

Unlocking the potential of the Integrated Data Infrastructure for research

RezBaz July 2025

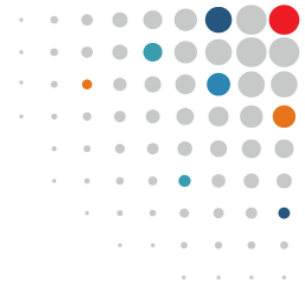


Social Investment Agency
Toi Hau Tāngata

Te Kāwanatanga o Aotearoa
New Zealand Government



Insight arising from integration

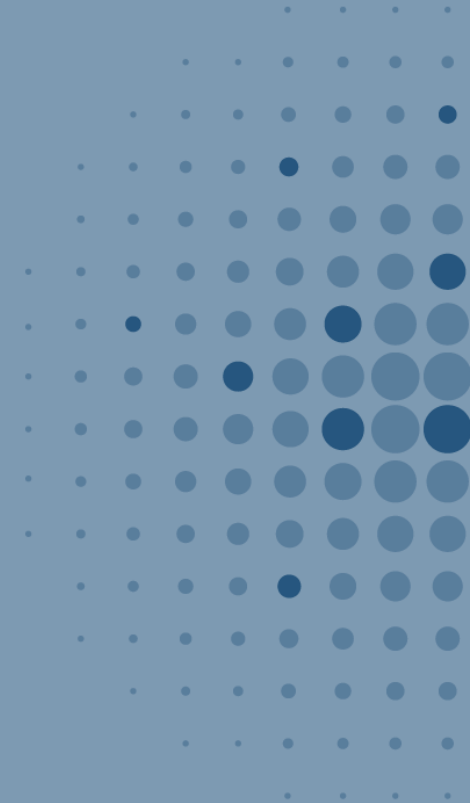


Many insights arise from bringing together information that was once separate

Integrated data is designed for this purpose

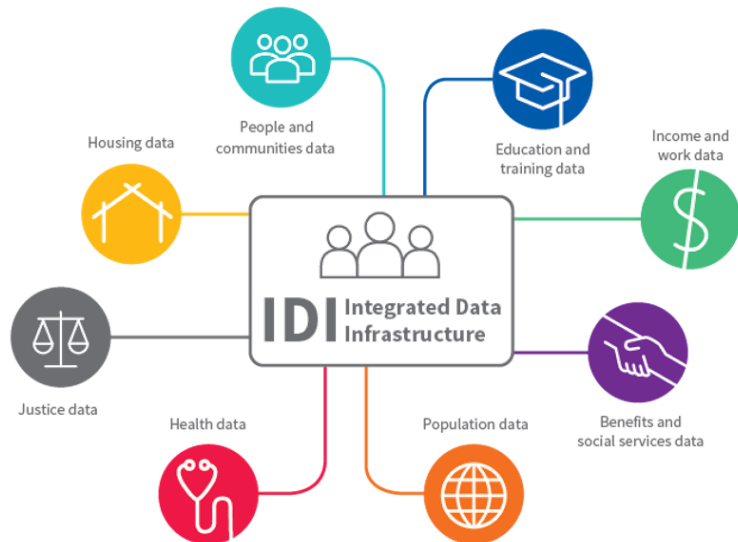
- What is the Integrated Data Infrastructure (IDI)
 - What is available and how it is integrated
 - Data protections in place
- What has been done with it
 - Examples of projects
 - How integration enables questions to be answered
- Some tips, tricks, and resources for using it
 - Significant data wrangling with steep learning curve
 - Range of resources to assist new researchers

What is the integrated data infrastructure?

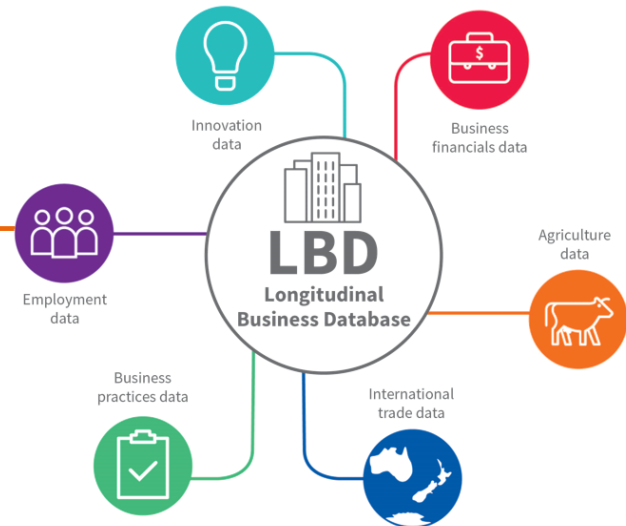


World leading tool for research and analysis

Integrated Data Infrastructure (IDI)



Longitudinal Business Database (LBD)



The IDI and LBD are linked through tax data

The power of integrated data

Combine information

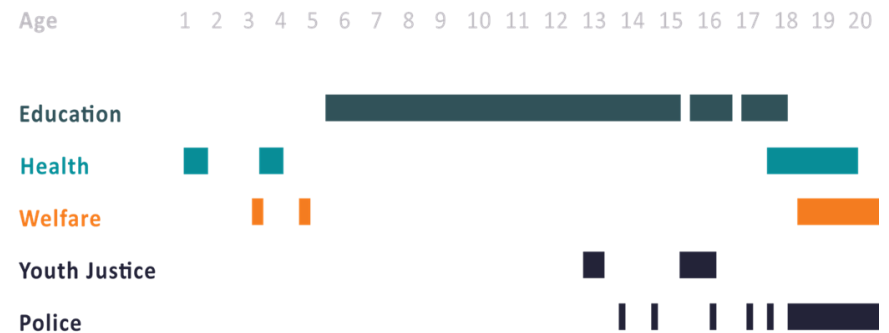
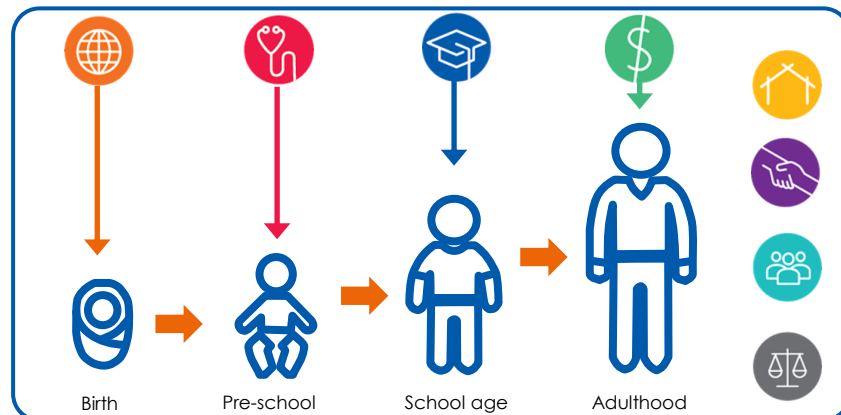
- from multiple domains
- from multiple life stages

