TECHNICAL REPORT

Impact of Mild to Moderate Mental Health service on participants' outcomes: Technical Report

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MINISTRY OF SOCIAL DEVELOPMENT
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PREPARED BY
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Summary

Introduction

This report summarises the results and method used to estimate the impact of the Mild to Moderate Mental Health (MMMH) pilot on participants' outcomes.

Mild to Moderate Mental Health (MMMH) pilot

The MMMH service was a time-limited health and disability service purchased by MSD from late 2007 to early 2009 through the Health and Disability Innovation Fund. MMMH was funded based on the observation that mental health conditions such as stress and depression make up an increasing and significant proportion of all Sickness (SB) and Invalid's Benefit (IB) claims.

In MMMH, Work and Income case managers referred clients to a service co-ordinator (Primary Health Organisation (PHO), District Health Board or independent provider). The service co-ordinator assessed the client's mental health needs and arranged the most appropriate support services to meet these needs. One or more providers delivered these services. At completion of the support period, the service co-ordinator provided Work and Income with a summary of the client's progress and identified further actions necessary to assist the client into employment.

Main Findings

ANALYSIS ASSUMPTIONS

The following findings rest on two assumptions (see Technical Notes section for more detail, page 7).

- Our measures are good proxies for intended outcomes.
- Matching MMMH participants to a comparison group based on observed characteristics[1] means the two groups have the same expected future outcomes at the start of the programme.

Although we believe these assumptions to be reasonable, we recognise they are violated to some degree. In particular, there are likely to be unobserved differences between participants and comparison groups for which our analysis cannot fully control.

For clients who participated between 2008 and 2009 MMMH had the following impacts over the six months after starting the programme. Because of the short interval since participants started the programme, we cannot report on the medium- to long-term impacts of the programme.

[1] See **Table 4** on page 10 for summary of the characteristics used to match the comparison group.

MMMH INCREASED PART-TIME WORK AND PROGRAMME STAIRCASING[2]

- MMMH participants spent more time in part-time work while on benefit.
- After completing MMMH, participants were more likely to participate in further employment and training programmes.

MMMH RESULTED IN A SMALL INCREASE IN THE TIME PARTICIPANTS SPENT ON MAIN BENEFIT

- Participants spent longer on benefit in the first six months after starting MMMH than the comparison group, indicating the programme has some lock-in effect[3].
- Participants spent more time on unemployment-related benefits than the comparison group.

Conclusion

Because of the short outcome period, we cannot provide any firm conclusions over the effectiveness of MMMH. The observed lock-in effect and subsequent short-term negative impact on time off benefit is a common feature of employment programmes. The unanswered question will be whether participants' off-benefit outcomes will exceed the comparison over the medium- to long-term. The analysis indicates MMMH has resulted in increased part-time work whilst on benefit, movement onto unemployment-related benefits and staircasing onto further Work and Income programmes. The impacts indicate participants are at least moving towards full-time employment and leaving benefit.

[2] Staircasing is a case management term that refers to moving clients through a sequence of programmes to move them into employment rather than relying on a single programme.

[3] Lock-in effect occurs because while participants are on the programme they are less likely to exit benefit than the comparison group.

Analysis

This section presents the analysis of the estimated impact of MMMH on participants' outcomes.

Cumulative impact of Mild to Moderate Mental Health (MMMH)

