

# BMJ Open Examining the pathways for young people with drug and alcohol dependence: a mixed-method design to examine the role of a treatment programme

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## ABSTRACT

**Introduction:** Young people with drug and alcohol problems are likely to have poorer health and other psychosocial outcomes than other young people. Residential treatment programmes have been shown to lead to improved health and related outcomes for young people in the short term. There is very little robust research showing longer term outcomes or benefits of such programmes. This paper describes an innovative protocol to examine the longer term outcomes and experiences of young people referred to a residential life management and treatment programme in Australia designed to address alcohol and drug issues in a holistic manner.

**Methods and analysis:** This is a mixed-methods study that will retrospectively and prospectively examine young people's pathways into and out of a residential life management programme. The study involves 3 components: (1) retrospective data linkage of programme data to health and criminal justice administrative data sets, (2) prospective cohort (using existing programme baseline data and a follow-up survey) and (3) qualitative in-depth interviews with a subsample of the prospective cohort. The study will compare findings among young people who are referred and (a) stay 30 days or more in the programme (including those who go on to continuing care and those who do not); (b) start, but stay fewer than 30 days in the programme; (c) are assessed, but do not start the programme.

**Ethics and dissemination:** Ethics approval has been sought from several ethics committees including a university ethics committee, state health departments and an Aboriginal-specific ethics committee. The results of the study will be published in peer-reviewed journals, presented at research conferences, disseminated via a report for the general public and through Facebook communications. The study will inform the field more broadly about the value of different methods in evaluating programmes and examining the pathways and trajectories of vulnerable young people.

## Strengths and limitations of this study

- The proposed study directly addresses key gaps in the current research evidence evaluating residential drug and alcohol treatment programmes for young people.
- The study includes a comparison group and is the first internationally to combine multiple methods (data linkage and a prospective cohort study using a survey and in-depth interviews).
- There is potential loss to follow-up in the prospective cohort arm as the study includes a hard to reach population.
- Potential limitations of data linkage include data errors, mismatching of records and missing data, however using administrative data together with data from a prospective cohort will assist in addressing these issues.
- The advantages of using administrative data in the linkage component include the ability to obtain information on large numbers of young people spanning many years with minimised loss to follow-up and on a wide range of outcomes, including health and crime.

## INTRODUCTION

There can be a range of adverse physical, psychological and social impacts of drug use at all ages.<sup>1 2</sup> However, research has highlighted the significant effects of alcohol and other drugs on the developing brains of young people.<sup>1 3</sup> In Australia, alcohol, cannabis and tobacco are the most common currently used drugs (past 7 days) and recently used drugs (past 12 months) among young people.<sup>2 4</sup> It is estimated that 30% of young people aged 12–24 years drank alcohol at risky or high-risk levels for short-term harm and 12% for long-term harm.<sup>5</sup> Aboriginal young people experience a disproportionate

burden due to alcohol.<sup>5</sup> According to the WHO, the leading cause of healthy life years lost for males aged 15–19 years in high-income countries, such as Australia, the UK, Canada and the USA, is alcohol misuse, while substance misuse was in the top 10 for all young people aged 15–19 years.<sup>6</sup> Among those aged 16–24 years in Australia, 13% reported having a substance use disorder, with alcohol being the most common drug of concern, followed by cannabis and stimulants.<sup>5</sup> In 2012–2013, those aged 10–19 years comprised 14% of total clients seeking treatment for their own drug and/or alcohol use across Australia.<sup>7</sup>

A recent study<sup>8</sup> of an adolescent population admitted to residential treatment in Australia from 2009 to 2014 found that meth/amphetamines were the only drug class with an upward trend in reports of drug of greatest concern (10.8–48.4%) and current use of drug at admission (28.8–59.4%). Additionally, 64.1% of participants reported currently using alcohol, 85.2% cannabis and 72.7% tobacco in 2014.

The impact on health of drug and alcohol misuse is reflected in hospital separations data. In 2008–2009, there were 8442 reported hospital separations for those aged 12–24 years where the main diagnosis was for mental and behavioural disorders due to drug and/or alcohol use, a rate of 218/100 000 across Australia.<sup>5</sup> Over half of the separations were due to alcohol use (61%), and 14% due to cannabis use.<sup>5</sup> Amphetamine-related hospital separations in 2011–2012 for 10–19-year olds were the highest since 1993–1994 and have steadily increased over the past 3 years.<sup>9</sup> Cannabis-related separations among 10–19-year olds remain low, but have started to increase over the past 5 years.<sup>9</sup>

Young people with drug and alcohol problems have been reported to be at greater risk of offending.<sup>10–11</sup> At least two-thirds of young people in custody surveyed in Australia reported they had used illicit drugs or had been drunk at least weekly in the year prior to custody.<sup>12</sup> Further, only 23% reported ever receiving support to address a drug and alcohol problem despite 61% having said their alcohol use, and 45% said their drug use had caused them problems in the last year.<sup>12</sup> Aboriginal young people are grossly over-represented in the criminal justice system in Australia,<sup>13</sup> being 24 times more likely to be in a juvenile correctional facility compared with others,<sup>14</sup> and being more likely to have long-term engagement with the system.<sup>15–16</sup> Apart from an ongoing study by Halsey,<sup>17</sup> little is known about the pathways of those who desist from reoffending compared with those who reoffend,<sup>18</sup> particularly in Australia.<sup>19</sup>