Construct detailed cross-sections

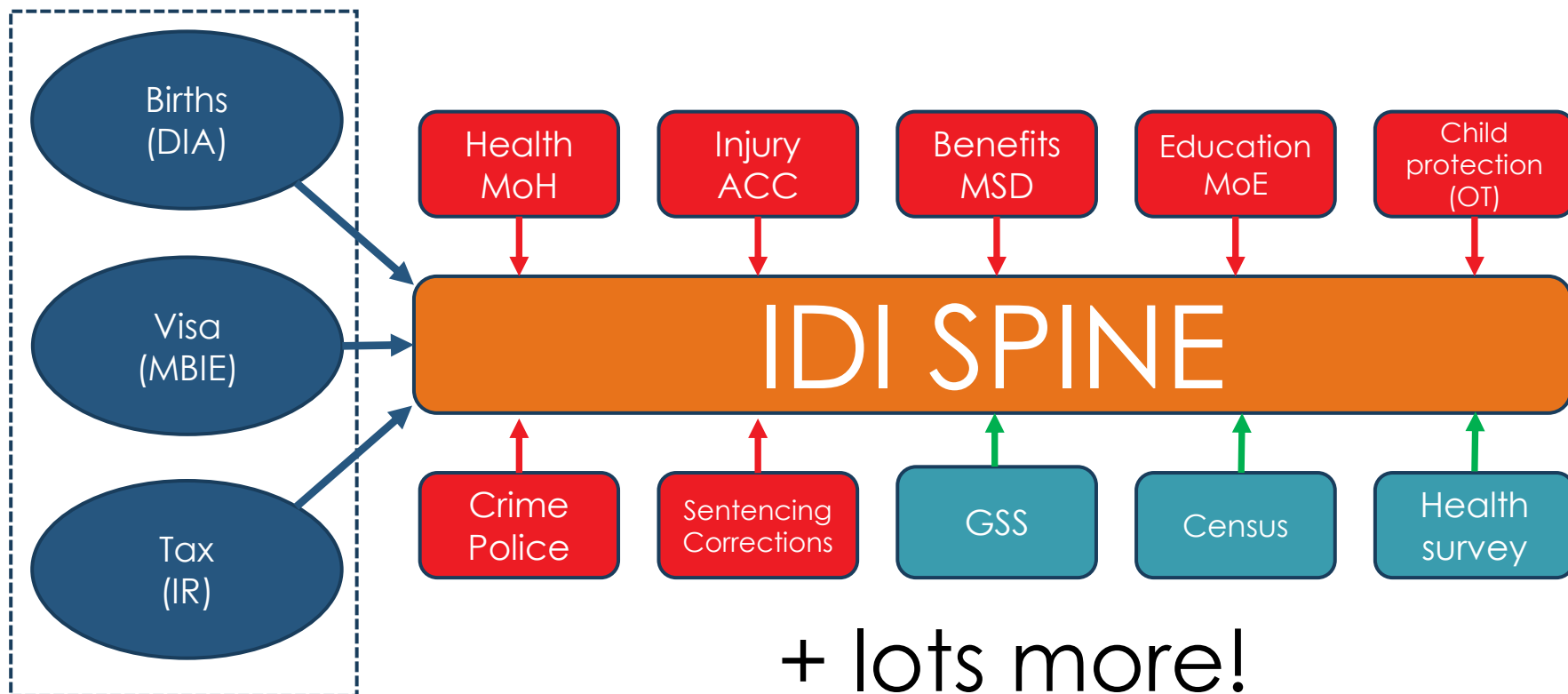
Follow experiences over time

- Interactions between services
- Panel and longitudinal data

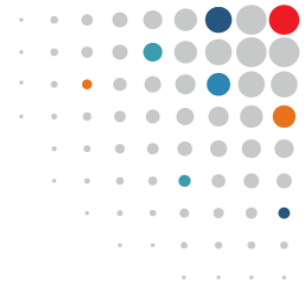
Predict or track outcomes



A list of all identities – the IDI Spine



Deterministic vs Probabilistic linking



Name: Joseph Blogs
DOB: 31 May 1971
Passport Number: ABCDEF
IRD Number: 123456



Health Records



Name: Joe Blogs
DOB: 31 May 1971
IRD Number: 123456

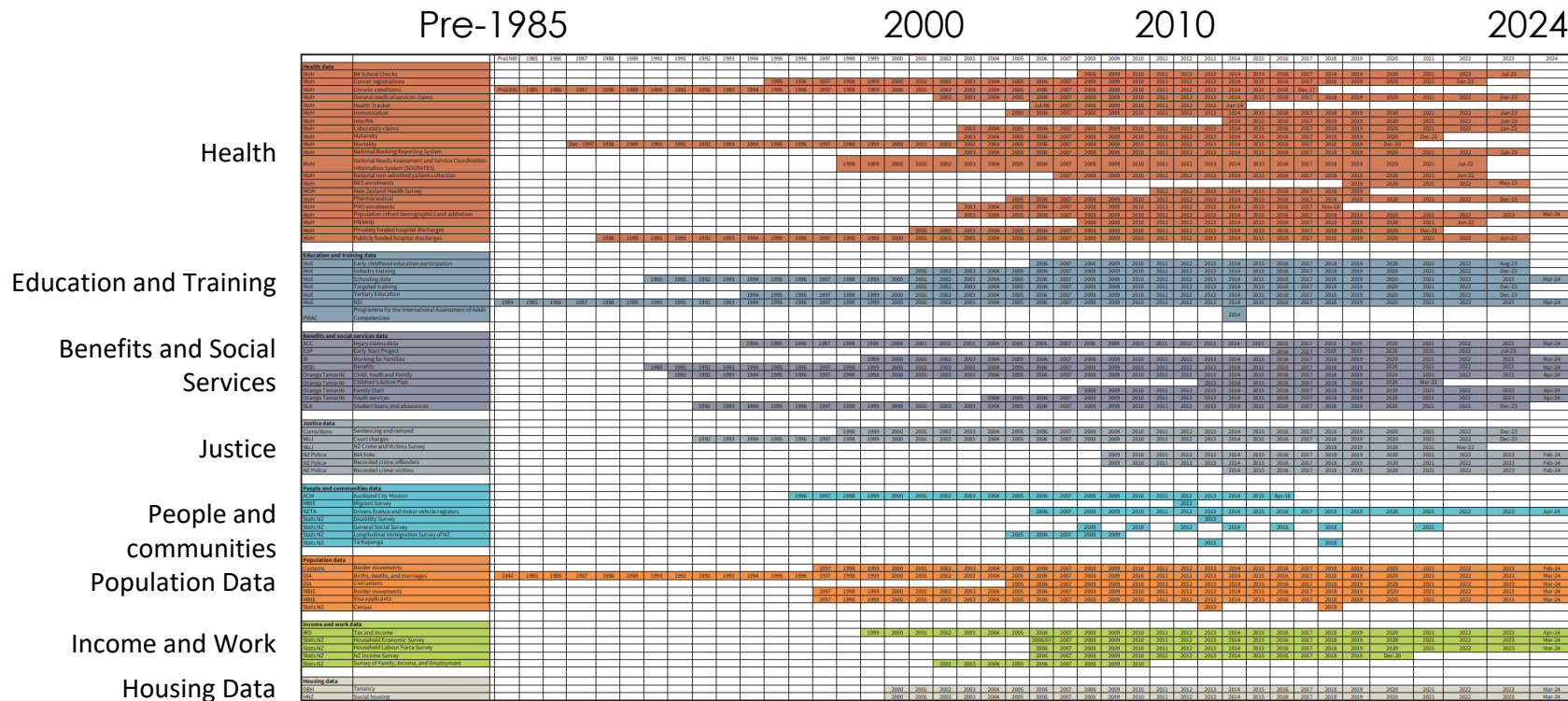


Name: Jo Bloggs
DOB: 31 May 1971



Name: Jo Blogs
DOB: 31 May 1971

IDI Data sets vary in history and currency





‘Five Safes’ keep integrated data safe

Safe People

Only approved researchers can access or view microdata.

Safe Projects

Data can only be used for research projects in the public interest.

Safe Settings

Research takes place in secure data labs which Stats controls.

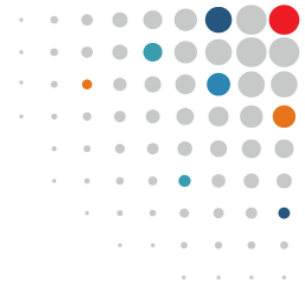
Safe Data

Access is granted only to the data that is needed for the research.

Safe Output

Confidentiality rules protect against privacy breaches.
All output is checked by Stats NZ to confirm it is safe.

Data is de-identified



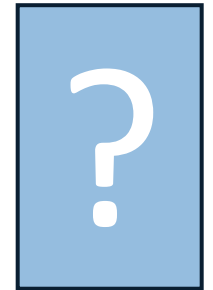
Information supplied to Stats NZ

- **Name:** Star Thinker
- **Date of birth:** 29 February 1933
- **IRD:** 123-123-123
- **NHI:** 0123456789
- **Address:** 123 Enlightenment Terrace, Researchville

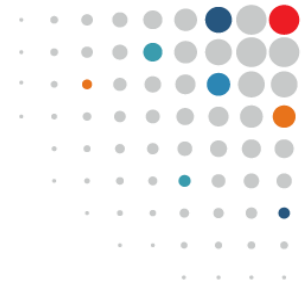


Information visible to researchers

- **snz_uid:** 4545454545
- **Birth month:** May
- **Birth year:** 1981
- **snz_ird_uid:** 111111
- **snz_moh_uid:** 22222
- **address_uid:** 99999
- **Meshblock:** 4507



Confidentiality rules limit data release



Microdata output guide specifies output rules

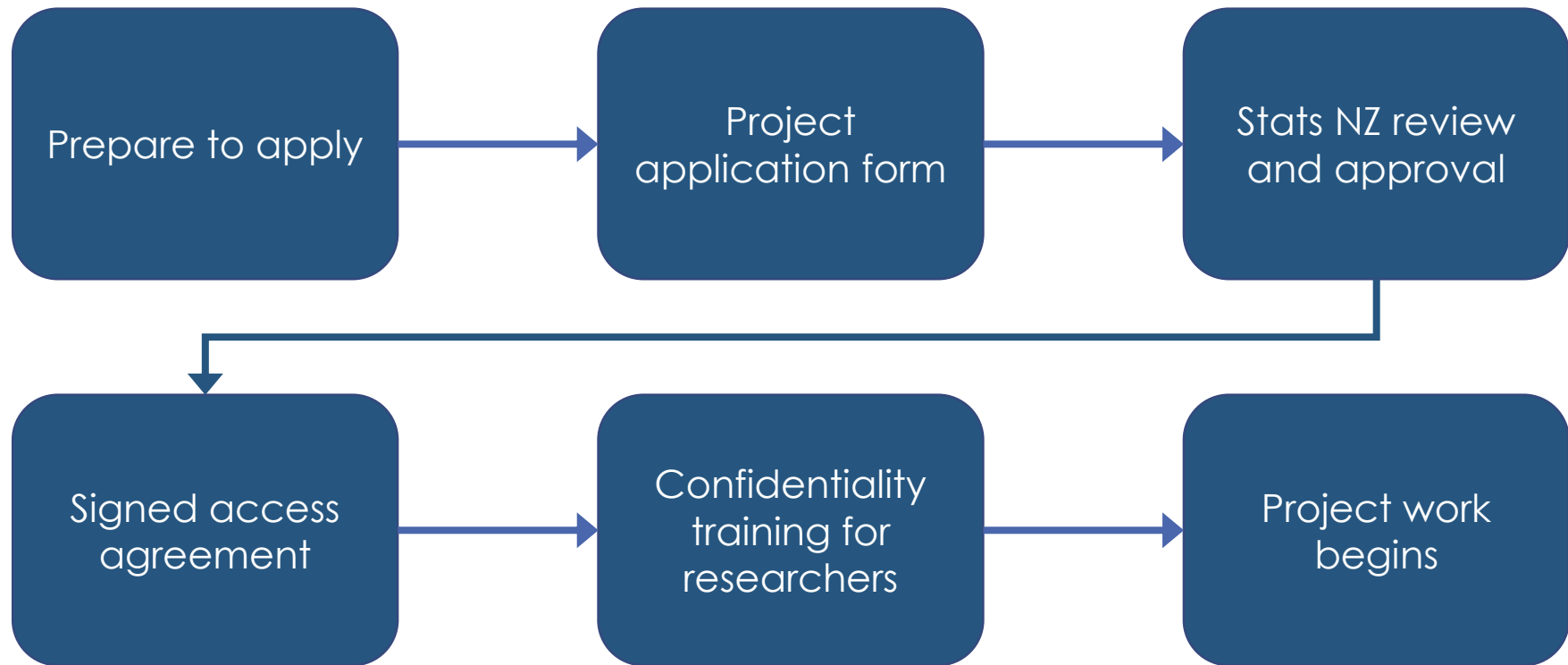
Four most common rules:

- Random rounding of counts to base 3
- Counts of fewer than 6 people are suppressed
- Totals for fewer than 20 people are suppressed
- Values that reflect a single organization are suppressed

Example process

Output	Raw	Released
People in Researchville	62	60
Total income for people in Researchville	\$999999	\$999999
Academics in Researchville	17	18
Total income for academics in Researchville	\$777777	Suppress
Award winners in Researchville	5	Suppress
Total income for award winners in Researchville	\$555555	Suppress
Employees of Top Research Inc	8	Suppress

