MINISTRY OF SOCIAL DEVELOPMENT
TE MANATŪ WHAKAHIATO ORA

17 JUL 2018

[redacted]

Dear [redacted]

On 9 May 2018 you emailed the Ministry requesting, under the Official Information Act 1982, information regarding the Service Effectiveness Model (SEM) used by the Ministry.

The Ministry designed the SEM model in 2017. The SEM is intended to reflect how much help a client might need from Work and Income and predicts which of the Ministry's case management services are likely to work best for them. It assesses the comparative effectiveness of services by estimating the benefit of placing a particular client into an intensive case management service rather than the least intensive service.

Intensive management involves case managers being more available to clients to work together in overcoming barriers to successful outcomes. This might involve supporting clients in accessing health or addiction services or being referred to an organisation that has specialist staff who can work directly with these clients.

It takes into account previous clients' experiences of support received through Work and Income to help the Ministry make better service decisions for current clients.

The SEM uses information known to the Ministry related to:

- age
- gender
- children
- country of origin and time since immigration
- benefit history
- employment history.

For clarity your questions will be answered in turn.

- *any policy documents pertaining to the use of this model*
- *any evaluation reports pertaining to the use of this model*
- *any reviews (external or internal) of this model*

MSD National Office / 56 The Terrace / Off Aurora Tce / Wellington 6011
56 The Terrace / Aurora Tce / Wellington City 6011 / New Zealand
Fax: 04 918 0099 / **www.msd.govt.nz**

Policy documents regarding the SEM do not exist as it is a back end operational process. No evaluation or review of the model has yet been completed in the year since it was deemed fit for purpose. As such your request for this information is refused under section 18(e) of the Act, as this information does not exist.

- *any training materials provided to staff who use this model or whose decisions are "supported" by this model*
- *practice notes about the model*

Service Delivery staff were informed of the implementation of SEM in a staff briefing on 2 August 2017. The key message of this briefing was:

> *From 31 July 2017 clients will be allocated to Work Focused Case Management –General, Work Focused Case Management – Health Condition or Disability and Work Search Support, using a predictive model that allows us to determine which service will likely work best for each individual client.*

This was supported with a video and a link to the *Client Service Matching - Eligibility and priority rules* page on the Ministry intranet was also provided. A copy of this page and a transcript of the video are attached for your reference.

The SEM exists within the Ministry's systems. As such, staff do not interact directly with it and no training was required.

- *any reports written about its implementation*

Please find attached a copy of the document '*Implementation Plan: Client Service Matching Service Effectiveness Model*', dated July 2017.

Please note, the names of some individuals are withheld under section 9(2)(a) of the Act in order to protect the privacy of natural persons. The need to protect the privacy of these individuals outweighs any public interest in this information. The work contact details of officials are withheld under section 9(2)(k) to reduce the possibility of staff being exposed to phishing and other scams. This is because information released under the OIA may end up in the public domain, for example, on websites including the Ministry's own website.

- *data about the accuracy of the model (in your previous response to me you said "The accuracy of the SEM at recommending clients to specific services is much higher than previous approaches" - I want to see data that proves that)*

The Ministry can specify the accuracy of the model based on assessments conducted during the build phase using the gains statistic, which is a measure of how accurately a model's predictions rank clients in order from high to low (compared to what actually happens). For SEM, this ranking is in terms of future benefit costs. Gains range from 0 (random ranking) to 1 (perfect ranking of clients from highest to lower future benefit costs). The SEM sub-models have gains statistics ranging from 0.64 to 0.83.

The Ministry compared the SEM with the previous approach through modelling which was measured in terms of the potential reduction in expected future time on benefit. For information on this modelling please find attached a copy of the document *'Service Effectiveness Model Assurance'*, dated 21 July 2017

Note that the final accuracy of SEM predictions depends on the combined accuracy of both models for the services that are being compared, for example the benefit of an intensive case management service compared to the baseline less-intensive service, but this isn't something that can be summarised in a single statistic.

- *please also provide a copy of the model*

Your request for a copy of the model is refused under sections 18(f) and 18(g) of the Act, as the model is embedded in the Ministry's systems and as such does not exist in a form which could be provided to you and substantial manual collation would be required in order to do so. The diversion of resources to complete this task would impair the Ministry's ability to continue standard operations and would be an inefficient use of the Ministry's resources. The greater public interest is in the effective and efficient administration of the public service.

I have considered whether the Ministry would be able to respond to your requests given extra time, or the ability to charge for the information requested. I have concluded that, in either case, the Ministry's ability to undertake its work would still be prejudiced.

The Ministry is happy to talk through the use of this model and the services within which it operates. I understand a time has now been set up for us to discuss this on 23 July. We are currently developing materials that will provide further explanation of this and will share these when they are ready.

The principles and purposes of the Official Information Act 1982 under which you made your request are:

- to create greater openness and transparency about the plans, work and activities of the Government,
- to increase the ability of the public to participate in the making and administration of our laws and policies and
- to lead to greater accountability in the conduct of public affairs.

This Ministry fully supports those principles and purposes. The Ministry therefore intends to make the information contained in this letter and any attached documents available to the wider public shortly. The Ministry will do this by publishing this letter and attachments on the Ministry of Social Development's website. Your personal details will be deleted and the Ministry will not publish any information that would identify you as the person who requested the information.

If you wish to discuss this response with us, please feel free to contact OIA_Requests@msd.govt.nz.

If you are not satisfied with this response regarding the SEM model, you have the right to seek an investigation and review by the Ombudsman. Information about how to make a complaint is available at www.ombudsman.parliament.nz or 0800 802 602.