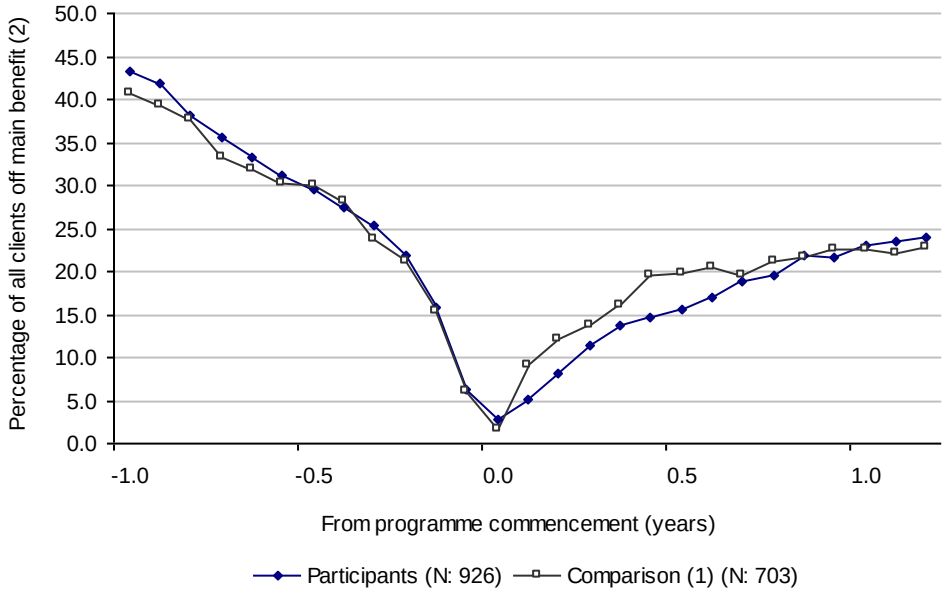
Table 1 shows the impact of MMMH pilot on the time participants spend on different outcomes (Table 4, page 10, has the actual outcomes of participants). The impact estimates are based on subtracting the time participants spend from the time the comparison group spends in each outcome. Positive values show participants have spent more time in that outcome than the comparison group. We can only report outcomes six months after starting MMMH as we cannot measure all participants' outcomes over a full year (this information will be available in late 2010).

TABLE 1: CUMULATIVE IMPACT OF MMMH ON SELECTED PARTICIPANT OUTCOMES

	Programme Mild to Moderate Mental Health pilot (2008-2009)
Lapse period from participation start (years)[1]	0.5
Impact of MMMH programmes on primary outcomes (in weeks)[2]	
Combined positive outcomes[3]	-0.1
Independent of Work and Income Assistance[4]	*-1.5
Time off main benefit[5]	*-1.1
Tertiary Study[6]	-0.1
Impact of PATHS programmes on secondary outcomes (in weeks)[2]	
Part-time work while on main benefit[7]	0.9
Programme Staircasing[8]	0.4
Repeat participation in the same programme type[9]	*9.1

1: Period after participation start date that outcomes and impacts are measured.
2: Estimated change in the time spent in each outcome state over the lapse period as a result of the programme (based on matching on observables impact method).
3: Combines all positive outcomes for MMMH programmes and includes time spent: Off main benefit, on Placement programmes, in Tertiary study, part-time work while on benefit, on Job Search programmes, on Work Experience programmes, on Training programmes, on Work Confidence programmes, on Information services programmes.
4: No longer receiving a main benefit or participating in Work and Income programmes.
5: No longer receiving a main benefit (eg Unemployment, Sickness, Invalid's or Domestic Purposes).
6: Receiving either a student loan or allowance.
7: Declaring earnings from work while on a main benefit.
8: Includes participation in programmes that indicate progression towards sustainable employment beyond the current programme type (eg participation in a wage subsidy after finishing a training programme).
9: Additional time spent in the same programme type (eg additional training spells after finishing a training programme).
*: impact is statistically significant at the 95% confidence interval.
Source: Information Analysis Platform, 2009 (research information, not official MSD statistics).

FIGURE 1: IMPACT OF MMMH ON PARTICIPANTS OFF MAIN BENEFIT OUTCOMES



1: Comparison group are matched to participants based on observed characteristics of participants at programme start.
2: No longer receiving a main benefit (eg Unemployment, Domestic Purposes or Sickness Invalid's Benefit).
Source: Information Analysis Platform, MSD, 2009 (research data not official MSD statistics).

MMMH MADE NO DIFFERENCE TO COMBINED POSITIVE OUTCOMES IN THE SHORT TERM

Based on our Combined Positive Outcomes measure we find no substantial difference between the participant and comparison group in the time spent in Combined Positive Outcomes in the first six months. Breaking this outcome down, we see a non-significant positive impact on part-time work while on benefit and programme staircasing. However, over the same period participants also spent longer receiving main benefits.

MMMH RESULTED IN A SMALL INCREASE IN THE TIME PARTICIPANTS SPENT ON MAIN BENEFIT

One common result of participating in employment and training programmes is that participants are less likely to leave benefit while on the programme than the comparison group. The increased time on benefit while participating in a programme is referred to as lock-in effect and occurs because participants have:

- less time to search for work while on the programme
- an incentive to complete the programme and therefore may even turn down job opportunities.