Some literature suggests that addressing alcohol and drug use in a holistic manner may lead to improved health and legal outcomes.<sup>20–23</sup> Residential treatment programmes often take a holistic approach.<sup>24</sup> Length of stay in treatment and programme completion are important to the impact and have been associated with improved outcomes, such as lower arrest rates, and positive health outcomes, for both adults and young people

in the short term.<sup>20–21</sup> There is, however, very little robust research showing longer term outcomes or benefits of such programmes.<sup>25–27</sup> Many programmes do not gather reliable follow-up data, report outcomes only for those who complete a programme, and have no comparison group.<sup>26–28</sup> There have been very few high-quality outcome studies focused on residential treatment outcomes for young people internationally<sup>27–29</sup> and none identified in Australia apart from one more than a decade ago which followed up young people to 6 months postdischarge.<sup>22</sup> Internationally, one study found positive effects on substance use and psychological functioning in the first 12 months following intake were not maintained longer term, with no evidence of positive effects on criminal activity and general functioning in the later years.<sup>29</sup> A further study found reductions in substance use, school absences, delinquent behaviour and hospitalisations up to 2 years post-treatment though had no comparison group.<sup>30</sup> Recommendations are made for continuing support postdischarge as a way to prevent the erosion of short-term effects of programmes,<sup>29</sup> but evidence is scarce.<sup>31–33</sup>

Equally lacking is evidence on the costs and economic benefits of treatment for young people. A 2005 review on the economic costs and/or benefits of young people's substance misuse treatments found only three relevant studies.<sup>34</sup> A subsequent systematic review of literature on interventions for young people experiencing alcohol-related harms found no economic or cost analyses of such programmes.<sup>35</sup>

This paper describes an innovative research design to examine the outcomes and experiences of young people referred to a residential life management programme in Australia, designed to address alcohol and drug issues in a holistic manner. The proposed study directly addresses key gaps in current research evidence evaluating residential treatment programmes for young people.

## The programme

The Program for Adolescent Life Management (PALM) is a modified therapeutic community (TC)<sup>36</sup> for young people with alcohol and other drug difficulties as well as underlying and associated life problems, such as family dysfunction and trauma. The TC approach aims to support young people to develop skills to manage their lives. In accordance with Australia's National Drug Strategy<sup>37</sup> it takes a harm minimisation approach, and does not expect complete abstinence post-treatment. Specifically, the ultimate goal of PALM is to build a positive basis for life outside the programme, including stability in accommodation, employment and positive social and family networks, and it includes a focus on psychosocial functioning using individual and group therapy, vocational education and TC mechanisms to effect change.<sup>25–36</sup> Residents come from varying socioeconomic backgrounds and many have a history of social and family dysfunction, early school leaving and criminal activity—between 2001 and 2005, 70% had

been arrested at least once in the 3 months prior to attending the programme.<sup>38</sup> Aboriginal young people comprise ~30% of PALM referrals.

In addition to PALM is the Continual Adolescent Life Management (CALM) programme. CALM is a 3-year continuing support programme offered to all clients who have participated in PALM. CALM aims to assist young people to overcome ongoing barriers they experience in life, namely alcohol and drug use, criminal activity, mental health and social exclusion. Staff provide counselling, vocational education, housing and employment assistance through face-to-face meetings, telephone and Facebook contact.

## METHODS AND ANALYSIS

### Objective

This research project will examine and analyse a range of health and social outcomes and experiences for young people who have participated in PALM compared with similar young people who have not completed such a programme, who have drug and/or alcohol issues.

### Aims

1. To describe and compare the health, social and criminal justice outcomes over the short term (up to 1 year postdischarge from PALM) and the health and legal outcomes over the long term (up to 10 years postdischarge from PALM) among young people who are referred and (a) stay 30 days or more in PALM (including those who go on to continuing care and those who do not); (b) start, but stay <30 days in PALM; (c) are assessed, but do not start PALM.
2. To describe and compare economic costs associated with different outcomes and pathways among young people across the three comparison groups above.
3. To describe and compare outcomes of those young people who are referred to the programme by the criminal justice system to those referred from other sources.
4. If there are more positive outcomes for young people who attend or complete a life management programme, to describe and examine the perceptions of young people about the effective elements and strategies associated with these outcomes, including for those receiving continuing care and those who do not.

### Overview of study components

Assessment and admission to PALM represents a point in time at which a young person is referred to a community-based programme to address their life problems, including their drug and alcohol use. PALM collects data on variables such as education, social and family functioning, mental health, criminal activity, and drug and alcohol use at referral. This provides a unique data set from which a mixed-methods study can retrospectively and prospectively examine these young people's pathways into and out of the programme. The

study will compare key outcomes and events across the three groups (a)–(c), examine the role of continuing care, and the economic costs associated with different outcomes and pathways.