Yours sincerely

Nic Blakeley
Deputy Chief Executive Insights and Investment

Client Service Matching - Eligibility and priority rules

On this Page:

Eligibility and priority rules

The Client Service Matching tool uses a set of rules for who will be prioritised, included or excluded from service.

To be considered for selection a client must be eligible for a service, by meeting the inclusion rules and not meeting the exclusion rules.

To be selected the client must be prioritised for the limited spaces in a service and eligible clients are prioritised every week for the available spaces in each service and site. For WFCM-HCD, WFCM-GEN and WSS, clients are prioritised for service based on a model that predicts which clients are most likely to benefit most from the particular service. These insights are based on which clients have had the most benefit from that service in the past.

For information on the Tactical Refresh of active case management services and how services were refilled following the refresh, please see: Tactical Refresh and Refill of Selected Case Management Service [http://doogle.ssi.govt.nz/business-groups/helping-clients/work-and-income/our-service/csm-tactical-refresh.html]

Additional rules also try to keep clients in service when appropriate, or will stream additional clients to your caseload, for example Low Trust clients (see Why clients remain in service [http://doogle/business-groups/helping-clients/work-and-income/our-service/csm-remain-in-service.html]).

The table below shows the eligibility and prioritisation rules specific to each service:

Service	Inclusion for service	Prioritised clients	Exclusion (service specific)
WFCM–IS	To be selected for WFCM-IS, clients must: • have a current benefit status, and • be aged less than 25 years	Priority is given to ex-YP/YPP clients who have aged out of the Youth Service and are yet to achieve a sustainable outcome.	NA (Also see general exclusion rules below)
WFCM-HCD	To be selected for WFCM-HCD, clients must: • have a current benefit status, and • be aged less than 60 years, and • be in receipt of JS-HCD with 'work preparation' work obligations	Clients are prioritised for service based on a model that predicts which clients are most likely to beneift most from WFCM-HCD. These insights are based on which clients have had the most benefit from WFCM-HCD in the past.	NA (Also see general exclusion rules below)
WFCM-Gen	To be selected for WFCM-Gen, clients must: • have a current benefit status AND • be aged less than 60 years, and	Clients are prioritised for service based on a model that predicts which clients are most likely to beneift most from WFCM-Gen. These insights are based on which clients have had the most benefit from WFCM-Gen in the past.	Clients in WFCM-Gen will be excluded if: • client is single and a non-subsequent child aged less than 2 years of age comes into care, or • JS-HCD client is no longer part or full-time work obligated

Clients tend to be excluded from a service if they meet one of the following principles:

they are receiving an approved alternative service (e.g. Youth Service), contracted case management, or Investment Approach trial

they are unable to visit a service centre due to security (e.g. trespass order) or their situation (e.g. in Residential Care)

they have been assigned to a control group for evaluation purposes, or

they have a change in circumstances that means they are no longer eligible for an active case management service (e.g. are pregnant 27 weeks or with complications).

The table below lists the exclusion rules that are common across most services:

General exclusion rules

Clients will not be eligible for selection, or excluded from a service, if:

they are currently assigned to one of the following services, trials or contracts

Sole Parent Employment Service

Youth Service (YSSU)

Remote Client Unit (RCU)

Young SLP trial

WFCM - Intensive Client Support trial

Supporting Offenders into Employment trial

Red Cross Pathways to Employment service

a higher service (see How we fill our services)

they are assigned to a control group for the service (see How we learn)

they are in receipt of a benefit type not associated with the service (e.g. Youth Payment, Young Parent Payment, Emergency Benefit, Supported Living Payment)

they age over 64 years

their main benefit is cancelled

they are a partner (only primary and single clients are streamed)

they have a current trespass notice

they are in Residential Care

they are living overseas

they are nominated for WFCM-IS under the Integrated Services Response

they have a medical certificate loaded in CMS for pregnant 27 weeks or with complications

they have a SWIFTT exemption with more than one day remaining for:

416 pregnant 27 weeks or with complications

437 full court imposed conditions

510 temporarily hospitalised

401 caring full time for a person with a health condition, injury or disability

402 partner sick/injured/disabled (partial) – Not WFCM-HCD

512 sick/injured/disabled (partial) – Not WFCM-HCD

530 unable to prepare for work (full) – Not WFCM-HCD

506 temporary sick/injured/disabled – Not WFCM-HCD

494 client would qualify for SLP sick/injured/disabled (full)

495 client would qualify for SLP sick/injured/disabled (partial)

498 caring for ill/disabled person full time (partial)

NOTE: In some cases a full-time work obligation exemption in SWIFTT lasting longer than 4 weeks will exclude clients from the WFCM-Gen and WSS services

	• JS-WR with part- or full-time work obligations, or • SPS, or • JS-HCD with part-time work obligations OR • have a current benefit status, and • be aged 60 – 63 years, and • have applied for benefit due to ceasing employment, and • have full-time work obligations, and • have no children in care		(Also see general exclusion rules below)
WSS	To be selected for WSS, clients must: • have a current benefit status AND • be aged less than 60 years, and • JS-WR with part- or full-time work obligations, or • SPS with part-time work obligations, and • have a continuous duration of less than 12 months. OR • have a current benefit status, and • be aged 60 – 63 years, and • have applied for benefit due to ceasing employment, and • have full-time work obligations, and • have no children in care	Clients are prioritised for service based on a model that predicts which clients are most likely to beneift most from WSS. These insights are based on which clients have had the most benefit from WSS in the past.	Clients in WSS will be excluded if: • client is a Child Sex Offender • client is LTCM, or • client is single and a non-subsequent child aged less than 3 years of age comes into care (Also see general exclusion rules below)

Service effectiveness model – Video Transcript

Getting smarter at helping clients

In 2013 we began using targeted case management services

for different groups of clients.