MMMH has a lock-in effect as shown in Figure 1. Figure 1 tracks the outcomes for participants and comparison group from one year before and 1.2 years after MMMH participants started the programme. We can see the lock-in effect as the participants' off-benefit outcomes remain below that of the comparison group over the first year after starting the programme.

IT IS TOO SOON TO TELL IF MMMH HAS A LONG TERM POSITIVE IMPACT ON BEING OFF MAIN BENEFIT

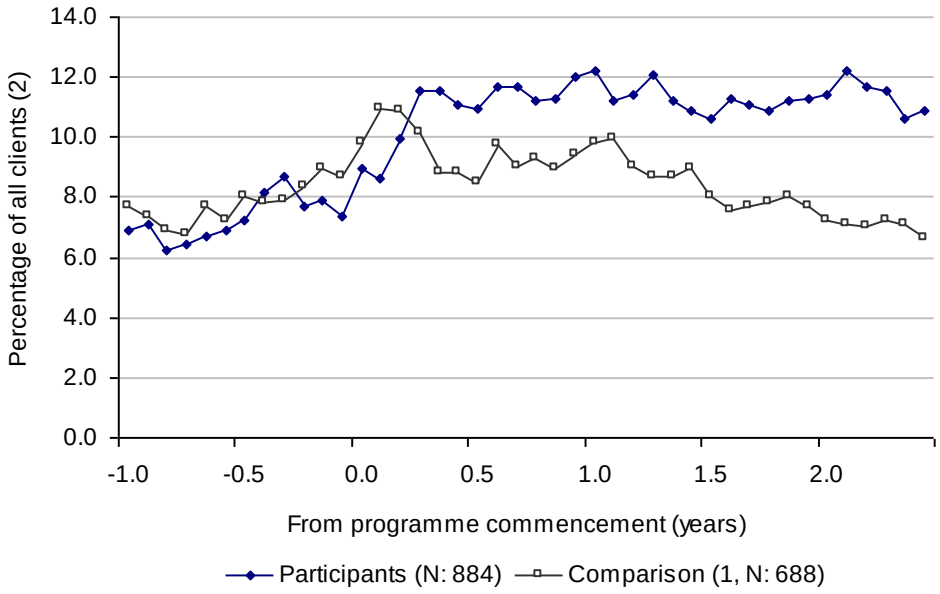
After the first year, the off-benefit outcomes of participants are similar to those of the comparison group (Figure 1). However, because of the short period since participants started the programme we

do not have enough information on whether the programme will result in increased off-benefit outcomes in the medium- to long-term.

BUT, MMMH HAS INCREASED PART-TIME EMPLOYMENT WHILE ON BENEFIT

MMMH has increased the time participants are in part-time work while on benefit. According to this measure, participants who participated in MMMH spent just under an extra week on average in part-time work in the six months after starting the programme. Furthermore, as Figure 2 shows, this difference is sustained and appears to be increasing over time. If this trend continues, we would expect the cumulative difference in part-time work between participant and comparison group to increase and become statistically significant.

FIGURE 2: IMPACT OF MMMH ON PARTICIPANTS TIME IN PART TIME WORK WHILE ON MAIN BENEFIT



1: Comparison group is matched to participants based on observed characteristics of participants at programme start.
2: Based on declared earnings from work and may underestimate actual earnings.
Source: Information Analysis Platform, MSD, 2009 (research data not official MSD statistics).

MMMH PARTICIPANTS ARE MORE LIKELY TO BE ON UNEMPLOYMENT BENEFIT

Of those who are on main benefit, a higher proportion of the participant group are on unemployment-related benefits than those in the comparison group. Point in time comparisons show that after one year 10.7 percent of participants on benefit are receiving an unemployment-related benefit compared to 6.7 percent of the comparison group on benefit. These point in time differences are not significant, but we expect the cumulative difference to be significant over the medium term.

Technical notes

Outcomes of Mild to Moderate Mental Health (MMMH) participants

Table 2 shows the outcomes of MMMH participants for the same lapse periods as the impacts summarised in Table 1 (page 4). To calculate the comparison group outcomes subtract the impact values in Table 1 from the participants' outcomes in Table 2.