Applying for access



Apply to use microdata for research

www.stats.govt.nz/integrated-data/apply-to-use-microdata-for-research/

Not perfect – has strengths and limitations



Rich range of data



Skilled and in-demand roles



Secure access



Enforced privacy protections



Range of data quality and documentation shortcomings



Technical capability and knowledge requirements

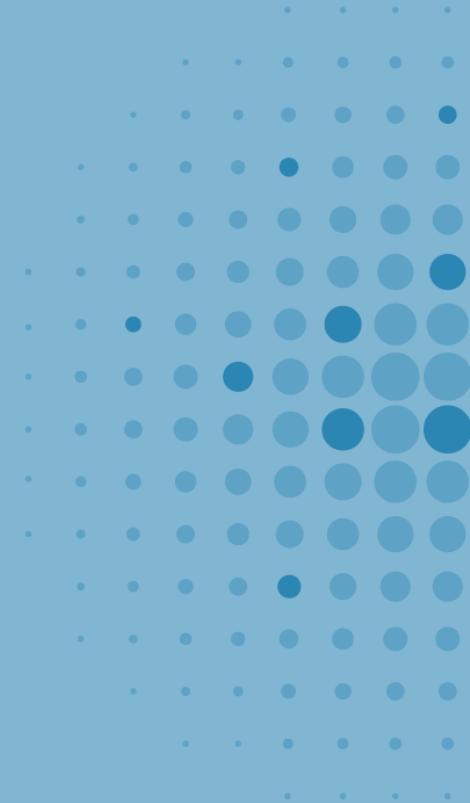


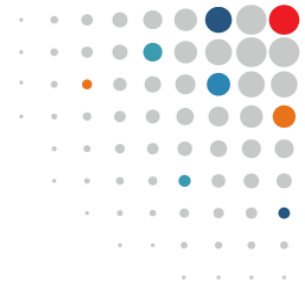
Administrative process
Barriers to collaboration



Small number studies limited

What has been done with integrated data?





Types of questions the IDI is good at

Descriptive

Inferential

Predictive

Overlaps

What don't I know about my clients?

Finding people who have an interaction with agency A (or other characteristic) and looking at what other agencies know about them.

Unmet needs

'Who else should we provide services to?'

The inverse of overlaps – who are the people who we don't see in agency A, but they look like agency A clients?

Impact

'Are we making a difference?'

The richness of data in the IDI can help in identifying comparison groups; the longitudinal nature allows for follow-up.

Lifecourse

'What leads to the outcomes we want (or don't want)?'

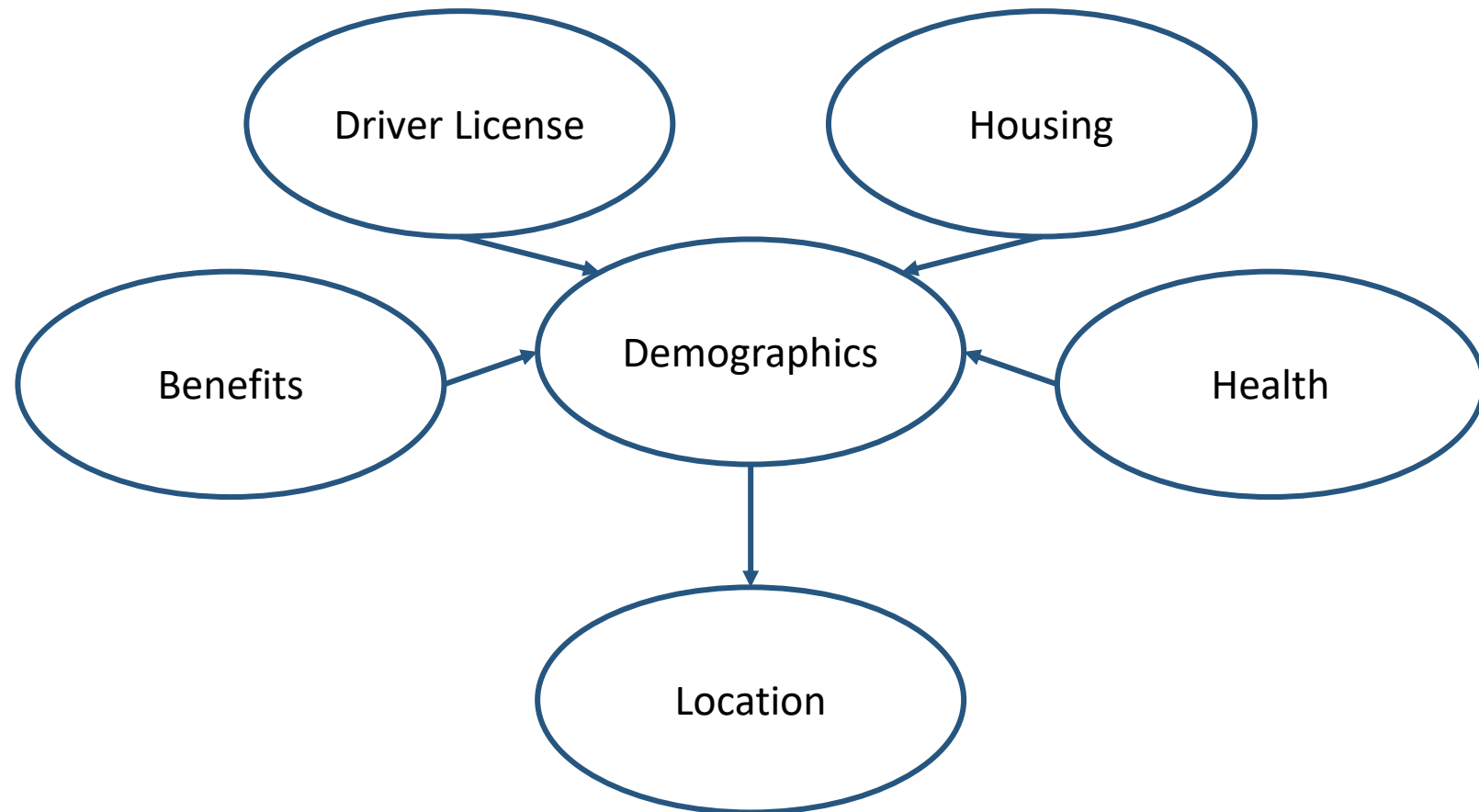
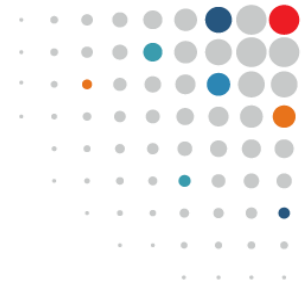
Longitudinal analysis that could be defined by an experience/outcome at the start, middle or end of period.

Simulation

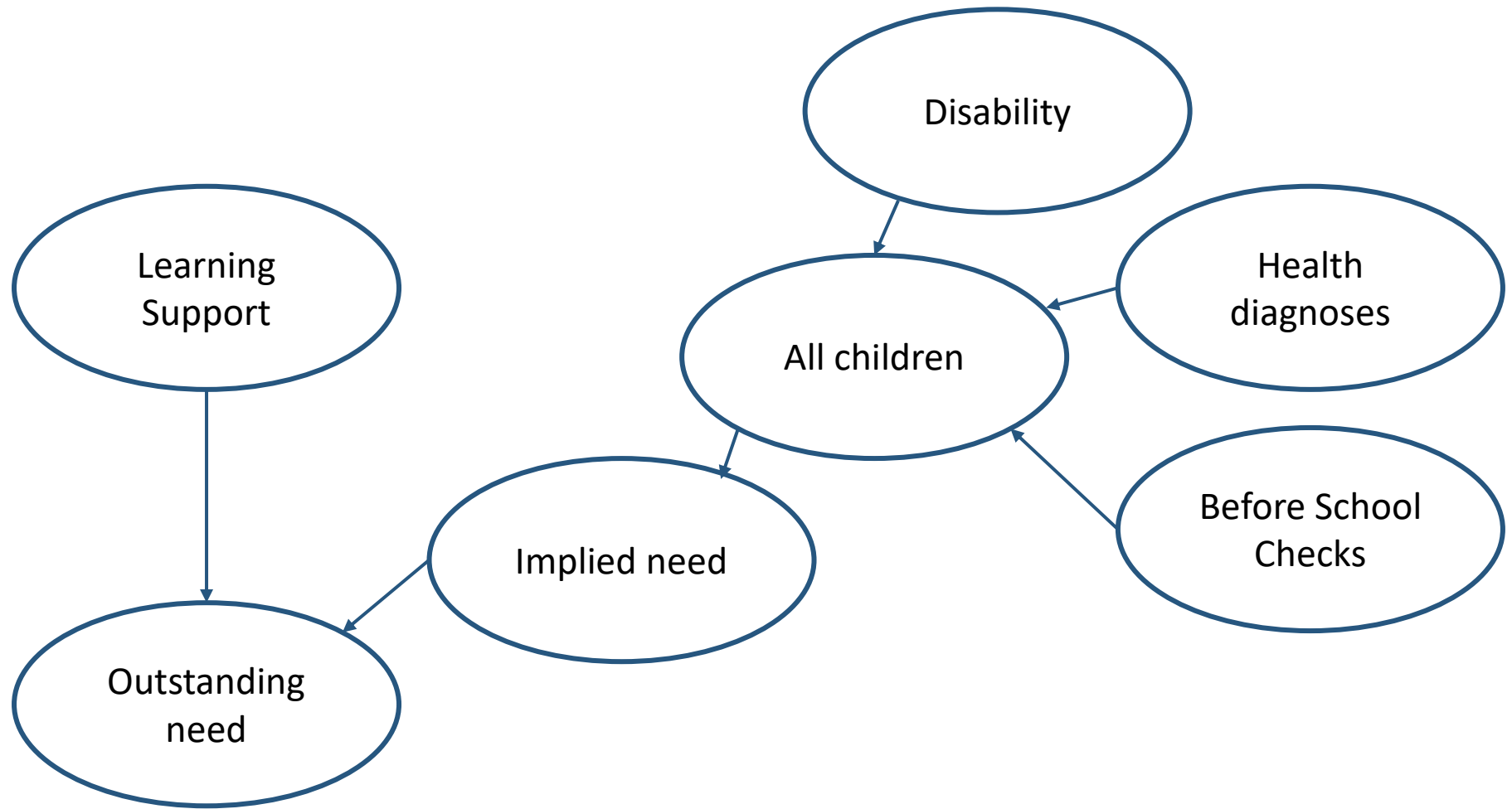
'Where should we take action? What would be the likely impact?'