The study involves three components:

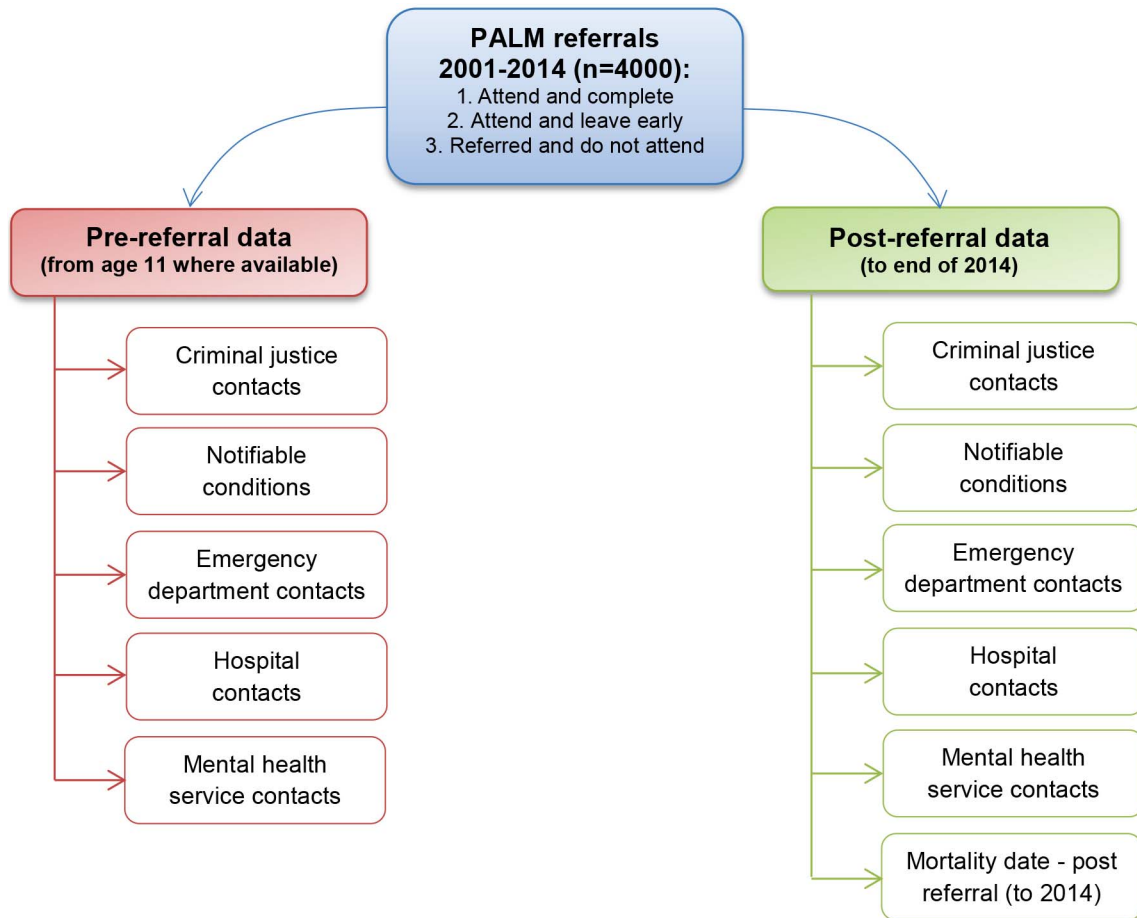
1. Retrospective data linkage of programme data to health and criminal justice administrative data sets. The data linkage component will examine contacts with the health and justice systems prior to and postreferral for the whole data set held by PALM from 2000 to 2014 of ~4000 clients (figure 1) addressing aims 1–3.
2. A prospective cohort (using existing programme baseline data and a follow-up survey). This will include a survey at 12 months postadmission to PALM addressing aims 1–3. The survey will be completed by ~400 young people over a 2–3-year period that consent at referral.
3. Qualitative in-depth interviews with a subsample of the prospective cohort. Interviews will be undertaken with a purposefully selected<sup>39</sup> subsample of 40 young people who have attended the programme (from the 12-month survey sample) to address aim 4.

The contribution of each component to the study aims is shown in table 1.

### Conceptual framework

Psychosocial models have been used in understanding behaviour change, but remain largely focused on changes at the individual level.<sup>40</sup> While changes at the individual level will be examined, a lifecourse perspective within a social determinants framework will inform refinement of measures and interpretation and analysis of collected data in this study.<sup>41 42</sup> A lifecourse perspective within social science (as distinct from the epidemiological use of the term) is concerned with how one stage of life impacts another (often called transitions) and the roles of cultural and social structures in these transitions.<sup>42</sup> In this study, we are focused on a specific aspect of the lifecourse—the transition from adolescence to adulthood. A lifecourse perspective on drug and alcohol issues suggests that an earlier onset of drug use might be associated with increased levels of drug dependence and abuse, brain injury, criminal justice involvement, and risky injection practices and sexual practices in later life.<sup>43</sup>