Since then we have found our case management services are effective

But not for everyone

These insights have allowed us to predict

which clients could benefit most from these services.

And move from "streaming" big groups of clients...

to a much more individual approach for...

Work Focused Case Management – GEN

Work Focused Case Management – HCD

and Work Search Support

so we can now stream clients into the service...

which will work best for them.

We're ready to use that knowledge

to top up WFCM case loads again

with clients we know who will benefit the most from this help.

WFCM-HCD case loads will be filled up again on 1 August

and WFCM general caseloads will be filled up gradually

So these case managers have time to meet their new clients

And start building rapport..

..to help them to better lives

MINISTRY OF SOCIAL DEVELOPMENT
TE MANATŪ WHAKAHIATO ORA

Implementation Plan

Client Service Matching
Service Effectiveness Model

July 2017

Business Group	Investment Approach
Project Sponsor	Ruth Bound
Project/ Business Owner	Jayne Russell
Senior User/s	Jayne Russell
Business Project Manager	9(2)(a)
Version	1.0

Objective Document Number: A9704973

Document Control

Template V0.5

Document Version

Version	Date	Description	Author
0.1	29/06/2017	Distributed for review to: 9(2)(a) [redacted]	9(2)(a) [redacted]
0.2	03/07/2017	Distributed for review to: 9(2)(a) [redacted]	
0.3	13/07/2017	Distributed for review to: 9(2)(a) [redacted]	
0.4	13/07/2017	Distributed for review to: 9(2)(a) [redacted]	
0.5	21/07/2017	Distributed for review to: 9(2)(a) [redacted]	
1.0	25/07/2017	Distributed for sign off	

Key Signatories

Role	Name	Signature
General Manager, Investment Approach	Jayne Russell	
General Manager, Insights MSD	Rob Hodgson	

Glossary of Terms

Term	Description
SEM	Service Effectiveness Model
LET	Liability Estimator Tool
WSS	Work Search Support
WFCM-GEN	Work Focused Case Management – General
WFCM-HCD	Work Focused Case Management – Health Conditions & Disability
RCT	Randomised Control Trial
SLP	Supported Living Payment
PHRaE	Privacy, Human Rights and Ethics
IAP	Information Analysis Platform

CBI	Client and Business Intelligence
IA	Investment Approach
IPV	Integrated Person View

Contents

Purpose

The purpose of this document is to provide assurance that all parties involved in the Service Effectiveness Model (SEM) project are ready to go live. It also seeks approval in principle to proceed with the go live contingent on sign off of the Privacy, Human Rights and Ethics (PHRaE) documentation by the Deputy Chief Executive (DCE) of Service Delivery.

Background

The goal of service matching is to enable better targeting of case management and employment assistance to clients who need additional support. These clients typically have a higher estimated lifetime liability and it is more likely that they will remain on a benefit for long periods of time without intervention.

To increase positive outcomes for clients, service matching requires both an identification of those at risk of long term benefit receipt *and* likely to respond well to current service offerings.

In order to achieve this, work has been undertaken to develop SEM. SEM determines which clients are most likely to benefit from particular services by estimating the change in future welfare support, due to receiving active case management. See Appendix A: How the Predictive Model was Built.

SEM will be utilised within the following three services:

- Work Search Support (WSS)
- Work Focused Case Management – General (WFCM-GEN)
- Work Focused Case Management – Health Conditions & Disability (WFCM-HCD)

SEM will be used to prioritise eligible clients on an individual basis rather than the current system that prioritises clients as part of a cohort.

Use of SEM in Client Service Matching

SEM will be used in place of the current business rules to prioritise clients for service in WSS, WFCM-GEN and WFCM-HCD. Note that the existing eligibility rules for each service will remain in place. See Appendix B: Client Service Matching Process.

The Weekly Process

The final output from the model (SEM scores) is an estimate of the benefit to a client of being in a service. Clients are then ranked according to their SEM score. See Appendix D: Detailed Weekly Process.

The variables that have been used to determine the model output have been chosen due to their predictive power. Some of the major variables are shown below.