Many models exist in the IDI that can be used for forecasting or 'what if' analysis.

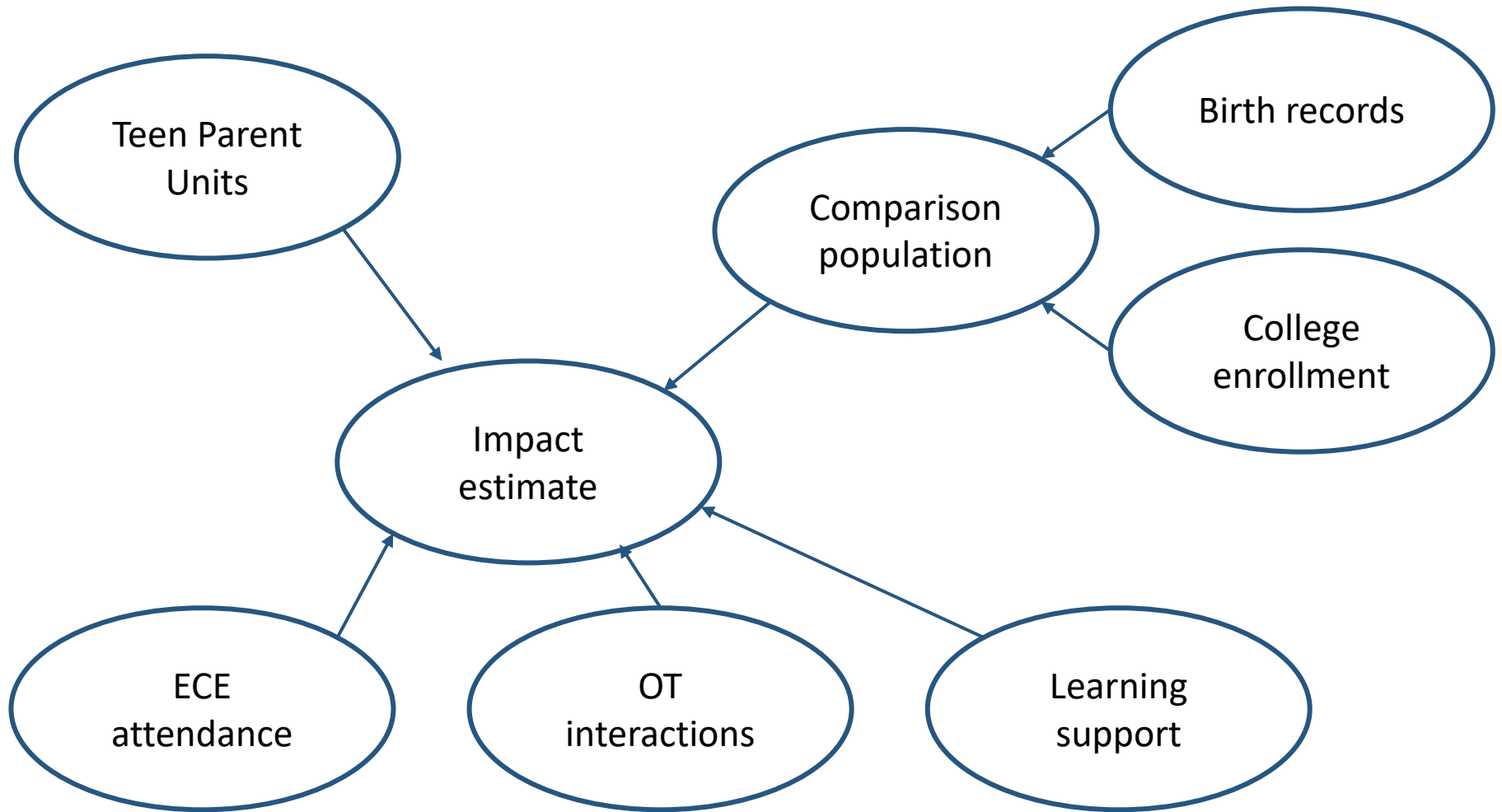
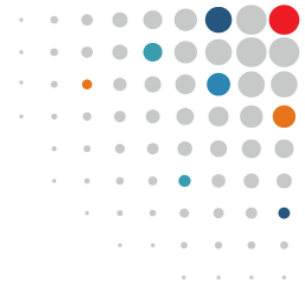
Older people experiencing vulnerability



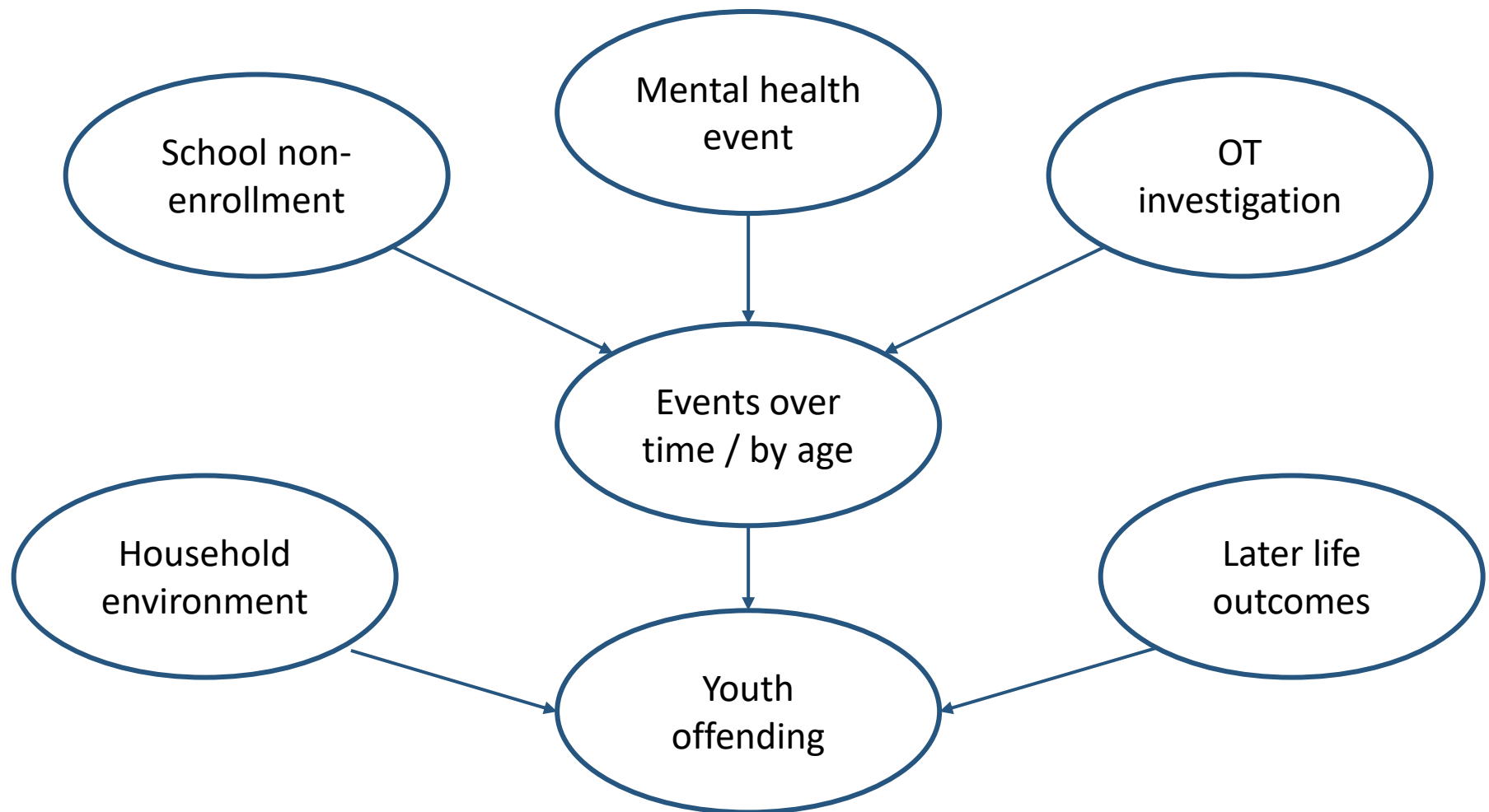
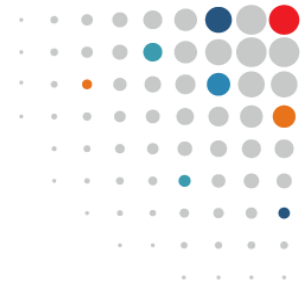
Highest learning needs review



