Learning what works for whom at what cost

How to ask the right questions to generate insight

FrankAdvice

better decisions

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The first step to better decisions is knowing the right question to ask

When organisations seek to use evidence to make better decisions and achieve greater impact through the services they deliver, they need to understand what works, for whom, at what cost.

This is a broad and multifaceted question, and there are many different approaches that can be taken to answering it. The best approach to take depends on the specific insights required, and these vary depending on both the specific circumstances and the available information.

This document sets out four analytical approaches that can be used to improve understanding of what works, for whom, at what cost:

- **Understanding the population** - what is the likelihood that an individual will experience a specific outcome?
- **Measuring our impact against short- and long-term outcomes** - how effective is our service when it comes to supporting people to live their full potential?
- **Supporting frontline staff** - how can we make sure that what we learn is applied to decisions about which services are best suited to which clients?
- **Developing an evaluation plan for future initiatives** - how can we use what we learn to continually improve our performance over time?

For each of these approaches, we outline:

- What **insights** the approach will generate
- What **analysis** is involved
- What **data** is required
- How the results could be **applied**

These analyses help us understand people's lived experience, and what we can do better

When it comes to creating meaningful change for people in the real world, there is no one-size-fits all approach to service and intervention. Different population groups require different approaches and different types of support. We can use administrative data to learn about the factors which are most closely associated with the outcomes we're supporting people to achieve, or avoid, so that we can know who is receiving services, identify groups who may be missing out, and measure how effective our services are at achieving their objectives.

We must use information safely and respectfully

It's important to note that most of this analysis is performed without using any information which would identify an individual, risking their privacy and their trust. We don't need to know the identity of any individual who receives our services to learn how effective our services are. Under the right circumstances, organisations may use the data they hold about their clients to support frontline staff to apply evidence to their operational decision-making, but for the most part we conduct these analyses using de-identified data.

A de-identified data set includes everything that is known about a person except for their name, address and case numbers. Information such as the person's age, the general area they live in, their education, health, income, and service history are linked to a unique numeric identifier before their identifying information is stripped from the dataset. It is not possible to re-associate a person's data profile with their name or address once this process is complete.

The most comprehensive de-identified data set in New Zealand is Statistics New Zealand's Integrated Data Infrastructure (IDI). The IDI is a large research database containing matched, de-identified data on people and households in New Zealand collected by government agencies, Stats NZ surveys, and non-governmental organisations (NGOs). The IDI contains longitudinal data on more than nine million New Zealanders. The Social Investment Agency's Beginner's Guide to the IDI explains what the IDI is, what it can be used for, what data is available, and how organisations can apply for access.

1. Understanding the population

This work involves calculating the likelihood that each person in a defined population group will experience a certain outcome in the future, based on their characteristics and lived experiences to date. For instance, an organisation committed to improving water safety might want to learn which characteristics are most closely associated with an increased risk of drowning.

When we perform this sort of analysis, we're looking for correlations that indicate which groups are most likely to experience the outcome, we aren't looking for causation. People's intrinsic characteristics (i.e. their age or ethnicity) don't directly cause their vulnerability, and neither do their past life experiences. However, correlations can be powerful indicators of who is most likely to experience an outcome, and this can deliver a lot of useful information to organisations who want to improve how they deliver services.

This analysis is performed by selecting an outcome of interest, and a time period. The outcome might be positive, such as quitting smoking, or it might be something to be avoided, such as leaving school without qualifications. The analysis reveals the relationship between the characteristics of the people in the population group at the beginning of the time period, and the outcome they experienced at its end.

What insight would this approach generate?

- How likely a person is to experience a specific outcome, given what we can know about the relationship between characteristics, experiences, and outcomes in de-identified data
- An understanding of the characteristics that have the greatest impact on an individual's likelihood to experience a particular outcome.

For example, if we wanted to know how likely it is that a person in our population group will be victim of crime, we might look at factors such as age, ethnicity, income, place of residence, education level and how many times they have been a victim of crime in the past. The analysis will identify which of these characteristics and experiences are most closely associated with increased vulnerability to crime.