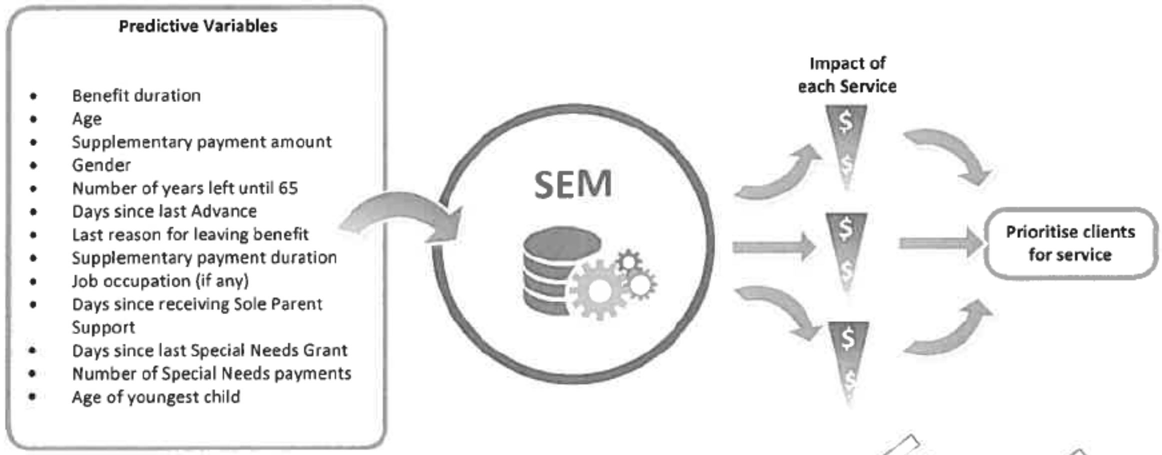


Figure 1: SEM uses predictive variables to prioritise clients for service

Campaign Manager

Campaign Manager is the tool that streams clients to services, one service at a time in a set order (see Appendix E: Campaign Manager Service Order). WSS is filled before WFCM-GEN and both these services have similar eligibility criteria, so a client may be assigned to WSS even if their highest SEM score is for WFCM-GEN. This will depend on the site capacity for WSS and the client's SEM score.

Work is underway to develop a new version of Campaign Manager that will be able to assess priority for multiple services at once. This means that for each service that SEM is used for, clients can be assigned to their optimum service rather than assigning clients in a set order of services.

Actuarial Assurance

The Head of Actuarial has assessed and approved the modelling techniques and the suitability of the variables used within the SEM model. SEM has been approved as fit for purpose within client service matching as outlined in the section above. It is expected that prioritising clients using SEM and excluding additional cohort based business rules will improve the outcomes overall of the services.

Implementation Approach

Technical Deployment Plan

SEM has been deployed into the IAP production environment and is producing scores for clients each week; however these are only accessible to the CBI team at this stage. The technical deployment process is outlined below:

1. The data items required for the modelling put into production in the IPV on IAP
2. The model scoring put into production to be run weekly by CBI and IAP teams
3. The SEM scores put into the data tables that the prioritisation tool can access
4. Prioritisation factors changed to SEM ranking (age adjustment for 50+) by IA team
5. The output of the prioritisation tool is input to Campaign Manager that allocates clients to services and generates the weekly service lists

Steps 1-3 have been completed, while steps 4 and 5 are planned to take place from 26 July 2017. It is expected that steps 4 and 5 will take one day to implement, ready for the weekly service matching process on 31 July 2017.

Delivery of streamed clients to front line will remain the same i.e. Campaign Manager will continue to produce the weekly service lists that case managers access via Briefcase.

Implementation Risks

There are three main implementation risks which can be found in Appendix F: Implementation Risks.

Rollback Plan

In the unlikely event of a technical issue, the Team Manager CBI will notify the National Manager of Investment Implementation immediately and will work collaboratively to resolve the issue. If the issue is not able to be resolved by noon on Friday, we will seek approval from the General Manager IA and National Commissioner to revert back to the existing prioritisation rules to stream clients. This is to ensure that the weekly streaming of clients is not interrupted.

IA will be responsible for keeping the General Manager IA and the National Commissioner informed throughout any issue.

Project Deliverables Completed

This section confirms that all required deliverables have been completed, with the exception of the PHRaE review, as per the following section.

Area	Products or tasks completed
Business Processes	• Not applicable
User Guides/Manuals	• Not applicable
Website Content	• Not applicable
Communications and Change Management	• An appendix has been added to the Tactical Refresh Communications Plan since these projects are closely related • A summary of the key messages and communication approach has been included in this document
Media Readiness	• Not applicable
Stakeholder Engagement	• Key stakeholders have been informed of the upcoming change
Transitional Arrangements	• Not applicable
Letters	• Not applicable
Forms, Brochures and Factsheets	• Not applicable
Exceptions Management	• Not applicable
Contracts	• Not applicable
Training	• Not applicable
Reporting & Monitoring	• The SEM scores will be recorded each week in the IAP • CBI will monitor these scores weekly on Monday to confirm that the results, which are emailed to their shared mailbox, are as expected

Escalation	• The Team Manager CBI will notify the National Manager of Investment Implementation immediately of any issues identified and will work collaboratively to resolve these. CBI and IA will ensure appropriate teams are involved as follows:
	  o IAP (source data related)
	  o Simplification Digital Analytics (summary data related)
	• National Manager Investment Implementation will be responsible for keeping the General Manager IA and the National Commissioner informed throughout any issue

Area	Products or tasks completed
Evaluation	• The evaluation plan is under development. Go-live is not dependent on it and the plan will be in place by 30 November 2017
Information Technology	• SEM has been fully developed & tested and is already running in production, producing scores for clients each week, although they are not yet being used to prioritise clients for service
Information Security	• Information security has been considered as part of the Privacy Impact Assessment, full details of which can be found alongside the PHRaE assessment. There is no increased security risk of this model
Privacy Impact Assessment (PIA)	• This assessment shows that there is no increased risk to the treatment of clients' private information. More detail can be found in the Privacy Impact Assessment, which is outlined in the PHRaE assessment
Business Continuity Planning	• A rollback plan has been developed, which is included in this document
Communication	• The Regional Commissioners, Regional Directors and the Service Delivery Leadership Team have all been informed of the impending changes • Messaging to regional staff is outlined in the accompanying Communications Plan
Contact Centre Readiness	• Not applicable
Post Implementation Support	• The Investment Implementation team in IA will be ready for any operational queries sent to the IA inbox (Investment_Approach@msd.govt.nz) which is monitored daily by the Investment Implementation team. The National Manager Investment Implementation will also be available on 029 200 6584 • The National Manager Investment Implementation will contact the Team Manager CBI for any technical issues in support of these queries
Actuarial Assurance	• MSD Head of Actuarial has provided assurance that the model is fit for operational use. This is detailed in the Actuarial Assurance documentation

Figure 2: Completed Deliverables

Project Deliverables In Progress

This section shows two deliverables that are still in progress. The PHRaE deliverable must be completed before go-live.