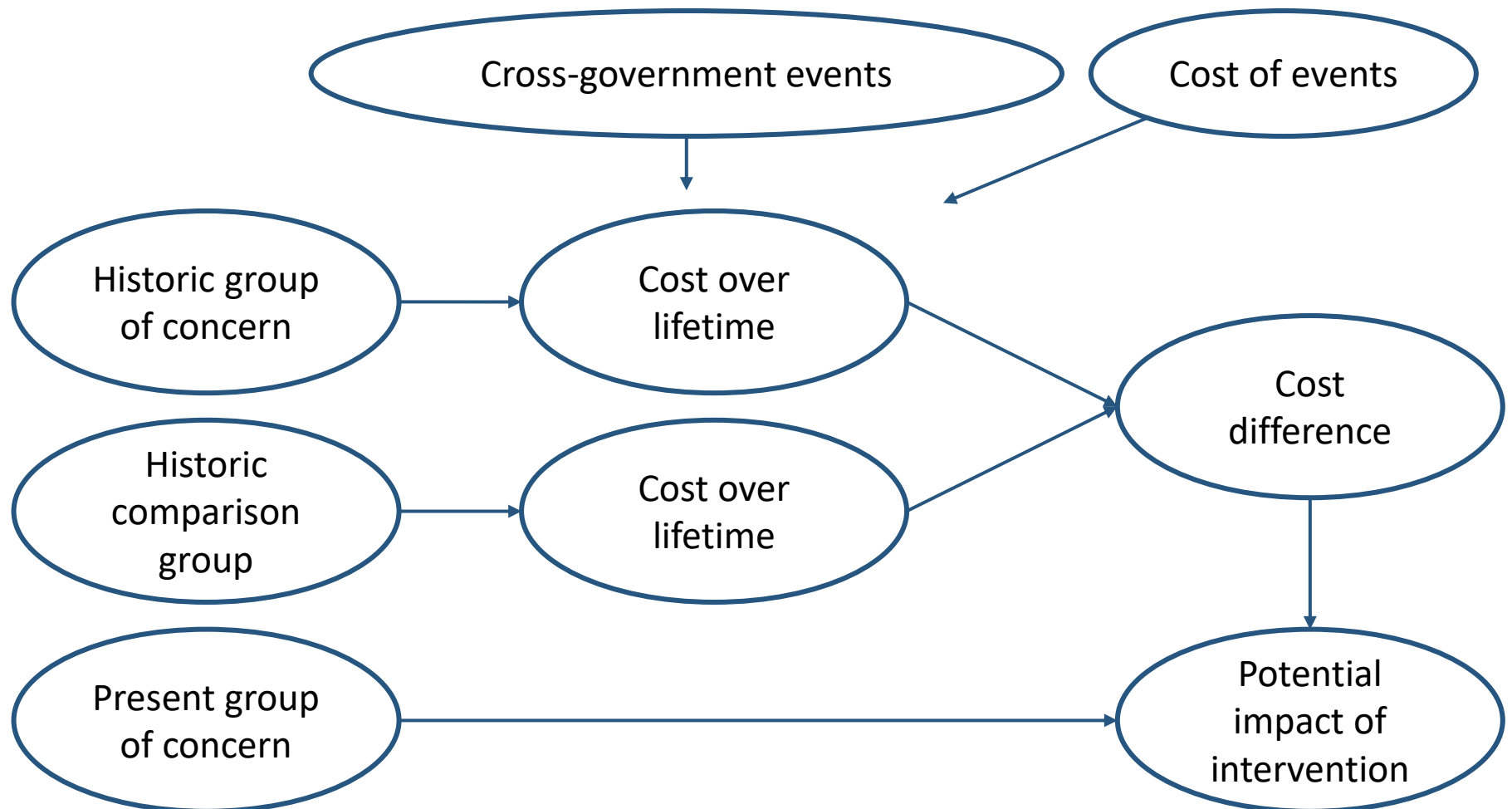
Long-term impact of teen parent units



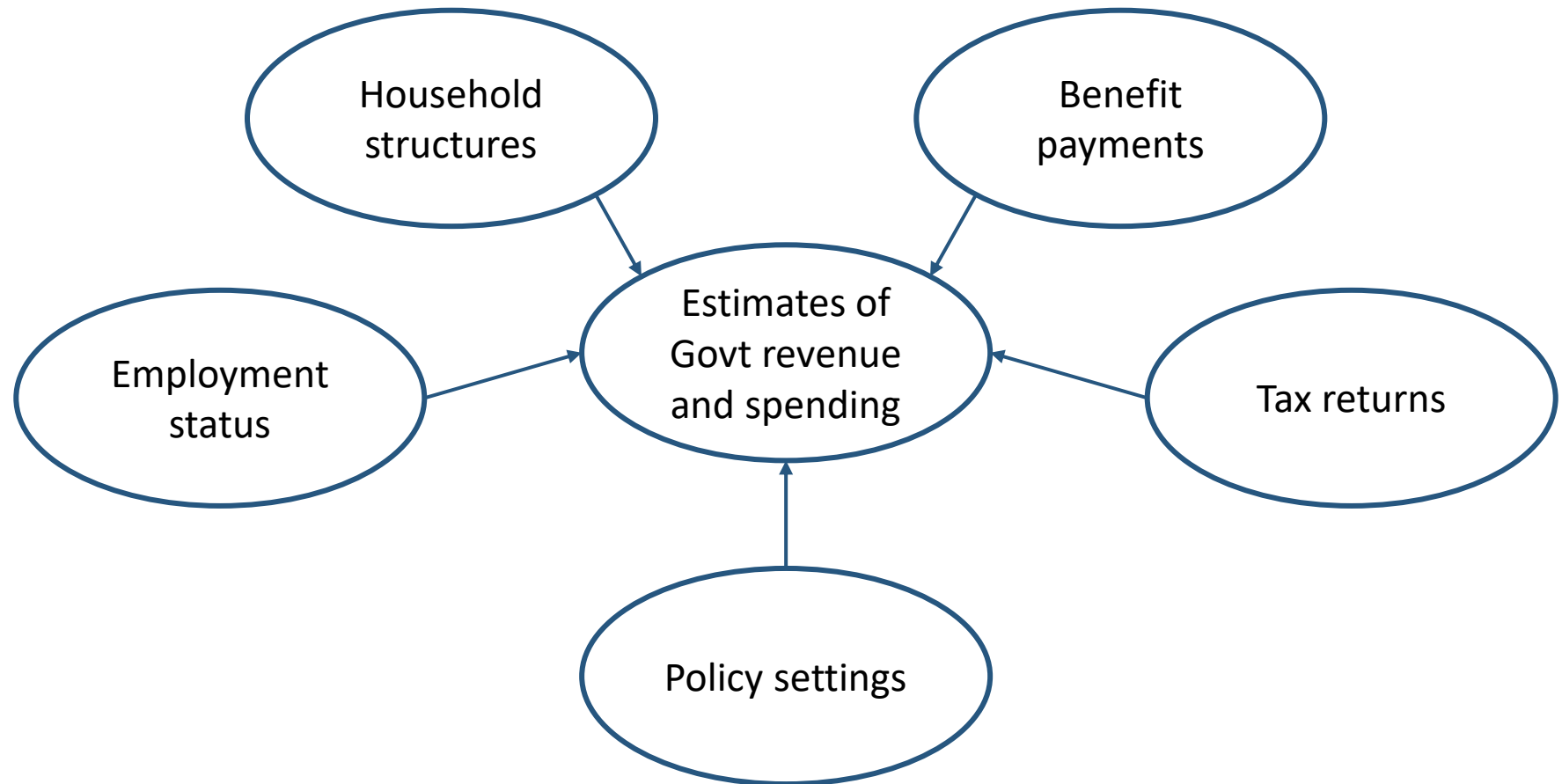
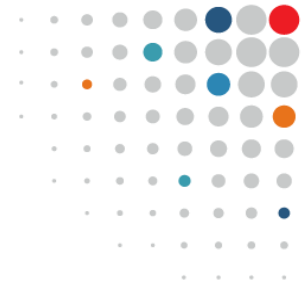
Journeys of youth offenders