TABLE 2: SELECTED OUTCOMES OF MILD TO MODERATE MENTAL HEALTH PARTICIPANTS

	Programme Mild to Moderate Mental Health pilot (2008-2009)
Lapse period from participation start (years)[1]	0.5
Primary outcomes of MMMH participants	
Combined positive outcomes[2]	1.7 mths
Independent of Work and Income Assistance[3]	2.2 wks
Time off main benefit[4]	3.1 wks
Tertiary Study[5]	6.2 days
Secondary outcomes of MMMH participants	
Part-time work while on main benefit[6]	3.5 wks
Programme Staircasing[7]	1.4 wks
Repeat participation in the same programme type[8]	2.1 mths

1: Period after participation start date that outcomes and impacts are measured.
2: Combines all positive outcomes for MMMH programmes and includes time spent: Off main benefit, on Placement programmes, in Tertiary study, part-time work while on benefit, on Job Search programmes, on Work Experience programmes, on Training programmes, on Work Confidence programmes, on Information services programmes.
4: No longer receiving a main benefit (eg Unemployment, Sickness, Invalid's or Domestic Purposes).
5: Receiving either a student loan or allowance.
6: Declaring earnings from work while on a main benefit.
7: Includes participation in programmes that indicate progression towards sustainable employment beyond the current programme type (eg participation in a wage subsidy after finishing a training programme).
8: Additional time spent in the same programme type (eg additional training spells after finishing a training programme).
Source: Information Analysis Platform, 2009 (research information, not official MSD statistics).

Outcome measures

LAPSE PERIOD FROM PARTICIPATION START

We measure participants' outcomes from when they start MMMH. From experience, outcomes measured over relatively short periods (less than two years) do not provide a full picture of the difference a programme makes to participants' outcomes.

COMBINED POSITIVE OUTCOMES

Combined Positive Outcomes is a global measure that attempts to capture all positive outcomes for a given programme. The measure ranks outcomes according to their proximity to full-time employment, including employment programmes themselves. For a given programme, the Combined Positive Outcomes measure includes all outcomes that are closer to full-time employment than the programme being evaluated. **Table 3** below summarises the ranking of outcomes according to their proximity to

employment. In the case of MMMH, which is defined as a Health Intervention (level 12), Combined Positive Outcomes measure includes all the outcomes identified in the table (ie levels 1 to 11). In cases where positive outcomes overlap, this time is counted only once.

TABLE 3: COMBINED POSITIVE OUTCOME LEVELS

Combined Positive Outcomes level	Outcome	Comments
1	Full-time employment	Cannot be reliably measured using MSD administrative data.
2	Independent of Work and Income assistance	Proxy measure for people achieving full-time employment.
3	Placement programmes: Self-employment assistance, wage subsidies, in-work support, training for pre-determined employment	These programmes are designed to move people into unsubsidised employment.
4	Tertiary study	Unfunded through Work and Income. Based on receipt of Student Loans or Allowances.
5	Off benefit	People can be off main benefit but continue to receive employment assistance (see level 3).
6	Part-time work whilst on benefit	Based on declared earnings from work.
7	Job search programmes	Includes Job Search Service programmes.
8	Work experience programmes	Includes Taskforce Green, unsubsidised work placement and Activity in the Community.
9	Training programmes	Funded by Work and Income (eg Training Opportunities and Skills Training).
10	Work confidence programmes	Includes Outward Bound and Limited Services Volunteers.
11	Information services and case management	Includes Careers Advice.
12	Health interventions	Includes MMMH

INDEPENDENT OF WORK AND INCOME ASSISTANCE

Independence from Work and Income Assistance means a person is no longer receiving a main benefit (eg Domestic Purposes, Unemployment, Sickness or Invalid's) or participating in a Work and Income employment programme. People receiving supplementary income but not on a main benefit are defined as being independent of Work and Income assistance.

Independent of Work and Income assistance is our proxy indicator for full-time employment. However, it has some drawbacks as there are many reasons people are Independent of Work and Income assistance other than employment, and some of these are negative or neutral (eg prison, death and emigration). Our assumption is that any impact on Independence from Work and Income assistance is primarily through the programme changing the time participants are in full-time employment.

TIME OFF MAIN BENEFIT

Time off main benefit measures the time a person spends not in receipt of a main benefit (eg Domestic Purposes, Unemployment, Sickness or Invalid's), but they can still be receiving supplementary assistance. Off main benefit differs from Independent of Work and Income assistance in that it includes people participating in Work and Income employment programmes whilst Independent of Work and Income assistance does not.

