

Using linked data for complex evaluations

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This presentation will cover...



- Evaluating an adaptive, complex system
- The program being evaluated- is it a complex system?
- The evaluation questions
- Identifying data sources
- Assessing data quality
- Negotiating with Data Owners and custodians
- Linking and analysis
- Analysing, interpreting and displaying linked data

The Evaluation



PwC’s Indigenous Consulting (PIC) and Menzies School of Health Research (Menzies) are evaluating the Alcohol Mandatory Treatment (AMT) Program for the Northern Territory Department of Health.

Purpose=

- the to assess effectiveness and efficiency of AMT services
- to assess the impact of the program on clients who enter the AMT system; and
- to inform enhancements to the service model.

What characterises a complex system? Why do we need novel approaches?

what is a complex system?

- *It is not a program or project with a clear intervention that everyone is exposed to, with pre-determined impact indicators, controlled by a single entity*

Complex situations are characterized by high levels of uncertainty and social conflict...where the outcomes of interventions aimed at solving problems ... are unpredictable.

Michael Q. Patton, 2011, p. 90

To measure all the aspects of the program that can influence the outcomes cannot be done using traditional evaluation approaches – looking back, pre and post, calculating change before and after

Is the AMT a complex, adaptive system?

- Are there many components or parts to the intervention?
- Who has power and/or control? Is it shared, or fragmented? Is it spread over decision makers or institutions with conflicting values, differing mandates and ideal outcomes?
- Is the issue related to other issues or problems?
- Is the context continuously changing?
- Are relationships important to success?
- Do things change just as you've thought you've gotten a handle on them?
- Is there a straight path from implementation to outcomes – are the outcomes predictable?
- Is it taking place in multiple locations?
- Are many individuals and organizations involved? Across different sectors?
- Are there any shared values, or conflicting mandates?
- Are there different definitions of success?
- Are all the outcomes known or knowable?

What is the AMT and why is it complex?

Who are the various actors?

What is their connection to each other?

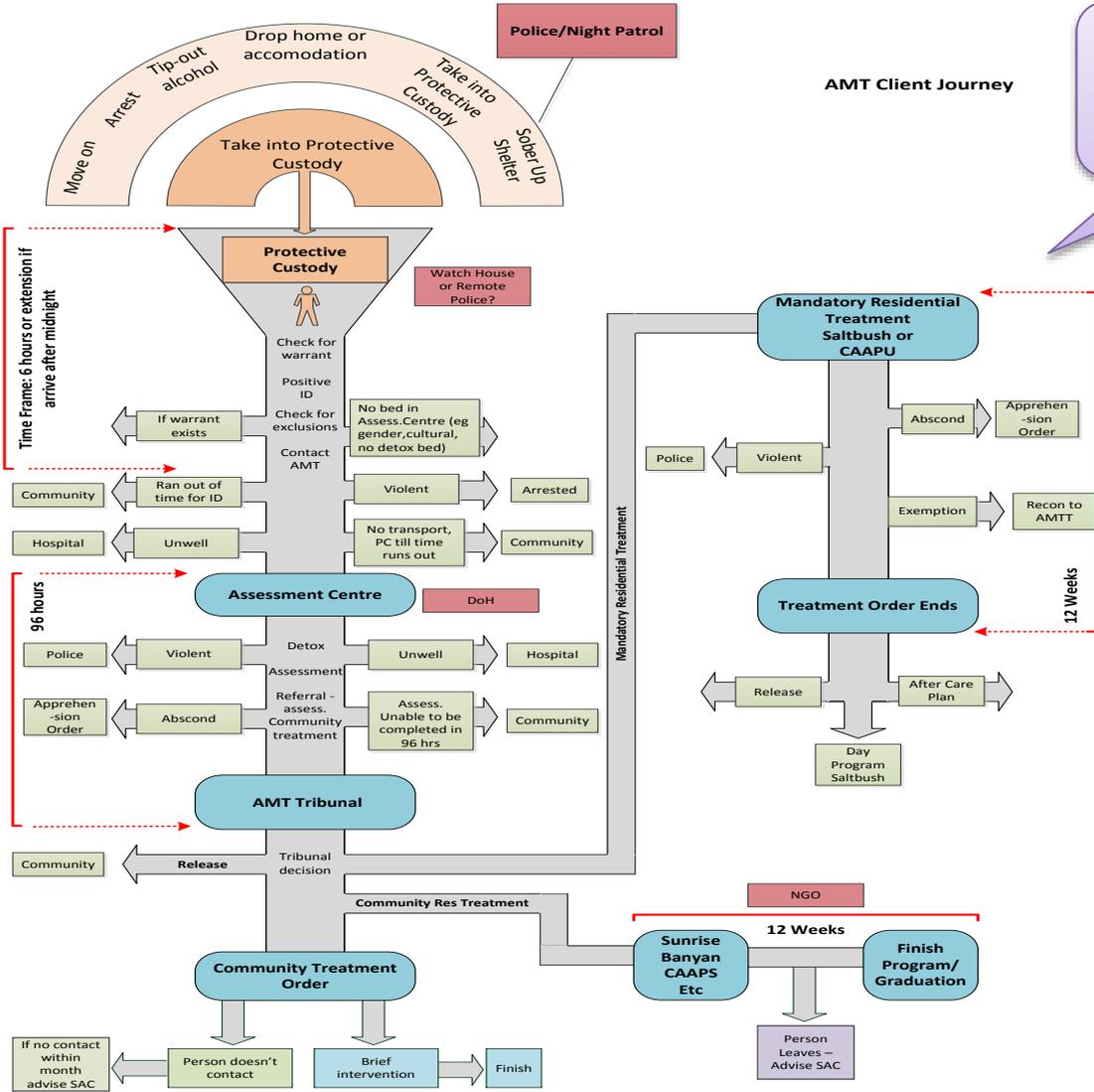
How are they connected to each of the key activities?