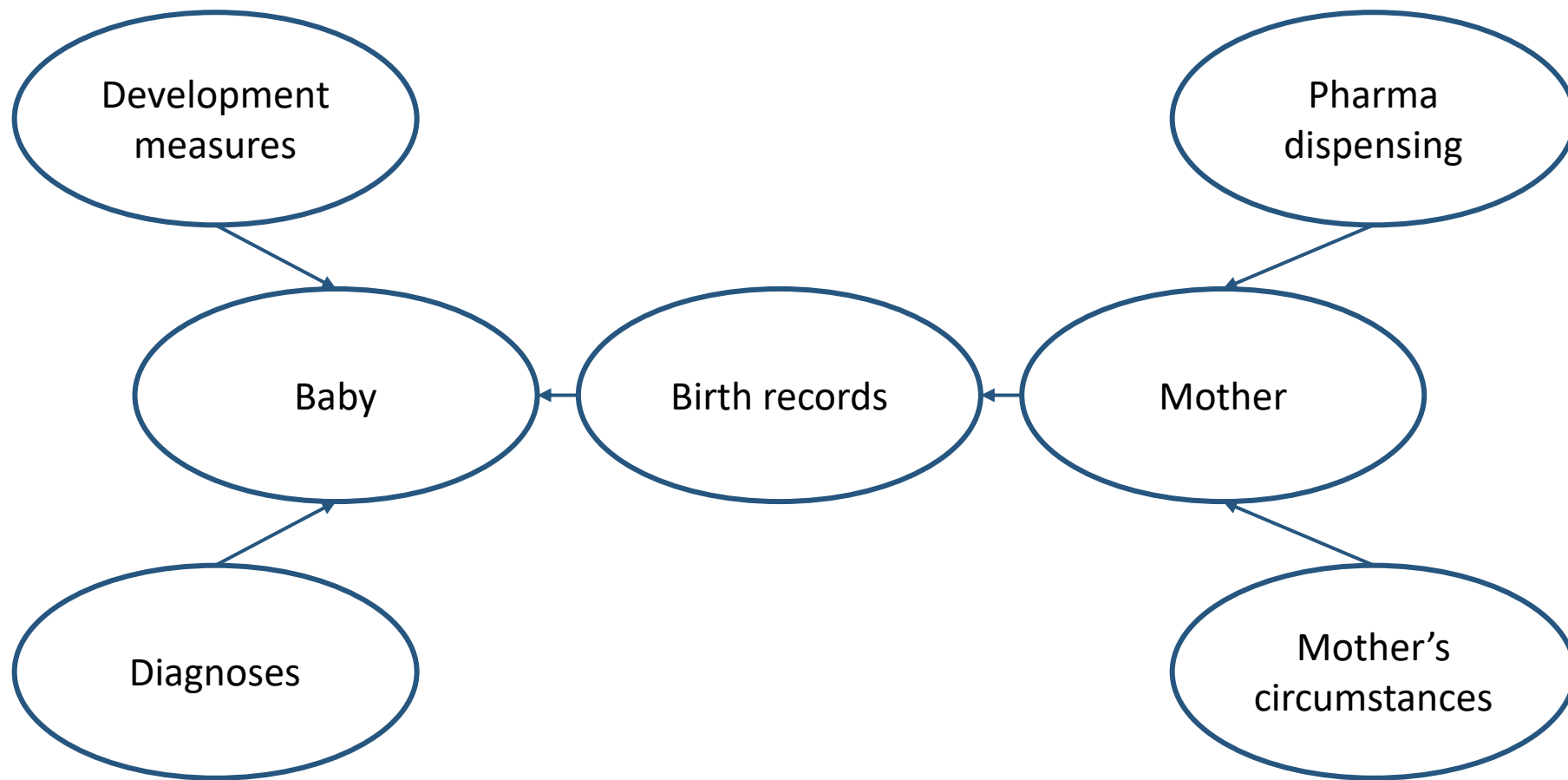
Changes in trajectory



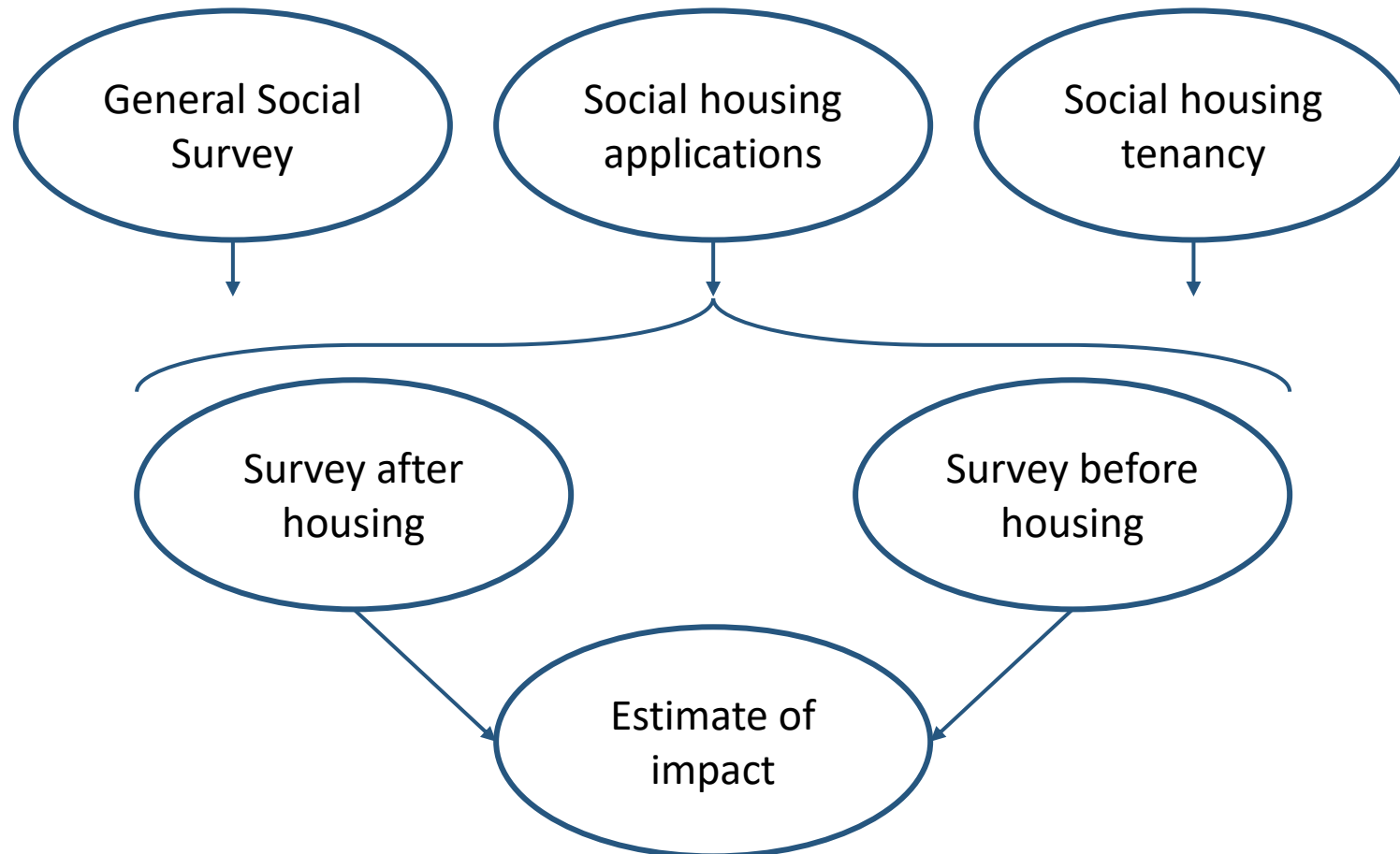
Tax policy microsimulation modelling



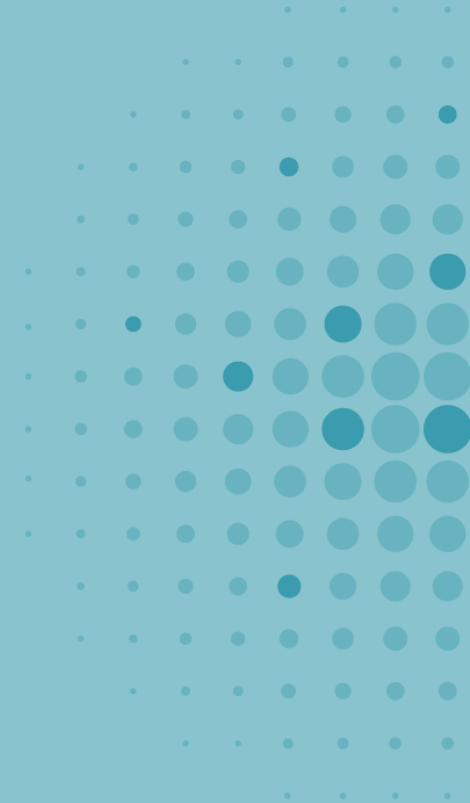
Effect of maternal antibiotic use of babies