This lifecourse perspective and acknowledgement of social determinants is very relevant when understanding the lives and experiences of Aboriginal young people.<sup>44 45</sup> In addition to poverty,<sup>46</sup> Aboriginal young people have often experienced intergenerational disadvantage and trauma,<sup>45 47–49</sup> more family intervention by government agencies and care and protection orders,<sup>50 51</sup> as well as the regular and compounding effects of racism.<sup>52 53</sup> This study acknowledges the impact of colonisation and history as additional determinants of health and contact with the criminal justice system among Aboriginal people.<sup>54–56</sup>



**Figure 1** Retrospective data linkage component. PALM, Program for Adolescent Life Management.

**Table 1** Relationship between project objectives and study components

	Retrospective cohort: data linkage	Prospective cohort: survey	Prospective cohort: interview
Aim 1: to describe and compare the health, social and criminal justice outcomes over the short term and long term among young people who are referred across the three comparison groups	X	X	
Aim 2: to describe and compare economic costs associated with different outcomes and pathways among young people across the three comparison groups	X	X	
Aim 3: to describe and compare outcomes of those young people who are referred to the programme by the criminal justice system to those referred from other sources	X	X	
Aim 4: if there are more positive outcomes for young people who attend or complete a life management programme, to describe and examine the perceptions of young people about the effective elements and strategies associated with these outcomes, including for those who receive continuing care and those who do not			X



These related perspectives will be integrated to examine and understand the data collected. The authors will develop an explanatory model of the factors and events characterising youth pathways, and identify the points of intervention and experiences, including aspects of PALM and CALM, which may produce more positive life trajectories.

### Retrospective cohort component—data linkage

Data linkage is increasingly being used in health research to examine outcomes of programmes and the pathways of vulnerable people, including young people.<sup>57 58</sup> To date, relevant studies linking administrative and programme data in the drug and alcohol field have been focused on adults<sup>59–63</sup> and have not combined findings with a prospective cohort study. In the justice sector, linkage studies are relatively new and few have focused specifically on juveniles<sup>64 65</sup> and often link only basic demographic correlates with outcomes.<sup>65</sup> Nevertheless, research using linked and merged detailed lifelong administrative data, including childhood and young person data, shows the feasibility and value of data linkage to provide understanding of the complex range of factors in a young person's life in determining adult outcomes.<sup>66</sup>

### Data collection

Data for the complete PALM client database (TED) from 2000 to 2014 will be linked to administrative data from a series of health and criminal government data sets from two Australian jurisdictions (figure 1).

The health system variables will include attendance at an emergency department, including date of presentation, referral source (self, police), diagnosis and outcome of treatment. The variables for patients admitted to hospital will include hospital separations (a separation is the administrative process by which a hospital records the cessation of an episode of care for a patient within the one hospital stay, eg, discharge to home, discharge to another hospital or nursing home, or death), length of stay for each visit, number of diagnosis and most common diagnosis. Mental health variables are from mental health day programmes, psychiatric outpatients and outreach services (eg, home visits) including mental health service usage such as an episode of care and duration of contact, type of service provider, such as a counsellor or youth worker number of diagnoses and most common diagnosis. Mortality will be identified from registrations of deaths, which is mandatory in Australia. Examining mortality is important as the study population group is at greater risk of self-harm, suicide and drug overdose. Notifiable diseases (including blood-borne viruses) and mortality as a result of a notifiable disease will also be included in the data set for analysis. The criminal justice data sets will contain key variables relevant to understanding offending and reoffending behaviour including police apprehensions, age at first and subsequent court appearance, offence types and

penalties (table 2). See online supplementary material and figure S1 for detailed information on the data linkage process.

### Data analysis

The data linkage component will enable the study team to compare healthcare utilisation (eg, hospitalisation rates), legal outcomes (such as reincarceration rates) and associated costs for across the three comparison groups. The analysis will have >90% power to detect a difference between the 2-year reoffending rate of 65% for those who are assessed, but do not start PALM (we expect about 600 clients from 2000 to 2014) compared with a rate of 55% for those who complete at least 30 days of PALM (about 1700 clients). We will use propensity score methods to reduce confounding when conducting comparisons.<sup>67</sup> A comparison of the 2-year reoffending rate using logistic regression will be conducted. Analyses will also be conducted using proportional hazards models to examine time to first event (eg, reincarceration, hospitalisation). In addition, count data regression methods will be used to examine the number of arrests, hospitalisations and other key events. This aspect of the study will provide data on offending and health events (and their associated costs), which occur among the study population after and prior to referral.

The analysis of costs and outcomes/events will be reported in the form of cost-consequences analysis<sup>68</sup> drawing on findings from the data linkage and survey component (discussed further below). This form of economic analysis is appropriate for examining a range of outcomes as it accounts for different types of benefit that cannot be measured using the same units.<sup>68 69</sup> It allows costs and benefits to be presented separately or disaggregated enabling different decision makers to focus on benefits and costs of interest to them and is particularly appropriate for public health interventions.<sup>68</sup>

### Prospective cohort component—survey

The 12-month survey is an adaptation of the Ted Noffs Foundation referral survey completed at baseline and will be completed by ~400 young people over a 2–3-year period that consent at referral (figure 2). The survey instrument was adapted drawing on the expertise of the investigators to ensure a cost-consequence analysis could be conducted, and key demographics and important background details included that may impact on treatment effects and pathways.