Area	Products or tasks planned/in progress	Impact on go live
Privacy, Human Rights and Ethics (PHRaE)	• An external ethicist and human rights law expert has completed an assessment of SEM • The MSD PHRaE team will review the assessment, and any risks identified will be presented to the DCE SD for acceptance before go-live	• If the risks identified in the PHRaE review are not accepted, the project cannot go live
Doogle Content	• The Client Service Matching page will be updated as per the Communications Plan	• The project can still go-live with very minimal impact

Figure 3: In-Progress Deliverables

Communications Plan

A Communications Plan has been developed as an appendix to the Tactical Refresh Communications Plan, since the two work items are highly related. Please refer to this link for the full plan.

2017 03 10 Refresh of Selected Case Man

Implementation Timeline

The proposed implementation timeline is as follows:

Date	Milestone
12/07/2017	PHRaE Assessment received
19/07/2017	Review of PHRaE Assessment received from working group
20/07/2017	Send PHRaE review to IA GM for final feedback
20/07/2017	Messaging to Regional Commissioners and Regional Directors
25/07/2017	Deployment approval of SEM with PHRaE Assessment
26/07/2017	Finalise content for Client Service Matching Doogle page
26/07/2017	Finalise weekly brief for 02/08/2017
28/07/2017	Finalise Manager's Weekly Note for 31/07/2017
28/07/2017	Technical Deployment
31/07/2017	Streaming clients using SEM

Figure 5: Implementation Timeline

Post Implementation Support Plan

The IA team will be point of contact via the shared mailbox for any operational queries. In case of technical issues we will contact CBI or the Digital Analytics team within Simplification depending on the nature of the issue. This support will be in place indefinitely.

Filling Service Caseloads

As part of the Tactical Refresh on 6 June 2017 clients who had been in WFCM-GEN or WFCM-HCD for more than two years, and in WSS for more than one year, were exited from service. Streaming of clients into WSS has already commenced. Streaming using SEM to prioritise clients for service, will resume for all affected services on 31 July 2017.

For WFCM-GEN, the caseloads will be refilled at no more than 20 new clients per case manager, with all sites expected to reach capacity within a month. WFCM-HCD will be filled all at once, as no case manager will receive more than 20 new clients.

Monitoring Implementation Success

Check	Success criteria
Site capacity	Each site has reached the set capacity of clients in each service
The profile of clients allocated	SEM allocation results will be monitored by the IA team to ensure that SEM is performing as expected and there are no disproportional results of key client cohorts

Figure 6: Implementation Success Measures

Implementation Team Contact List

Name	Role	Contact
Shared Mailbox	IA Team	Investment_Approach@msd.govt.nz
9(2)(a)	National Manager Investment Implementation	9(2)(k)
9(2)(a)	Senior Advisor Investment Implementation	
9(2)(a)	Team Manager Client & Business Intelligence	

Figure 7: Implementation Team Contact List

Appendix A: How the Predictive Model was Built

SEM is a predictive model. Predictive models define the relationship between a number of variables or inputs (client characteristics) and an outcome (impact of case management services on client associated costs) using historical data. When the relationship is defined it can be applied to current situations (clients to be allocated to service) to determine the expected outcome.

Predictor Variables (Input)

SEM was built using the evaluation of the impact of case management services data. The impact for any client can be positive or negative based on actual and expected benefit costs. Predictor variables are client characteristics from up to five years before the time the client was allocated to the particular service. Numerous potential predictor variables were then tested to see which ones were most indicative of clients who have the greatest impact from being in service. Some important predictor variables are:

- past time on benefit
- income (if any)
- hardship, and
- demographic information.

Now that these predictor variables have been identified, current clients who are available for streaming can be assessed on an individual basis to estimate their likely impact of being in service.

Impact of Service (Output)

SEM has been built based the historical impact of service outcomes. These outcomes were determined utilising a randomised control trial (RCT) evaluation design.

