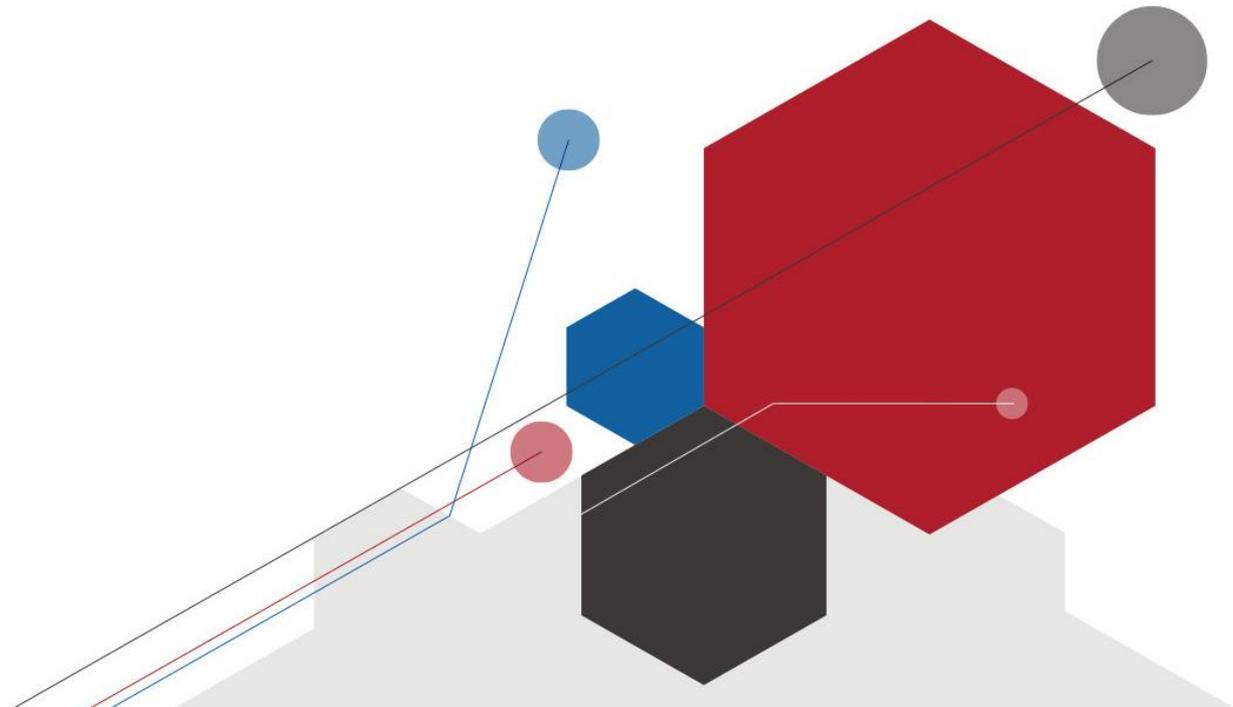


USING PREDICTIVE ANALYTICS TO LEARN WHAT WORKS FOR VULNERABLE JOBSEEKERS

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INTRODUCTION

- Governments face three important challenges:
 - Determining what services to offer, given a range of client needs and labour market contexts
 - Getting the right clients to the right services at the right time
 - Ensuring service delivery staff have the resources to deliver effective services while meeting diverse demands
- In transforming their employment services and income assistance systems, provinces—such as Manitoba, Ontario, and Nova Scotia—have recognized the role that optimal service allocation plays in effective and efficient service delivery, and how analytics can support allocation

ANALYTICS PROCESS

- 1. Assess technical feasibility** – Can we use available data to predict the likelihood of clients achieving outcome(s) of interest?
- 2. Determine policy and program alignment** – Can we use clients' predicted likelihood of achieving outcomes to meaningfully categorize clients in a way that aligns with policy objectives?
- 3. Implement in practice** – Can these client categories be used to plan and deliver services that effectively and efficiently improves client outcomes?

Using data to predict client outcomes

IDENTIFYING OUTCOME VARIABLES

- Outcomes used in predictive modelling should be purpose-driven, and in selecting them we should consider:
 - Is the predicted outcome related to key goals?
 - Is the data for the outcome reliable?
- Consider two approaches operating in the same context, but with different goals and outcomes:

GOAL: Improve labour market outcomes of income assistance clients through employment services.