TERTIARY STUDY

We define a person as being in tertiary study where they have either drawn down funding for a student loan or received student allowance payments. The duration of study is defined either by the duration the student loan is active (and reflects the period of study) or when a person receives student allowance payments, whichever is greater. The measure will miss instances where a person undertakes study without recourse to either loan or allowance funding. In addition, the duration of student loan and allowance payments may not always accurately reflect the actual time a person is studying (eg where a person ends a course prematurely).

PART-TIME WORK WHILST ON BENEFIT

This measure uses declared earnings from work when a person is receiving a main benefit. All clients receiving a main benefit and in part-time work must regularly declare supplementary income. There is likely to be under-reporting of earnings from work and therefore our measure will underestimate the level of part-time work whilst on benefit.

PROGRAMME STAIRCASING

Staircasing is based on the idea of moving people through a logical sequence of programmes to move them into employment. The staircasing measure uses the same ranking of employment programmes as the Combined Positive Outcomes (see **Table 3**). Any time spent in programmes at levels closer to employment than the programme being evaluated is counted in the staircasing outcome measure. The measure is indicative only as it does not take into account the sequence of subsequent programmes or the time between programmes participation spells.

REPEAT PARTICIPATION IN THE SAME PROGRAMME TYPE

Repeat participation in the same programme type provides a useful indicator of whether people are repeating the same type of programme. In some cases this may be appropriate; for example, Training Opportunities and Training Incentive Allowance often involve several repeat spells to complete the training or education course.

Impact estimation: propensity matching

The next step is to estimate whether MMMH improved participants' likelihood of achieving a positive outcome. We answer this question by asking the counterfactual question: what outcomes would have occurred had the participant not gone on the programme?

By definition, it is not possible to observe the counterfactual outcomes of participants. The solution is to identify a proxy for the counterfactual, usually a group of non-participants whose outcomes are used for comparison purposes. The challenge is to ensure the proxy is an accurate representation of participants' counterfactual outcomes. Specifically, other than programme participation, are there other reasons for any differences between the outcomes of participants and those of the comparison group (ie selection bias)? There is no foolproof means to remove selection bias; rather, various methods are able to control it to a greater or lesser degree. In general, randomisation is considered the best method to estimate the counterfactual outcomes of participants (ie it requires fewer assumptions than alternative approaches).

MATCHING ON OBSERVABLE CHARACTERISTICS

One approach is to construct a matched group of non-participants who have the same (or similar) characteristics as the participants. The simplest method is to find a non-participant with an identical

profile to that of each participant. However, such methods are limited by the probability that two people share the same set of observable characteristics. The more characteristics included in the match, the less likely that for each participant there is a matching non-participant. As a result, these methods require the arbitrary selection of only a few matching variables.

An alternative approach, favoured in this analysis, involves a logistic regression model to regress observable characteristics against programme participation. Logistic regression produces an estimate of the probability that a given client is a participant in a programme. Using this probability (called "the propensity score") it is possible to match participants and non-participants based on the similarity of their propensity scores. If the propensity score is properly specified, the participants and matched comparison groups will have a similar observable characteristic profile (eg similar duration, benefit type, age, number of children).

Conditional Independence Assumption

Estimating impact by controlling for observable characteristics requires the Conditional Independence Assumption (CIA) to hold. The CIA states that controlling for differences in observable characteristics between participant and comparison group also controls for unobserved differences between the two groups. If the CIA holds, the only statistically significant difference between participant and comparison group will be their participation in the programme. Any resulting estimates would be unbiased. In other words, the only explanation of differences in outcomes between the two groups would be whether they participated in the programme. If the CIA fails, the estimate will be biased. Here differences in outcomes could be due to unobserved differences between participants and comparison, as well as the impact of the programme.

The main limitation of this method is that it relies on available and measurable information about people eligible to receive Work and Income assistance. It is rare that comprehensive information exists about the types of people who participate in the programme or those who could form part of the comparison group. The analysis relies on the information available on MSD's administrative databases. This increases the risk of biased estimates. The second limitation of the CIA is that it is not possible to determine whether it has been violated or to what extent.