What data is required?

Depending on what outcome we're interested in studying, it's usually possible to use Stats NZ's IDI to understand a population group's likelihood of experiencing a certain outcome.

Some outcomes are directly recorded in the IDI, for instance, whether or not a person achieved a university degree. If a particular outcome is not directly recorded in the IDI, it can often still be measured using a proxy metric. For instance, there is no direct indicator for housing security, but if we wanted to know how securely the people in our population group are housed we might look at how many times they have changed addresses in the last two years as a proxy measure.

Information on what outcomes and relevant data are available in the IDI can be found using the Social Investment Agency's Social Investment Measurement Map. This is a searchable table of indicators which are available in the IDI.

The following information needs to be clearly defined:

- The population group we want to learn about
- The outcome or proxy outcome that we want to understand
- The variables we want to explore for association with the outcome
- The dates the analysis is required to cover.

How could the analysis be applied?

This analysis will produce a profile of the population that details the factors most closely associated with the outcome in question. These characteristics are referred to as 'risk factors'. Although they don't necessarily cause the increased risk, when they occur at a high frequency within the group that went on to experience the outcome of interest they are considered to be indicators of increased risk. Since administrative data often reveals the relationships that people have with other organisations, this analysis can help organisations identify opportunities new ways to reach the groups they're aiming to support.

2. Measuring our impact against short- and long-term outcomes

This work builds upon the population analysis described above. Once we know which characteristics are most closely associated with an outcome of interest, we can look at who is receiving a service to find out whether it is being delivering it to the people who need it most.

To find out whether the service is having a measurable impact, two groups are created in the data to compare the outcomes for people who received the service with people who did not. The two groups must be alike in every other respect, so that the difference in their outcomes can be attributed to the effectiveness of the service. This can only be done after the service or initiative has been delivered, and a suitable time period has elapsed.

We can measure impact in both the short- and the long-term, which is useful because successful impact in the short term can lead to flow-on positive effects in the future, returning more value over time. For example, an intervention which supports people to stop smoking can be evaluated in terms of the short term outcome (i.e. whether the people who received the intervention were more likely to stop smoking than those who did not receive the intervention) and the long term outcome (i.e. the reduction in healthcare needs for the group who stopped smoking after five years).

When cost data is available, we can calculate the value that is returned by a service or intervention over time. This needs to be completed as an additional, separate piece of analysis. We can establish the costs associated with the outcome of interest, and the cost of delivering the service, and combine this with what we know about the

service's effectiveness to calculate the costs that were avoided when the service successfully achieved its objective.

What insight would this approach generate?

- Who is being selected to receive our service
- Whether we are delivering our service to the people who need it most
- Which people receive the most benefit from the service we provide

With additional analysis:

- How much measurable value, whether in terms of a dollar value or improved quality of life, we create when our service successfully achieves its objective
- The measurable value our service delivers when the cost of delivering it is taken into account

What data is required?

If participation in the intervention is recorded in the IDI, then IDI can be used for this work. If this data is not already present in the IDI, then adding it can take Statistics NZ between several weeks and several months. The IDI also contains cost data for many government agencies, which can be used to calculate the value returned by a successful service.

The following information needs to be clearly defined:

- The population of interest
- The variables that identify increased likelihood of experiencing specific outcomes
- Participation in the initiative
- The short term outcomes of interest
- The long term outcomes of interest, with associated costs
- The cost of delivering the initiative
- The dates the initiatives relate to
- The dates the evaluation will apply to.

How could the analysis be applied?

The results of an effectiveness analysis can be used understand whether the effectiveness of the service is greater for some population sub-groups than others. For instance, if the positive benefits of the service are more pronounced for urban than rural populations, or vice versa, or if it is more beneficial for people in certain age groups.

These results could be used to improve the service's targeting, making sure it's delivered to the people who need it most, and for whom it works the best. If the analysis demonstrates a high return on investment, it could be used to make the case to scale up the intervention, and expand its coverage. It could also identify groups for whom the intervention is not effective, prompting the development of new interventions to address the specific needs of these people.