OUTCOME: Income assistance use one year after intake.

GOAL: Reduce time caseworkers spend on compliance monitoring of income assistance clients, to increase resources available for active case management.

OUTCOME: Ineligibility due to compliance issues.

IDENTIFYING PREDICTORS

- Administrative data often provides rich measures of clients outcomes and characteristics
- New assessment tools can collect new information to strengthen the model

Caseload administrative data:

Income assistance history variables (e.g. number of months on caseload over last X months, number of previous cases)

Demographics and case characteristics (e.g. age, education, case category, and region)

New assessment tool data:

Detailed work history information (e.g. hourly wage of last job, why they left last job, number of jobs over last X years)

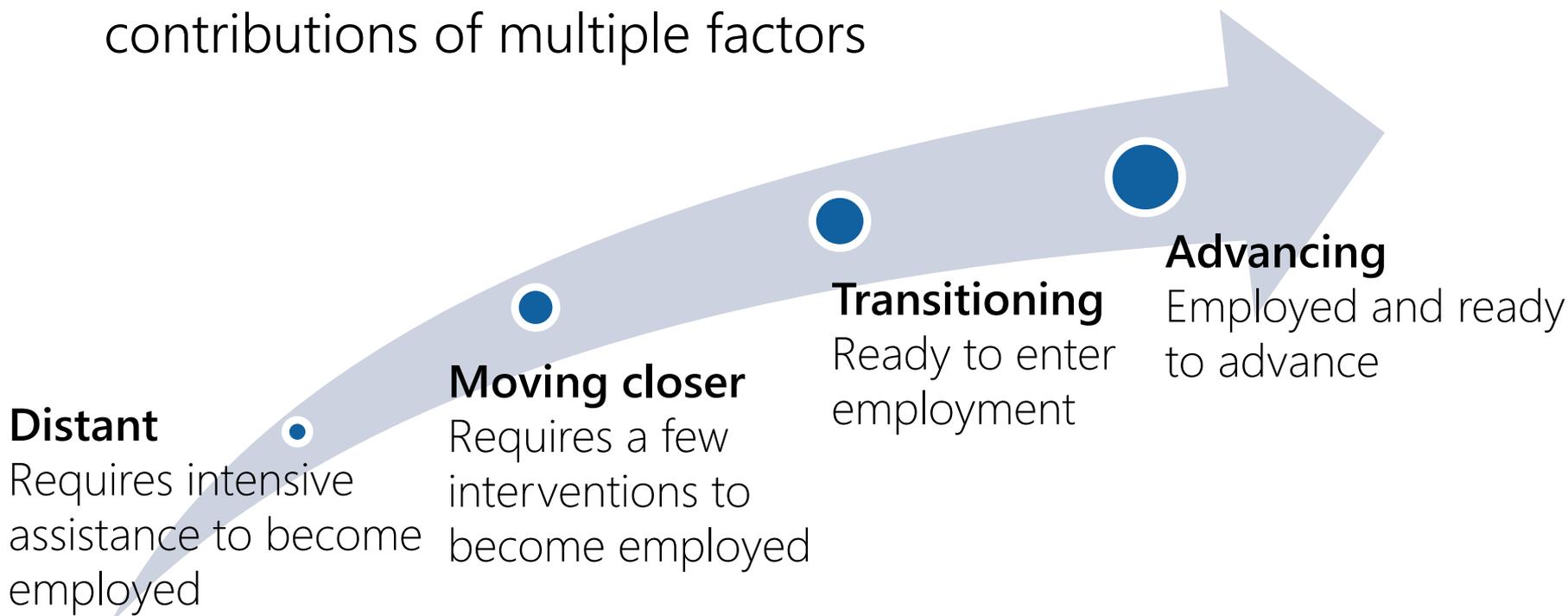
Skill measures (e.g. English language skills, Essential Skills, technical skills)

Indicators of other barriers to employment (e.g. childcare availability, health barriers, driver's license)