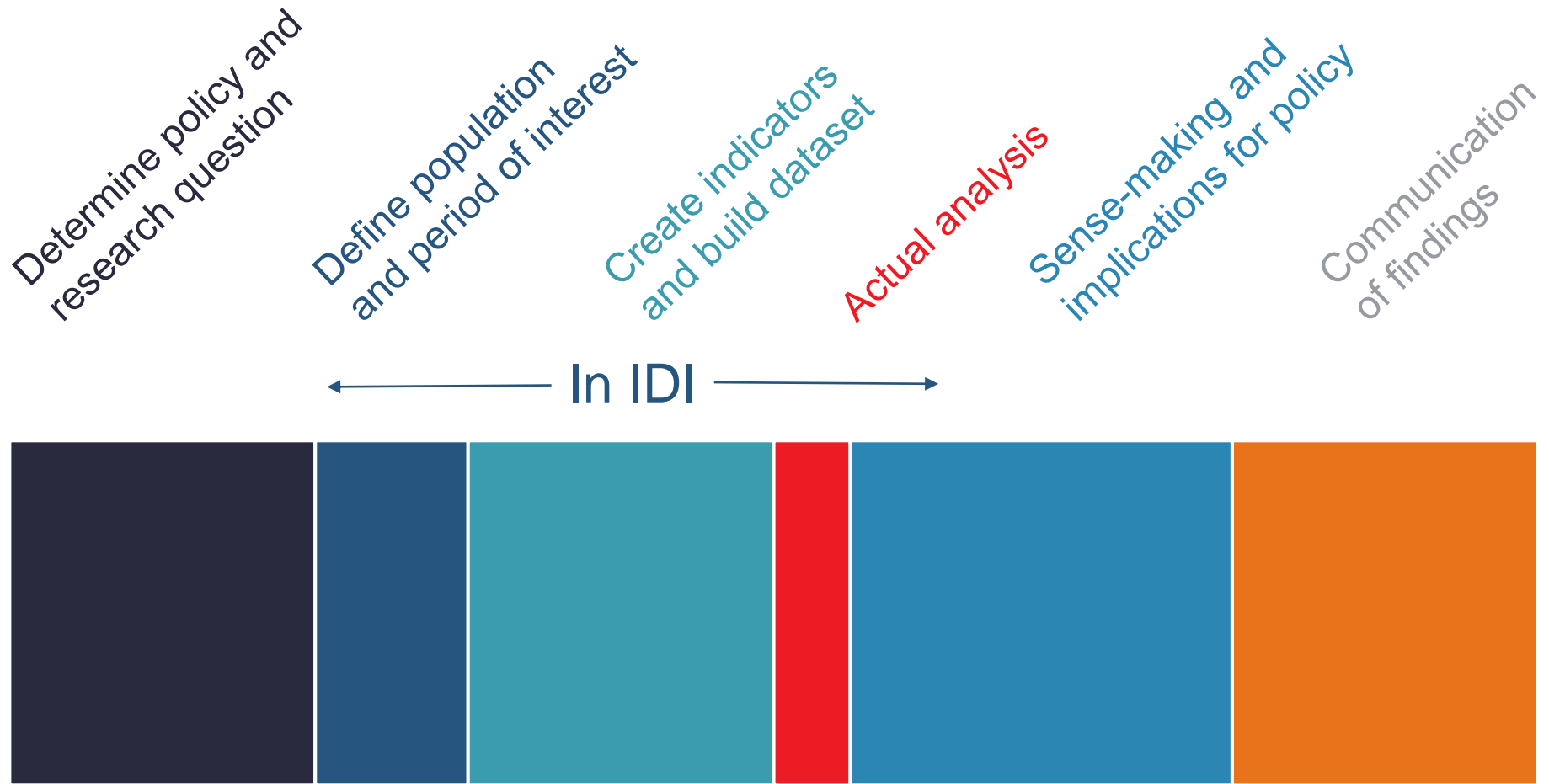
Wellbeing impact of social housing



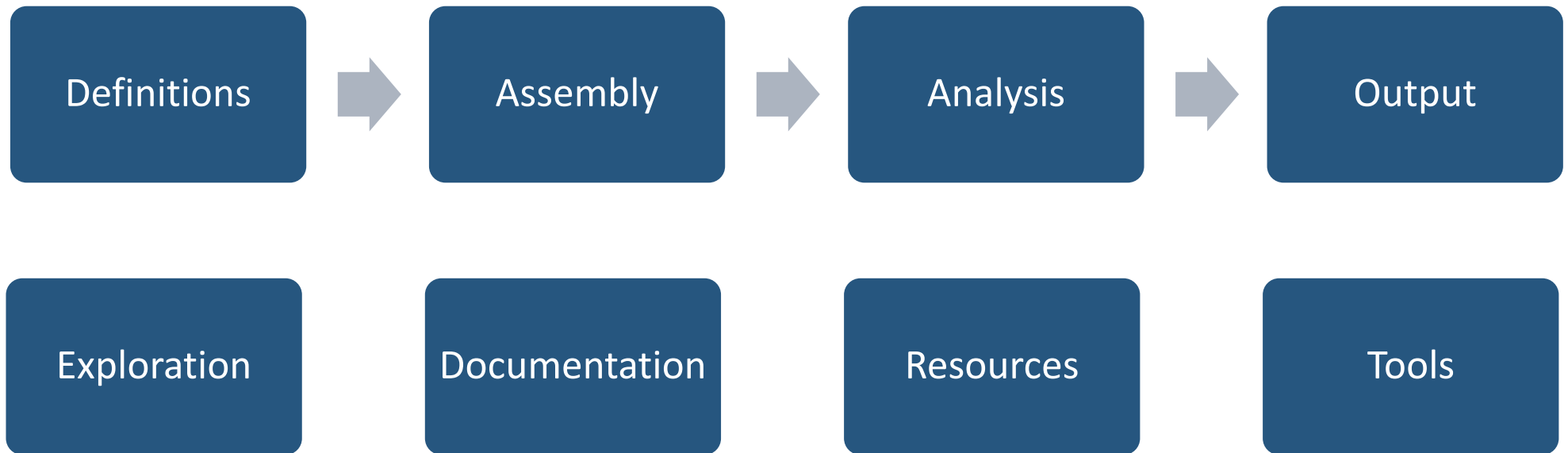
What advice makes it easier to use integrated data?



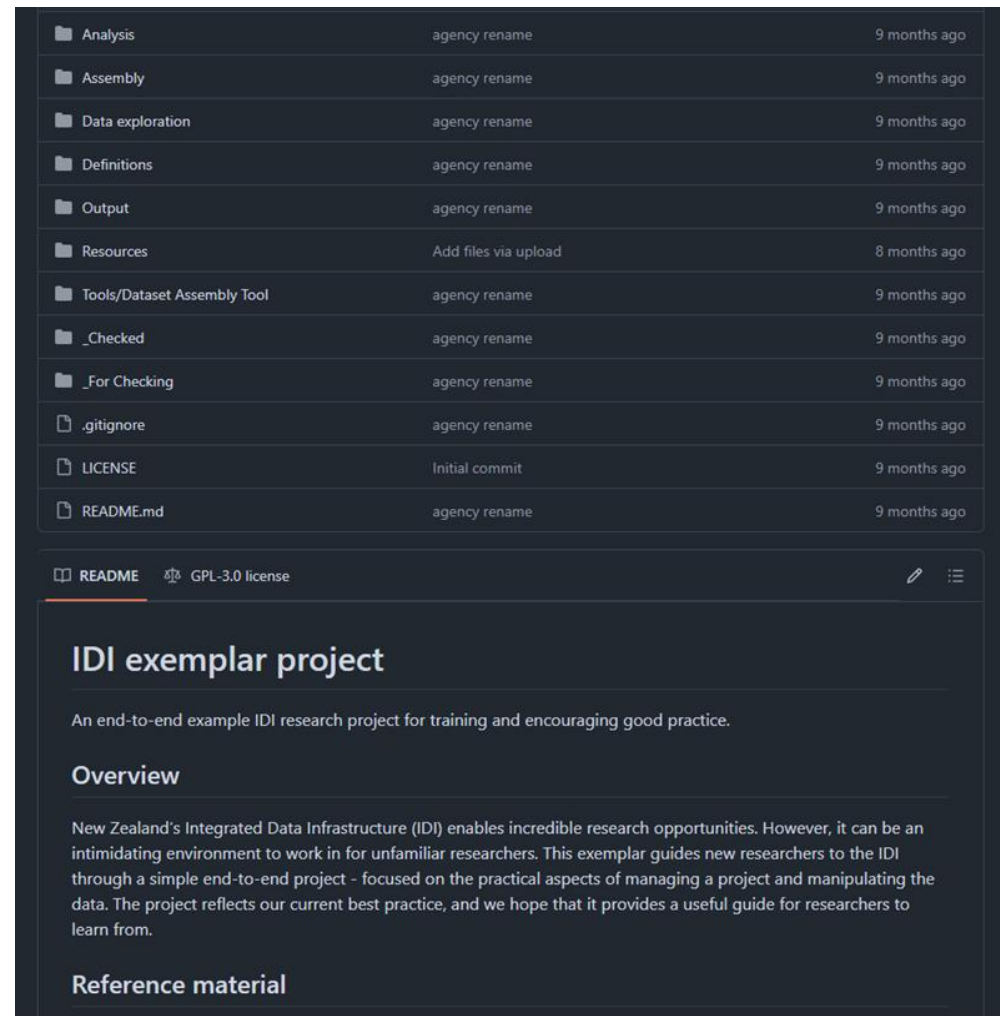
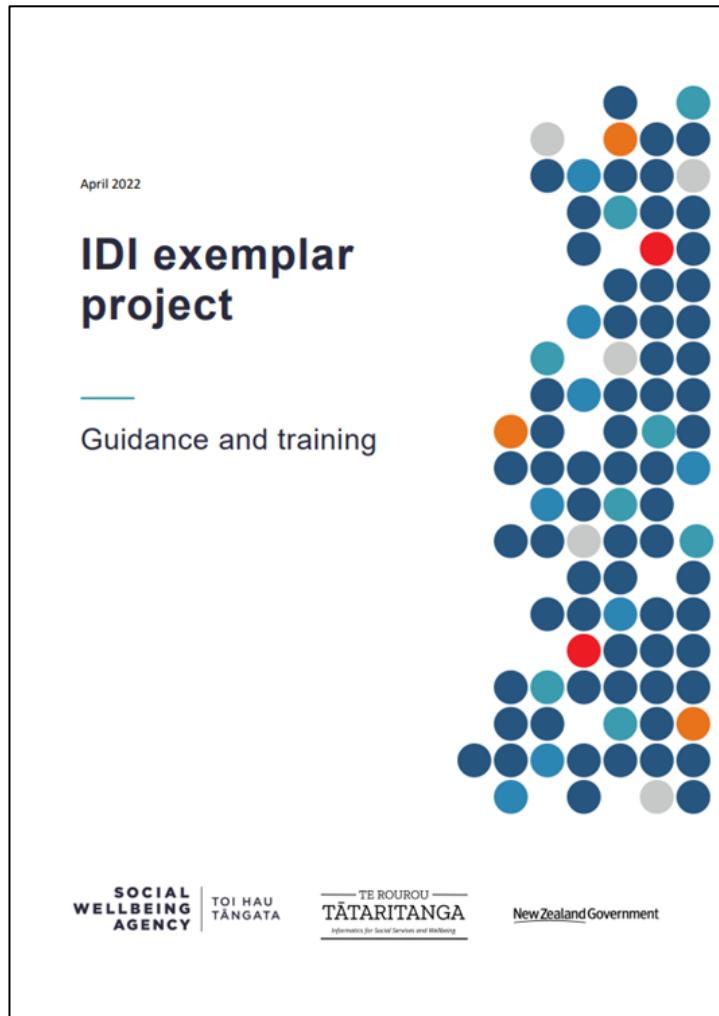
Lifecycle of an IDI project (our experience)

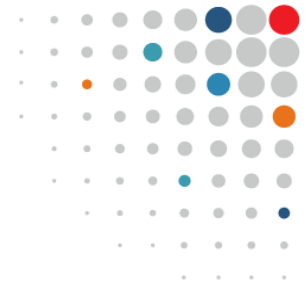


Structure projects using consistent patterns



Start with a small project





Recalibrate expectations

Example task 1:

Compare self-reported life satisfaction against every other measure in the General Social Survey (GSS).

Non-technical perspective:

Concern that large number of crosstabs will be time consuming to create.

Analytic approach:

Quick and straightforward.

Only one input table, already arranged for analysis. Repetitive processing done by computer not researcher.

Example task 2:

Count the number of benefit recipients with children who have diabetes.

Non-technical perspective:

Straightforward as only a single number, benefit receipt, children, and diabetes are all unambiguous concepts.

Analytic approach:

Very challenging.

Diabetes must be constructed from a range of source tables. Multiple ways to define parenting status – may need to test and compare approaches.

Review metadata resources

The screenshot displays the IDI Search App interface, version 1.0.2. The top navigation bar includes links for Home, About, Quick Stats, and Help. A search bar with a magnifying glass icon is present, with the placeholder text "Enter search term to filter results". Below the search bar, there are four main sections:

- Data Supply Agencies (25)**: A table with one column, "Name". It lists "Accident Compensation Corporation" and "Auckland City Mission". The table is on page 1 of 13.
- Collections (106)**: A table with two columns, "Name" and "Agency". It lists "ARCOS" (University of Auckland), "Centre of Innovation and Entrepreneurship Participation" (University of Auckland), and "NZ Rugby Representatives" (NZ Rugby). The table is on page 1 of 36.
- Datasets (1046)**: A table with two columns, "Name" and "Collection / Agency". It lists "Client" (IDI ACC Injury Claims data), "Claims" (IDI ACC Injury Claims data), "Claims historic" (IDI ACC Injury Claims data), "Medical codes" (IDI ACC Injury Claims data), and "Addresses" (IDI ACC Injury Claims data). The table is on page 1 of 210.
- Variables (50049)**: A table with two columns, "Name" and "Dataset / Collection". It lists "1st standard data" (IDI 1st standard data).

On the right side of the interface, there is a "Welcome to the IDI Search App" section. It explains that the app allows researchers to search for variables available in the IDI and, in some cases, metadata about these variables. It also provides instructions on how to use the search box to enter terms to filter results, including using a plus sign (+) to search for multiple terms. Below this, there is a section for updates: "App updated 27 August 2024", "Database updated 4 April 2024", and "Latest refresh April 2024". At the bottom right, there is a logo for "inZight analytics" with the text "Proudly supported by" above it.