Supporting frontline staff

In some cases, it is legal and safe to use identifying data to improve decision-making on the front line. While de-identified data is useful for improving decision-makers' understanding of the population they serve and the effectiveness of services, it has limited use in an operational sense. For operational tools, we need to use data that includes identifying information.

What insight would this approach generate?

- Which specific, identified individuals are likely to experience the outcome we're interested in
- The most appropriate and effective service to deliver for this individual, based on what we know works best for people in their situation
- The cost of delivering the service to this person.

What analysis is involved?

This involves using a combination of "1. Understanding the population" and "2. Measuring our impact against short- and long-term outcomes", but using matched, identifiable data on individuals, rather than the IDI. The method for the analysis is the same, but using data that contains identifying information.

What data is required?

The IDI cannot be used to identify individuals - this means that any research performed using the IDI can only be used to learn about a population, not to identify individual clients to offer additional or improved services. To perform any analysis that would identify individual people, an organisation will need to approach the other organisations and government agencies that hold the relevant data and negotiate information sharing agreements with each.

The Social Investment Agency's Data Exchange is a safe, controlled platform that enables social sector agencies and organisations to share data securely. The platform cleans, structures, and manages the exchange of data. The organisation which owns the data has full control over what is shared.

The following information needs to be clearly defined:

- The population of interest
- Interaction with social services agencies
- The short term outcomes of interest
- The long term outcomes of interest
- The initiatives to be evaluated
- The cost of the initiatives
- The dates the initiatives relate to
- The dates the evaluation will apply to
- Person level identifying information.

How could the analysis be applied?

An organisation could use individually identifying information to create tools which support their front-line staff to make decisions about what services should be offered to different clients. It could help to prioritise clients based on their relative risk of experiencing a negative outcome, alert staff when clients present an increased risk, accelerate new client onboarding, or simplify referrals.

Developing an evaluation plan for future initiatives

What insight would this approach generate?

How future initiatives could be evaluated   building the evaluation plan into the pilot, planning what metrics you need to gather,

What analysis is involved?

Establishing the intent of the programme and the purpose of the evaluation, the outcomes desired, the timeframes over which they are expected to be experienced, the cost of the programme, the quality of the insight required.

What data is required?

Depends on the type of evaluation required, but as always the outcome we're interested in, the population profile, the timeframes.

What other information is required?

Depends on the type of evaluation required.

How could the analysis be applied?

Learn what interventions were effective in **what circumstances**, with a dataset specifically tailored to answer the question posed.

Data available to complete this work

There are two approaches to accessing the data to complete this work. The first, and fastest approach, is to use Statistics NZ's Integrated Data Infrastructure (IDI). The IDI can only be used for the first to analytical pieces of work, where personal identifying information for individuals is not required.

The second approach is to use matched, identifiable data on individuals. This will need to be requested from each agency directly, and information sharing agreements will need to be put in place.

The data available for these two approaches are detailed below.

Statistics NZ's Integrated Data Infrastructure (IDI)

Which outcomes are appropriate will depend on the focus of the evaluation and the selected population of interest.

Note the IDI cannot be used to identify individuals so if these outcomes are required for operational purposes we will need to collect data from agencies directly using relevant privacy agreements.

Information on the outcomes and relevant data available in the IDI is available through the Social Investment Unit's Social Investment Measurement Map – https://www.siu.govt.nz/tools-and-guides/measurement-map/ and Social Investment Analytical Layer – https://www.siu.govt.nz/tools-and-guides/social-investment-analytical-tool/.

Note – information on smoking does not appear to be in the IDI currently. There will be a piece of work to prepare and match this information to the existing IDI data. This takes StatisticsNZ between several weeks and several months.

Identifiable data available from agencies

This information is generally not collected or linked for the whole population.

If identifiable data is required an initial piece of work will need to be completed to understand in more detail what information is available from each agency, the quality of this information, and how it will be collected and stored.