Using predicted outcomes to meaningfully
categorize clients

CATEGORIZING LABOUR MARKET NEED

- Many jurisdictions are aiming to engage clients with a wider range of needs, but traditional 'eligibility criteria' approach fails to accurately measure client need
- 'Distance to the labour market' (DLM) approach aims to more comprehensively measure client need by understanding contributions of multiple factors



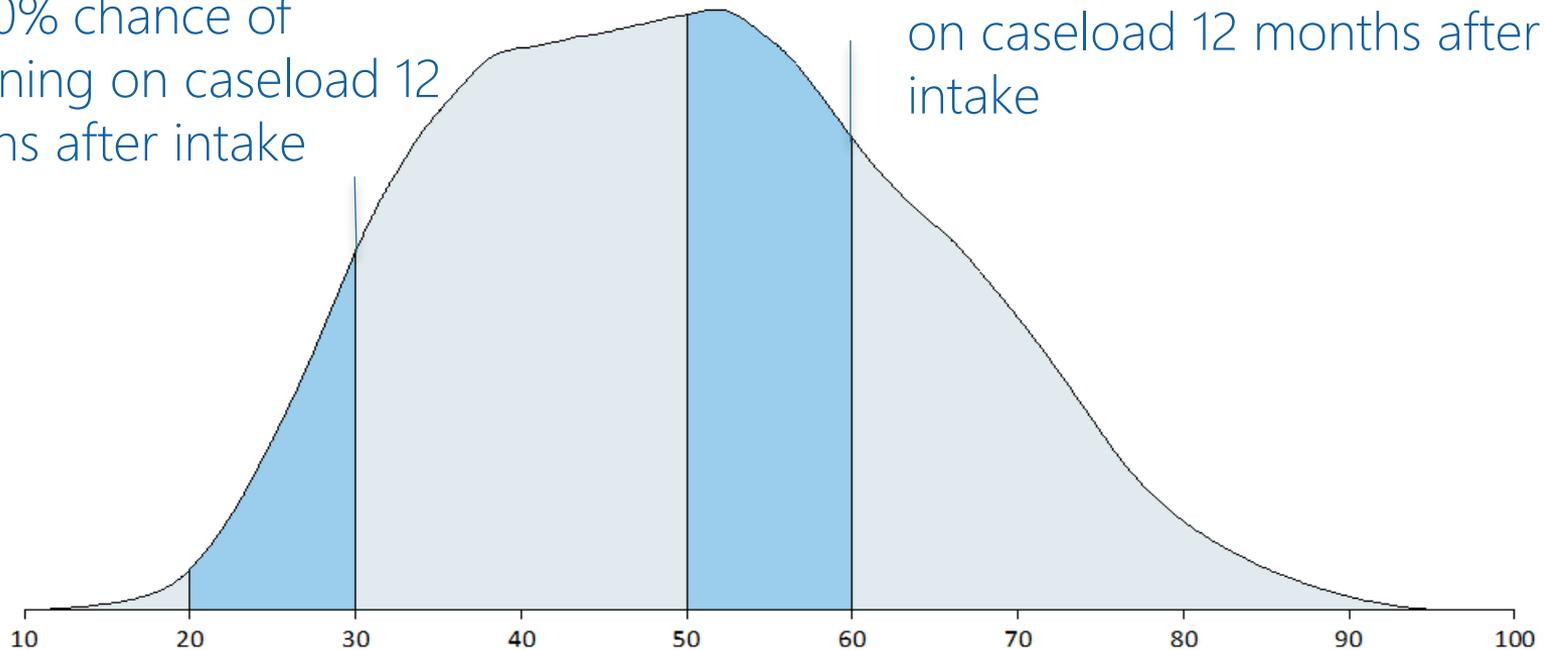
OPERATIONALIZING DLM

DLM model of labour market attachment can be operationalized using data and multivariate statistical modelling

Distribution of predicted probability of remaining on caseload 12 months after intake

7% of intakes have a 20–30% chance of remaining on caseload 12 months after intake

23% of intakes have a 50–60% chance of remaining on caseload 12 months after intake



