demographic profile of each cluster at the end of 2001. This shows the characteristics that differentiate the cluster from the rest of the Sickness and Invalid's Benefit (SB/IB) population.
- **Outcomes**: the patterns of benefit receipt and employment for people in each cluster over the three-year outcome period from 2001 to 2004. NB: The same person may have had a mix of on-benefit and off-benefit outcomes in the outcome period (e.g. Unemployment Benefit (UB), employment, new Sickness Benefit spell).

Table 4   Cluster History Patterns

History (1993–2001)	Total SB/IB	Work Rich	Ex-Job-seekers	Carers/ Depend-ants	Long-term SB	Long-term IB
Percentage of history period:						
• receiving SB/IB	100/61*	100/22	100/30	100/24	100/80	100/95
– SB	63/30	88/17	95/22	60/15	100/78	31/28
– IB	63/67	34/23	39/22	60/24	12/20	100/87
• receiving any benefit	100/78	100/33	100/82	100/83	100/92	100/98
– UB-related	38/28	48/18	97/50	31/13	53/18	12/13
– DPB/WB**	12/36	5/15	13/15	71/56	9/17	4/17
– as partner	8/21	7/11	11/11	41/37	6/11	3/12
• working part-time	30/25	28/28	36/12	43/21	31/26	27/30
• in full-time employment	51/39	100/66	72/15	36/14	52/13	19/11
• % of employment spells assumed	48	47	38	55	59	65
• in prison	4/13	1/7	16/18	2/6	5/7	2/7
• dependent on working partner	5/23	3/10	6/11	33/35	3/12	1/11
• with a dependent child on benefit	25/28	25/62	35/39	75/73	33/48	18/47
Percentage of people in cluster who transferred to SB/IB from:						
• full-time employment	32	69	22	15	34	15
• another benefit	30	22	68	76	38	12
• school	5	0	0	0	7	9

* Where there are two numbers in a cell, the first refers to the proportion of the cluster with that characteristic, and the second refers to the percentage of time in that state. For example, 63% of the Sickness and Invalid's Benefit population received Sickness Benefit in the history period, for an average 30% of that period.
** DPB = Domestic Purposes Benefit; WB = Widow's Benefit.

Table 5   Cluster Profiles

Profile at End of 2001	Total SB/IB	Work Rich	Ex-Job-seekers	Carers/Depend-ants	Long-term SB	Long-term IB
At the end of 2001, percentage of people in cluster:						
• receiving SB (remainder on IB)	38	67	62	41	93	0
• declaring income	8	7	5	7	10	10
• with partner on benefit	12	21	10	13	14	7
• with a dependent child	10	13	12	25	12	5
Incapacity						
Co-morbidity (multiple conditions)	27	29	32	40	24	24
Accident / injury	8	9	10	7	11	6
Cancer	3	5	2	6	1	2
Cardiovascular	10	15	9	15	8	8
Congenital	3	1	1	2	1	5
Intellectual	12	1	2	2	1	27
Musculoskeletal	20	28	18	26	25	14
Nervous system / sensory	13	10	8	12	9	17
Other psychological*	27	27	34	33	29	23
Other	17	21	19	28	19	13
Pregnancy related	2	3	5	2	2	0
Schizophrenia	6	2	8	4	2	9
Substance abuse	6	5	12	5	11	3
Unspecified	1	0	0	0	0	1
Ethnicity						
Māori	21	17	35	31	21	18
NZ European	57	60	52	53	59	57
Other/unspecified ethnicity	16	15	7	11	13	22
Pacific	5	7	6	5	8	3

*   Excluding schizophrenia, which is a separate category.

Profile at End of 2001	Total SB/IB	Work Rich	Ex-Job-seekers	Carers/ Depend-ants	Long-term SB	Long-term IB
Age						
15–19 years	3	1	4	0	6	5
20–29 years	15	14	31	7	13	13
30–39 years	21	18	23	21	21	21
40–49 years	23	21	21	34	24	23
50–59 years	25	30	16	27	28	25
60–64 years	12	16	4	12	8	13
65+ years	1	1	0	0	1	1
Gender						
Male	57	63	66	14	59	58

Table 6   Cluster Outcomes

Outcomes (2002 to 2004)	Total SB/IB	Work Rich	Ex-Job-seekers	Carers/ Depend-ants	Long-term SB	Long-term IB
Benefit						
Percentage of people in cluster who received:						
• the same benefit without interruption	56	32	40	52	38	80
• UB-related	9	16	23	9	11	1
• a Domestic Purposes or Widows Benefit	3	5	8	9	4	0
• new SB	9	15	20	10	13	1
• new IB	10	13	14	11	25	3
Other outcomes						
Percentage of people in cluster who:						
• died	4	5	4	5	2	5
• retired/received NZ Superannuation	4	5	1	4	3	5
• went to prison	2	1	6	1	2	1

Outcomes (2002 to 2004)	Total SB/IB	Work Rich	Ex-Job-seekers	Carers/ Depend-ants	Long-term SB	Long-term IB
Employment						
Percentage of people in cluster who exited benefit to employment in outcome period	24	44	33	23	28	8
Percentage of exits to employment assumed	54	51	45	55	58	58
• of those people who exited to employment, percentage who remained off-benefit until the end of 2004	54	56	38	53	54	64

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