Is it taking place in multiple locations?

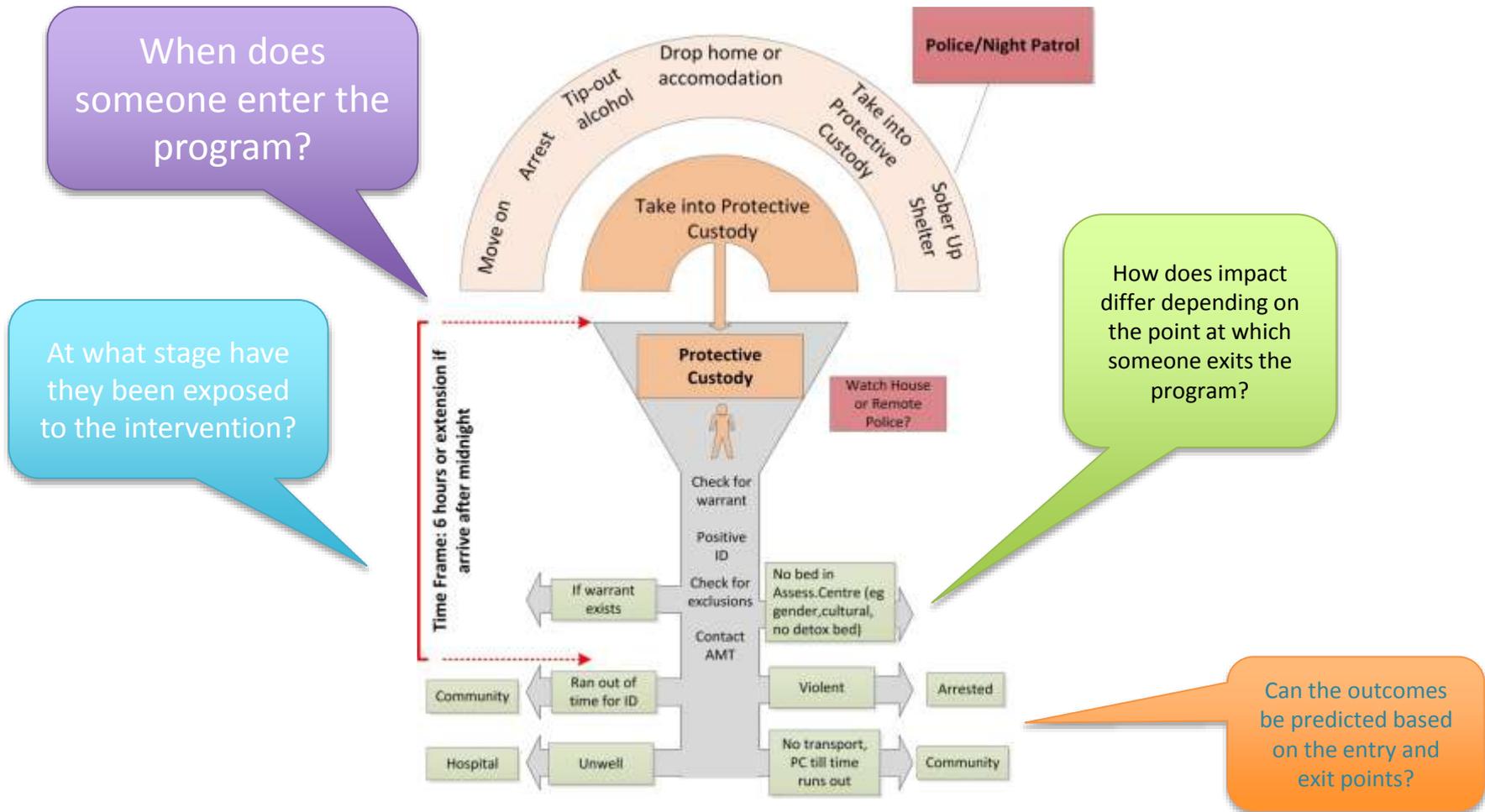
Are there any shared values, or conflicting mandates?