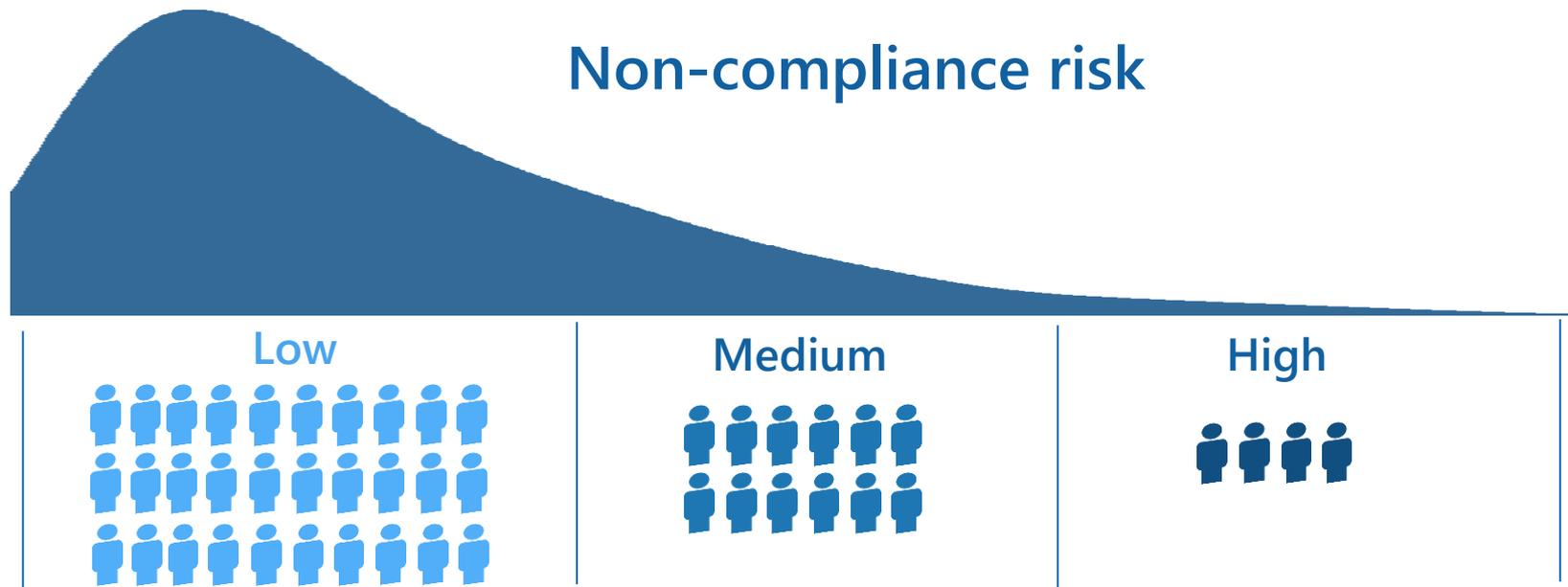
CATEGORIZING LABOUR MARKET NEEDS

- DLM model can measure level of need, but different clients may have a similar level of need for very different reasons
- Can build categorizations that reflect both levels of need and the patterns of factors that drive it, using insights from data and a service planning lens
- Ensures model is both predictively accurate and informative about actual needs

	Low DLM	High DLM
Client categories	1. Adults with recent work experience and few other barriers	3. Youth with complex needs
	2. Youth with low labour market barriers	4. Adults with low work exp.
		5. Individuals with significant reported physical or mental health issues

CATEGORIZING CASE MANAGEMENT RISK

- Risk of ineligibility/non-compliance can be modelled across population of interest, like DLM
- Shape of distribution and goals of model should drive categorization – most individuals are low risk, and may represent opportunities to shift caseworker resources away from compliance monitoring