### Data collection

Young people who have consented to participate will be followed up by phone, mobile messaging and a study Facebook page to arrange a time to complete a phone survey at 12 months postreferral to PALM. We expect at least 75% of those who consent at baseline to participate at 12 months postreferral based on previous research with young people.<sup>20 22</sup> Reimbursement for participation and multiple methods for contacts will be required at

**Table 2** Data sets and variables

Health data set	Data description	Data provider	Data type	Geographical coverage	Available from	Key variables
Admitted Patients Data Collection	NSW—all admitted patient services provided by public and private hospitals and day procedure centres ACT—inpatient separations from all public and private hospitals	NSW Health ACT Health	Administrative (mandatory)	NSW ACT	2001 2004	Date of admission Date of separation <sup>i</sup> Length of stay Primary and additional diagnoses Admitted to and days in psychiatry ward Separation mode Demographics (age, sex, SLA of residence)
Death registrations Cause of Death Unit Record File	Mortality information for deaths occurring in NSW and ACT	NSW Registry of Births, Deaths and Marriages ACT Registry of Births, Deaths and Marriages	Registry (mandatory)	NSW ACT	1985 1997	Date of birth Date of death Age at death Year of death registration Cause of death
Emergency Department Data Collection	Provides information about patient presentations to the emergency departments of public hospitals in NSW and ACT	NSW Health ACT Health	Administrative (mandatory)	NSW ACT	2005 2004	Arrival and triage date Doctor seen date Mode of arrival and referral source Diagnosis Mode of separation Departure date Demographics (age, sex, SLA)
Mental Health Ambulatory Data Collection	Includes assessment, treatment, rehabilitation or care of non-admitted patients. It may include mental health day programmes, psychiatric outpatients and outreach services (eg, home visits).	NSW Health	Administrative	NSW	2001	Activity type and duration Activity start date Group session identifier Mental health additional diagnosis Mental health provider role and type Demographics (age, area of usual residence, country of birth)
Notifiable Conditions/ Diseases	Diagnoses of certain infectious diseases and adverse events following immunisation. Notified by laboratories, hospitals, medical practitioners, schools and child care centres	NSW Health ACT Health	Administrative (mandatory)	NSW ACT	1993 2000	Disease name/condition notified Diagnosis method Recorded date Laboratory confirmed Demographics (age, sex, SLA)
Criminal justice data sets	Data description	Data provider	Data type	Geographical coverage	Available from	Key variables
PROMIS	Central recording system for all crime, incidents and offences committed in the ACT	ACT Police	Administrative	ACT	1998	Date arrested Date of offence for which arrested Offence committed—Australian Standard Offence Classification Method used to clear an offence or charge <sup>ii</sup> and date cleared

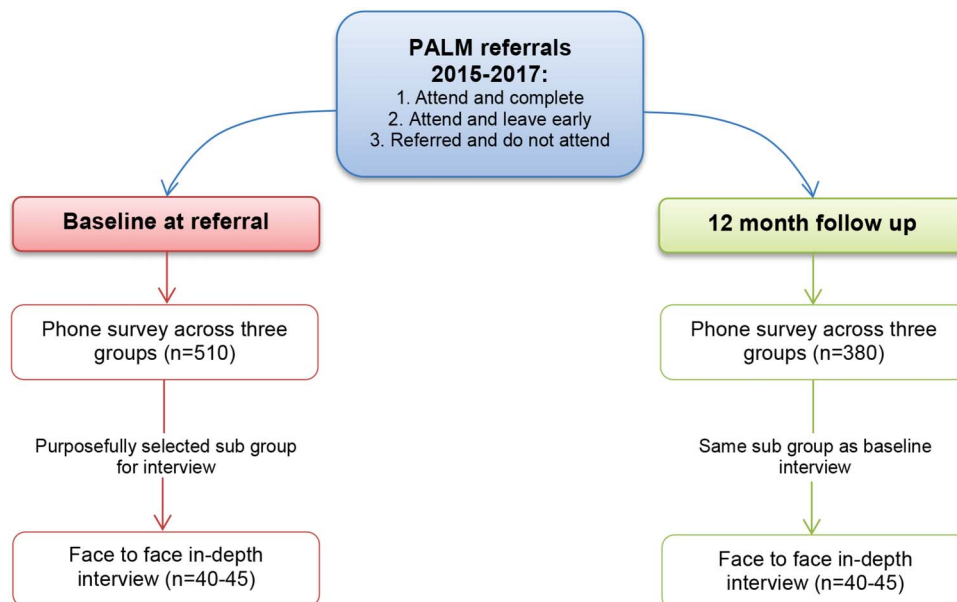
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Table 2 Continued