Are there different definitions of success?

Is there a straight path from implementation to outcomes?



Just working out who is 'exposed' to 'the intervention' is complex



When it comes to evaluating **complex, multifaceted initiatives** and **adaptive programs** operating in the **real world**, as well as those operating in **complex settings and environments**, we must consider novel approaches and using multiple data sets controlled by a range of data owners, which don't exist for the purposes of research

Why use linked data?

- The data we can use to answer the evaluation questions is spread across many data sets
- Connect participation in the program to outcome data
- To link service utilisation data to outcome data (PHC, hospital, PC, watch house, court, jail etc.)
- To validate self report responses (collected from the case studies)

Evaluations of complex initiatives, or within complex environments should:

Be adaptive, flexible, and iterative

Describe the whole system, including components and connections

Strengthen feedback loops and improve access to information

Pay attention to context and changes as they occur

Look for effective principles of practice in action

Identify points of energy and influence, momentum, and power

Focus on the nature of relationships and interdependencies within the system

Explain the non-linear and multi-directional relationships between the initiative and its outcomes

Watch for patterns, both one-off and repeating

The NT Alcohol Mandatory Treatment Program Evaluation

The evaluation will address five key questions through three core components as shown in the table below.

• Question	• Components
• To what extent are the aims of the AMT being achieved for the client group? What impact has the program had on them?	
• What is the relationship between a client's engagement in the program and identified outcomes? Did exposure to the intervention result in any change?	• Client Outcomes
• How does each service model operate?	
• Has the service model been implemented as intended and is the uptake as predicted?	• Service model and Implementation
• Is the service model and its delivery in each location cost effective?	• Cost Effectiveness

Sounds simple, right?

Data timeline

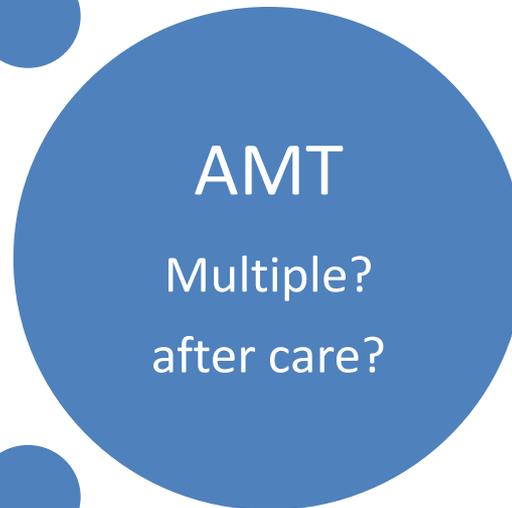
Health (ED, PHC,
Hospital)