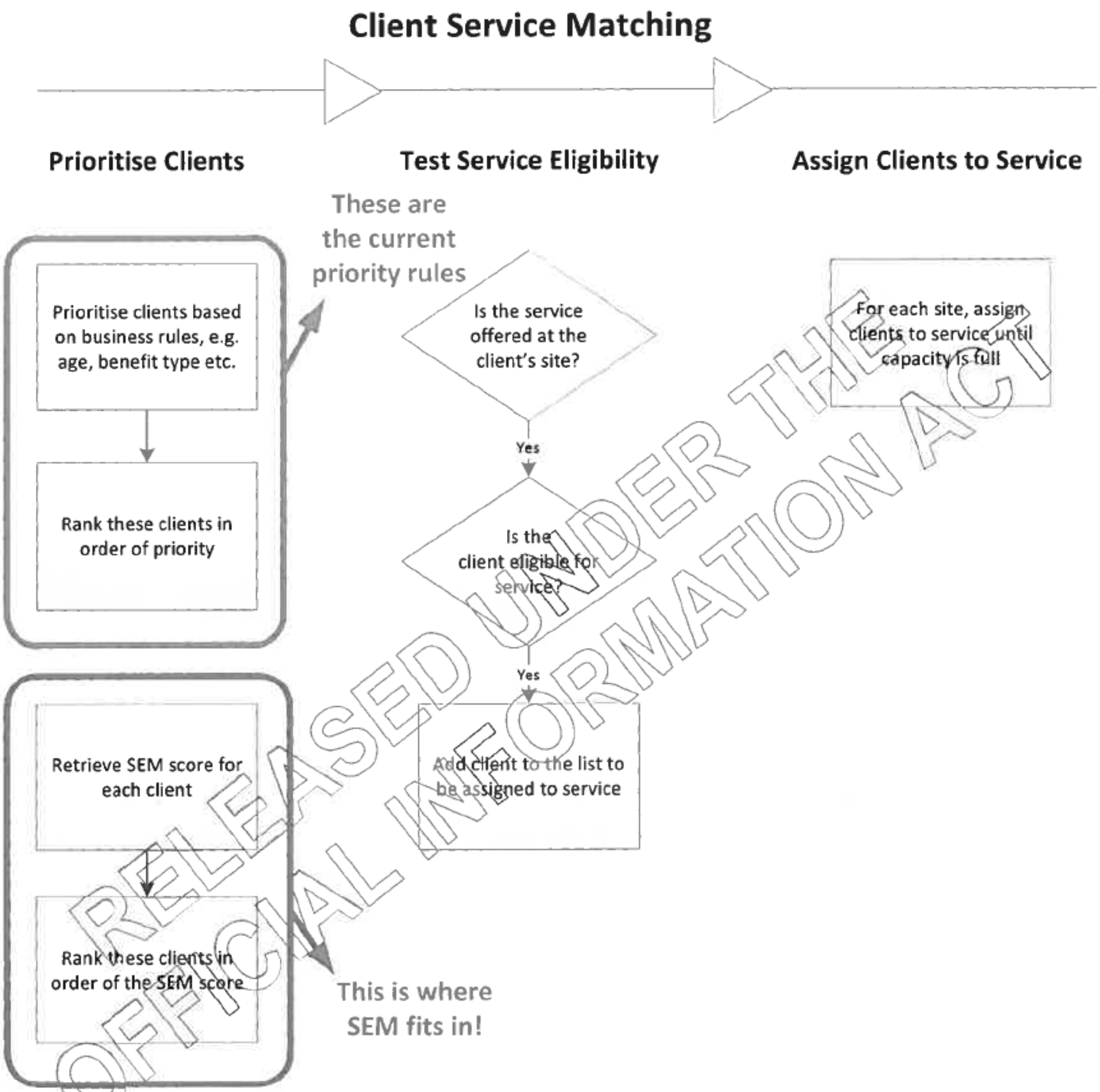
The impact of the service is measured based on:

- all income support costs[1] during the observation period
- all staff and direct costs[2] incurred by MSD during the observation period, and
- the estimated lifetime liability of the client (up to age 65) at the end of the observation period.

The first two measures are actual observed costs as they have occurred in the past. The third measure is an estimate based on the Liability Estimator Tool (LET) – the assumption being that the impact of the service will be seen not only in reduced cost during the observation period but also in the reduced lifetime liability.

[1] All costs are CPI-adjusted to 2014Q4 where CPI figures are obtained from STATS NZ
[2] Direct costs are programmes or services that MSD pays for e.g. wage subsidies or contracted training programmes

Appendix B: Client Service Matching Process



Appendix C: Reasons for Eligibility Rules

WFCM-HCD Eligibility	Reasons
Have a current benefit status	SSA
Be aged < 60 years	SSA working age 18-64, Taylor Fry target cohort, 2013 SM review W&I governance agreed to include clients 59 year olds currently in service
Be in receipt of JS-HCD with 'work preparation' work obligations	Operational policy to prevent going onto SLP, target cohort

WFCM-GEN Eligibility	Reasons
Have a current benefit status	SSA
Be aged < 60 years	SSA working age 18-64, Taylor Fry target cohort
JS-WR with part or full-time work obligations	Implemented October 2013
SPS	Social Security (Youth Support and Work Focus) Amendment Bill (Bill One) passed on 20 July 2012 changes to work expectations for sole parents
JS-HCD with part-time work obligations	Operational Policy implemented 14 October 2013 to prevent going to SLP
Be aged 60 – 63 years	SSA working age 18-64, grandparents feedback and issues. Political, media exposure, sensitive situation, strict criteria
Have applied for benefit due to ceasing employment	
Have full-time work obligations	
Have no children in care	