Health data set	Data description	Data provider	Data type	Geographical coverage	Available from	Key variables
Re-offending Database (ROD)	Contains information on each person who has been convicted of a criminal offence in NSW since 1994 and is used by the Bureau of Crime Statistics and Research to determine the proportion of offenders who have been re-convicted for a further offence	NSW BOCSAR	Administrative	NSW	1994	Date released following apprehension Family violence related Court appearances Principal offence—Australian Standard Offence Classification Date offence occurred Date accused was arrested/charged for offence Plea and outcome of the charge Drug associated with offence Year and jurisdiction case was finalised Type and duration or value of penalty Duration of total term for prison sentence Custody—those in custody (date of reception, type of custody, sentence type, date of discharge, discharged type)
Reference data set	Data description	Data provider	Data type	Geographical coverage	Available from	Key variables
TED Database	TED is the Ted Noffs Foundation Client Information System for young people referred for residential drug treatment in NSW and the ACT since 2001. Includes all variables in a pretreatment referral questionnaire administered by staff over the phone or in person	Ted Noffs Foundation	Administrative	NSW ACT	2000	Admission to PALM (referral source, date of admission, date of discharge, reason for departure) Demographics (age, Indigenous status, education, occupation, housing) Substance use (age first use, current use, route of administration) Severity of Dependence Scale (table 3) Occasions of Drug Use Scale (table 3) Blood Borne Virus Exposure Risk Scale (table 3) Treatment history and motivation to attend treatment Psychological Wellbeing Scale (table 3) Suicide and self-harm attempts (ever attempted, attempted 3 months) Social Functioning Scale (table 3) Family Assessment Device (General Functioning Scale; table 3) Past criminal activity (times arrested 3 months prior to screening, times in custody, type and number of crimes committed, under the influence of alcohol or any other drugs during any offences)

<sup>†</sup>A separation is the administrative process by which a hospital records the cessation of an episode of care for a patient within the one hospital stay e.g. discharge to home, discharge to another hospital or nursing home, or death

<sup>‡</sup>Method could include caution, summons, charge withdrawn, unfounded, court, attendance notice, charge before the court, diversionary conference, simple Cannabis Offence Notice. ACT, Australian Capital Territory; BOCSAR, Bureau of Crime Statistics and Research; NSW, New South Wales; PALM, Program for Adolescent Life Management; PROMIS, Police Real Time Online Management Information System; SLA, Statistical Local Area.



**Figure 2** Prospective cohort survey and interview components. PALM, Program for Adolescent Life Management.

consent to achieve the projected response rates. Facebook and mobile phone messaging will be important means to follow-up young people. Facebook is currently used by CALM with most clients each year staying

more than 30 days in PALM becoming friends of their Facebook site. Facebook was also identified in a pilot study earlier this year as a preferred method of contact among former clients. Outcomes and experiences of the

**Table 3** Instruments included in the survey

Instrument /items	Constructs measured	Psychometric testing
Severity of Dependence Scale (SDS) <sup>70</sup>	Degree of psychological dependence on different illicit drugs	Published psychometric data available <sup>70</sup> Australian comparative data available <sup>76</sup>
GAIN Short Screener (GAIN-SS) (Psychological Functioning Scale) <sup>71</sup>	Psychological functioning: background; substance use; physical health; risk behaviours; mental health; and environment, legal and vocational factors	Published psychometric data available <sup>77</sup> Australian comparative data available <sup>76</sup>
The Opiate Treatment Index (Social Functioning Scale (SFS)) <sup>72 73</sup>	Social functioning: drug use; HIV risk-taking behaviour, social functioning criminality, health and psychological adjustment	Published psychometric data available <sup>73</sup> Australian comparative data available <sup>76</sup>
Blood-Borne Virus Exposure Risk scale (BBVER) <sup>78</sup>	Injecting drug behaviour: item of injection equipment used	Published psychometric data available from Australia <sup>76</sup>
Occasions of Drug Use Index (ODUI) and polydrug use <sup>78</sup>	Number of days in the last month that they used the following: alcohol, heroin and other illicit opioids, cannabis, cocaine, amphetamines, tranquilisers and tobacco	Published psychometric data available from Australia <sup>76</sup>
Family Assessment Device (FAD)—General Functioning Scale <sup>79 80</sup>	Structural, organisational and transactional characteristics of families	Published psychometric data available <sup>79</sup>
EQ-5D-5L Quality of Life Scale	Measures quality of life using 5 levels across 5 dimensions: mobility, self-care, usual activities, pain/discomfort, anxiety/depression	Published psychometric data available <sup>74</sup>
Australian and New Zealand Standard Offence Classification (ANZSOC) codes <sup>75</sup>	Number of arrests, type of offence committed and outcomes of arrests	The items measure offence-related events not psychological constructs
Health service utilisation questionnaire	Type and number of health services accessed	The items measure health service events not psychological constructs. The instrument has been used previously in Australian studies. <sup>81–83</sup>



young people to be collected will include drug and alcohol use, physical and mental health, social and family functioning using validated instruments currently used by the programme at assessment or baseline compared across the three groups. These include items from the Severity of Dependence Scale (SDS)<sup>70</sup> and Psychological and Social Functioning Scales<sup>71–73</sup> as well as items related to treatment for drug and/or alcohol and related issues. To support the economic analyses, the EQ-5D-5L quality of life scale<sup>74</sup> and items related to health services utilisation and criminal offences, based on Australian Standard Offence Classification (ASOC) codes,<sup>75</sup> will be included (table 3).