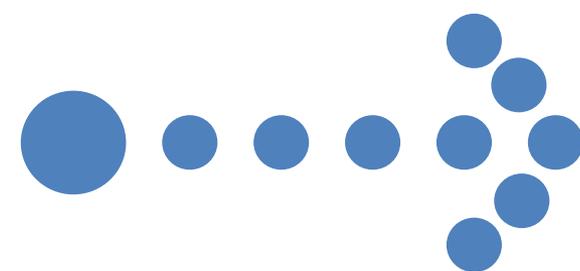
Protective Custody



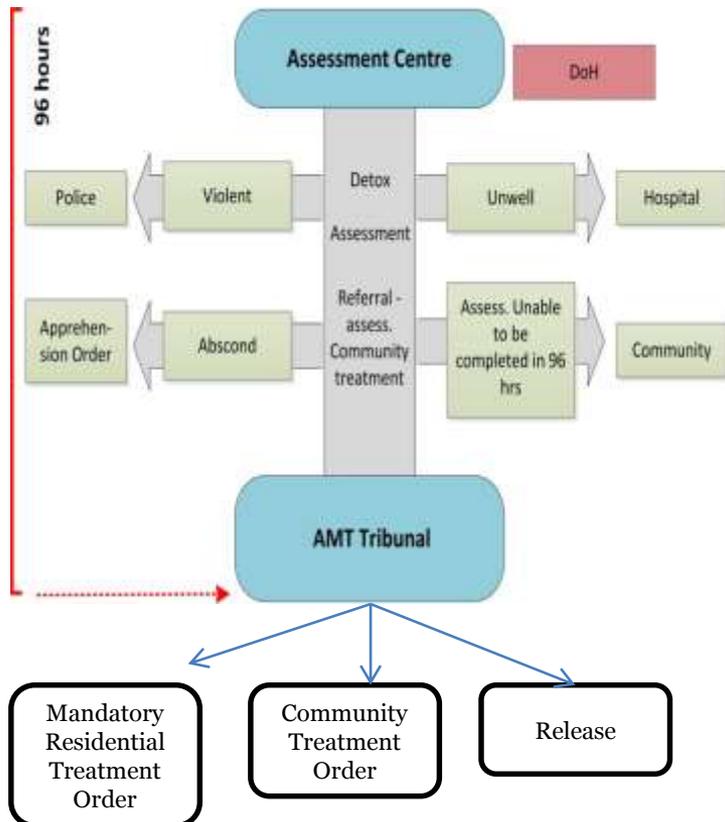
Offending record



Up to 18
months post
release



5 years prior



1. 1) To what extent are the aims of the AMT being achieved for the client group?
2. 2) Does the outcome of the tribunal hearing determine or affect impact?
3. 3) Does the treatment model vary across each residential treatment provider?
4. 4) Does the treatment model vary across all the different community based providers?
5. 5) Can you compare the outcomes pre and post residential versus pre and post community based Tx?

The effectiveness of this intervention = the ability to generate change

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Specifically, the evaluation will assess whether people who are assessed for a mandatory treatment order experience:

- a) increased stability
- b) improvements in health
- c) improvements in their social functioning (through appropriate therapeutic and other life and work skills interventions); and
- d) 'restored'/increased capacity to make decisions about their alcohol use and personal welfare; and
- e) improvements in their access to ongoing treatment to reduce the risk of relapse.

these are the intended objectives, as set out in the Alcohol Mandatory Treatment Act

- Date of Admission into Assessment Phase.
- Recommendation
- Tribunal Hearing Outcome
- If a release order was granted, then reason for ruling
- Event Dates and descriptions
- Breaks in service
- Date Care Plan commenced
- Events / activities or episodes of care that occur under the After care plan: Date of occurrence; type of event; referrals made
- After Care Plan date lodged with Tribunal; date After Care Plan commences and ends

Outcome: Improvements in health

- ED presentations
- hospital admissions
- Reason for referral to hospital
- Diagnosis
- Date and type of primary health care contact/episode
- Specialist Referrals
- Dialysis
- ANC/Birthing /STOP
- Chronic conditions, care plan, recalls
- Mortality

Outcome: Improvements in social functioning



- IJIS receptions and discharges
- Number of times reoffended
- Date charges laid
- Offence code - ASOC
- Court appearance date
- Court appearance outcome
- Length of sentence
- Type of Community Order
- Correctional Programs attended

Method: The Cohort of interest will be compared to a comparison population (? the most similar group?)

- Calculating differences (before/after)
- Calculating effect size
- Comparing the before and after across the 2 groups (and multiple subgroups)
- Triangulating with Case Studies

To calculate change we need pre-exposure and post exposure data, which is spread across many data sets

How to link the data?

- SANT Data Linkage (2009)
- SANT is usually the starting point, and we did start here, but for this project it wasn't the ending point
- Why?
- 24 different data sets, some retrospective, some real time, and some prospective
- Small cohort (~400 and 400 comparisons)

Let's ask

SA·NT



DataLink



Established in 2009 as a collaboration between NT Government and South Australian partners



Enables the linkage of administrative and clinical datasets in a secure environment. Does not hold content data.



Agreements in place with NT Government Departments of

- Health | Children & Families | Education | Housing
- Attorney General & Justice (Births & Deaths to 1868!)



Client Services facilitate access to new datasets and provide project support



Government of South Australia
Department for Education and
Child Development

Separation Principle

1. Linkage Variables

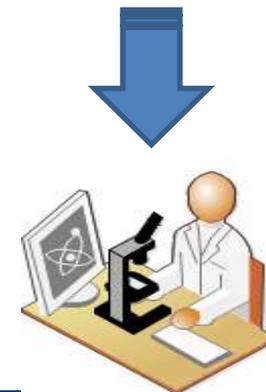
Example ...