Table 4 summarises the variables currently included in the propensity matching of comparison group to programme participants. The emphasis is on historical variables and, in particular, the two years prior to the start date.[4]

TABLE 4: OBSERVABLE CHARACTERISTICS INCLUDED IN THE PROPENSITY MATCHING OF THE COMPARISON GROUP

Area	Variable	Presentation of variable in the analysis
Demographics	Gender	Female, Male
	Age	Age in years
		Age group (16–<18 yrs,18–<20 yrs, 20–<25 yrs, 25–<30 yrs, 30–<35 yrs, 35–<40 yrs, 40–<45 yrs, 45–<50 yrs, 50–<55 yrs, 55–<60 yrs, 60–<65 yrs)
	Ethnicity	Māori, NZ European, Pacific people, Other
Residency	Migrant	Yes, No
	Time in NZ	1–2 yrs, 4–8 yrs, 8–12 yrs, 12+ yrs, New Zealand
	English preferred language	Yes, No

[4] Start date refers to the date participants commenced the programme (the actual date is usually three days prior to recorded participation start) or the date the non-participants were selected for inclusion in the comparison group.

Area	Variable	Presentation of variable in the analysis
Labour market skills	Education	None; NCEA Lvl 1, <80 credits, NCEA Lvl 1, 80+ credits; NCEA Lvl 2; NCEA Lvl 3; Other school qualifications; NCEA Lvl 4; Post-secondary; Degree/prof qualifications
	Numeracy literacy barrier	Yes, No
	Language verbal barrier	Yes, No
	Income in six months prior to benefit commencement	No income, Under $250, $250 to $499, $500 to $749, $750 to $999, Over $1,000
Family status	Client has an identified partner	Yes, No
	Age of youngest child	0–5 yrs, 6–13 yrs, 14+ yrs, No child
	Number of children	Categorical (ie No child, 1 child, 2 children, etc)
Health and disability	Employment barriers identified: Disability, Alcohol and drug, Intellectual, Mental illness, Mobility and agility, Sensory, Unspecified (7 variables)	Yes, No
	Number of current incapacities	0 incapacity, 1 incapacity, 2 incapacities, 3 incapacities, 4 incapacities
	Current incapacity 1 to 4 (4 variables)	Accident, Cancer, Cardiovascular, Congenital, Musculoskeletal, Nervous sensory, No incapacity, Other psychological, Other unspecified
	Identified incapacity in the previous two years: Accident, Cancer, Cardiovascular, Congenital, Musculoskeletal, Nervous sensory, Pregnancy, Substance abuse, Schizophrenia, Other psychological, Other unspecified (11 variables)	Yes, No
Labour market context	Territorial local authority area	64 categories
	Work and Income region	12 categories
	Quarter of start date	2004Qtr1, 2004Qtr2, 2004Qtr3, etc
Other	Ex-prisoner	Yes, No
Independence from Work and Income assistance	Dependent on Work and Income assistance in each of the 24 months prior to start date (24 variables)	Yes, No
Benefit information	Current benefit	Unemployment/Independent Youth, Domestic Purposes/Widow's/Emergency, Sickness, Invalid's, Supplementary only, No benefit
	Duration on current benefit	Categorical (<3 months, >3–6 months, >6–12 months, >1–2 years, >2–4 years, >4–6 years, >6–8 years, >8–10 years, Over 10 yrs, Unspecified)
		Continuous (days)
	Years on main benefit over previous 10 years	Categorical (0 years, <1 year, 1 year, 2 years, …, 10 years)
	OnBenAt18	Yes, No, Too old
	Benefit status in each of the 24 months prior to start date (24 variables)	Unemployment/IYB, DPB/Widow's/EB, Sickness, Invalid's, Supplementary only, No benefit
Register duration	Current register duration	Categorical (< 3 months, >3–6 months, >6–12 months, >1–2 years, >2–4 years, >4–6 years, >6–8 years, >8–10 years, Over 10 years, Unspecified)
		Continuous (days)
Employment programme participation	Current participation in: Into-work support, Job search, Matching and placement, Training, Wage subsidy, Work confidence, Work experience, Other (8 variables)	Yes, No
	Participation in the previous five years in: Into-work support, Job search, Matching and placement, Training, Wage subsidy, Work confidence, Work experience, Other (8 variables)	No participation, Under 1 month, 1 to 3 months, 3 to 6 months, 6 months to 1 year, 1 to 2 years
	Programme participation in each of the 24 months prior to start date (24 variables)	Into-work support, Job search, Wage subsidy, Work confidence, Work experience, Training, Matching and placement, Other, No participation