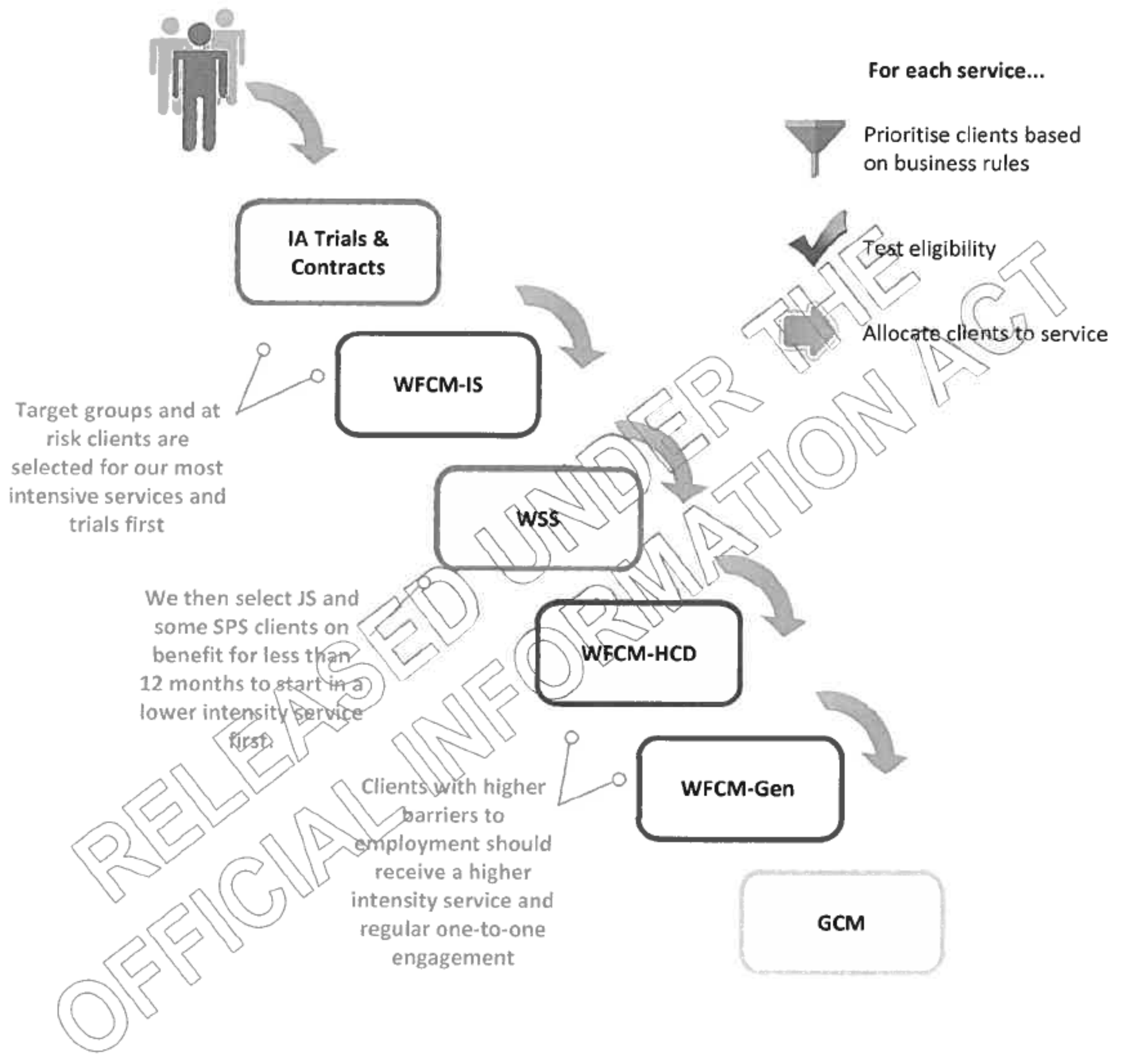
WSS Eligibility	Reasons
Have a current benefit status	SSA
Be aged < 60 years	SSA working age 18-64, Taylor Fry target cohort
JS-WR with part or full-time work obligations	Amenability, work obligations
SPS with part-time work obligations and with youngest child aged >3 years	Legislation, Policy
Have a continuous benefit duration of less than 12 months	Amenability
Be aged 60 – 63 years	SSA working age 18-64, grandparents feedback and issues. Political, media exposure, sensitive situation, strict criteria
Have applied for benefit due to ceasing employment	
Have full-time work obligations	
Have no children in care	

Appendix D: Detailed Weekly Process

SEM has been deployed into the IAP production environment so each week on Sunday the following process will be run:

1. SEM will produce scores for each service for each client on a main benefit at the time
2. A full history of the scores will be kept in a separate database, as well as the predictor variables
3. Campaign Manager will then take the adjusted scores to test service eligibility and allocate clients to service for each site until capacity is full

Appendix E: Campaign Manager Service Order



Appendix F: Implementation Risks

#	Risk Description	Inherent Rating: Consequence	Inherent Rating: Likelihood	Controls/ Planned Mitigation	Residual Rating: Consequence	Residual Rating: Likelihood
01	Because the Privacy, Human Rights and Ethics (PHRaE) assessment of SEM is not yet complete there **may be risks identified that are not acceptable to Service Delivery**, which may impact the go-live date	Major	Possible	We have been supported by the PHRaE working group to ensure that any risks identified can be addressed through the development of the model	Major	Unlikely
		High			**Medium**	
02	If SEM is not updated over time to reflect service and client population changes there is a risk that **SEM may produce outdated results** so a client is recommended for service that is not best for them	Major	Likely	We are developing a formal approach to evaluate the effectiveness of SEM over time	Major	Unlikely
		High			**Medium**	

MINISTRY OF SOCIAL DEVELOPMENT
TE MANATŪ WHAKAHIATO ORA

Memo

To: Jayne Russell, General Manager Investment Approach

From: Eric Judd, Head of Actuarial

Date: 21 July 2017

Security level: IN CONFIDENCE

Service Effectiveness Model Assurance

Action: To Note

Purpose

This memo provides assurance that the Service Effectiveness Model (SEM) has been deemed fit for purpose.

Summary

I have reviewed the suitability of the Service Effectiveness Model in regard to the predictor and target variables, and the model design. Based on the tests performed and checks made, I consider the SEM model to be suitable for use in service streaming and expect it to improve the outcomes overall of the service. There are cohorts where SEM results are less accurate due to scarcity of data for model building. I believe a well-designed RCT would help gain better insights of service success across a broader range of client cohorts, prior to the next iteration of SEM.

Benefits

The benefit to our clients can be measured in the potential reduction in expected future time on benefit which is estimated using expected savings in life-time benefit payments (or actuarial release). Our conservative estimate of the additional actuarial release expected by the June 2018 BPS1 target date, is $0.3 billion (ie, the expected life-time savings for those additional clients we estimate will exit benefit by June 2018 as a result of the change to streaming using the SEM model). On average, this equates to approximately ¾ of a year less on benefit over the life-times of those streamed to these services (WFCM-GEN, WFCM-HCD and WSS).