Aligning client needs with a high-impact
service response

ALIGNING NEEDS WITH SERVICES

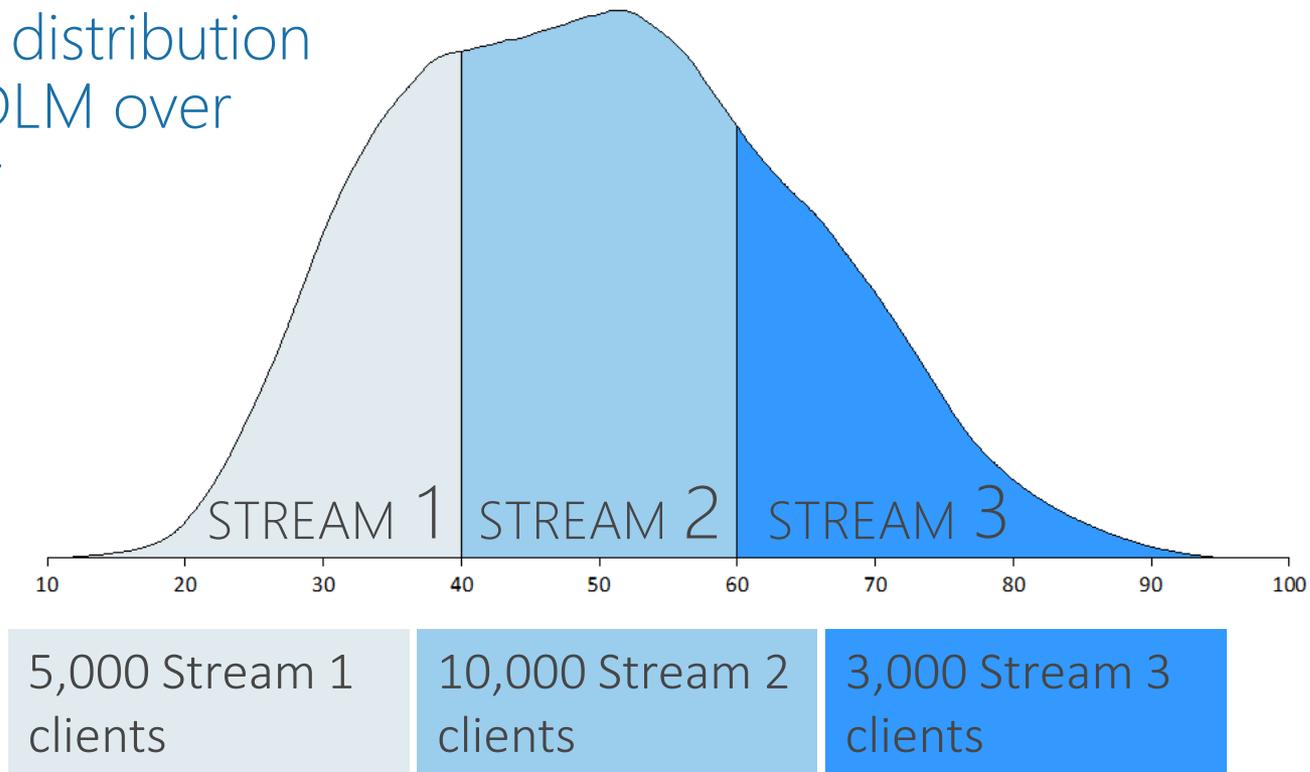
An effective continuum of services requires effective services, a way to match services to needs, and well-supported staff

- Predictive analytics can support:
 - **Service planning** – Using data at a population/caseload level to determine what services should be offered in what quantity to address client needs
 - **Service determination** – Using data at an individual level to match each client to the service option that best meets their needs
 - **Service delivery** – Supporting service delivery staff to better deliver services by reducing administrative and monitoring burdens

USING ANALYTICS FOR SERVICE PLANNING

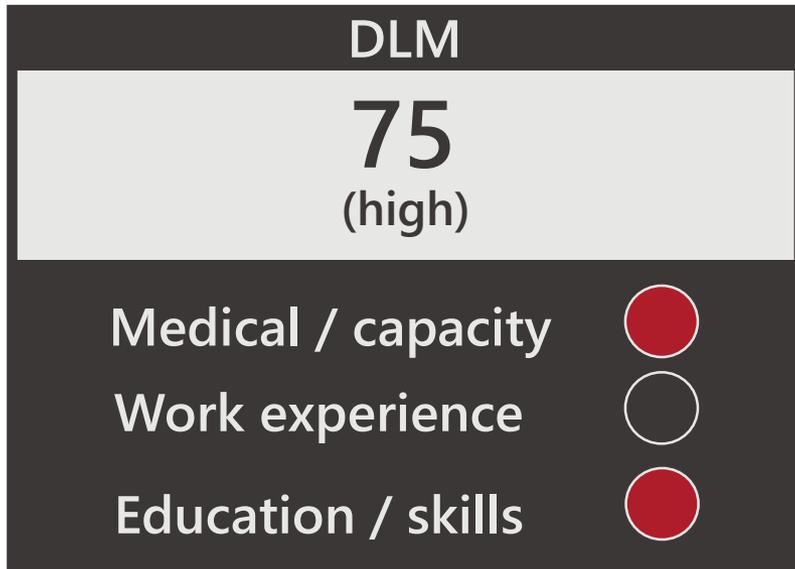
Planning can be based on client flow estimates and calibrated to policy goals, fiscal constraints, and program effectiveness