Area	Variable	Presentation of variable in the analysis
Participation in tertiary study	Received student loans or allowances in each of the 24 months prior to start date (24 variables)	Yes, No
	Proportion of time receiving student loans and allowances in last 5 years or since 2000	Categorical (0 years, <1 year, 1 year, 2 years, …, 5 years)
Part-time work	Average weekly declared earnings in each of the 24 months prior to start date (48 variables)	Categorical (No income, >$0–$80, >$80–$180, >$180–$300, >$300)
		Continuous (nearest dollar)

PROPENSITY MATCHING MMMH PARTICIPANTS

As Table 4 illustrates the participants and comparison group are matched on a large number of variables, and for this reason these tables are not reproduced here. However, **Table 5** summarises the results of the propensity matching balancing test. The balancing test involves checking whether there are significant differences in the observable characteristics of the participant and comparison group. Statistical theory tells us that if we use the 95% confidence interval no more than 5% of these individual tests should be significant. As we can see, the proportion is well below 5%.

TABLE 5: SUMMARY OF BALANCING TEST RESULTS FOR MMMH PROPENSITY MATCHING

Intervention	Variables tested	% in model	Number of classes (eg variable categories)	Variable classes with a significant difference (95%CI)
Mild to Moderate Mental Health pilot (2008-2009)	284	85%	821	2.3%

PARTICIPANT AND COMPARISON GROUP OBSERVATIONS

Table 6 shows the number of observations in the participant and comparison group. Because the propensity matching was with replacement, individual comparison group members could be matched more than once, for this reason there are fewer comparison observations than participants. The average weighting for the comparison group is around 1.3.

TABLE 6: PARTICIPANT AND COMPARISON GROUP OBSERVATIONS

Programme	Observations		Average weight
	Participants	Comparison	
Mild to Moderate Mental Health pilot (2008-2009)	926	703	1.32

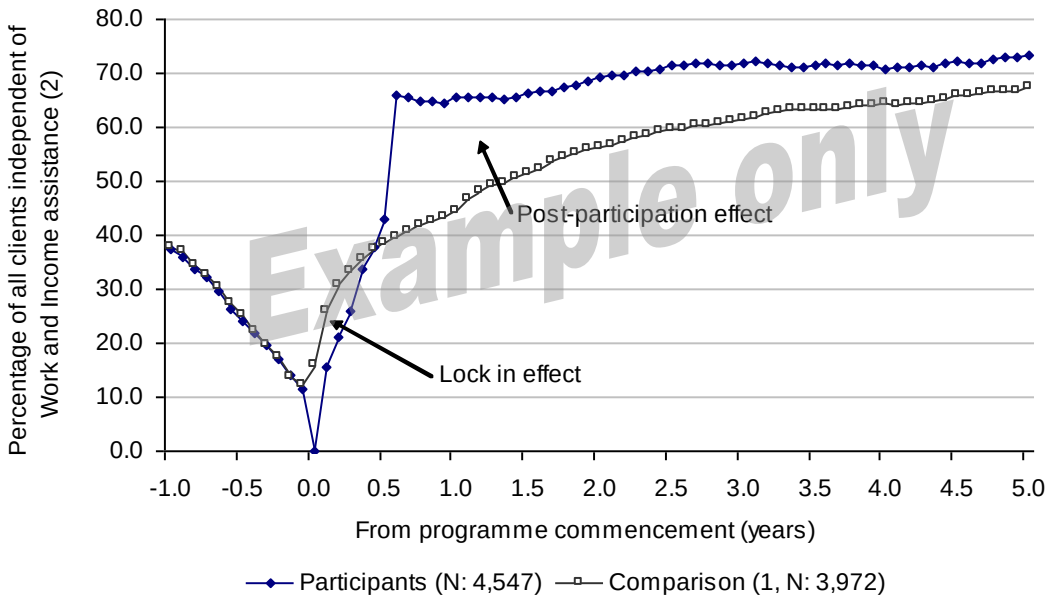
CUMULATIVE OUTCOME MEASURE

How clients' outcomes are measured can influence the conclusions about a programme's effectiveness. In this report we present clients' outcomes using a cumulative measure (eg the proportion of time clients spent independent of Work and Income assistance in the first year after starting the programme). The alternative would be to measure the proportion of clients independent of Work and Income assistance exactly one year after starting a programme. The problem with the latter "point in time" (or "as at") measure is that it ignores changes in clients' outcomes over time and therefore is a partial picture.