Eric Judd, Head of Actuarial

Date

Background

In July 2013 targeted active case management was introduced as part of wider welfare reform changes. Clients are allocated to case management based on whether the client is eligible and there is local capacity. Where there are more eligible clients than capacity available clients are prioritised using business rules.

In November 2016 a predictive model, the Liability Estimator Tool (LET), was implemented within the prioritisation of clients to better identify clients with higher estimated future benefit receipt. It was recognised that the Service Delivery Model (SDM) needed a way of not only identifying higher liability clients but those who are likely to respond positively to active case management service in order to support the targeting of services to client needs and the achievement of Better Public Services Result Area One (BPS1).

SEM has been developed to meet these requirements collaboratively between Insights and Investments, Service Delivery and the actuarial team. As subject matter experts on liability the actuaries are best placed to ensure any operational uses of liability are fit for purpose.

Service Effectiveness Model

In order to determine whether SEM is fit for purpose the actuarial team have assessed the following:

- Suitability of predictor and target variables
- Model design

We have also compared those who would be streamed to services by the current methodology and those streamed using SEM.

Intended Use of SEM

Service Delivery proposes to implement SEM operationally from 1 August 2017.

Client Service Matching (CSM)

SEM will be used within CSM to prioritise clients into a case management service after business rules have determined client eligibility.

Actuarial findings and review

Principles for the use of SEM in prioritising clients for case management:

- SEM was developed based on experience for those clients who had historically gone into service and may not be accurate for cohorts of clients that have not been allocated to these services in the past, or have only been allocated in numbers too small to be statistically significant.

- As there has not been significant numbers of clients in the 50+ age group placed in service to measure effectiveness for, the SEM model is not considered reliable at high ages. Results above age 50 have been adjusted to reflect lower creditability.

- As further versions of the Liability Estimator Tool (LET) are developed the SEM model should also be considered for updating to reflect improvements to the estimate of client's future benefit costs.

- The current version of the SEM model should be identified as a starting point for a production-ready streaming tool and further learning's and insights need to be incorporated over time. I would also recommend an RCT is established to help gain better insights of service success across a broad range of client cohorts.

The following score distributions were assessed:

- The distribution of SEM scores for clients who were allocated to service in May 2017 as an indication of the spread of clients by key characteristics, assuming clients are allocated to the service for which they had the highest SEM score. This was compared to the client spread of those who were allocated in the service streams from the current streaming rules. Refer to the appendix for details.

- A comparison was made as at end of June 2016 for all those in the relevant service streams to clients that the SEM model would direct to each stream if the whole client population was re-allocated.

Appendix

The following tables represent a sample of clients newly allocated to case management services in May 2017. The table shows the percentage of clients that SEM would have allocated to the service relative to those that were actually allocated.

It should be noted that the capacity within sites at the time of allocation has a significant impact on the clients allocated. These results are indicative only.

WFCM GEN		WFCM HCD		WSS	
Female	**88%**	**Female**	**98%**	**Female**	**92%**
15 - 20	117%	15 - 20	88%	15 - 20	87%
20 - 25	109%	20 - 25	85%	20 - 25	73%
25 - 30	85%	25 - 30	81%	25 - 30	107%
30 - 35	78%	30 - 35	77%	30 - 35	108%
35 - 40	76%	35 - 40	120%	35 - 40	106%
40 - 45	81%	40 - 45	122%	40 - 45	98%
45 - 50	75%	45 - 50	132%	45 - 50	75%
50 - 55	71%	50 - 55	127%	50 - 55	81%
55 - 60	93%	55 - 60	190%	55 - 60	86%
60 - 65	61%	60 - 65		60 - 65	100%
Male	**117%**	**Male**	**102%**	**Male**	**77%**
15 - 20	131%	15 - 20	174%	15 - 20	79%
20 - 25	152%	20 - 25	88%	20 - 25	61%
25 - 30	118%	25 - 30	67%	25 - 30	86%
30 - 35	104%	30 - 35	75%	30 - 35	96%
35 - 40	100%	35 - 40	108%	35 - 40	87%
40 - 45	109%	40 - 45	168%	40 - 45	83%
45 - 50	89%	45 - 50	157%	45 - 50	70%
50 - 55	108%	50 - 55	128%	50 - 55	64%
55 - 60	137%	55 - 60	264%	55 - 60	64%
60 - 65	81%	60 - 65	45%	60 - 65	57%

WFCM GEN		WFCM HCD		WSS	
JSWR < 1 YEAR	122%	JSWR < 1 YEAR	49%	JSWR < 1 YEAR	80%
JSWR > 1 YEAR	83%	JSWR > 1 YEAR	57%	JSWR > 1 YEAR	45%
JSHCD < 1 YEAR	87%	JSHCD < 1 YEAR	130%	JSHCD < 1 YEAR	127%
JSHCD > 1 YEAR	78%	JSHCD > 1 YEAR	83%	JSHCD > 1 YEAR	80%
SPS, CHILD < 2	86%	SPS, CHILD < 2	100%	SPS, CHILD < 2	242%
SPS, CHILD 3-5	91%	SPS, CHILD 3-5		SPS, CHILD 3-5	123%
SPS, CHILD 5-13, < 1 YEAR	95%	SPS, CHILD 5-13, < 1 YEAR		SPS, CHILD 5-13, < 1 YEAR	114%
SPS, CHILD 5-13, > 1 YEAR	93%	SPS, CHILD 5-13, > 1 YEAR		SPS, CHILD 5-13, > 1 YEAR	66%