Predicted distribution of client DLM over fiscal year



USING ANALYTICS FOR SERVICE DETERMINATION

CLIENT A

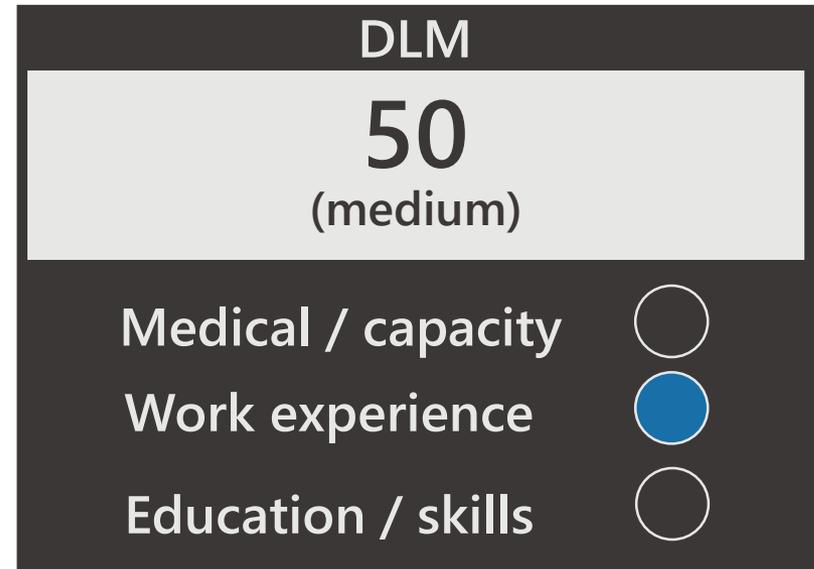


CLIENT A has a high DLM related to medical and skills barriers.

SERVICE RECOMMENDATION:

Supported employment, skills development, or transitional jobs

CLIENT B



CLIENT B has a medium DLM related to work experience barriers.

SERVICE RECOMMENDATION:

Employment assistance with job development, or transitional jobs.

USING ANALYTICS TO IMPROVE SERVICE DELIVERY

Reducing administrative and monitoring burden can increase staff effectiveness in supporting client outcomes

- Jurisdictions have turned toward more client-centred case management approaches for working with vulnerable jobseekers, and evidence supports this approach
- However, effectively implementing these approaches requires caseworker resources
- Models prioritizing client risk can reduce monitoring and compliance burden and strategically reallocate resources
 - Increase monitoring for small number of high-risk clients
 - Keep monitoring unchanged for medium-risk clients
 - Reduce monitoring for large number of low-risk clients

OVERALL SERVICE IMPROVEMENT

Overall, predictive analytics can provide substantial benefits across service systems supporting vulnerable jobseekers

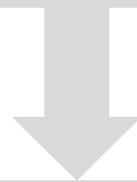
LABOUR MARKET NEEDS MODEL:

Predicts level and drivers of labour market need at the level of both individual jobseekers and broader jobseeker populations



SERVICE PLANNING:

Forecast distribution of client needs, and strategically plan services provision to meet these needs.



SERVICE DETERMINATION:

Identify individual patterns of need to more efficiently and effectively match jobseekers to services.

RISK MODEL:

Predicts risk of case management issues at individual level



SERVICE DELIVERY:

Identify potential efficiencies in case management processes, to free up valuable caseworker resources.