Figure 3 illustrates the difference between "point in time" ("as at") and cumulative measures using an example programme. **Figure 3** tracks the outcomes of a group of programme participants and a matched comparison group. Taking a "point in time" approach, the impact of the programme varies considerably over time. In the first three months after starting the programme, participants' outcomes are **less** than those of the comparison group, implying a negative impact. However, at one year the

situation is reversed, with participants' outcomes exceeding those of the comparison group. But, even at this point, the magnitude of the programme's impact will vary according to which lapse period is selected.

FIGURE 3: PROPORTION OF PARTICIPANTS AND COMPARISON[1] INDEPENDENT OF WORK AND INCOME ASSISTANCE[2] OVER TIME



1: Comparison group is matched to participants based on observed characteristics of participants at programme start.
2: No longer receiving a main benefit (eg Unemployment Benefit) or Work and Income employment assistance (eg wage subsidy).
Source: Information Analysis Platform, 2008 (research information, not official MSD statistics).

The cumulative impact measure calculates the total time participants are off benefit at each lapse period (see Table 7). After six months (lapse period 0.5), participants and comparison groups had spent about the same amount of time independent of Work and Income assistance. However, since participants' outcomes exceed the comparison group after this time (see **Figure 3**), the cumulative impact steadily increases over each successive lapse period.

TABLE 7: IMPACT[1] OF ILLUSTRATIVE PROGRAMME ON THE CUMULATIVE TIME PARTICIPANTS SPEND INDEPENDENT OF WORK AND INCOME ASSISTANCE[2]

	Time spent independent of Work and Income assistance over each lapse period					
	Participants		Comparison		Impact	
Lapse period (years)	Weeks	% of lapse period	Weeks	% of lapse period	Weeks	% of comparison
0.5	6.7	26%	8.2	32%	-1.5	-19%
1.0	23.4	46%	18.9	37%	4.5	24%
1.5	40.3	52%	31.4	41%	8.8	28%
2.0	57.6	56%	45.4	44%	12.3	27%
2.5	75.7	59%	60.3	47%	15.4	25%
3.0	94.1	61%	75.9	49%	18.2	24%
3.5	112.5	63%	92.0	51%	20.6	22%
4.0	130.9	64%	108.4	53%	22.5	21%
4.5	149.3	65%	125.0	54%	24.3	19%
5.0	167.9	65%	142.1	55%	25.8	18%

1: Impact estimates are based on matching on observables method.
2: Independent of Work and Income assistance means a person is no longer receiving a main benefit or participating in Work and Income employment programmes.
Source: Information Analysis Platform, 2008 (research information, not official MSD statistics).

LOCK-IN EFFECT AND POST-PARTICIPATION EFFECT

Related to measuring outcomes cumulatively are the concepts of programme lock-in (or locking-in) and post-participation effects. To help understand these two concepts, **Figure 3** shows the impact of an example programme on the time participants spent independent of Work and Income assistance. The lock-in effect occurs during the time participants are on the programme, and generally means participants are less likely to become independent of Work and Income assistance. Using the example programme, participants spent an average of three months on the programme (from lapse period 0 to 0.3 in **Figure 3**). As the figure shows, during this period the outcomes of participants are less than those of the comparison group.

The post-participation effect is the (hoped for) benefit of the programme. In the example, **Figure 3** demonstrates that the programme had a large positive post-participation effect from about three months after commencing the programme. After this point (lapse period 0.6 onwards), the outcomes of participants exceed those of the comparison by a wide margin.

The cumulative impact is the sum of the lock-in and post-participation effects. By definition, for a programme to have a positive cumulative impact the post-participation effect has to exceed the lock-in effect.

What determines the size of the lock-in effect?

There are two main reasons for employment programmes to have lock-in effects. The first is that participants have less time to engage in job search while participating in a programme. The second is that participants may have a strong incentive to defer taking up job opportunities while on a programme. A good example of the latter is when participants are training for a qualification; if they leave the programme early they will not achieve the qualification and will fail to gain the benefits of the programme. The latter explains why formal training such as gaining tertiary qualifications has such large lock-in effects. Therefore, although programme impacts can be improved by minimising lock-in effects, it is not possible to remove them for all programme types.