### Data analysis

In the 12-month survey component, there will be ~165 clients who stay 30 days or more in PALM; another 165 who start, but stay <30 days in PALM; and 180 who are assessed, but do not start PALM. Based on previous research experience at the programme<sup>38</sup> and related studies,<sup>20 22</sup> the team will be able to recruit and follow-up about 75% of these clients for 12 months, which will give 124, 124 and 135 clients in the three groups, respectively. This will enable detection of a difference at 12 months of 0.4 SDs between either of the groups that attend PALM versus the group that does not attend with  $\alpha$  of 0.05 and power of 90% for either of two primary outcome measures, the Psychological Functioning and the Severity of Dependence scales. Previous research has indicated that much larger differences are likely to be observed.<sup>84</sup> The analysis will compare Psychological Functioning and Severity of Dependence scores at 12 months across the three groups using multiple linear regression after adjusting for potential confounders such as previous criminal history, Psychological Functioning and Severity of Dependence scores at referral, gender and age. Days in PALM will be used as a continuous variable to examine 'dose-response'. Analysis using propensity score methods to compare across the groups will also be used; propensity scoring is a statistical technique which reduces bias from confounders.<sup>67</sup> In addition, assessment and interview data collected at 0 months across the three groups will assist in understanding differences at baseline between the groups and inform statistical analysis and interpretation.

### Prospective cohort component—in-depth interviews

Qualitative interviews will be undertaken to provide data and insights about the individual, structural and social features that shape young people's histories, and subsequent experiences in PALM and CALM including their life trajectories up to 12 months postreferral. The in-depth interview component will only include young people who attend the programme including those that stay less and more than 30 days (figure 2). This component is to address aim 4 which is focused on describing and examining effective elements and strategies associated with positive outcomes for young people who

attend or complete a life management programme, including for those receiving continuing care.

### Data collection

A purposeful sample<sup>39</sup> of 40 young people who attend PALM will be invited to participate in qualitative in-depth interviews with sampling aiming to include a diversity of participants, for example, males, females, programme completers and non-completers, and Aboriginal young people to build a data set that informs and develops theory.<sup>85</sup> These young people interviewed twice will provide substantial data for analysis.<sup>86</sup> Baseline interviews will be undertaken at intake in the first few weeks in PALM, helping to establish rapport and trust and gain informed consent, and again at 12 months face-to-face wherever possible or by phone at the time or soon after the follow-up survey. The interviews will be semistructured, exploring the young people's perspectives of their own drug and alcohol use; the strength of their social ties with family, peers and significant others; their expectations of and experiences with services like PALM; and their experiences with crime. The approach to these interviews and specific question types are under review and will be developed with young people who have attended the programme. The in-depth interview is likely to be adapted over time based on interviewer experiences.<sup>87</sup>

### Data analysis

Analysis of the interview data will include initial inductive thematic analysis<sup>85</sup> using NVIVO to assist with data management and to link survey and interview respondent findings using attribute features of NVIVO enabling triangulation.<sup>86 88</sup> This will be complemented by more intensive narrative analysis<sup>89</sup> of a subgroup of interviews selected to reflect diversity of experiences.

### Ethics and dissemination

Ethics approval has been sought from several ethics committees including a university Human Research Ethics Committee (HREC), state health departments for access to administrative data for linkage and an Aboriginal-specific ethics committee.

### Ethical considerations

This study involves the recruitment of young people, many of whom have experienced significant disadvantage and marginalisation during their lives. As such, there are a number of ethical considerations related to ensuring safety and protection of these young people throughout the study.

### Verbal consent for the survey and interview

Some young people referred to the PALM programme undertake the initial assessment over the phone as they are in a rural area or juvenile detention at the time of referral and many have low literacy levels. Verbal consent, using a carefully scripted process is therefore

being used instead of written consent. Ted Noffs Foundation staff or counsellors will use this verbal consent process to obtain informed consent from participants after they have completed their entry assessment for PALM. Verbal consent will be reobtained at the time of the survey at 12 months and prior to each in-depth interview.

#### Consent for those aged 16 years and under

Approximately 20% of potential participants will be aged 16 years and under. For these participants' parents or carers will be approached to also provide consent. These young people will be asked whether they wish their parents or carer to be informed of their intention to participate. Contacting family members is sometimes not appropriate due to the history of family problems. If the young person wishes to participate and is under 16 years of age and does not wish their parent or carer to be contacted, then a process adapted from the Gillick Competence test and the Fraser Guidelines<sup>90</sup> used for medical procedures will be used to assess a young person's competence to give consent without parent involvement. PALM staff assessing competency to consent will be trained psychologists, social workers, counsellors or an alcohol and other drug worker.