- Hospital Record Number
- Given names, Surnames
- Date of Birth (dd/mm/yyyy)
- Gender
- Address line 1
- Address line 2
- Suburb/Locality



2. Research Variables

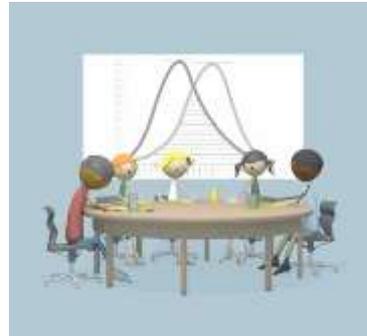
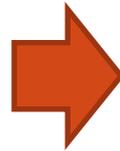
- Project Specific Linkage Key
- Date of birth to nearest year
- Gender
- Indigenous Status
- Suburb/Locality
- Diagnosis (ICD-10)
- Length of hospital stay



The Data Linking Process



Identify Data Sets, Variables and Selection Criteria



Custodian Approvals



Ethics & Privacy Approvals



Receives Data Extracts for Research



Data Provider Extracts De-Identified Data



Link Datasets & Extract Project Keys

1. Software compatibility
2. Are matching variables available ?
(probable or deterministic matching)
 - How many Mary Smith's are there?
 - How many episodes of treatment and/or aftercare has each Mary Smith had?
 - In which data sets has Mary Smith been positively identified?

- Who collects what?
- How is it collected and stored?
- Is it in a database?
- Is there a minimum data set?
- How is the data usually used ?
- do Darwin, Katherine and Alice Springs use the same assessment tools, at the same point in the service system?

Negotiating with Data Owners and custodians



- Everyone said it would be impossible, especially in the timeframe we have
- Need Data Owners approval before going to HREC
- BUT owners want to know you have HREC approval before agreeing
- Many different perceptions of the AMTx
- Different attitudes to data sharing
- Human rights concerns

Data Source Name / Reference	Organisation/ Custodian
AMT Assessment Phase Data & Cohort Identification	DoH (PCIS)
Residential Treatment Centre Data	DoH (PCIS)
AMT Treatment Services – NGOs	NGOs: Saltbush (from March 2015) CAAAPU (entire timeframe)
Primary Health Care Records (Department of Health remote clinic data recorded in PCIS)	DoH (PCIS)
Sobering up Shelter Data	AoD Database
Imprisonment – DoH Prison Clinics	DoH (PCIS)
Imprisonment Data – Corrections (Receptions and Discharges)	Department of Corrections
Watch-house Presentations (Health Assessment nurse)	DoH (PCIS)
AoD services	DoH (CCIS)
Emergency Department Presentations	DoH
Admitted Patients	DoH
Mental Health Records	DoH (CCIS)
AMT Assessment services Data not recorded in PCIS – records of absconding	DoH (
Finance Data: Activity Based Funding (Emergency Department Admission Episodes; Inpatient Admission Episodes)	DoH
Expenditure Data (GAS) AMT specific services	DoH
Expenditure Data (GAS) AMT non-specific services	DoH
Personnel Data (PIPS) AMT specific services	DoH
Personnel Data (PIPS) AMT non-specific services	DoH
AMS' – NGOs who provide primary health care	AMS/NGOs
NTPFES Protective Custody Data (Spec also includes request for costs, however these can only be provided by NTPFES) Identification of clients for the AMT Cohort & Control)	DAGJ (protective Custody Data) NTPFES (Data relating to costs)
NTPFES – Offence Data for persons subject to AMT	DAGJ
AMT Tribunal data (incl. costs of sitting)	DAGJ
Community Visitor Program	DAGJ
Advocacy Services	DAGJ – AMT Tribunal
Death Register Data	DAGJ
AMT Capital Expenditure Data	DoI
Client Master Index (to enable linkage)	DoH



Analysis, Interpretation and Display

Which variables need to be analysed together to answer the evaluation questions?

Each of the following by age, by gender, by 'home' address, by number of exposures? By serious offending profile?

- a) increased stability – housing? Income? employment? Enrolled in training? Return to country?
- b) improvements in health? ED presentations, on a CC care plan? Pharmacy refill times? Potentially preventable hospital admissions? on dialysis?
- c) improvements in their social functioning (protective custody appearances?)
- d) 'restored'/increased capacity to make decisions about their alcohol use and personal welfare; (disappear from the Police and IJIS data sets?)
- e) improvements in their access to ongoing treatment to reduce the risk of relapse (After Care? Care plan? Voluntary treatment?)

Display issues are related to the range in audiences, the size of the cohort, the range of possible outcomes

Thank You

- Questions? Comments? Ideas?
- Thank you