<https://idisearch.terourou.org/>

Video series are available

The image is a collage of several YouTube video player screenshots, primarily from the Stats NZ channel. The top-left screenshot shows a video titled "Data lab orientation" with a thumbnail of a remote desktop. Below it is a playlist titled "Data Lab Orientation - second video series (1..." by Stats NZ, containing 6 videos with 219 views. The top-middle screenshot shows a video titled "S2E1 Remote Desktop" by Stats NZ, with 124 views and posted 1 year ago. Below it is another video titled "S2E2 Where to find things in the Data Lab - Stats NZ" with 93 views. The bottom-middle screenshot shows a video titled "IDI Demonstration Analysis – series three..." by Stats NZ, with 313 views. It includes a description about the Five Safes and a "Play all" button. The bottom-right screenshot shows a video titled "Submitting data lab output" by Stats NZ, with 797 subscribers. The video player interface includes a progress bar at 0:10 / 4:25, a "Share" button, and a "Subscribe" button. A text overlay on the video says "This video is part of a series on submitting data lab output."

Build on existing tool and resources

The screenshot shows the GitHub profile of the Social Investment Agency. The header includes the agency's name and a navigation bar with links to Overview, Repositories (19), Projects, Packages, Teams, People (7), Insights, and Settings. The profile section features the agency's logo, a bio stating "We use data, evidence and insights to inform decision-makers to improve people's lives.", and statistics: 5 followers, Wellington, New Zealand, and website info. The "Pinned" section displays four repositories: 'dataset_assembly_tool' (R), 'definitions_library' (TSQL), 'idi_exemplar_project' (R), and 'sql_code_styler' (R). The "Repositories" section lists 'Regional_Data_Explorer' and 'definitions_library' with their descriptions, languages, licenses, and update dates. The right sidebar includes a "View as: Public" dropdown, a note about viewing the README, a "Get started with tasks" link, a "Discussions" section with a "Turn on discussions" link, and a "Top languages" section showing SAS, R, TSQL, and HTML.

<https://github.com/nz-social-investment-agency>

Connect with the research community

The screenshot displays the Stats NZ website with a focus on the 'idcommons' community. The header includes the Stats NZ logo and a 'Browse Tags' search bar. The left sidebar contains navigation links for 'About', 'Topics', 'Docs', and 'More', along with a 'CATEGORIES' section listing 'Networking and Collaboration', 'Datasets and Variables', 'Data Lab Guidance', 'Skill Share', and 'Code Modules'. The main content area features a welcome message in both Māori and English, a reminder about privacy guidelines, and a grid of category cards. These cards include 'Networking and Collaboration', 'Datasets and Variables', 'Data Lab Guidance', 'Skill Share', 'Code Modules', 'Commons Platform', and 'News and Announcements', each with a list of sub-topics.

Stats NZ
Tāhauranga Aotearoa

Browse Tags 🔍 S

Nau mai, haere mai. By using the Commons, you indicate that you have reviewed and agree to abide by all guidelines and policies described in the [Welcome Pack](#).

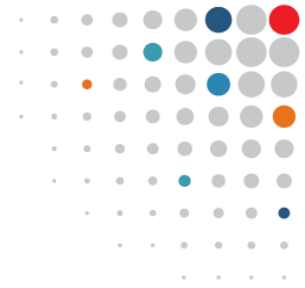
Reminder: No post should contain identifying information, unpublished statistics or data, microdata or specific identifiers, or anything from the Data Lab that has not been output-checked. If you spot a possible privacy breach, please flag the post.

categories ▾ tags ▾ Categories Latest Bookmarks Unanswered [New Topic](#)

- Networking and Collaboration**
Te Mahi Whakawhanaunga me te Pāhekoheko
 - Project updates and publica...
 - Seeking collaborations and ...
 - Other networking Q and A
 - Events
 - DLAG Member Discussion
- Datasets and Variables**
Ngā Kāpuinga Raraunga me ngā Tāupe
 - Metadata
 - Analytical approaches
 - Other dataset Q and A
- Data Lab Guidance**
He Aratohu Taiwhanga Raraunga
 - Application questions and ti...
 - Best practices
 - Software
 - Confidentiality questions an...
 - Data Lab user Q and A
- Skill Share**
Te Tiritiri Pūkenga
 - Code Snippets
 - Common Tools
 - Skills Q and A
 - LBD Guidance
- Code Modules**
Ngā Kōwae Uho
 - About Code Modules
 - Business
 - Code Modules Q and A
 - Driver Licensing
 - Education
 - Employment
 - HLFS
 - Housing
 - Income
- Commons Platform**
Pūhara Tūmatanui
 - Commons guidelines and tips
 - Issues and feedback
 - Site Q and A
- News and Announcements**
Ngā Rongokōrero me ngā Pānui
 - Commons announcements
 - Data Lab announcements
 - Data Lab Action Group Upda...

<https://idcommons.discourse.group/>

Plan for confidentiality rules



Design research within rules

- Estimate population size
- List subgroups you want to analyse
- Will every subgroup be large enough?
- Random rounding adds noise
- Will your results be robust with this noise?
- Track entity counts through analysis, difficult to add retrospectively

Make output process easy

- Stats NZ check 50+ submissions every week
- A small amount of extra effort on each output submission adds up to days of extra effort
- Spend a little more time ensuring submission is correct and clear
- Save the checker time and save yourself delays
- Watch the video series on good output practice before your first submission

Distinguish between different table layouts

Tidy rectangular source

ID	region	age	income
1	north	younger	200
2	north	older	400
3	north	younger	100
4	south	older	200
5	south	younger	100
6	south	older	0
7	south	older	400
8	south	younger	300
9	south	younger	400
10	south	younger	400
11	north	older	100
12	north	older	300
13	north	older	0
14	north	younger	400
15	north	younger	200
16	north	older	300

Long-thin results

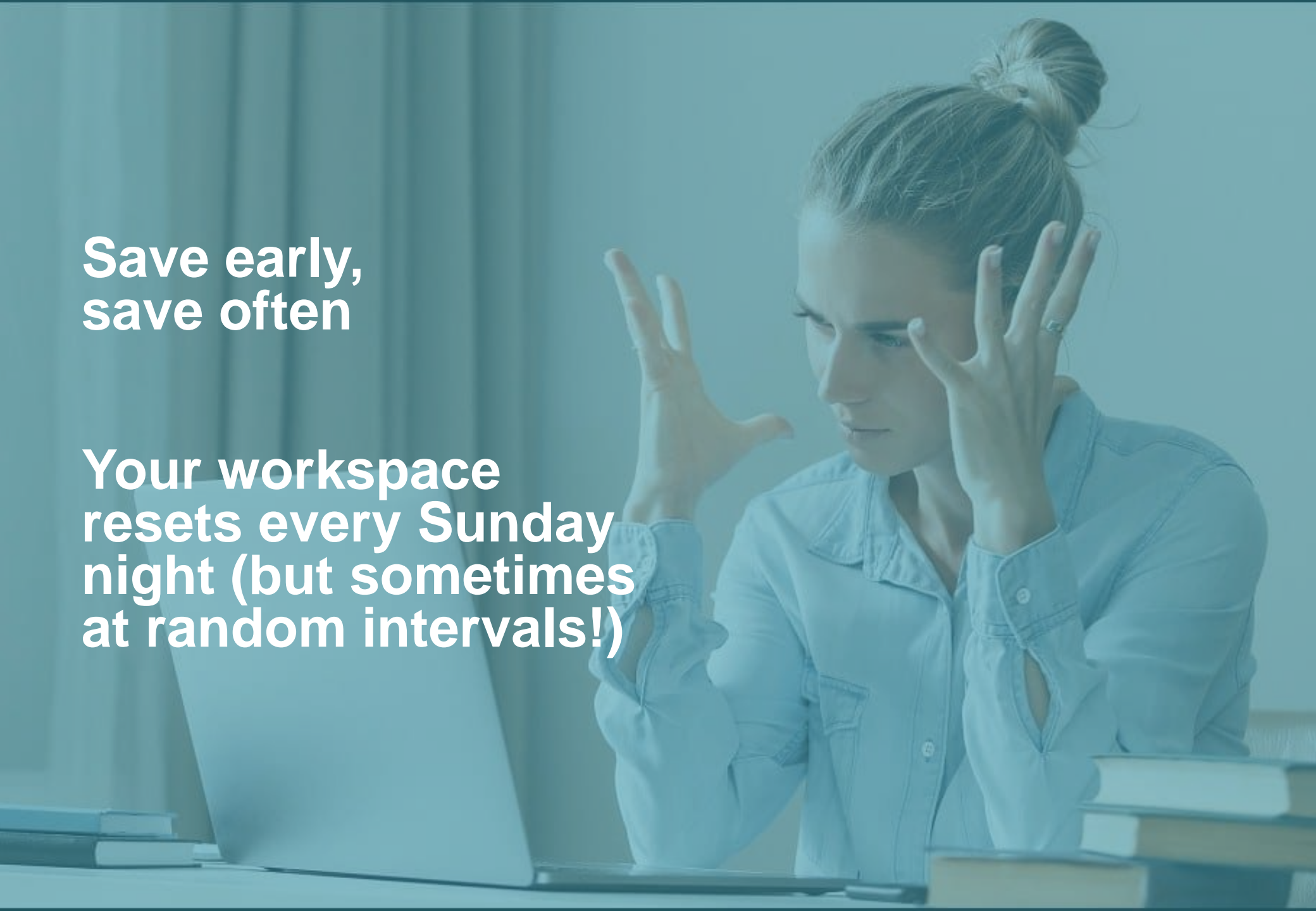
region	age	count	total income
north	older	5	1100
north	younger	4	900
south	older	3	600
south	younger	4	1200
-	older	8	1700
-	younger	8	2100
north	-	9	2000
south	-	7	1800
-	-	16	3800

Presentation results

count	younger	older
north	4	5
south	4	3
total income	younger	older
north	900	1100
south	1200	600

**Save early,
save often**

**Your workspace
resets every Sunday
night (but sometimes
at random intervals!)**



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sia.govt.nz



Social Investment Agency
Toi Hau Tāngata

Te Kāwanatanga o Aotearoa
New Zealand Government