#### Aboriginal participants

As the sample comprises a significant proportion of Aboriginal clients (over 30%), the research design reflects values of Aboriginal research, detailed in the Australian National Health and Medical Research Council (NHMRC) guidelines.<sup>91 92</sup> Aboriginal Community Controlled Health Organisations (ACCHOs) are seen as partners in the research, and Aboriginal researchers (one of whom is an investigator on the study) are involved in the design and conduct of this aspect of the study, in particular the interview component. These organisations and individuals are members of an Aboriginal Advisory Committee (AAC; see below).

#### Waiver of consent for data linkage

Ethics approval for a waiver of consent is being sought for the data linkage component. Consent for the retrospective cohort would be very difficult logistically and also without infringing the privacy of past clients whose current partner/family/significant other may be unaware of their previous history of drug and alcohol issues. The privacy risks of consenting all past clients significantly outweigh the privacy risks of not recontacting, which we believe are negligible with a sample of 4000 past clients over a 14-year time span with de-identification.

#### Data linkage process

The process of linkage is designed to ensure that the staff performing the linkage do not have access to the administrative information about the individuals. Data

custodians will only have access to data within their data collections. The research team will receive data that contains no identifying variables (such as name and address).

#### Dissemination

Study findings will be disseminated through publications in openaccess journals, presentation of results in the third year of the study at conferences, and a report for the general public and key stakeholders of the final results, including a media and stakeholder launch of the report to increase exposure. Results will be communicated to young people via the Ted Noffs Facebook page for their continuing care programme.

#### Governance

This study has implications for a range of stakeholders including study participants, the Ted Noffs Foundation, data custodians in the linkage component, and Aboriginal people and their communities. A number of governance structures are being established to enable these stakeholders to have input throughout the study including the dissemination of findings.

A Youth Advisory Council (YAC) will be convened to support the study comprised of ~8–10 young people post-PALM who will meet face-to-face every 3–6 months with sitting fees and reimbursement of expenses. This group will include two Aboriginal members. The young people will be involved in a range of aspects including input to the interview schedule and processes and dissemination of findings to young people. Training will be provided to members to support their engagement, including training to understand research methods.

An AAC has been convened including representatives from three ACCHOs, two Aboriginal researchers with experience working within the corrective services context (including author MW) and two Aboriginal young people. This AAC facilitates inclusion of the worldviews of Aboriginal people in the study, to ensure data is collected in a relevant way and about meaningful issues. The AAC will have an instrumental role in reflecting on data gathered for its meaning to Aboriginal populations of young people particularly in the context of contemporary culture, history and the socioeconomic disadvantage colonised Indigenous peoples often experience. It will also provide leadership to disseminate findings in ways that do not further disadvantage or stigmatise Aboriginal people, seeking to promote understanding of Aboriginal peoples' experiences, cultures and aspirations.

#### DISCUSSION

This study is innovative in its approach by combining retrospective data linkage and prospective cohort components with current clients, who have drug and alcohol issues referred to a residential community life management programme with a continuing support programme

arm. The findings will be used to advance fundamental knowledge in the fields of public health and criminology related to vulnerable and at-risk young people and the strategies and mechanisms related to improved outcomes. Specifically, it will provide critical new knowledge and understanding of how young people with drug and alcohol issues fare in the longer term and the contribution of a life management programme to their pathways and trajectories informing policy and service design relating to treatment and desistance more broadly.

The study will be the first among juvenile offenders linking programme data to justice and health administrative data sets which goes beyond basic demographic correlates to include rich demographic and a range of psychosocial measures, including drug and alcohol use collected at referral for more than a decade. The study will also be the first follow-up study of such a programme in Australia in many years and importantly will include a comparison group for the data linkage and survey components comprised of those who are assessed, but do not attend. Only one study with follow-up to 6 months postdischarge has been identified prior to this time in Australia.<sup>22</sup> The study will also trial the use of social media as a tool for recruitment, improving response rates and communicating findings with the study population.

The integrated findings from across the diverse data sets will underpin the development of new models and theories about the factors that influence transition among these young people into adulthood. This will include a focus on the concepts of turning points and life events,<sup>42</sup> as well as the 'desistance process' model to understand how and why people stop offending.<sup>93</sup> Importantly, research governance will involve Aboriginal people and Aboriginal Community-Controlled Organisations in an ongoing partnership structure. The governance mechanisms will also involve young people from the participating community in key advisory and engagement processes for the first time in this field of research and will examine the mechanisms and value of their involvement.

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Aboriginal researchers with experience working within the corrective or drug and alcohol treatment services context with Aboriginal clients including Mr Michael Doyle and author MW. Two Aboriginal young people who have been clients of the PALM programme. An Aboriginal staff member from Ted Noffs Foundation, Mr Leo Wright. A representative of Ted Noffs Foundation as an organisation, Mr Kieran Palmer.

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**Ethics approval** The UNSW Human Research Ethics Committee and Aboriginal Health and Medical Research Council Ethics Committee have approved the prospective component of this study. Ethics applications to State-level ethics committees for the retrospective component have been approved subject to Aboriginal Health and Medical Research Council Ethics which is currently under review and also final approval by ACT data custodians.

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